

FCC Test Report (BT-LE)

Report No.: RF151104E03-3

FCC ID: UZ7VC80

Test Model: VC80

Received Date: Nov. 04, 2015

Test Date: Nov. 17 to 28, 2015

Issued Date: Dec. 16, 2015

Applicant: Zebra Technologies Corporation

Address: 1 Zebra Plaza, Holtsville, NY 11742

Manufacturer: Zebra Technologies Corporation

Address: 1 Zebra Plaza, Holtsville, NY 11742

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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A D T

Release Control Record

Issue No.	Description	Date Issued
RF151104E03-3	Original release.	Dec. 16, 2015

1 Certificate of Conformity

Product: Vehicle Computer

Brand: Zebra

Test Model: VC80

Sample Status: ENGINEERING SAMPLE


Applicant: Zebra Technologies Corporation

Test Date: Nov. 17 to 28, 2015

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Dec. 16, 2015
Elsie Hsu / Specialist

Approved by :  , **Date:** Dec. 16, 2015
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.19dB at 0.58364MHz.
15.205 & 209 & 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.1dB at 259.83MHz & 260.08MHz & 260.18MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

2.1 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:

Measurement	Frequency	Expended Uncertainty (k=2) (\pm)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.37 dB
	200MHz ~ 1000MHz	3.72 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.00 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (BT-LE)

Product	Vehicle Computer
Brand	Zebra
Test Model	VC80
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 9-24V from Adapter DC 12-60V from Vehicle Battery DC 12.6V from PSU Battery
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 1Mbps
Operating Frequency	2402MHz ~ 2480MHz
Number of Channel	40
Output Power	1.811mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The EUT has two different types could be chosen and please refer the below table:

Type	Difference
1	With External antenna
2	With Internal antenna

2. There are WLAN and BT technology used for the EUT.

3. For WLAN: 2.4GHz and 5GHz technology cannot transmit at same time.

4. 2.4GHz/5GHz WLAN + BT will timely shared at same antenna port

5. The EUT could be supplied with a power adapter as below table (only for test, not for sale):

Brand	FSP GROUP INC.
Model No.	FSP150-AAAN2
Input power	100-240V, 50-60Hz, 2A
Output power	+24V, 6.25A DC output cable (Unshielded, 1.8m with 2 cores)

6. The EUT antennas information:

Antenna No	PCB Chain No.	Model	Antenna Type	Antenna Connector	Antenna Gain (dBi) Exclude cable loss	Internal cable loss (dB)	External cable loss (dB)	Antenna Gain (dBi) Include cable loss	Internal cable length (mm)	External cable length (mm)	Frequency (GHz to GHz)
1	Int.Chain0	AN000097A01	Patch	i-pex (MHFL4)	5	NA	NA	5	NA	NA	2.4~2.4835
					5	NA	NA	5	NA	NA	5.15~5.85
	Int.Chain1				5	NA	NA	5	NA	NA	2.4~2.4835
					5	NA	NA	5	NA	NA	5.15~5.85
2	ext.Chain0	AN2010	Monopole	RPSMA	2	0.6	1.8	-0.4	147	2850	2.4~2.4835
					2	0.9	2.6	-1.5	147	2850	5.15~5.85
	ext.Chain1				2	0.6	1.8	-0.4	147	2850	2.4~2.4835
					2	0.9	2.6	-1.5	147	2850	5.15~5.85
3	ext.Chain0	AN2020	Monopole	RPSMA	5	0.6	1.8	2.6	147	2850	2.4~2.4835
	ext.Chain1				5	0.6	1.8	2.6	147	2850	2.4~2.4835
4	ext.Chain0	AN2030	Dipole	RPSMA	2	0.6	NA	1.4	147	NA	2.4~2.4835
					3.7	0.9	NA	2.8	147	NA	5.15~5.85
	ext.Chain1				2	0.6	NA	1.4	147	NA	2.4~2.4835
					3.7	0.9	NA	2.8	147	NA	5.15~5.85
5	ext.Chain0	AN2040	Dipole	RPSMA	2	0.6	NA	1.4	147	NA	2.4~2.4835
	ext.Chain1				2	0.6	NA	1.4	147	NA	2.4~2.4835

Note:

1. For 1TX configuration mode: max gain was selected as representative antenna.

7. The Version of EUT information are as below:

HW Version	MLB	EVT
	IO Board	EVT
	Battery Heater	EVT
	DTB	EVT
	DB9	EVT
	PSU	2
	Keypad	EVT
	Screen	Mitsubishi
SW Version	Operating System	WIN 7 professional
		WIN 7 Embedded
	Broadcom-WLAN	6.30.223.249 for Embedde
		6.30.223.262 for professional

8. The HW spec. are as below:

Detail HW spec.	Basic Warehouse int. Antenna	Basic Warehouse ext. Antenna
Intel E3825 Dual Core, 1.33GHz, 1MB Cache, 2GB RAM	v	v
16 GB SSD	v	v
Internal Antenna	v	
External Antenna (mag mount)		v
400 NITs Display	v	v
CAN Bus I/O	v	v

10. The EUT was pre-tested under following test modes:

Pre-test Mode	Description
Mode A	Power from Adapter
Mode B	DC 12V from DC Power Supply
Mode C	DC 24V from DC Power Supply

From the above modes, the worst case was found in **Mode A**. Therefore only the test data of the modes were recorded in this report individually.

11. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Description of Test Modes

40 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE<1G	PLC	APCM	
1	√	√	-	√	With Antenna 1 (Power from adapter)
2	√	√	√	-	With Antenna 3 (Power from adapter)
3	√	√	-	-	With Antenna 4 (Power from adapter)
4	-	-	√	-	With Antenna 2 (DC 24V from DC power supply)
5	-	-	√	-	With Antenna 2 (DC 12V from DC power supply)

Where **RE \geq 1G**: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

APCM: Antenna Port Conducted Measurement

NOTE 1: “-” means no effect.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0	GFSK	1

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1

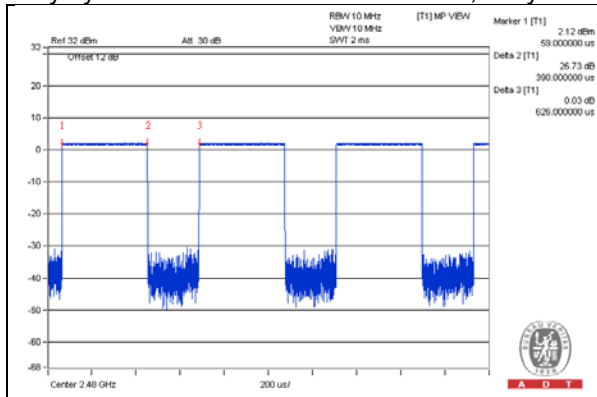
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE \geq 1G	25deg. C, 73%RH	120Vac, 60Hz	Andy Ho
RE<1G	26deg. C, 71%RH	120Vac, 60Hz	Robert Cheng
PLC	25deg. C, 63%RH 22deg. C, 63%RH 24deg. C, 62%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.

Duty cycle = $0.39 \text{ ms} / 0.626 \text{ ms} = 0.623$, Duty factor = $10 * \log(1/0.623) = 2.1$



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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Modem	ACEEX	1414	0206026778	IFAXDM1414	Provided by Lab
B.	Modem	ACEEX	1414	0206026779	IFAXDM1414	Provided by Lab
C.	Notebook Computer	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab
D.	Keyboard	MOTOROLA	KYBD-NU-VC70	NA	NA	Supplied by Client
E.	Scanner	Symbol	DS3508	NA	NA	Supplied by Client
F.	Speaker/ mic	OTTO	V2-10332 1250	NA	NA	Supplied by Client
G.	Adapter	FSP GROUP INC.	FSP150-AAAN2	H00000231	NA	Supplied by Client
H.	DC Power Supply	Topward	6603D	795551	NA	Provided by Lab

Note:

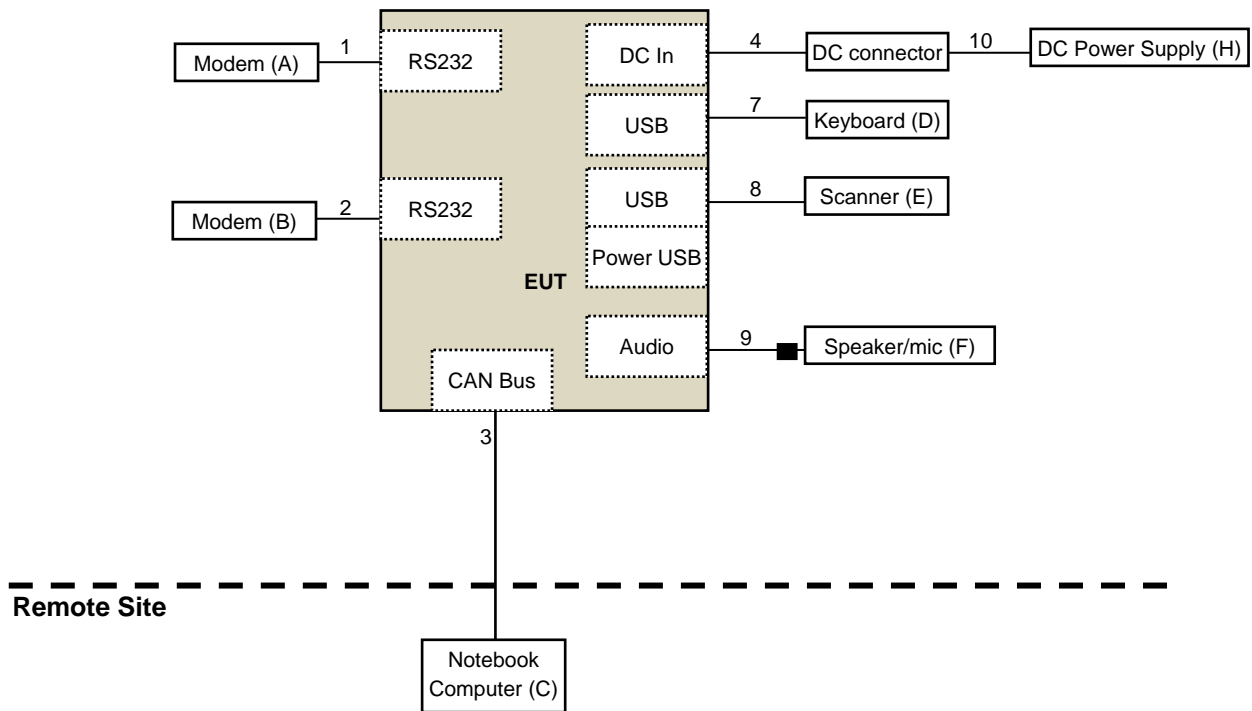
1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RS232	1	0.9	No	0	Provided by Lab
2.	RS232	1	0.9	No	0	Provided by Lab
3.	RJ45	1	10	No	0	Provided by Lab
4.	DC	1	0.6	No	0	Supplied by Client
5.	DC	1	1.8	No	2	Supplied by Client
6.	AC	1	1.8	No	0	Provided by Lab
7.	USB	1	0.9	No	0	Supplied by Client
8.	USB	1	2	No	0	Supplied by Client
9.	Audio	1	0.6	No	1	Supplied by Client
10.	DC	1	1.8	No	0	Supplied by Client

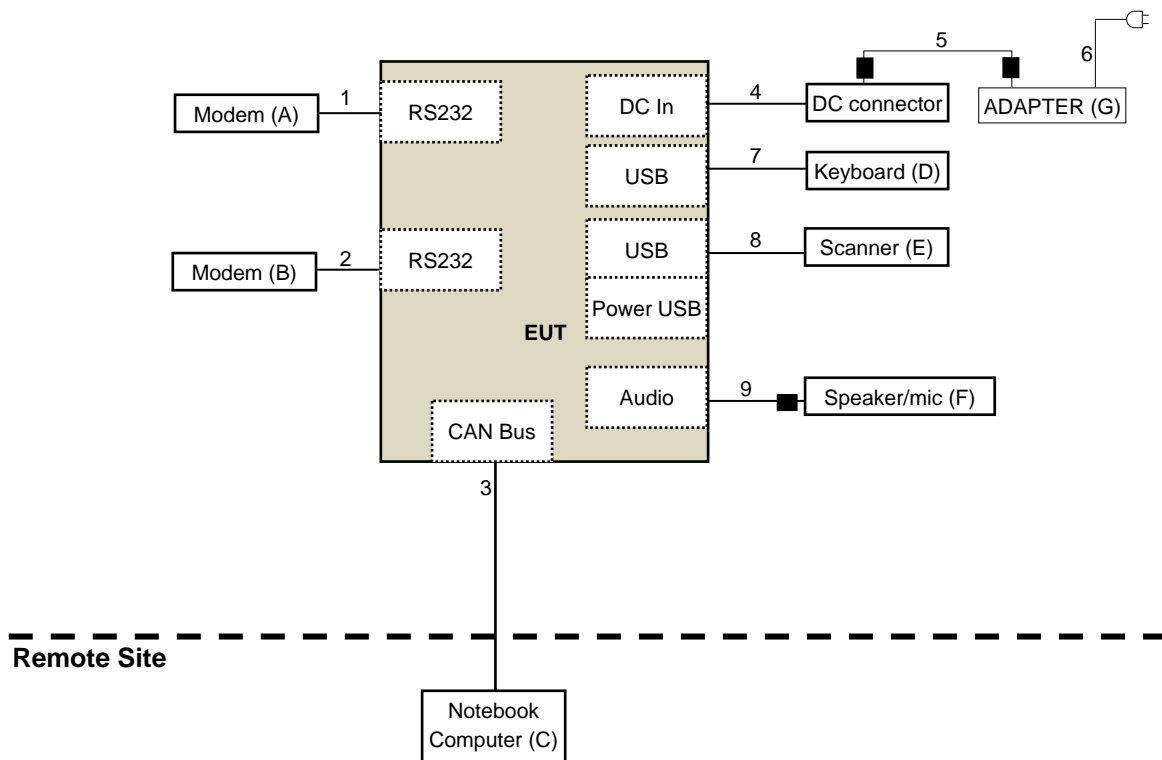
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For Conducted emission test mode 4 & 5:



For Other test items:



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r03

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/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
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 13, 2014	Jan. 12, 2016
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-00 1 LOOPCAB-00 2	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-07	May 08, 2015	May 07, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	138	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Feb. 05, 2015	Feb. 04, 2016
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM- SM-2000 EMC104-SM- SM-5000 EMC104-SM- SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX10 4	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Spectrum Analyzer R&S	FSP40	100060	May 08, 2015	May 07, 2016

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The test was performed in 966 Chamber No. 3.
- 6 The FCC Site Registration No. is 147459
- 7 The CANADA Site Registration No. is 20331-1
- 8 Tested Date: Nov. 17 to 26, 2015

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

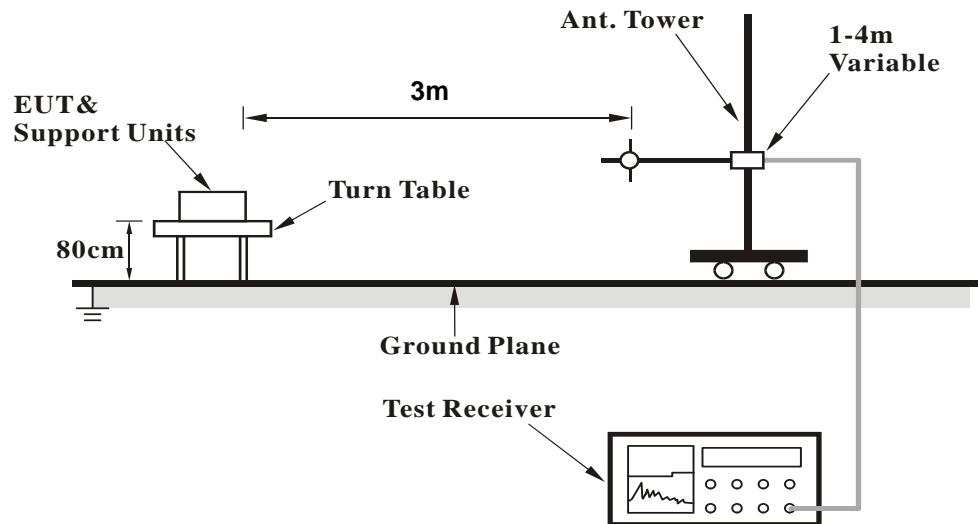
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

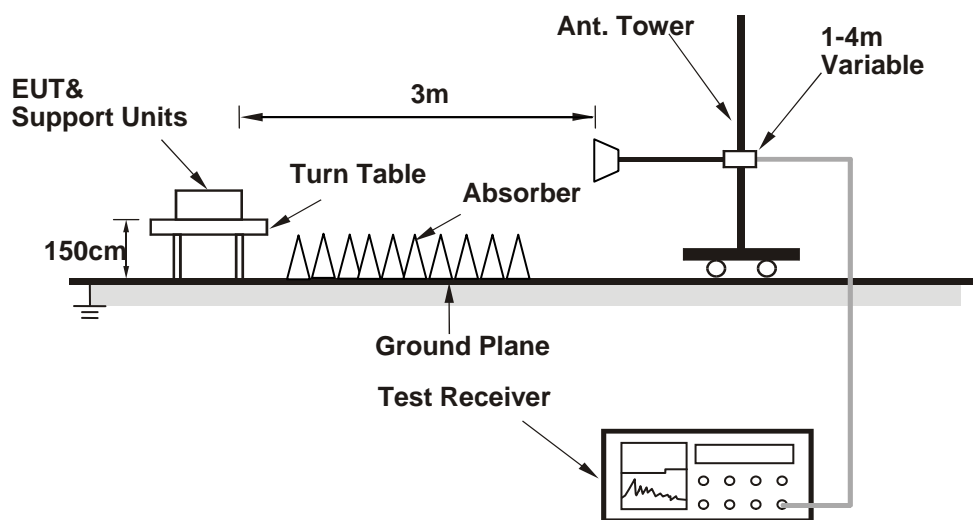
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

1. Connect the EUT with the support unit C (Notebook Computer) which is placed on remote site.
2. The communication partner run test program "Blue Tool.exe [ver1.9.0.2]" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

Above 1GHz Data

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.3 PK	74.0	-16.7	2.21 H	63	59.97	-2.67
2	2390.00	45.8 AV	54.0	-8.2	2.21 H	63	48.47	-2.67
3	*2402.00	95.1 PK			2.21 H	63	97.71	-2.61
4	*2402.00	88.3 AV			2.21 H	63	90.91	-2.61
5	4804.00	41.3 PK	74.0	-32.7	1.67 H	36	37.20	4.10
6	4804.00	29.7 AV	54.0	-24.3	1.67 H	36	25.60	4.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.8 PK	74.0	-16.2	2.59 V	89	60.47	-2.67
2	2390.00	45.8 AV	54.0	-8.2	2.59 V	89	48.47	-2.67
3	*2402.00	94.0 PK			2.59 V	89	96.61	-2.61
4	*2402.00	87.6 AV			2.59 V	89	90.21	-2.61
5	4804.00	40.5 PK	74.0	-33.5	1.53 V	229	36.40	4.10
6	4804.00	28.8 AV	54.0	-25.2	1.53 V	229	24.70	4.10

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	95.8 PK			1.92 H	54	98.28	-2.48
2	*2440.00	89.2 AV			1.92 H	54	91.68	-2.48
3	4880.00	41.2 PK	74.0	-32.8	1.71 H	28	36.91	4.29
4	4880.00	29.3 AV	54.0	-24.7	1.71 H	28	25.01	4.29
5	7320.00	48.8 PK	74.0	-25.2	1.58 H	213	38.16	10.64
6	7320.00	35.8 AV	54.0	-18.2	1.58 H	213	25.16	10.64
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	94.7 PK			2.57 V	85	97.18	-2.48
2	*2440.00	88.5 AV			2.57 V	85	90.98	-2.48
3	4880.00	40.9 PK	74.0	-33.1	1.58 V	234	36.61	4.29
4	4880.00	29.0 AV	54.0	-25.0	1.58 V	234	24.71	4.29
5	7320.00	50.0 PK	74.0	-24.0	1.36 V	174	39.36	10.64
6	7320.00	36.0 AV	54.0	-18.0	1.36 V	174	25.36	10.64

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.2 PK			1.79 H	38	97.51	-2.31
2	*2480.00	88.6 AV			1.79 H	38	90.91	-2.31
3	2483.50	57.0 PK	74.0	-17.0	1.79 H	38	59.30	-2.30
4	2483.50	45.5 AV	54.0	-8.5	1.79 H	38	47.80	-2.30
5	4960.00	41.1 PK	74.0	-32.9	1.74 H	24	36.46	4.64
6	4960.00	29.2 AV	54.0	-24.8	1.74 H	24	24.56	4.64
7	7440.00	48.2 PK	74.0	-25.8	1.59 H	213	37.35	10.85
8	7440.00	35.4 AV	54.0	-18.6	1.59 H	213	24.55	10.85

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	94.1 PK			2.60 V	90	96.41	-2.31
2	*2480.00	87.9 AV			2.60 V	90	90.21	-2.31
3	2483.50	57.0 PK	74.0	-17.0	2.60 V	90	59.30	-2.30
4	2483.50	45.4 AV	54.0	-8.6	2.60 V	90	47.70	-2.30
5	4960.00	41.2 PK	74.0	-32.8	1.53 V	235	36.56	4.64
6	4960.00	29.3 AV	54.0	-24.7	1.53 V	235	24.66	4.64
7	7440.00	50.1 PK	74.0	-23.9	1.37 V	177	39.25	10.85
8	7440.00	35.9 AV	54.0	-18.1	1.37 V	177	25.05	10.85

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.97	24.7 QP	40.0	-15.3	1.47 H	163	34.20	-9.50
2	195.14	39.8 QP	43.5	-3.7	1.46 H	43	51.10	-11.30
3	260.26	42.7 QP	46.0	-3.3	1.53 H	53	51.60	-8.90
4	379.37	33.3 QP	46.0	-12.7	1.09 H	321	38.60	-5.30
5	696.02	37.6 QP	46.0	-8.4	1.05 H	329	36.20	1.40
6	1000.00	41.1 QP	54.0	-12.9	2.04 H	269	35.40	5.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.77	25.2 QP	43.5	-18.3	1.90 V	334	38.40	-13.20
2	195.80	34.2 QP	43.5	-9.3	1.50 V	210	45.60	-11.40
3	260.33	39.0 QP	46.0	-7.0	1.97 V	145	47.90	-8.90
4	325.70	32.1 QP	46.0	-13.9	1.09 V	19	38.50	-6.40
5	750.11	36.7 QP	46.0	-9.3	1.53 V	320	34.30	2.40
6	1000.00	39.0 QP	54.0	-15.0	1.00 V	264	33.30	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.48	24.7 QP	40.0	-15.3	1.52 H	148	34.30	-9.60
2	195.22	40.2 QP	43.5	-3.3	1.54 H	45	51.50	-11.30
3	259.86	42.8 QP	46.0	-3.2	1.52 H	45	51.80	-9.00
4	379.75	33.3 QP	46.0	-12.7	1.02 H	344	38.60	-5.30
5	695.74	37.1 QP	46.0	-8.9	1.04 H	323	35.70	1.40
6	1000.00	41.0 QP	54.0	-13.0	2.03 H	263	35.30	5.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.32	25.2 QP	43.5	-18.3	1.96 V	314	38.60	-13.40
2	195.81	33.9 QP	43.5	-9.6	1.56 V	209	45.30	-11.40
3	260.20	39.1 QP	46.0	-6.9	2.00 V	118	48.00	-8.90
4	326.06	32.5 QP	46.0	-13.5	1.06 V	0	38.90	-6.40
5	749.94	36.9 QP	46.0	-9.1	1.58 V	322	34.50	2.40
6	1000.00	39.2 QP	54.0	-14.8	1.02 V	286	33.50	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.65	24.3 QP	40.0	-15.7	1.50 H	156	33.90	-9.60
2	195.03	40.1 QP	43.5	-3.4	1.46 H	47	51.40	-11.30
3	259.83	42.9 QP	46.0	-3.1	1.50 H	36	51.90	-9.00
4	379.57	33.1 QP	46.0	-12.9	1.07 H	334	38.40	-5.30
5	695.95	37.2 QP	46.0	-8.8	1.03 H	335	35.80	1.40
6	1000.00	41.1 QP	54.0	-12.9	2.01 H	246	35.40	5.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.68	25.6 QP	43.5	-17.9	1.99 V	321	38.80	-13.20
2	196.15	33.7 QP	43.5	-9.8	1.54 V	201	45.10	-11.40
3	260.23	39.2 QP	46.0	-6.8	2.01 V	125	48.10	-8.90
4	325.83	32.3 QP	46.0	-13.7	1.00 V	5	38.70	-6.40
5	749.98	37.0 QP	46.0	-9.0	1.52 V	341	34.60	2.40
6	1000.00	38.9 QP	54.0	-15.1	1.00 V	286	33.20	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.1.8 Test Results (Mode 2)

Above 1GHz Data

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	2.23 H	56	59.67	-2.67
2	2390.00	45.3 AV	54.0	-8.7	2.23 H	56	47.97	-2.67
3	*2402.00	94.8 PK			2.23 H	56	97.41	-2.61
4	*2402.00	88.3 AV			2.23 H	56	90.91	-2.61
5	4804.00	41.2 PK	74.0	-32.8	1.76 H	49	37.10	4.10
6	4804.00	29.7 AV	54.0	-24.3	1.76 H	49	25.60	4.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.8 PK	74.0	-17.2	2.55 V	92	59.47	-2.67
2	2390.00	44.9 AV	54.0	-9.1	2.55 V	92	47.57	-2.67
3	*2402.00	93.9 PK			2.55 V	92	96.51	-2.61
4	*2402.00	86.6 AV			2.55 V	92	89.21	-2.61
5	4804.00	40.6 PK	74.0	-33.4	1.46 V	237	36.50	4.10
6	4804.00	28.8 AV	54.0	-25.2	1.46 V	237	24.70	4.10

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	94.8 PK			2.18 H	78	97.30	-2.50
2	*2440.00	87.9 AV			2.18 H	78	90.40	-2.50
3	4880.00	40.4 PK	74.0	-33.6	1.69 H	53	36.00	4.40
4	4880.00	29.3 AV	54.0	-24.7	1.69 H	53	24.90	4.40
5	7320.00	49.2 PK	74.0	-24.8	1.59 H	228	38.60	10.60
6	7320.00	36.1 AV	54.0	-17.9	1.59 H	228	25.50	10.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	93.6 PK			2.63 V	98	96.10	-2.50
2	*2440.00	86.4 AV			2.63 V	98	88.90	-2.50
3	4880.00	42.0 PK	74.0	-32.0	1.56 V	255	37.60	4.40
4	4880.00	29.9 AV	54.0	-24.1	1.56 V	255	25.50	4.40
5	7320.00	49.5 PK	74.0	-24.5	1.33 V	182	38.90	10.60
6	7320.00	36.1 AV	54.0	-17.9	1.33 V	182	25.50	10.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.0 PK			2.30 H	41	97.40	-2.40
2	*2480.00	87.9 AV			2.30 H	41	90.30	-2.40
3	2483.50	56.8 PK	74.0	-17.2	2.30 H	41	59.20	-2.40
4	2483.50	45.5 AV	54.0	-8.5	2.30 H	41	47.90	-2.40
5	4960.00	42.2 PK	74.0	-31.8	1.76 H	23	37.60	4.60
6	4960.00	30.1 AV	54.0	-23.9	1.76 H	23	25.50	4.60
7	7440.00	48.3 PK	74.0	-25.7	1.52 H	198	37.50	10.80
8	7440.00	35.3 AV	54.0	-18.7	1.52 H	198	24.50	10.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	93.0 PK			2.61 V	78	95.40	-2.40
2	*2480.00	85.7 AV			2.61 V	78	88.10	-2.40
3	2483.50	56.7 PK	74.0	-17.3	2.61 V	78	59.10	-2.40
4	2483.50	44.9 AV	54.0	-9.1	2.61 V	78	47.30	-2.40
5	4960.00	40.5 PK	74.0	-33.5	1.48 V	230	35.90	4.60
6	4960.00	28.5 AV	54.0	-25.5	1.48 V	230	23.90	4.60
7	7440.00	49.6 PK	74.0	-24.4	1.47 V	193	38.80	10.80
8	7440.00	35.9 AV	54.0	-18.1	1.47 V	193	25.10	10.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.27	24.4 QP	40.0	-15.6	1.48 H	162	33.90	-9.50
2	195.81	40.3 QP	43.5	-3.2	1.56 H	37	51.70	-11.40
3	260.08	42.9 QP	46.0	-3.1	1.50 H	43	51.80	-8.90
4	379.52	33.6 QP	46.0	-12.4	1.09 H	336	38.90	-5.30
5	695.48	37.3 QP	46.0	-8.7	1.08 H	351	35.90	1.40
6	1000.00	41.4 QP	54.0	-12.6	2.06 H	262	35.70	5.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.35	25.0 QP	43.5	-18.5	2.00 V	303	38.40	-13.40
2	196.05	33.6 QP	43.5	-9.9	1.48 V	229	45.00	-11.40
3	260.02	38.9 QP	46.0	-7.1	2.00 V	148	47.80	-8.90
4	325.81	31.7 QP	46.0	-14.3	1.00 V	42	38.10	-6.40
5	750.16	37.5 QP	46.0	-8.5	1.59 V	317	35.10	2.40
6	1000.00	39.0 QP	54.0	-15.0	1.00 V	271	33.30	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.38	24.5 QP	40.0	-15.5	1.45 H	160	34.00	-9.50
2	195.53	40.2 QP	43.5	-3.3	1.52 H	29	51.60	-11.40
3	260.22	42.5 QP	46.0	-3.5	1.50 H	57	51.40	-8.90
4	379.56	33.8 QP	46.0	-12.2	1.01 H	332	39.10	-5.30
5	695.89	37.4 QP	46.0	-8.6	1.10 H	344	36.00	1.40
6	1000.00	41.1 QP	54.0	-12.9	2.09 H	246	35.40	5.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.42	25.1 QP	43.5	-18.4	2.02 V	314	38.40	-13.30
2	195.76	33.2 QP	43.5	-10.3	1.51 V	222	44.60	-11.40
3	259.93	38.7 QP	46.0	-7.3	2.01 V	158	47.70	-9.00
4	326.09	32.3 QP	46.0	-13.7	1.00 V	44	38.70	-6.40
5	749.77	37.4 QP	46.0	-8.6	1.63 V	331	35.00	2.40
6	1000.00	38.8 QP	54.0	-15.2	1.04 V	249	33.10	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.23	24.3 QP	40.0	-15.7	1.53 H	158	33.80	-9.50
2	195.34	39.9 QP	43.5	-3.6	1.61 H	19	51.30	-11.40
3	260.18	42.9 QP	46.0	-3.1	1.57 H	65	51.80	-8.90
4	379.54	33.7 QP	46.0	-12.3	1.11 H	345	39.00	-5.30
5	695.54	37.3 QP	46.0	-8.7	1.09 H	346	35.90	1.40
6	1000.00	40.9 QP	54.0	-13.1	2.02 H	256	35.20	5.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.44	25.2 QP	43.5	-18.3	2.03 V	307	38.50	-13.30
2	195.92	33.3 QP	43.5	-10.2	1.52 V	214	44.70	-11.40
3	259.85	39.1 QP	46.0	-6.9	1.98 V	159	48.10	-9.00
4	325.90	32.0 QP	46.0	-14.0	1.00 V	44	38.40	-6.40
5	750.06	37.6 QP	46.0	-8.4	1.58 V	327	35.20	2.40
6	1000.00	38.9 QP	54.0	-15.1	1.04 V	259	33.20	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.1.9 Test Results (Mode 3)

Above 1GHz Data

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.8 PK	74.0	-17.2	2.26 H	55	59.47	-2.67
2	2390.00	45.0 AV	54.0	-9.0	2.26 H	55	47.67	-2.67
3	*2402.00	94.6 PK			2.26 H	55	97.21	-2.61
4	*2402.00	87.9 AV			2.26 H	55	90.51	-2.61
5	4804.00	41.3 PK	74.0	-32.7	1.71 H	49	37.20	4.10
6	4804.00	29.8 AV	54.0	-24.2	1.71 H	49	25.70	4.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	2.58 V	91	59.67	-2.67
2	2390.00	45.0 AV	54.0	-9.0	2.58 V	91	47.67	-2.67
3	*2402.00	93.6 PK			2.58 V	91	96.21	-2.61
4	*2402.00	86.4 AV			2.58 V	91	89.01	-2.61
5	4804.00	41.2 PK	74.0	-32.8	1.50 V	245	37.10	4.10
6	4804.00	29.3 AV	54.0	-24.7	1.50 V	245	25.20	4.10

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	94.7 PK			2.22 H	67	97.20	-2.50
2	*2440.00	87.8 AV			2.22 H	67	90.30	-2.50
3	4880.00	40.8 PK	74.0	-33.2	1.67 H	44	36.40	4.40
4	4880.00	29.6 AV	54.0	-24.4	1.67 H	44	25.20	4.40
5	7320.00	48.9 PK	74.0	-25.1	1.56 H	223	38.30	10.60
6	7320.00	36.0 AV	54.0	-18.0	1.56 H	223	25.40	10.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	93.1 PK			2.58 V	86	95.60	-2.50
2	*2440.00	86.1 AV			2.58 V	86	88.60	-2.50
3	4880.00	41.8 PK	74.0	-32.2	1.55 V	245	37.40	4.40
4	4880.00	29.6 AV	54.0	-24.4	1.55 V	245	25.20	4.40
5	7320.00	50.0 PK	74.0	-24.0	1.36 V	172	39.40	10.60
6	7320.00	36.3 AV	54.0	-17.7	1.36 V	172	25.70	10.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.3 PK			2.30 H	51	97.70	-2.40
2	*2480.00	88.4 AV			2.30 H	51	90.80	-2.40
3	2483.50	57.0 PK	74.0	-17.0	2.30 H	51	59.40	-2.40
4	2483.50	45.5 AV	54.0	-8.5	2.30 H	51	47.90	-2.40
5	4960.00	41.7 PK	74.0	-32.3	1.72 H	35	37.10	4.60
6	4960.00	29.9 AV	54.0	-24.1	1.72 H	35	25.30	4.60
7	7440.00	48.9 PK	74.0	-25.1	1.53 H	203	38.10	10.80
8	7440.00	35.7 AV	54.0	-18.3	1.53 H	203	24.90	10.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	93.4 PK			2.59 V	79	95.80	-2.40
2	*2480.00	86.1 AV			2.59 V	79	88.50	-2.40
3	2483.50	56.9 PK	74.0	-17.1	2.59 V	79	59.30	-2.40
4	2483.50	45.3 AV	54.0	-8.7	2.59 V	79	47.70	-2.40
5	4960.00	41.1 PK	74.0	-32.9	1.52 V	236	36.50	4.60
6	4960.00	28.9 AV	54.0	-25.1	1.52 V	236	24.30	4.60
7	7440.00	49.6 PK	74.0	-24.4	1.42 V	180	38.80	10.80
8	7440.00	35.7 AV	54.0	-18.3	1.42 V	180	24.90	10.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.05	24.6 QP	40.0	-15.4	1.51 H	158	34.10	-9.50
2	195.47	40.3 QP	43.5	-3.2	1.55 H	35	51.70	-11.40
3	259.90	42.5 QP	46.0	-3.5	1.54 H	66	51.50	-9.00
4	379.52	33.7 QP	46.0	-12.3	1.06 H	341	39.00	-5.30
5	695.45	37.6 QP	46.0	-8.4	1.07 H	325	36.20	1.40
6	1000.00	41.2 QP	54.0	-12.8	2.08 H	247	35.50	5.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.21	25.3 QP	43.5	-18.2	1.97 V	321	38.70	-13.40
2	196.17	33.7 QP	43.5	-9.8	1.59 V	199	45.10	-11.40
3	259.79	39.1 QP	46.0	-6.9	2.06 V	150	48.10	-9.00
4	326.12	32.3 QP	46.0	-13.7	1.02 V	29	38.70	-6.40
5	750.19	37.4 QP	46.0	-8.6	1.58 V	330	35.00	2.40
6	1000.00	39.0 QP	54.0	-15.0	1.00 V	281	33.30	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.14	24.8 QP	40.0	-15.2	1.42 H	141	34.30	-9.50
2	195.25	40.1 QP	43.5	-3.4	1.52 H	17	51.40	-11.30
3	259.96	42.4 QP	46.0	-3.6	1.60 H	74	51.40	-9.00
4	379.66	33.6 QP	46.0	-12.4	1.00 H	336	38.90	-5.30
5	695.58	37.0 QP	46.0	-9.0	1.02 H	327	35.60	1.40
6	1000.00	41.0 QP	54.0	-13.0	2.08 H	250	35.30	5.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.01	25.1 QP	43.5	-18.4	2.00 V	296	38.60	-13.50
2	196.40	33.8 QP	43.5	-9.7	1.55 V	215	45.20	-11.40
3	260.33	39.1 QP	46.0	-6.9	2.02 V	134	48.00	-8.90
4	325.75	32.0 QP	46.0	-14.0	1.00 V	43	38.40	-6.40
5	750.38	37.3 QP	46.0	-8.7	1.61 V	355	34.90	2.40
6	1000.00	39.3 QP	54.0	-14.7	1.01 V	254	33.60	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.92	24.7 QP	40.0	-15.3	1.52 H	163	34.20	-9.50
2	195.37	40.2 QP	43.5	-3.3	1.53 H	27	51.60	-11.40
3	259.97	42.5 QP	46.0	-3.5	1.60 H	70	51.50	-9.00
4	379.84	33.6 QP	46.0	-12.4	1.00 H	322	38.90	-5.30
5	695.67	37.4 QP	46.0	-8.6	1.02 H	330	36.00	1.40
6	1000.00	41.4 QP	54.0	-12.6	2.00 H	255	35.70	5.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.44	25.4 QP	43.5	-18.1	1.96 V	319	38.70	-13.30
2	196.31	33.4 QP	43.5	-10.1	1.53 V	203	44.80	-11.40
3	259.90	39.2 QP	46.0	-6.8	2.07 V	128	48.20	-9.00
4	325.82	32.5 QP	46.0	-13.5	1.00 V	54	38.90	-6.40
5	750.36	36.9 QP	46.0	-9.1	1.56 V	343	34.50	2.40
6	1000.00	39.0 QP	54.0	-15.0	1.02 V	263	33.30	5.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Nov. 20 to 28, 2015

4.2.3 Test Procedures

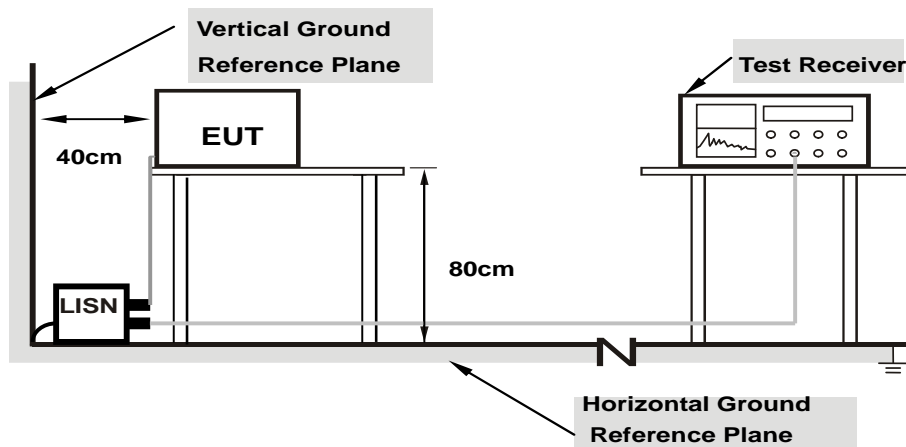
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 TEST SETUP



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

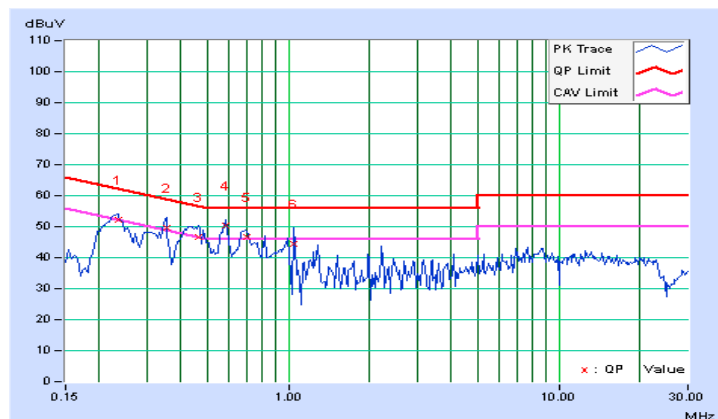
4.2.7 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.23594	10.22	41.88	36.23	52.10	46.45	62.24	52.24	-10.13	-5.78
2	0.35315	10.24	39.26	35.16	49.50	45.40	58.89	48.89	-9.39	-3.49
3	0.46283	10.23	36.32	24.74	46.55	34.97	56.64	46.64	-10.09	-11.67
4	0.58364	10.22	40.23	32.59	50.45	42.81	56.00	46.00	-5.55	-3.19
5	0.70073	10.20	36.34	26.69	46.54	36.89	56.00	46.00	-9.46	-9.11
6	1.05079	10.17	34.21	29.18	44.38	39.35	56.00	46.00	-11.62	-6.65

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

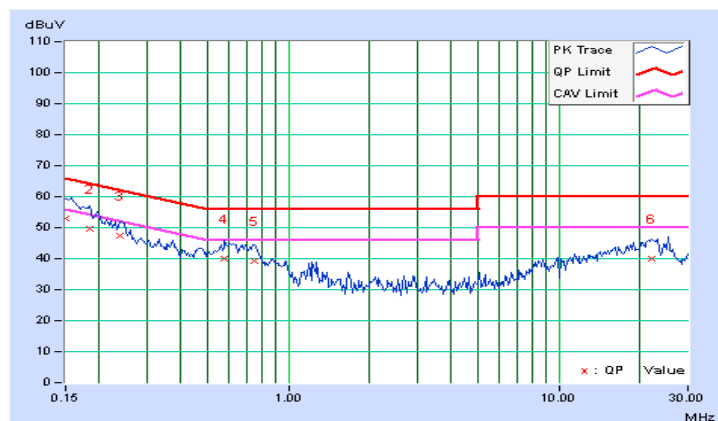


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	42.89	23.86	53.13	34.10	66.00	56.00	-12.87	-21.90
2	0.18518	10.21	39.31	22.92	49.52	33.13	64.25	54.25	-14.73	-21.12
3	0.23982	10.20	37.16	25.18	47.36	35.38	62.10	52.10	-14.74	-16.72
4	0.57971	10.20	29.75	20.63	39.95	30.83	56.00	46.00	-16.05	-15.17
5	0.75158	10.18	29.12	18.88	39.30	29.06	56.00	46.00	-16.70	-16.94
6	22.09767	10.97	29.10	14.16	40.07	25.13	60.00	50.00	-19.93	-24.87

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



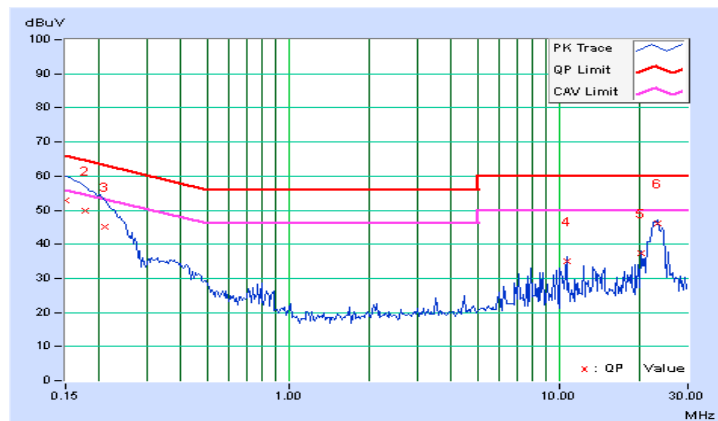
4.2.8 Test Results (Mode 4)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.26	42.63	14.21	52.89	24.47	66.00	56.00	-13.11	-31.53
2	0.17736	10.24	39.69	10.18	49.93	20.42	64.61	54.61	-14.68	-34.19
3	0.20862	10.22	34.78	7.23	45.00	17.45	63.26	53.26	-18.26	-35.81
4	10.65626	10.55	24.56	24.69	35.11	35.24	60.00	50.00	-24.89	-14.76
5	20.22268	10.92	26.46	25.94	37.38	36.86	60.00	50.00	-22.62	-13.14
6	23.23049	10.96	35.26	33.56	46.22	44.52	60.00	50.00	-13.78	-5.48

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

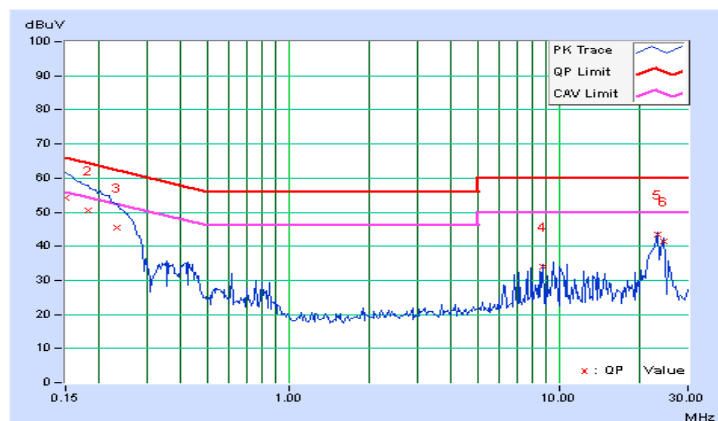


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	43.86	14.41	54.10	24.65	66.00	56.00	-11.90	-31.35
2	0.18126	10.21	40.36	11.23	50.57	21.44	64.43	54.43	-13.85	-32.98
3	0.23205	10.20	35.21	7.49	45.41	17.69	62.38	52.38	-16.96	-34.68
4	8.74610	10.50	23.36	22.56	33.86	33.06	60.00	50.00	-26.14	-16.94
5	23.23048	10.98	32.51	32.03	43.49	43.01	60.00	50.00	-16.51	-6.99
6	24.32425	10.99	30.39	30.14	41.38	41.13	60.00	50.00	-18.62	-8.87

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



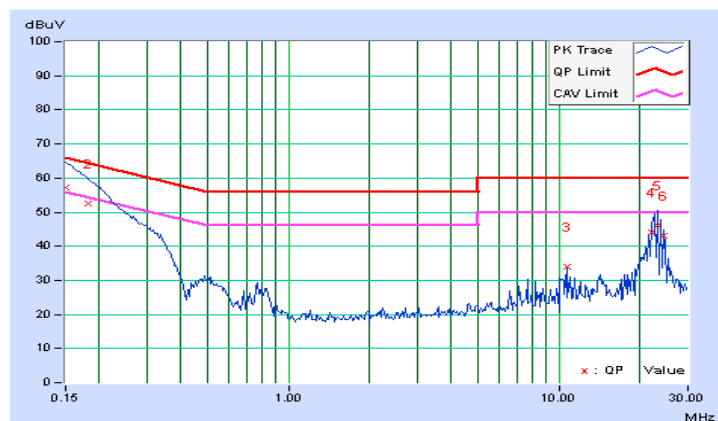
4.2.9 Test Results (Mode 5)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.26	47.12	17.78	57.38	28.04	66.00	56.00	-8.62	-27.96
2	0.18126	10.23	42.33	13.36	52.56	23.59	64.43	54.43	-11.86	-30.83
3	10.66018	10.55	23.46	22.55	34.01	33.10	60.00	50.00	-25.99	-16.90
4	22.14064	10.95	33.29	32.43	44.24	43.38	60.00	50.00	-15.76	-6.62
5	23.23441	10.96	35.18	33.69	46.14	44.65	60.00	50.00	-13.86	-5.35
6	24.32815	10.97	32.18	31.66	43.15	42.63	60.00	50.00	-16.85	-7.37

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

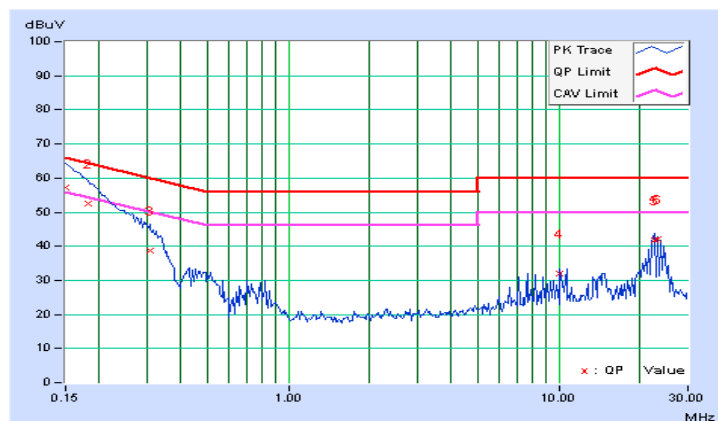


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	47.03	17.74	57.27	27.98	66.00	56.00	-8.73	-28.02
2	0.18128	10.21	42.46	13.36	52.67	23.57	64.43	54.43	-11.75	-30.85
3	0.30624	10.21	28.54	5.64	38.75	15.85	60.07	50.07	-21.32	-34.22
4	10.11330	10.54	21.46	20.38	32.00	30.92	60.00	50.00	-28.00	-19.08
5	22.68752	10.97	30.82	30.49	41.79	41.46	60.00	50.00	-18.21	-8.54
6	23.23441	10.98	30.96	30.33	41.94	41.31	60.00	50.00	-18.06	-8.69

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

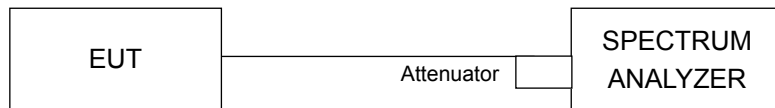


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation from Test Standard

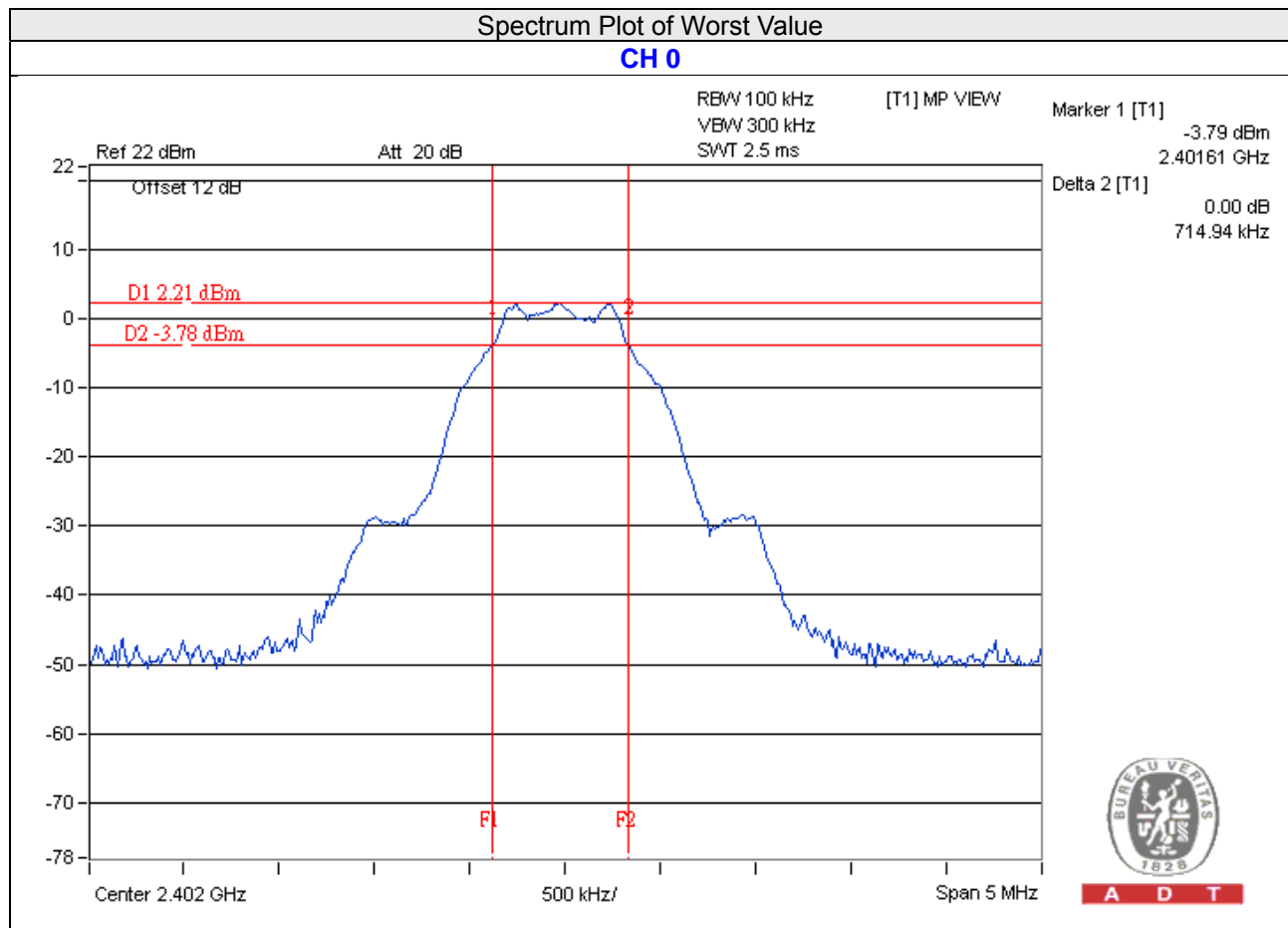
No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.71	0.5	Pass
19	2440	0.72	0.5	Pass
39	2480	0.72	0.5	Pass

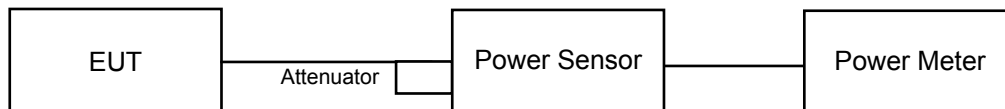


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor and set the detector to PEAK . Record the power level.

A average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power senso and set the detector to AVERAGE . Record the power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR PEAK POWER

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	1.811	2.58	30	Pass
19	2440	1.614	2.08	30	Pass
39	2480	1.406	1.48	30	Pass

FOR AVERAGE POWER

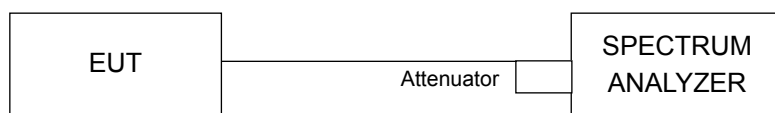
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.730	2.38
19	2440	1.545	1.89
39	2480	1.330	1.24

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

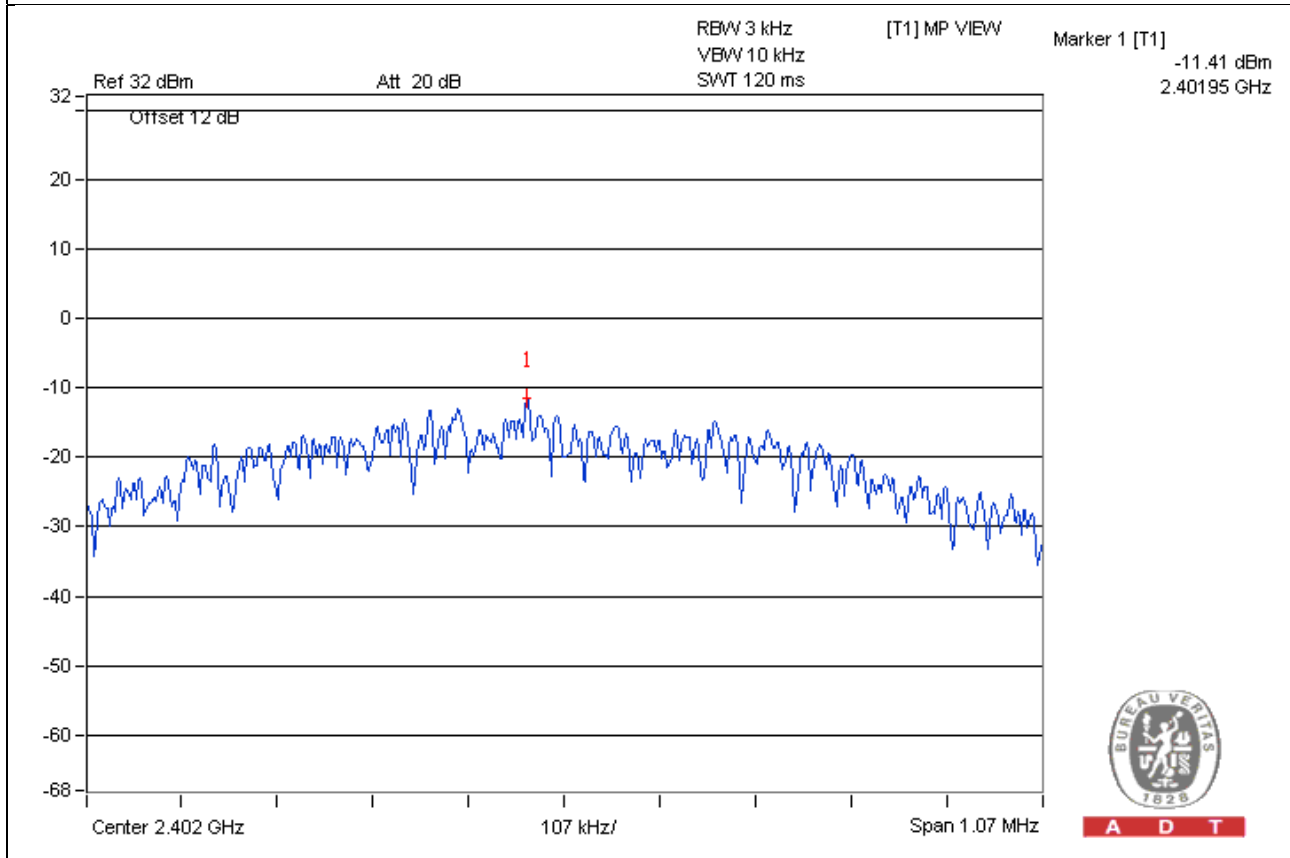
Same as Item 4.3.6

4.5.7 Test Results

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass/Fail
0	2402	-11.41	8	Pass
19	2440	-11.69	8	Pass
39	2480	-12.31	8	Pass

Spectrum Plot of Worst Value

CH 0

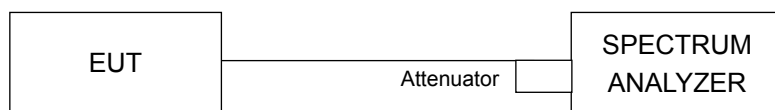


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

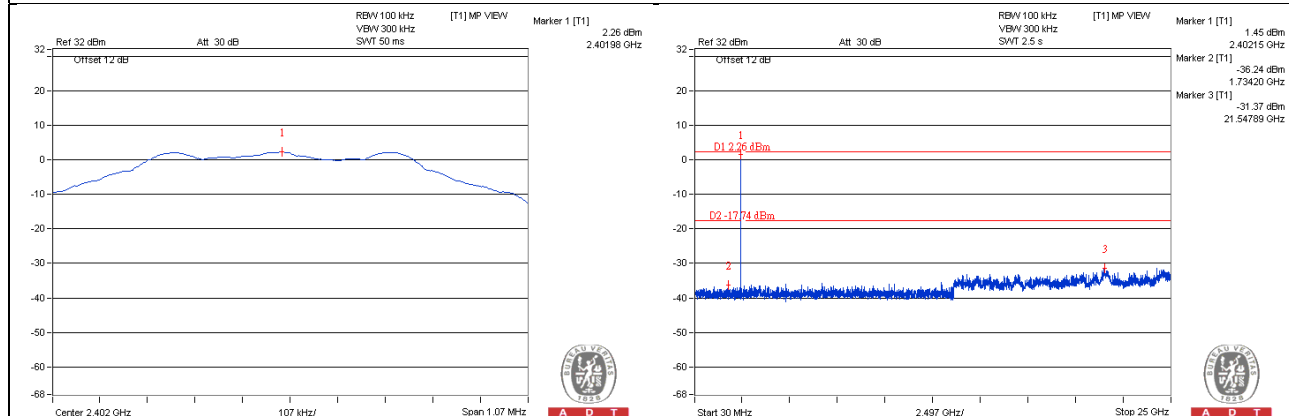
No deviation.

4.6.6 EUT Operating Condition

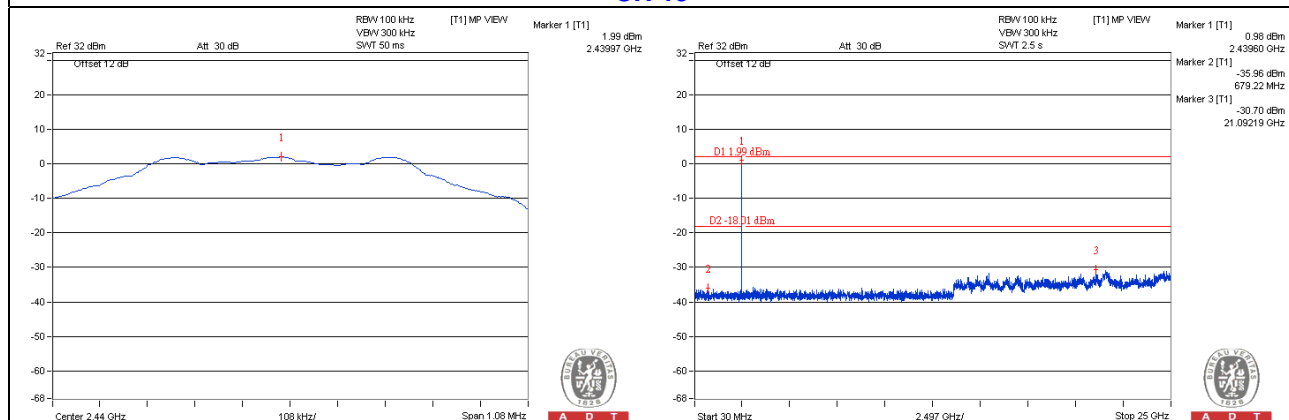
Same as Item 4.3.6

4.6.7 TEST RESULTS

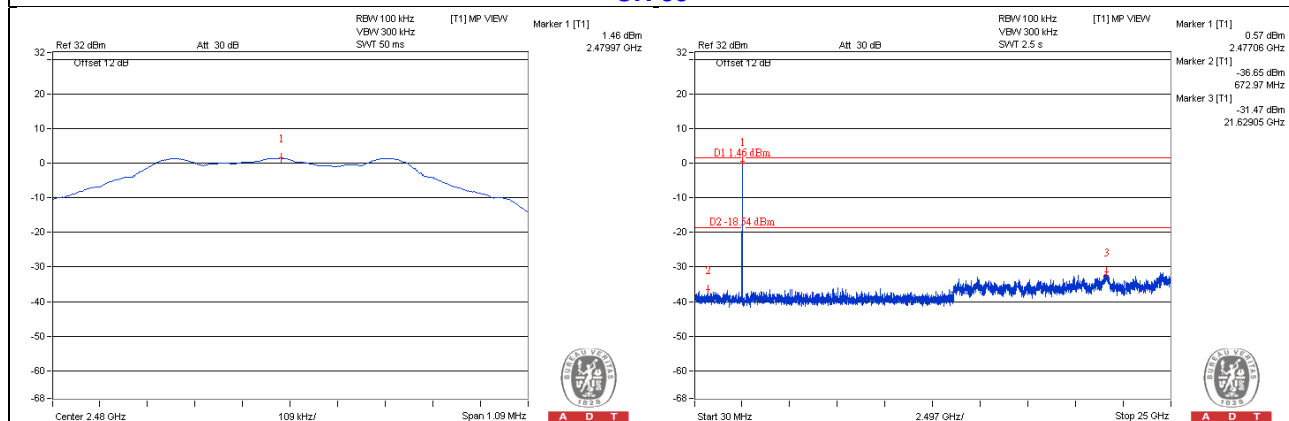
CH 0



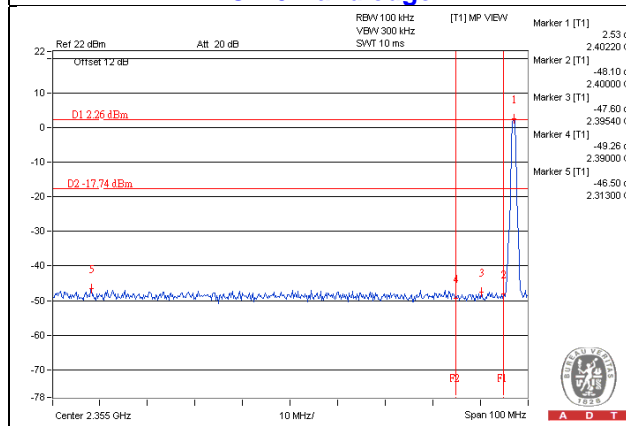
CH 19



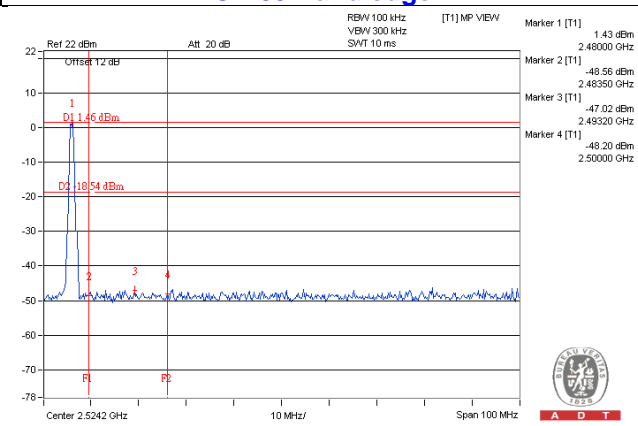
CH 39



CH 0 Band edge



CH 39 Band edge



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Hsin Chu EMC/RF Lab/Telecom Lab

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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