

S P E C I F I C A T I O N

LG Innotek Co., Ltd.

|                           |          |                             |          |                     |
|---------------------------|----------|-----------------------------|----------|---------------------|
| A P P D.                  | C H K D. | D S G D.                    | MODEL NO | T A D M - H 1 0 2 F |
| 2002.10.26<br>G.S<br>Park |          | 2002.10.26<br>H.S<br>Cheong |          | B C 4 0 3 8 9       |

|                           |    |                                 |      |      |          |          |          |                      |  |
|---------------------------|----|---------------------------------|------|------|----------|----------|----------|----------------------|--|
| S P E C I F I C A T I O N |    |                                 |      |      |          |          |          |                      |  |
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|                           |    |                                 |      |      | A P P D. | C H K D. | D S G D. | MODEL NO: TADM-H102F |  |
|                           |    |                                 |      |      |          |          |          | TITLE:               |  |
|                           |    |                                 |      |      |          |          |          | SPECIFICATION        |  |
|                           |    |                                 |      |      |          |          |          | DOCUMENT NO:         |  |
| SYMB                      | NO | APPD                            | CHKD | DSGD |          |          |          | BC 40389 (1/23)      |  |

|      |                                  |           |
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|      |    |      |      |      |          |          |          |                         |
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1. Common
- 1- 1. Application
- This specification applies to TMI type (RF Front-End system) for TV, VTR
- 1- 2. Structure
- Refer to the attached assembly drawing.
- 1- 3. Circuit
- Refer to the attached circuit diagram.
2. General specifications.
- 2- 1. Applicable broadcasting system
- M NTSC / US CH
- 2- 2. Receiving system
- Upper Heterodyne
- 2- 3. Intermediate frequency
- Picture intermediate frequency : 45.75 MHz
- Sound intermediate frequency : 41.25 MHz
- 2- 4. Receiving channel
- VHF LOW : 2 ~ B Ch
- VHF HIGH : C ~ W+11 Ch
- UHF : W+12 ~ 69 Ch
- 2- 5. Output channel of modulator
- US 3 / 4 Ch

|      |    |      |      |      |          |          |          |                         |
|------|----|------|------|------|----------|----------|----------|-------------------------|
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|      |                |
|------|----------------|
|      | Terminal NO. 2 |
| 3 Ch | OPEN           |
| 4 Ch | GND            |

2- 6. Input / Output condition

ANT nominal impedance

ANT IN : 75Ω unbalance

ANT OUT : 75Ω unbalance

Video in impedance : 0.7kΩ ~ 1.3kΩ (typ. 1kΩ)

Audio in impedance : 10kΩ min.

Control impedance : 30kΩ min. (typ. 100kΩ)

Video out load : 10kΩ

Audio out load : 100kΩ

2- 7. Operating temperature range

**Temperature: -10℃ ~ +60℃**  
**(Normally Air Temperature)**

Humidity : less than 65%RH

2- 8. Storage temperature range

**Temperature : -10℃ ~ +70℃**  
**(Normally Air Temperature)**

Humidity : less than 70%RH

2-9. Guarantee voltage for operation

| Terminal       | Supply voltage |      |      |      |
|----------------|----------------|------|------|------|
|                | min.           | typ. | max. | unit |
| +B             | 4.8            | 5.0  | 5.2  | Vdc  |
| MB             | --             | --   | --   |      |
| TU             | 29.0           | 32.0 | 34.0 |      |
| CONTROL(MD:ON) | 4.8            | 5.0  | 5.2  |      |

|      |    |      |      |      |          |          |          |                         |
|------|----|------|------|------|----------|----------|----------|-------------------------|
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| SYMB | NO | APPD | CHKD | DSGD |          |          |          | BC 40389 (4/23)         |

2-10. Maximum ratings

| Terminal       | Supply voltage | Unit |
|----------------|----------------|------|
| +B             | 6.0            | Vdc  |
| MB             | --             |      |
| TU             | 35.0           |      |
| CONTROL(MD:ON) | 6.0            |      |

(note) Within “PB” supply voltage at SCL,SDA,terminal.

2-11. Current consumption

| Terminal       | Current consumption |      |      |      |
|----------------|---------------------|------|------|------|
|                | min.                | typ. | max. | unit |
| +B             | –                   | 170  | 200  | mA   |
| MB             | –                   | --   | --   |      |
| TU             | –                   | 1.5  | 5.0  |      |
| CONTROL(MD:ON) | –                   | 47.0 | 173  | μA   |

2-12. PLL characteristics of tuner section

2-12-1. I2C data format

|                | MSB |     |     |     |     |     |     | LSB |   |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|---|
| Address byte   | 1   | 1   | 0   | 0   | 0   | MA1 | MA0 | 0   | A |
| Divider byte 1 | 0   | N14 | N13 | N12 | N11 | N10 | N9  | N8  | A |
| Divider byte 2 | N7  | N6  | N5  | N4  | N3  | N2  | N1  | N0  | A |
| Control byte   | 1   | CP  | 0   | 0   | 0   | R1  | R0  | 0   | A |
| B AND SW byte  | 0   | 0   | 0   | 0   | BS3 | BS2 | BS1 | BS0 | A |

|      |    |      |      |      |          |          |          |                         |  |
|------|----|------|------|------|----------|----------|----------|-------------------------|--|
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Where:

- A : Acknowledge bit
- Address Selection

| “ADSW” 단자전압         | MA1 | MA0 |
|---------------------|-----|-----|
| 0~0.1 × PB          | 0   | 0   |
| OPEN                | 0   | 1   |
| 0.4 × PB ~ 0.6 × PB | 1   | 0   |
| 0.9 × PB ~PB        | 1   | 1   |

- CP : Charge pump current ( CP = 0 = 50μA, CP = 1 = 200μA )
- N14~ N0 : Programmable divider byte  
$$N = N14 \times 2^{14} + N13 \times 2^{13} + \text{---} + N1 \times 2^1 + N0$$
- Band switching byte

|          | BS3 | BS2 | BS1 | BS0 |
|----------|-----|-----|-----|-----|
| UHF      | 1   | 0   | 0   | 0   |
| VHF HIGH | 0   | 0   | 1   | 0   |
| VHF LOW  | 0   | 0   | 0   | 1   |

2-12-2. Oscillator frequency calculation

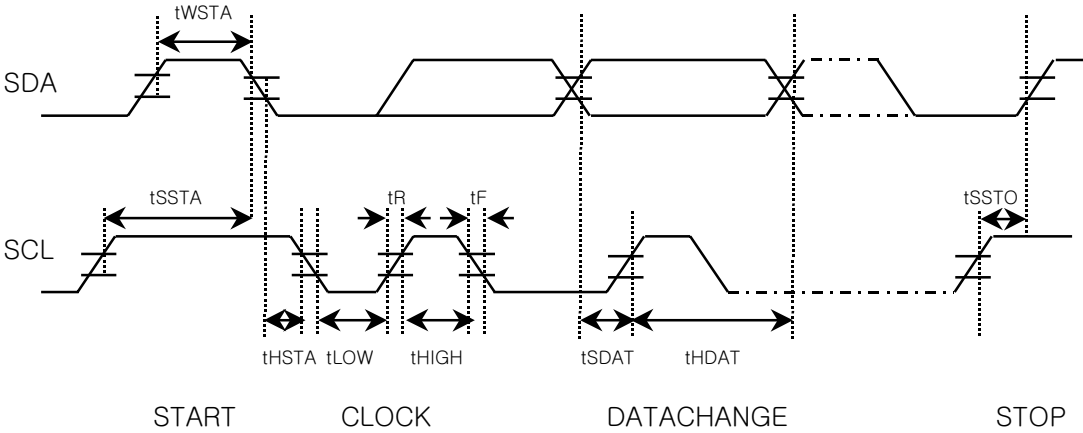
- $F_{osc} = F_{ref} \times 8 \times N$
- Fosc : Locked oscillator frequency
  - Fref : 4MHz/512 = 7.8125kHz
  - N : Oscillator frequency data

2-12-3. Input Signal Level ( SCL, SDA )

| INPUT Signal level | MIN | MAX | Unit |
|--------------------|-----|-----|------|
| High level         | 3.0 | 5.5 | V    |
| Low level          | -   | 1.5 |      |

|      |    |      |      |      |          |          |          |                         |
|------|----|------|------|------|----------|----------|----------|-------------------------|
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2-12-4 I<sup>2</sup>C BUS Time



|       |                        | MIN  | TYP | MAX | 단 위  |
|-------|------------------------|------|-----|-----|------|
| fSCL  | SCL clock frequency    | 0    |     | 400 | kHz  |
| tWSTA | Start waiting time     | 1300 |     |     | nsec |
| tHSTA | Start hold time        | 600  |     |     | "    |
| tLOW  | Low clock pulse width  | 1300 |     |     | "    |
| tHIGH | High clock pulse width | 600  |     |     | "    |
| tSSTA | Start set-up time      | 600  |     |     | "    |
| tHDAT | Data hold time         | 1300 |     |     | "    |
| tSDAT | Data set-up time       | 600  |     |     | "    |
| tR    | Rise time              |      |     | 300 | "    |
| tF    | Fall time              |      |     | 300 | "    |
| tSSTO | Stop set-up time       | 600  |     |     | "    |

2-13. Test condition

| Terminal            | Supply voltage | Unit | Remarks             |
|---------------------|----------------|------|---------------------|
| +B                  | 5 ± 0.1        | Vdc  | Ripple:10mVp-p max. |
| MB                  | 5 ± 0.1        | Vdc  |                     |
| TU                  | 32 ± 2         | Vdc  |                     |
| CONTROL             | 5 ± 0.1        | Vdc  |                     |
| Ambient temperature | 25 ± 5         | ℃    |                     |
| Relative humidity   | 65 ± 10        | %RH  |                     |

|      |    |      |      |      |          |          |          |                                 |
|------|----|------|------|------|----------|----------|----------|---------------------------------|
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| SYMB | NO | APPD | CHKD | DSGD |          |          |          |                                 |

2-14. Measuring instruments

2-14-1. RF-modulator section

|                        |          |                 |
|------------------------|----------|-----------------|
| Audio analyzer         | : 8903B  | HP              |
| Television demodulator | : 5126A  | NIHON TSUSHINKI |
| Spectrum analyzer      | : 8568B  | HP              |
| Network analyzer       | : 8753C  | HP              |
| TV pattern generator   | : TSG120 | TEKTRONIX       |
|                        | 3900N    | NIHON TSUSHINKI |
| Video Measurement      | : VM700A | TEKTRONIX       |

2-14-2. IF section

|                      |          |           |
|----------------------|----------|-----------|
| TV pattern generator | : TG-7/1 | SHIBASOKU |
|                      | TG2000   | TEKTRONIX |
| IF modulator         | : RM54A  | SHIBASOKU |
|                      | 146F     | EIDEN     |
| RF converter         | : RC51B  | SHIBASOKU |
|                      | 458C-X   | EIDEN     |
| Video Measurement    | : VM700A | TEKTRONIX |
| Audio Analyzer       | : 8903B  | HP        |

|      |    |      |      |      |          |          |          |                         |
|------|----|------|------|------|----------|----------|----------|-------------------------|
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|      |    |      |      |      |          |          |          | TITLE:<br>SPECIFICATION |
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| SYMB | NO | APPD | CHKD | DSGD |          |          |          | BC 40389 (8/23)         |

3. Electrical characteristics

The unit stated in  $\text{dB}\mu\text{V}$  is defined the value at 75 $\Omega$  terminal in this specification. ( 0  $\text{dBm}$  = 109  $\text{dB}\mu\text{V}$  )

3- 1. RF-modulator section

| Item | Specification |      |      |      | Note |
|------|---------------|------|------|------|------|
|      | min.          | typ. | max. | unit |      |

|                          |    |    |    |   |                                                                                       |
|--------------------------|----|----|----|---|---------------------------------------------------------------------------------------|
| 3-1- 1. Video modulation | 74 | 80 | 86 | % | Input signal : 1.0Vp-p white<br>Measure at the output of the<br>standard demodulator. |
|--------------------------|----|----|----|---|---------------------------------------------------------------------------------------|

|                                                   |        |        |        |     |                                                                                                                                                                                                                 |
|---------------------------------------------------|--------|--------|--------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3-1- 2. Video limit modulation                    | 87     | 93     | 99     | %   | Input signal : 1.5Vp-p stair-steps or ramp.<br>Measure at the output of the standard demodulator.                                                                                                               |
| 3-1- 3. V/S ratio                                 | 10:3.8 | 10:4.0 | 10:4.1 | -   | Input signal :1.0Vp-p white<br>V : S = 10 : 4<br>Measure at the output of the standard demodulator.                                                                                                             |
| 3-1- 4. Video amplitude frequency characteristics | -3.0   | -0.5   | +3.0   | dB  | Measure range : 0.1MHz ~ 4.2MHz<br>Based on 1MHz                                                                                                                                                                |
| 3-1- 5. Differential Gain (DG)                    | -      | 2      | 7      | %   | Input signal : 1.0Vp-p stair-steps<br>Chrominance : 20 IRE<br>Luminance : 0 ~ 90 %                                                                                                                              |
| 3-1- 6. Differential Phase (DP)                   | -      | 2      | 7      | deg | Input signal : 1.0Vp-p stair-steps<br>Chrominance : 20 IRE<br>Luminance : 0 ~ 90 %                                                                                                                              |
| 3-1- 7. Video S/N                                 | 45     | 47     | -      | dB  | Compensation of spectral luminance efficacy.<br>RF output should be amped 12dB. (LGEC control method<br>Measurement conditions.<br>Measure at the out of the Standard demodulator.<br>(5126A - NIHON TSUSHINKI) |

[illegible]

| Item                                                    |    |      |      |      | Specification |              |            |                   | Note                                                                                                                                                                                                    |
|---------------------------------------------------------|----|------|------|------|---------------|--------------|------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                         |    |      |      |      | min.          | typ.         | max.       | unit              |                                                                                                                                                                                                         |
|                                                         |    |      |      |      |               |              |            |                   | Video Measurement : VM700A<br>( TEKTRONIX )<br>HPF : 100kHz, LPF : 4.2MHz<br>SC TRAP : ON, WEIGHT : OFF<br>Input signals :<br>Video : 100% white signal<br>Audio : none<br>Video band : 0.1MHz ~ 4.2MHz |
| 3-1- 8. Chroma beat<br>(920kHz P.C.S. beat)             |    |      |      |      | 55            | 65           | -          | dB                | Input signal : 0.4Vp-p<br>3.58MHz sine wave<br>Use spectrum analyzer to<br>measure the level of<br>Fp + 0.92MHz<br>The value is relative to the<br>level of Fp without video<br>modulation.             |
| 3-1- 9. Audio modulation<br>(deviation)                 |    |      |      |      | 32<br>(64)    | 40<br>(80)   | 48<br>(96) | kHz<br>dev<br>(%) | Input signal : -6.5dBs,<br>(1.04Vp-p)<br>1kHz sine wave<br>(100 % modulation =<br>± 25kHz dev.)                                                                                                         |
| 3-1-10. Audio maximum<br>modulation                     |    |      |      |      | 150<br>(300)  | 220<br>(440) | -          | kHz<br>dev<br>(%) | Input signal : 1kHz sine wave<br>The input should be adjusted<br>to the level just before<br>the saturation of the<br>modulation.                                                                       |
| 3-1-11. Audio amplitude<br>frequency<br>characteristics |    |      |      |      | -3            | +0.2<br>-0.6 | +3         | dB                | Input signal : -6.5dBs,<br>(1.04Vp-p)<br>Measure range : 50Hz ~ 10kHz<br>Based on 1kHz                                                                                                                  |
| 3-1-12. Audio distortion                                |    |      |      |      | -             | 0.5          | 2.0        | %                 | Input signals :<br>Audio : -6.5dBs (1.04Vp-p),<br>1kHz sine wave<br>Video : 1Vp-p color bar<br>De-emphasis is on.(75μ sec)                                                                              |
|                                                         |    |      |      |      | A P P D.      |              | C H K D.   | D S G D.          | MODEL NO: TADM-H102F                                                                                                                                                                                    |
|                                                         |    |      |      |      |               |              |            |                   | TITLE:                                                                                                                                                                                                  |
|                                                         |    |      |      |      |               |              |            |                   | SPECIFICATION                                                                                                                                                                                           |
|                                                         |    |      |      |      |               |              |            |                   | DOCUMENT NO:                                                                                                                                                                                            |
| SYMB                                                    | NO | APPD | CHKD | DSGD |               |              |            |                   | BC 40389 (10/23)                                                                                                                                                                                        |

| Item                                          |  |  |  |  | Specification |       |      |      | Note                                                                                                                                                                                          |  |
|-----------------------------------------------|--|--|--|--|---------------|-------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                               |  |  |  |  | min.          | typ.  | max. | unit |                                                                                                                                                                                               |  |
| 3-1-13. Audio S/N                             |  |  |  |  | 48            | 54    | -    | dB   | Input signals :<br>Audio : -6.5dBs (1.04Vp-p),<br>1kHz sine wave<br>Video : All black<br>(sync. only)<br>Use standard demodulator of<br>inter-carrier system.<br>De-emphasis is on. (75μ sec) |  |
| 3-1-14. Audio buzz                            |  |  |  |  | 45            | 55    | -    | dB   | Video input signal : 1Vp-p<br>color bar<br>Other conditions : same as<br>item 3-1-13.                                                                                                         |  |
| 3-1-15. Video carrier<br>output level         |  |  |  |  | 63            | 66.0  | 67   | dBμV | Video input signal : 1Vp-p<br>100% white signal.                                                                                                                                              |  |
| 3-1-16. P/S ratio<br>(sound carrier<br>level) |  |  |  |  | -12.5         | -14.5 | -17  | dB   | Audio input signal : none<br>Other conditions : same as<br>item 3-1-15.                                                                                                                       |  |
| 3-1-17. Video carrier<br>frequency            |  |  |  |  | -150          | -     | +150 | kHz  | Video input signal : none                                                                                                                                                                     |  |
| 3-1-18. Sound carrier<br>frequency            |  |  |  |  | 4493          | 4500  | 4507 | kHz  | Audio input signal : none<br>The measurements are taken<br>after 1 min. from the power on.                                                                                                    |  |
| 3-1-19. Outband<br>spurious                   |  |  |  |  | -             | -     | 39.5 | dBμV | Video input signal : 1Vp-p<br>color bar<br>Measure range : 0 ~ 1GHz<br>Except the range from<br>Fp-4.6MHz to Fp+7.4MHz.                                                                       |  |
| 3-1-20. Inband<br>spurious                    |  |  |  |  | 60            | -     | -    | dB   | Input signals :<br>Video : none<br>Audio : none<br>Measure range : Fp~Fp+4.5MHz.                                                                                                              |  |
| 3-1-21. Terminal leakage                      |  |  |  |  | -             | -     | 54   | dBμV | Measure range : 0 ~ 1GHz<br>except GND.                                                                                                                                                       |  |

|      |    |      |      |      |          |          |          |                                  |
|------|----|------|------|------|----------|----------|----------|----------------------------------|
|      |    |      |      |      | A P P D. | C H K D. | D S G D. | MODEL NO: TADM-H102F             |
|      |    |      |      |      |          |          |          | TITLE:<br>SPECIFICATION          |
|      |    |      |      |      |          |          |          | DOCUMENT NO:<br>BC 40389 (11/23) |
| SYMB | NO | APPD | CHKD | DSGD |          |          |          |                                  |

3-1-22. Stability

- 3-1-22-1. Video carrier frequency rise up time.  
The time to approach the set value  $\pm 100\text{kHz}$  : within 3 seconds
- 3-1-22-2. Audio carrier frequency rise up time.  
The time to approach the set value  $\pm 5\text{kHz}$  : within 10 seconds
- 3-1-22-3. Video carrier frequency shift by supply voltage drift.  
Within  $\pm 10\text{kHz}$  by  $\pm 0.3\text{V}$  shift of the supply voltage.
- 3-1-22-4. Audio carrier frequency shift by supply voltage drift.  
Within  $\pm 3\text{kHz}$  by  $\pm 0.3\text{V}$  shift of the supply voltage.

3-1-23. Thermal Stability

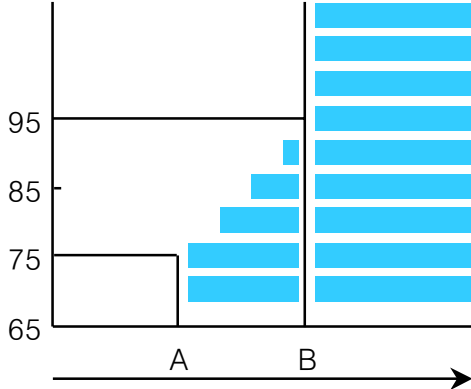
- 3-1-23-1. Thermal stability of video modulation.  
Within  $\pm 4\%$  based on the temperature of  $25^{\circ}\text{C}$ .  
  
※ Unless otherwise specified, thermal stability tests shall be performed under the following conditions.  
  
Measurement temperature range :  $-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$   
  
Humidity range : 45%RH ~85%RH  
  
Test measurement order and time :  
 $25^{\circ}\text{C} \rightarrow -10^{\circ}\text{C}(2\text{H}) \rightarrow 10^{\circ}\text{C}(1\text{H}) \rightarrow 25^{\circ}\text{C}(1\text{H}) \rightarrow 45^{\circ}\text{C}(1\text{H}) \rightarrow 60^{\circ}\text{C}(2\text{H})$
- 3-1-23-2. Thermal stability of video modulation.  
Within  $\pm 150\text{kHz}$  based on the temperature of  $25^{\circ}\text{C}$ .
- 3-1-23-3. Thermal stability of audio modulation.  
Within  $\pm 20\%$  based on the temperature of  $25^{\circ}\text{C}$ .
- 3-1-23-4. Thermal stability of video modulation.  
Within  $\pm 10\%$  on the temperature of  $25^{\circ}\text{C}$ .
- 3-1-23-5. Thermal stability of P/S ratio  
Within  $\pm 3.0\text{ dB}$  based on the temperature of  $25^{\circ}\text{C}$ , but the P/S ratio itself should not be less than 13 dB.

|      |    |      |      |      |          |          |          |                         |
|------|----|------|------|------|----------|----------|----------|-------------------------|
|      |    |      |      |      | A P P D. | C H K D. | D S G D. | MODEL NO: TADM-H102F    |
|      |    |      |      |      |          |          |          | TITLE:<br>SPECIFICATION |
|      |    |      |      |      |          |          |          | DOCUMENT NO:            |
| SYMB | NO | APPD | CHKD | DSGD |          |          |          | BC 40389 (12/23)        |

|                                                                                                                                                      |    |      |      |      |               |      |          |            |                                                                            |           |                                  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----|------|------|------|---------------|------|----------|------------|----------------------------------------------------------------------------|-----------|----------------------------------|--|
| 3- 2. ANT SW section                                                                                                                                 |    |      |      |      |               |      |          |            |                                                                            |           |                                  |  |
| Unless otherwise specified, measurement range shall be 54MHz ~ 810MHz,<br>and unused RF terminals shall be terminated by rated impedance Terminator. |    |      |      |      |               |      |          |            |                                                                            |           |                                  |  |
| Item                                                                                                                                                 |    |      |      |      | Specification |      |          |            | Note                                                                       |           |                                  |  |
|                                                                                                                                                      |    |      |      |      | min.          | typ. | max.     | unit       |                                                                            |           |                                  |  |
| 3-2-1. Insertion loss                                                                                                                                |    |      |      |      | -             | 5    | 6        | dB         | ANT IN to ANT OUT<br>mode : TV (at MD OFF)                                 |           |                                  |  |
| 3-2-2. VSWR I                                                                                                                                        |    |      |      |      | -             | 5.5  | 7        |            | ANT IN Terminal<br>mode : TV (at MD OFF)<br>54MHz ~ 810MHz                 |           |                                  |  |
| 3-2-3. VSWR II                                                                                                                                       |    |      |      |      | -             | 2    | 4        |            | ANT OUT terminal<br>mode : TV (at MD OFF)<br>54MHz ~ 810MHz                |           |                                  |  |
|                                                                                                                                                      |    |      |      |      | -             | 2    | 3        |            | mode : VTR (at MD ON)<br>61MHz ~ 72MHz                                     |           |                                  |  |
| 3-2-4. Isolation                                                                                                                                     |    |      |      |      | 60            | 65   | -        | dB         | Isolation from ANT OUT to ANT IN<br>mode : VTR (at MD ON)<br>61MHz ~ 72MHz |           |                                  |  |
| 3-2-5. ANT IN leakage<br>- MD<br><br>- TU OSC                                                                                                        |    |      |      |      | -             | -    | 9.5      | dB $\mu$ V | mode : VTR (at MD ON)<br>RF-modulator section :<br>none input signal       |           |                                  |  |
|                                                                                                                                                      |    |      |      |      | -             | -    | 52       | dB $\mu$ V | Tuner OSC leakage.                                                         |           |                                  |  |
| 3-2-6. 2nd Harmonics<br>inter modulation                                                                                                             |    |      |      |      | 55            | 64   | -        | dB         | f1/(f1+f2) ratio<br>mode : TV (at MD OFF)                                  |           |                                  |  |
|                                                                                                                                                      |    |      |      |      |               |      |          |            | item                                                                       | freq(MHz) | level(dB) $\mu$ V                |  |
|                                                                                                                                                      |    |      |      |      |               |      |          |            | f1                                                                         | 91.25     | 100                              |  |
|                                                                                                                                                      |    |      |      |      |               |      |          |            | f2                                                                         | 103.25    | 100                              |  |
|                                                                                                                                                      |    |      |      |      |               |      |          |            | Both f1 and f2 are not modulated.                                          |           |                                  |  |
|                                                                                                                                                      |    |      |      |      | A P P D.      |      | C H K D. |            | D S G D.                                                                   |           | MODEL NO: TADM-H102F             |  |
|                                                                                                                                                      |    |      |      |      |               |      |          |            |                                                                            |           | TITLE:<br>SPECIFICATION          |  |
|                                                                                                                                                      |    |      |      |      |               |      |          |            |                                                                            |           | DOCUMENT NO:<br>BC 40389 (13/23) |  |
| SYMB                                                                                                                                                 | NO | APPD | CHKD | DSGD |               |      |          |            |                                                                            |           |                                  |  |

| Item                    |    |      |      |      | Specification |      |          |      | Note                                                                                                                                                                                                                                                                                                                                                                 |  |                         |           |                   |    |       |     |    |        |    |
|-------------------------|----|------|------|------|---------------|------|----------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------|-----------|-------------------|----|-------|-----|----|--------|----|
|                         |    |      |      |      | min.          | typ. | max.     | unit |                                                                                                                                                                                                                                                                                                                                                                      |  |                         |           |                   |    |       |     |    |        |    |
| 3-2-7. Cross modulation |    |      |      |      | 55            | 62   | -        | dB   | <div>Then take the smallest ratio from the sideband to f2 as cross modulation value.</div> <table><tr><td>item</td><td>freq(MHz)</td><td>level(dB)<math>\mu V</math></td></tr><tr><td>f1</td><td>91.25</td><td>105</td></tr><tr><td>f2</td><td>193.25</td><td>80</td></tr></table> <div>f1 is 40% AM modulated by 15.75KHz sine wave.<br/>f2 is not modulated.</div> |  | item                    | freq(MHz) | level(dB) $\mu V$ | f1 | 91.25 | 105 | f2 | 193.25 | 80 |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  | item                    | freq(MHz) | level(dB) $\mu V$ |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  | f1                      | 91.25     | 105               |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  | f2                      | 193.25    | 80                |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  |                         |           |                   |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  |                         |           |                   |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  |                         |           |                   |    |       |     |    |        |    |
|                         |    |      |      |      | A P P D.      |      | C H K D. |      | D S G D.                                                                                                                                                                                                                                                                                                                                                             |  | MODEL NO: TADM-H102F    |           |                   |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  | TITLE:<br>SPECIFICATION |           |                   |    |       |     |    |        |    |
|                         |    |      |      |      |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  | DOCUMENT NO:            |           |                   |    |       |     |    |        |    |
| SYMB                    | NO | APPD | CHKD | DSGD |               |      |          |      |                                                                                                                                                                                                                                                                                                                                                                      |  | BC 40389 (14/23)        |           |                   |    |       |     |    |        |    |

|                                                                            |        |      |      |      |               |          |          |                                 |                                                                                                                          |                |
|----------------------------------------------------------------------------|--------|------|------|------|---------------|----------|----------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------|
| 3- 3. Tuner section                                                        |        |      |      |      |               |          |          |                                 |                                                                                                                          |                |
| When the test characteristics, test point is pin no.16/if output terminal. |        |      |      |      |               |          |          |                                 |                                                                                                                          |                |
| Item                                                                       |        |      |      |      | Specification |          |          |                                 | Note                                                                                                                     |                |
|                                                                            |        |      |      |      | min.          | typ.     | max.     | unit                            |                                                                                                                          |                |
| 3-3-1. IF Rejection                                                        |        |      |      |      |               |          |          |                                 | 75Ω terminated                                                                                                           |                |
|                                                                            |        | UHF  |      | 60   | 80            | -        | dB       | ANT INPUT level<br>65dB $\mu$ V |                                                                                                                          |                |
| VHF                                                                        | HIGH   |      | 60   | 80   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            | LOW    |      | 45   | 60   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            |        | UHF  |      | 40   | 60            | -        | dB       | ANT INPUT level<br>95dB $\mu$ V |                                                                                                                          |                |
| VHF                                                                        | HIGH   |      | 40   | 65   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            | LOW    |      | 40   | 60   | -             |          |          |                                 |                                                                                                                          |                |
| 3-3-2. Image Rejection                                                     |        |      |      |      |               |          |          |                                 |                                                                                                                          | 75Ω terminated |
|                                                                            |        | UHF  |      | 45   | 60            | -        | dB       | ANT INPUT level<br>65dB $\mu$ V |                                                                                                                          |                |
| VHF                                                                        | CATV   |      | 45   | 70   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            | 13 ~ 7 |      | 60   | 75   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            | 6 ~ 2  |      | 60   | 75   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            |        | UHF  |      | 40   | 55            | -        | dB       | ANT INPUT level<br>95dB $\mu$ V |                                                                                                                          |                |
| VHF                                                                        | CATV   |      | 40   | 60   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            | 13 ~ 7 |      | 40   | 60   | -             |          |          |                                 |                                                                                                                          |                |
|                                                                            | 6 ~ 2  |      | 40   | 60   | -             |          |          |                                 |                                                                                                                          |                |
| 3-3-3. 920kHz Color Beat Rejection                                         |        |      |      |      |               |          |          |                                 | ANT INPUT level<br>p:60dB $\mu$ V (75Ω terminated)<br>c:44dB $\mu$ V (75Ω terminated)<br>s:54dB $\mu$ V (75Ω terminated) |                |
|                                                                            |        | UHF  |      | 50   | 80            | -        | dB       |                                 |                                                                                                                          |                |
|                                                                            |        | VHF  |      | 50   | 80            | -        |          |                                 |                                                                                                                          |                |
|                                                                            |        |      |      |      |               |          |          |                                 |                                                                                                                          |                |
|                                                                            |        |      |      |      | A P P D.      | C H K D. | D S G D. | MODEL NO: TADM-H102F            |                                                                                                                          |                |
|                                                                            |        |      |      |      |               |          |          | TITLE:<br>SPECIFICATION         |                                                                                                                          |                |
|                                                                            |        |      |      |      |               |          |          | DOCUMENT NO:                    |                                                                                                                          |                |
| SYMB                                                                       | NO     | APPD | CHKD | DSGD |               |          |          | BC 40389 (15/23)                |                                                                                                                          |                |

| Item                       |  |  |  |  | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |               |      | Note                                                                                                                        |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
|----------------------------|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------|------|-----------------------------------------------------------------------------------------------------------------------------|-----|---------------------------|----|--|---------------|--|---------------|--|-----|--|----|--|----|--|-----|----------|----|--|----|--|--------|----|--|----|--|----|--|------|------|------|-------|------|
|                            |  |  |  |  | min.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | typ.     | max.          | unit |                                                                                                                             |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
| 3-3-4. CH 6 beat           |  |  |  |  | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60       | -             | dB   | ANT INPUT level<br>desire : 60dB $\mu$ V<br>(75 $\Omega$ terminated)<br>undesire : 54dB $\mu$ V<br>(75 $\Omega$ terminated) |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
| 3-3-5. CH A-5 beat         |  |  |  |  | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60       | -             | dB   | ANT INPUT level<br>desire : 60dB $\mu$ V<br>(75 $\Omega$ terminated)                                                        |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
| 3-3-6. CB rejection.       |  |  |  |  | 0.535 MHz ~ 30 MHz<br>-7dBm min                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |               |      | desire : 55.25MHz ~ 83.25MHz<br>(Ch.2 ~ Ch.6)<br>-66dBm                                                                     |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
| 3-3-7. 1% Cross modulation |  |  |  |  | <div><div>(dB <math>\mu</math>V)</div><div>desire<br/>input signal</div><div><div>75<math>\Omega</math> terminated</div></div><div>Un-desire signal (dB<math>\mu</math>V)</div></div> <table><tr><th colspan="2">CH</th><th colspan="2">A(dB<math>\mu</math>V)</th><th colspan="2">B(dB<math>\mu</math>V)</th></tr><tr><td colspan="2">UHF</td><td colspan="2">67</td><td colspan="2">84</td></tr><tr><td rowspan="2">VHF</td><td>W+11 ~ J</td><td colspan="2">67</td><td colspan="2">89</td></tr><tr><td>13 ~ 2</td><td colspan="2">67</td><td colspan="2">89</td></tr></table> <div>Cross modulation value should be within hantched area.<br/>※ Tuner should be measured for 1% cross modulation<br/>with <math>\pm 2</math> channel undesired signal.</div> |          |               |      |                                                                                                                             |     |                           | CH |  | A(dB $\mu$ V) |  | B(dB $\mu$ V) |  | UHF |  | 67 |  | 84 |  | VHF | W+11 ~ J | 67 |  | 89 |  | 13 ~ 2 | 67 |  | 89 |  | CH |  | min. | typ. | max. | unit. | note |
|                            |  |  |  |  | CH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          | A(dB $\mu$ V) |      | B(dB $\mu$ V)                                                                                                               |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
|                            |  |  |  |  | UHF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | 67            |      | 84                                                                                                                          |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
|                            |  |  |  |  | VHF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | W+11 ~ J | 67            |      | 89                                                                                                                          |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
|                            |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13 ~ 2   | 67            |      | 89                                                                                                                          |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
|                            |  |  |  |  | UHF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | -             | -    | 250                                                                                                                         | kHz | + B $\pm$ 10%<br>PLL "ON" |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |
|                            |  |  |  |  | VHF HIGH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          | -             | -    | 250                                                                                                                         |     |                           |    |  |               |  |               |  |     |  |    |  |    |  |     |          |    |  |    |  |        |    |  |    |  |    |  |      |      |      |       |      |

|      |    |      |      |      |          |  |          |  |          |  |                         |  |
|------|----|------|------|------|----------|--|----------|--|----------|--|-------------------------|--|
|      |    |      |      |      | A P P D. |  | C H K D. |  | D S G D. |  | MODEL NO: TADM-H102F    |  |
|      |    |      |      |      |          |  |          |  |          |  | TITLE:<br>SPECIFICATION |  |
|      |    |      |      |      |          |  |          |  |          |  | DOCUMENT NO:            |  |
| SYMB | NO | APPD | CHKD | DSGD |          |  |          |  |          |  | BC 40389 (16/23)        |  |

|                              |           |        |      |      |       |          |       |
|------------------------------|-----------|--------|------|------|-------|----------|-------|
| 3-3-9. Over range            | CH        | Vtu    |      | min. | typ.  | max.     | unit. |
|                              | UHF       | 28.0 V |      | 2.0  | -     | -        | MHz   |
|                              |           | 0.5 V  |      | 2.0  | -     | -        |       |
|                              | VHF       | 28.0 V |      | 2.0  | -     | -        |       |
|                              |           | 0.5 V  |      | 2.0  | -     | -        |       |
| 3-3-10. Noise Figure         | CH        | min.   | typ. | max. | unit. | note     |       |
|                              | UHF       | -      | 9.0  | 14.0 | dB    |          |       |
|                              | VHF HIGH  | -      | 8.0  | 14.0 |       |          |       |
|                              | VHF LOW   | -      | 8.0  | 13.0 |       |          |       |
|                              |           |        |      |      |       |          |       |
| 3-3-11. Power gain deviation | UHF       | -      | 6    | 12   | dB    |          |       |
|                              | VHF HIGH  | -      | 6    | 12   |       |          |       |
|                              | VHF LOW   | -      | 6    | 12   |       |          |       |
| 3-3-12. Temperature shift    | W+12 ~ 69 | -      | -    | 3000 | kHz   | 25℃± 25℃ |       |
|                              | W+11 ~ J  | -      | -    | 3000 |       |          |       |
|                              | 13 ~ 2    | -      | -    | 2000 |       |          |       |

3-4. IF section

When the test electrical characteristics when there are no instruction.  
fp input level is 70 dBμV and p/s ratio is -7 dB.

| Item             | Specification |      |      |      | Note                                                                                           |
|------------------|---------------|------|------|------|------------------------------------------------------------------------------------------------|
|                  | min.          | typ. | max. | unit |                                                                                                |
| 3-4-1. Video S/N | 44            | 47   | -    | dB   | A figure in parentheses is spec by LGIT measurement system                                     |
|                  | 43            | 47   | -    |      | 50% white signal.<br>87.5% modulation.<br>Subcarrier trap : on<br>HPF : 100 kHz, LPF : 4.2 MHz |

|      |    |      |      |      |          |          |          |                         |
|------|----|------|------|------|----------|----------|----------|-------------------------|
|      |    |      |      |      | A P P D. | C H K D. | D S G D. | MODEL NO: TADM-H102F    |
|      |    |      |      |      |          |          |          | TITLE:<br>SPECIFICATION |
|      |    |      |      |      |          |          |          | DOCUMENT NO:            |
| SYMB | NO | APPD | CHKD | DSGD |          |          |          | BC 40389 (17/23)        |

| Item                                             |    |      |      |      | Specification |      |          |            | Note                                                                                                           |                                             |                      |
|--------------------------------------------------|----|------|------|------|---------------|------|----------|------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------|
|                                                  |    |      |      |      | min.          | typ. | max.     | unit       |                                                                                                                |                                             |                      |
| 3-4-2. Noise limiting sensitivity                |    |      |      |      |               | 45   | 48       | dB $\mu$ V | A figure in parentheses is spec by LGIT measurement system                                                     |                                             |                      |
| AIR                                              |    |      |      |      |               |      |          |            | 50% white signal.<br>87.5% modulation.<br>Subcarrier trap : on<br>HPF : 100kHz, LPF : 4.2MHz<br>Video S/N=30dB |                                             |                      |
| CATV                                             |    |      |      |      |               |      |          |            |                                                                                                                |                                             |                      |
| UHF                                              |    |      |      |      |               |      |          |            |                                                                                                                |                                             |                      |
| 3-4-3. Video output level                        |    |      |      |      | 0.8           | 1.0  | 1.2      | Vp-p       | standard color bar:87.5% mod.                                                                                  |                                             |                      |
| 3-4-4. SYNC ratio                                |    |      |      |      | 25            | 28.6 | 30       | %          | standard color bar:87.5% mod.                                                                                  |                                             |                      |
| Burst ratio                                      |    |      |      |      | 17            | 25   | 37       |            |                                                                                                                |                                             |                      |
| 3-4-5. Video amplitude frequency characteristics |    |      |      |      |               | -3   | -1       | +2         | dB                                                                                                             | Full sweep : 87.5% mod.<br>based on 0.5 MHz |                      |
| 1.0 MHz                                          |    |      |      |      |               |      |          |            |                                                                                                                |                                             |                      |
| 2.0 MHz                                          |    |      |      |      |               |      |          |            |                                                                                                                |                                             |                      |
| 3.0 MHz                                          |    |      |      |      |               |      |          |            |                                                                                                                |                                             |                      |
| 3.58MHz                                          |    |      |      |      |               |      |          |            |                                                                                                                |                                             |                      |
| 3-4-6. Sin <sup>2</sup> 2T pulse response        |    |      |      |      | 70            | 90   | -        | %          | Sin <sup>2</sup> 2T pulse & bar:87.5% mod.                                                                     |                                             |                      |
| 3-4-7. Differential Gain                         |    |      |      |      | -             | 5    | 10       | %          | 5 stair-steps : 87.5% mod.<br>Set modulation at the peak of 5'th chroma signal                                 |                                             |                      |
| 3-4-8. Differential Phase                        |    |      |      |      | -             | 5    | 10       | deg        | 5 stair-steps : 87.5% mod.<br>Set modulation at the peak of 5'th chroma signal                                 |                                             |                      |
| 3-4-9. Y/C delay time                            |    |      |      |      | -100          | 0    | +100     | nsec       | 0.25 MHz standard Envelope delay meter.                                                                        |                                             |                      |
|                                                  |    |      |      |      | A P P D.      |      | C H K D. |            | D S G D.                                                                                                       |                                             | MODEL NO: TADM-H102F |
|                                                  |    |      |      |      |               |      |          |            |                                                                                                                |                                             | TITLE:               |
|                                                  |    |      |      |      |               |      |          |            |                                                                                                                |                                             | SPECIFICATION        |
|                                                  |    |      |      |      |               |      |          |            |                                                                                                                |                                             | DOCUMENT NO:         |
| SYMB                                             | NO | APPD | CHKD | DSGD |               |      |          |            |                                                                                                                |                                             | BC 40389 (18/23)     |

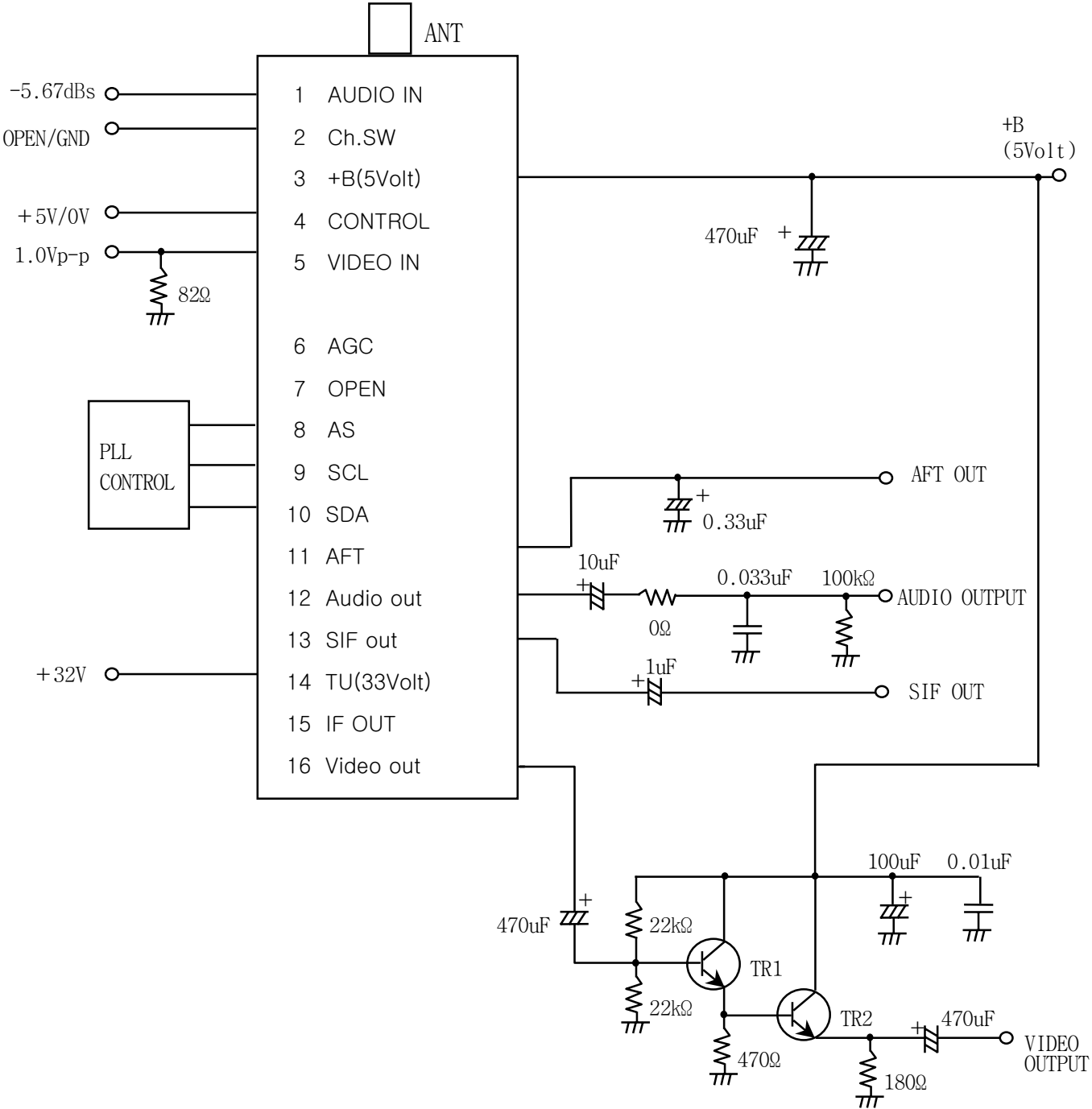
| Item                                    |    |      |      |      | Specification |      |          |            | Note                                                                                                                                                                    |  |
|-----------------------------------------|----|------|------|------|---------------|------|----------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                         |    |      |      |      | min.          | typ. | max.     | unit       |                                                                                                                                                                         |  |
| 3-4-10. Audio output level              |    |      |      |      | 280           | 370  | 500      | mVrms      | 1kHz /± 25kHz dev.<br>standard color bar:87.5% mod.                                                                                                                     |  |
| 3-4-11. Audio distortion                |    |      |      |      | -             | 1    | 2        | %          | 1kHz /± 25kHz dev.<br>standard color bar:87.5% mod.                                                                                                                     |  |
| 3-4-12. Audio frequency characteristics |    |      |      |      |               |      |          |            | 20Hz ~ 12kHz<br>Based on 1kHz /± 7.5kHz dev.<br>standard color bar:87.5% mod.<br>PRE-EMP ( 75usec ) : "ON"                                                              |  |
| 50 Hz                                   |    |      |      |      | -3            | 0    | +3       | dB         |                                                                                                                                                                         |  |
| 10 kHz                                  |    |      |      |      | -3            | 0    | +3       | dB         |                                                                                                                                                                         |  |
| 3-4-13. Audio S/N                       |    |      |      |      | 42            | 50   | -        | dB         | 1kHz /± 25kHz dev.<br>standard color bar:87.5% mod.<br>Use IHF filter.                                                                                                  |  |
| 3-4-14. SYNC buzz                       |    |      |      |      | -             | 50   | 100      | mVp-p      | standard color bar:87.5% mod.<br>400Hz/± 25kHz dev.<br>P/S=-17dB                                                                                                        |  |
| 3-4-15. AFT alignment accuracy          |    |      |      |      | 1.5           | 2.5  | 3.5      | Vdc        | Alignment center : 2.5V<br>IF input level : 90dB $\mu$ V<br>P/S=-7dB<br>standard color bar:87.5% mod.<br>( 25°C± 10°C & 0 ~ 45% Hum )                                   |  |
| 3-4-16. SIF Output Level                |    |      |      |      | 60            | 65   |          | dB $\mu$ V | Video mod. : Color Bar 87.5% mod.<br>RF INPUT Level = 70 dB $\mu$ V<br>P/S = -6dB<br>Measure peak of 4.5MHz carrier<br>Level using Spectrum Analyzer<br>and 1:10 Probe. |  |
|                                         |    |      |      |      | A P P D.      |      | C H K D. |            | D S G D.                                                                                                                                                                |  |
|                                         |    |      |      |      |               |      |          |            | MODEL NO: TADM-H102F                                                                                                                                                    |  |
|                                         |    |      |      |      |               |      |          |            | TITLE:<br>SPECIFICATION                                                                                                                                                 |  |
|                                         |    |      |      |      |               |      |          |            | DOCUMENT NO:<br>BC 40389 (19/23)                                                                                                                                        |  |
| SYMB                                    | NO | APPD | CHKD | DSGD |               |      |          |            |                                                                                                                                                                         |  |

| 4. ENVIRONMENTAL TESTS   |    |      |      |      |                                                                         |                                                                                                                                                                                                                                            |                                                                                                                                                                                |                                  |  |
|--------------------------|----|------|------|------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|
| Item                     |    |      |      |      | Specification                                                           |                                                                                                                                                                                                                                            |                                                                                                                                                                                | Note                             |  |
|                          |    |      |      |      | TUNER                                                                   | MODULATOR                                                                                                                                                                                                                                  | IF                                                                                                                                                                             |                                  |  |
| 4-1. Heat load teat      |    |      |      |      | OSC frequency<br>(PLL : ON)<br><br>UHF : ± 100kHz<br><br>VHF : ± 100kHz | Video modulation<br>± 8%max<br><br>Video carrier frequency<br>± 150kHz max<br><br>Video carrier output level<br>± 4dB max<br><br>Audio modulation<br>± 18% max<br><br>Audio carrier frequency<br>± 20kHz max<br><br>P/S ratio<br>± 3dB max | Video S/N<br>± 6dB<br><br>Video output<br>± 0.2Vp-p max<br><br>Noise limiting sensitivity<br>± 6dB<br><br>Audio output<br>± 30% max<br><br><b>AFT OUTPUT<br/>1.4 ~ 3.5 Vdc</b> | test condition 4-1-1             |  |
| 4-2. Humidity load teat  |    |      |      |      | same as in item 4-1                                                     |                                                                                                                                                                                                                                            |                                                                                                                                                                                | test condition 4-2-1             |  |
| 4-3. Cold test           |    |      |      |      | same as in item 4-1                                                     |                                                                                                                                                                                                                                            |                                                                                                                                                                                | test condition 4-3-1             |  |
| 4-4. Operating life test |    |      |      |      | same as in item 4-1                                                     |                                                                                                                                                                                                                                            |                                                                                                                                                                                | test condition 4-4-1             |  |
| 4-5. High voltage test   |    |      |      |      | same as in item 4-1                                                     |                                                                                                                                                                                                                                            |                                                                                                                                                                                | test condition 4-5-1             |  |
| 4-6. Vibration test      |    |      |      |      | same as in item 4-1                                                     |                                                                                                                                                                                                                                            |                                                                                                                                                                                | test condition 4-6-1             |  |
| 4-7. Impact test         |    |      |      |      | same as in item 4-1                                                     |                                                                                                                                                                                                                                            |                                                                                                                                                                                | test condition 4-7-1             |  |
|                          |    |      |      |      | A P P D.                                                                | C H K D.                                                                                                                                                                                                                                   | D S G D.                                                                                                                                                                       | MODEL NO: TADM-H102F             |  |
|                          |    |      |      |      |                                                                         |                                                                                                                                                                                                                                            |                                                                                                                                                                                | TITLE:<br>SPECIFICATION          |  |
|                          |    |      |      |      |                                                                         |                                                                                                                                                                                                                                            |                                                                                                                                                                                | DOCUMENT NO:<br>BC 40389 (20/23) |  |
| SYMB                     | NO | APPD | CHKD | DSGD |                                                                         |                                                                                                                                                                                                                                            |                                                                                                                                                                                |                                  |  |

|                                      |    |      |      |      |                                                                                                                                                                                                                                                                                                                                                         |          |          |                         |  |
|--------------------------------------|----|------|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------------------------|--|
| Environmental test condition         |    |      |      |      |                                                                                                                                                                                                                                                                                                                                                         |          |          |                         |  |
| Item                                 |    |      |      |      | Test condition                                                                                                                                                                                                                                                                                                                                          |          |          |                         |  |
| 4-1-1 Heat load teat                 |    |      |      |      | 1. Initial value measure at standard test condition.<br>2. Leave samples in 70℃± 2℃ for 96± 5 hours, and in standard test condition for 30 minutes, then take measurements within 1 hour.<br>3. Supply voltage : standard ± 10%<br>4. Supply voltage cycle : 1.5h on, 0.5h off                                                                          |          |          |                         |  |
| 4-2-1 Humidity load test             |    |      |      |      | 1. Leave samples in 40± 5℃ for 24± 2 hours, and in standard test condition for 30 minutes, then take measurements.<br>2. Leave samples in 40± 5℃ 80 ~ 90% rh, for 96± 5 hours, and in standard test condition for 30 minutes, then take measurements within 1 hour.<br>3. Supply voltage : standard +10%<br>4. Supply voltage cycle : 1.5h on, 0.5h off |          |          |                         |  |
| 4-3-1 Cold test                      |    |      |      |      | 1. Initial value measure at standard test condition.<br>2. Leave samples in -20℃± 2℃ for 96± 5 hours, and in standard test condition for 2 hours, then take measurements within 1 hour.                                                                                                                                                                 |          |          |                         |  |
| 4-4-1 Operating life test            |    |      |      |      | 1. Take measurements in standard test condition.<br>2. Leave samples for 1000 hours, then take measurements.<br>3. Supply voltage : standard                                                                                                                                                                                                            |          |          |                         |  |
| 4-5-1 High voltage test              |    |      |      |      | Ant. IN : ± 15kV, 10 times (150pF charged)<br>series R=150Ω                                                                                                                                                                                                                                                                                             |          |          |                         |  |
| 4-6-1 Vibration test                 |    |      |      |      | Vibration test fixture in used to vibrate the tuner with a total amplitude of 1mm and frequency ranging from 10 to 55hz, once per minute consecutively, for 40 minutes in each of three directions, x,y and z.                                                                                                                                          |          |          |                         |  |
| 4-7-1 Impact test                    |    |      |      |      | 1. Impact acceleration : 50m/sec²<br>2. Impact time : 11msec<br>3. Impact time & direction : 3 times per each 6 sides                                                                                                                                                                                                                                   |          |          |                         |  |
| 5. Mechanical characteristics        |    |      |      |      |                                                                                                                                                                                                                                                                                                                                                         |          |          |                         |  |
| 5-1 Outline view assembly appearance |    |      |      |      | No defects of wiring, soldering and assembling.<br>No dirt, rust, corrosion or foreign material.                                                                                                                                                                                                                                                        |          |          |                         |  |
|                                      |    |      |      |      | A P P D.                                                                                                                                                                                                                                                                                                                                                | C H K D. | D S G D. | MODEL NO: TADM-H102F    |  |
|                                      |    |      |      |      |                                                                                                                                                                                                                                                                                                                                                         |          |          | TITLE:<br>SPECIFICATION |  |
|                                      |    |      |      |      |                                                                                                                                                                                                                                                                                                                                                         |          |          | DOCUMENT NO:            |  |
|                                      |    |      |      |      |                                                                                                                                                                                                                                                                                                                                                         |          |          | BC 40389 (21/23)        |  |
| SYMB                                 | NO | APPD | CHKD | DSGD |                                                                                                                                                                                                                                                                                                                                                         |          |          |                         |  |

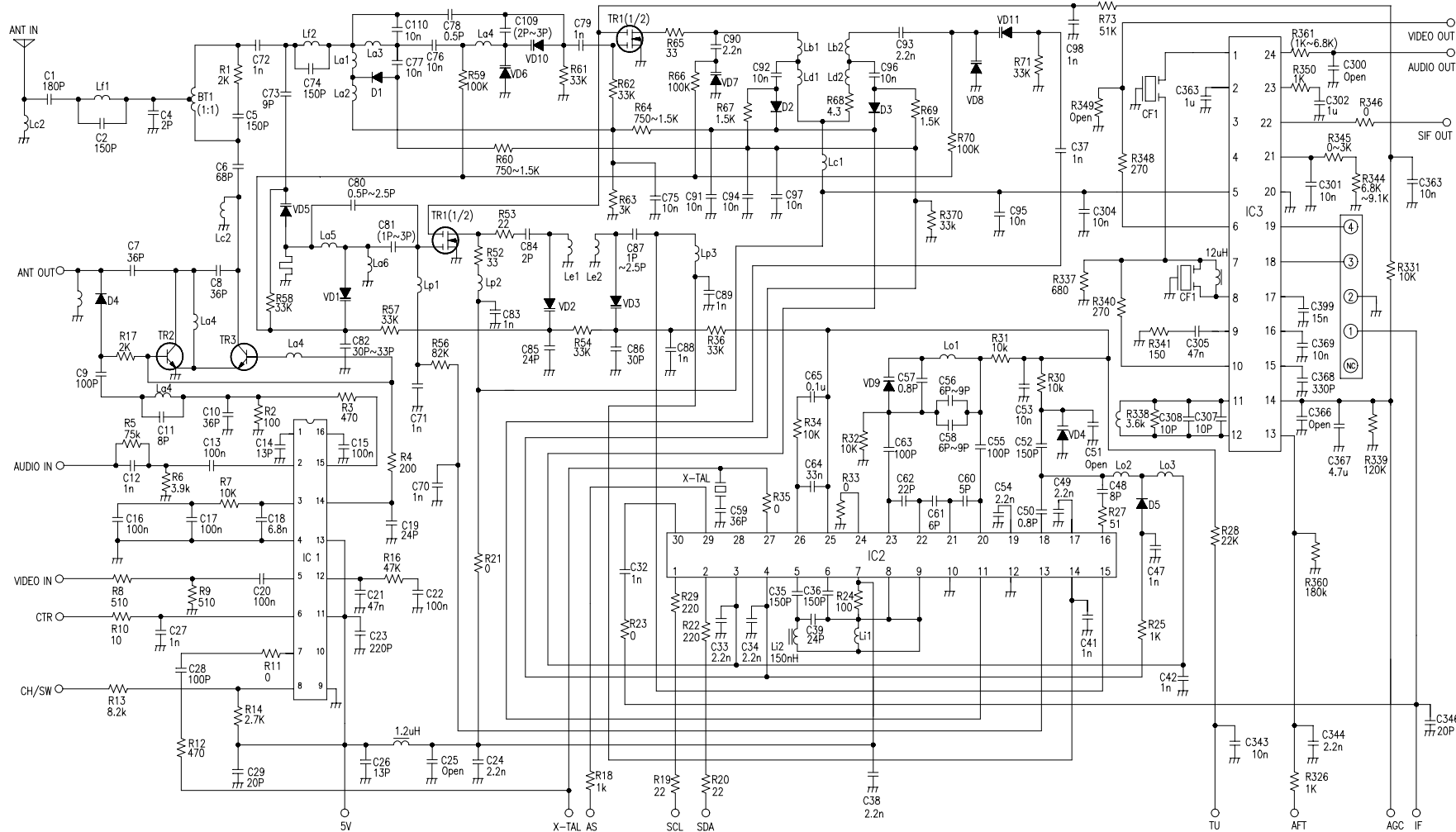
| Item                                                                                                        |    |      |      |      | Test condition                                                                                                                                                                                                              |          |          |                                  |
|-------------------------------------------------------------------------------------------------------------|----|------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------------------------------|
| 5-2 Appearance structure<br><br>Dimension<br>Mounting<br>Weight<br><br>6. Others<br>6-1. Ant jack Load Test |    |      |      |      | As assembly drawing.<br>As assembly drawing.<br>Approximately 60± 5g.<br><br>Crack, defection and shaking should not be existed with 15kg.cm banding moment after caulking.<br><br><div data-bbox="526 576 929 828"> </div> |          |          |                                  |
|                                                                                                             |    |      |      |      |                                                                                                                                                                                                                             |          |          |                                  |
|                                                                                                             |    |      |      |      |                                                                                                                                                                                                                             |          |          |                                  |
|                                                                                                             |    |      |      |      | A P P D.                                                                                                                                                                                                                    | C H K D. | D S G D. | MODEL NO: TADM-H102F             |
|                                                                                                             |    |      |      |      |                                                                                                                                                                                                                             |          |          | TITLE:<br>SPECIFICATION          |
|                                                                                                             |    |      |      |      |                                                                                                                                                                                                                             |          |          | DOCUMENT NO:<br>BC 40389 (22/23) |
| SYMB                                                                                                        | NO | APPD | CHKD | DSGD |                                                                                                                                                                                                                             |          |          |                                  |

7. TEST CIRCUIT



NOTE  
TR1, TR2 : 2SC1213 or  
EQUIVALENT

|      |    |      |      |      |          |          |          |                                  |
|------|----|------|------|------|----------|----------|----------|----------------------------------|
|      |    |      |      |      | A P P D. | C H K D. | D S G D. | MODEL NO: TADM-H102F             |
|      |    |      |      |      |          |          |          | TITLE:<br>SPECIFICATION          |
|      |    |      |      |      |          |          |          | DOCUMENT NO:<br>BC 40389 (23/23) |
| SYMB | NO | APPD | CHKD | DSGD |          |          |          |                                  |



1. Unless otherwise specified.

All resistors are in ohm. Capacitors are in farad. inductor are in henry.

2. Semiconductors are as follows.

|         |                           |          |                          |
|---------|---------------------------|----------|--------------------------|
| TR1     | : TBB1002                 | F1       | : TSF5232P, M1865D       |
| TR2,TR3 | : 2SC4774, 2SC5343, BF799 | CF1      | : SFSRA4M50, LT4.5MH     |
| IC1     | : LA77000, LA7161         | CF2      | : TPSRA4M50              |
| IC2     | : CXA3627N                | VD1~VD12 | : BB659C, HVC200A, 1W403 |
| IC3     | : LA75676VA               | D1~D4    | : BA892, HSC277          |

|          |                                                                                       |      |             |                                                                                       |      |          |      |  |                                                                                       |                                             |                                          |        |                                          |            |                          |  |  |
|----------|---------------------------------------------------------------------------------------|------|-------------|---------------------------------------------------------------------------------------|------|----------|------|--|---------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------|--------|------------------------------------------|------------|--------------------------|--|--|
|          |                                                                                       |      |             |                                                                                       |      |          |      |  |                                                                                       |                                             |                                          |        |                                          |            | A3                       |  |  |
| PART NO. |                                                                                       |      | NAME        |                                                                                       |      | MATERIAL |      |  | SPEC.                                                                                 |                                             |                                          | FINISH |                                          |            | SIZE                     |  |  |
|          |  |      |             |  |      |          |      |  |  | UNIT<br>mm                                  |                                          | SCALE  |                                          | TADM-H102F |                          |  |  |
|          |  |      |             |  |      |          |      |  | APPD.<br>'02.10.25<br>Gil<br>Sang<br>Park                                             | CHKD.<br>'02.10.25<br>Hyo<br>Sung<br>Cheong | DSGD.<br>'02.10.25<br>Jin<br>Kyu<br>Park |        | DRAW.<br>'02.10.25<br>Myo<br>Soon<br>Kim |            | TITLE<br>CIRCUIT DIAGRAM |  |  |
| ZONE     |                                                                                       | SYMB | DATE OR NO. |                                                                                       | APPD | CHKD     | DSGD |  | DOCUMENT NO.<br>BD30327                                                               |                                             |                                          |        |                                          |            |                          |  |  |



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## 1. GENERAL SPECIFICATION

### 1) APPLICATION

This specification is applied to the VCR receiving the US 181 channel system VHF and UHF bands. ( RF modulator output channel is 3 or 4 CH. )

### 2) RECEIVING CHANNELS

- \* M NTSC / USA
- \* UHF : CH. W+12 - CH. 69
- \* VHF HIGH BAND : CH. C - CH. W+11
- \* VHF LOW BAND : CH. 2 - CH. B

### 3) INTERMEDIATE FREQUENCY

- \* PIF : 45.75MHz
- \* SIF : 41.25MHz

### 4) RECEIVING SYSTEM

- \* UPPER HETERODYNE SYSTEM

### 5) OUTPUT CHANNEL OF MODULATION

- \* 3 CH. : OPEN (61.25MHz)
- \* 4 CH. : GND (67.25MHz) By controlled PIN NO.2 (CH)

### 6) OPERATING CONDITIONS FOR GUARANTEE

- \* TEMPERATURE :  $-10^{\circ}\text{C}$  -  $60^{\circ}\text{C}$ , HUMIDITY 85% OR LESS

### 7) STORAGE CONDITION

- \* TEMPERATURE :  $-20^{\circ}\text{C}$  -  $70^{\circ}\text{C}$ , HUMIDITY 90% OR LESS

### 8) TESTING AMBIENT CONDITION

- \* DEFINED AS TEMPERATURE OF  $25 \pm 5^{\circ}\text{C}$  AND HUMIDITY OF  $65 \pm 10\%$  RH

### 9) REGULATION

- \* TCMN0682PA20C IS APPLIED FOR FCC REGULATION.

## 10) TERMINAL NAMES AND FUNCTIONS

| ITEM                         | PIN NO. | TERMINAL  | FUNCTION                             | REMARK |
|------------------------------|---------|-----------|--------------------------------------|--------|
| R F<br>SECTION               |         | RF INPUT  | RF SIGNAL INPUT TERMINAL             |        |
|                              |         | RF OUTPUT | RF SIGNAL OUTPUT TERMINAL            |        |
|                              | 1       | A I       | AUDIO INPUT                          |        |
|                              | 2       | C H       | CHANNEL CONTROL( OPEN:3CH,GND:4CH )  |        |
|                              | 3       | B +       | POWER SUPPLY TERMINAL                | 5V DC  |
|                              | 4       | CONTROL   | VIDEO /TV CONTROL TERMINAL           |        |
|                              | 5       | V I       | VIDEO SIGNAL INPUT                   |        |
| TUNER<br>/<br>PIF<br>SECTION | 6       | N.C       | -                                    |        |
|                              | 7       | N.C       | -                                    |        |
|                              | 8       | SAS       | SERIAL ADDRESS TERMINAL              |        |
|                              | 9       | SCL       | SERIAL CLOCK SUPPLY TERMINAL         |        |
|                              | 10      | SDA       | SERIAL DATA SUPPLY TERMINAL          |        |
|                              | 11      | AFT       | AFT OUTPUT TERMINAL                  |        |
|                              | 12      | A0        | AUDIO OUTPUT TERMINAL                |        |
|                              | 13      | SIF       | SIF OUTPUT TERMINAL                  |        |
|                              | 14      | BT        | TUNING VOLTAGE POWER SUPPLY TERMINAL | 33V DC |
|                              | 15      | N.C       | -                                    |        |
|                              | 16      | VO        | VIDEO OUTPUT TERMINAL                |        |

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## T M - B L O C K

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### 11) SEMICONDUCTOR USED

| ITEM             | FUNCTION       |            | Q'TY | NAME OF SEMICONDUCTOR         | REMARK |
|------------------|----------------|------------|------|-------------------------------|--------|
| R F<br>SECTION   | I C            |            | 1    | LA7161V-A                     |        |
|                  | S/W TRANSISTOR |            | 2    | 2SC5345U OR EQUIVALENT DEVICE |        |
|                  | S/W DIODE      |            | 1    | KDS114E                       |        |
| TUNER<br>SECTION | MOPLL IC       |            | 1    | TDA6503ATS                    |        |
|                  | VVC DIODE      |            | 11   | BB153, BB149(BB178, BB179)    |        |
|                  | RF AMP         | VHF        | 1    | BF909WR                       |        |
|                  |                | UHF        | 1    | BF909WR OR BF2030WR           |        |
| PIF<br>SECTION   | I C            |            | 1    | LA75676V                      |        |
|                  | FILTER         | SAW-FILTER | 1    | M1865D                        |        |
|                  |                | C - TRAP   | 1    | TPS4.5MB, XT4.5MB             |        |
|                  |                | C - FILTER | 1    | SFSH4.5MDB, LT4.5MH           |        |

### 12) CURRENT CONSUMPTION & SUPPLY VOLTAGE

| TERMINAL            |      | STANDARD SUPPLY<br>VOLTAGE( V ) | CURRENT CONSUMPTION( mA ) |       |       | GURANTEE<br>VOL. RATINS |
|---------------------|------|---------------------------------|---------------------------|-------|-------|-------------------------|
|                     |      |                                 | MIN.                      | TYP.  | MAX.  |                         |
| MOD.                | MB   | 5 ± 0.1V DC                     | -                         | 50    | 55    | 4.9 ~ 5.1 V             |
|                     | CON. | 5 ± 0.1V DC                     | -                         | 0.047 | 0.173 | 4.9 ~ 5.1 V             |
| TUNER<br>AND<br>PIF | BT   | 33 ± 0.1V DC                    | -                         | 2.5   | 5     | 30 ~ 34 V               |
|                     | BP   | 5V ± 0.1V DC                    | 115                       | 140   | 165   | 4.9 ~ 5.1 V             |

### 13) PLL DATA FORMAT

#### 13-1) Description of Tuner PLL Block

The PLL on this IC supports the IIC bus control format.

The control pins are as shown in the table below.

ref) ADSW(Address selection), SCL(SCL input), SDA(SDA I/O)

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## 13-2) INPUT SIGNAL LEVEL(SCL,SDA)

HIGH -LEVEL INPUT VOLTAGE : 3.0V MIN.

LOW -LEVEL INPUT VOLTAGE : 1.5V MAX.

## 13-3) X-TAL FREQUENCY : 4MHz

STEP SIZE IS CHANGED BY REFERENCE DIVIDER.

## 13-4) Address Setting

The response address can be changed according to the ADSW pin voltage, so that multiple PLL can exist within one system.

| ADSW pin voltage         | MA1 | MA0 |
|--------------------------|-----|-----|
| 0 to 0.1Vcc              | 0   | 0   |
| Open or 0.2Vcc to 0.3Vcc | 0   | 1   |
| 0.4Vcc to 0.6Vcc         | 1   | 0   |
| 0.9Vcc to Vcc            | 1   | 1   |

HEXA MODE = C2

# S P E C I F I C A T I O N

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## T M - B L O C K

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13-5) The TDA6503ATS control format is as follows

13-5-1) Write-mode

| Byte<br>Write Data | Byte | Bits |     |     |     |      |     |       |       |     | Remarks |
|--------------------|------|------|-----|-----|-----|------|-----|-------|-------|-----|---------|
|                    |      | MSB  |     |     |     |      |     |       |       | LSB |         |
| Address byte       | ADB  | 1    | 1   | 0   | 0   | 0    | MA1 | MA0   | 0     | A   |         |
| Divider byte 1     | DB1  | 0    | N14 | N13 | N12 | N11  | N10 | N9    | N8    | A   |         |
| Divider byte 2     | DB2  | N7   | N6  | N5  | N4  | N3   | N2  | N1    | N0    | A   |         |
| Control byte       | CB   | 1    | 0   | 0   | 0   | *    | 0   | 1     | 0     | A   |         |
| band SW byte       | BB   | X    | X   | X   | X   | PUHF | X   | PVHFH | PVHFL | A   |         |

13-5-2) Read-mode : Slave Transmitter

| Mode         | bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |   |
|--------------|------|------|------|------|------|------|------|------|---|
| Address byte | 1    | 1    | 0    | 0    | 0    | MA1  | MA0  | 1    | A |
| Status byte  | POR  | FL   | R    | 1    | 1    | A2   | A1   | A0   | A |

13-5-3) Description of symbols used in table

| SYMBOL                       | DESCRIPTION                                                                                                                                                                                                                                                        |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------|---------------------|---------------------|---|---|----|----|---|---|------------|-------|---|---|----|------|
| A                            | Acknowledge bit                                                                                                                                                                                                                                                    |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| MA1,MA0                      | programmable address bits ( MA1=0 ,MA0=1 ) ref: 13-4)                                                                                                                                                                                                              |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| N14 to N0                    | programmable divider bits                                                                                                                                                                                                                                          |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| CP                           | charge pump current bit( output current )<br>logic 0 : charge pump current is 60 $\mu$ A(default)<br>logic 1 : charge pump current is 280 $\mu$ A                                                                                                                  |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| OS                           | tuning amplifier control bits<br>logic 0 : tuning voltage is 'on' (during normal operating)<br>logic 1 : tuning voltage is 'off';high impedance output of pin VT(default)                                                                                          |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| PVHFL,PVHFH,PUHF<br>and FMST | PMOS ports control bis:<br>logic 0 : corresponding buffer is 'off'(default)<br>logic 1 : corresponding buffer is 'on'                                                                                                                                              |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| X                            | don't care : may be a logic 0 or a logic 1.                                                                                                                                                                                                                        |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| RSA and RSB                  | Reference Divider ratio select bits                                                                                                                                                                                                                                |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|                              | <table><tr><td>RSA</td><td>RSB</td><td>Divider</td><td>FREQUENCY STEP(KHz)</td></tr><tr><td>X</td><td>0</td><td>80</td><td>50</td></tr><tr><td>0</td><td>1</td><td>128( 1024)</td><td>31.25</td></tr><tr><td>1</td><td>1</td><td>64</td><td>62.5</td></tr></table> | RSA | RSB        | Divider             | FREQUENCY STEP(KHz) | X | 0 | 80 | 50 | 0 | 1 | 128( 1024) | 31.25 | 1 | 1 | 64 | 62.5 |
|                              | RSA                                                                                                                                                                                                                                                                | RSB | Divider    | FREQUENCY STEP(KHz) |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|                              | X                                                                                                                                                                                                                                                                  | 0   | 80         | 50                  |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|                              | 0                                                                                                                                                                                                                                                                  | 1   | 128( 1024) | 31.25               |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| 1                            | 1                                                                                                                                                                                                                                                                  | 64  | 62.5       |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|                              |                                                                                                                                                                                                                                                                    |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|                              |                                                                                                                                                                                                                                                                    |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
|                              |                                                                                                                                                                                                                                                                    |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| POR                          | power-on reset flag:<br>logic 0 : at power off<br>logic 1 : at power on                                                                                                                                                                                            |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| FL                           | in-lock flag :<br>logic 0 : loop is not locked<br>logic 1 : loop is locked                                                                                                                                                                                         |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| R                            | ready flag:<br>logic 0 : mode after power-on reset and the PLL is locked<br>logic 1 : in other conditions                                                                                                                                                          |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |
| A2,A1 and A0                 | digital outputs of the 5-level ADC                                                                                                                                                                                                                                 |     |            |                     |                     |   |   |    |    |   |   |            |       |   |   |    |      |

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## 2. ELECTRICAL CHARACTERISTICS

## 2-1. RF SECTION PERFORMANCE

## 2-1-1. VIDEO CHARACTERISTICS

| ITEM                                      | SPECIFICATION |      |        | UNIT | REMARK                                                                                                                                                                                                            |
|-------------------------------------------|---------------|------|--------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | MIN.          | TYP. | MAX.   |      |                                                                                                                                                                                                                   |
| Video Modulation                          | 72            | 80   | 88     | %    | Input signal: 1Vp-p white<br>stair step or ramp                                                                                                                                                                   |
| Video Maximum Modulation                  | 87            | 93   | 99     | %    | Input signal: 1.5Vp-p<br>stair step or ramp                                                                                                                                                                       |
| V/S Ratio                                 | 10:3.8        | 10:4 | 10:4.1 |      | Input signal: 1Vp-p white<br>V:S = 10:4                                                                                                                                                                           |
| Video Amplitude Frequency Characteristics | -3.0          | -0.5 | +3.0   | dB   | Measure range: 0.1MHz~4.2MHz<br>Based on 1MHz<br>Audio input signal: None                                                                                                                                         |
| Differential Gain(DG)                     | -7            | +2   | +7     | %    | Input signal: 1.0Vp-p stair step<br>Video Mod. : 80%<br>Luminance : 10~90%                                                                                                                                        |
| Differential Phase(DP)                    | -7            | +1.5 | +7     | deg  | Input signal: 1.0Vp-p stair step<br>Video Mod. : 80%<br>Luminance : 10~90%                                                                                                                                        |
| Video S/N                                 | 45            | 47   | -      | dB   | Measurement Conditions<br>-Standard De-modulator.<br>-S/N Meter<br>H.P.F: 100KHz, L.P.F: 4.2MHz<br>SC trap: ON, Weight: OFF<br>*Input signal<br>Video: 100% White signal<br>Audio: None<br>Video band: 0.1~4.2MHz |
| Chroma Beat                               | 58            | 65   |        | dB   | Input signal<br>Video: 0.4Vp-p, 3.58MHz,<br>Sine wave<br>Audio: None                                                                                                                                              |

## 2-1-2. SOUND CHARACTERISTICS

| ITEM                                      | SPECIFICATION |      |      | UNIT | REMARK                                                                                        |
|-------------------------------------------|---------------|------|------|------|-----------------------------------------------------------------------------------------------|
|                                           | MIN.          | TYP. | MAX. |      |                                                                                               |
| Audio Modulation                          | 64            | 80   | 96   | %    | Input signal:1.1Vp-p Sine wave<br>1KHz<br>(100% Mod.=±25KHzp-p dev.)                          |
| Audio Maximum Modulation                  | 150           |      |      |      | Input signal<br>: 1KHz, Sine wave                                                             |
| Audio Amplitude Frequency Characteristics | -3            | +1.0 | +3   | dB   | Input signal:1.1Vp-p<br>Sine wave<br>Measure range:50Hz~10KHz<br>Based on 1KHz                |
| Audio Distortion                          |               | 0.3  | 2.0  | %    | Input signal: 1.1Vp-p,1KHz<br>De-emphasis :0N(75usec)                                         |
| Audio S/N                                 | 48            | -    | -    | dB   | Video input signal<br>:Black burst<br>Reference audio input signal<br>:1.1Vp-p,1KHz,Sine wave |

## 2-1-3. OUTPUT CHARACTERISTICS

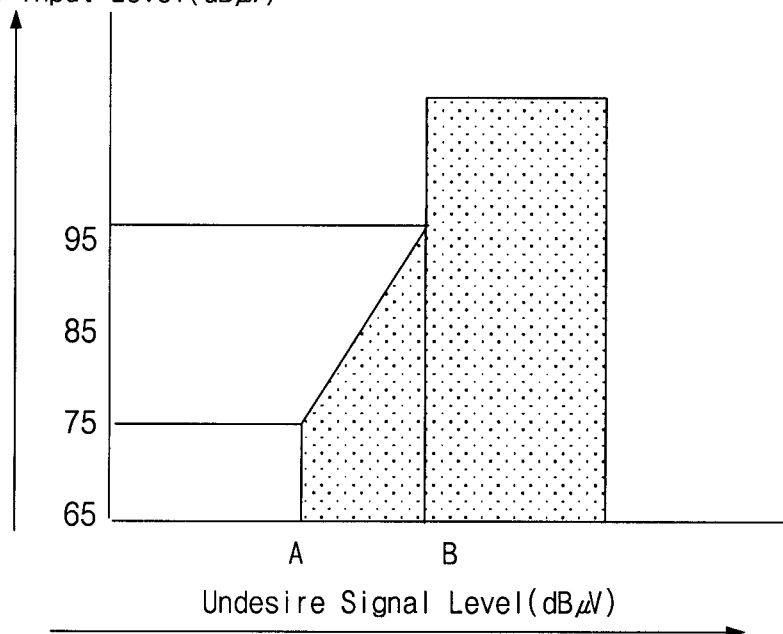
| ITEM                          | SPECIFICATION |      |      | UNIT       | REMARK                                                                 |
|-------------------------------|---------------|------|------|------------|------------------------------------------------------------------------|
|                               | MIN.          | TYP. | MAX. |            |                                                                        |
| Video Carrier                 | -80           | Fp   | +80  | KHz        | Video input signal:None                                                |
| Sound Carrier                 | -7            | Fs   | +7   | KHz        | Audio input signal:None                                                |
| Outband spurious              | 30            | -    |      | dB         | FCC Standard Precedure<br>Measure range:0~1GHz                         |
| Inband spurious               | 60            | -    | -    | dB         | Input signal<br>Video:None<br>Audio:None<br>Measure range:Fp ~ +4.5MHz |
| Video Carrier<br>Output Level | 63            | 66   | 69   | dB $\mu$ V |                                                                        |
| P/S Ratio                     | 13            | 16   | 19   | dB         | Audio input signal:None                                                |

## 2-1-4. ANTENNA CHARACTERISTICS

| ITEM            | SPECIFICATION |      |      | UNIT       | REMARK                                                                               |
|-----------------|---------------|------|------|------------|--------------------------------------------------------------------------------------|
|                 | MIN.          | TYP. | MAX. |            |                                                                                      |
| Insertion Loss  | -             | -    | 7.0  | dB         | ANT IN to ANT OUT<br>Mode:TV (at MOD. OFF)                                           |
| VSWR            |               |      | 3    |            | ANT OUT Terminal<br>Mode:TV (at MOD. OFF) 54~810MHz<br>Mode:VCR(at MOD. ON) 61~72MHz |
| Isolation       | 60            | -    | -    | dB         | Isolation from ANT OUT to ANT<br>IN:Mode-VCR(at MOD. ON) 61~72MHz                    |
| ANT. IN Leakage |               | 6    | 9.5  | dB $\mu$ V | Mode:VCR (at MOD. ON) 0~1GHz<br>ANTENA-OUT 75 $\Omega$ Loaded<br>Applied for FCC     |

## 2-2. TUNER SECTION

| ITEM                            | SPECIFICATION                  |      |      | UNIT  | REMARK                                                                      |
|---------------------------------|--------------------------------|------|------|-------|-----------------------------------------------------------------------------|
|                                 | MIN.                           | TYP. | MAX. |       |                                                                             |
| IF Rejection                    |                                |      |      |       |                                                                             |
| UHF                             | 60                             | 90   | -    | dB    | GR = 0dB<br>(75Ω terminate)<br>GR:Gain Reduction                            |
| VHF High                        | 60                             | 90   | -    |       |                                                                             |
| VHF Low                         | 50                             | 80   | -    |       |                                                                             |
| UHF                             | 40                             | 65   | -    |       |                                                                             |
| VHF High                        | 50                             | 75   | -    |       |                                                                             |
| VHF Low                         | 45                             | 70   | -    |       |                                                                             |
| Image Rejection                 |                                |      |      |       |                                                                             |
| UHF                             | 50                             | 60   | -    |       | GR = 0dB<br>(75Ω terminate)<br>GR:Gain Reduction                            |
| VHF W+11 <sup>-</sup> J         | 50                             | 65   | -    |       |                                                                             |
| 13 <sup>-</sup> 2               | 55                             | 65   | -    |       |                                                                             |
| UHF                             | 40                             | 55   | -    |       |                                                                             |
| VHF W+11 <sup>-</sup> J         | 45                             | 60   | -    |       |                                                                             |
| 13 <sup>-</sup> 2               | 50                             | 65   | -    |       |                                                                             |
| CH 6 Beat                       | 50                             |      |      | dB    | ANT INPUT<br>Des:60dB(μV), (75Ω terminate)<br>Und:54dB(μV), (75Ω terminate) |
| CH A-5 Beat                     | 50                             |      |      | dB    | ANT INPUT<br>Des:54dB(μV), (75Ω terminate)                                  |
| CB Rejection                    | 0.535MHz ~ 30MHz<br>-7dBm Min. |      |      |       | Desire:55.25MHz~83.25MHz<br>(CH2 ~ CH6)<br>-66dBm s/i=40dB                  |
| Available Input<br>signal level | 90                             | 100  |      | dB/μV | Distortion is nothing on normal condition.                                  |

1% Cross  
ModulationDesire Input Level(dB $\mu$ V)

| CH  | A (dB $\mu$ V) | B (dB $\mu$ V) |
|-----|----------------|----------------|
| UHF | $\geq 64$      | $\geq 84$      |
| VHF | $\geq 64$      | $\geq 84$      |

Cross modulation value should be within hatched area.

A = GR = 0dB

B = GR = 30dB

※ Tuner should be measured for 1% cross modulation with  $\pm 2$  channel undesired signal.

|            |           |          |      |      |      |      |  |
|------------|-----------|----------|------|------|------|------|--|
| Over Range | CH        | OSC Fre. | MIN. | TYP. | MAX. | UNIT |  |
|            | UHF       | High-end | +1   |      |      | MHz  |  |
|            |           | Low -end | -2   |      |      |      |  |
|            | V<br>High | High-end | +1   |      |      |      |  |
|            |           | Low -end | -2   |      |      |      |  |
|            | V<br>Low  | High-end | +2   |      |      |      |  |
|            |           | Low -end | -2   |      |      |      |  |

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|                                            |                 |                          |      |                                                                                                                                          |                                            |
|--------------------------------------------|-----------------|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Noise Figure                               | CH              | MIN.                     | TYP. | MAX.                                                                                                                                     | UNIT                                       |
|                                            | VHF             |                          |      | 12.5                                                                                                                                     | dB                                         |
|                                            | CATV            |                          |      | 12.5                                                                                                                                     |                                            |
|                                            | UHF             |                          |      | 14                                                                                                                                       |                                            |
| Lock-up time<br>(Tuning<br>searching time) |                 | Band low ch.<-->high ch. |      | UNIT                                                                                                                                     | REMARK                                     |
|                                            | VHF             | 100(typ.)                |      | ms                                                                                                                                       | CP = 0<br>( Charge pump<br>current=±50μA ) |
|                                            | CATV            | 100(typ.)                |      |                                                                                                                                          |                                            |
|                                            | UHF             | 100(typ.)                |      |                                                                                                                                          |                                            |
| ANT Local<br>Radiation                     | Applied for FCC |                          |      | When Tuner will be mounted in<br>standard set box,field strength<br>local oscillator should be<br>measured.<br>(Measurement distance:3m) |                                            |
| Accuracy of<br>Oscillator                  | MIN.            | TYP.                     | MAX. | UNIT                                                                                                                                     |                                            |
|                                            | -80             |                          | +80  | KHz                                                                                                                                      |                                            |

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## 2-3. IF SECTION

When test the electrical characteristics, Fp input level is 70dB $\mu$ V,  
P/S=-7dB, unless otherwise specified.

| ITEM                                | SPECIFICATION |      |      | UNIT       | REMARK                                                                                                                                                                      |
|-------------------------------------|---------------|------|------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | MIN.          | TYP. | MAX. |            |                                                                                                                                                                             |
| Video S/N                           |               |      |      |            | 100% white signal.<br>87.5% modulation.<br>Subcarrier trap:ON<br>HPF:100KHz, LPF:4.2MHz<br>ANT input level<br>VHF:70dB $\mu$ V, UHF:70dB $\mu$ V<br>(75 $\Omega$ terminate) |
| VHF                                 | 45            | 47   |      | dB         |                                                                                                                                                                             |
| UHF                                 | 45            | 47   |      |            |                                                                                                                                                                             |
| Video Noise<br>Limit<br>Sensitivity |               |      |      |            | 100% white signal.<br>87.5% modulation.<br>Subcarrier trap:ON<br>HPF:100KHz, LPF:4.2MHz<br>Video S/N=30dB                                                                   |
| VHF                                 |               |      | 48   | dB $\mu$ V |                                                                                                                                                                             |
| UHF                                 |               |      | 48   |            |                                                                                                                                                                             |
| Video Output<br>Level               | 0.8           | 1.0  | 1.2  | Vp-p       | Standard color bar:87.5% mod.                                                                                                                                               |
| Sync Ratio                          | 23.6          | 28   | 33.6 | %          | Standard color bar:87.5% mod.<br>V+S=100%                                                                                                                                   |
| Color Burst Level                   | 220           | 280  | 340  | mVp-p      | Input Level : 70dB $\mu$ V<br>Standard color bar:87.5% mod.                                                                                                                 |

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| ITEM                                            | SPECIFICATION |      |      | UNIT   | REMARK                                                                                                                                                                           |
|-------------------------------------------------|---------------|------|------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 | MIN.          | TYP. | MAX. |        |                                                                                                                                                                                  |
| Video Amplitude<br>Frequency<br>Characteristics |               |      |      |        | Multi-burst Signal:87.5% mod.<br>0.5MHz Reference                                                                                                                                |
| 1.0 MHz                                         | -3            | -1   | 1    | dB     |                                                                                                                                                                                  |
| 2.0 MHz                                         | -3            | -1   | 1    |        |                                                                                                                                                                                  |
| 3.0 MHz                                         | -4            | -1   | 2    |        |                                                                                                                                                                                  |
| 3.58MHz                                         | -6            | -2   | 0    |        |                                                                                                                                                                                  |
| Sin <sup>2</sup> 2T Pulse<br>Response           | 80            | 90   |      | %      | Sin <sup>2</sup> 2T Pulse & bar:87.5% mod.                                                                                                                                       |
| Differential Gain                               |               | 5    | 8    | %      | 5 stair step:87.5% mod.<br>Set modulation at the peak of<br>5th chroma signal.                                                                                                   |
| Differential<br>Phase                           |               | 5    | 8    | deg    | 5 stair step:87.5% mod.<br>Set modulation at the peak of<br>5th chroma signal.                                                                                                   |
| Y/C Delay time                                  | -200          | -50  | 100  | nsec   | Input Sin <sup>2</sup> 2T Pulse & Bar.<br>Use VM700A(Tektronix)                                                                                                                  |
| Chroma S/N                                      |               |      |      |        | 100% Chroma signal(RED)<br>87.5% modulation.<br>Subcarrier trap:OFF<br>HPF:100Hz, LPF:500KHz<br>Ant input level<br>VHF:70dB $\mu$ V, UHF:70dB $\mu$ V<br>(75 $\Omega$ terminate) |
| AM                                              | 49            | 52   |      | dB     |                                                                                                                                                                                  |
| PM                                              | 48            | 51   |      |        |                                                                                                                                                                                  |
| Audio Output<br>Level                           | 200           | 300  | 400  | mV rms | 1KHz/ $\pm$ 15KHz Dev.(60%)<br>Standard color bar:87.5% mod.<br>De-emphasis:ON<br>(ref: figure A of page 16 )                                                                    |
| Audio Distortion<br>[ CH:11 ]                   |               | 0.8  | 3    | %      | 1KHz/ $\pm$ 25KHz Dev.(100%)<br>Standard color bar:87.5% mod.<br>De-emphasis:ON<br>(ref: figure A of page 16 )                                                                   |

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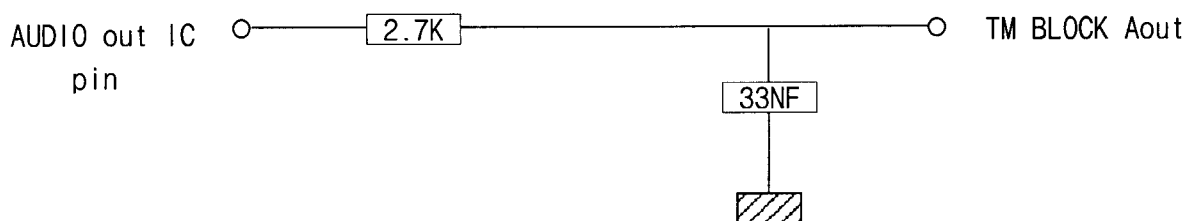
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| ITEM                   | SPECIFICATION |      |      | UNIT    | REMARK                                                                                                                                                                         |
|------------------------|---------------|------|------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | MIN.          | TYP. | MAX. |         |                                                                                                                                                                                |
| Audio Frequency        |               |      |      |         | 50Hz~10KHz<br>1KHz/±15KHz Standard<br>Standard color bar:87.5%<br>De-emphasis:ON<br>(ref: figure A of page 16 )                                                                |
| 50 Hz                  | -3            | 0    | 3    | dB      |                                                                                                                                                                                |
| 10KHz                  | -3            | 0    | 3    |         |                                                                                                                                                                                |
| Audio S/N              | 47            | 55   |      | dB      | 1KHz/±15KHz Dev.<br>Standard color bar:87.5% mod.<br>use CCITT filter<br>De-emphasis:ON<br>(ref: figure A of page 16 )                                                         |
| Audio Buzz             |               | 40   | 100  | mV(p-p) | Standard color bar:87.5% mod.<br>Ant input level:70dB(μV)<br>P/S=-10dB<br>De-emphasis:ON<br>(ref: figure A of page 16 )                                                        |
| AFT Alignment Accuracy | 1.5           | 2.5  | 3.5  | V       | Alignment center:2.5V<br>RF input level:70dB(μV)<br>P/S=-7dB<br>Standard color bar:87.5% mod.<br>Testing channel:11CH                                                          |
| 920KHz Beat            | 40            | 48   |      | dB      | 11CH,100dB(μV)(75Ω term.)<br>P/S=-7dB<br>Video:100% Chroma(RED)<br>$S/i = \frac{3.58 \text{ MHz signal level}}{920 \text{ KHz beat level}}$<br>*Check at Video output terminal |

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| ITEM                  | SPECIFICATION |      |      | UNIT       | REMARK                                                                                                                                                                                        |
|-----------------------|---------------|------|------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | MIN.          | TYP. | MAX. |            |                                                                                                                                                                                               |
| 4.5MHz Signal Leakage | 40            | 45   |      | dB         | 11CH, 100dB( $\mu V$ )(75 $\Omega$ term.)<br>P/S=-7dB<br>Video: 100% Chroma(RED)<br>$S/i = \frac{3.58MHz \text{ signal level}}{4.5MHz \text{ beat level}}$<br>*Check at Video output terminal |
| SIF LEVEL<br>(4.5MHz) | 70            | 75   |      | dB $\mu V$ | Standard color bar: 87.5% mod.<br>Ant input level: 70dB( $\mu V$ )<br>P/S=-7dB                                                                                                                |

「 Figure A 」

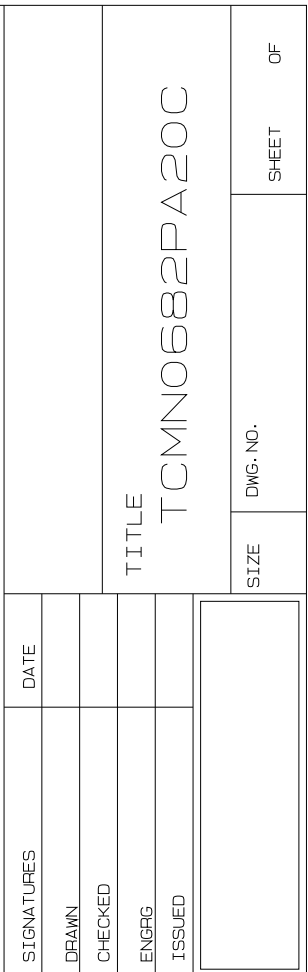


[ De-emphasis circuits for Test (Audio)

## 3.ENVIRONMENT TEST

| ITEM               | SPECIFICATION                                                         |                                                                                                                              | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | TUNER                                                                 | IF                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Heat Load Test     | OSC frequency<br>UHF: $\pm 2.0\text{MHz}$<br>VHF: $\pm 2.5\text{MHz}$ |                                                                                                                              | 1. Initial value measure at standard test condition.<br>2. Leave samples in $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for $96 \pm 5$ hours, and in standard test condition for 30 minutes, then take measurements within 1 hours.<br>3. Supply voltage : Standard $\pm 10\%$<br>4. Supply voltage cycle : 1.5H ON, 0.5H OFF                                                                                                                                           |
| Humidity Load Test |                                                                       | *VIDEO S/N $\pm 6\text{dB}$<br><br>*VIDEO OUTPUT LEVEL $\pm 0.2\text{Vp-p}$<br><br>*NOISE LIMIT SENSITIVITY $\pm 6\text{dB}$ | 1. Leave samples in $40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $24 \pm 2$ hours, and in standard test condition for 30 minutes, then take measurements<br>2. Leave samples in $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for $96 \pm 5\%$ RH hours, for $96 \pm 5$ hours, and in standard test condition for 30 minutes then take measurement within 1 hours.<br>3. Supply voltage : Standard $\pm 10\%$<br>4. Supply voltage cycle : 1.5 hours ON , 0.5 hours OFF |
| Cold Test          |                                                                       | *AUDIO OUTPUT LEVEL $\pm 30\% \text{ MAX}$                                                                                   | 1. Initial value measure at standard test condition.<br>2. Leave samples in $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for $96 \pm 5$ hours, and in standard test condition for 2 hours, then take measurements within 1 hours.                                                                                                                                                                                                                                       |
| Vibration Test     |                                                                       |                                                                                                                              | 1. Vibration test fixture is used to vibrate the tuner with a total amplitude of 1mm and frequency ranging from 10 to 55Hz, once per minute consecutively, for 40 minutes in each of three directions X, Y and Z.                                                                                                                                                                                                                                                      |

| ITEM                                | SPECIFICATION |                                                                                                      | TEST CONDITION                                                                                                                            |
|-------------------------------------|---------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | TUNER         | IF                                                                                                   |                                                                                                                                           |
| Operating Life Test                 | OSC frequency | *VIDEO S/N<br>$\pm 6\text{dB}$                                                                       | 1.Take measurements in standard test condition.<br>2.Leave samples for 1000 hours, then take measurements.<br>3.Supply voltage : Standard |
| Impact Test                         |               | *VIDEO<br>OUTPUT LEVEL<br>$\pm 0.2\text{Vp-p}$                                                       | 1.Impact acceleration : $50 \text{ m/s}^2$<br>2.Impact time : 11msec<br>3.Impact direction : 6 sides per each direction                   |
| High Test (Static Electricity Test) |               | *NOISE LIMIT SENSITIVITY<br>$\pm 6\text{dB}$<br><br>*AUDIO<br>OUTPUT LEVEL<br>$\pm 30\% \text{ MAX}$ | 5KV~20KV, 3 times(150pF charged)<br>series R = 330ohm<br>Terminal: Between RF-IN,RF-OUT & GND<br>Standard pulse at 5KV~20KV               |

[illegible]

