

EMI TEST REPORT

According to FCC Part 15 Subpart B/Class B

Product : Laser Beam Printer

Model No. : CLP-500N

FCC ID : A3LCLP500N

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All tests necessary to show compliance to the requirements were and these results met the specifications requirement.
4. That data in this report are traceable to National or International Standards.

Date of test : June 27, 2003

Issued Date : June 30, 2003

Tested by:

Jong Ho, LEE / Test Engineer

Reviewed by:

Choon Kil, KIM / Manager of EMC Lab.

Authorised by:

Kyu Baek, CHUNG / Chief of EMC Lab.

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NVLAP Code: 200447

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Distribution

This test report has been made available as follows:

CS Management Center, EMC Laboratory	1 original
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1. General Information

Applicant : Samsung Electronics Co., Ltd.

Full Address : 416 Maetan 3 Dong, Paldal-Ku,
Suwon City, Kyungki Do, Korea, 442-742

Kind of Product : Laser Beam Printer

FCC ID : A3LCLP500N

Project Name : -

Model & Variant Names : **CLP-500** Brand : Samsung
; Basic Model
; Option: IEEE802.11,10/100 BaseTX Ethernet
; Memory : 32MB

Test Report Produced by : Jong Ho,LEE / Test Engineer

1.1 Product Description

1) Justification

The system was configured for testing in typical fashion use. Cable were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. The mode of operation utilized for testing was selected to best simulate typical EUT use.

In each test mode, Finally we found worst case emission that is above configuration with the Worst case components(in the above table). So, the DATA of the maximum EUT operation was reported.

Further details of cabling and configuration are shown in the test system configuration.

2) Operating Frequency :

CLP-500N is supporting the IEEE1284,USB,LAN,WireLess LAN Printing Mode.

CLP-500N model have

Video : 19.00064MHz,CPU:60MHz,LPEC clock:19.00064MHz,Main Clock:12MHz
USB clock:30MHz,N/W clock:25MHz
Wireless LAN BW:2.4GHz

3) Description of Testing operating mode

Operating Mode	Operating section of EUT
USB Printing	Continuously H pattern printing by Computer
IEEE1284 Printing	Continuously H pattern printing by Computer
LAN Printing	Continuously H pattern Receiving and Transmitting
Wireless LAN Printing	Continuously H pattern Copying

EUT was tested all operating mode as above. Finally EUT was tested USB Printing mode as maximum emission.

4) Tested Resolution :

Tested Video mode	Resolutions	Refresh rates	Colors

5) Manufacturer : SAMSUNG Electronics Co., Ltd.

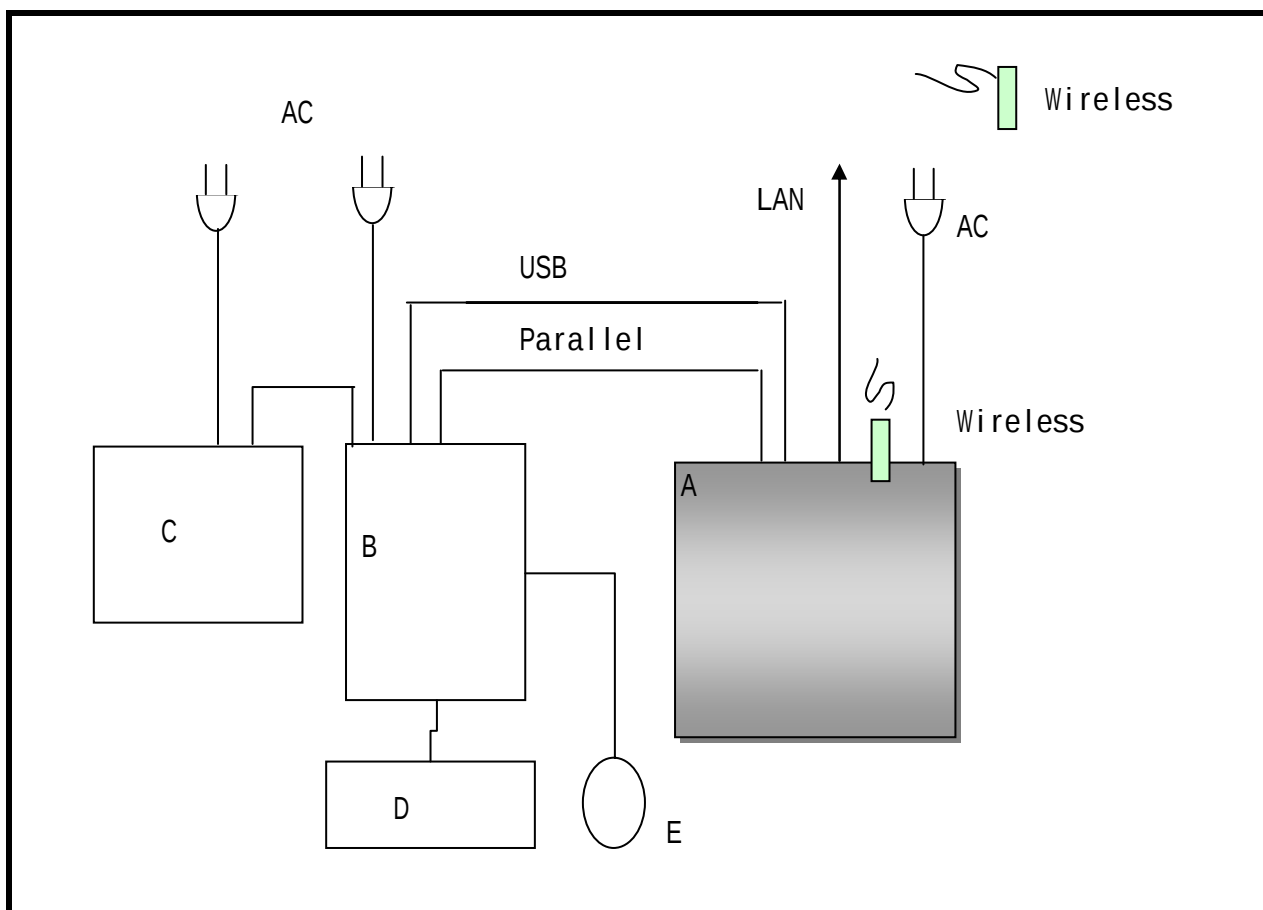
1.2 Configuration of EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	Remark
A	Laser Beam Printer	CLP-500N	-	Samsung	EUT
B	Computer	8311 15U	11s32p4744zj1lh8800773	IBM	DoC
C	Monitor	CX151S	N209H4NT726970	Samsung	DoC
D	Mouse	M-S35	LZB05162649	Logitech	DoC
E	Keyboard	SDL3520	27011380	Samsung	DoC

1.3 Used Cable Description

No.	Item	Length[m]	Shielded (Y/N)	Remark
1	AC Power Cable	1.7	N	-
2	LAN	2.0	Y	-
3	USB Cable	1.5	Y	-
4	Parallel Cable	1.5	Y	-
5	AC Power Cable	1.5	N	-

1.4 System Block Diagram of Test Configuration



1.5 Test Facility

All test described in this report were performed by :
SAMSUNG ELECTRONICS CO., LTD.
EMC TESTING LABORATORY
416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea, 442-742
Semi Anechoic Chamber #2(Registration Number:873282) and Shielded Room.

This test facility has been filed in FCC under the criteria in ANSI C63.4-1995.

2. System Test Configuration

2.1 Configuration of Radiated and Conducted Interference Measurement

* Cabling was taken into consideration and test data was taken under worse case conditions.

1)Conduction(Front View)



2)Conduction(Rear View)



3) Radiation(Front View)



4) Radiation(Rear View)



2.2 Operation Environment

	Conduction	Radiation
Temperature [C] :	25.1	23
Humidity [%]	40	43
Power supply	: AC110V/60Hz	AC110V/60Hz

2.3 Test Procedure

2.3.1 Conducted Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop. All other surfaces of tabletop was at least 80cm from any other grounded conducting surface. I/O cables and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT current-carrying power lead, except the ground(safety) lead, were individually connected through a LISN to the input power source.

All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

The EUT was switched on and allowed to warm up to its normal operating condition.

A quick scan, from 150kHz to 30MHz, was made on the L1 & L2 line by LISN.

High peaks, relative to the limit line, over the frequency range were then selected.

The EMI TEST RECEIVER was then tuned to the selected frequencies.

CISPR quasi-peak measurements with a receiver bandwidth setting of 10kHz, were taken.

2.3.2 Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop. I/O cables that were connected to the peripherals were bundle in center.

They were folded back and forth forming a bundle 30cm to 40cm long and were hanged 40cm height to the ground plane.

The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using biconiLog antenna.

Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment; powering the monitor from the floor mounted outlet box and the computer aux AC outlet if applicable, and changing the polarity of the antenna; whichever determined the worst-case emission.

3. Conducted Emission Test Data

O Test Mode :

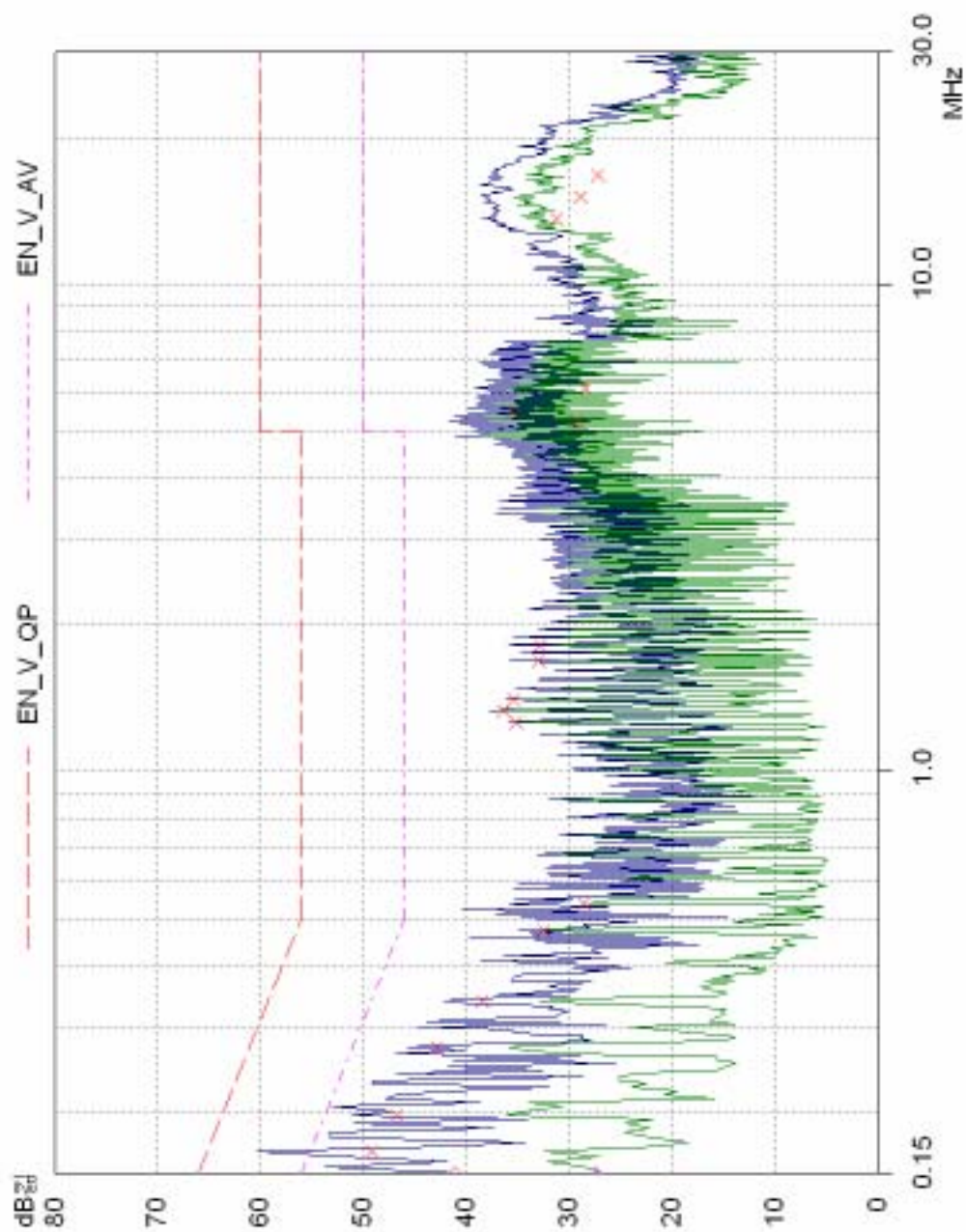
Frequency [MHz]	Meter reading (a)		Phase	Total Loss	Limits		Result	
	QP				QP	AV	QP	AV
	[dBuV]				[dBuV]		[dBuV]	
0.197	52.6		L1	0.6	63.7	53.7	53.2	
0.249	47.8		L1	0.6	61.8	51.8	48.4	
0.300	42.2		L1	0.6	60.2	50.2	42.8	
0.351	40.6		N	0.6	58.9	48.9	41.2	
0.401	37.6		L1	0.6	57.8	47.8	38.2	
0.501	36.2		L1	0.6	56.0	46.0	36.8	
0.699	38.2		N	0.5	56.0	46.0	38.7	
1.752	37.2		L1	0.5	56.0	46.0	37.7	
2.553	39.0		L1	0.6	56.0	46.0	39.6	
4.290	36.7		N	0.8	56.0	46.0	37.5	
6.045	30.0		L1	0.9	60.0	50.0	30.9	
6.439	29.0		L1	0.8	60.0	50.0	29.8	
10.338	30.5		L1	1.2	60.0	50.0	31.7	
17.084	27.0		L1	1.6	60.0	50.0	28.6	
19.123	25.0		L1	1.7	60.0	50.0	26.7	
20.634	25.0		L1	1.7	60.0	50.0	26.7	

Quasi-peak value is less 10dB than Average limits.

* Results = Meter Reading(QP) + Total Loss(LISN Insertion loss + Cable loss)

* Margin = Limits - Result

3-1. Conducted Emission Test Graph



4. Radiated Emission Test Data

Frequency Range	Tested Frequency	ANT Pol.	Meter Reading [A]	Total Loss [B]	Antenna Height [Cm]	Turn table Degree [Deg]	Results [A+B]	Limits at 3m [dBuV/m]	Margin (Limit-Result) [dB]
[MHz]	[MHz]		[dBuV/m]				[dBuV/m]	[dBuV/m]	
30 - 230	30.260	V	0.5	18.8	100	184	19.3	30.0	10.7
	33.890	V	4.0	17.0	126	173	21.0	30.0	9.0
	36.385	V	4.6	15.6	150	211	20.2	30.0	9.8
	82.905	V	5.5	8.7	144	89	14.2	30.0	15.8
	135.120	H	9.8	12.8	400	82	22.6	33.5	10.9
	191.480	H	9.5	10.6	262	29	20.1	33.5	13.4
230 - 1000	392.515	H	0.4	18.6	392	60	19.0	36.0	17.0
	429.505	H	1.2	19.8	399	224	21.0	36.0	15.0
	529.270	V	3.8	21.7	202	238	25.5	36.0	10.5
	930.445	H	1.6	25.4	100	179	27.0	36.0	9.0
1000 - 8500	1652.0	V	11.3	22.0	100	330	33.3	74.0	40.7
	2150.0	V	8.1	24.6	100	307	32.7		41.3

* "<" Means equal or less then 5dB

* Receiving Antenna Mode : **Horizontal, Vertical**

* Results = Meter Reading + Total Loss(Antenna factor + Cable loss)

* Measurement detector function and bandwidth

Detector function : CISPR quasi-peak(Above 1000MHz: Peak)

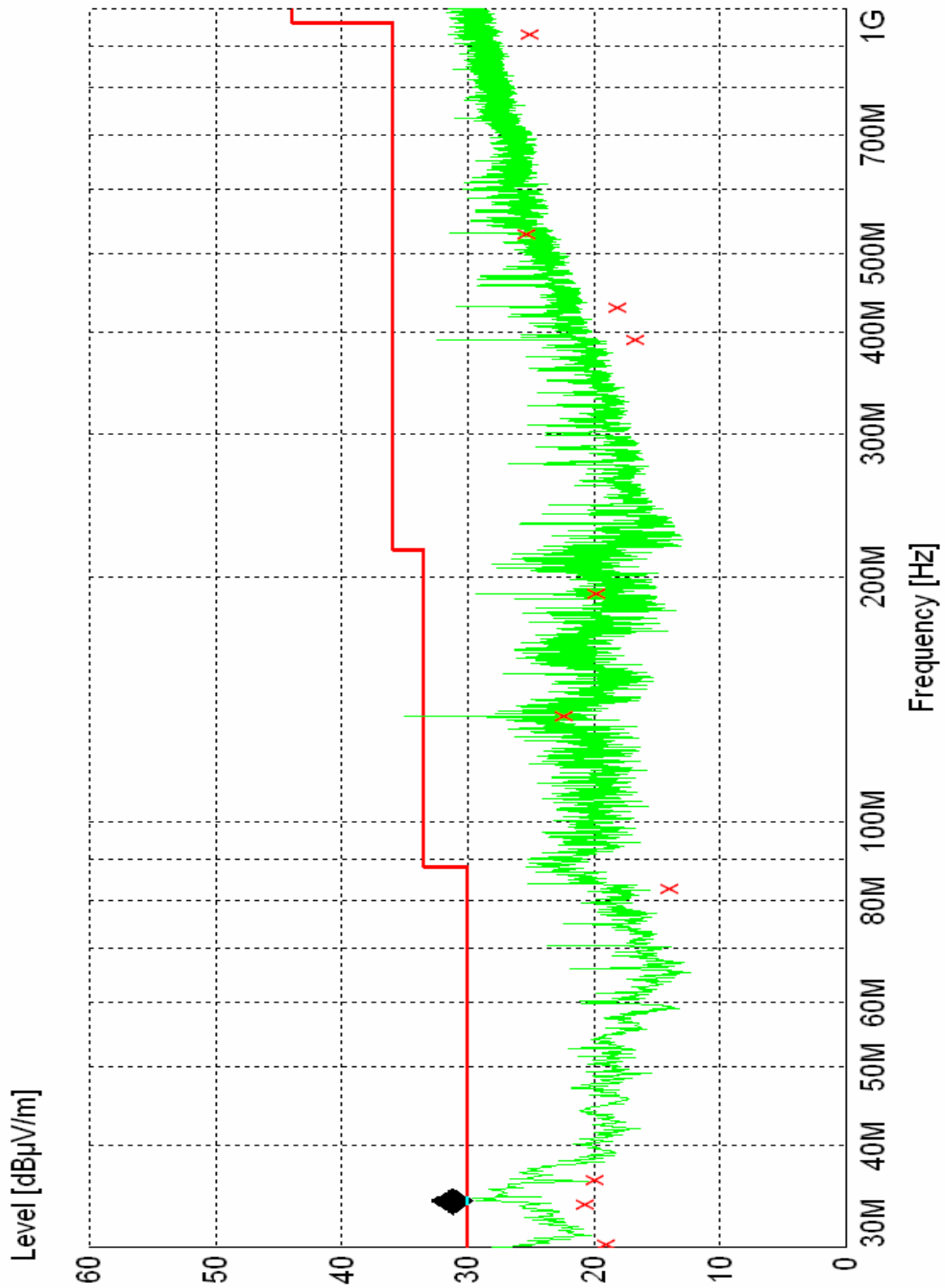
Resolution Bandwidth : 120kHz(Above 1000MHz: 1MHz)

* Test distance

- Below 1000MHz: 3m(Quasi-peak)

- Above 1000MHz: 3m(Peak)

4-2. Radiated Emission Test Graph



5. FCC Label Configuration and Location

5.1 Label Configuration

SAMSUNG

Model No. : CLP-500N
Volts : AC110-127V
Hertz : 50/60Hz
Amps: 10A
Manufactured JUNE 2003

Samsung Electronics Co.,Ltd.
259, Gongdan-Dong, Gumi-City,
Kyung-Buk, 730-030, Korea
Place : M258

Serial No.:

 **LISTED**
51Y7
E148081
I.T.E.

 '5YP-01'

FCC ID : A3LCLP500N (Printer)
FCC ID : A3LSWL-2250U (WLAN)

This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
i) This device may not cause harmful interference, and
ii) This device must accept any interference received,
including interference that may cause undesired operation.

This Class B digital apparatus meets all requirements of the
Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe B respecte toutes les
exigences du Règlement sur le matériel brouilleur du Canada.
Canadian Certification Number(RSS-210) : 649E-SWL2250U (WLAN)

This Class B digital apparatus complies with
Canadian ICES-003.
Cet appareil numérique de la classe B est conforme
à la norme NMB-003 du Canada.

This product complies with 21 CFR Chapter 1 ,
subchapter J.

MADE IN KOREA
JC88-01185A Rev. 5.0

5.2 Location of Label



6. Test Equipment Used

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Field strength meter	ESCS30	830986/004	R & S	03/ 04/03, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI	100019	R & S	02/ 07/09, 12Months
L.I.S.N	3810/2NM	EMCO	2251	03/02/07, 12Months
L.I.S.N	ESH3-Z5	831887/0004	R & S	02/ 08/06, 12Months
Bi-Log Antenna	CBL6112B	2805	Schaffner	03/04/02, 12Months