

1-1 GENERAL

Frequency Range	Digital Mode	Analog Mode
Transmitter	824 ~ 849 MHz	824 ~ 849 MHz
Receiver	869 ~ 894 MHz	869 ~ 894 MHz
Channel Spacing	1.23 MHz	30KHz
Number of Channels	20 FA	832 CHs
Duplex Spacing	45 MHz	
Frequency Stability	+ 2.5 ppm (-20°C ~ +60 °C, -4°C ~ +140 °C)	
Operating Temperature	-20°C ~ +60 °C (-4°C ~ +140 °C)	
Operating Voltage	3.6V DC (±10%)	
HHP	13.7V DC (±10%)	
Hands-Free		
Size and Weight	88 x 56 x 22 / 32 mm	
Operating Time	Digital Mode	Analog Mode
Standby Time	61 ~ 70 hours	7 ~ 8 hours
Talk Time	up to 150 minutes	up to 150 minutes

1-2 ANALOG MODE

TRANSMITTER

RF output power	0.6W (+2/-4dB)
Carrier ON/OFF conditions "ON" Condition "OFF" Condition	within ± 3 dB of specification output (in 2mS) below -60dBm (in 2mS)
Compressor Compression Rate Attack Time Recovery Time Reference Input	2:1 3mS 13.5mS Input level for producing a nominal ± 2.9 KHz peak frequency deviation of transmitted carrier
Preamphasis	6dB/OCT within 0.3 ~ 3KHz
Maximum Frequency Deviation F3 of G3 Supervisory Audio Tone Signaling Tone Wideband Data	± 12 KHz ± 2 KHz ($\pm 10\%$) ± 8 KHz ($\pm 10\%$) ± 8 KHz ($\pm 10\%$)
Post Deviation Limiter Filter 3.0 ~ 5.9KHz 5.9 ~ 6.1KHz 6.1 ~ 15KHz Over 15KHz	above 40 LOG (F/3000) dB above 35 dB above 40 LOG (F/3000) dB above 28 dB
Spectrum Noise Suppression For all modulation f0 +20KHz ~ f0 +45KHz For modulation by voice and SAT f0 +45KHz For modulation by WBD(without SAT) and ST (with SAT) f0 +45KHz ~ f0 +60KHz f0 +60KHz ~ f0 +90KHz f0 +90KHz ~ 2f0	above 26 dB above 63 +10 LOG (PY) dB above 45 dB above 65 dB above 63 +10 LOG (PY) dB (where f0=carrier frequency PY=mean output power in watts)
Harmonic and conducted Spurious Emissions	below 43 + 10 LOG (PY) dB

RECEIVER

De-Emphasis	-6dB / OCT within 0.3 ~3KHz
Expander Expander Rate Attack Time Recovery Time Reference Input	1:2 within 3mS within 13.5mS output level to a 1000Hz tone from a carrier within ± 2.9 KHz peak frequency deviation
Sensitivity	12dB SINAD / -116dBm
Intermodulation Spurious Response Attenuation	above 65dB
RSSI Range	above 60dB
Protection Against Spurious Response Interference	above 60dB
In Band Conducted Spurious Emission Transmit Band Receive Band Other Band	below -60dBm below -80dBm below -47dBm
Radiated Spurious Emission	
Frequency Range 25 ~ 70 MHz 70 ~ 130MHz 130 ~ 174 MHz 174 ~ 260 MHz 260 ~ 470 MHz 470 ~ 1GHz	Maximum Allowable EIRP -45dBm -41dBm -41 ~ -32dBm -32dBm -32 ~ -26dBm -21dBm

1-3 DIGITAL MODE

Waveform Quality	0.944 or more
Time Reference	$\pm 1\mu\text{S}$ or less
Rx Sensitivity and Dynamic Range	-104dBm, FER=0.5% or less -25dBm, FER=0.5% or less
Tx Output Power	320mW (25dBm)
Tx Frequency Deviation	$\pm 300\text{Hz}$ or less
Occupied Band Width	1.32MHz
Tx Conducted Spurious Emission	900KHz : -42dBc / 30KHz below 1.98MHz: -54dBc / 30KHz below
Minimum Tx Power Control	below -50dBm
Open Loop Power Control	-25dBm: -57.0dBm ~ -38.5dBm -65dBm: -17.5dBm ~ + 1.5dBm -104dBm: +18.0dBm ~ +30.0dBm
Standby Output Power	below -61dBm
Closed Loop Tx Power Control Range	Test1: $\pm 24\text{dB}$ or less Test2: 0mS ~ 2.5mS Test3: $\pm 24\text{dB}$ or more Test4: $\pm 24\text{dB}$ or more Test5: $\pm 24\text{dB}$ or more

1-4 FREQUENCY RANGE

Transmitter Frequency

FA NO.	AMPS CH NO.	Center Frequency	FA NO.	AMPS CH NO.	Center Frequency
1	1011	824.640MHz	11	404	837.120MHz
2	29	825.870MHz	12	445	838.350MHz
3	70	827.100MHz	13	486	839.580MHz
4	111	828.330MHz	14	527	840.810MHz
5	152	829.560MHz	15	568	842.04MHz
6	193	830.790MHz	16	609	843.270MHz
7	234	832.020MHz	17	650	844.500MHz
8	275	833.250MHz	18	697	845.910MHz
9	316	834.480MHz	19	738	847.140MHz
10	363	835.890MHz	20	779	848.370MHz

Receiver Frequency

FA NO.	AMPS CH NO.	Center Frequency	FA NO.	AMPS CH NO.	Center Frequency
1	1011	869.640MHz	11	404	882.120MHz
2	29	870.870MHz	12	445	883.350MHz
3	70	872.100MHz	13	486	884.580MHz
4	111	873.330MHz	14	527	885.810MHz
5	152	874.560MHz	15	568	887.04MHz
6	193	875.790MHz	16	609	888.270MHz
7	234	877.020MHz	17	650	889.500MHz
8	275	878.250MHz	18	697	890.910MHz
9	316	879.480MHz	19	738	892.140MHz
10	363	880.890MHz	20	779	893.370MHz

3-1 Frequency Synthesizer Circuit

The Frequency synthesizer is an indirect frequency synthesizer PLL(Phased Locked Loop). It consists of a VCTCXO(U305), PLL IC(U306), VCO(U307) and loop filter.

VCTCXO

The VCTCXO(U305) is a reference source of the frequency synthesizer. It provides 19.68MHz reference frequency to PLL. The VCTCXO is a Voltage Controlled Temperature Compensated Crystal Oscillator having 19.68MHz $\pm$ 2.5ppm frequency stability over all useful temperature range.

A correct frequency tuning is made by the voltage control.

VCO

The VCO(U307) generates the signal having 966 $\pm$ 12.5MHz center frequency with the voltage control. PLL IC controls this signal.

PLL IC

The PLL IC(U306) includes prescalers and charge pump. The reference divider in PLL IC divides the frequency of VCTCXO by 656 and makes reference frequency to 30KHz.

This reference frequency is supplied to one of the input of phase detector. The signal generated at VCO goes into another input stage of the phase detector through a prescaler and the main divider. At this point, the error proportional to the phase difference of two inputs is occurred. This error signal is supplied to the frequency control input stage of VCO through the loop filter composed of RC.

3-2 Spurious Radiation Suppression Circuit

The spurious signal from antenna is suppressed at the duplexer. The duplexer has a flat characteristics to the receive signal and a high attenuation characteristics to the harmonic signals of transmission. So, it suppress the spurious radiation

Table 1. The characteristic of duplexer filter(F300)

T X	
Center Frequency	836.5 MHz (FT)
Bandwidth	FT ₁ ±12.5 MHz
Insertion Loss at BW	3.0dB Max
VSWR at BW	1.7 Max
Input Power	2W Max
Attenuation (Absolute Value)	869 ~ 894MHz 40dB Min 1648 ~ 1698 MHz 27dB Min 2472 ~ 2547 MHz 30dB Min
Ripple at BW	2.0dB Max
R X	
Center Frequency	881.5 MHz (FR)
Bandwidth	FR ₁ ±12.5 MHz
Insertion Loss at BW	4.0dB Max
VSWR at BW	1.8 Max
Input Power	1W Max
Attenuation (Absolute Value)	824 ~ 849 MHz 50dB Min
Ripple at BW	2.0dB Max