Supplementary FCC Test Report (BT-LE)

Report No.:	RF131028E08K-4
FCC ID:	UZ7MC32N0
Test Model:	MC32N0
Received Date:	Mar. 15, 2017
Test Date:	Mar. 20 to 21, 2017
Issued Date:	Mar. 29, 2017
Applicant:	Zebra Technologies Corporation
Address:	1 Zebra Plaza, Holtsville, NY 11742
Manufacturer:	Symbol Technologies, Inc.
Address:	1 Zebra Plaza, Holtsville, NY 11742
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Report Issue History Record of EUT (MC32N0)

Attachment No.	Issue Date	Description
131028E08	Feb. 07, 2014	Original release.
131028E08 R1	Feb. 07, 2014	Modified the test result of section 4.3.7
131028E08J	Mar. 02, 2017	1. Upgraded standard version. 2. Change Mg alloy to Al alloy for LCD frame 3. Remove 2 LCD contact springs in the middle 4. Reduce 3 screws from PCB to Option Frame mount from LCD side 5. Change Audio amplifier from SSM2317 to TPA2038 6. Change uSD socket without card detection pin 7. Remove IST (sensor hub) microcontroller and connect the Accelerometer directly to SoC (OMAP) 8. Change Antenna connector from Hirose to IPEX 9. Solder bumps instead of gold tracing in PCB board
131028E08K	Mar. 29, 2017	1. Add BT-LE funtion 2. Add new OS Android Lollipop

Release Control Record

Issue No.	Description	Date Issued
RF131028E08K-4	Original release.	Mar. 29, 2017

1 Certificate of Conformity

Product:	Mobile Computer
Brand:	Symbol
Test Model:	MC32N0
Sample Status:	MASS-PRODUCTION
Applicant:	Zebra Technologies Corporation
Test Date:	Mar. 20 to 21, 2017
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 : Wendy Wu , **Date:** Mar. 29, 2017

Wendy Wu / Specialist

Approved by : , **Date:** Mar. 29, 2017

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 -12.38dB at 0.19687MHz.
15.205 & 209 & 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.6dB at 288.00MHz.
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	Antenna connector is IPEX not a standard connector.

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	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.30 dB
	1GHz ~ 6GHz	4.78 dB
Radiated Emissions above 1 GHz	6GHz ~ 18GHz	4.52 dB
	18GHz ~ 40GHz	5.08 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (BT-LE)

Product	Mobile Computer
Brand	Symbol
Test Model	MC32N0
Status of EUT	MASS-PRODUCTION
MFD	16JAN17
Power Supply Rating	DC 5.4V from power adapter or DC 3.7V from battery
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 1Mbps
Operating Frequency	2402MHz ~ 2480MHz
Number of Channel	40
Output Power	1.786mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Refer to Note
Data Cable Supplied	Refer to Note

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF131028E08J as the following:
   - ◆ Add BT-LE funtion
   - ◆ Add new OS Android Lollipop
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. There are Bluetooth technology and WLAN 802.11 a/b/g/n technology.
4. For WLAN: 2.4GHz and 5GHz technology cannot transmit at same time.
5. WLAN & Bluetooth technology can transmit at same time. The emission of the simultaneous operation has been evaluated and no non-compliance was found.

6. EUT Configuration list:

	Feature	Straight	Rotate	Gun
OS	WIN CE 7.0	V	V	V
	Android	V	V	V
Display	Size 3", Resolution: 320x320	V	V	V
Scanner	2D Imager SE4750	V		V
	1D SE965	V	V	V
Keypad	28 keys	V	V	V
	38 keys	V	V	V
	48 keys	V	V	V
Battery	1X	V	V	
	2X	V	V	V
RF	WLAN 802.11 a/b/g/n (N20)	V	V	V
	BT 2.1 EDR	V	V	V
Accessories	USB1.1 Full speed host/client	V	V	V
	Holster	V	V	V
	Headset	V	V	V

7. The associated devices(optional) of EUT information are as below:

Product	Brand	Model
Headset	MOTOROLA	RCH51
Cable (RCH51 adapter cable to MC32N0) (Part No. : 25-124411-02R)		

8. The Version of EUT information are as below:

WinCE System		
Mobile Computer	OS Version	07.00.2824
	OEM Version	00.50.0000
Wireless(Fusion)	Part Number	31-FUSION-X2.01
	Version	X_2.01.0.0.089R
	Firmware	X_2.01.0.0.200

Android System		
Android	Version	5.1.1
EA	Version	2.57
Kernal version	Version	3.4.48
Firmware	Version	A_4.01.0.0.1
XW2DMT	Version	X_2.01.0.0.3
	version	X_2.01.0.0.166
BTRegTest Ver 4.1	version	3.00.2.0.031R

9. The EUT could be supplied with the a power adapter and/or Li-ion battery as below:

Power Adapter	
Brand:	MOTOROLA
Part No.:	PWRS-14000-249R
Input power:	100~240V, 50~60Hz, 0.6A
Output power:	5.4V, 3A
US AC line cord, un-grounded and unshielded, 1.85m (Part No.: 50-16000-182R)	
USB Client Communication and Charging Cable Brand: MOTOROLA Part No.: 25-67868-03R Associated Devices: AC cable*1 (Part No.: 50-16000-182R) Adapter * 1 (Part No.: PWRS-14000-249R)	
Li-ion Battery 1	
Brand:	Symbol
Model No.:	82-000011-01
RATING:	3.7V, 2740mAh, 10.2Wh
Li-ion Battery 2	
Brand:	Symbol
Model No.:	82-000012-02
RATING:	3.7V, 5200mAh, 19.2Wh

10. The antennas provided to the EUT, please refer to the following table:

For WLAN								
No.	**Brand**	**Model**	**Antenna Type**	**Gain (dBi)**	**Connecter Type**	**Frequency range (MHz)**	**Cable Loss(dB)**	**Cable Length(mm)**
1	Laird	Rot - Main	PIFA	0.95 (2.4G) 5.5 (5G)	Hirose U.FL	2400~2500 4900~5850	0.1~0.15	61 +2/-1
2	Laird	Rot - Aux	PIFA	0.61 (2.4G) 5.89 (5G)	Hirose U.FL	2400~2500 4900~5850	0.1~0.15	23 +2.5/0
3	Laird	Str - Main	PIFA	1.09 (2.4G) 4.65 (5G)	Hirose U.FL	2400~2500 4900~5850	0.1~0.15	61 +2/-1
4	Laird	Str - Aux	PIFA	0.66 (2.4G) 4.19 (5G)	Hirose U.FL	2400~2500 4900~5850	0.1~0.15	23 +2.5/0
5	Laird	Gun - Main	PIFA	1.77 (2.4G) 4.82 (5G)	Hirose U.FL	2400~2500 4900~5850	0.1~0.15	61 +2/-1
6	Laird	Gun - Aux	PIFA	1.61 (2.4G) 5.82 (5G)	Hirose U.FL	2400~2500 4900~5850	0.1~0.15	23 +2.5/0
Note : 1. For 2.4G: The antenna 5 was selected as representative antenna for the test. 2. For 5G: The antenna 2 was selected as representative antenna for the test.								
For Bluetooth								
No.	**Brand**	**Model**	**Antenna Type**	**Gain (dBi)**	**Connecter Type**	**Frequency range (MHz)**	**Cable Loss(dB)**	**Cable Length(mm)**
7	Aristotle	Rot	PIFA	2.6	IPEX	2400~2480	0.1~0.15	26 ± 0.5
8	Aristotle	Str	PIFA	2.71	IPEX	2400~2480	0.1~0.15	26 ± 0.5
9	Aristotle	Gun	PIFA	3.74	IPEX	2400~2480	0.1~0.15	26 ± 0.5
Note : 1. The antenna 9 was selected as representative antenna for the test.								

11. The EUT was pre-tested in chamber under following test modes :

Mode	Axis	Scanner	Keypad	Feature	Memory	Antenna	Battery	Adapter
Mode A	**X-Y**	**SE965**	**48 keys**	**Gun**	**4GBFlash/1GB DDR**	**BT**	**2X**	**Yes**
Mode B	X-Z	SE965	48 keys	Gun	4GBFlash/1GB DDR	BT	2X	Yes
Mode C	Y-Z	SE965	48 keys	Gun	4GBFlash/1GB DDR	BT	2X	Yes
Mode D	X-Y	SE965	48 keys	Rotate	4GBFlash/1GB DDR	BT	2X	Yes
Mode E	X-Y	SE965	48 keys	Straight	4GBFlash/1GB DDR	BT	2X	Yes

The worse radiated emission was found in **Mode A**. Therefore only the test data of the modes were recorded in this report. (Note: BT testing followed worst case options of scanner/keypad/memory/battery has determined during 2.4GHz WLAN testing, as the two technologies operate in the same frequency band.)

12. 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≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

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	19	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	TESTED BY
RE≥1G	26deg. C, 65%RH	120Vac, 60Hz	Andy Ho
RE<1G	23deg. C, 68%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 66%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 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.	Earphone	MOTOROLA	RCH51	NA	NA	Supplied by client
B.	USB Client Communication	MOTOROLA	25-67868-03R	NA	NA	Supplied by client
C.	Laptop	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab
D.	Adapter	Symbol	PWRS-14000-249R	NA	NA	Supplied by client
E.	Micro SD Card	Gigastone	8GB	NA	NA	Provided by Lab

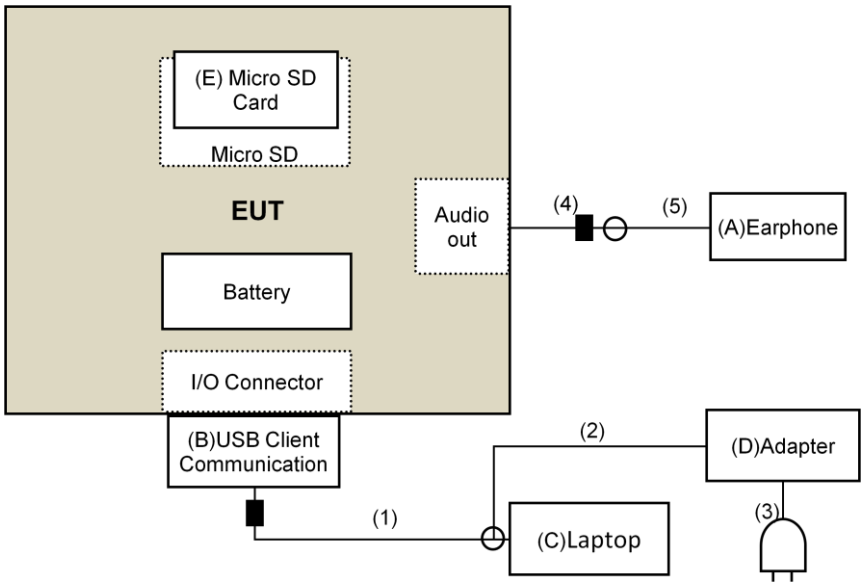
Note:

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.	USB Cable	1	1.8	Yes	1	Supplied by client
2.	DC Cable	1	1.8	No	0	Supplied by client
3.	AC Cable	1	1.8	No	0	Supplied by client
4.	Audio Cable	1	0.6	No	1	Supplied by client
5.	Audio Cable	1	0.5	No	0	Supplied by client

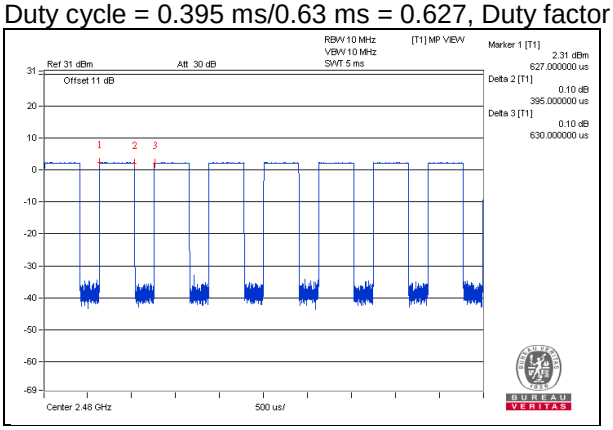
Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration of System under Test



3.4 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.
Duty cycle = 0.395 ms/0.63 ms = 0.627, Duty factor = 10 * log(1/0.627) = 2.03



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)
KDB 558074 D01 DTS Meas Guidance v03r05
ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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 Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 10, 2016	Nov. 09, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Dec. 13, 2016	Dec. 12, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	160923 150318 150323	Feb. 02, 2017 Mar. 30, 2016 Mar. 30, 2016	Feb. 01, 2018 Mar. 29, 2017 Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSv40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017

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. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Mar. 20 to 21, 2017

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case 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.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

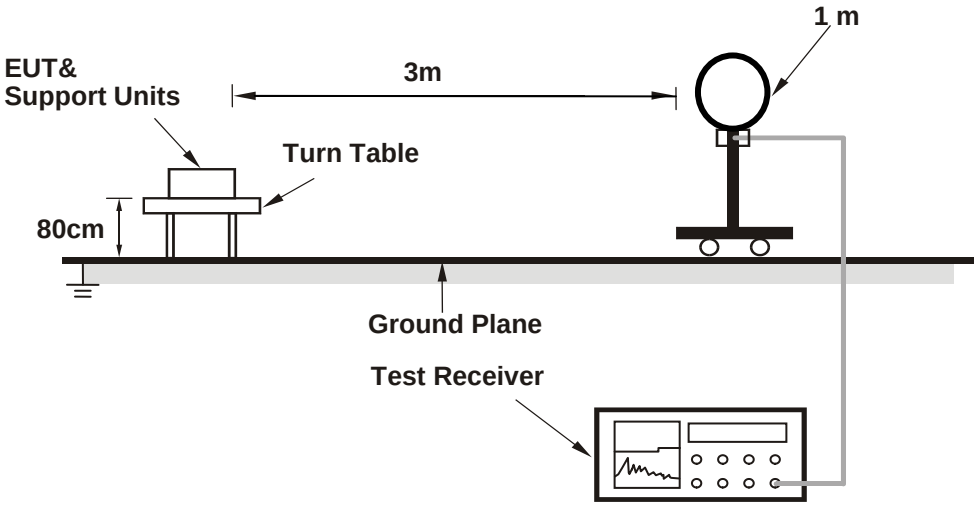
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 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

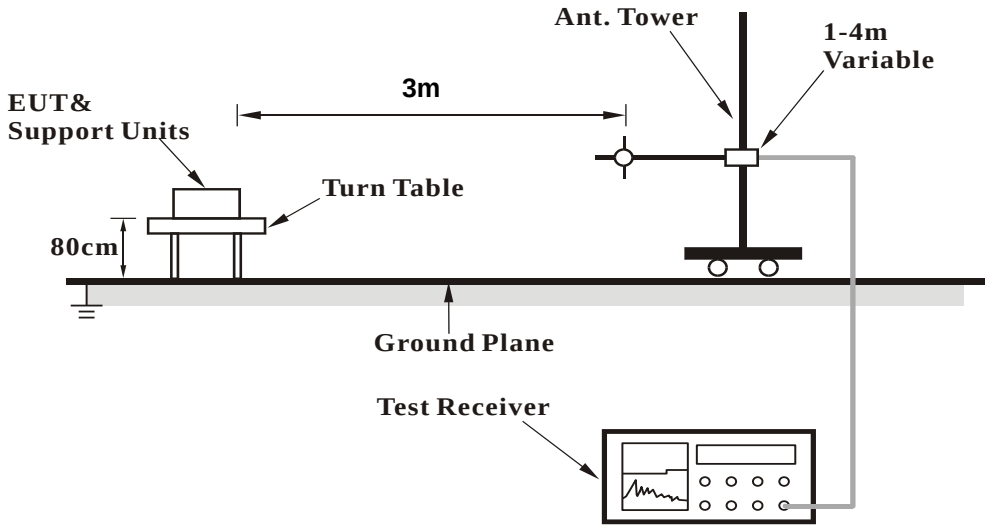
No deviation.

4.1.5 Test Setup

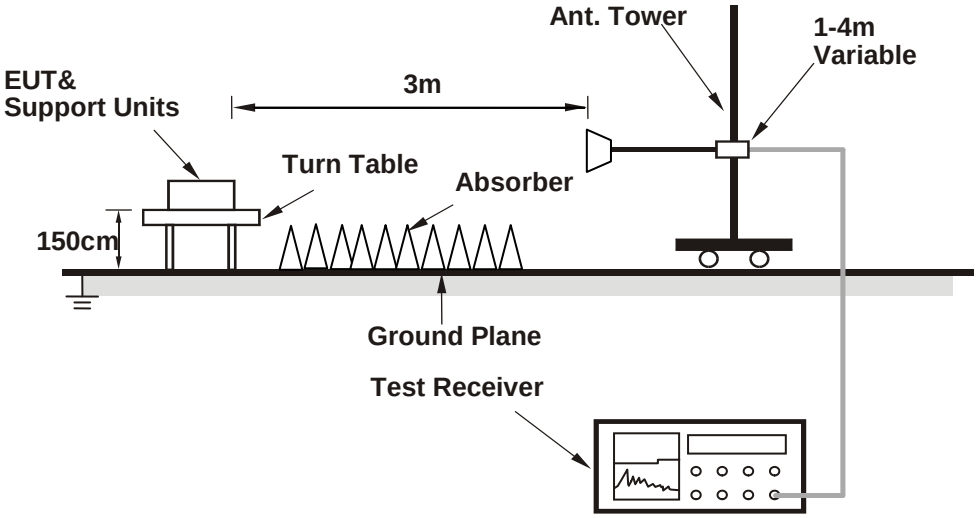
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.
b. Contorlling software (TNT1 Reg Test V4.10) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

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

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	47.1 PK	74.0	-26.9	1.80 H	323	49.2	-2.1
2	2390.00	34.1 AV	54.0	-19.9	1.80 H	323	36.2	-2.1
3	*2402.00	92.7 PK			1.80 H	323	94.7	-2.0
4	*2402.00	91.5 AV			1.80 H	323	93.5	-2.0
5	4804.00	43.7 PK	74.0	-30.3	1.56 H	50	41.5	2.2
6	4804.00	37.1 AV	54.0	-16.9	1.56 H	50	34.9	2.2
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	48.7 PK	74.0	-25.3	1.16 V	168	50.8	-2.1
2	2390.00	36.6 AV	54.0	-17.4	1.16 V	168	38.7	-2.1
3	*2402.00	99.2 PK			1.16 V	168	101.2	-2.0
4	*2402.00	98.2 AV			1.16 V	168	100.2	-2.0
5	4804.00	42.6 PK	74.0	-31.4	1.49 V	231	40.4	2.2
6	4804.00	36.7 AV	54.0	-17.3	1.49 V	231	34.5	2.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	92.7 PK			1.81 H	319	94.6	-1.9
2	*2440.00	91.3 AV			1.81 H	319	93.2	-1.9
3	4880.00	43.3 PK	74.0	-30.7	1.50 H	46	40.9	2.4
4	4880.00	36.7 AV	54.0	-17.3	1.50 H	46	34.3	2.4
5	7320.00	41.9 PK	74.0	-32.1	1.55 H	187	33.5	8.4
6	7320.00	31.4 AV	54.0	-22.6	1.55 H	187	23.0	8.4
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	98.4 PK			1.37 V	167	100.3	-1.9
2	*2440.00	97.7 AV			1.37 V	167	99.6	-1.9
3	4880.00	43.0 PK	74.0	-31.0	1.50 V	239	40.6	2.4
4	4880.00	36.8 AV	54.0	-17.2	1.50 V	239	34.4	2.4
5	7320.00	42.0 PK	74.0	-32.0	1.52 V	168	33.6	8.4
6	7320.00	31.6 AV	54.0	-22.4	1.52 V	168	23.2	8.4

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	93.0 PK			1.76 H	322	94.7	-1.7
2	*2480.00	91.6 AV			1.76 H	322	93.3	-1.7
3	2483.50	46.8 PK	74.0	-27.2	1.76 H	322	48.5	-1.7
4	2483.50	34.4 AV	54.0	-19.6	1.76 H	322	36.1	-1.7
5	4960.00	43.5 PK	74.0	-30.5	1.54 H	60	41.0	2.5
6	4960.00	36.9 AV	54.0	-17.1	1.54 H	60	34.4	2.5
7	7440.00	42.1 PK	74.0	-31.9	1.60 H	178	33.4	8.7
8	7440.00	31.6 AV	54.0	-22.4	1.60 H	178	22.9	8.7
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	98.4 PK			1.40 V	170	100.1	-1.7
2	*2480.00	97.8 AV			1.40 V	170	99.5	-1.7
3	2483.50	47.2 PK	74.0	-26.8	1.40 V	170	48.9	-1.7
4	2483.50	35.7 AV	54.0	-18.3	1.40 V	170	37.4	-1.7
5	4960.00	43.3 PK	74.0	-30.7	1.55 V	251	40.8	2.5
6	4960.00	37.2 AV	54.0	-16.8	1.55 V	251	34.7	2.5
7	7440.00	42.3 PK	74.0	-31.7	1.51 V	163	33.6	8.7
8	7440.00	32.0 AV	54.0	-22.0	1.51 V	163	23.3	8.7

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:

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	86.31	34.4 QP	40.0	-5.6	2.00 H	205	48.4	-14.0
2	217.60	38.4 QP	46.0	-7.6	1.00 H	137	49.9	-11.5
3	288.00	42.3 QP	46.0	-3.7	1.50 H	241	50.3	-8.0
4	302.38	39.3 QP	46.0	-6.7	1.00 H	206	47.1	-7.8
5	649.49	33.0 QP	46.0	-13.0	1.00 H	178	32.9	0.1
6	699.15	34.3 QP	46.0	-11.7	1.50 H	224	33.5	0.8
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	60.83	34.5 QP	40.0	-5.5	1.00 V	148	43.4	-8.9
2	68.94	34.2 QP	40.0	-5.8	1.00 V	249	44.2	-10.0
3	100.33	38.3 QP	43.5	-5.2	1.50 V	206	51.1	-12.8
4	288.65	41.1 QP	46.0	-4.9	1.00 V	143	49.1	-8.0
5	604.77	39.8 QP	46.0	-6.2	1.50 V	183	40.1	-0.3
6	956.98	35.6 QP	46.0	-10.4	2.00 V	114	31.0	4.6

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	9kHz ~ 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	86.30	34.4 QP	40.0	-5.6	2.00 H	241	48.4	-14.0
2	217.60	37.2 QP	46.0	-8.8	1.00 H	119	48.7	-11.5
3	**288.00**	**42.4 QP**	**46.0**	**-3.6**	**1.00 H**	**252**	**50.4**	**-8.0**
4	302.38	39.4 QP	46.0	-6.6	1.00 H	143	47.2	-7.8
5	649.49	32.1 QP	46.0	-13.9	1.00 H	226	32.0	0.1
6	699.15	33.3 QP	46.0	-12.7	1.41 H	284	32.5	0.8
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	60.85	34.7 QP	40.0	-5.3	1.00 V	221	43.6	-8.9
2	68.94	35.8 QP	40.0	-4.2	1.21 V	256	45.8	-10.0
3	100.33	38.4 QP	43.5	-5.1	1.00 V	173	51.2	-12.8
4	288.65	41.2 QP	46.0	-4.8	1.50 V	224	49.2	-8.0
5	604.77	40.1 QP	46.0	-5.9	1.50 V	226	40.4	-0.3
6	956.98	34.4 QP	46.0	-11.6	2.00 V	206	29.8	4.6

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	9kHz ~ 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	86.30	34.3 QP	40.0	-5.7	1.50 H	143	48.3	-14.0
2	217.61	38.5 QP	46.0	-7.5	1.50 H	287	50.0	-11.5
3	288.00	42.1 QP	46.0	-3.9	1.13 H	206	50.1	-8.0
4	302.38	39.1 QP	46.0	-6.9	1.50 H	205	46.9	-7.8
5	649.49	34.3 QP	46.0	-11.7	1.50 H	178	34.2	0.1
6	699.15	35.3 QP	46.0	-10.7	1.50 H	114	34.5	0.8
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	60.82	34.2 QP	40.0	-5.8	1.51 V	287	43.1	-8.9
2	68.93	34.1 QP	40.0	-5.9	1.24 V	198	44.1	-10.0
3	100.33	38.2 QP	43.5	-5.3	1.50 V	98	51.0	-12.8
4	288.65	40.5 QP	46.0	-5.5	1.21 V	287	48.5	-8.0
5	604.77	39.6 QP	46.0	-6.4	1.50 V	226	39.9	-0.3
6	956.99	35.5 QP	46.0	-10.5	1.50 V	224	30.9	4.6

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	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	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. 1.
3 Tested Date: Mar. 20, 2017

4.2.3 Test Procedures

a. 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

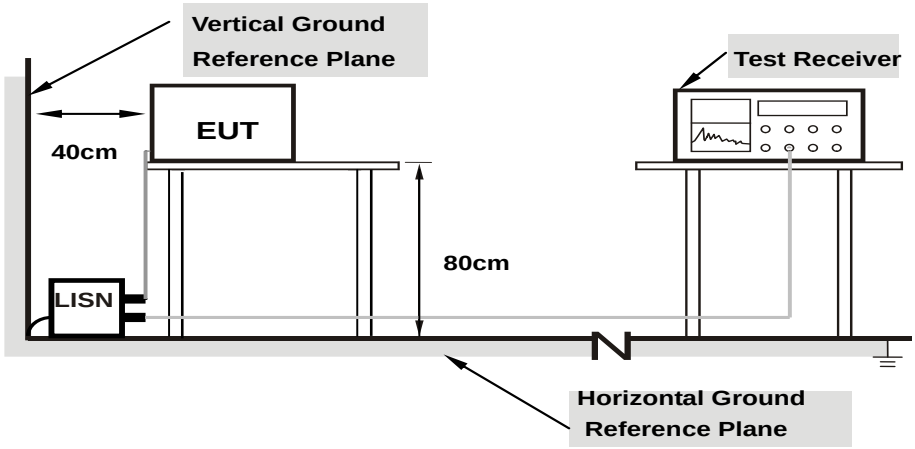
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

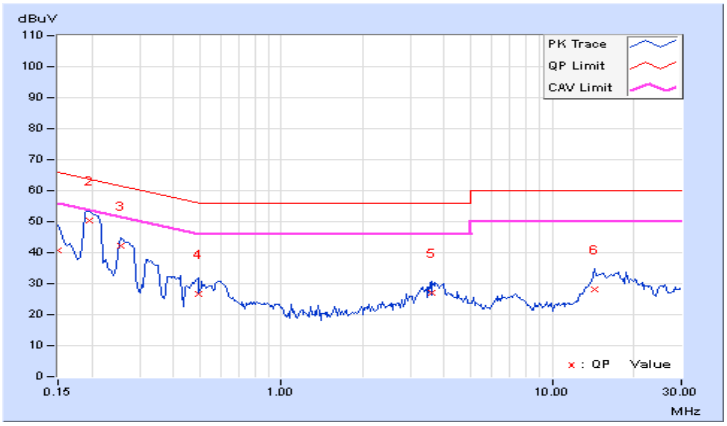
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	30.70	9.14	40.89	19.33	66.00	56.00	-25.11	-36.67
2	0.19687	10.19	40.24	27.82	50.43	38.01	63.74	53.74	-13.31	-15.73
3	0.25547	10.20	31.93	13.85	42.13	24.05	61.58	51.58	-19.45	-27.53
4	0.49375	10.23	16.49	1.48	26.72	11.71	56.10	46.10	-29.38	-34.39
5	3.60547	10.24	16.94	8.32	27.18	18.56	56.00	46.00	-28.82	-27.44
6	14.37891	10.99	17.29	11.31	28.28	22.30	60.00	50.00	-31.72	-27.70

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.

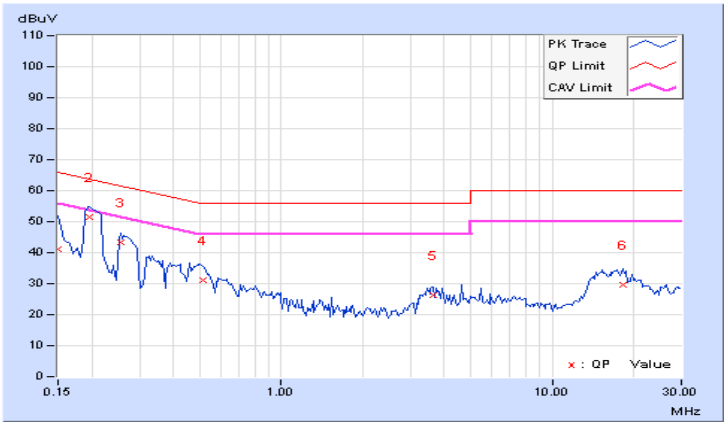


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.18	30.96	16.38	41.14	26.56	66.00	56.00	-24.86	-29.44
2	**0.19687**	**10.16**	**41.20**	**28.95**	**51.36**	**39.11**	**63.74**	**53.74**	**-12.38**	**-14.63**
3	0.25547	10.17	33.06	15.29	43.23	25.46	61.58	51.58	-18.35	-26.12
4	0.51594	10.21	21.04	8.35	31.25	18.56	56.00	46.00	-24.75	-27.44
5	3.62109	10.18	16.11	6.72	26.29	16.90	56.00	46.00	-29.71	-29.10
6	18.24609	11.02	18.56	12.95	29.58	23.97	60.00	50.00	-30.42	-26.03

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.

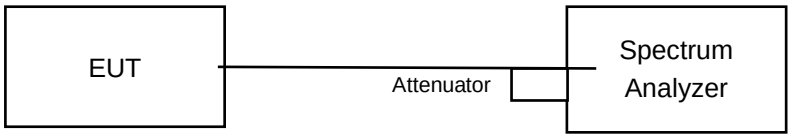


4.3 6dB Bandwidth Measurement

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

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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 fromTest Standard

No deviation.

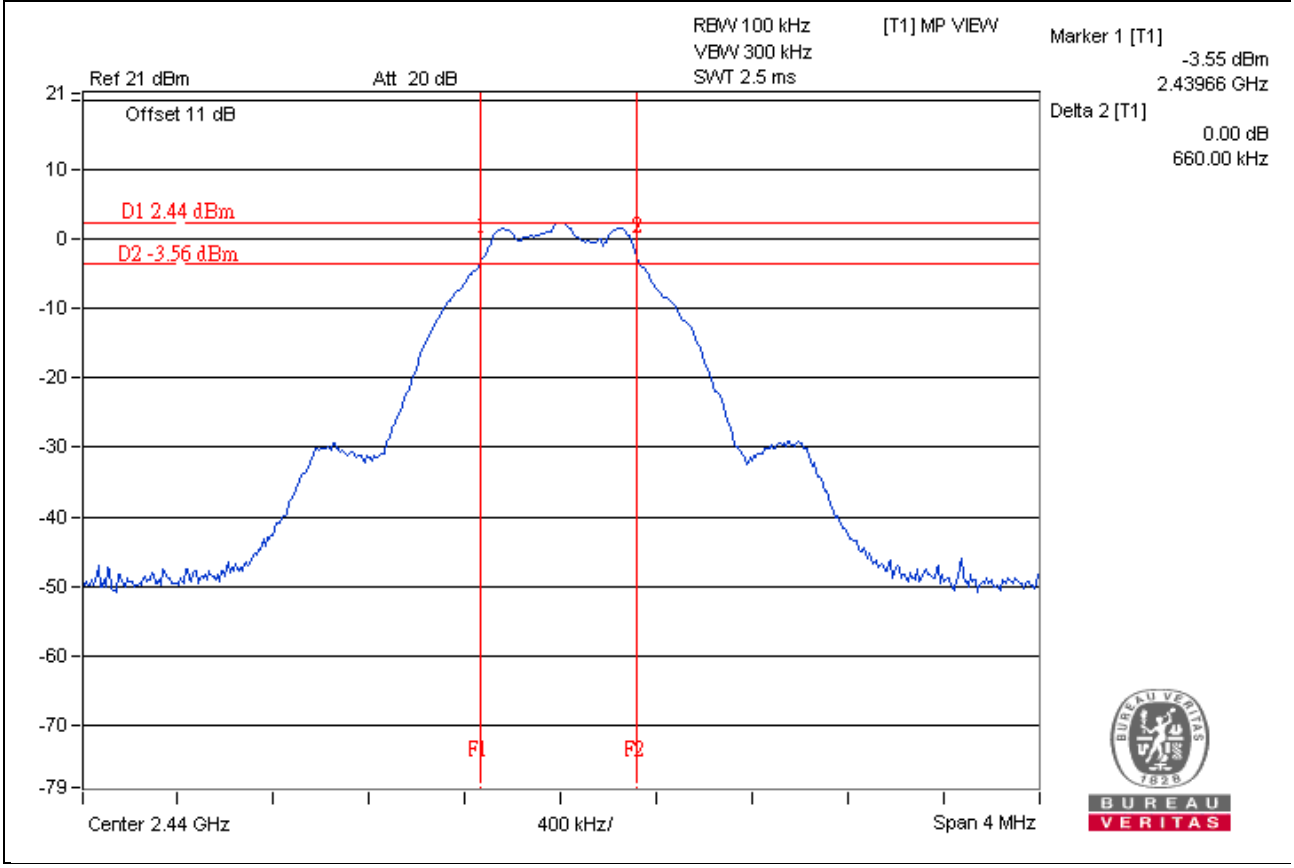
4.3.6 EUT Operating Conditions

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	0.68	0.5	Pass
19	2440	0.66	0.5	Pass
39	2480	0.67	0.5	Pass

Spectrum Plot of Worst Value
CH 19

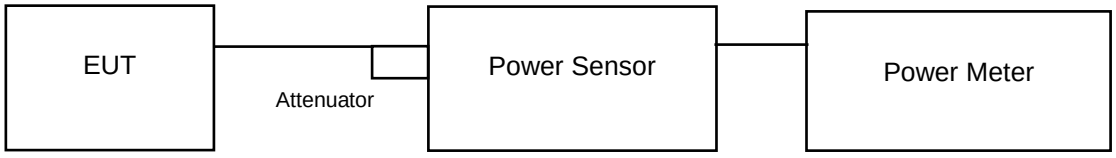


4.4 Conducted Output Power Measurement

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 / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. 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	1.644	2.16	30	Pass
19	2440	1.786	2.52	30	Pass
39	2480	1.778	2.50	30	Pass

FOR AVERAGE POWER

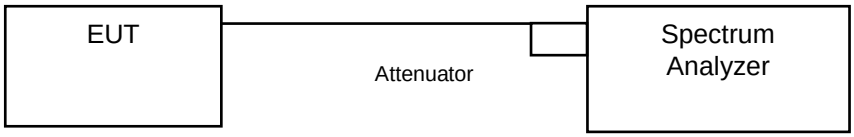
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.607	2.06
19	2440	1.75	2.43
39	2480	1.726	2.37

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

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

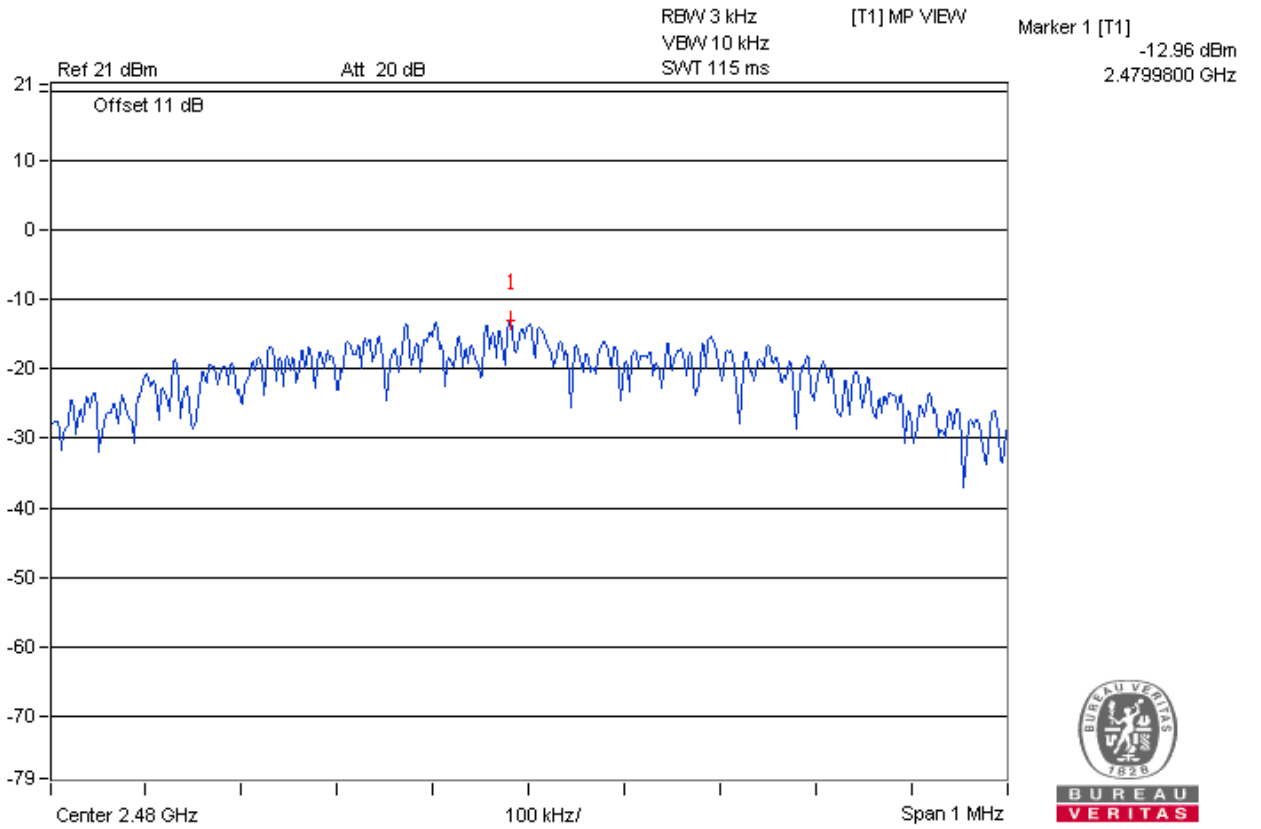
4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	2402	-13.38	8	Pass
19	2440	-13.15	8	Pass
39	2480	-12.96	8	Pass

Spectrum Plot of Worst Value
CH39

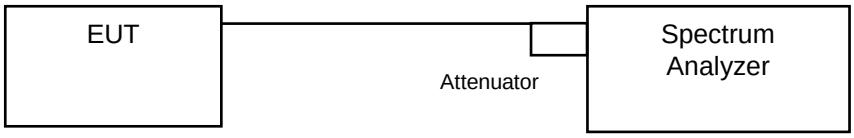


4.6 Conducted Out of Band Emission Measurement

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 ≥ 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 OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 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

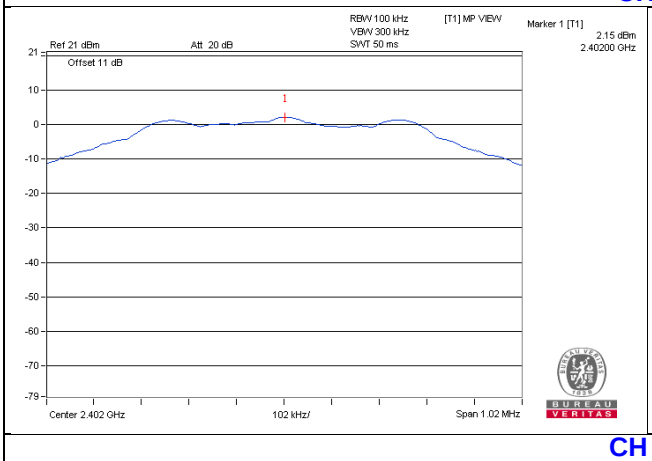
No deviation.

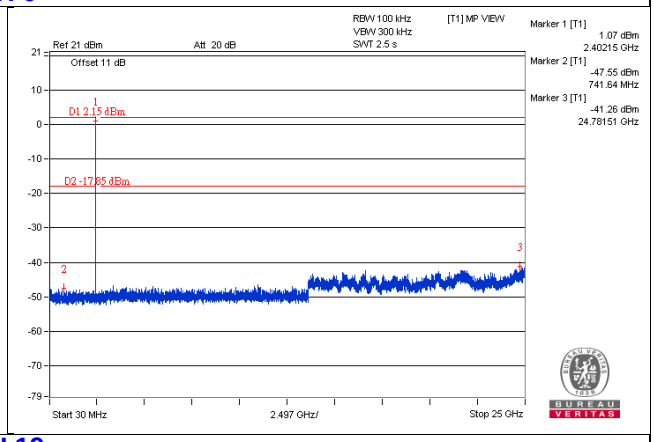
4.6.6 EUT Operating Condition

Same as Item 4.3.6

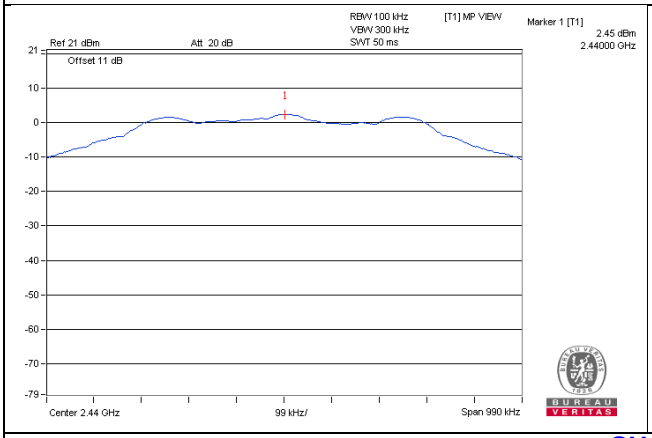
4.6.7 Test Results

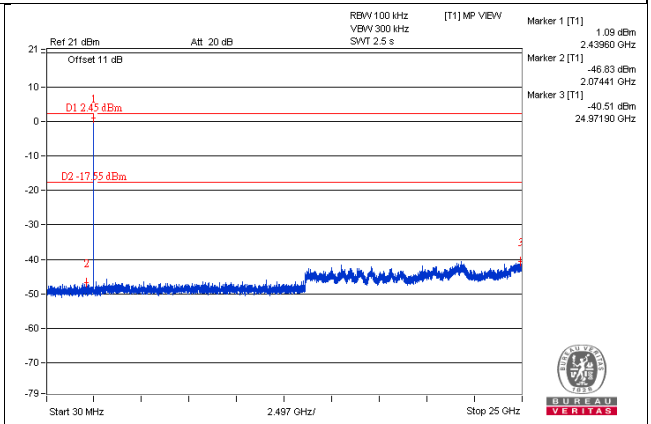
CH 0



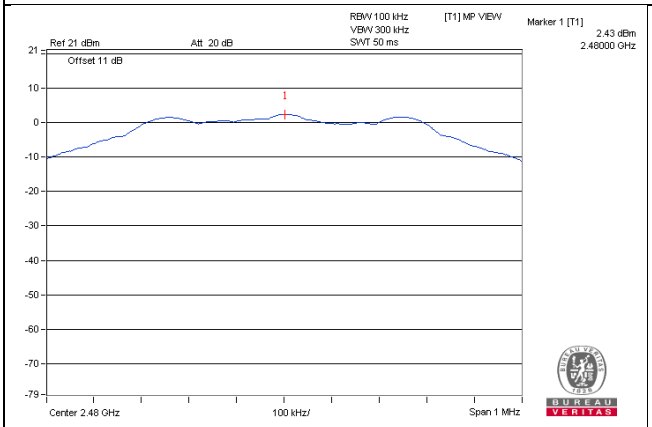


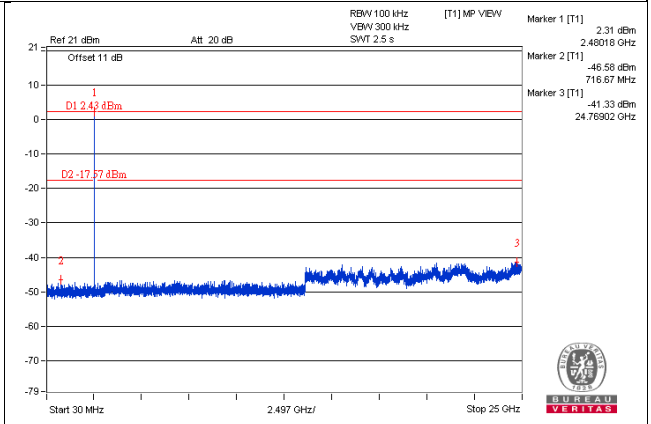
CH 19



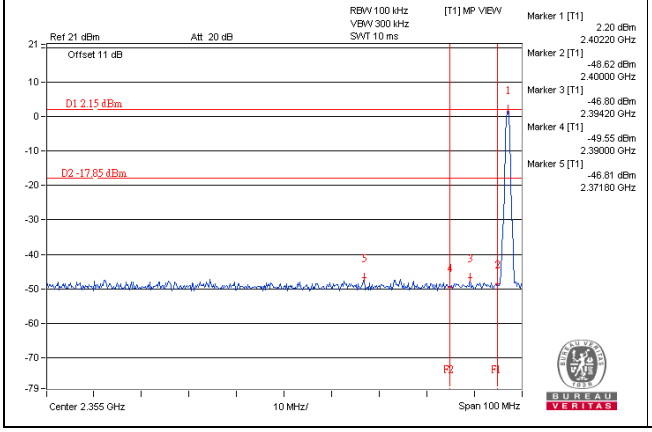


CH 39

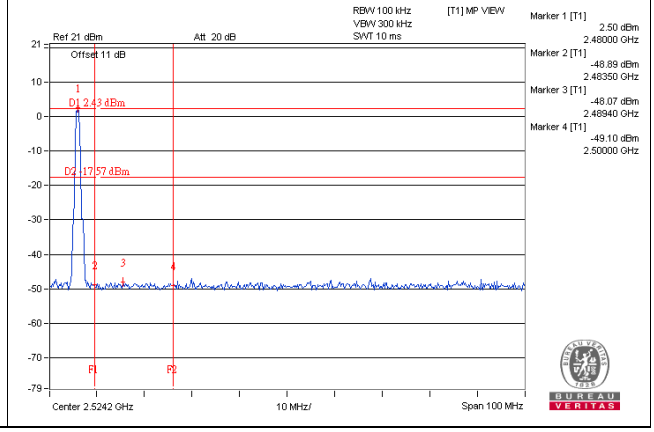




CH 0 Band edge



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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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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