

FC

Test Report

Product Name	Navigator 700 Laser
Model No.	GM-070017/T
FCC ID.	FSUGMZI6

Applicant	KYE SYSTEMS CORP. (Genius)
Address	No.492 Sec.5, Chung Hsin Rd., San Chung, Taipei Hsien, 24160, Taiwan. R.O.C.

Date of Receipt	Dec. 24 2007
Issued Date	Jan. 10, 2008
Report No.	07C344R-RFUSP03V01

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of Quietek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Test Date: Jan. 10, 2008

Report No.: 07C344R-RFUSP03V01



Product Name	Navigator 700 Laser
Applicant	KYE SYSTEMS CORP. (Genius)
Address	No.492 Sec.5, Chung Hsin Rd., San Chung, Taipei Hsien, 24160, Taiwan. R.O.C.
Manufacturer	KYE SYSTEMS CORP. (Genius)
Model No.	GM-070017/T
FCC ID.	FSUGMZI6
Rated Voltage	AC 120V/60Hz
EUT Working Voltage	DC 1.5V
Trade Name	Genius
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2007 ANSI C63.4: 2003 CISPR 22: 2005
Test Result	Complied



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Documented By :

Genie Chang

(Adm. Specialist / Genie Chang)



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Johnson Liao

(Assistant Engineer /
Johnson Liao)



Approved By :

Vincent Lin

(Deputy Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Navigator 700 Laser
Trade Name	Genius
FCC ID.	FSUGMZI6
Model No.	GM-070017/T
EUT Working Voltage	DC 1.5V
Frequency Range	27.045MHz
Type of Modulation	FSK
Type of antenna	Loop Antenna
Number of Channel	1
Channel Control	Manual

Frequency of Each Channel:

Channel	Frequency
Channel 01:	27.045MHz

Note:

1. The EUT is a Navigator 700 Laser used in household and office PC system or related application.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR Title 47 Part 15 Subpart C Paragraph 15.227.

1.2. Operational Description

The EUT is a Navigator 700 Laser (Mouse) used in household and office PC system.

The number of the channels is 1 in 27.045MHz.

The device adopts FSK modulation. The loop antenna provides diversity function to improve the transmitting function.

Test Mode	Mode 1: Transmitter
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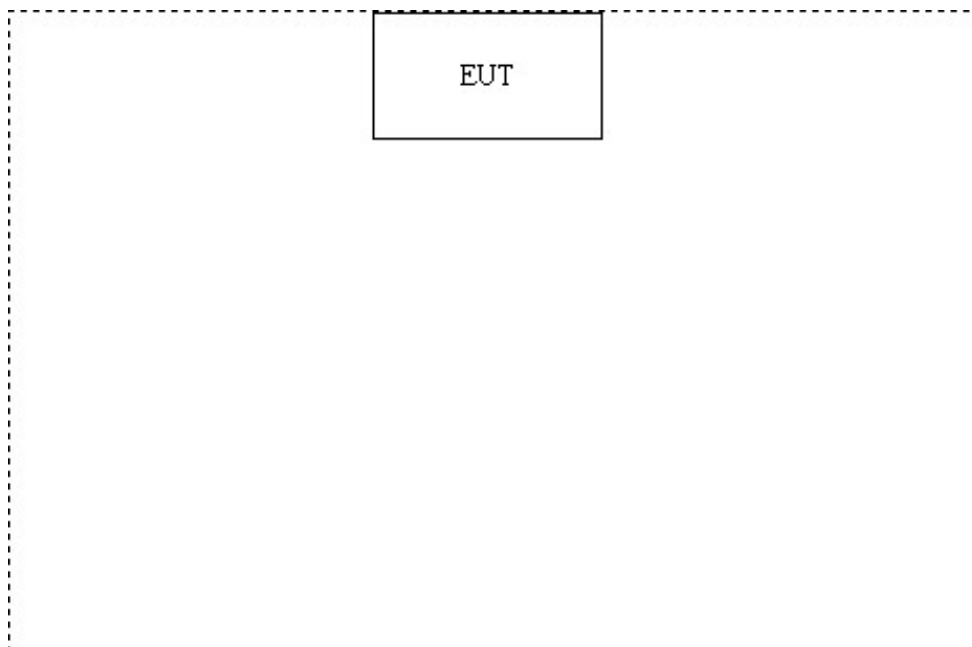
1.3. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
N/A					

Signal Cable Type	Signal cable Description
N/A	

1.4. Configuration of Test System



1.5. EUT Exercise Software

1	Setup the EUT and display as shown on 1.5.
2	Turn on the power of all equipment.
3	The EUT to enter RF test mode.
4	The EUT will continuously transmit the radio signal.
5	Repeat the above procedure (3) to (4)

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



Accreditation on NVLAP
NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation
Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014



2. Conducted Emission

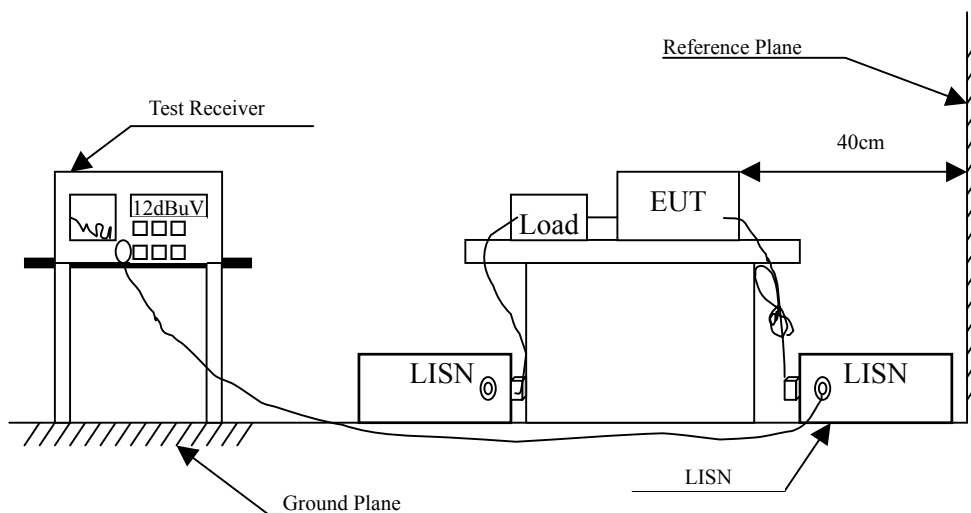
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/838251/001	May, 2007	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2007	EUT
3	L.I.S.N.	R & S	ENV 4200/833209/0023	May, 2007	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2007	
6	No.1 Shielded Room				

Note: All equipments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Data of Conducted Emission

The EUT is powered by batteries Owing to the DC operation. This test item is not performed

3. Radiated Emission

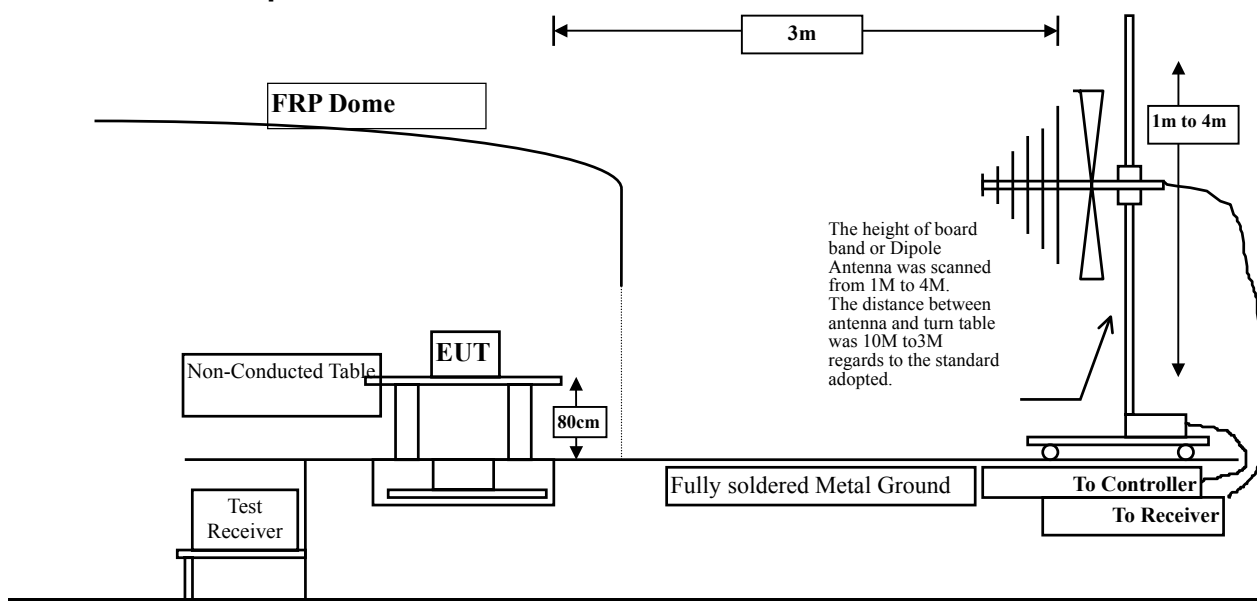
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input type="checkbox"/> Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	May, 2007
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2007
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Sep., 2007
<input type="checkbox"/> Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	May, 2007
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2007
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	May, 2007
	Horn Antenna	ETS	3115 / 0005-6160	Sep., 2007
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	May, 2007
<input checked="" type="checkbox"/> Site # 3	Test Receiver	R & S	ESI 26 / 838786/004	May, 2007
	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
	Pre-Amplifier	HP	8449B / 3008A01123	July, 2007

- Note:
1. All equipments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

3.2. Test Setup



3.3. Limits

➤ FCC Part 15 Subpart C Paragraph 15.227 Limit

FCC Part 15 Subpart C Paragraph 15.227 Limits		
Fundamental Frequency MHz	Field strength of fundamental	
	uV/m	dBuV/m
26.96-27.28	10000	80.0

Remarks :

1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

➤ Frequencies in restricted band are complied to limits on Paragraph 15.209.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to

ANSI C63.4: 2003 on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 3 meters.

The frequency range from 30MHz to 10th harmonics is checked.

Below 30MHz the magnetic loop antenna was used.

3.5. Uncertainty

± 3.9 dB above 1GHz

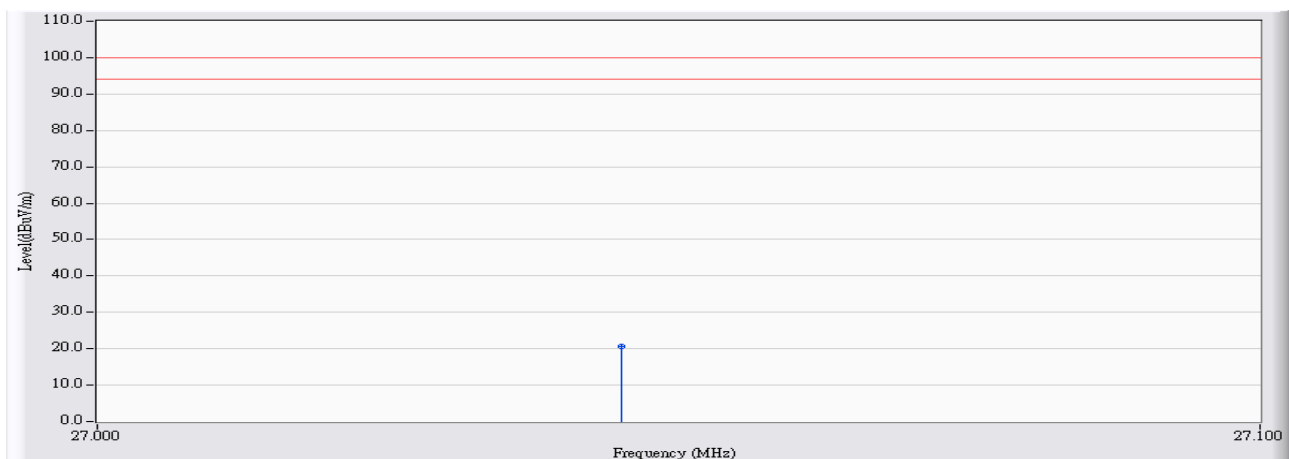
± 3.8 dB below 1GHz

3.6. Test Data of Radiated Emission

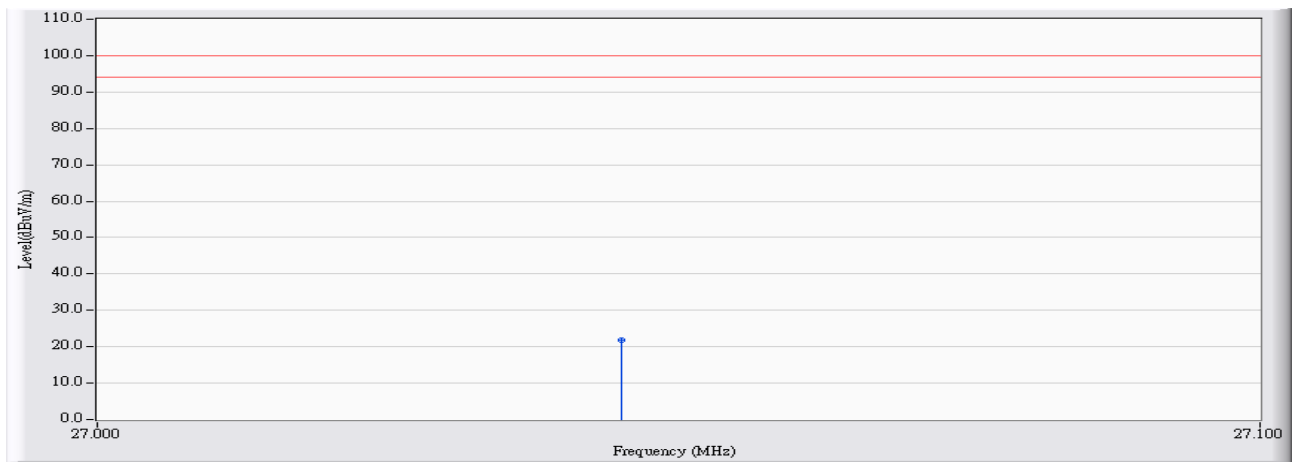
Product : Navigator 700 Laser
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Voltage : AC 120V/60Hz
 Test Mode : Mode 1: Transmitter

Polarity	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
Peak Detector							
X	27.045	-3.490	24.090	20.600	-79.400	100.000	80.000
Y	27.045	-3.490	25.220	21.730	-78.270	100.000	80.000
Z	27.045	-3.490	26.450	22.960	-77.040	100.000	80.000
Average Detector							
X	27.045	-3.490	20.180	16.690	-63.310	100.000	80.000
Y	27.045	-3.490	23.940	20.450	-59.550	100.000	80.000
Z	27.045	-3.490	23.470	19.980	-60.020	100.000	80.000

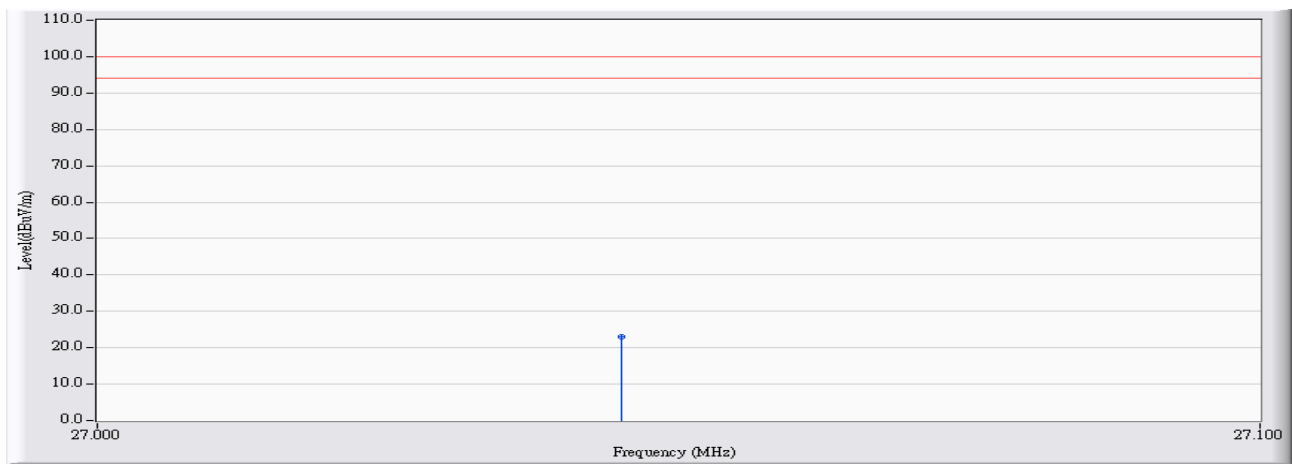
Peak Detector:
 Polarity X



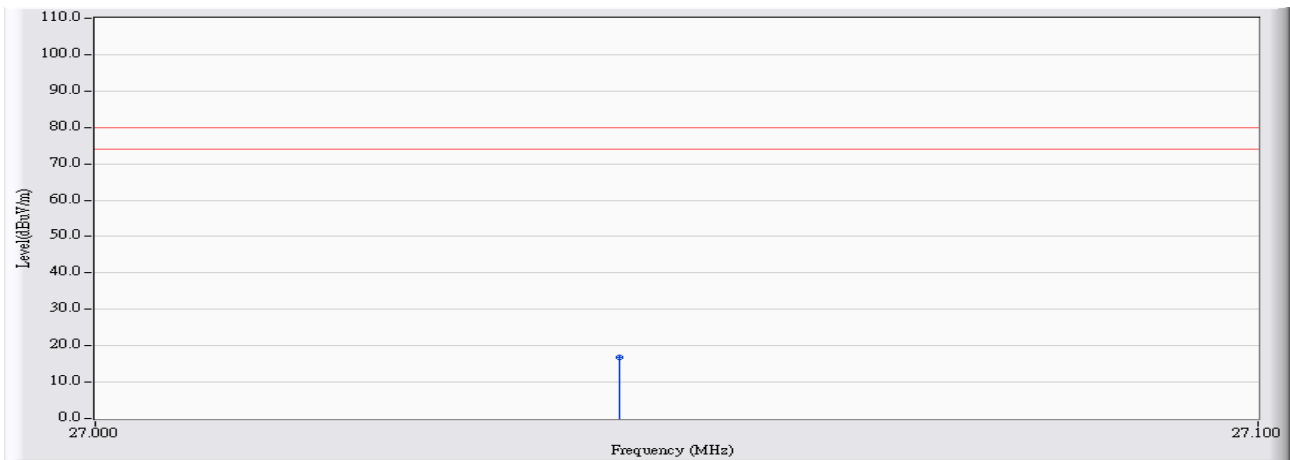
Polarity Y



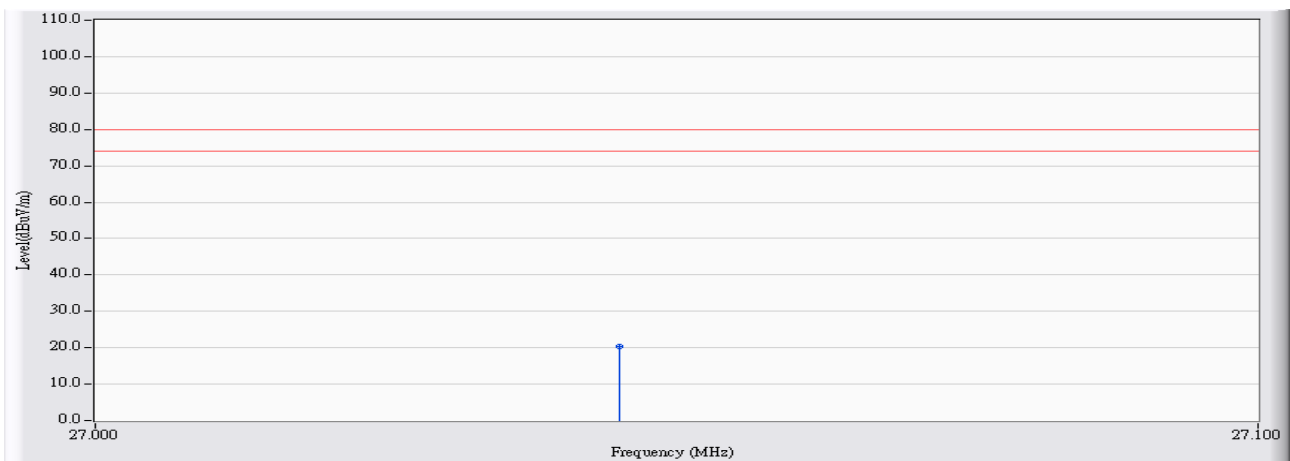
Polarity Z



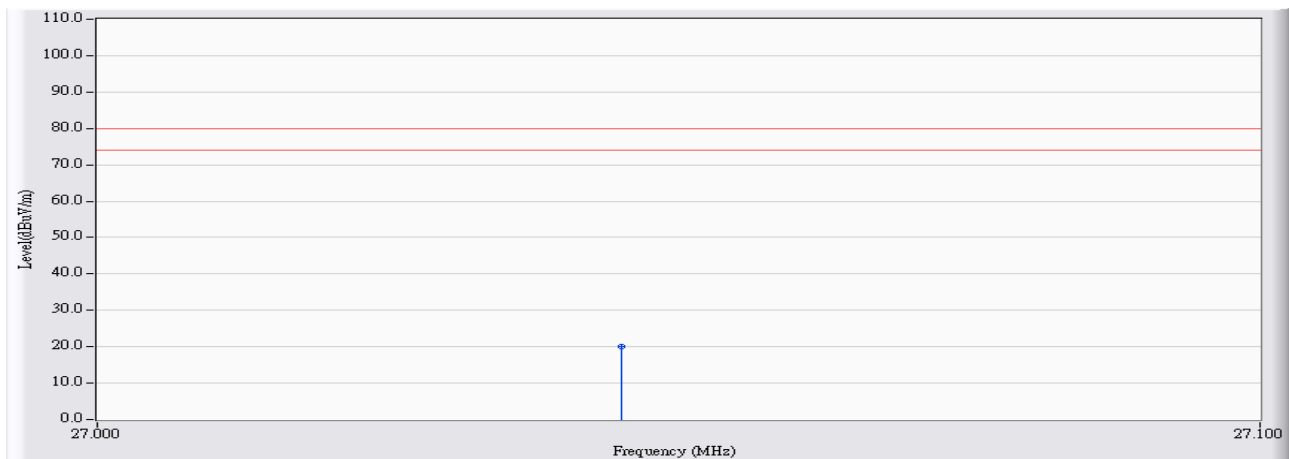
Average Detector: Polarity X



Polarity Y



Polarity Z



Note:

1. Below 30MHz, the magnetic loop antenna was used.
2. Only fundamental frequency is shown on the test report.
3. For those measured radiated emissions below 30MHz, not shown above, mean they are below the limit.
4. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain

Product : Navigator 700 Laser
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Voltage : AC 120V/60Hz
Test Mode : Mode 1: Transmitter

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
134.760	12.817	17.141	29.958	-13.542	43.500
161.920	10.593	17.193	27.786	-15.714	43.500
189.080	9.293	21.439	30.732	-12.768	43.500
216.240	9.579	21.498	31.077	-14.923	46.000
379.200	15.669	14.793	30.462	-15.538	46.000
817.640	21.732	6.963	28.695	-17.305	46.000
Vertical					
134.760	11.823	10.647	22.470	-21.030	43.500
161.920	9.732	14.142	23.874	-19.626	43.500
189.080	9.501	14.284	23.785	-19.715	43.500
216.240	10.702	12.030	22.732	-23.268	46.000
379.200	16.655	14.148	30.803	-15.197	46.000
967.020	22.939	1.946	24.885	-29.115	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier Gain

4. Band Edge

4.1. Test Equipment

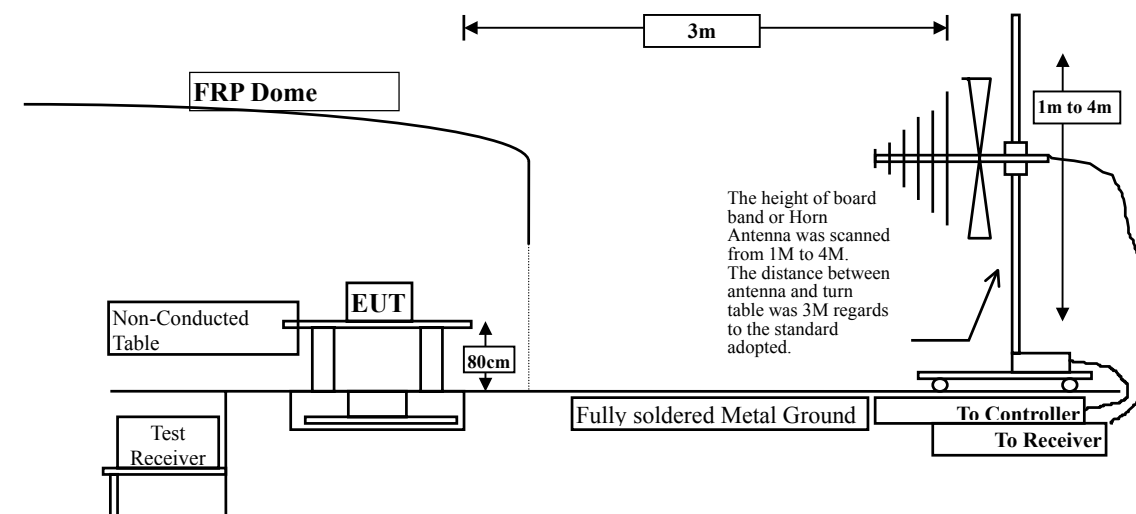
The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input type="checkbox"/> Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2007
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2007
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2007
<input type="checkbox"/> Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2007
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2007
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2007
<input checked="" type="checkbox"/> Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
	Spectrum Analyzer	HP	E4407B / US39440758	May, 2007
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
	Broadband Antenna	Schwarzbeck	VULB9166/1085	April, 2007
	Horn Antenna	ETS	3115 / 0005-6160	July, 2007
	Loop Antenna	R&S	HFH2-Z2/833799/004	July, 2007
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007

- Note:
1. All equipments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

RF Radiated Measurement:



4.3. Limit

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to

ANSI C63.4: 2003 on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

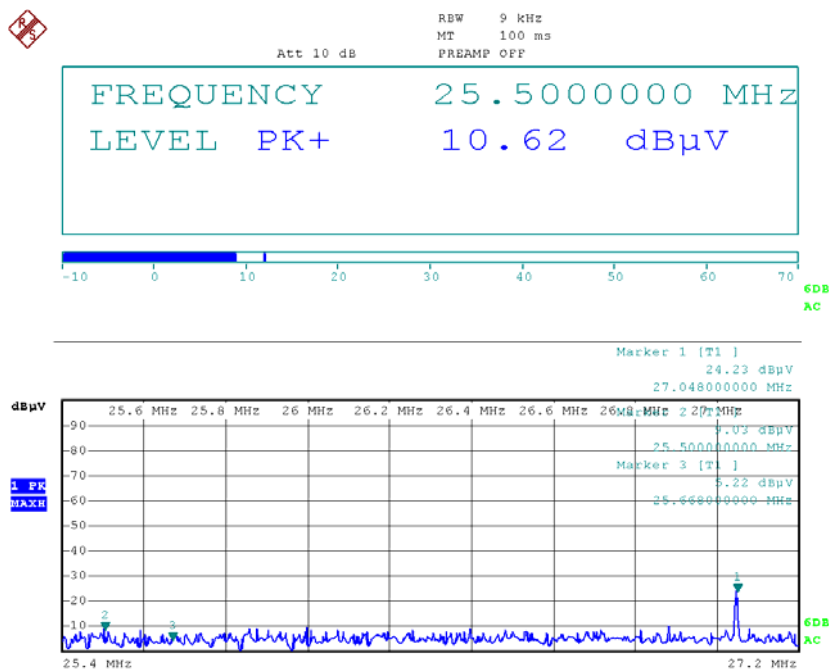
The bandwidth below 30MHz setting on the field strength meter is 10 kHz

4.5. Test Result of Band Edge

Product : Navigator 700 Laser
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter

RF Radiated Measurement: (Peak Detector)

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)
25.500	25.000	10.620	35.620	-34.380	70.000



Date: 7.JAN.2008 06:57:11

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.