

EMI TEST REPORT

FCC Part 15 Subpart B, Class B

Product : CABLE MODEM
Model No. SCM-120U, SCM-120R

JOB NO. : 01ISM008

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All tests necessary to show compliance to the requirements were and these results met the specifications requirement.

Date of test Jan 2 to 5, 2001

Issued Date Jan 8, 2001

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1. General Information

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REGULATION(S) : FCC Part 15 Subpart B, Class B

MODEL NUMBER : SCM-120U, SCM-120R

SERIAL NUMBER :-

KIND OF PRODUCT : CABLE MODEM

TESTED DATE : Jan 2 to 5, 2001

TEST SITE : 3meter semi-anechoic chamber

TEST SITE ADDRESS : San 14, Nongseo-Ri, Kihung-Eup,
Yongin-City, Kyungki-Do, Korea, 449-900

1.1 Product Description

The Samsung cable modem, SCM-120U and SCM-120R(for marketing purpose) is supporting downstream data rate of 40Mbps and upstream data rate of 10Mbps in the highest level and has clock speeds of 100MHz, 25MHz and 35.83MHz.

The operating voltage is AC120V and DC +12V

See the attached SCM-120U User's Guide for more information.

1.2 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

Model	FCC ID/DoC	Description	Cable description
(1) Samsung Electronics M/N : SCM-120U S/N : - (EUT)	A3LSCM120	Cable Modem	Unshielded ethernet cable Coaxial cable Unshielded USB cable Unshielded AC power cable
(2) HP M/N : Pavilion 7850 S/N : MX04704167	DoC	Personal Computer	Shielded video cable Shielded parallel cable Shielded serial cable Unshielded USB cable Unshielded ethernet cable Unshielded AC power cable
(3) IBM M/N : 6547-OBN S/N : 55-00006	DoC	Monitor	Shielded video cable Unshielded AC power cable
(4) USRobotics M/N : SPORTSTER S/N : 33083962	CJE-0149-217	External modem	Shielded serial cable Unshielded AC power cable
(5) HP M/N : 5183-9980 S/N : J94003612	Doc	Keyboard	Shielded keyboard Cable
(6) Sejin Electronics M/N : SMB-400 S/N : 4FEF027845	GJJS965CO	Mouse	Shielded mouse cable
(7) Samsung Electronics M/N : ML-85 S/N : B1AJ700174	A3LML85	Laser printer	Shielded parallel cable Unshielded AC power cable

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4(1992).

Radiated testing was performed at a distance of 3 meters from the antenna to EUT.

1.4 Test Facility

All test described in this report were performed by :

Open area test site : 781-14, Chung-Ri, Dongtan-Myun, Hwasung-Kun, Kyungki-Do, Korea

Conducted measurement facility and 3meter Semi-anechoic chamber :

San 14, Nongseo-Ri, Kihung-Eup, Yongin-City, Kyungki-Do, Korea, 449-900

2. System Test Configuration

2.1 Operation Environment

	Conduction	Radiation
Temperature [] :	21	20
Humidity [%]	32	45
Power supply	AC120V/60Hz	AC120V/60Hz

2.2 Justification

The system was configured in typical fashion(as a customer would normally use it) for testing.

2.3 EUT Exercise Soft ware

The EUT exercise program used during radiated and conducted testing was ping and diagnostic test software.

2.4 Test Procedure

2.4.1 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.

2.4.2 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.

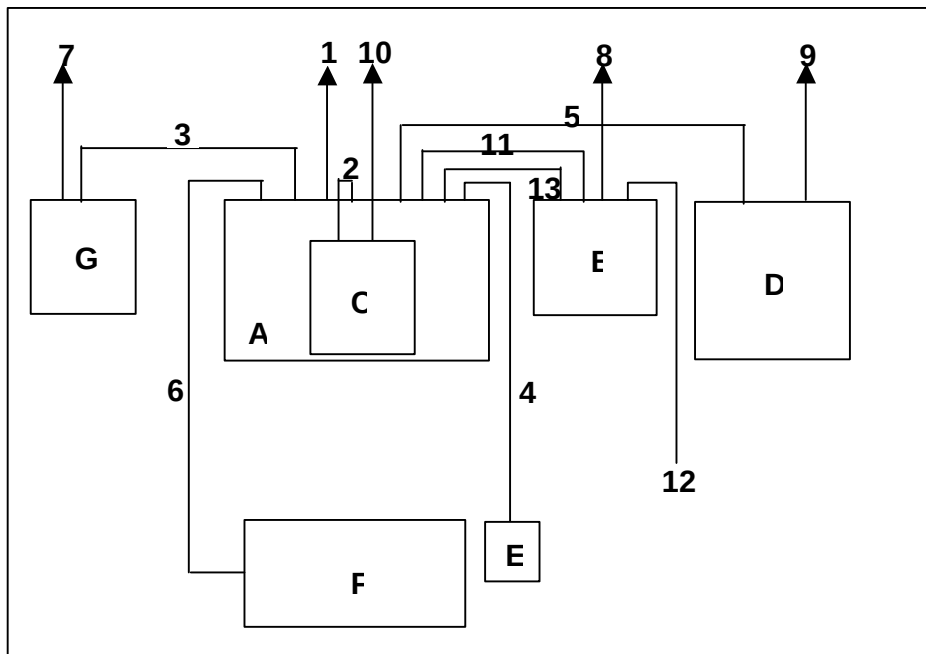
I/O cables that were connected to the peripherals were bundle in center.

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

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

2.5 Test System configuration

2.5.1 System Block Diagram of Test Configuration



2.5.2 Configuration of EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	Remark
A	Desktop computer	M520T	92EH500026	Samsung	EUT
B	Cable Modem	SCM-120U	-	Samsung	
C	LCD Monitor	Syncmaster 400TFT	001	Samsung	
D	Laser Printer	ML-66G+	B1AJ700174	Samsung	
E	PS/2 Mouse	SMB-400	7FA079017	SEJIN	
F	Keyboard	SKR-2283S	7FBE000663	SEJIN	
G	External Modem	SPORTSTER	33083962	US ROBOTICS	

2.5.3 Used Cable Description

No.	Item	Length[m]	Shielded(Y/N)	Remark
1	AC Power cable	1.7	N	
2	Video cable	1.5	Y	
3	Serial cable	1.5	Y	
4	Mouse cable	2	Y	
5	Printer cable	1.5	Y	
6	Keyboard Cable	1.5	Y	
7	AC Power cable	1.7	N	
8	AC Power cable	1.7	N	
9	AC Power cable	1.7	N	
10	AC Power cable	1.7	N	
11	USB cable	1.5	N	
12	Coaxial cable	2	N	
13	Ethernet cable	1.7	N	

4. Measurement Uncertainty

All data in report are to be traceability to the national or international standards.

4.1 Conducted Emission Test

The measurement uncertainty(with a 95% confidence level)for this test was $\pm 2.2\text{dB}$.

The data listed in this test report may exceed the test limit because it does not have enough margin(more than 2.0dB).

The data listed in this test report has enough margin, more than 2.0dB.

4.2 Radiated Emission Test

The measurement uncertainty(with a 95% confidence level)for this test was $\pm 3.4\text{dB}$.

The data listed in this test report may exceed the test limit because it does not have enough margin(more than 2.0dB).

The data listed in this test report has enough margin, more than 3.4dB.

5. Conducted Emission Test Data

The initial step in collecting conducted data was to perform a quasi-peak scan over the measurement range using a spectrum analyzer.

During two kinds of operating modes, ping and diagnostic software quasi-peak level was investigated and the worst-case emission(during execution of ping software) are reported. All other emission are non-significant.

The minimum margin to the limit is as follows :

Frequency : **11.092** [MHz]
Meter Reading : **33.9** [dBuV]
LISN Loss : **0.35** [dB]
Cable loss : **0.7** [dB]
Corrected Readings : **34.95** [dBuV/m]
Margin : **-13.01** [dB]

Test Data Sheet

Tested Frequency	Meter Reading [A]	LISN Pol.	Factor[B]		Corrected Reading [A+B]	Limits	Margin
			LISN Loss	Cable Loss			
	[MHz]		[dBuV]	[L1/L2]	[dB]		
2.991	14.8	L1	0.11	0.20	15.11	47.96	-32.85
4.133	13.5	L1	0.23	0.40	14.13	47.96	-33.83
7.171	20.4	L1	0.30	0.60	21.30	47.96	-26.66
7.575	23.2	L1	0.31	0.60	24.11	47.96	-23.85
8.675	26.3	L1	0.32	0.60	27.22	47.96	-20.74
9.601	28.5	L1	0.32	0.70	29.52	47.96	-18.44
11.092	33.9	L1	0.35	0.70	34.95	47.96	-13.01
19.899	28.4	L1	0.55	0.90	29.85	47.96	-18.11

- * All readings are quasi-peak mode.
- * The selected bandwidth in emission testing is 9kHz.
- * Results = Meter Reading + LISN Insertion loss + Cable loss
- * Margin = Corrected Reading - Limits
- * L1 = Hot, L2 = Neutral

6. Radiated Emission Test Data

The initial step in collecting radiated data was to perform a quasi-peak scan over the measurement range using a spectrum analyzer. During two kinds of operating modes, ping and diagnostic software quasi-peak level was investigated and the worst-case emission(during execution of ping software) are reported. All other emission are non-significant.

The minimum margin to the limit is as follows :

Frequency **700.00** [MHz]
Meter Reading **16.8** [dBuV]
Antenna Factor **21.70** [dB]
Cable loss **3.00** [dB]
Corrected Readir **41.5** [dBuV/m]
Margin **-4.50** [dB]

Test Data Sheet

Frequency Range [MHz]	Tested Frequency [MHz]	Ant. Pol.	Meter Reading [A] [dBuV]	Factor[B]		Antenna Height [Cm]	Turn table Degree [Deg]	Corrected Reading [A+B] [dBuV/m]	Margin [dB]	Limits [3m] [dBuV/m]
				Ant. Factor	Cable Loss					
				[dB]						
30 - 88	53.80	H	10.3	7.50	0.15	150	120	18.0	-22.05	40.0
	125.00	H	12.0	7.10	0.75	170	110	19.9	-20.15	
88 - 216	200.00	H	24.3	10.51	1.10	130	100	35.9	-7.59	43.5
216 - 960	225.00	H	27.1	11.80	1.40	170	90	40.3	-5.70	46.0
	249.80	H	26.7	13.08	1.50	150	170	41.3	-4.72	
	300.00	H	24.9	14.22	1.60	130	100	40.7	-5.28	
	573.40	H	18.6	19.97	2.70	150	180	41.3	-4.73	
	600.00	H	15.5	20.73	2.80	230	110	39.0	-6.97	
	700.00	H	16.8	21.70	3.00	200	120	41.5	-4.50	
960 -										54.0

* "<" Means equal or less than * All readings are quasi-peak mode.

* The selected bandwidth in emission testing is 100kHz.

* Corrected Reading = Meter Reading + Antenna Factor + Cable loss

* Margin = Corrected Reading - Limits

* H = Horizontal Polarization/Antenna, V = Vertical Polarization/Antenna

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