Test Report

Product Name	TwinTouch 750e Laser
Model No.	GK-070004/T
FCC ID.	FSUGMZI4

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	Oct. 23, 2007
Issued Date	Nov. 08, 2007
Report No.	07A304R-RFUSP03V01

Test Report Certification

Test Date: Nov. 08, 2007
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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.	GK-070004/T
FCC ID.	FSUGMZI4
Rated Voltage	AC 120V/60Hz
EUT Working Voltage	DC 3V
Trade Name	Genius
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2006 ANSI C63.4: 2003 CISPR 22: 2005 NVLAP Lab Code: 200533-0
Test Result	Complied

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

Documented By : _____
(Senior Engineering Adm. Specialist / Anita Chou)

Tested By : _____
(Engineer / Tim Sung)

Approved By : _____
(Deputy Manager / Vincent Lin)

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Description Page

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	TwinTouch 750e Laser
Trade Name	Genius
FCC ID.	FSUGMZI4
Model No.	GK-070004/T
EUT Working Voltage	DC 3V
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:	27.045 MHz

Note:

1. The EUT is a TwinTouch 750e 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 TwinTouch 750e Laser used in household and office PC system. The number of the channels is 1 in 27.045MHz.
The device adapts FSK modulation. The loop antenna provides diversity function to improve the transmitting function.

Test Mode	Mode 1: Transmitter

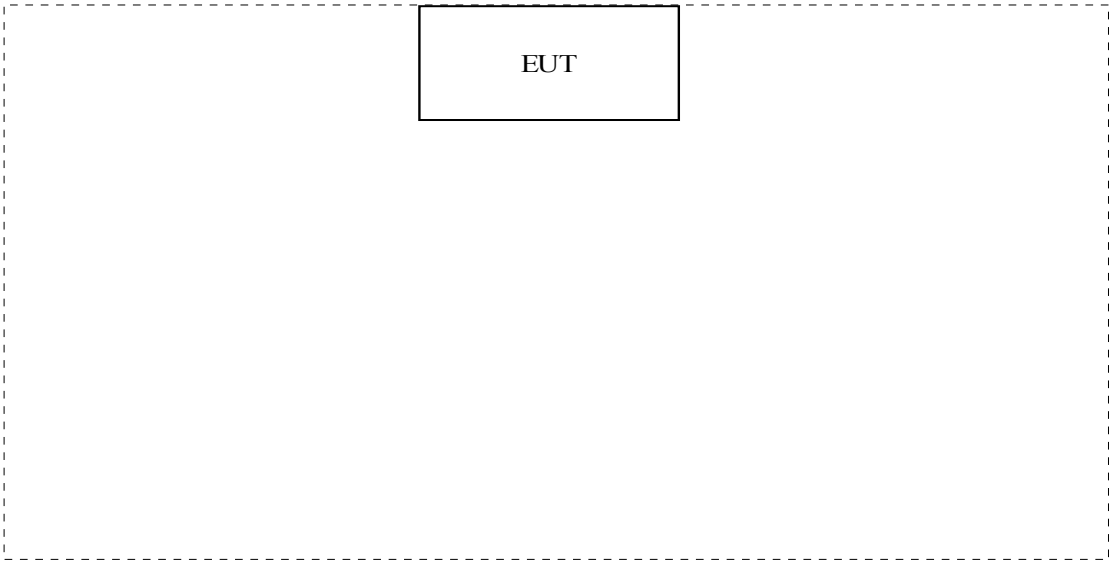
1.3. Test System Details

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 as shown in section 1.4.
2	Press and hold the left and the middle button.
3	Install the batteries.
4	Check that the cursor moves circularly on the notebook.
5	Remove the notebook and start the tests.

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

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FCC Accreditation Number: TW1014

2. Conducted Emission

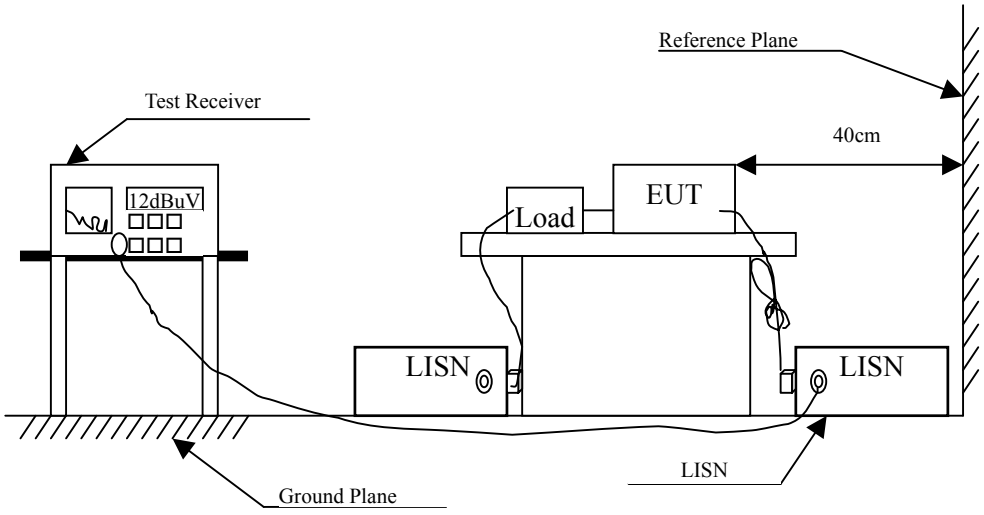
2.1. Test Equipment

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 invested 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

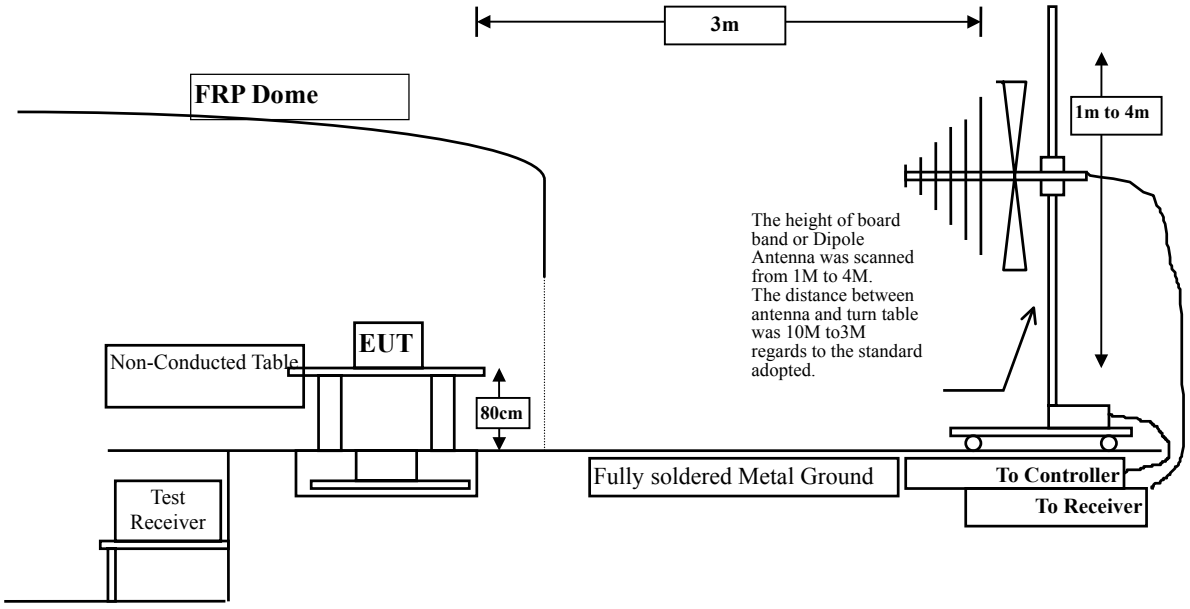
The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐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
☐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
☒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 invested over the frequency range from 30MHz to1GHz 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 harminics is checked.

Below 30MHz the magnetic loop antenna was used.

3.5. Uncertainty

± 3.9 dB above 1GHz

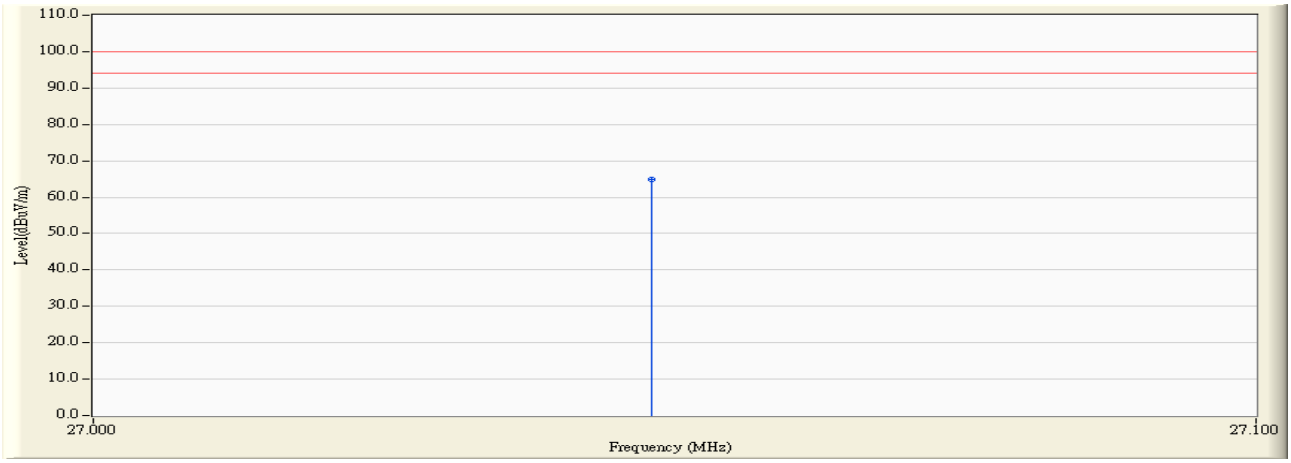
± 3.8 dB below 1GHz

3.6. Test Data of Radiated Emission

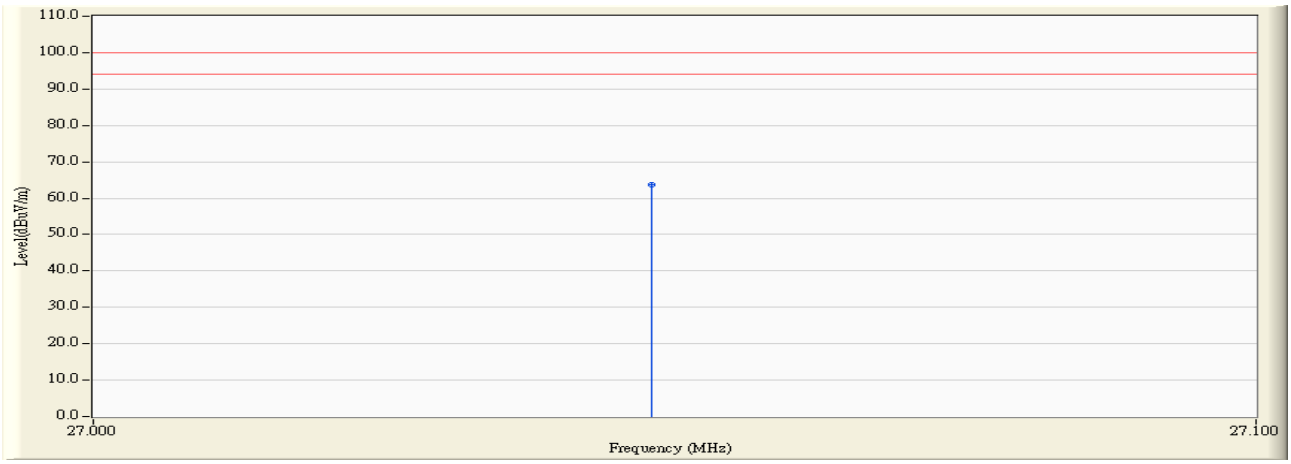
Product : TwinTouch 750e Laser
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test Voltage : AC 120V/60Hz
Test Mode : Mode 1: Transmitter

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	27.048	20.190	44.560	64.750	-35.250	100.000	80.000
Y	27.048	20.190	43.470	63.660	-36.340	100.000	80.000
Z	27.048	20.190	42.850	63.040	-36.960	100.000	80.000

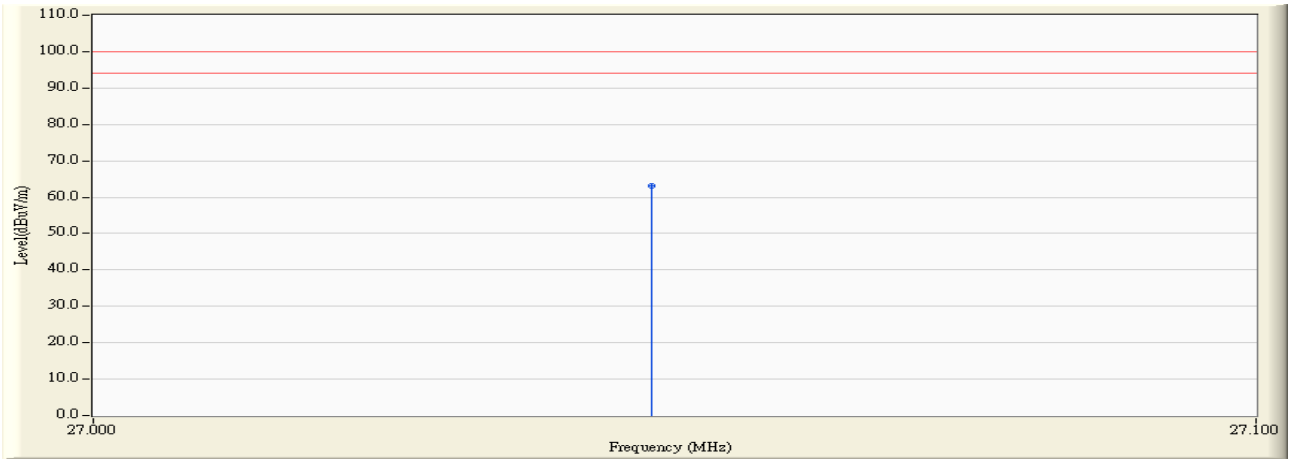
Polarity X



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 : TwinTouch 750e Laser
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Voltage : AC 120V/60Hz
Test Mode : Mode 1: Transmitter

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
80.541	8.982	16.196	25.178	-14.822	40.000
107.567	13.064	6.613	19.677	-23.823	43.500
137.970	12.444	8.870	21.313	-22.187	43.500
568.457	19.179	11.051	30.230	-15.770	46.000
622.886	20.811	12.402	33.213	-12.787	46.000
650.100	20.899	12.916	33.815	-12.185	46.000

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

Product : TwinTouch 750e Laser
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Voltage : AC 120V/60Hz
Test Mode : Mode 1: Transmitter

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical					
84.429	8.727	11.395	20.122	-19.878	40.000
134.970	11.835	10.237	22.071	-21.429	43.500
199.011	9.619	12.458	22.077	-21.423	43.500
568.457	21.207	4.427	25.633	-20.367	46.000
622.879	21.211	6.438	27.649	-18.351	46.000
650.100	20.119	9.896	30.015	-15.985	46.000

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:

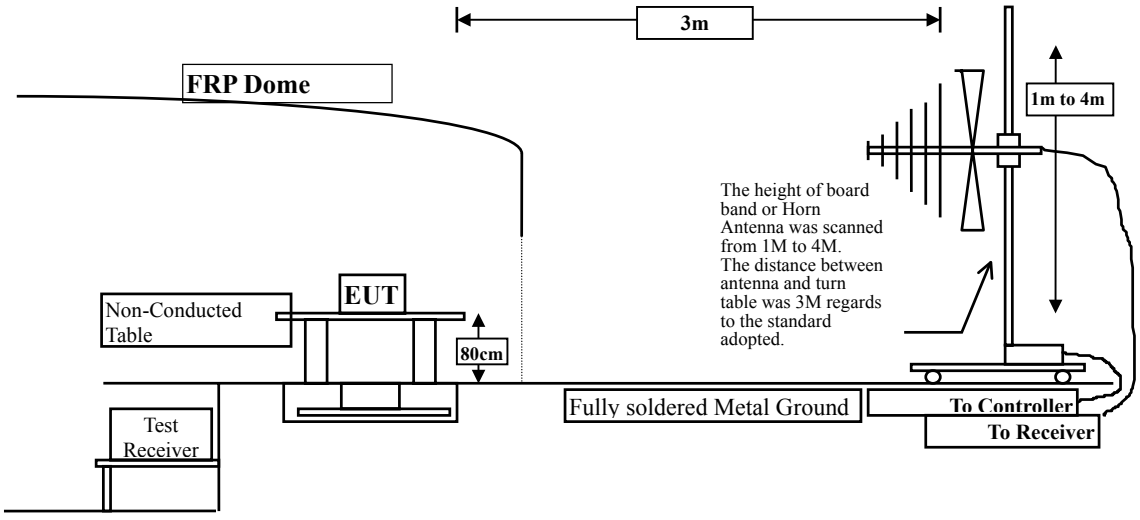
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2007
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2007
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2007
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2007
☐Site # 2	Test 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
☒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

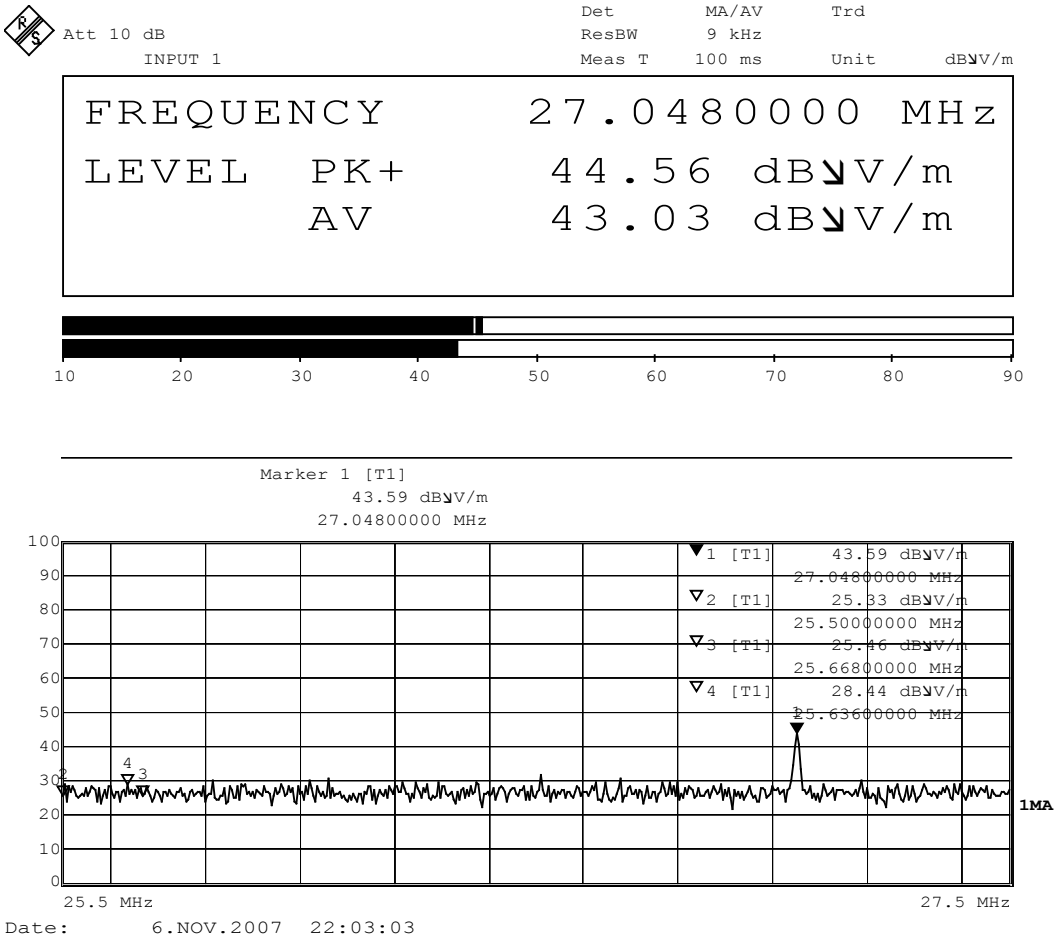
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 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 dtrength of harmonics measurement.
The bandwidth below 30MHz setting on the field strength meter is 10 kHz

4.5. Test Result of Band Edge

Product : TwinTouch 750e 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)
25.636	20.230	28.440	48.670	-25.330	74.000



5. EMI Reduction Method During Compliance Testing

No modification was made during testing.