

EMI TEST REPORT

According to FCC Part 15 Subpart B/Class B

Product : USB Flash Drive

Model No. : SECCL_256

FCC ID : A3LSECCL

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3. This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.
All tests necessary to show compliance to the requirements were and these results met the specifications requirement.

Date of test : May 13, 2003 ~ May 16, 2003

Issued Date : May 16, 2003

Tested by:

Jin Hwan, Jung / Test Engineer

Reviewed by:

Choon Kil, Kim / Manager of EMC Lab.

Authorised by:

Kyu Baek, CHUNG / Chief of EMC Lab.

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The test reported herein have been performed in accordance with its terms of registration.



NVLAP Code: 200447

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Distribution

This test report has been made available as follows:

CS Management Center, EMC Laboratory	1 original
Memory Division	1 copy

1. General Information

Applicant : Samsung Electronics Co., Ltd.
Device Solution Network, Memory Division

Full Address : San #16 Banwol-Ri, Taeon-Eup, Hwasung-City
Kyungki-Do, Korea, 442-742

Kind of Product : USB Flash Drive

FCC ID : A3LSECCL

Project Name : -

Model & Variant Names : SECCL_256 (Brand Name: Samsung)

SECCL_128
SECCL_64
SECCL_32
SECCL_16

Test Report Produced by : Jin Hwan, Jung / 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.

And then the system was tested with the configuration of clause 1.4

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 :

48MHz(Ceramic SMD-type)

3) Description of Testing operating mode

Operating Mode	Operating section of EUT
Read & Write & Delete	USB Flash Drive

4) Manufacturer : SAMSUNG Electronics Co., Ltd.

5) Assemble Parts

Item	Specification	Remark
Flash Memory	256MB	
Controller	FC1610-TC-AJ-01	Lexar
X-tal	Ceramic-SMD,48MHz	
CHIP-LED	1608,green	
Interface	USB	
PCB Part Name	MC1DD2569*Y3	

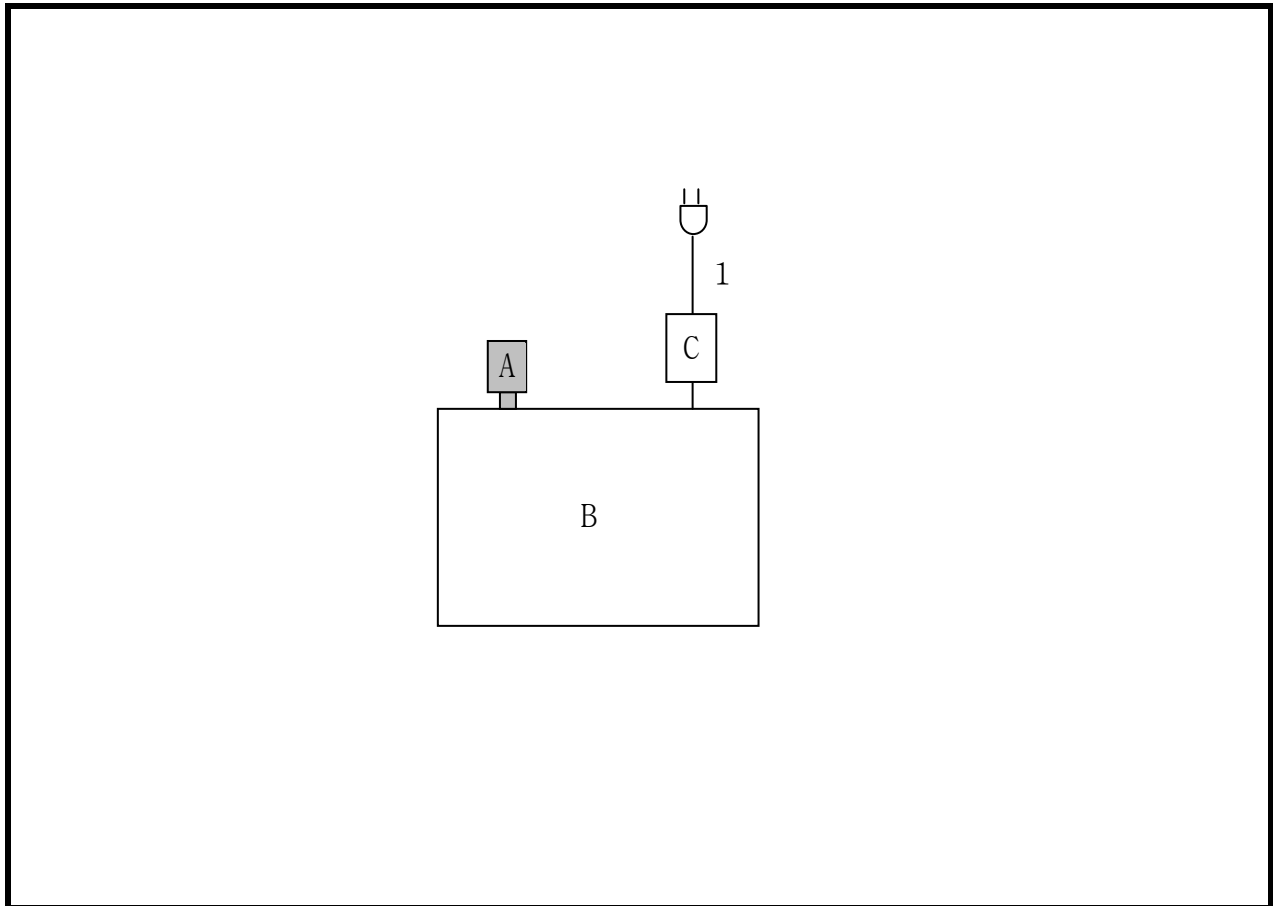
1.2 Configuration of EUT and peripherals

[illegible]

1.3 Used Cable Description

No.	Item	Length[m]	Shielded (Y/N)	Remark
1	AC Power Cable	1.7	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 #1(Registration Number:873282) and Shielded Room.

This test facility has been filed in FCC under the criteria in ANSI C63.4-1992.

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.

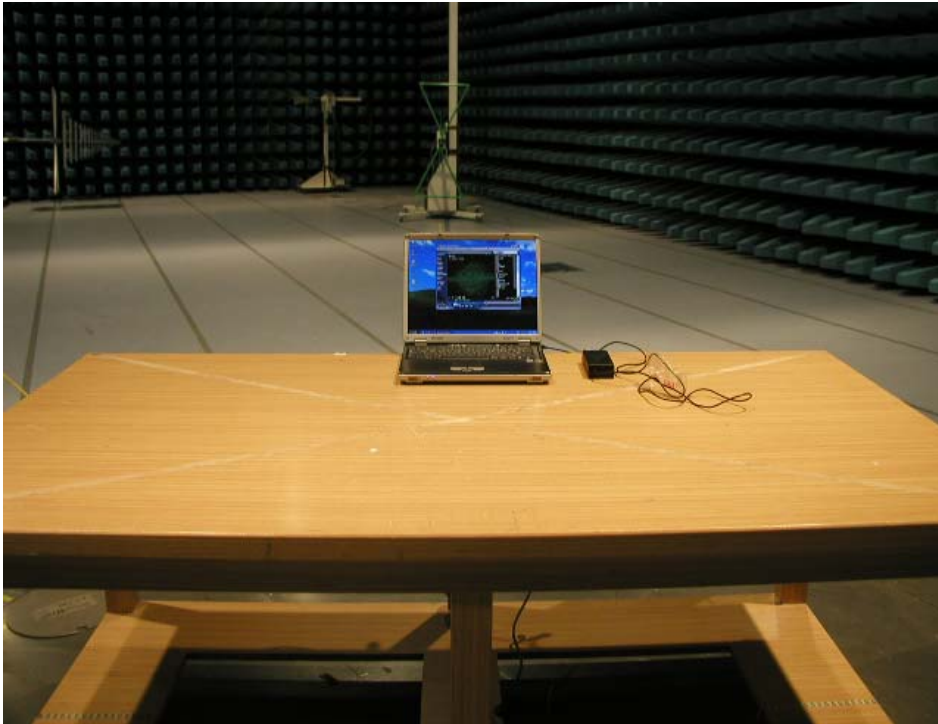
1)Conduction(Front View)



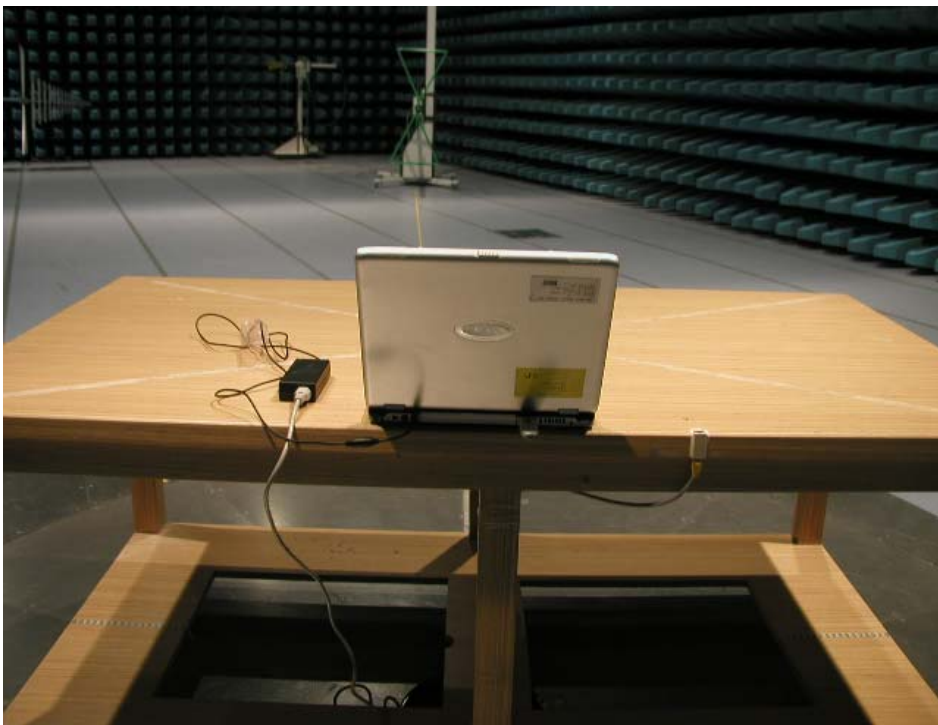
2)Conduction(Rear View)



3) Radiation(Front View)



4) Radiation(Rear View)



2.2 Operation Environment

	Conduction	Radiation
Temperature [C] :	24.9	23
Humidity [%]	41	43
Power supply	: AC120V/60Hz	AC120V/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.

The explanation of measuring instrument setup when respective function is used in any frequency band is as following:

Frequency Band [MHz]	Instrument	Detector fuction	resolution Bandwidth	Video Bandwidth
30 to 1000	Spectrum analyzer	Peak	1MHz	1MHz
	EMI Test receiver	Quasi-Peak	120kHz	-

3. Conducted Emission Test Data

Quasi Peak

Frequency	Meter reading (a)	Total Loss (b)	Results (a) + (b)	Limits	Margin (Limits-Result)
	QP		QP	QP	QP
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
0.2008	54.05	0.61	54.7	63.58	8.9
0.3609	46.76	0.52	47.3	58.71	11.4
0.4000	43.7	0.52	44.2	57.85	13.6
0.4313	42.62	0.52	43.1	57.23	14.1
0.6383	41	0.63	41.6	56	14.4
0.7047	39.55	0.54	40.1	56	15.9
1.5055	32.89	0.58	33.5	56	22.5

Average

Frequency	Meter reading (a)	Total Loss (b)	Results (a) + (b)	Limits	Margin (Limits-Result)
	AV		AV	AV	AV
[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dB]
0.2008	47.24	0.61	47.9	53.58	5.7
0.3023	40.2	0.51	40.7	50.18	9.5
0.3336	27.65	0.51	28.2	49.36	21.2
0.4000	28.23	0.52	28.8	47.85	19.1
1.4156	27.71	0.65	28.4	46	17.6
4.6188	23.59	0.85	24.4	46	21.6

* QP : Quasi-peak, AV: Average

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

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 10m [dBuV/m]	Margin (Limit-Result) [dB]
[MHz]	[MHz]		[dBuV/m]	[dB]	[Cm]	[Deg]	[dBuV/m]	[dBuV/m]	[dB]
30 - 230	39.655	V	0.2	14.00	147	96	14.20	30.0	15.8
	72.690	V	4.7	7.30	373	195	12.00		18.0
	78.260	V	10.8	8.10	273	67	18.90		11.1
	109.005	V	4.4	13.40	128	332	17.80		12.2
	120.000	V	9.1	13.60	332	195	22.70		7.3
	161.450	V	4.9	11.90	126	316	16.80		13.2
	200.405	H	9.8	11.20	399	135	21.00		9.0
230 - 1000.0	299.815	V	2.4	16.30	100	195	18.70	37.0	18.3
	364.500	V	15.2	18.40	100	210	33.60		3.4
	456.355	V	10.4	20.60	301	44	31.00		6.0
	955.985	H	0.1	26.40	237	285	26.50		10.5

* "<" 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)

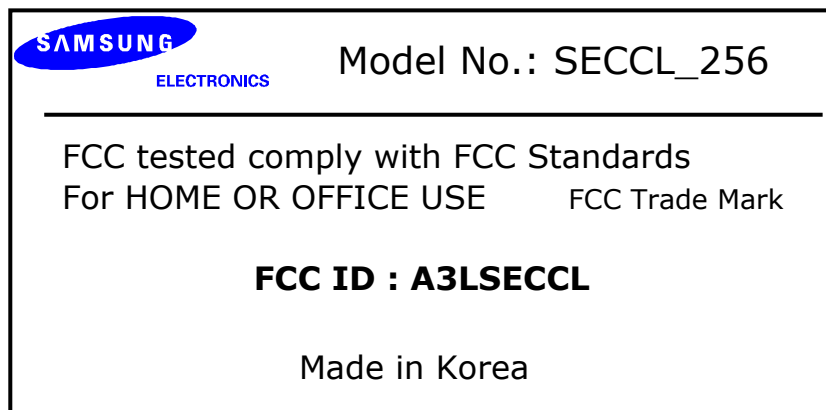
* Test distance

- Below 1000MHz: 10m(Quasi-peak)

- Above 1000MHz: 3m(Peak)

5. 5. FCC Label Configuration and Location

5.1 Label Configuration



5.2 Location of Label



6. Test Equipment Used

Equipment	Model No.	Makers.	Serial No	Calibration Last calibration
Field strength meter	ESCS30	830986/004	R & S	2003-4-3
	Firmware versions : Main 2.22, OTP 02.01, GRA 02.36			
Test Receiver	ESI26	100010	R&S	2003-5-4
L.I.S.N	3810/2NM	2251	EMCO	2003-2-7
L.I.S.N	ESH3-Z5	831887/0004	R & S	2003-8-6
Bi-Log Antenna	CBL6112B	2805	SCHAFFNER	2003-4-2
Double Ridged Guide Antenna	HF906	100027	R & S	2002-7-26