FCC Radio Test Report

FCC ID: XW3DK8061RM

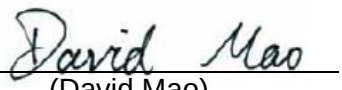
This report concerns (check one): ■ **Original Grant** □ **Class II Change**

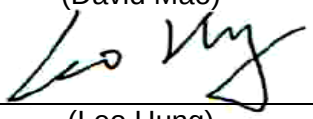
Issued Date	:	Sep. 12, 2013
Project No.	:	1309C002
Equipment	:	2.4 GHz Mini Thumb keyboard
Model Name	:	DK-8061RM;KB115
Applicant	:	Dongguan Siliten Electronics CO.,LTD
Address	:	Sijia Yewu Industrial estate, Shijie Town, Dongguan City, Guangdong Province, China

Tested by: Neutron Engineering Inc. EMC Laboratory

Date of Receipt: Aug. 31, 2013

Date of Test: Aug. 31, 2013~ Sep. 11, 2013

Testing Engineer : 
(David Mao)

Technical Manager : 
(Leo Hung)

Authorized Signatory : 
(Steven Lu)

Neutron Engineering Inc.

No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.
TEL : (0769) 8318-3000 FAX : (0769) 8319-6000

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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1. CERTIFICATION

Equipment	:	2.4 GHz Mini Thumb keyboard	
Brand Name	:	N/A	AZIO
Model Name	:	DK-8061RM	KB115
Applicant	:	Dongguan Siliten Electronics CO.,LTD	
Manufacturer	:	Dongguan Siliten Electronics CO.,LTD	
Address	:	Sijia Yewu Industrial estate, Shijie Town, Dongguan City, Guangdong Province, China	
Factory	:	Dongguan Siliten Electronics CO.,LTD	
Address	:	Sijia Yewu Industrial estate, Shijie Town, Dongguan City, Guangdong Province, China	
Date of Test	:	Aug. 31, 2013~ Sep. 11, 2013	
Test Sample	:	Engineering Sample	
Standard(s)	:	FCC Part15, Subpart C(15.249)/ ANSI C63.4-2009	

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1309C002) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249)			
StandardSection FCC	Test Item	Judgment	Remark
15.207	Conducted Emission	-	N/A
15.209	Radiated Emission	PASS	
15.249	Radiated Spurious Emission	PASS	

NOTE:

(1)"N/A" denotes test is not applicable in this test report.

(2)The EUT used new battery.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792
Neutron's test firm number for FCC 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The reported uncertainty of measurement y ± U,where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2,providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U,(dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)	NOTE
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td colspan="2">2.4 GHz Mini Thumb keyboard</td></tr>
<tr><td>Brand Name</td><td>N/A</td><td>AZIO</td></tr>
<tr><td>Model Name.</td><td>DK-8061RM</td><td>KB115</td></tr>
<tr><td>Model Difference</td><td colspan="2">Only differ in model name.</td></tr>
<tr><td>Product Description</td><td colspan="2">
<table>
<tr><td>Product Type</td><td>Low Power Communication Device</td></tr>
<tr><td>Operation Frequency</td><td>2408~2474 MHz</td></tr>
<tr><td>Modulation Technology</td><td>GFSK</td></tr>
<tr><td>Data rate</td><td>1Mbps</td></tr>
<tr><td>Number of Channel</td><td>34CH .Please see note 2. (Page 11)</td></tr>
<tr><td>Antenna Gain(Peak)</td><td>Please see note 3.(Page 9).</td></tr>
<tr><td>Field Strength</td><td>66.55 dBuV/m (AV Max.)</td></tr>
</table>
More details of EUT technical specification. Please refer to the User's Manual.
</td></tr>
<tr><td>Power Source</td><td colspan="2">DC voltage supplied from 2*AAA battery.</td></tr>
<tr><td>Power Rating</td><td colspan="2">DC 3.0V</td></tr>
<tr><td>Connecting I/O Port(s)</td><td colspan="2">Please refer to the User's Manual</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.

Frequency Channel			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2408**	18	2442
02	2410	19	2444
03	2412	20	2446
04	2414	21	2448
05	2416	22	2450
06	2418	23	2452
07	2420	24	2454
08	2422	25	2456
09	2424	26	2458
10	2426	27	2460
11	2428	28	2462
12	2430	29	2464
13	2432	30	2466
14	2434	31	2468
15	2436	32	2470
16	2438	33	2472
17	**2440**	**34**	**2474**

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Printed Antenna	N/A	1.10	-

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

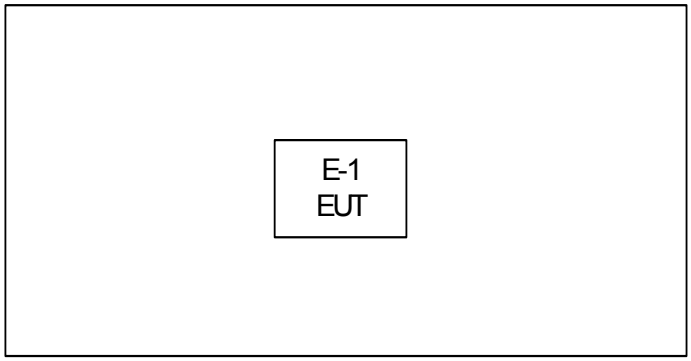
Pretest Mode	Description
Mode 1	Normal Link
Mode 2	Low – 2408MHz
Mode 3	Middle – 2440MHz
Mode 4	High -2474MHz

For Conducted Test	
Final Test Mode	Description
-	”N/A” denotes test is not applicable in this test report.

For Radiated Test	
Final Test Mode	Description
Mode 2	Low – 2408MHz
Mode 3	Middle – 2440MHz
Mode 4	High -2474MHz

Note:
(1) The measurements are performed at the high, middle, low available channels.

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	2.4 GHz Mini Thumb keyboard	N/A	DK-8061RM	XW3DK8061RM	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	

Note:

(1) For detachable type I/O cable should be specified the length in m in『Length』column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2SH	00052766	Apr. 25, 2014
2	LISN	R&S	ENV216	100526	Feb. 25, 2014
3	Test Cable	N/A	RG400 12m	N/A	Mar. 15, 2014
4	EMI Test Receiver	R&S	ESCS30	826547/022	Apr. 25, 2014
5	50Ω Terminator	SHX	TF2-3G-A	08122901	Apr. 25, 2014

Remark: “N/A” denotes no model name, serial no. or calibration specified.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

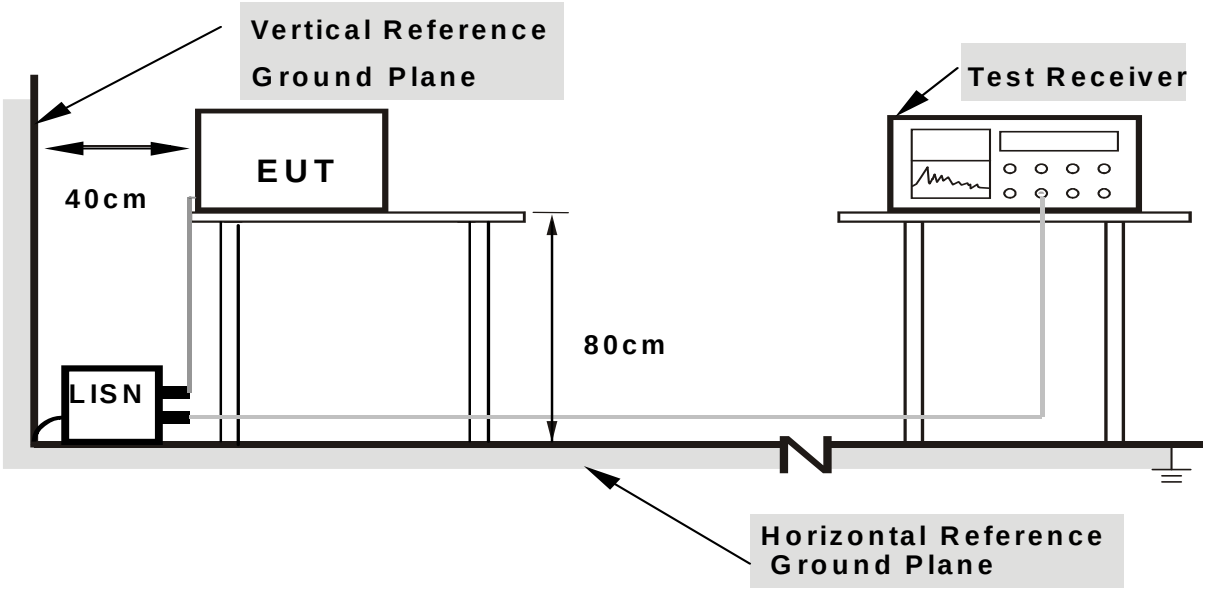
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting mode.

4.1.7 TEST RESULTS

E.U.T	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	--	Relative Humidity	--
Pressure	--	Test Power	--
Test Mode	N/A		

Note: ”N/A” denotes test is not applicable in this test report.

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn‘t perform.In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured.
(2) Measuring frequency range from 150KHz to 30MHz.
(3) “N/A” denotes test is not applicable in this Test Report.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 μV/m (54 dBμV/m) @ 3 m	Above 2483.5

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Apr. 25, 2014
2	Amplifier	HP	8447D	2944A09673	Apr. 25, 2014
3	Test Receiver	R&S	ESCI	100382	Apr. 25, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jun.30.2014
5	Antenna	ETS	3115	00075789	Apr. 25, 2014
6	Amplifier	Agilent	8449B	3008A02274	Apr. 25, 2014
7	Spectrum	Agilent	E4408B	US39240143	Nov. 16.2013
8	Test Cable	HUBER+SUHNER	C-45	N/A	Apr. 30, 2014
9	Controller	CT	SC100	N/A	N/A
10	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Apr. 25, 2014
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct.12.2013
12	Horn Antenna	EMCO	3115	9605-4803	Apr. 25, 2014

Remark: “N/A” denotes no model name, serial no. or calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2.3 TEST PROCEDURE

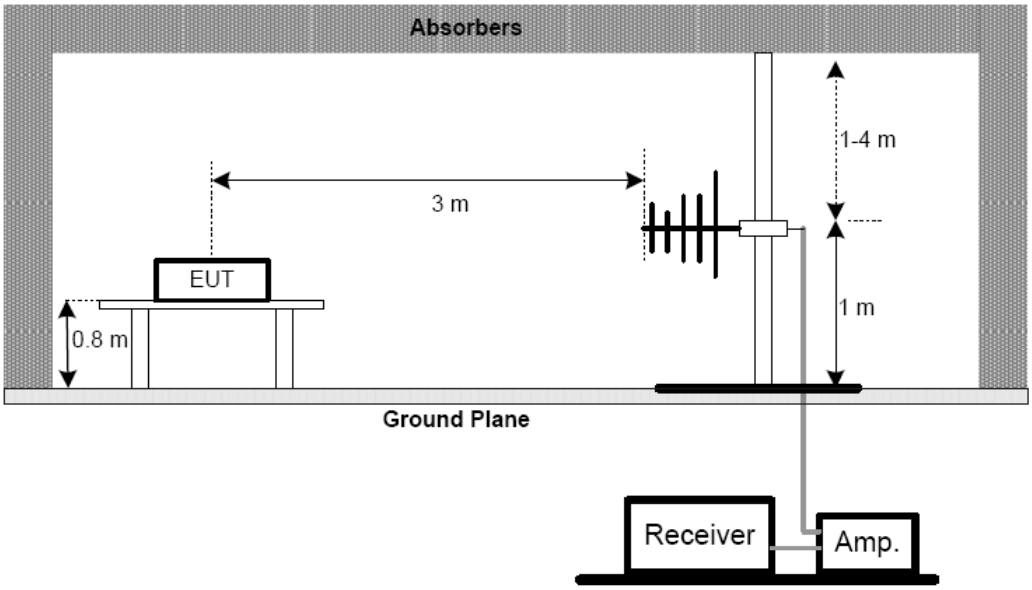
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then AV detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

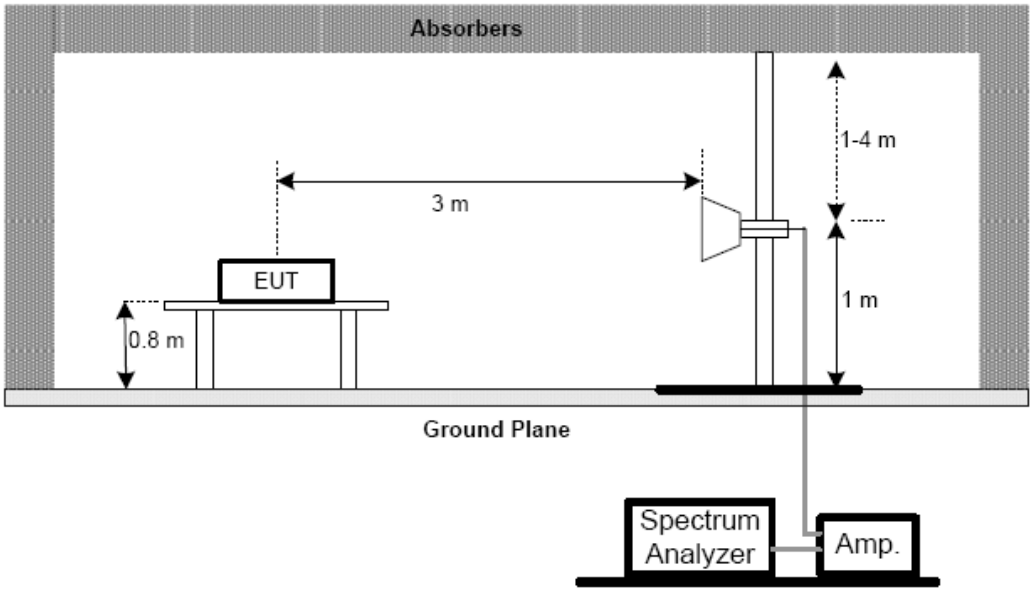
No deviation

4.2.5 TEST SETUP

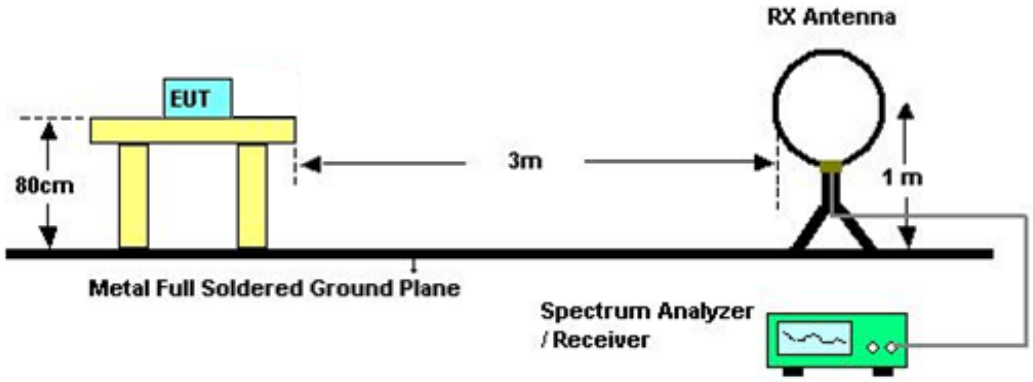
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.7 TEST RESULTS (BELOW 30MHz)

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	26℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2408MHz		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0098	0°	27.15	24.30	51.45	127.78	-76.33	AVG
0.0098	0°	30.65	24.30	54.95	147.78	-92.83	PK
0.0256	0°	23.78	23.95	47.73	119.44	-71.71	AVG
0.0256	0°	26.42	23.95	50.37	139.44	-89.07	PK
0.0402	0°	20.04	23.02	43.06	115.53	-72.46	AVG
0.0402	0°	22.71	23.02	45.73	135.53	-89.79	PK
0.0623	0°	23.56	22.15	45.71	111.71	-66.00	AVG
0.0623	0°	25.82	22.15	47.97	131.71	-83.74	PK
0.3528	0°	20.34	20.15	40.49	96.65	-56.16	AVG
0.3528	0°	23.02	20.15	43.17	116.65	-73.48	PK
1.7430	0°	27.35	19.53	46.88	69.54	-22.66	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0096	90°	19.68	24.30	43.98	127.96	-83.98	AVG
0.0096	90°	23.05	24.30	47.35	147.96	-100.61	PK
0.0225	90°	18.94	24.14	43.08	120.56	-77.48	AVG
0.0225	90°	20.59	24.15	44.74	140.56	-95.82	PK
0.0465	90°	20.48	22.62	43.10	114.26	-71.16	AVG
0.0465	90°	22.69	22.62	45.31	134.26	-88.94	PK
0.0705	90°	22.16	21.99	44.15	110.64	-66.49	AVG
0.0705	90°	25.09	21.99	47.08	130.64	-83.56	PK
0.3680	90°	21.67	20.12	41.79	96.29	-54.50	AVG
0.3680	90°	23.36	20.12	43.48	116.29	-72.81	PK
1.5240	90°	23.88	19.55	43.43	63.95	-20.52	QP

Remark：

(1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
(2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);.
(3) Limit line = specific limits (dBuV) + distance extrapolation factor..

4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)

Remark：

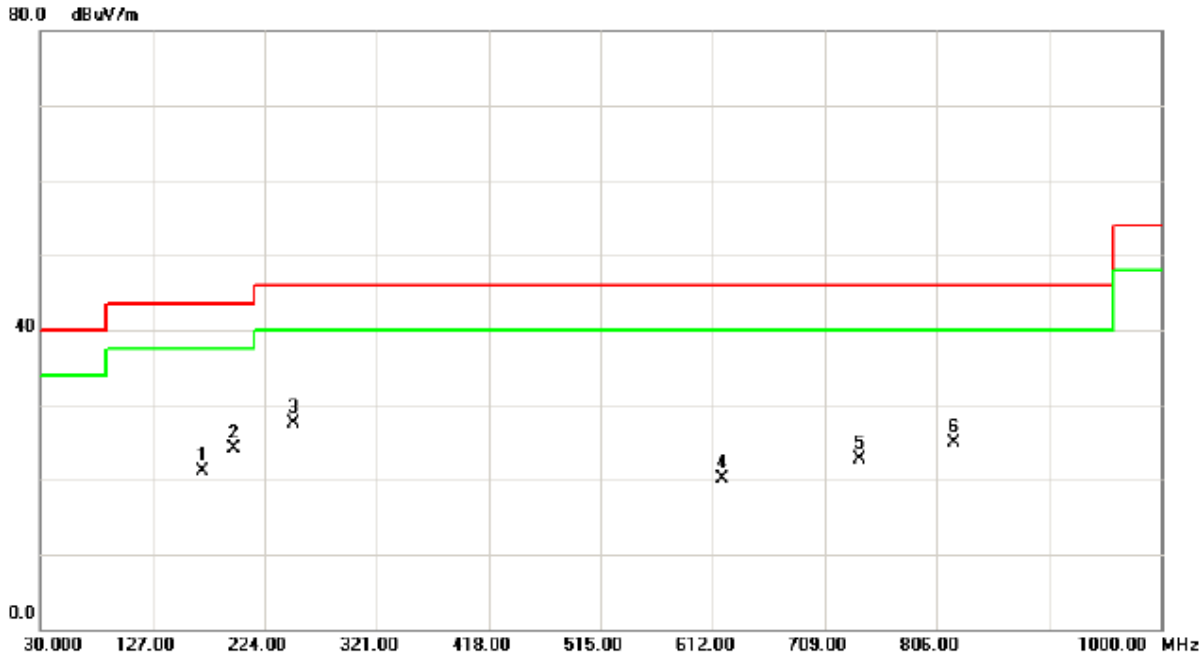
(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .

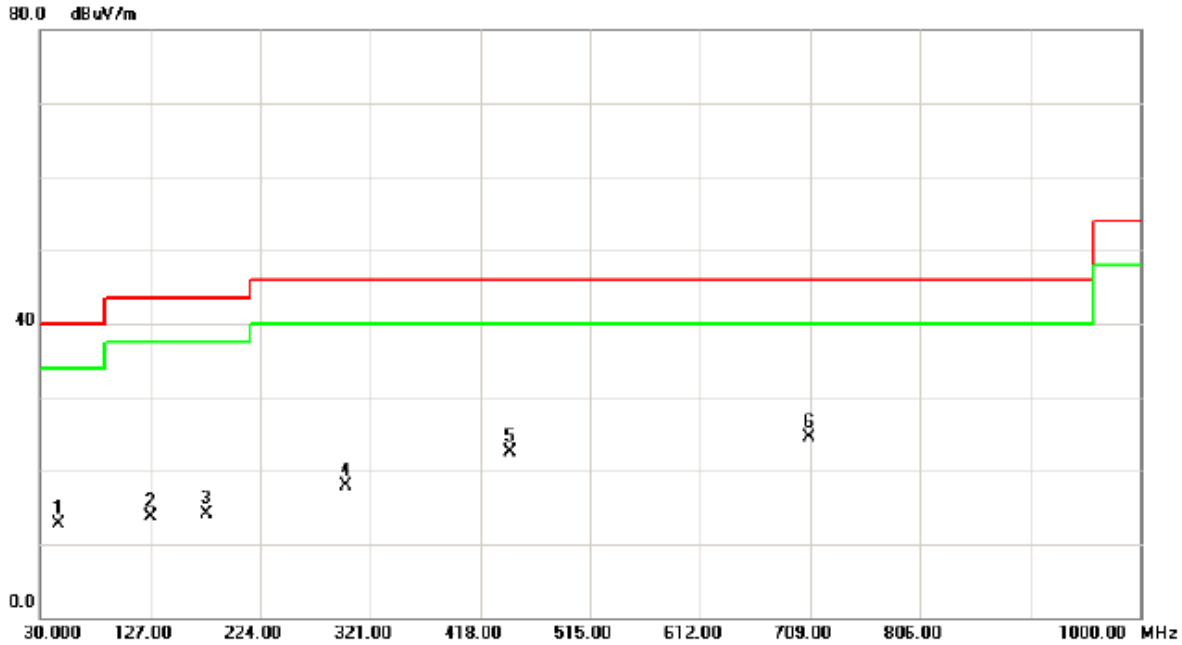
(4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25 ℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2408MHz	Polarization:	Vertical



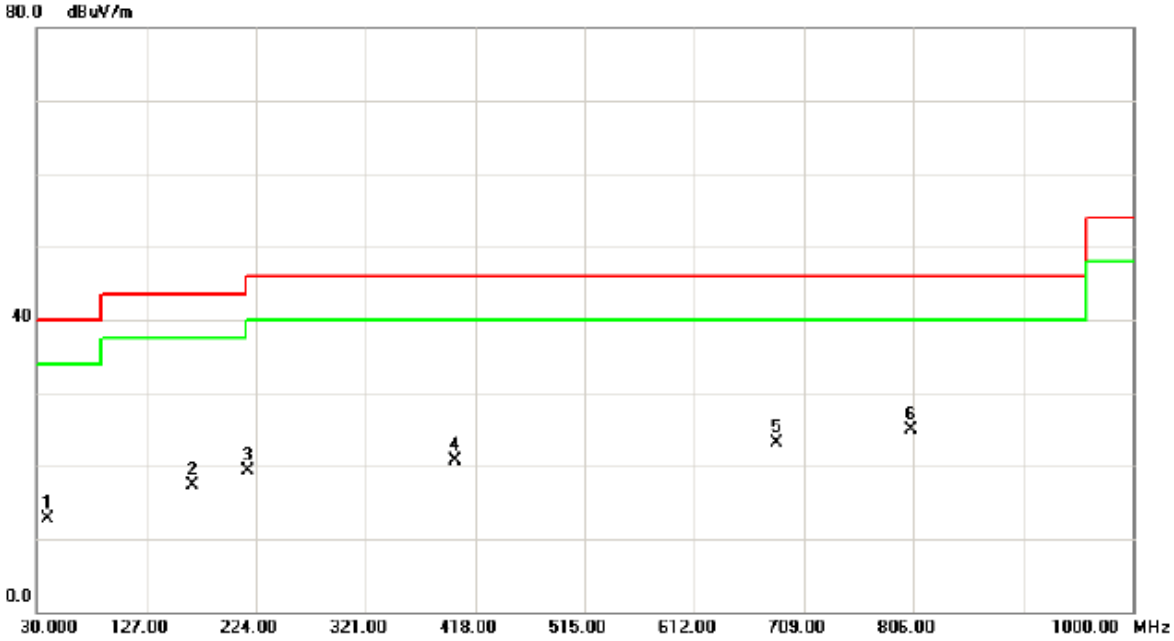
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		170.6500	33.78	-12.73	21.05	43.50	-22.45	peak	
2		197.8100	39.17	-15.00	24.17	43.50	-19.33	peak	
3	*	249.2200	42.47	-14.96	27.51	46.00	-18.49	peak	
4		619.7600	27.18	-7.10	20.08	46.00	-25.92	peak	
5		739.0700	27.67	-4.88	22.79	46.00	-23.21	peak	
6		820.5500	28.30	-3.34	24.96	46.00	-21.04	peak	

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25 ℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2408MHz	Polarization:	Horizontal



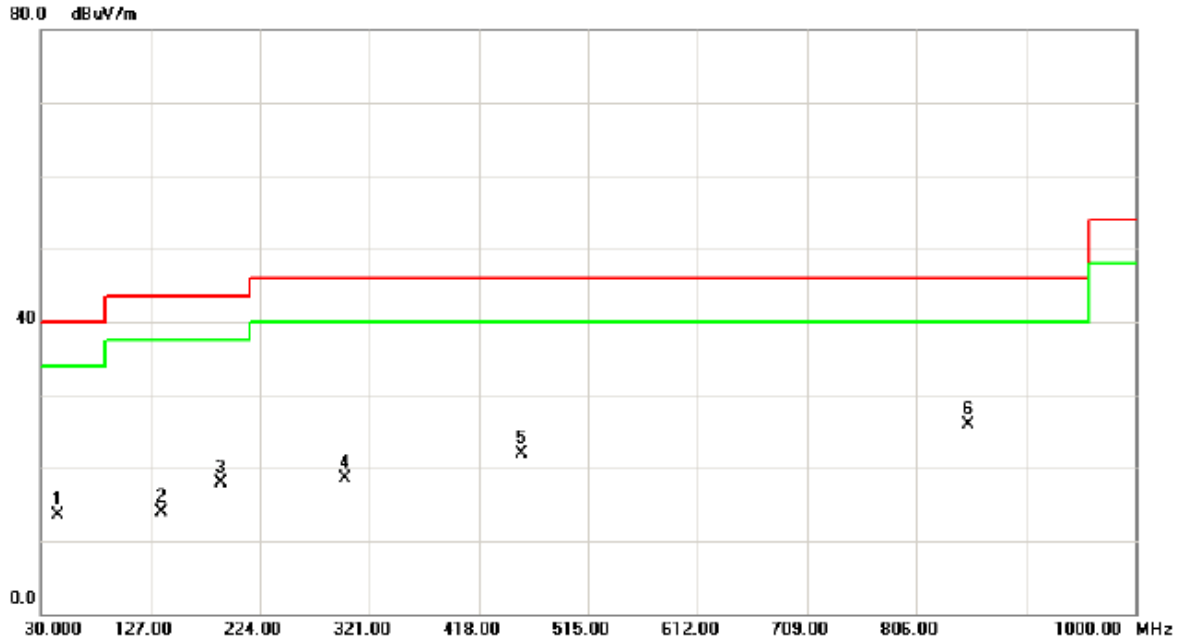
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		46.4900	26.88	-14.22	12.66	40.00	-27.34	peak	
2		127.0000	27.29	-13.50	13.79	43.50	-29.71	peak	
3		176.4700	26.92	-12.80	14.12	43.50	-29.38	peak	
4		299.6600	29.12	-11.27	17.85	46.00	-28.15	peak	
5		444.1900	31.45	-9.02	22.43	46.00	-23.57	peak	
6	*	708.0300	29.35	-4.83	24.52	46.00	-21.48	peak	

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25 ℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2440MHz	Polarization:	Vertical



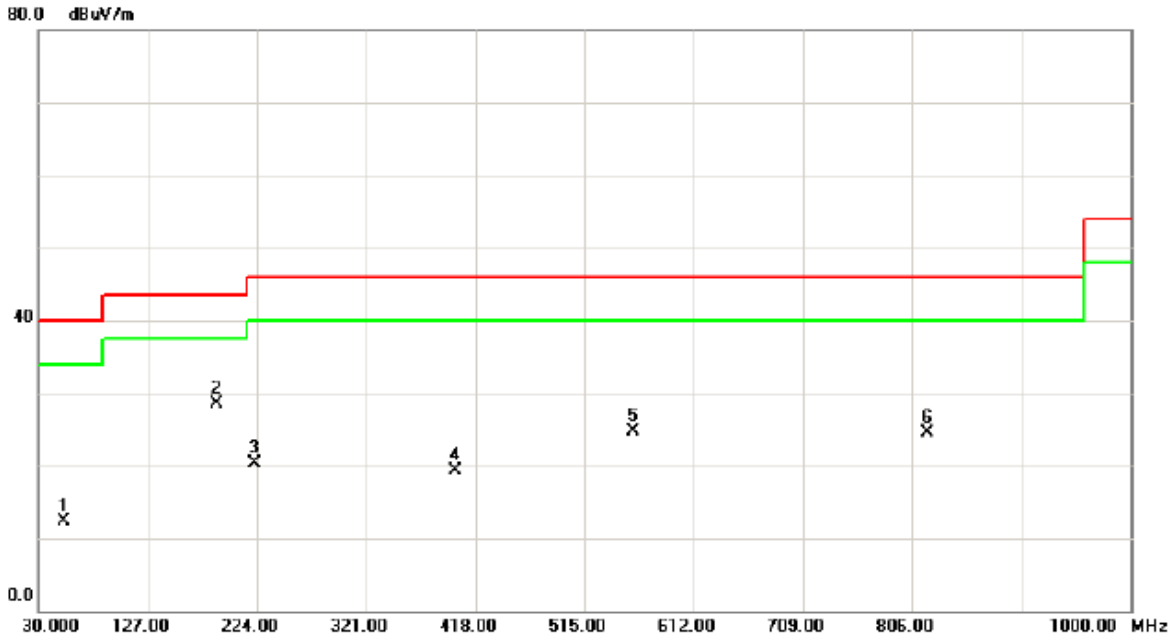
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		39.7000	27.27	-14.66	12.61	40.00	-27.39	peak	
2		167.7400	30.31	-12.93	17.38	43.50	-26.12	peak	
3		216.2400	34.37	-15.12	19.25	46.00	-26.75	peak	
4		400.5400	30.67	-9.87	20.80	46.00	-25.20	peak	
5		684.7500	28.23	-5.04	23.19	46.00	-22.81	peak	
6	*	804.0600	28.03	-3.15	24.88	46.00	-21.12	peak	

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25 ℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2440MHz	Polarization:	Horizontal



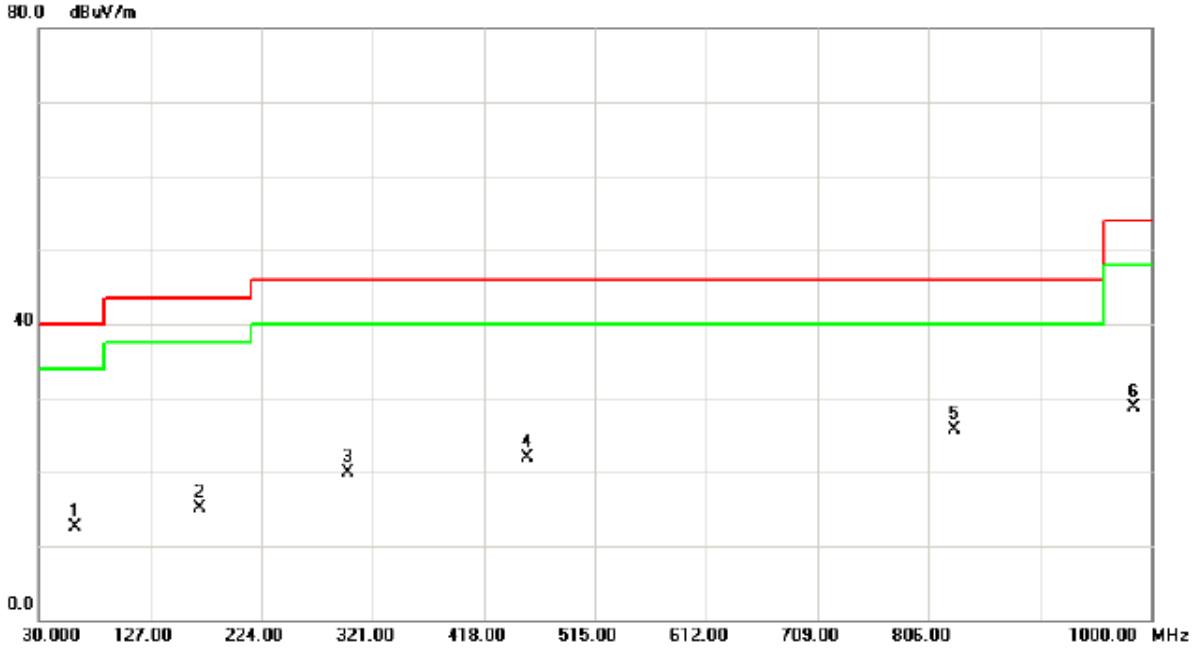
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		44.5500	27.57	-14.15	13.42	40.00	-26.58	peak	
2		136.7000	27.47	-13.62	13.85	43.50	-29.65	peak	
3		189.0800	32.15	-14.18	17.97	43.50	-25.53	peak	
4		299.6600	29.81	-11.27	18.54	46.00	-27.46	peak	
5		455.8300	30.92	-9.08	21.84	46.00	-24.16	peak	
6	*	851.5900	29.53	-3.60	25.93	46.00	-20.07	peak	

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25 ℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2474MHz	Polarization:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		52.3100	27.03	-14.68	12.35	40.00	-27.65	peak	
2	*	188.1100	42.62	-14.04	28.58	43.50	-14.92	peak	
3		222.0600	35.23	-14.91	20.32	46.00	-25.68	peak	
4		400.5400	29.11	-9.87	19.24	46.00	-26.76	peak	
5		557.6800	32.38	-7.72	24.66	46.00	-21.34	peak	
6		819.5800	27.86	-3.33	24.53	46.00	-21.47	peak	

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25 ℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX Mode 2474MHz	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		61.0400	27.78	-15.36	12.42	40.00	-27.58	peak	
2		169.6800	27.96	-12.76	15.20	43.50	-28.30	peak	
3		299.6600	31.18	-11.27	19.91	46.00	-26.09	peak	
4		455.8300	31.00	-9.08	21.92	46.00	-24.08	peak	
5	*	828.3100	29.14	-3.43	25.71	46.00	-20.29	peak	
6		984.4800	28.66	0.01	28.67	54.00	-25.33	peak	

4.2.9 TEST RESULTS (ABOVE 1000 MHz)

EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	56 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX 2408MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	24.38	13.78	34.09	58.47	47.87	74.00	54.00	X/E
2395.60	V	25.22	14.53	34.10	59.32	48.63	74.00	54.00	X/E
2407.60	**V**	**32.05**	**27.45**	**34.14**	**66.19**	**61.59**	**114.00**	**94.00**	**X/F**
4816.00	V	21.89	12.79	6.42	28.31	19.21	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .

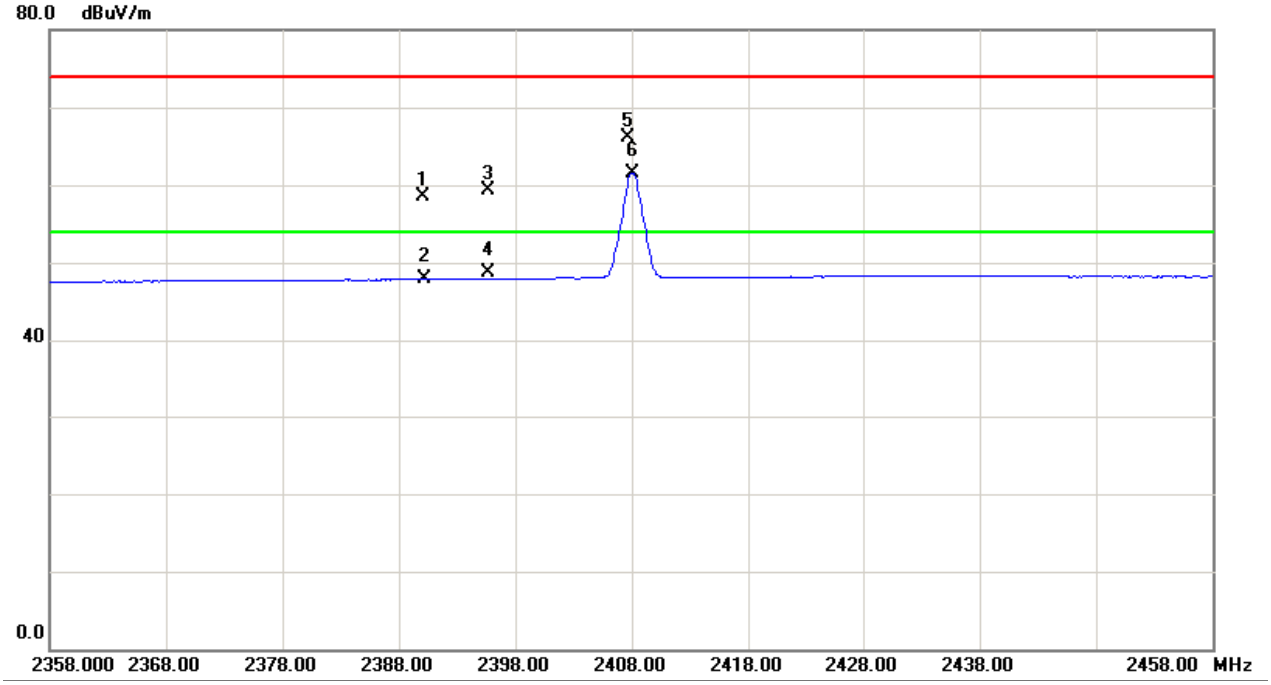
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

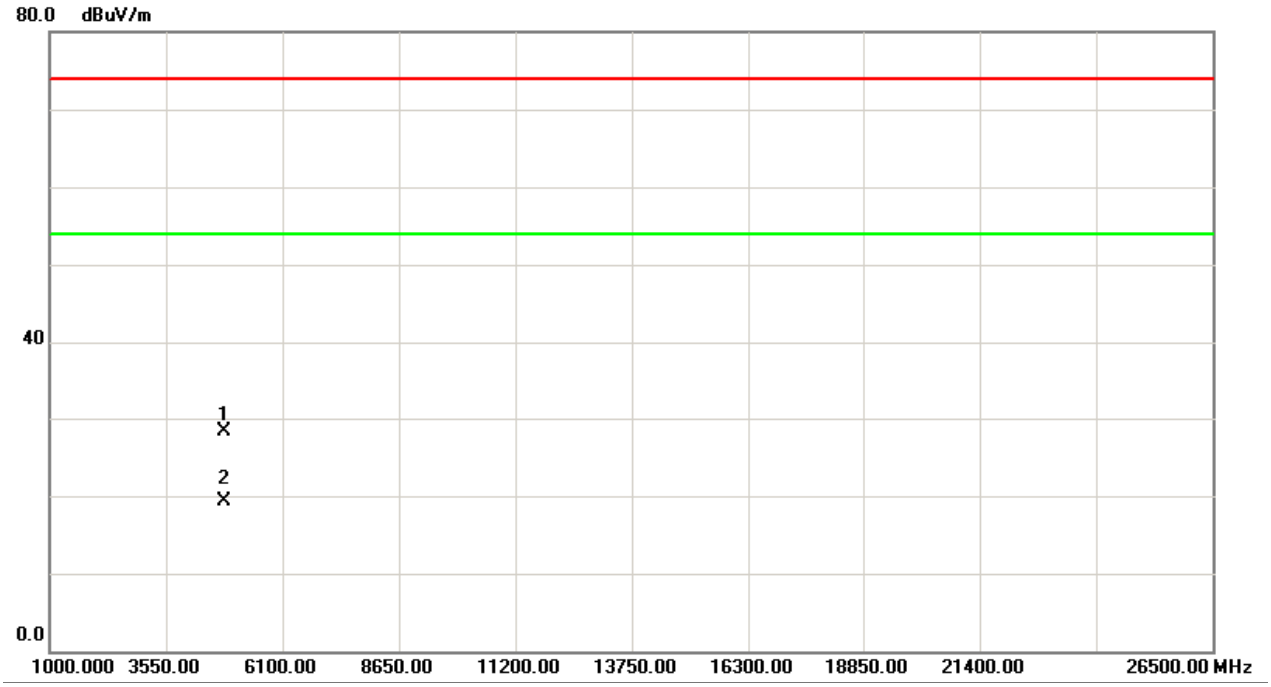
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2408MHz (Above 1000 MHz, Vertical)





EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	56 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX 2408MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	23.49	13.72	34.09	57.58	47.81	74.00	54.00	X/E
2395.60	H	25.13	14.56	34.10	59.23	48.66	74.00	54.00	X/E
2408.40	**H**	**34.08**	**29.80**	**34.14**	**68.22**	**63.94**	**114.00**	**94.00**	**X/F**
4816.00	H	20.51	12.76	6.42	26.93	19.18	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .

(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

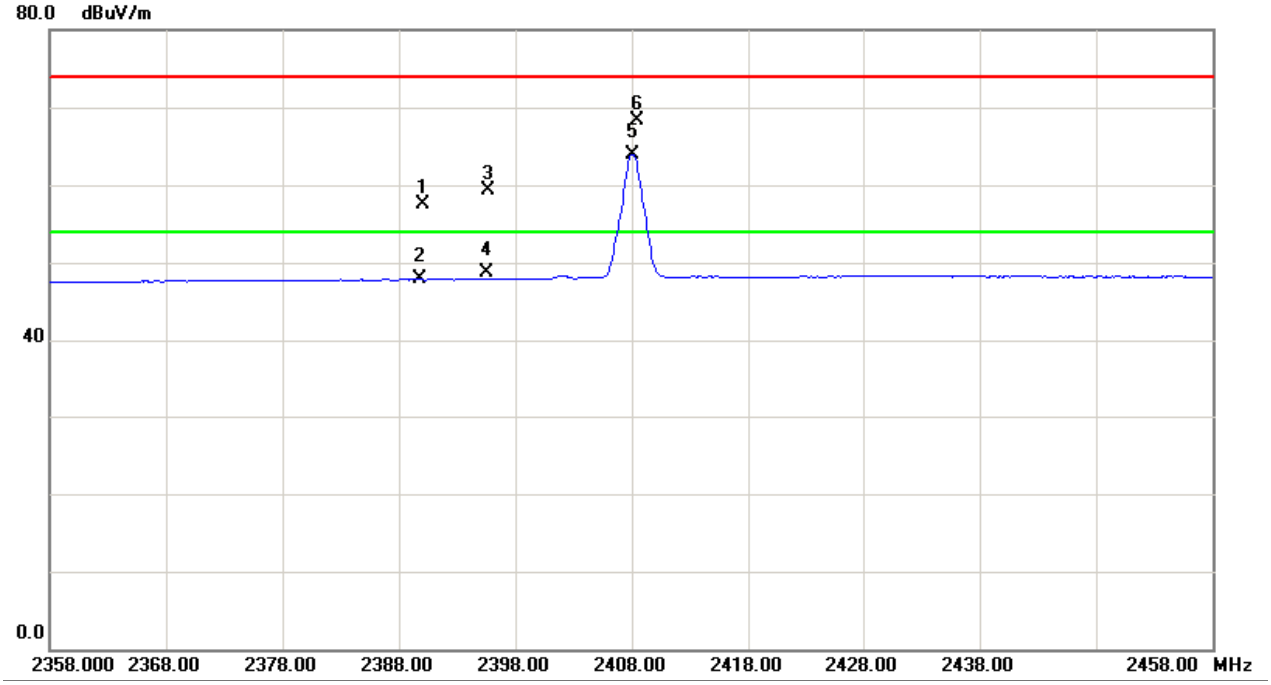
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

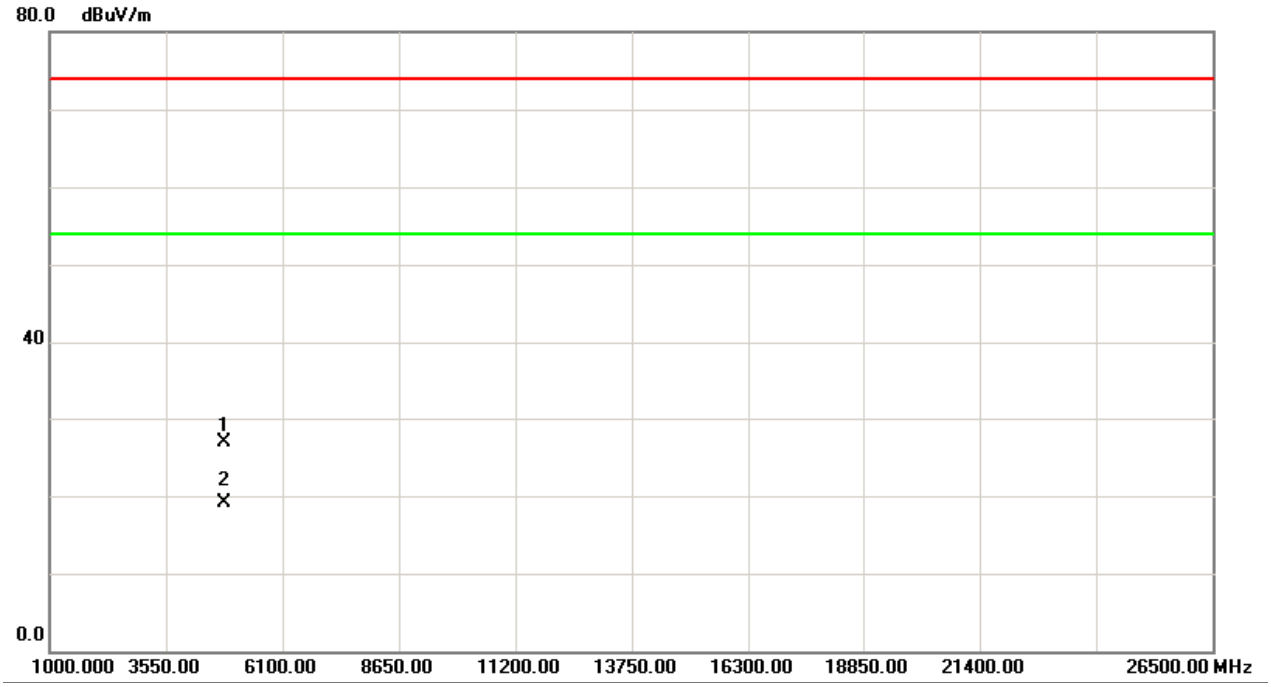
(6) EUT Orthogonal Axis：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2408MHz (Above 1000 MHz, Horizontal)





EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	56 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX 2440MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2440.00	**V**	**31.81**	**26.89**	**34.24**	**66.05**	**61.13**	**114.00**	**94.00**	**X/F**
4880.00	V	21.10	12.72	6.61	27.71	19.33	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .

(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

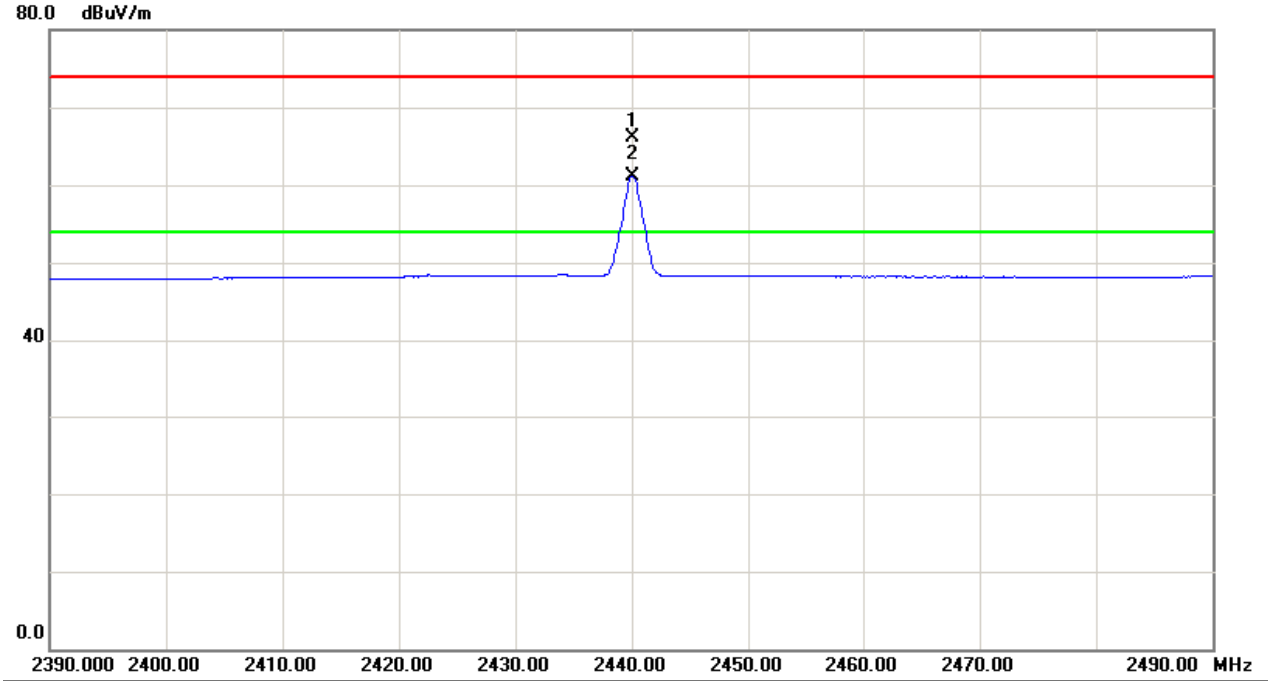
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

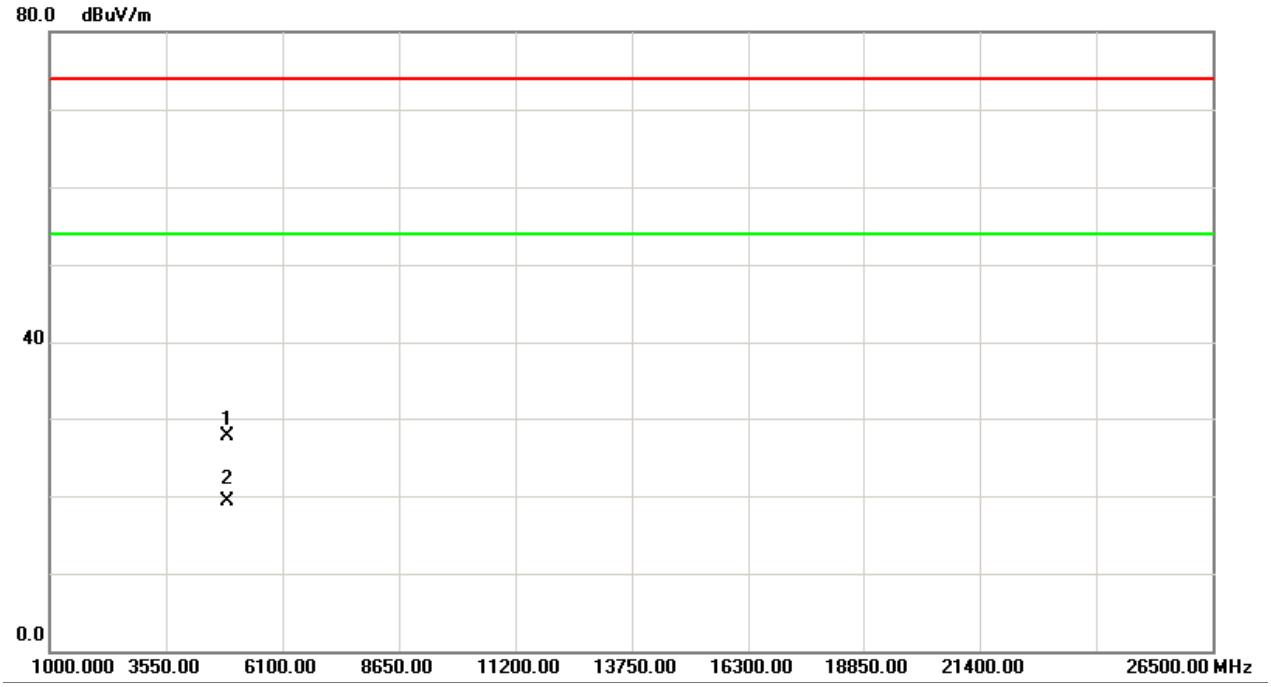
(6) EUT Orthogonal Axis：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2448 MHz (Above 1000 MHz, Vertical)





EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	56 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX 2440MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2440.00	**H**	**34.91**	**31.15**	**34.24**	**69.15**	**65.39**	**114.00**	**94.00**	**X/F**
4880.00	H	22.73	12.76	6.61	29.34	19.37	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .

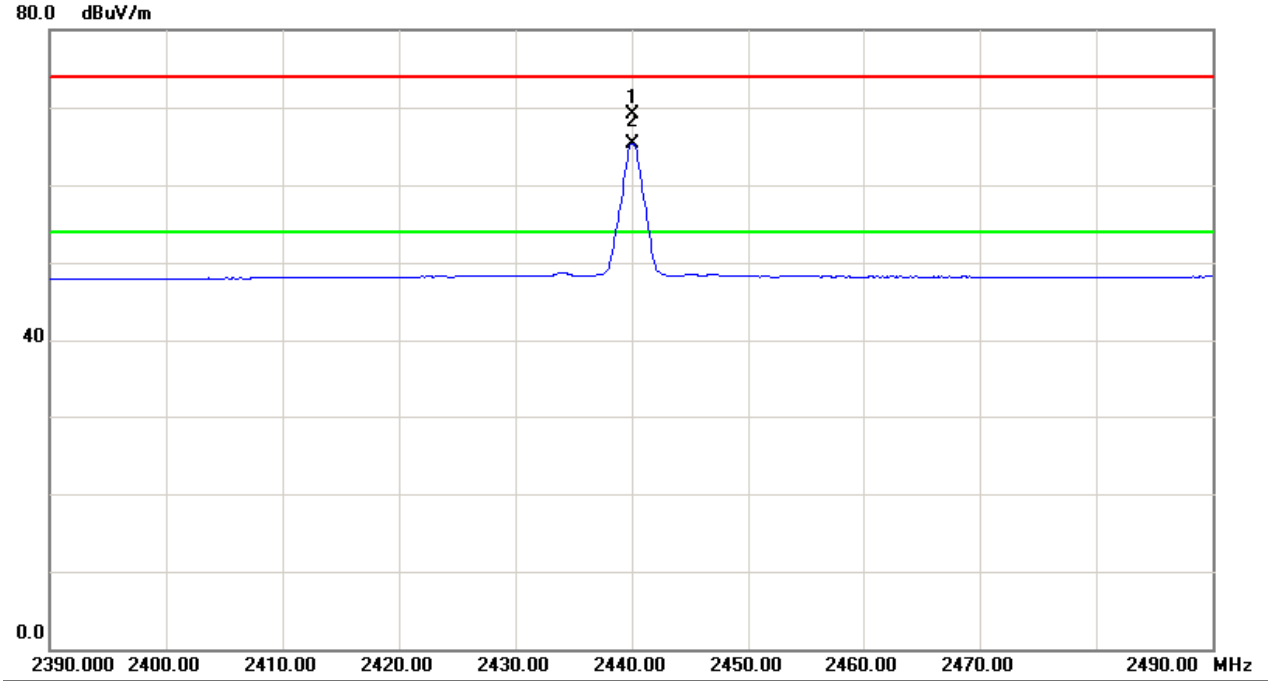
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

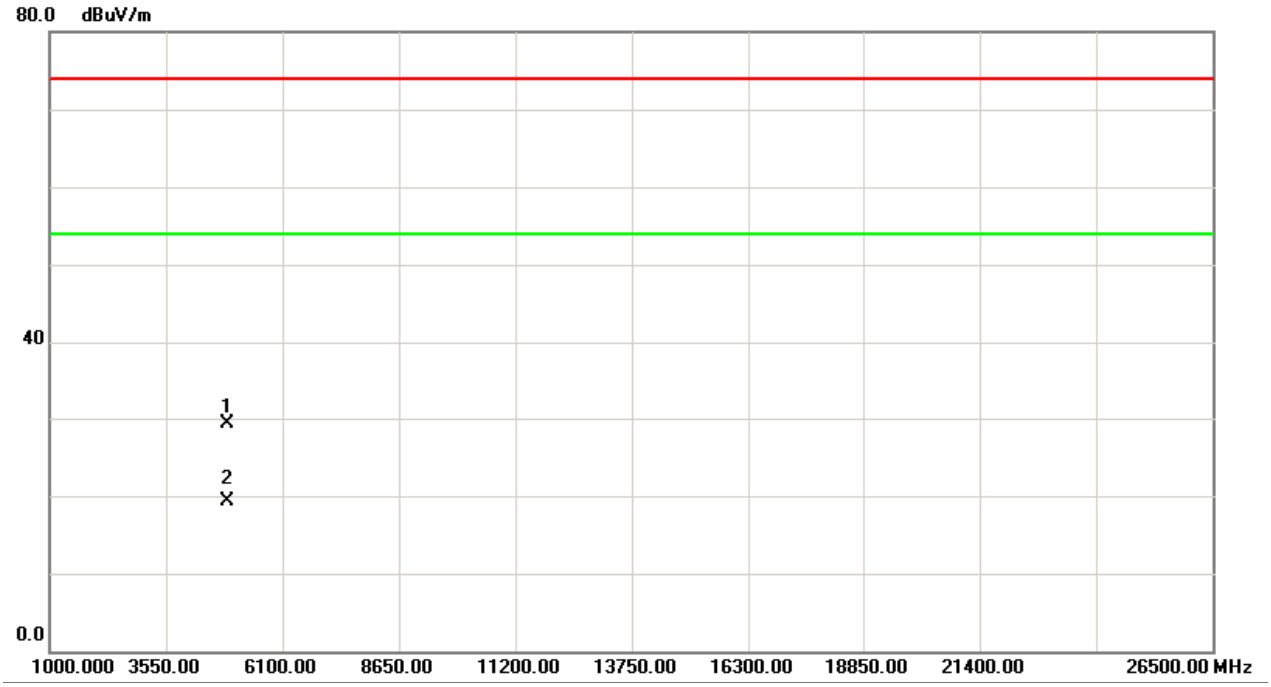
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2440MHz (Above 1000 MHz, Horizontal)





EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	56 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX 2474MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2473.70	**V**	**31.89**	**27.23**	**34.34**	**66.23**	**61.57**	**114.00**	**94.00**	**X/F**
2483.50	V	24.29	13.72	34.37	58.66	48.09	74.00	54.00	X/E
2487.40	V	25.35	14.32	34.38	59.73	48.70	74.00	54.00	X/H
4948.00	V	23.80	13.19	6.80	30.60	19.99	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .

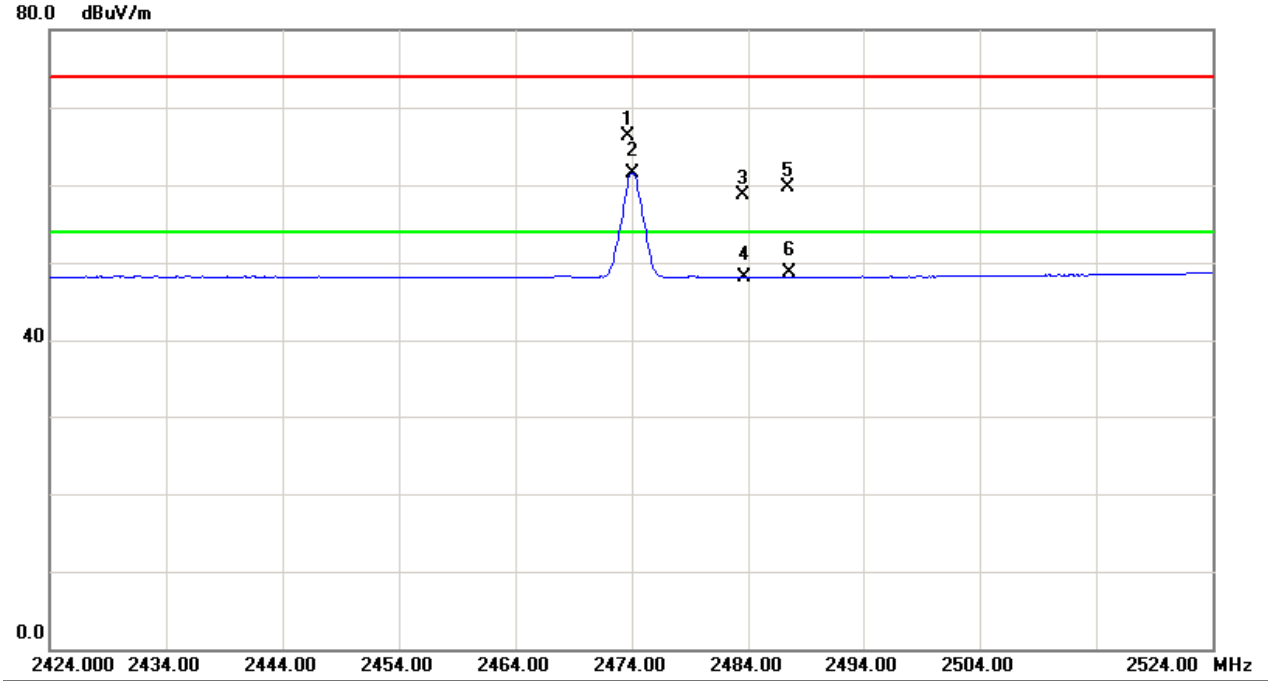
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

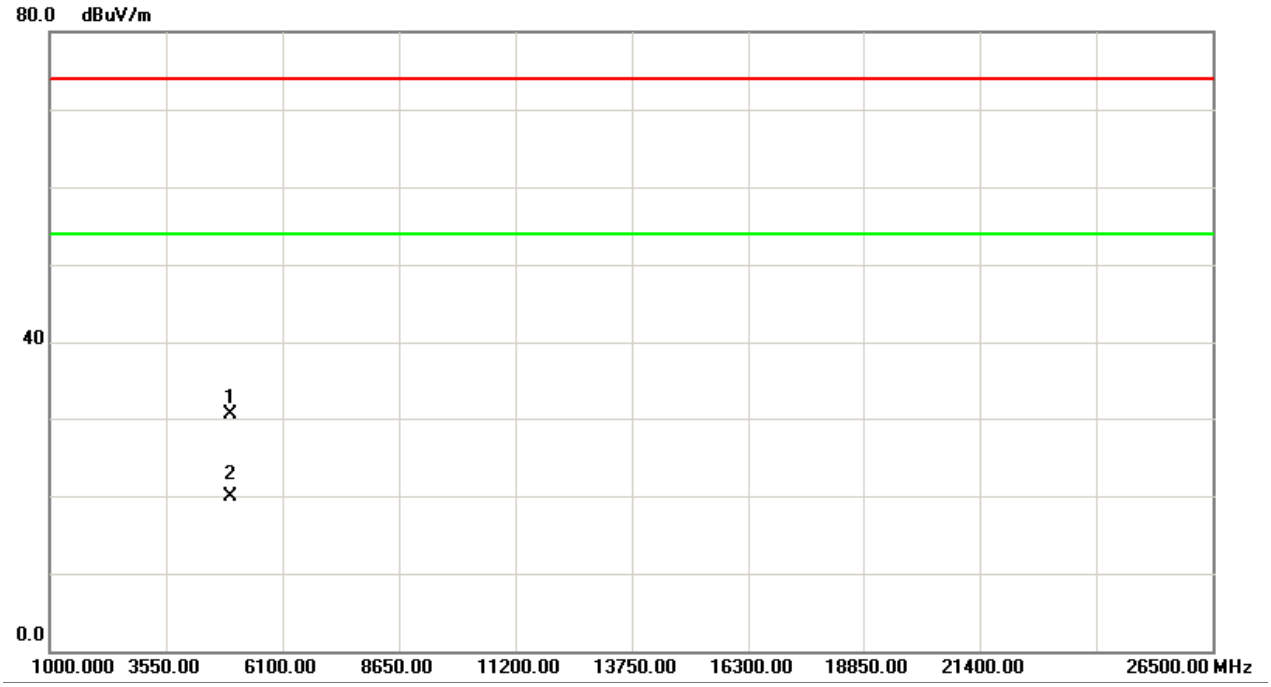
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2474MHz (Above 1000 MHz, Vertical)





EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	56 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX 2474MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2474.00	**H**	**36.04**	**32.21**	**34.34**	**70.38**	**66.55**	**114.00**	**94.00**	**X/F**
2483.50	H	24.02	13.67	34.37	58.39	48.04	74.00	54.00	X/E
2487.40	H	25.69	14.39	34.38	60.07	48.77	74.00	54.00	X/H
4948.00	H	25.10	13.31	6.80	31.90	20.11	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .

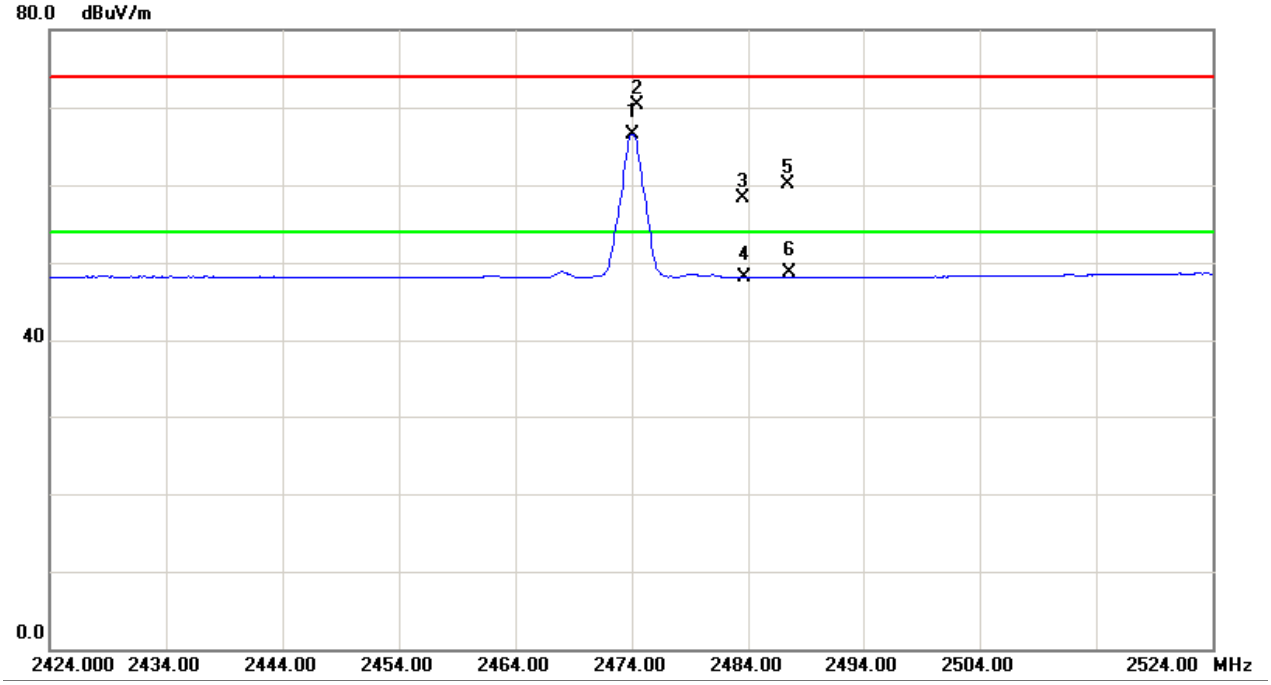
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

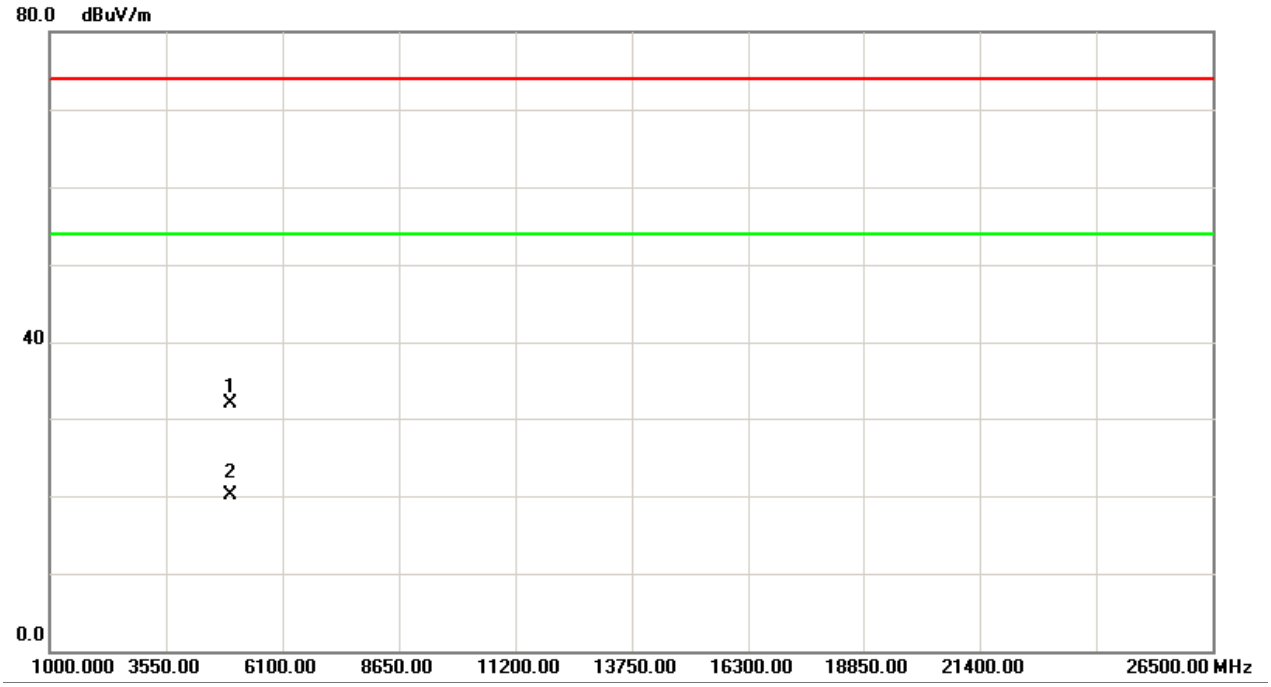
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2474MHz (Above 1000 MHz, Horizontal)





5. BANDWIDTH TEST

5.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.

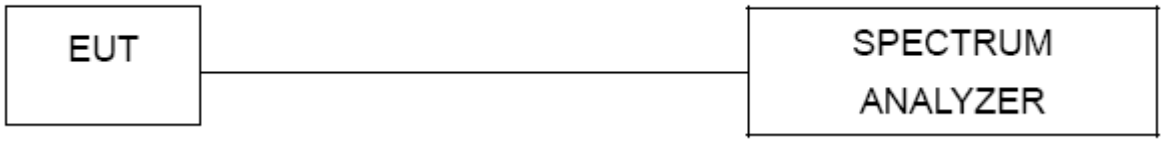
5.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

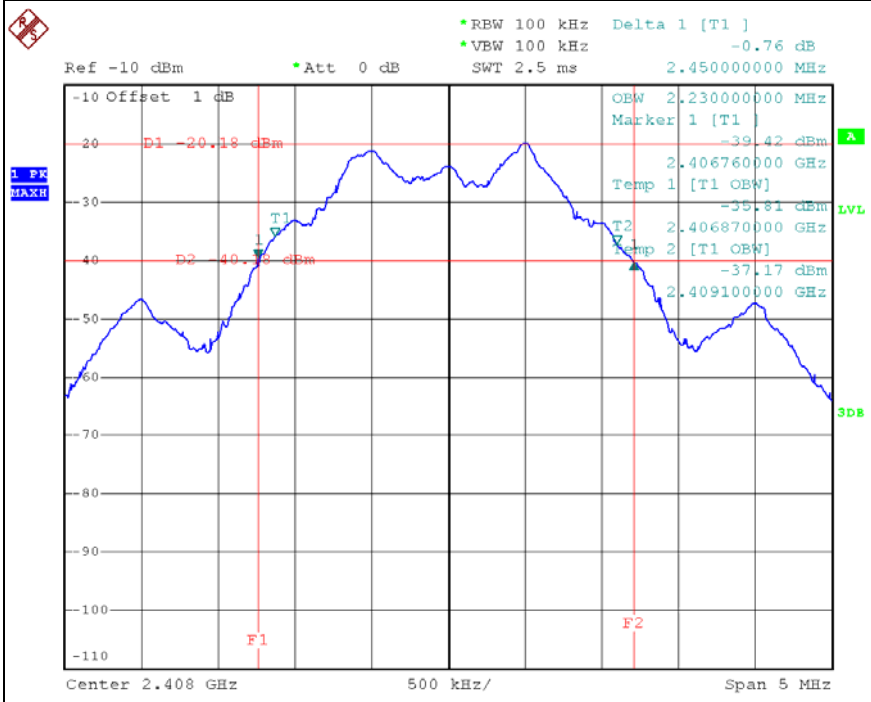
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

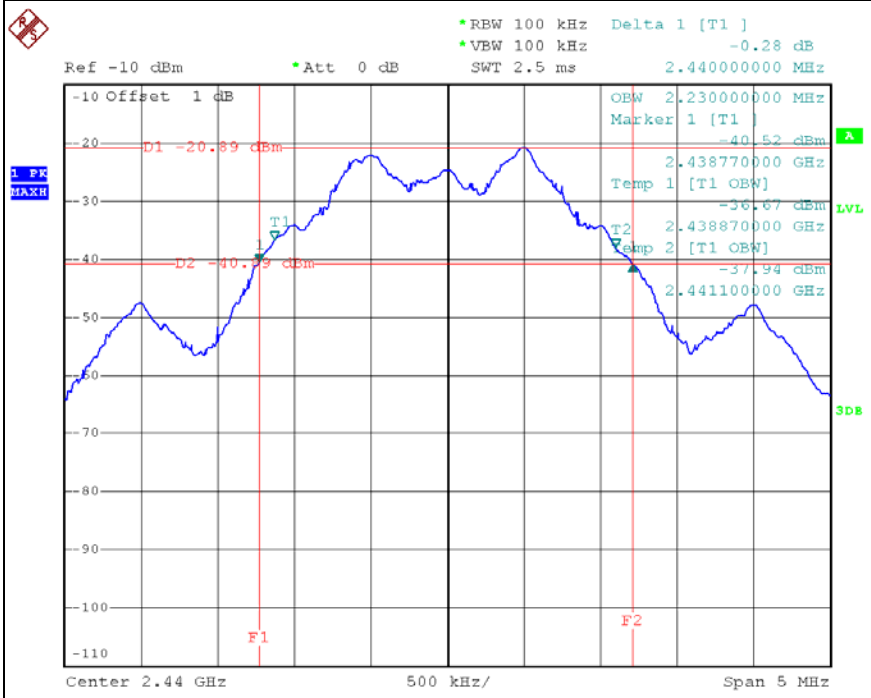
EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX CH 01/17/34		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% occupied Bandwidth(MHz)
CH 01	2408	2.45	2.23
CH 17	2440	2.44	2.23
CH 34	2474	2.45	2.23

TX CH01

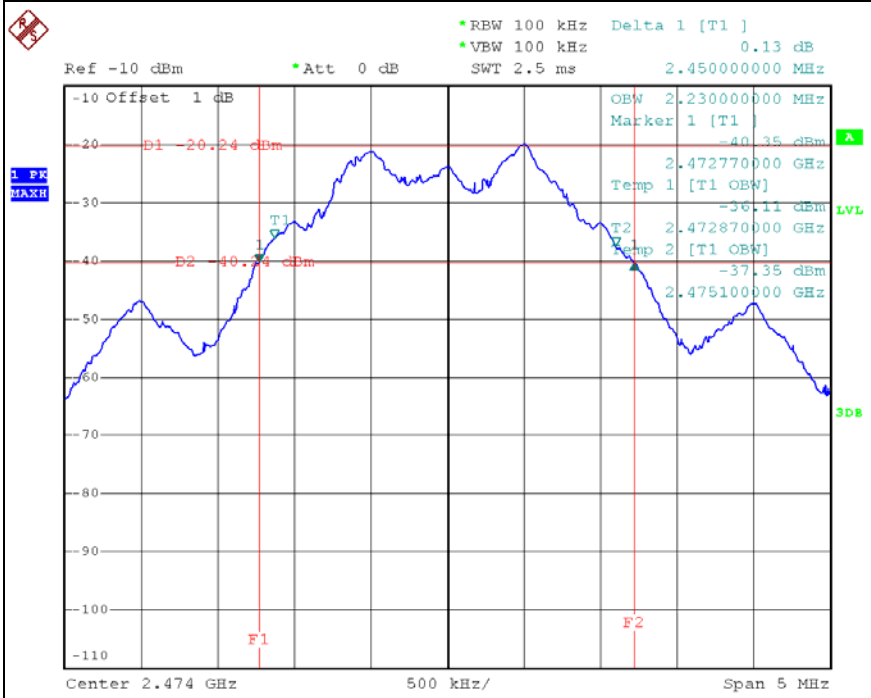


TX CH 17



Date: 11.SEP.2013 18:57:23

TX CH 34



Date: 11.SEP.2013 19:00:14

6. ANTENNA CONDUCTED SPURIOUS EMISSION

6.1 APPLIED PROCEDURES / LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.

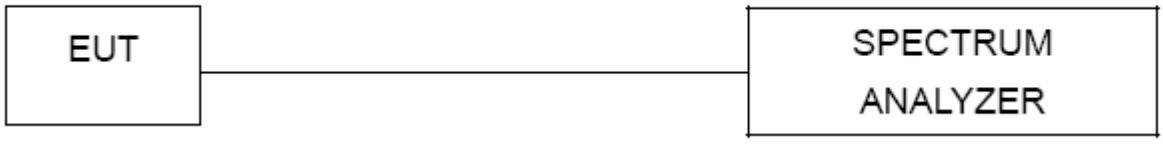
6.1.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 10 ms.

6.1.3 DEVIATION FROM STANDARD

No deviation.

6.1.4 TEST SETUP



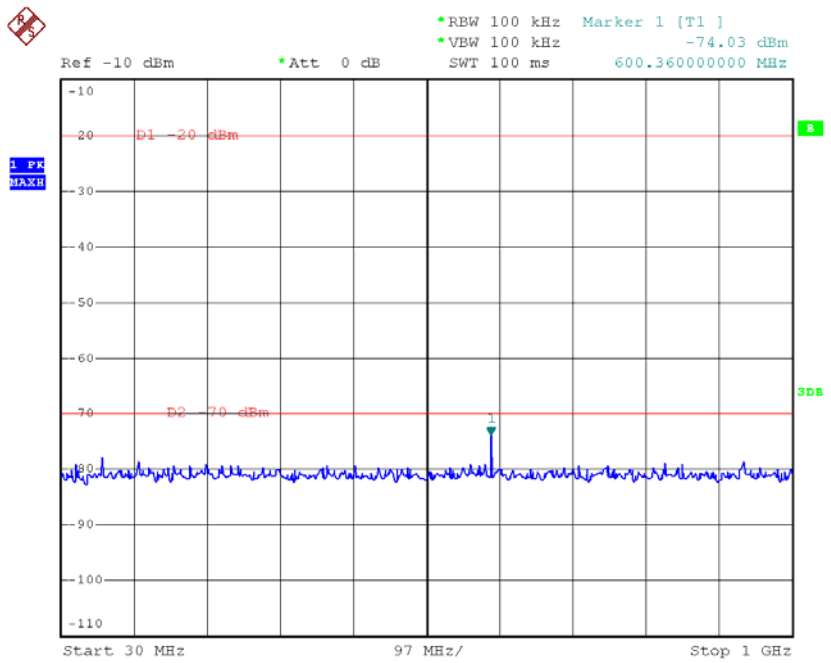
6.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.6 TEST RESULTS

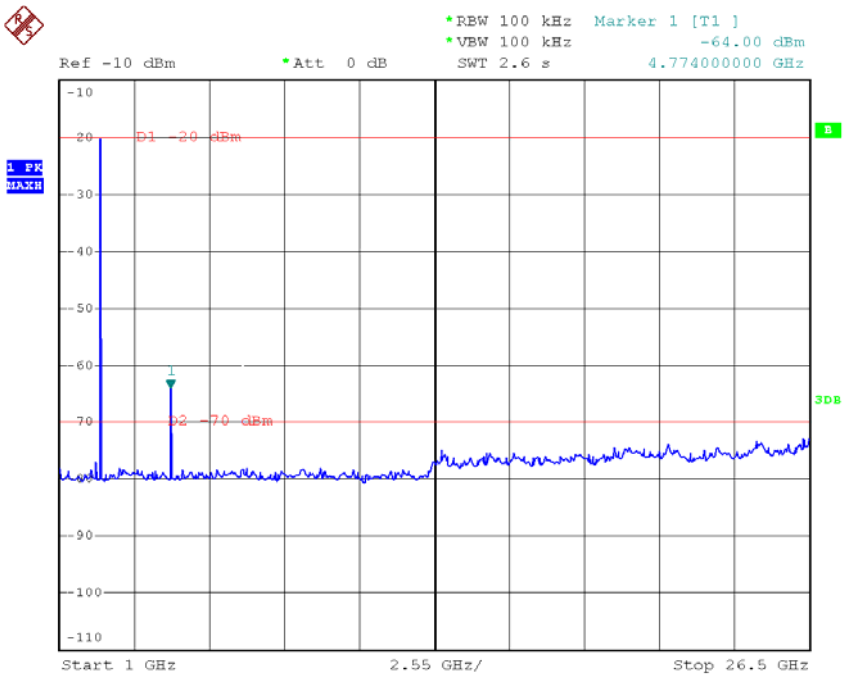
EUT	2.4 GHz Mini Thumb keyboard	Model Name	DK-8061RM
Temperature	25℃	Relative Humidity	55 %
Pressure	1009 hPa	Test Power	DC 3.0V
Test Mode	TX CH01, CH 17, CH 34		

TX CH 01 (30MHz~1GHz)



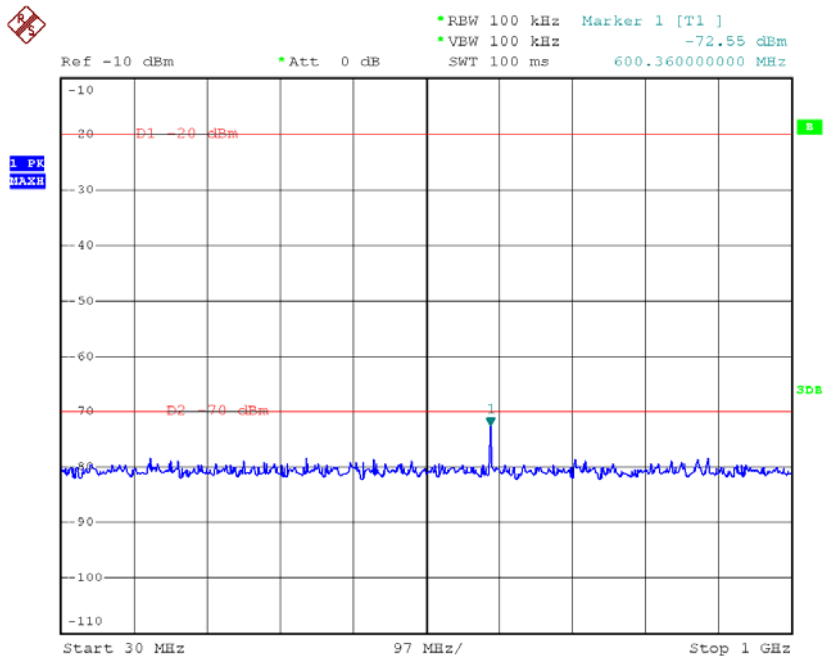
Date: 11.SEP.2013 18:54:58

TX CH 01(1GHz～10th Harmonic)



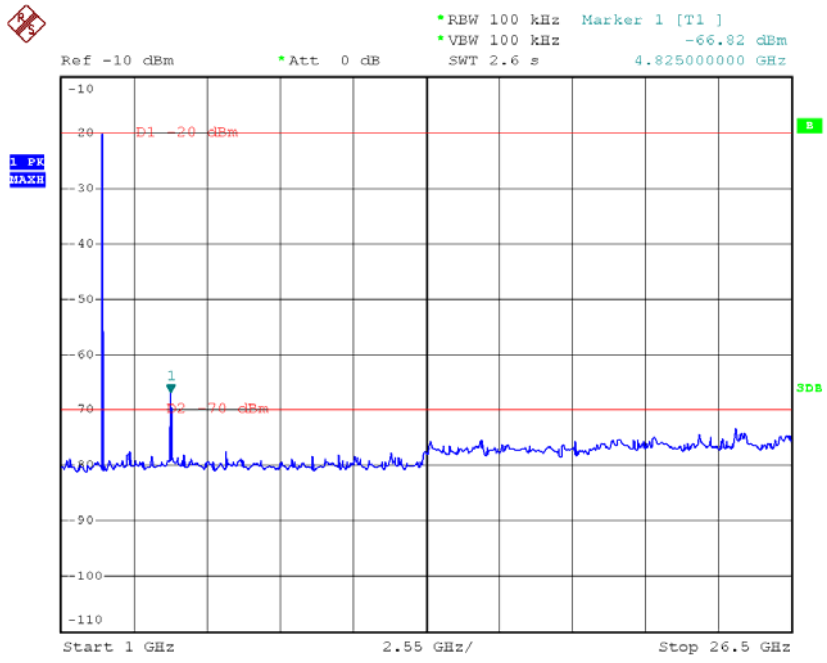
Date: 11.SEP.2013 18:46:43

TX CH 17 (30MHz~1GHz)



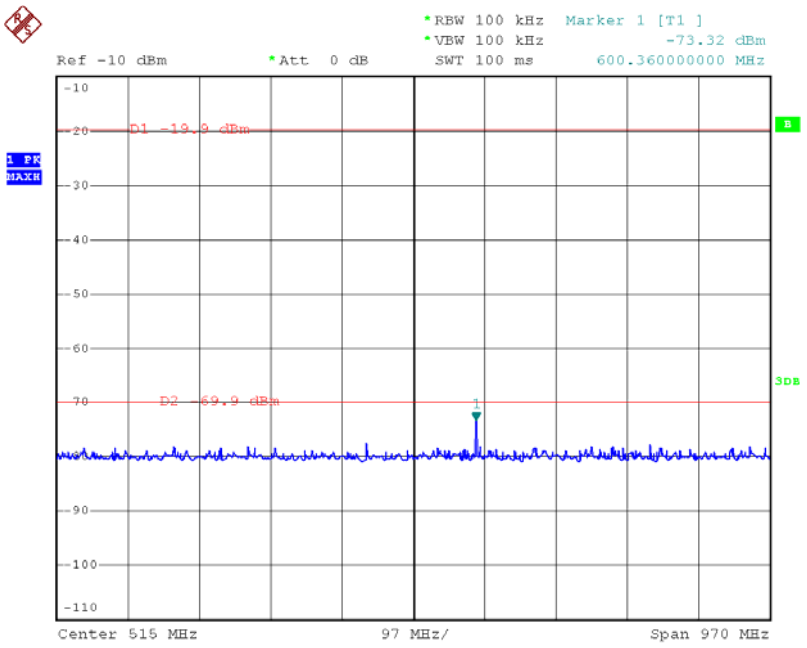
Date: 11.SEP.2013 18:58:29

TX CH 17(1GHz～10th Harmonic)



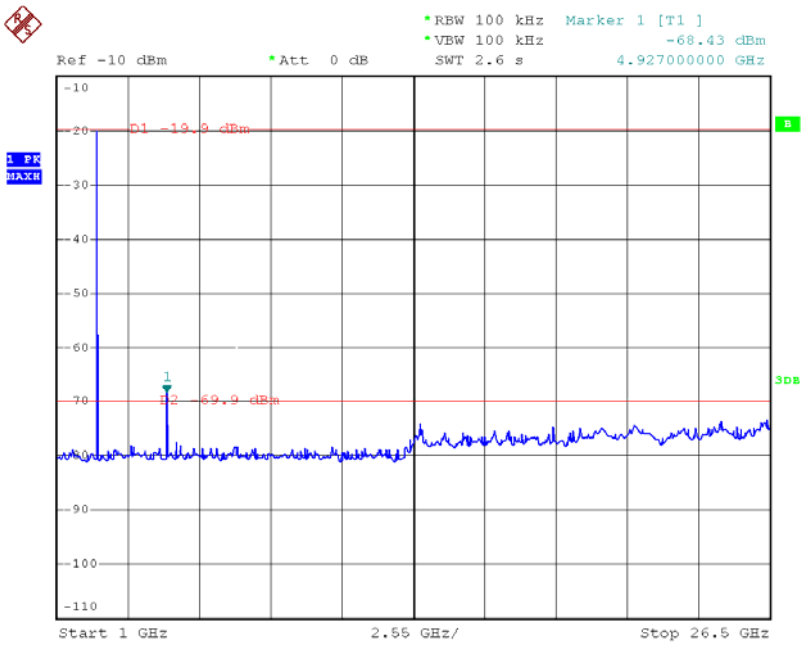
Date: 11.SEP.2013 18:57:59

TX CH 34(30MHz~1GHz)



Date: 11.SEP.2013 19:01:04

TX CH 34(1GHz～10th Harmonic)

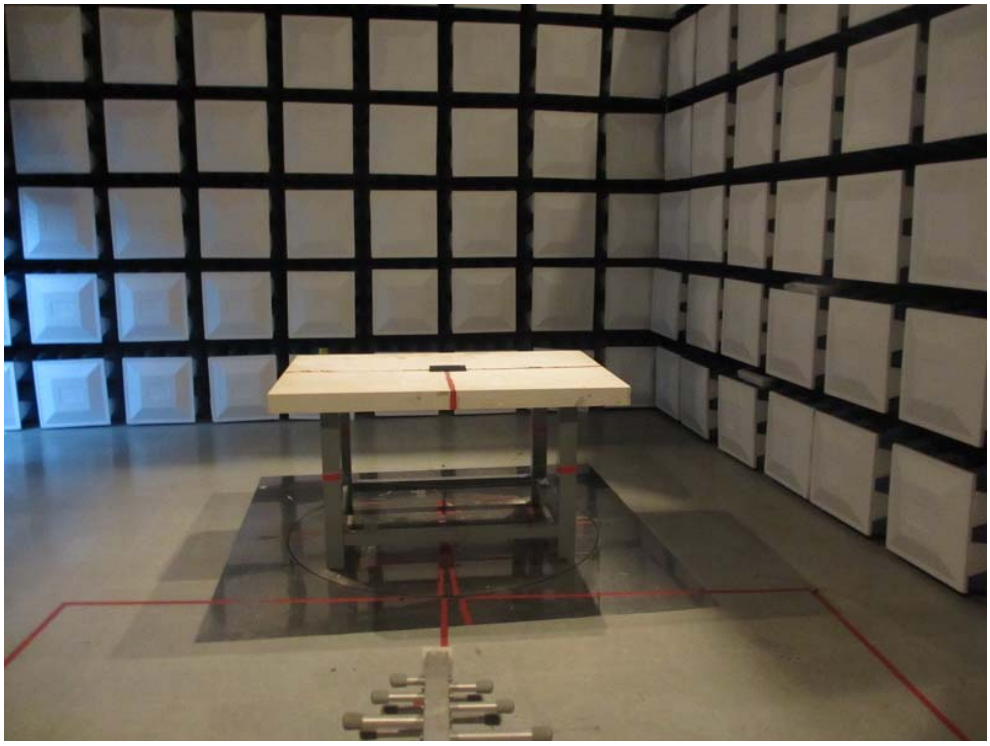


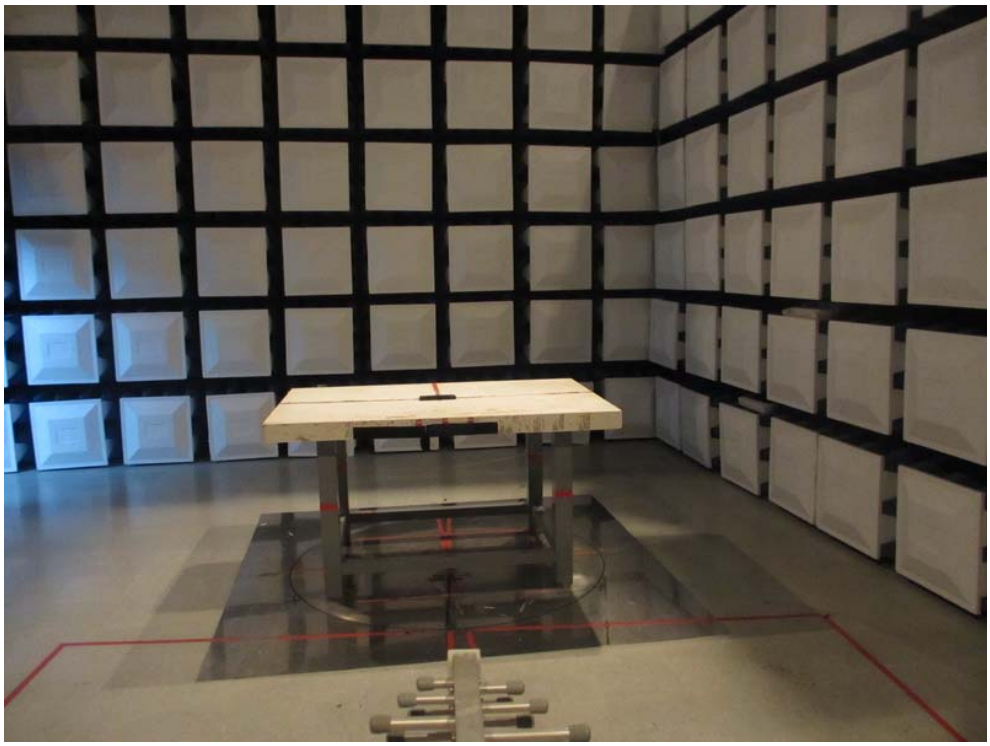
Date: 11.SEP.2013 19:01:36

7. EUT TEST PHOTO

Radiated Measurement Photos
9KHz-30MHz

Radiated Measurement Photos
30MHz~1000MHz





Radiated Measurement Photos
Above 1000MHz