FCC Test Report (BT-EDR)

Report No.:	RF161216E08H-3
FCC ID:	UAY-W8997-M1216
Test Model:	W8997-M1216
Received Date:	July 18, 2019
Test Date:	July 18 to Sep. 06, 2019
Issued Date:	Sep. 16, 2019

Applicant:	Marvell Semiconductor, Inc.
Address:	5488 Marvell Lane, Santa Clara CA95054 USA

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 :	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF161216E08H-3	Original release.	Sep. 16, 2019

1 Certificate of Conformity

Product:	IEEE 802.11 2X2 MU-MIMO ac/a/b/g/n Wireless LAN + Bluetooth NGFF Module
Brand:	Marvell
Test Model:	W8997-M1216
Sample Status:	ENGINEERING SAMPLE
Applicant:	Marvell Semiconductor, Inc.
Test Date:	July 18 to Sep. 06, 2019
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:** Sep. 16, 2019

Wendy Wu / Specialist

Approved by : _____ , **Date:** Sep. 16, 2019

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.247(b)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
15.205 & 209 & 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -8.0dB at 4960.00MHz.

NOTE:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.0 dB
	30MHz ~ 1GHz	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.2 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (BT-EDR)

Product	IEEE 802.11 2X2 MU-MIMO ac/a/b/g/n Wireless LAN + Bluetooth NGFF Module
Brand	Marvell
Test Model	W8997-M1216
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 3.3V from host equipment
Modulation Type	GFSK, π/4-DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	Up to 3Mbps
Operating Frequency	2402MHz ~ 2480MHz
Number of Channel	79
Output Power	4.529mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF161216E08C-3 as the following:
   - ◆ Add new antennas as following table:

Original

Antenna Set.	Brand	Model	Chain No.	Antenna Net. Gain(dBi)	Frequency range (MHz)	Antenna Type	Connector Type	Cable Length
1	MAG.LAYERS	MSA-4008-25GC1-A1	Chain 0(Aux)	2.98	2400~2500	PIFA	i-pex(MHF)	15cm
				5.16	4900~5900			
			Chain 1(Main)	2.98	2400~2500			15cm
				5.16	4900~5900			
2	Bondale	G-RA0K10090176-1436 B	Chain 0(Aux)	1.9	2400~2500	Dipole	RP-SMA	120mm
				3.6	4900~5800			
			Chain 1(Main)	1.9	2400~2500			120mm
				3.6	4900~5800			
3	San Jose	UEN-201	Chain 0(Aux)	2.4	2400~2500	Dipole	RP-SMA	120mm
				4.4	4900~5800			
			Chain 1(Main)	2.4	2400~2500			120mm
				4.4	4900~5800			

Newly

Antenna Set.	Brand	Model	chain no.	Antenna Net Gain(dBi) included cable loss	Frequency range	Antenna Type	Connector Type	Cable Length
4	Unictron	H2B1PC1A1C175L	Chain 0(Aux)	1.6	2400-2500	PCB	I-pex	100±5mm
				4.8	5150~5850			
			Chain 1(Main)	1.6	2400-2500	PCB	I-pex	100±5mm
				4.8	5150~5850			
5	LSR	001-0012	Chain 0(Aux)	2	2400-2500	Dipole	RP-SMA	100mm
				2	5150~5850			

			Chain 1(Main)	2	2400-2500	Dipole	RP-SMA	100mm
				2	5150~5850			
6	Laird	MAF94051	Chain 0(Aux)	2.4	2400-2500	Dipole	RP-SMA	100mm
				3.4	5150~5850			
			Chain 1(Main)	2.4	2400-2500	Dipole	RP-SMA	100mm
				3.4	5150~5850			
7	Taoglas	GW.59.3153	Chain 0(Aux)	2.86	2400-2500	Dipole	RP-SMA	100mm
				4.74	5150~5850			
			Chain 1(Main)	2.86	2400-2500	Dipole	RP-SMA	100mm
				4.74	5150~5850			
8	Chang Hong	DA-2458-02-SMR	Chain 0(Aux)	2.85	2400-2500	Dipole	RP-SMA	100mm
				2.17	5150~5850			
			Chain 1(Main)	2.85	2400-2500	Dipole	RP-SMA	100mm
				3.13	5150~5850			
9	Unictron	H2B1PD1A1C385L	Chain 0(Aux)	2.8	2400-2500	PCB	I-pex	100mm
				4.2	5150~5850			
			Chain 1(Main)	2.8	2400-2500	PCB	I-pex	100mm
				4.2	5150~5850			
10	Molex	2042811100	Chain 0(Aux)	2.562	2400-2500	PCB	I-pex	100mm
				3.094	5150~5850			
			Chain 1(Main)	2.562	2400-2500	PCB	I-pex	100mm
				3.094	5150~5850			
11	Molex	1461531100	Chain 0(Aux)	1.829	2400-2500	PCB	I-pex	100mm
				2.485	5150~5850			
			Chain 1(Main)	1.829	2400-2500	PCB	I-pex	100mm
				2.485	5150~5850			
12	MAG.LAYERS	MSA-4008-25GC1-A2	Chain 0(Aux)	2.98	2400-2500	PIFA	i-pex(MHF)	NA
				5.16	5150~5850			
			Chain 1(Main)	2.98	2400-2500	PIFA	i-pex(MHF)	
				5.16	5150~5850			

Note:
1. Max. gain was selected for Antenna Port Conducted Measurement test.
2. Antenna Set. 4, 7 were selected for radiated emissions test.

2. According to above condition, all test items (Except AC Power Conducted Emissions and Frequency Stability) need to be performed. And all data weres verified to meet the requirements.

3. There are WLAN, BT technology used for the EUT.
4. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	Bluetooth
2	WLAN (5GHz)	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

79 channels are provided for BT-EDR mode:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE≥1G	RE<1G	APCM	
1	-	-	√	PIFA antenna
2	√	√	-	PCB antenna
3	√	√	-	Dipole antenna

RE≥1G: Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz

APCM: Antenna Port Conducted Measurement

NOTE: The EUT's PCB antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane.**

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 TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH5
0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

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 TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0	FHSS	8DPSK	3DH5

Antenna Port Conducted Measurement:

☒ 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.

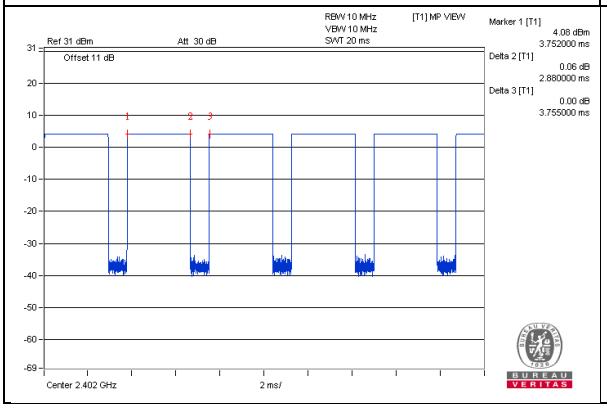
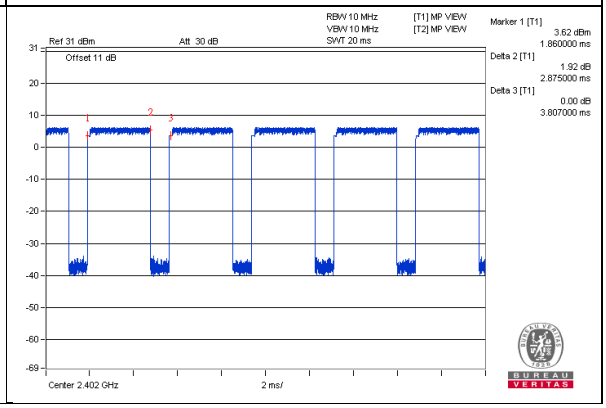
AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH5
0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE≥1G	24deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Tom Yang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

GFSK : Duty cycle = 2.88 ms/3.755 ms = 0.767 , Duty factor = 10 * log(1/Duty cycle) = 1.15
8DPSK : Duty cycle = 2.875 ms/3.807 ms = 0.755 , Duty factor = 10 * log(1/Duty cycle) = 1.22

GFSK	8DPSK
	

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.

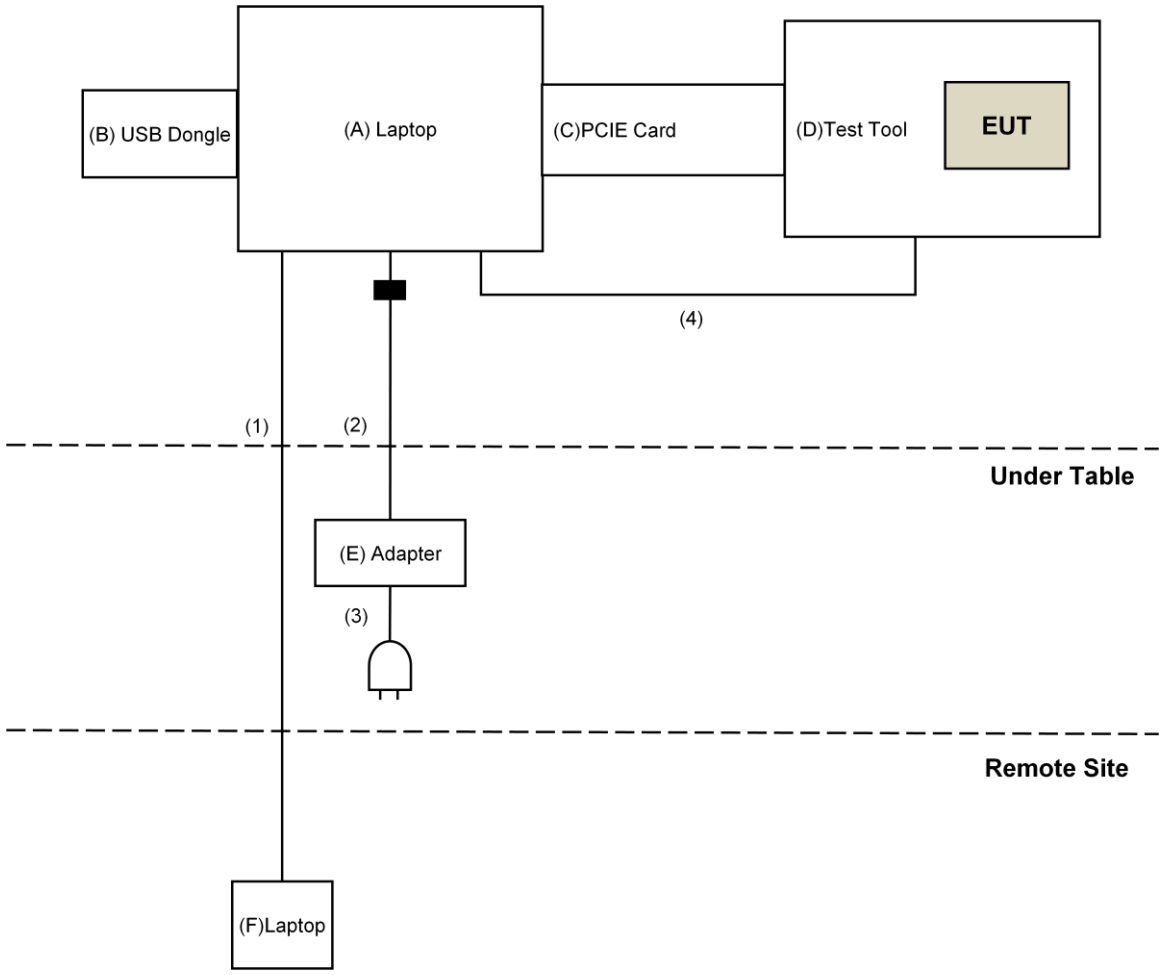
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab
B.	USB Dongle	AzureWave	USB Dongle	NA	NA	Supplied by client
C.	PCIE Card	AzureWave	PCIE Card	NA	NA	Supplied by client
D.	Test Tool	AzureWave	Test Tool	NA	NA	Supplied by client
E.	Adapter	DELL	LA65NS2-01	NA	NA	Provided by Lab
F.	Laptop	DELL	P88G	G1WJL42	PD93165NG	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.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	DC Cable	1	1.8	No	1	Provided by Lab
3.	AC Cable	1	1	No	0	Provided by Lab
4.	Type C Cable	1	1.5	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



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 15.247 Meas Guidance v05r02
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	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-3-1	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-2	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-3	Mar. 18, 2019	Mar. 17, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-1200	160922	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-2000	180601	June 10, 2019	June 09, 2020
RF Cable	EMC104-SM-SM-6000	180602	June 10, 2019	June 09, 2020
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC102-KM-KM-1200	160925	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020

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 test was performed in 966 Chamber No. 3.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: July 18 to Sep. 06, 2019

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. Parallel, perpendicular, and ground-parallel orientations 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:

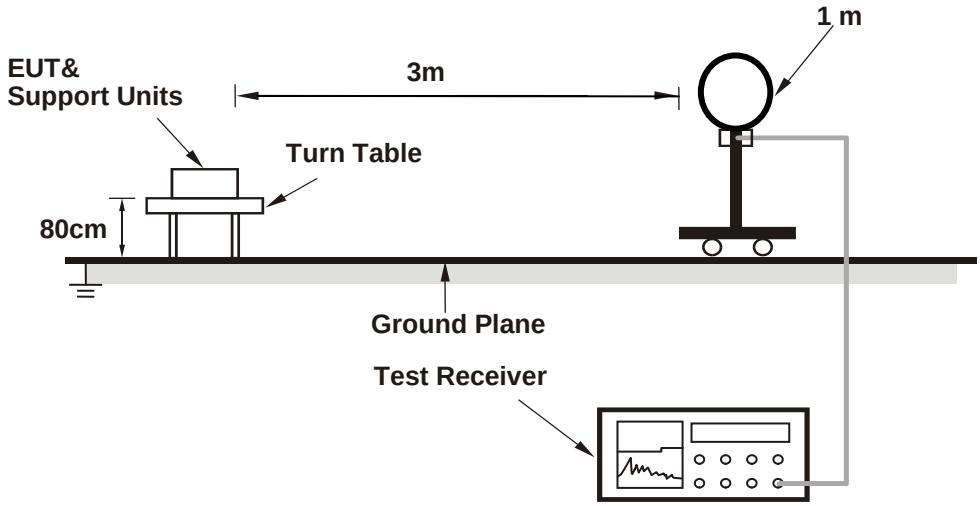
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

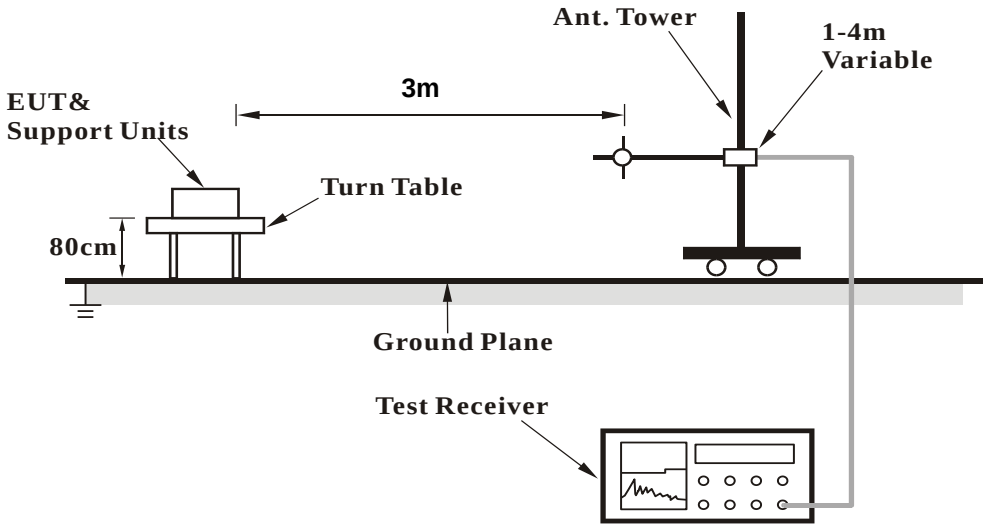
No deviation.

4.1.5 Test Setup

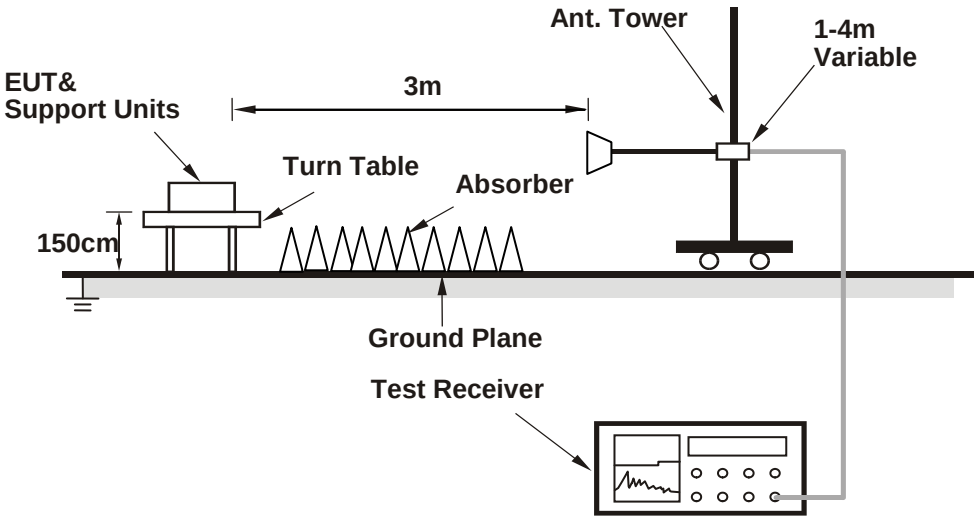
For Radiated emission below 30MHz



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 Computer which is placed on remote site.
b. Controlling software (DUT labtool (1.0.0.109)) has been activated to set the EUT under transmission condition continuously at specific channel frenquency.

4.1.7 Test Results (PCB antenna)

Above 1GHz Data:

BT_GFSK

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	50.3 PK	74.0	-23.7	1.08 H	190	52.3	-2.0
2	2390.00	34.8 AV	54.0	-19.2	1.08 H	190	36.8	-2.0
3	*2402.00	100.7 PK			1.08 H	190	102.7	-2.0
4	*2402.00	100.5 AV			1.08 H	190	102.5	-2.0
5	4804.00	48.0 PK	74.0	-26.0	1.42 H	232	45.7	2.3
6	4804.00	44.0 AV	54.0	-10.0	1.42 H	232	41.7	2.3
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	45.1 PK	74.0	-28.9	2.89 V	354	47.1	-2.0
2	2390.00	32.0 AV	54.0	-22.0	2.89 V	354	34.0	-2.0
3	*2402.00	94.2 PK			2.89 V	354	96.2	-2.0
4	*2402.00	93.9 AV			2.89 V	354	95.9	-2.0
5	4804.00	43.4 PK	74.0	-30.6	1.74 V	154	41.1	2.3
6	4804.00	36.8 AV	54.0	-17.2	1.74 V	154	34.5	2.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	*2441.00	100.6 PK			1.09 H	188	102.7	-2.1
2	*2441.00	100.3 AV			1.09 H	188	102.4	-2.1
3	4882.00	48.6 PK	74.0	-25.4	1.47 H	218	46.3	2.3
4	4882.00	44.5 AV	54.0	-9.5	1.47 H	218	42.2	2.3
5	7323.00	43.6 PK	74.0	-30.4	1.83 H	165	35.4	8.2
6	7323.00	32.8 AV	54.0	-21.2	1.83 H	165	24.6	8.2
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	*2441.00	93.9 PK			2.88 V	343	96.0	-2.1
2	*2441.00	93.5 AV			2.88 V	343	95.6	-2.1
3	4882.00	43.5 PK	74.0	-30.5	1.64 V	153	41.2	2.3
4	4882.00	36.6 AV	54.0	-17.4	1.64 V	153	34.3	2.3
5	7323.00	43.4 PK	74.0	-30.6	2.17 V	144	35.2	8.2
6	7323.00	31.8 AV	54.0	-22.2	2.17 V	144	23.6	8.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 78	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	100.4 PK			1.14 H	192	102.6	-2.2
2	*2480.00	100.2 AV			1.14 H	192	102.4	-2.2
3	2483.50	50.6 PK	74.0	-23.4	1.14 H	192	52.8	-2.2
4	2483.50	35.1 AV	54.0	-18.9	1.14 H	192	37.3	-2.2
5	4960.00	48.6 PK	74.0	-25.4	1.51 H	220	46.1	2.5
6	4960.00	44.4 AV	54.0	-9.6	1.51 H	220	41.9	2.5
7	7440.00	44.1 PK	74.0	-29.9	1.77 H	170	35.7	8.4
8	7440.00	33.1 AV	54.0	-20.9	1.77 H	170	24.7	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	*2480.00	94.3 PK			2.89 V	333	96.5	-2.2
2	*2480.00	93.8 AV			2.89 V	333	96.0	-2.2
3	2483.50	45.0 PK	74.0	-29.0	2.89 V	333	47.2	-2.2
4	2483.50	32.1 AV	54.0	-21.9	2.89 V	333	34.3	-2.2
5	4960.00	43.9 PK	74.0	-30.1	1.67 V	168	41.4	2.5
6	4960.00	37.0 AV	54.0	-17.0	1.67 V	168	34.5	2.5
7	7440.00	43.2 PK	74.0	-30.8	2.13 V	137	34.8	8.4
8	7440.00	31.5 AV	54.0	-22.5	2.13 V	137	23.1	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

BT_8DPSK

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	53.1 PK	74.0	-20.9	1.20 H	213	55.1	-2.0
2	2390.00	36.3 AV	54.0	-17.7	1.20 H	213	38.3	-2.0
3	*2402.00	101.3 PK			1.20 H	213	103.3	-2.0
4	*2402.00	97.5 AV			1.20 H	213	99.5	-2.0
5	4804.00	48.4 PK	74.0	-25.6	1.50 H	217	46.1	2.3
6	4804.00	44.3 AV	54.0	-9.7	1.50 H	217	42.0	2.3
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	48.4 PK	74.0	-25.6	2.87 V	355	50.4	-2.0
2	2390.00	33.9 AV	54.0	-20.1	2.87 V	355	35.9	-2.0
3	*2402.00	96.0 PK			2.87 V	355	98.0	-2.0
4	*2402.00	92.2 AV			2.87 V	355	94.2	-2.0
5	4804.00	43.1 PK	74.0	-30.9	1.72 V	152	40.8	2.3
6	4804.00	36.6 AV	54.0	-17.4	1.72 V	152	34.3	2.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

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	*2441.00	100.8 PK			1.09 H	201	102.9	-2.1
2	*2441.00	97.0 AV			1.09 H	201	99.1	-2.1
3	4882.00	49.8 PK	74.0	-24.2	1.53 H	207	47.5	2.3
4	4882.00	45.5 AV	54.0	-8.5	1.53 H	207	43.2	2.3
5	7323.00	45.2 PK	74.0	-28.8	1.80 H	165	37.0	8.2
6	7323.00	34.4 AV	54.0	-19.6	1.80 H	165	26.2	8.2
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	*2441.00	96.1 PK			2.79 V	345	98.2	-2.1
2	*2441.00	91.9 AV			2.79 V	345	94.0	-2.1
3	4882.00	44.3 PK	74.0	-29.7	1.68 V	160	42.0	2.3
4	4882.00	37.4 AV	54.0	-16.6	1.68 V	160	35.1	2.3
5	7323.00	43.9 PK	74.0	-30.1	2.07 V	130	35.7	8.2
6	7323.00	31.9 AV	54.0	-22.1	2.07 V	130	23.7	8.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 78	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	101.2 PK			1.18 H	204	103.4	-2.2
2	*2480.00	97.3 AV			1.18 H	204	99.5	-2.2
3	2483.50	53.3 PK	74.0	-20.7	1.18 H	204	55.5	-2.2
4	2483.50	36.2 AV	54.0	-17.8	1.18 H	204	38.4	-2.2
5	4960.00	48.6 PK	74.0	-25.4	1.48 H	210	46.1	2.5
6	4960.00	44.8 AV	54.0	-9.2	1.48 H	210	42.3	2.5
7	7440.00	44.0 PK	74.0	-30.0	1.73 H	170	35.6	8.4
8	7440.00	33.3 AV	54.0	-20.7	1.73 H	170	24.9	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	*2480.00	96.0 PK			2.94 V	347	98.2	-2.2
2	*2480.00	92.1 AV			2.94 V	347	94.3	-2.2
3	2483.50	47.8 PK	74.0	-26.2	2.94 V	347	50.0	-2.2
4	2483.50	33.5 AV	54.0	-20.5	2.94 V	347	35.7	-2.2
5	4960.00	44.1 PK	74.0	-29.9	1.61 V	154	41.6	2.5
6	4960.00	37.3 AV	54.0	-16.7	1.61 V	154	34.8	2.5
7	7440.00	43.7 PK	74.0	-30.3	2.09 V	143	35.3	8.4
8	7440.00	31.8 AV	54.0	-22.2	2.09 V	143	23.4	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Below 1GHz Data:

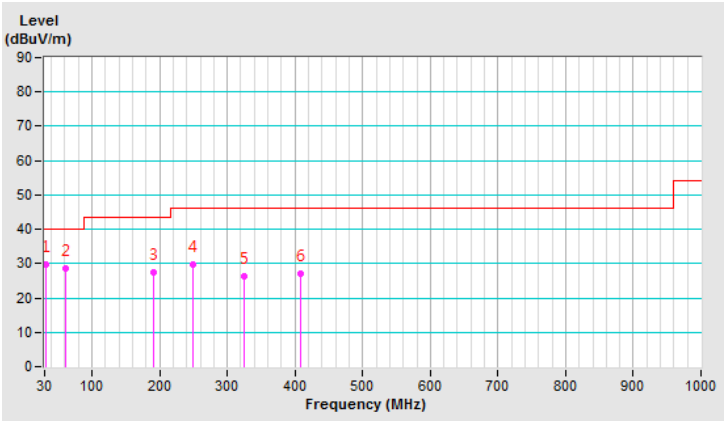
BT_8DPSK

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	32.48	29.7 QP	40.0	-10.3	1.50 H	5	39.2	-9.5
2	60.82	28.5 QP	40.0	-11.5	1.50 H	23	37.6	-9.1
3	190.68	27.6 QP	43.5	-15.9	1.00 H	300	37.4	-9.8
4	249.13	29.8 QP	46.0	-16.2	1.00 H	66	38.2	-8.4
5	325.10	26.4 QP	46.0	-19.6	1.00 H	186	32.0	-5.6
6	408.43	27.2 QP	46.0	-18.8	1.00 H	156	31.2	-4.0

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

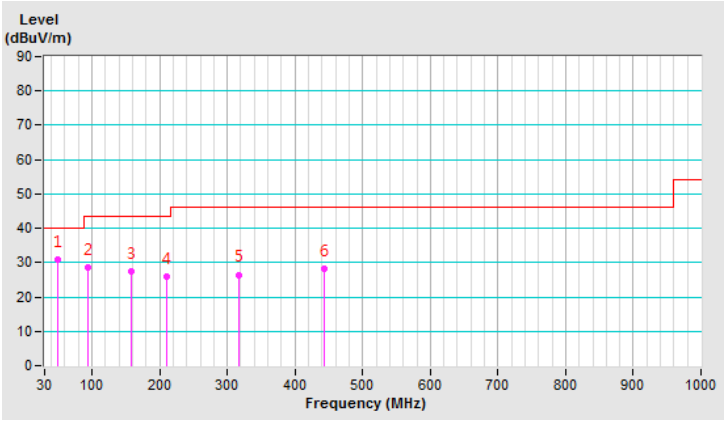


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	50.20	30.8 QP	40.0	-9.2	1.50 V	234	39.3	-8.5
2	94.14	28.5 QP	43.5	-15.0	1.00 V	300	41.4	-12.9
3	157.30	27.4 QP	43.5	-16.1	1.00 V	20	35.2	-7.8
4	210.27	25.9 QP	43.5	-17.6	2.00 V	189	35.9	-10.0
5	317.55	26.5 QP	46.0	-19.5	1.50 V	50	32.3	-5.8
6	443.46	28.1 QP	46.0	-17.9	2.00 V	0	31.1	-3.0

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.1.8 Test Results (Dipole antenna)

Above 1GHz Data:

BT_GFSK

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	46.3 PK	74.0	-27.7	1.39 H	230	48.3	-2.0
2	2390.00	33.2 AV	54.0	-20.8	1.39 H	230	35.2	-2.0
3	*2402.00	95.4 PK			1.39 H	230	97.4	-2.0
4	*2402.00	95.1 AV			1.39 H	230	97.1	-2.0
5	4804.00	44.6 PK	74.0	-29.4	1.07 H	318	42.3	2.3
6	4804.00	38.0 AV	54.0	-16.0	1.07 H	318	35.7	2.3
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	51.5 PK	74.0	-22.5	1.26 V	123	53.5	-2.0
2	2390.00	36.0 AV	54.0	-18.0	1.26 V	123	38.0	-2.0
3	*2402.00	101.9 PK			1.26 V	123	103.9	-2.0
4	*2402.00	101.7 AV			1.26 V	123	103.7	-2.0
5	4804.00	49.2 PK	74.0	-24.8	2.77 V	163	46.9	2.3
6	4804.00	45.2 AV	54.0	-8.8	2.77 V	163	42.9	2.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	*2441.00	95.1 PK			1.35 H	201	97.2	-2.1
2	*2441.00	94.7 AV			1.35 H	201	96.8	-2.1
3	4882.00	44.7 PK	74.0	-29.3	1.00 H	334	42.4	2.3
4	4882.00	37.8 AV	54.0	-16.2	1.00 H	334	35.5	2.3
5	7323.00	44.6 PK	74.0	-29.4	3.08 H	202	36.4	8.2
6	7323.00	33.0 AV	54.0	-21.0	3.08 H	202	24.8	8.2
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	*2441.00	101.8 PK			1.24 V	123	103.9	-2.1
2	*2441.00	101.5 AV			1.24 V	123	103.6	-2.1
3	4882.00	49.8 PK	74.0	-24.2	2.76 V	166	47.5	2.3
4	4882.00	45.7 AV	54.0	-8.3	2.76 V	166	43.4	2.3
5	7323.00	44.8 PK	74.0	-29.2	2.92 V	146	36.6	8.2
6	7323.00	34.0 AV	54.0	-20.0	2.92 V	146	25.8	8.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 78	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	95.5 PK			1.38 H	215	97.7	-2.2
2	*2480.00	95.0 AV			1.38 H	215	97.2	-2.2
3	2483.50	46.1 PK	74.0	-27.9	1.38 H	215	48.3	-2.2
4	2483.50	33.3 AV	54.0	-20.7	1.38 H	215	35.5	-2.2
5	4960.00	45.1 PK	74.0	-28.9	1.02 H	322	42.6	2.5
6	4960.00	38.2 AV	54.0	-15.8	1.02 H	322	35.7	2.5
7	7440.00	44.4 PK	74.0	-29.6	3.03 H	213	36.0	8.4
8	7440.00	32.7 AV	54.0	-21.3	3.03 H	213	24.3	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	*2480.00	101.6 PK			1.21 V	109	103.8	-2.2
2	*2480.00	101.4 AV			1.21 V	109	103.6	-2.2
3	2483.50	51.8 PK	74.0	-22.2	1.21 V	109	54.0	-2.2
4	2483.50	36.3 AV	54.0	-17.7	1.21 V	109	38.5	-2.2
5	4960.00	49.8 PK	74.0	-24.2	2.79 V	160	47.3	2.5
6	4960.00	45.6 AV	54.0	-8.4	2.79 V	160	43.1	2.5
7	7440.00	45.3 PK	74.0	-28.7	2.86 V	152	36.9	8.4
8	7440.00	34.3 AV	54.0	-19.7	2.86 V	152	25.9	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

BT_8DPSK

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	49.6 PK	74.0	-24.4	1.32 H	198	51.6	-2.0
2	2390.00	35.1 AV	54.0	-18.9	1.32 H	198	37.1	-2.0
3	*2402.00	97.2 PK			1.32 H	198	99.2	-2.0
4	*2402.00	93.4 AV			1.32 H	198	95.4	-2.0
5	4804.00	44.3 PK	74.0	-29.7	1.08 H	327	42.0	2.3
6	4804.00	37.8 AV	54.0	-16.2	1.08 H	327	35.5	2.3
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	54.3 PK	74.0	-19.7	1.21 V	98	56.3	-2.0
2	2390.00	37.5 AV	54.0	-16.5	1.21 V	98	39.5	-2.0
3	*2402.00	102.5 PK			1.21 V	98	104.5	-2.0
4	*2402.00	98.7 AV			1.21 V	98	100.7	-2.0
5	4804.00	49.6 PK	74.0	-24.4	2.81 V	162	47.3	2.3
6	4804.00	45.5 AV	54.0	-8.5	2.81 V	162	43.2	2.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

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	*2441.00	97.3 PK			1.33 H	223	99.4	-2.1
2	*2441.00	93.1 AV			1.33 H	223	95.2	-2.1
3	4882.00	45.5 PK	74.0	-28.5	1.07 H	329	43.2	2.3
4	4882.00	38.6 AV	54.0	-15.4	1.07 H	329	36.3	2.3
5	7323.00	45.1 PK	74.0	-28.9	2.99 H	212	36.9	8.2
6	7323.00	33.1 AV	54.0	-20.9	2.99 H	212	24.9	8.2
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	*2441.00	102.0 PK			1.24 V	94	104.1	-2.1
2	*2441.00	98.2 AV			1.24 V	94	100.3	-2.1
3	4882.00	49.8 PK	74.0	-24.2	2.73 V	152	47.5	2.3
4	4882.00	45.5 AV	54.0	-8.5	2.73 V	152	43.2	2.3
5	7323.00	45.2 PK	74.0	-28.8	2.95 V	136	37.0	8.2
6	7323.00	34.4 AV	54.0	-19.6	2.95 V	136	26.2	8.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 78	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	97.2 PK			1.29 H	212	99.4	-2.2
2	*2480.00	93.3 AV			1.29 H	212	95.5	-2.2
3	2483.50	49.0 PK	74.0	-25.0	1.29 H	212	51.2	-2.2
4	2483.50	34.7 AV	54.0	-19.3	1.29 H	212	36.9	-2.2
5	4960.00	45.3 PK	74.0	-28.7	1.00 H	319	42.8	2.5
6	4960.00	38.5 AV	54.0	-15.5	1.00 H	319	36.0	2.5
7	7440.00	44.9 PK	74.0	-29.1	3.05 H	209	36.5	8.4
8	7440.00	33.0 AV	54.0	-21.0	3.05 H	209	24.6	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	*2480.00	102.4 PK			1.19 V	102	104.6	-2.2
2	*2480.00	98.5 AV			1.19 V	102	100.7	-2.2
3	2483.50	54.5 PK	74.0	-19.5	1.19 V	102	56.7	-2.2
4	2483.50	37.4 AV	54.0	-16.6	1.19 V	102	39.6	-2.2
5	4960.00	49.8 PK	74.0	-24.2	2.74 V	157	47.3	2.5
6	**4960.00**	**46.0 AV**	**54.0**	**-8.0**	**2.74 V**	**157**	**43.5**	**2.5**
7	7440.00	45.2 PK	74.0	-28.8	2.88 V	136	36.8	8.4
8	7440.00	34.5 AV	54.0	-19.5	2.88 V	136	26.1	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Below 1GHz Data:

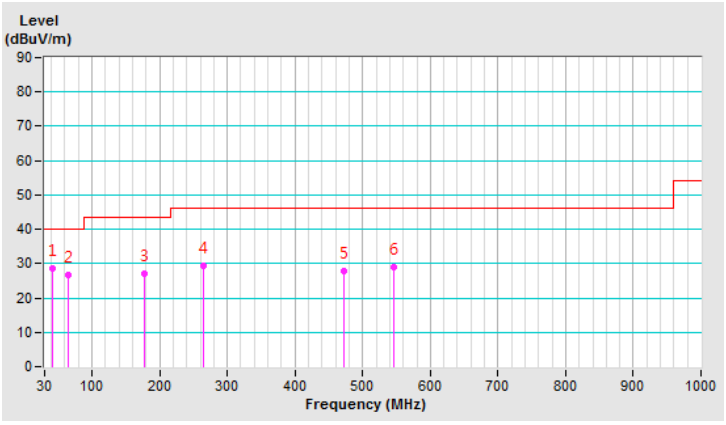
BT_8DPSK

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	41.49	28.5 QP	40.0	-11.5	1.50 H	43	37.5	-9.0
2	65.39	26.5 QP	40.0	-13.5	1.50 H	10	36.1	-9.6
3	176.61	27.0 QP	43.5	-16.5	1.50 H	143	36.0	-9.0
4	265.44	29.5 QP	46.0	-16.5	1.50 H	215	37.2	-7.7
5	472.83	27.9 QP	46.0	-18.1	1.50 H	154	30.2	-2.3
6	546.21	29.0 QP	46.0	-17.0	1.00 H	37	29.8	-0.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

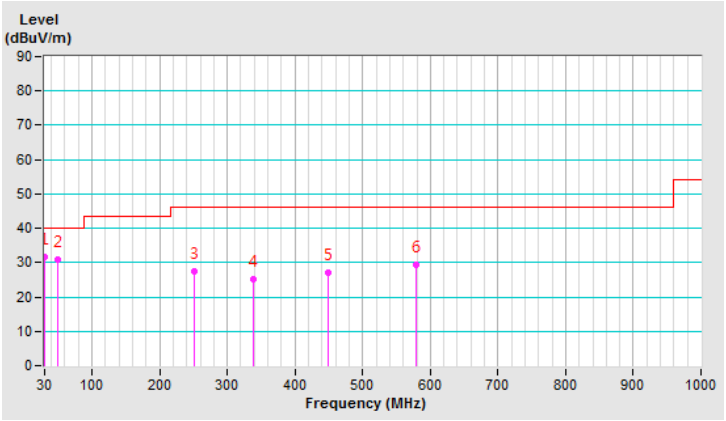


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.15	31.6 QP	40.0	-8.4	1.50 V	335	40.9	-9.3
2	50.29	30.9 QP	40.0	-9.1	2.00 V	243	39.4	-8.5
3	251.69	27.4 QP	46.0	-18.6	1.00 V	182	35.7	-8.3
4	338.01	25.1 QP	46.0	-20.9	1.50 V	0	30.6	-5.5
5	449.06	27.1 QP	46.0	-18.9	1.50 V	62	30.1	-3.0
6	579.59	29.5 QP	46.0	-16.5	2.00 V	118	29.2	0.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

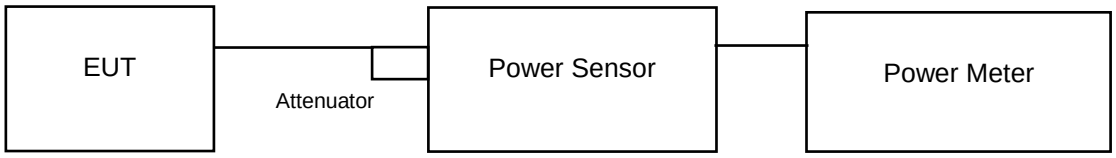


4.2 Maximum Output Power

4.2.1 Limits of Maximum Output Power Measurement

The Maximum Output Power Measurement is 125mW.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

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. Record the power level.

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.2.7 Test Results

FOR PEAK POWER

Channel	Frequency (MHZ)	GFSK		8DPSK		Power Limit (mW)	Pass / Fail
		Output Power (mW)	Output Power (dBm)	Output Power (mW)	Output Power (dBm)		
0	2402	2.685	4.29	4.529	6.56	125	Pass
39	2441	2.624	4.19	3.741	5.73	125	Pass
78	2480	2.46	3.91	3.811	5.81	125	Pass

FOR AVERAGE POWER

Channel	Frequency (MHZ)	GFSK		8DPSK	
		Average Power (mW)	Average Power (dBm)	Average Power (mW)	Average Power (dBm)
0	2402	2.415	3.83	2.606	4.16
39	2441	2.421	3.84	2.466	3.92
78	2480	2.323	3.66	2.307	3.63

5 Pictures of Test Arrangements

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

Appendix – Information of 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 FCC recognized accredited test firms and accredited 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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