

FCC Test Report

Report No.: RFBDKG-WTW-P21110454

FCC ID: JNZA00161

Test Model: A00161

Received Date: Nov. 14, 2021

Test Date: Nov. 25, 2021 ~ Dec. 08, 2021

Issued Date: Jan. 24, 2022

Applicant: LOGITECH FAR EAST LTD.

Address: 7700 Gateway Boulevard Newark California United States

- **Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
- Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
- Test Location (1): No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
- Test Location (2): No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan
- FCC Registration / 788550 / TW0003

Designation Number: 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFBDKG-WTW-P21110454	Original Release	Jan. 24, 2022



1 Certificate of Conformity

Product:	speaker+Docking station
Brand:	Logitech
Test Model:	A00161
Sample Status:	Engineering Sample
Applicant:	LOGITECH FAR EAST LTD.
Test Date:	Nov. 25, 2021 ~ Dec. 08, 2021
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 RF characteristics under the conditions specified in this report.

Prepared by :

Vera Huang

Vera Huang / Specialist

Date: Jan. 24, 2022

Approved by :

Jeremy Lin

Date: Jan. 24, 2022

Jeremy Lin / Project Engineer



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 -22.91 dB at 0.55998 MHz.		
15.247(a)(1) (iii)	Number of Hopping Frequency Used	Pass	Meet the requirement of limit.		
15.247(a)(1) (iii)			Meet the requirement of limit.		
15.247(a)(1)			Meet the requirement of limit.		
15.247(a)(1)	Maximum Peak Output Power	Pass	Meet the requirement of limit.		
	Occupied Bandwidth Measurement	Pass	Reference only		
15.205 & 209			Meet the requirement of limit. Minimum passing margin is -6.22 dB at 2483.50 MHz.		
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit.		
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.		
15.203	Antenna Requirement	Pass	No antenna connector is used.		

Note:

- If the Frequency Hopping System operating in 2400-2483.5 MHz band and the output power less than 125 mW. The hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of hopping channel whichever is greater.
- 2. For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- 3. 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) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
	9kHz ~ 30MHz	3.00 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.



3 General Information

3.1 General Description of EUT

Product	speaker+Docking station
Brand	Logitech
Test Model	A00161
Status of EUT	Engineering Sample
Power Supply Rating	19.5 Vdc (adapter)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK
Transfer Rate	1/2/3 Mbps
Operating Frequency	2402 ~ 2480 MHz
Number of Channel	79
Output Power	11.912 mW
Antenna Type	Monopole antenna with 4.79 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	FSP GROUP INC.	FSP230-AJAN3	I/P: 100-240 Vac, 50-60 Hz, 3 A O/P: 19.5 Vdc, 11.79 A DC Cable: 1.4 m shielded cable with 1 core
Type C to type C Cable	Logitech	502-001433	0.9 m non-shielded cable w/o core
Power Cable	Luxshare	A12-0127-AC2+ A12-0120-AC2	1.5 m shielded cable w/o core

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3. 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.

4. The EUT may have a lot of colors for marketing requirement.

5. Spurious emission of the simultaneous operation BT and BT LE has been evaluated and no non-compliance was found.



3.2 Description of Test Modes

79 channels are provided to this EUT:

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

UT Configure		Appli	Applicable To		Description			
Mode	RE≥1G RE<1G		B PLC APCM		Description			
-		\checkmark	\checkmark	\checkmark		-		
here RE	E≥1G: Radiated	Emission abo	ove 1 GHz	RE<1G: Ra	adiated Emi	ission below 1 GHz		
PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement								
te:								
The EUT had I	been pre-tested	on the position	oned of each 3 a	xis. The worst	case was fo	ound when positioned on	X-plane.	
or radiated er	mission (below 1	IGHz) and po	ower line conduct	ed emission te	st items ch	osen the worst maximum	n power.	
diated Em	ission Test	(Above 1	GHz):					
Radiated Emission Test (Above 1 GHz):								
						from all possible co		
between	available mo	dulations,	data rates an	d antenna p	orts (if El	UT with antenna div		
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between Following T Configure Mode	available mc g channel(s) Available Cha 0 to 78	annel To	data rates an) selected for ested Channel 0, 39, 78 0, 39, 78	d antenna p the final tes Modul Techn FHS	orts (if El at as listed ation ology	UT with antenna div d below. Modulation Type GFSK	ersity architecture Packet Type DH5	
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between Following T Configure Mode - diated Em	available mo g channel(s) Available Cha 0 to 78 0 to 78 hission Test of n has been co	(Below 1 (data rates an) selected for ested Channel 0, 39, 78 0, 39, 78 GHz): o determine t	d antenna p the final tes Modul Techn FHS FHS	orts (if El ation ology S S se mode	UT with antenna div d below. Modulation Type GFSK 8DPSK from all possible co	ersity architecture Packet Type DH5 3DH5	
between Followin JT Configure Mode - adiated Em Pre-Scar between	available mo g channel(s) Available Cha 0 to 78 0 to 78 hission Test available mo	(Below 1 (onducted t odulations,	data rates an) selected for ested Channel 0, 39, 78 0, 39, 78 GHz): o determine t	d antenna p the final tes Modul Techn FHS FHS	orts (if El ation ology S S se mode orts (if El	UT with antenna div d below. Modulation Type GFSK 8DPSK from all possible co UT with antenna div	ersity architecture Packet Type DH5 3DH5	

Power Line Conducted Emission Test:

0 to 78

-

 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(c) was (wore) selected for the final test as listed below.

FHSS

GFSK

DH5

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

0

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
-	0 to 78	0	FHSS	GFSK	DH5



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.

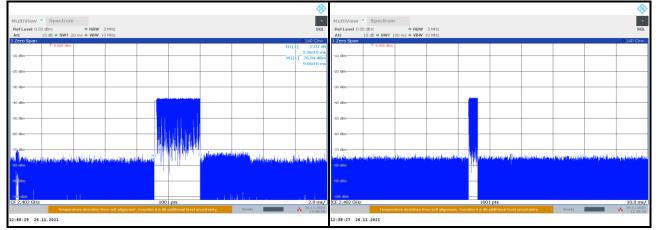
EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 66 % RH	120 Vac, 60 Hz	Randy Wu
RE<1G	23 deg. C, 68 % RH	120 Vac, 60 Hz	Wade Huang
PLC	25 deg. C, 75 % RH	120 Vac, 60 Hz	Edison Lee
APCM	25 deg. C, 60 % RH	120 Vac, 60 Hz	Gary Lin

3.3 Duty Cycle of Test Signal

Duty cycle = 2.960/100 = 0.0296, duty cycle correction factor = 20 * log(0.0296) = -30.57





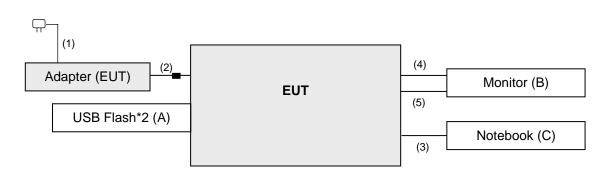
3.4 Description of Support Units

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
		HP	v250W	05	N/A	Provided by Lab
^	USB Flash*2	SanDisk	SDDDC3-032G	N/A	N/A	For Radiation emission test
A	USB Flash"2	0 Dist	SDDDC3-032G	N/A	N1/A	Provided by Lab
		SanDisk			N/A	For conducted emission test
D	Manitan		10440	CN-0J257M-72872-	FCC DOC	Drevided by Leb
В	Monitor	hitor DELL U2410		0A6-08JL	Approved	Provided by Lab
С	Notebook	DELL	P60F	1C0YHR2	N/A	Provided by Lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power Cable	1	1.5	Y	0	Accessory of the EUT
2.	DC Cable	1	1.4	Y	1	Accessory of the EUT
3.	Type C to type C Cable	1	0.9	Ν	0	Accessory of the EUT
4.	DP Cable	1	1.8	Ν	0	Provided by Lab
5.	HDMI Cable	1	2	N	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart C (15.247)

ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.



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 20 dB 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:

- a. The lower limit shall apply at the transition frequencies.
- b. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- c. For frequencies above 1000 MHz, 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 20 dB under any condition of modulation.



4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Rohde & Schwarz	N9038A	MY55420137	Apr. 09, 2021	Apr. 08, 2022
Spectrum Analyzer KEYSIGHT	N9020B	MY60110440	Dec. 18, 2020	Dec. 17, 2021
BILOG Antenna SCHWARZBECK	VULB9168	1213	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1049	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna EMCI	EM-6879	269	Sep. 16, 2021	Sep. 15, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC330N	980782	Jan. 12, 2021	Jan. 11, 2022
Preamplifier EMCI	EMC118A45SE	980808	Jan. 12, 2021	Jan. 11, 2022
Preamplifier EMCI	EMC184045SE	980788	Jan. 12, 2021	Jan. 11, 2022
RF signal cable EMCI	EMC104-SM-SM-(9 000+2000+1000)	201243+ 201231+ 210102	Jan. 12, 2021	Jan. 11, 2022
RF signal cable EMCI	EMCCFD400-NM-N M-(9000+300+500)	201236+ 201235+ 201233	Jan. 12, 2021	Jan. 11, 2022
RF signal cable EMCI	EMC101G-KM-KM- (5000+3000+2000)	201260+201257+201254	Jan. 12, 2021	Jan. 11, 2022
Software BV ADT	ADT_Radiated_V7. 6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/ MY55190007/MY55210005	Jul. 12, 2021	Jul. 11, 2022

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 WM Chamber 8.



4.1.3 Test Procedures

For Radiated Emission below 30 MHz

- 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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) / RMS detection (AVG) at frequency above 1 GHz.
- For Fundamental frequency and bandedge & harmonic: The average value of fundamental frequency is :average = peak value + 20log(Duty cycle) where the duty

factor is calculated from following formula:

20Log(Duty cycle) = 20 log (2.960ms/100) = -30.57dB ,please refer to the plotted duty (see section 3.3) 4. All modes of operation were investigated and the worst-case emissions are reported.

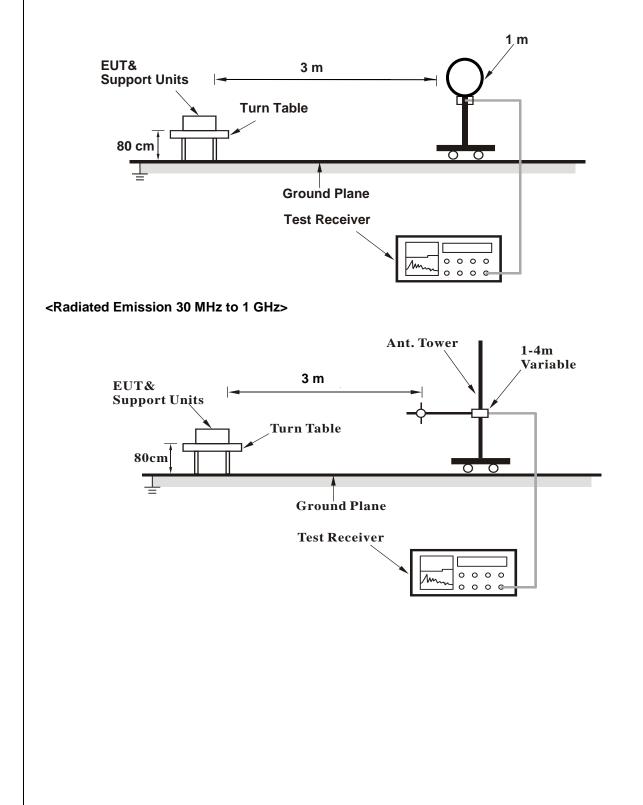


4.1.4 Deviation from Test Standard

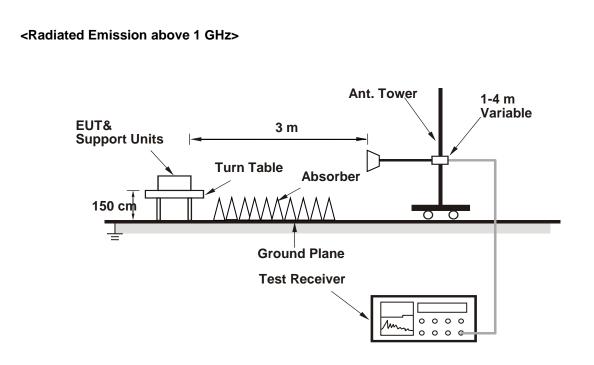
No deviation.

4.1.5 Test Set Up

<Radiated Emission below 30 MHz>







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

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.



4.1.7 Test Results

Above 1 GHz Data:

RF Mode	TX BT_GFSK	Channel	CH 0:2402 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

		Ante	enna Polarity	& Test Dist	ance : Horizo	ontal at 3 m		
No	Frequency (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	55.93 PK	74.00	-18.07	3.05 H	178	24.13	31.80
2	2390.00	45.39 AV	54.00	-8.61	3.05 H	178	13.59	31.80
3	*2402.00	110.43 PK			3.05 H	178	78.66	31.77
4	*2402.00	79.86 AV			3.05 H	178	48.09	31.77
5	4804.00	54.16 PK	74.00	-19.84	2.16 H	167	51.78	2.38
6	4804.00	23.59 AV	54.00	-30.41	2.16 H	167	21.21	2.38
		An	tenna Polari	ty & Test Dis	stance : Vert	ical at 3 m		
No	Frequency (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	55.25 PK	74.00	-18.75	3.09 V	158	23.45	31.80
2	2390.00	45.43 AV	54.00	-8.57	3.09 V	158	13.63	31.80
3	*2402.00	108.48 PK			3.09 V	150	76.71	31.77
4	*2402.00	77.91 AV			3.09 V	150	46.14	31.77
5	4804.00	54.24 PK	74.00	-19.76	2.07 V	86	51.86	2.38
6	4804.00	23.67 AV	54.00	-30.33	2.07 V	86	21.29	2.38

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.



RF Mode	TX BT_GFSK	Channel	CH 39:2441 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

		Ante	enna Polaritv	v & Test Dist	ance : Horizo	ontal at 3 m		
No	Frequency (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	108.74 PK			3.32 H	175	77.03	31.71
2	*2441.00	78.17 AV			3.32 H	175	46.46	31.71
3	4882.00	52.25 PK	74.00	-21.75	1.17 H	287	49.73	2.52
4	4882.00	21.68 AV	54.00	-32.32	1.17 H	287	19.16	2.52
	Antenna Polarity & Test Distance : Vertical at 3 m							
No	Frequency (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	108.30 PK			3.31 V	152	76.59	31.71
2	*2441.00	78.73 AV			3.31 V	152	47.02	31.71
3	4882.00	52.74 PK	74.00	-21.26	1.23 V	350	50.22	2.52
4	4882.00	22.17 AV	54.00	-31.83	1.23 V	350	19.65	2.52

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.



RF Mode	TX BT_GFSK	Channel	CH 78:2480 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Correction Factor (dB/m) 31.74 31.74 -4.50 -4.50
31.74 -4.50
-4.50
-4 50
- -
2.67
2.67
Correction Factor (dB/m)
31.74
31.74
-4.50
-4.50
2.67
2.67

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.



RF Mode	TX BT_8DPSK	Channel	CH 0 : 2402 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m									
Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
2390.00	61.45 PK	74.00	-12.55	3.06 H	178	29.65	31.80		
2390.00	45.44 AV	54.00	-8.56	3.06 H	178	13.64	31.80		
*2402.00	109.61 PK			3.06 H	178	77.84	31.77		
*2402.00	78.54 AV			3.06 H	178	46.77	31.77		
4804.00	52.02 PK	74.00	-21.98	2.17 H	164	49.64	2.38		
4804.00	21.45 AV	54.00	-32.55	2.17 H	164	19.07	2.38		
	An	tenna Polari	ty & Test Dis	stance : Vert	ical at 3 m				
Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
2390.00	61.46 PK	74.00	-12.54	3.07 V	154	29.66	31.80		
2390.00	45.46 AV	54.00	-8.54	3.07 V	154	13.66	31.80		
*2402.00	109.56 PK			3.07 V	154	77.79	31.77		
*2402.00	78.99 AV			3.07 V	154	47.22	31.77		
4804.00	52.19 PK	74.00	-21.81	2.22 V	85	49.81	2.38		
4804.00	21.62 AV	54.00	-32.38	2.22 V	85	19.24	2.38		
	(MHz) 2390.00 2390.00 *2402.00 4804.00 4804.00 Frequency (MHz) 2390.00 2390.00 2390.00 *2402.00 *2402.00	Frequency (MHz) Emission Level (dBuV/m) 2390.00 61.45 PK 2390.00 45.44 AV *2402.00 109.61 PK *2402.00 78.54 AV *2402.00 78.54 AV 4804.00 52.02 PK 4804.00 21.45 AV Frequency (MHz) Emission Level (dBuV/m) 2390.00 61.46 PK 2390.00 61.46 PK 2390.00 45.46 AV *2402.00 78.99 AV *2402.00 78.99 AV	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) 2390.00 61.45 PK 74.00 2390.00 45.44 AV 54.00 *2402.00 109.61 PK * *2402.00 78.54 AV 54.00 *2402.00 78.54 AV 54.00 4804.00 52.02 PK 74.00 4804.00 21.45 AV 54.00 Antenna Polarii Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) 2390.00 61.46 PK 74.00 2390.00 61.46 PK 74.00 2390.00 45.46 AV 54.00 *2402.00 109.56 PK * *2402.00 78.99 AV 4804.00	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) 2390.00 61.45 PK 74.00 -12.55 2390.00 45.44 AV 54.00 -8.56 *2402.00 109.61 PK - - *2402.00 78.54 AV - - 4804.00 52.02 PK 74.00 -21.98 4804.00 21.45 AV 54.00 -32.55 Antenna Polarity & Test Dis Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) 2390.00 61.46 PK 74.00 -12.54 2390.00 61.46 PK 74.00 -12.54 2390.00 61.46 PK 74.00 -8.54 *2402.00 109.56 PK - - *2402.00 78.99 AV - - 4804.00 52.19 PK 74.00 -21.81	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (m) 2390.00 61.45 PK 74.00 -12.55 3.06 H 2390.00 61.45 PK 74.00 -12.55 3.06 H 2390.00 45.44 AV 54.00 -8.56 3.06 H *2402.00 109.61 PK 3.06 H 3.06 H *2402.00 78.54 AV -21.98 2.17 H 4804.00 52.02 PK 74.00 -21.98 2.17 H 4804.00 21.45 AV 54.00 -32.55 2.17 H Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (m) 2390.00 61.46 PK 74.00 -12.54 3.07 V 2390.00 61.46 PK 74.00 -12.54 3.07 V 2390.00 45.46 AV 54.00 -8.54 3.07 V 2390.00 45.46 AV 54.00 -8.54 3.07 V *2402.00 109.56 PK 3.07 V 3.07 V *2402.00	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (dB) Table Angle (m) 2390.00 61.45 PK 74.00 -12.55 3.06 H 178 2390.00 45.44 AV 54.00 -8.56 3.06 H 178 *2402.00 109.61 PK - 3.06 H 178 *2402.00 78.54 AV - 3.06 H 178 *2402.00 78.54 AV -21.98 2.17 H 164 4804.00 21.45 AV 54.00 -32.55 2.17 H 164 Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (dB) Table Angle (m) 2390.00 61.46 PK 74.00 -12.54 3.07 V 154 2390.00 61.46 PK 74.00 -12.54 3.07 V 154 2390.00 61.46 PK 74.00 -8.54 3.07 V 154 2390.00 61.46 PK 74.00 -8.54 3.07 V 154 2402.00 109.56 P	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (dB) Table Angle (m) Raw Value (Degree) 2390.00 61.45 PK 74.00 -12.55 3.06 H 178 29.65 2390.00 45.44 AV 54.00 -8.56 3.06 H 178 13.64 *2402.00 109.61 PK - 3.06 H 178 77.84 *2402.00 78.54 AV - 3.06 H 178 46.77 4804.00 52.02 PK 74.00 -21.98 2.17 H 164 49.64 4804.00 21.45 AV 54.00 -32.55 2.17 H 164 19.07 Antenna Polarity & Test Distance : Vertical at 3 m Frequency (MHz) Emission Level (dBuV/m) Margin (dB) Antenna Height (dB) Angle (Degree) Value (dBuV) 2390.00 61.46 PK 74.00 -12.54 3.07 V 154 29.66 2390.00 61.46 PK 74.00 -8.54 3.07 V 154 13.66 *2402.		

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.



RF Mode	TX BT_8DPSK	Channel	CH 39:2441 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

	Antenna Polarity & Test Distance : Horizontal at 3 m									
No	Frequency (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	107.89 PK			2.92 H	175	76.18	31.71		
2	*2441.00	77.32 AV			2.92 H	175	45.61	31.71		
3	4882.00	50.68 PK	74.00	-23.32	1.35 H	286	48.16	2.52		
4	4882.00	20.11 AV	54.00	-33.89	1.35 H	286	17.59	2.52		
		An	tenna Polari	ty & Test Dis	stance : Vert	ical at 3 m				
No	Frequency (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	106.61 PK			3.29 V	149	74.90	31.71		
2	*2441.00	76.04 AV			3.29 V	149	44.33	31.71		
3	4882.00	51.61 PK	74.00	-22.39	1.87 V	55	49.09	2.52		
4	4882.00	21.04 AV	54.00	-32.96	1.87 V	55	18.52	2.52		

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.



RF Mode	TX BT_8DPSK	Channel	CH 78:2480 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m									
Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
*2480.00	106.93 PK			2.87 H	173	75.19	31.74		
*2480.00	76.36 AV			2.87 H	173	44.62	31.74		
2483.50	67.78 PK	74.00	-6.22	2.87 H	173	72.28	-4.50		
2483.50	37.21 AV	54.00	-16.79	2.87 H	173	41.71	-4.50		
4960.00	50.81 PK	74.00	-23.19	1.20 H	294	48.14	2.67		
4960.00	20.24 AV	54.00	-33.76	1.20 H	294	17.57	2.67		
	An	tenna Polari	ty & Test Dis	stance : Vert	ical at 3 m				
Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
*2480.00	106.22 PK			3.14 V	154	74.48	31.74		
*2480.00	75.65 AV			3.14 V	154	43.91	31.74		
2483.50	66.05 PK	74.00	-7.95	3.14 V	154	70.55	-4.50		
2483.50	35.48 AV	54.00	-18.52	3.14 V	154	39.98	-4.50		
4960.00	49.70 PK	74.00	-24.30	1.28 V	303	47.03	2.67		
4960.00	19.13 AV	54.00	-34.87	1.28 V	303	16.46	2.67		
	(MHz) *2480.00 2483.50 2483.50 4960.00 4960.00 Frequency (MHz) *2480.00 *2483.50 2483.50 4960.00	Frequency (MHz) Emission (dBuV/m) *2480.00 106.93 PK *2480.00 76.36 AV *2483.50 67.78 PK 2483.50 37.21 AV 4960.00 50.81 PK 4960.00 20.24 AV 4960.00 20.24 AV 4960.00 20.24 AV 4960.00 20.24 AV *2480.00 106.22 PK *2480.00 106.22 PK *2480.00 75.65 AV 2483.50 66.05 PK 2483.50 35.48 AV 4960.00 49.70 PK	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) *2480.00 106.93 PK	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) *2480.00 106.93 PK *2480.00 76.36 AV *2480.00 76.36 AV *2483.50 67.78 PK 74.00 -6.22 2483.50 37.21 AV 54.00 -16.79 4960.00 50.81 PK 74.00 -23.19 4960.00 20.24 AV 54.00 -33.76 Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) *2480.00 106.22 PK Margin (dB) *2480.00 75.65 AV *2483.50 66.05 PK 74.00 -7.95 2483.50 35.48 AV 54.00 -18.52 4960.00 49.70 PK 74.00 -24.30	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (dB) *2480.00 106.93 PK 2.87 H *2480.00 76.36 AV 2.87 H *2480.00 76.36 AV 2.87 H 2483.50 67.78 PK 74.00 -6.22 2.87 H 2483.50 37.21 AV 54.00 -16.79 2.87 H 4960.00 50.81 PK 74.00 -23.19 1.20 H 4960.00 20.24 AV 54.00 -33.76 1.20 H 4960.00 20.24 AV 54.00 -33.76 1.20 H Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (m) *2480.00 106.22 PK 3.14 V 3.14 V *2480.00 75.65 AV 3.14 V 3.14 V *2483.50 66.05 PK 74.00 -7.95 3.14 V 2483.50 35.48 AV 54.00 -18.52 3.14 V 2483.50 49.70 PK 74.00 -24.30 1.28 V	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (dB) Table Angle (m) *2480.00 106.93 PK 2.87 H 173 *2480.00 76.36 AV 2.87 H 173 *2480.00 76.36 AV 2.87 H 173 2483.50 67.78 PK 74.00 -6.22 2.87 H 173 2483.50 37.21 AV 54.00 -16.79 2.87 H 173 4960.00 50.81 PK 74.00 -23.19 1.20 H 294 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 fmggin (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna Height (dB) Table *2480.00 106.22 PK Imit (dBuV/m) Margin (dB) Antenna (MB) Table *2480.00 75.65 AV Imit (dB) Imit	Frequency (MHz) Emission Level (dBuV/m) Limit (dBuV/m) Margin (dB) Antenna (dB) Table Angle (m) Raw (Degree) *2480.00 106.93 PK - 2.87 H 173 75.19 *2480.00 76.36 AV - 2.87 H 173 44.62 2483.50 67.78 PK 74.00 -6.22 2.87 H 173 41.71 4960.00 50.81 PK 74.00 -23.19 1.20 H 294 48.14 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 48.14 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 48.14 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 48.14 4960.00 20.24 AV 54.00 -33.76 1.20 H 294 48.14 4960.00 106.22 PK Limit (dBuV/m) Margin (dB) Antenna Height (dB) Table (m) Raw Value (Degree) Value (dBuV) *2480.00 106.22 PK F4.00 -7.95		

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.



Below 1 GHz Worst-Case Data:

RF Mode	TX BT_GFSK	Channel	CH 0:2402 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

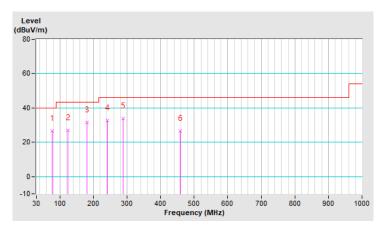
	Antenna Polarity & Test Distance : Horizontal at 3 m									
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
1	77.53	26.70 QP	40.00	-13.30	1.99 H	203	49.35	-22.65		
2	124.09	27.00 QP	43.50	-16.50	1.51 H	119	47.17	-20.17		
3	181.32	31.68 QP	43.50	-11.82	1.51 H	257	51.71	-20.03		
4	240.49	32.74 QP	46.00	-13.26	1.01 H	18	52.75	-20.01		
5	288.02	33.69 QP	46.00	-12.31	1.01 H	148	52.03	-18.34		
6	457.77	26.61 QP	46.00	-19.39	1.99 H	114	40.53	-13.92		

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.



RF Mode	TX BT_GFSK	Channel	CH 0 : 2402 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

	Antenna Polarity & Test Distance : Vertical at 3 m										
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)			
1	84.32	31.37 QP	40.00	-8.63	1.99 V	212	55.40	-24.03			
2	125.06	23.44 QP	43.50	-20.06	1.00 V	154	43.46	-20.02			
3	181.32	22.47 QP	43.50	-21.03	1.99 V	210	42.50	-20.03			
4	229.82	23.14 QP	46.00	-22.86	1.00 V	299	44.12	-20.98			
5	288.02	25.40 QP	46.00	-20.60	1.49 V	18	43.74	-18.34			
6	384.05	28.76 QP	46.00	-17.24	1.49 V	154	44.62	-15.86			

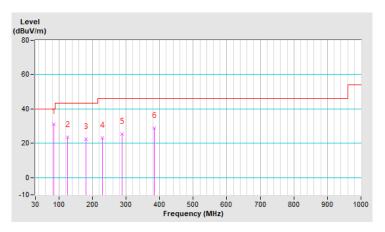
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)

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 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

	Conducted Limit (dBuV)				
Frequency (MHz)	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 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 04, 2020	Dec. 03, 2021
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 16, 2021	Jan. 15, 2022
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 25, 2021	Feb. 24, 2022
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Sep. 07, 2021	Sep. 06, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

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 HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-12040.

4. Test Date: 2021/11/25



4.2.3 Test Procedures

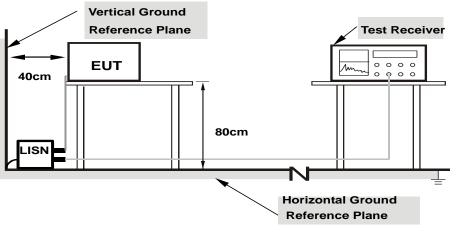
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Condition

Set the EUT under transmission condition continuously at specific channel frequency.



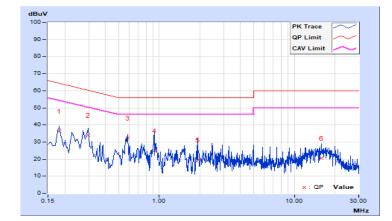
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz		Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested by	Edison Lee		

	Phase Of Power : Line (L)									
	Frequency	Correction	Reading Value		Emission Level		Limit		Margin	
No		Factor	(dB	uV)	(dB	uV)	(dB	uV)	(d	B)
	(MHz)	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18200	9.71	26.78	11.75	36.49	21.46	64.39	54.39	-27.90	-32.93
2	0.29800	9.72	24.22	10.02	33.94	19.74	60.30	50.30	-26.36	-30.56
3	0.58200	9.74	22.60	8.69	32.34	18.43	56.00	46.00	-23.66	-27.57
4	0.91800	9.76	15.06	1.94	24.82	11.70	56.00	46.00	-31.18	-34.30
5	1.93000	9.77	9.83	0.96	19.60	10.73	56.00	46.00	-36.40	-35.27
6	15.94600	9.83	10.75	1.40	20.58	11.23	60.00	50.00	-39.42	-38.77

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

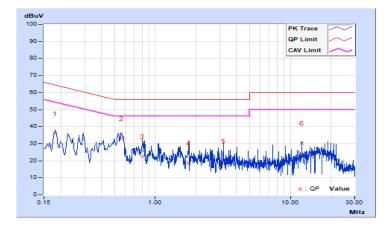




Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested by	Edison Lee	·	

	Phase Of Power : Neutral (N)									
	Frequency	Correction	Reading Value		Emission Level		Limit		Margin	
No		Factor	(dB	uV)	(dB	uV)	(dB	uV)	(d	B)
	(MHz)	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18180	9.77	26.31	11.47	36.08	21.24	64.40	54.40	-28.32	-33.16
2	0.55998	9.80	23.29	8.04	33.09	17.84	56.00	46.00	-22.91	-28.16
3	0.80600	9.81	12.80	3.36	22.61	13.17	56.00	46.00	-33.39	-32.83
4	1.77400	9.83	8.53	1.55	18.36	11.38	56.00	46.00	-37.64	-34.62
5	3.19000	9.84	10.00	1.68	19.84	11.52	56.00	46.00	-36.16	-34.48
6	12.15800	9.94	20.21	7.84	30.15	17.78	60.00	50.00	-29.85	-32.22

- 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

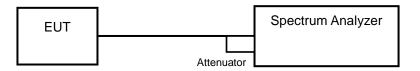


4.3 Number of Hopping Frequency Used

4.3.1 Limits of Hopping Frequency Used Measurement

At least 15 channels frequencies, and should be equally spaced.

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. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- d. Set the SA on View mode and then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were complete.

4.3.5 Deviation from Test Standard

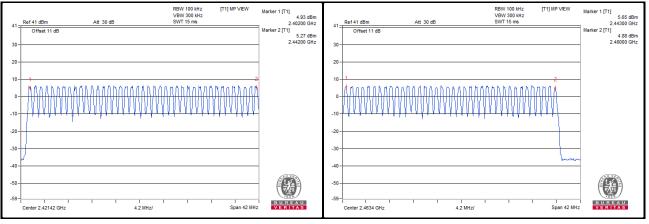
No deviation.



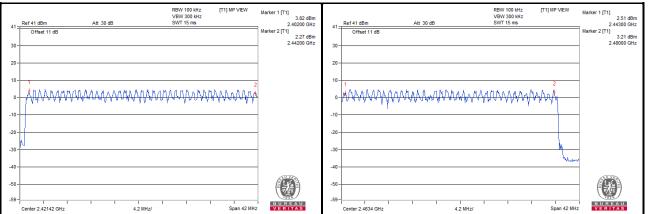
4.3.6 Test Results

There are 79 hopping frequencies in the hopping mode. Please refer to next page for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

<GFSK>



<8DPSK>



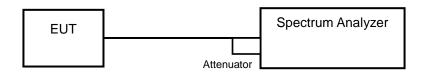


4.4 Dwell Time on Each Channel

4.4.1 Limits of Dwell Time on Each Channel Measurement

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

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. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- e. Repeat above procedures until all different time-slot modes have been completed.
- 4.4.5 Deviation from Test Standard

No deviation.

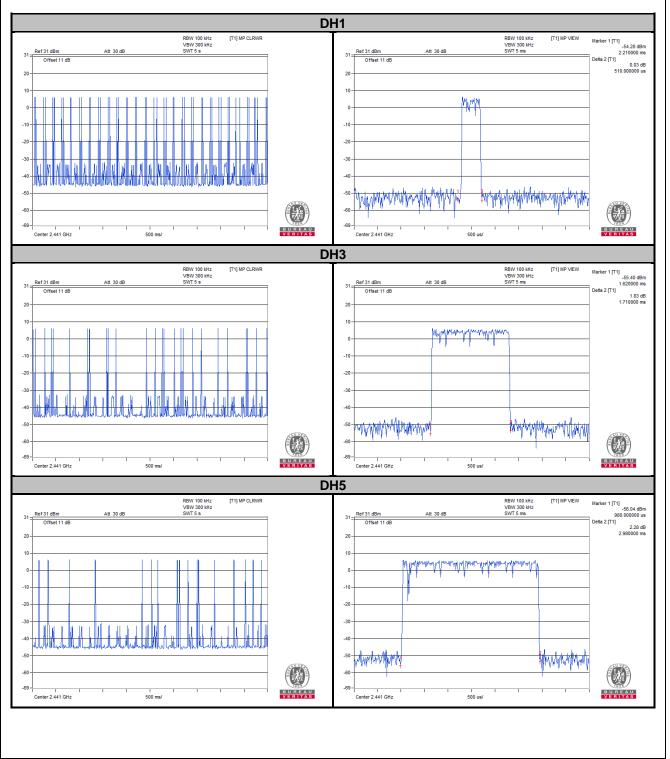


4.4.6 Test Results

GFSK

Mode	Number of Transmission in a 31.6 (79 Hopping*0.4)	Length of Transmission Time (msec)	Result (msec)	Limit (msec)
DH1	51 (times / 5 sec) * 6.32 = 323 times	0.51	164.73	400
DH3	25 (times / 5 sec) * 6.32 = 158 times	1.71	270.18	400
DH5	17 (times / 5 sec) * 6.32 = 108 times	2.98	321.84	400

Note: Test plots of the transmitting time slot are shown as below.

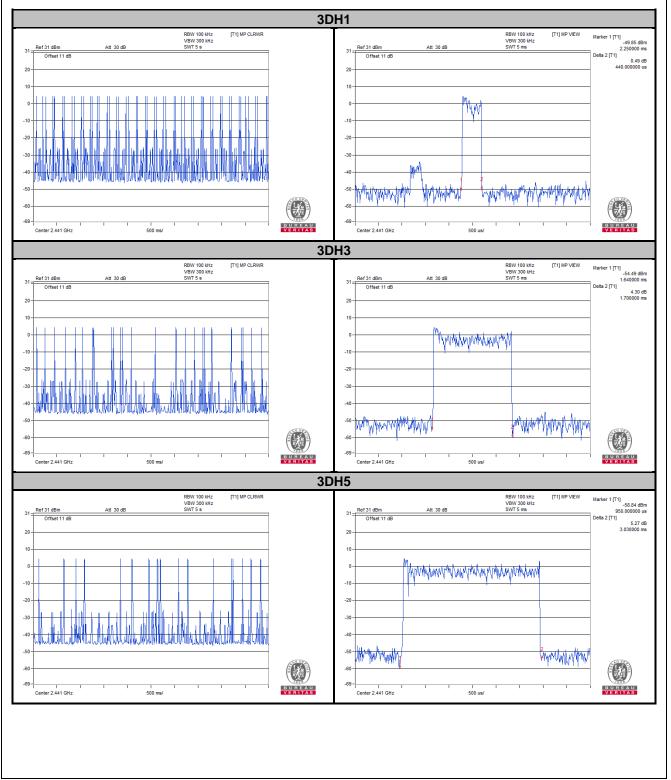




8DPSK

Mode	Number of Transmission in a 31.6 (79 Hopping*0.4)	Length of Transmission Time (msec)	Result (msec)	Limit (msec)
3DH1	50 (times / 5 sec) * 6.32 = 316 times	0.44	139.04	400
3DH3	25 (times / 5 sec) * 6.32 = 158 times	1.7	268.6	400
3DH5	17 (times / 5 sec) * 6.32 = 108 times	3.03	327.24	400

Note: Test plots of the transmitting time slot are shown as below.



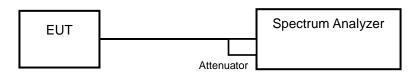


4.5 Channel Bandwidth

4.5.1 Limits of Channel Bandwidth Measurement

For frequency hopping system operating in the 2400-2483.5 MHz, if the 20 dB bandwidth of hopping channel is greater than 25 kHz, two-thirds 20 dB bandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

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. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

4.5.5 Deviation from Test Standard

No deviation.

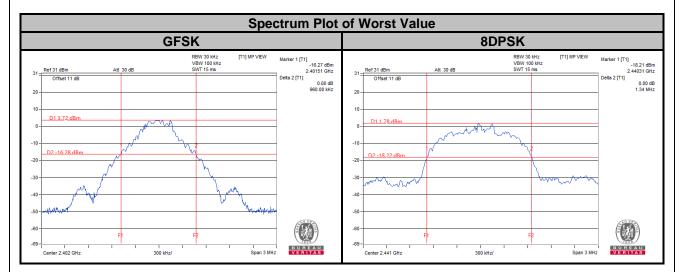
4.5.6 EUT Operating Condition

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



4.5.7 Test Results

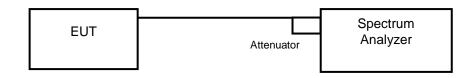
Channel	Frequency	20 dB Bandwidth (MHz)			
Channel	(MHz)	GFSK	8DPSK		
0	2402	0.96	1.33		
39	2441	0.96	1.34		
78	2480	0.95	1.33		





4.6 Occupied Bandwidth Measurement

4.6.1 Test Setup



4.6.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument

4.6.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.6.4 Deviation from Test Standard

No deviation.

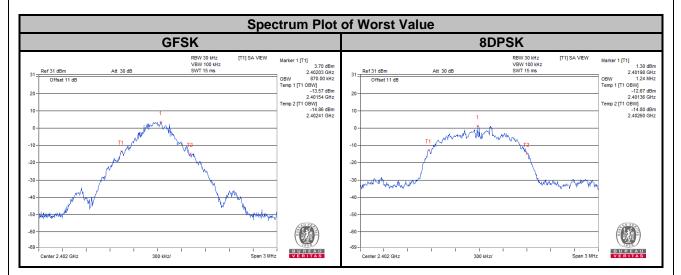
4.6.5 EUT Operating Conditions

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



4.6.6 Test Results

Channel	Frequency	Occupied Bar	ndwidth (MHz)
Channel	(MHz)	GFSK	8DPSK
0	2402	0.87	1.24
39	2441	0.87	1.24
78	2480	0.87	1.23



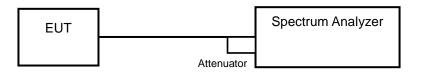


4.7 Hopping Channel Separation

4.7.1 Limits of Hopping Channel Separation Measurement

At least 25 kHz or two-third of 20 dB hopping channel bandwidth (whichever is greater).

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

Measurement Procedure REF

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
- c. By using the MaxHold function record the separation of two adjacent channels.
- d. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were complete.

4.7.5 Deviation from Test Standard

No deviation.

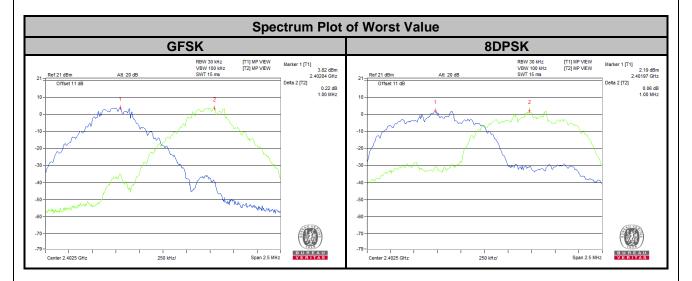


4.7.6 Test Results

Channel	Freq. (MHz)	Adjacent Separ (MI		20 Bandwid	dB lth (MHz)	Minimum I	₋imit (MHz)	Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK	GFSK	8DPSK	
0	2402	1.00	1.00	0.96	1.33	0.64	0.89	Pass
39	2441	1.00	1.00	0.96	1.34	0.64	0.90	Pass
78	2480	1.00	1.00	0.95	1.33	0.64	0.89	Pass

Note:

1. The minimum limit is two-third 20 dB bandwidth.





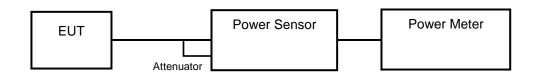
4.8 Maximum Output Power

4.8.1 Limits of Maximum Output Power Measurement

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt.

For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

4.8.2 Test Setup



4.8.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.8.4 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.

4.8.5 Deviation from Test Standard

No deviation.

4.8.6 EUT Operating Condition

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



4.8.7 Test Results

<GFSK>

Channel		Peak	Power	Average	e Power	Power Limit	Pass / Fail
Channel	Freq. (MHz)	(mW)	(dBm)	(mW)	(dBm)	(mW)	Fass/Fall
0	2402	11.912	10.76	11.272	10.52	125 / 1000 Note	Pass
39	2441	10.233	10.10	9.705	9.87	125 / 1000 Note	Pass
78	2480	10.28	10.12	9.84	9.93	125 / 1000 Note	Pass

Note: RF Output Power limit depends on the operating channel numbers, please refer to section 4.3 of the results.

<8DPSK>

Channel		Peak	Power	Average	e Power	Power Limit	Pass / Fail
Channel	Freq. (MHz)	(mW)	(dBm)	(mW)	(dBm)	(mW)	Fass / Fall
0	2402	8.831	9.46	8.395	9.24	125 / 1000 Note	Pass
39	2441	7.889	8.97	7.447	8.72	125 / 1000 Note	Pass
78	2480	7.87	8.96	7.311	8.64	125 / 1000 Note	Pass

Note: RF Output Power limit depends on the operating channel numbers, please refer to section 4.3 of the results.



4.9 Conducted Out of Band Emission Measurement

4.9.1 Limits Of Conducted Out of Band Emission Measurement

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

4.9.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.9.3 Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.9.4 Deviation from Test Standard

No deviation.

4.9.5 EUT Operating Condition

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

4.9.6 Test Results

The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.



			Hopp	ing Disable	ed_Low Cha	annel			
Ref 31 dBm Offset 11 dB	Att 30 dB	RBW 100 kHz VBW 300 kHz SWT 20 ms	[T1] MP VIEW	Marker 1 [T1] 6.38 dBm 2.40200 GHz Marker 2 [T1]	31 = Ref 31 dBm Offset 11 dB	Att 30 dB	RBW 100 kHz VBW 300 kHz SWT 2.5 s	[T1] MP VIEW	Marker 1 [T1] 5 2.402 Marker 2 [T1]
Unset 11 db				-47.39 dBm 2.40000 GHz Marker 3 [T1]	20-				-42. 12.770 Marker 3 [T1]
D1.6.38.dBm			1	-44.20 dBm 2.39270 GHz Marker 4 [T1] -47.72 dBm	10- <u>D1.6.3</u> 8.dBm				-43 22.07 Marker 4 [T1] -43
				2.39000 GHz Marker 5 [T1] -43.23 dBm	0-				23.84
D2 -13.62 dBm				2.38227 GHz	-10 - D2 -13 62 dBm -20 -				
				_	-30 -				
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		1	F2 F1						
			· · · ·	BUREAU	-69-	1 1 1	1 1		BUREA
Center 2.358 GHz	10 MH	I I I	Span 100 MH		Start 30 MHz	2.497	GHz/	Stop 25 GHz	
Center 2.358 GHz	и и и 10 МН		Норр	ing Disable					
Ref 31 dBm	Att 20 dB	RBW 100 kHz VBW 300 kHz SWT 35 ms		z VERITAS ing Disable Marker 1 [T1] 5.71 dBm 2.47995 GHz	start 30 MHz ed_High Ch		GHz/ RBW 100 kHz VBW 300 kHz SWT 2.5 s	Stop 25 GHz [T1] MP VIEW	VERITA Marker 1 [T1] 5 2.48
		RBW 100 kHz VBW 300 kHz	Норр	z VERITAS	start 30 MHz	annel	RBW 100 kHz VBW 300 kHz		VERITA Marker 1 [T1] 2.48 Marker 2 [T1] -45 2.73 Marker 3 [T1]
Ref 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	z EVERTAS ing Disable Marker 1 [71] 5.71 dBm 2.47995 GHz Marker 2 [71] - 0.39 dBm 2.4350 GHz Marker 3 [71] - 45.89 dBm 2.43517 GHz Marker 4 [71]	Start 30 MHz ed_High Ch. 31=Ref 31 dBm Offset 11 dB	annel	RBW 100 kHz VBW 300 kHz		VERITZ Marker 1 [T1] 2.48 Marker 2 [T1] -44 2.73 Marker 3 [T1] -44 6.59 Marker 4 [T1]
Ref 31 dBm Offset 11 dB		RBW 100 kHz VBW 300 kHz	Норр	z VERITYAS	Start 30 MHz ed_High Ch 31 = Ref 31 dBm 31 = Offset 11 dB 20 10	annel	RBW 100 kHz VBW 300 kHz		Marker 1 [T1] 2.40 Marker 2 [T1] 4.2.73 Marker 3 [T1] 4.4 6.59 Marker 4 [T1] -44
Ref 31 dBm Offset 11 dB		RBW 100 kHz VBW 300 kHz	Норр	z EVERTAS Ing Disable Marker 1 [11] 5.71 dBm 24795 GHz Marker 2 (11) 6.03 dBm 248350 GHz Marker 3 (11) 4.68 gBm 24837 GHz Marker 4 (11) -48.43 dBm	Start 30 MHz ed_High Ch. 31 = Ref 31 dBm Offset 11 dB 20 10 10 11 10 01 5.7(1 dBm 0 -10 -10 -12 -14 9 dBm	annel	RBW 100 kHz VBW 300 kHz		Marker 1 [T1] 2.40 Marker 2 [T1] 4.2.73 Marker 3 [T1] 4.4 6.59 Marker 4 [T1] -44
Ref 31 dBm Offset 11 dB D1 5.7 LdBm		RBW 100 kHz VBW 300 kHz	Норр	z EVERTAS Ing Disable Marker 1 [11] 5.71 dBm 24795 GHz Marker 2 (11) 6.03 dBm 248350 GHz Marker 3 (11) 4.68 gBm 24837 GHz Marker 4 (11) -48.43 dBm	Start 30 MHz 20	annel	RBW 100 kHz VBW 300 kHz		Marker 1 [T1] 5 2.48(Marker 2 [T1] -45 2.73(Marker 3 [T1] -44 6.591
Ref 31 dBm Offset 11 dB D1 5.7 LclRm		RBW 100 kHz VBW 300 kHz	Норр	z EVERTAS Ing Disable Marker 1 [11] 5.71 dBm 24795 GHz Marker 2 (11) 6.03 dBm 248350 GHz Marker 3 (11) 4.68 gBm 24837 GHz Marker 4 (11) -48.43 dBm	Start 30 MHz ed_High Ch. 31 = Ref 31 dBm Offset 11 dB 20 10 10 11 10 01 5.7(1 dBm 0 -10 -10 -12 -14 9 dBm	annel	RBW 100 kHz VBW 300 kHz		Marker 1 [T1] 2.40 Marker 2 [T1] 4.2.73 Marker 3 [T1] 4.4 6.59 Marker 4 [T1] -44
Ref 31 dBm Offset 11 dB D1 5.7 LdBm	Att 20 dB	RBW 100 kHz VBW 300 kHz	Hopp [T1] MP VEW	z EVERTAS Ing Disable Marker 1 [11] 5.71 dBm 24795 GHz Marker 2 (11) 6.03 dBm 248350 GHz Marker 3 (11) 4.68 gBm 24837 GHz Marker 4 (11) -48.43 dBm	Start 30 MHz 20	annel	RBW 100 kHz VBW 300 kHz		Marker 1 [T1] 2.40 Marker 2 [T1] 4.2.73 Marker 3 [T1] 4.4 6.59 Marker 4 [T1] -44
1 D1571.d8m	Att 20 dB	RBW 100 kHz VBW 300 kHz SWT 35 ms	Hopp [T1] MP VEW	z EVERTAS Ing Disable Marker 1 [11] 5.71 dBm 24795 GHz Marker 2 (11) 6.03 dBm 248350 GHz Marker 3 (11) 4.68 gBm 24837 GHz Marker 4 (11) -48.43 dBm	Start 30 MHz ed_High Ch 31 = Ref 31 dBm 0ffset 11 dB 20 10 1 10 10 1 20 20 20 20 20 20 20 20 20 20 20 20 20	annel	RBW 100 kHz VBW 300 kHz		Marker 1 [T1] (2.48 Marker 2 [T1] (44 2.73 Marker 3 [T1] 44 6.59 Marker 4 [T1] -44



		HO	pping Enable	d_Low Channel	
Ref 31 dBm	Att 30 dB	RBW 100 kHz [T1] MP V VBW 300 kHz SWT 20 ms		31 - Ref 31 dBm Att 30 dB	RBW 100 kHz [T1] MP VIEW Marker 1 [T1] VBW 300 kHz SWT 2.5 s 2.40
Offset 11 dB		1 	Marker 2 [T1] 	0	Marker 2 [71] 5.10 Marker 3 [71] 24.55 Marker 4 [71] 25.05
D2 -13.76 dBm			Marker 5 [T1] -40.56 dBm 2.38862 GHz	-10- <u>D2-13</u> 76.d8m -20	
	hugadasin sayahin ala din	F2 F1		-40 2 -50	
Center 2.358 GHz	14 MHz/			d_High Channel	2.497 GHz/ Stop 25 GHz VENTTZ RBW 100 kHz [T1] MP VEW Marker 1 [T1] VBW 300 kHz
Ref 31 dBm Offset 11 dB 1	Att 30 dB	SWT 20 ms	2.47397 GHz Marker 2 [T1] -44.14 dBm 2.48350 GHz Marker 3 [T1] -42.85 dBm 2.49917 GHz	31-Ref 31 dBm Att 30 dB Offset 11 dB 20-	SWT 2.5 s 2.47 Marker 2 [11] 4.18 Marker 3 [11] 4.18 Marker 3 [11] 2 25
D1641dBm 11640300000 11640300000 11600000000000000000000000000000			Marker 4 [T1] 45.17 dBm 2.50000 GHz	-10 12_13 89.48m	Marker 4 [71] 4 23.37
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8DPSK

		Hopping Disable	ed_Low Chan	nel			
31 - Ref 31 dBm Att 30 dB	RBW 100 kHz VBW 300 kHz SWT 20 ms	[T1] MP VIEW Marker 1 [T1] 4.10 dBm 2.40200 GHz	31 - Ref 31 dBm	Att 30 dB	RBW 100 kHz VBW 300 kHz SWT 2.5 s	[T1] MP VIEW	Marker 1 [T1] 2.13 dBm 2.40215 GHz
Offset 11 dB		Marker 2 [T1] -36.24 dBm	Offset 11 dB				Marker 2 [T1] -42.51 dBm
20 -		2.40000 GHz Marker 3 [T1]	20-				21.71020 GHz Marker 3 [T1]
10-		-32.99 dBm 2.39967 GHz	10-				-42.61 dBm 23.30204 GHz
D1.4.10.dBm		Marker 4 [T1] -49.15 dBm 2.39000 GHz	D1.4.10 dBm				Marker 4 [T1] -42.37 dBm 24.37575 GHz
0-		Marker 5 [T1] -43.21 dBm					24.57575 6112
-10		2.37867 GHz	-10- D2 -15 90 dBm				-
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-30 -			-30-				
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-60 -			-60 -				
-69-	F		-69 -				
Center 2.358 GHz 10 MH	iz/	Span 100 MHz VERITAS	Start 30 MHz	2.497 GH	z/	Stop 25 GHz	VERITAS
		Hopping Disable	ed_High Chan	nel			
	RBW 100 kHz VBW 300 kHz SWT 35 ms	[T1] MP VIEW Marker 1 [T1] 3.22 dBm	Def 31 dBm	Att 20 dB	RBW 100 kHz VBW 300 kHz SWT 2.5 s	(T1) MP VIEW	Marker 1 [T1] 2.02 dBm 2.48018 GHz
31= <mark>Ref 31 dBm Att 20 dB</mark>	VBW 300 kHz	[T1] MP VIEW Marker 1 [T1]			VBW 300 kHz	[T1] MP VIEW	Marker 1 [T1] 2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm
31-	VBW 300 kHz	[T1] MP VIEW Marker 1 [T1] 3.22 dBm 2.47996 GHz Marker 2 [T1] -42.55 dBm 2.48350 GHz Marker 3 [T1]	Ref 31 dBm		VBW 300 kHz	[T1] MP VIEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1]
31 - Offset 11 dB	VBW 300 kHz	[T1] MP VIEW Marker 1 [T1] 2 47966 GHz Marker 2 [T1] 42.55 dBm 2 43350 GHz Marker 3 [T1] 2 43351 GHz	31 - Ref 31 dBm Offset 11 dB		VBW 300 kHz	[T1] MP VIEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz
31	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 3.25 dBm 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.43350 GHz Marker 3 [T1] -41.04 dBm 2.43351 GHz Marker 4 [T1] -49.95 dBm -49.95 dBm	31= Ref 31 dBm Offset 11 dB 20- 10- D1 3.22 dBm		VBW 300 kHz	[T1] MP VIEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31 - Offset 11 dB 20	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 2.47996 GHz Marker 2 [T1] 2.4395 GHz 4.455 GHz Marker 3 [T1].41.04 dBm 2.43351 GHz Marker 4 [T1] Marker 4 [T1]	31 = Ref 31 dBm Offset 11 dB 20		VBW 300 kHz	[T1] MP VEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1]
31Offset 11 d8	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 3.25 dBm 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.43350 GHz Marker 3 [T1] -41.04 dBm 2.43351 GHz Marker 4 [T1] -49.95 dBm -49.95 dBm	31 = Ref 31 dBm Offset 11 dB 20 - 10 - 0 - - 10 -		VBW 300 kHz	[T1] MP VEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 3.25 dBm 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.43350 GHz Marker 3 [T1] -41.04 dBm 2.43351 GHz Marker 4 [T1] -49.95 dBm -49.95 dBm	31 - Ref 31 dBm 0 ffset 11 dB 20 - 10 - 0 - 0 - 0 -		VBW 300 kHz	[T1] MP VEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 3.25 dBm 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.43350 GHz Marker 3 [T1] -41.04 dBm 2.43351 GHz Marker 4 [T1] -49.95 dBm -49.95 dBm	31 = Ref 31 dBm 0 ffset 11 dB 20 - 10 - 0 - 10 - 0 - 10 - 0 - 10 - 0 - 10 - 0 - 1 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2		VBW 300 kHz	[T1] MP VEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 3.25 dBm 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.43350 GHz Marker 3 [T1] -41.04 dBm 2.43351 GHz Marker 4 [T1] -49.95 dBm -49.95 dBm	31		VBW 300 kHz	[T1] MP VIEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31	VBW 300 kHz SWT 35 ma	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.4350 GHz 2.4350 GHz Marker 3 [T1] -41.04 dBm Marker 4 [T1] -49.85 dBm 2.5000 GHz -2.5000 GHz	31 = Ref 31 dBm Offset 11 dB 20 - 10 - - - - - - - - - - - - - -		VBW 300 kHz	[T1] MP VEW	2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31	VBW 300 kHz	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.4350 GHz 2.4350 GHz Marker 3 [T1] -41.04 dBm Marker 4 [T1] -49.85 dBm 2.5000 GHz -2.5000 GHz	31		VBW 300 kHz		2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31 - Offset 11 48 20	VBW 300 kHz SWT 35 ma	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.4350 GHz 2.4350 GHz Marker 3 [T1] -41.04 dBm Marker 4 [T1] -49.85 dBm 2.5000 GHz -2.5000 GHz	31 Ref 31 dBm 0 ffset 11 dB 0 10 0 10 0 0 0 -10 0 -20 - -30 - -40 - -2.30 -		VBW 300 kHz		2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm
31 - Offset 11 48 20- 10- 10- 10- 10- 10- 10- 10- 1	VBW 300 kHz SWT 35 ma	[T1] MP VEW Marker 1 [T1] 3.22 dBm 2.4796 GHz 2.4796 GHz Marker 2 [T1] -42.55 dBm 2.4350 GHz 2.4350 GHz Marker 3 [T1] -41.04 dBm Marker 4 [T1] -49.85 dBm 2.5000 GHz -2.5000 GHz	31 = Ref 31 dBm 0 ffset 11 dB 20 - 10 - 10 - 10 - 10 - 10 - 20 -		VBW 300 kHz		2.02 dBm 2.48018 GHz Marker 2 [T1] -44.99 dBm 5.84801 GHz Marker 3 [T1] -45.07 dBm 6.40983 GHz Marker 4 [T1] -45.21 dBm



			Hopp	ing Enable	d Low	Channel				
ef 31 dBm	Att 30 dB	RBW 100 kHz VBW 300 kHz SWT 20 ms	[T1] MP VIEW	Marker 1 [T1] 4.78 dBm 2.40283 GHz	Pef 31 dBr			RBW 100 kHz VBW 300 kHz SWT 2.5 s	[T1] MP VIEW	Marker 1 [T1]
Offset 11 dB				Marker 2 [T1] -42.75 dBm	31 = Offset	11 dB				Marker 2 [T1]
				2.40000 GHz Marker 3 [T1]	20 -					18.3 Marker 3 [T1]
			1	-37.80 dBm 2.39996 GHz	10-					19.5
D1 4.78 dBm			Mandaata biilli	Marker 4 [T1] -44.90 dBm 2.39000 GHz	D1.4.78	l dBm				Marker 4 [T1]
			a fan de fan	Marker 5 [T1] -41.38 dBm						
D2 -15.22 dBm				2.32877 GHz	-10- D2-15.2	2 dBm				
					-20 -					-
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I I Inter 2.358 GHz	1 I I 14 MHz/	F2 F		ing Enable	-69 - Start 30 MH		1 I I 2.497 GHz/	1 1	I I Stop 25 GH	
I I enter 2.358 GHz	1 1 1 14 MHz/	RBW 100 kHz			-69 - Start 30 MH		I I I 2.497 GHz/	RBW 100 kHz	Stop 25 GH [T1] MP VIEW	Marker 1 [T1]
ef 31 dBm	Alt 30 dB		Норр	Marker 1 [T1] 4.46 dBm 2.46781 GHz	-69 - Start 30 MH	Channel		RBW 100 kHz VBW 300 kHz SWT 2.5 s		Z VERI
		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [T1] 4.46 dBm 2.46731 GHz Marker 2 [T1] -45.62 dBm	-69	Channel		VBW 300 kHz		Z VERIT
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [11] 4.46 dBm 2.46761 GHz Marker 2 [11] 4.5.62 dBm 2.48350 GHz Marker 3 [11] 43.45 dBm	-69 - Start 30 MH	Channel		VBW 300 kHz		Z VERT
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marter 1 [11] 4.46 dBm 2.4773 GHz Marter 2 [11] -45.62 dBm 2.4350 GHz Marter 3 [11] 2.43450 GHz Marter 4 [11]	-69	Channel Att 30 dB 11 dB		VBW 300 kHz		X VERT
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [71] 4.46 dBm 2.46781 GHz Marker 2 [71] -45.62 dBm 2.48380 GHz Marker 3 [71] -43.45 dBm 2.49469 GHz	-69 - Start 30 MH	Channel Att 30 dB 11 dB		VBW 300 kHz		Z WERT
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [11] 246761 GHz Marker 2 [11] - 62 G dBm 248300 GHz Marker 3 [11] - 43 45 GBm 249466 GHz Narker 4 [11] - 4426 GBm	-69 - 5tart 30 MH d_High 31 = Ref 31 dBm 20 - 07fset 0 - 01 4 4 0 - 01 4 4	Channel Att 30 dB 11 dB		VBW 300 kHz		X VERIT Marker 1 [T1] 2.4 Marker 2 [T1] 14.6 Marker 3 [T1] 15.7 Marker 4 [T1]
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [11] 246761 GHz Marker 2 [11] - 62 G dBm 248300 GHz Marker 3 [11] - 43 45 GBm 249466 GHz Narker 4 [11] - 4426 GBm	-69	Channel Att 30 dB 11 dB		VBW 300 kHz		X VERT
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [11] 246761 GHz Marker 2 [11] - 62 G dBm 248300 GHz Marker 3 [11] - 43 45 GBm 249466 GHz Narker 4 [11] - 4426 GBm	.69 Start 30 MH d_High 31 0ffset 20 0 0 0 0 0 0 0 0 0 0 0 14.4 0 0 0	Channel Att 30 dB 11 dB		VBW 300 kHz		X VERIT Marker 1 [T1] 2.4 Marker 2 [T1] 14.6 Marker 3 [T1] 15.7 Marker 4 [T1]
ef 31 dBm		RBW 100 kHz VBW 300 kHz	Норр	Marker 1 [11] 246761 GHz Marker 2 [11] - 62 G dBm 248300 GHz Marker 3 [11] - 43 45 GBm 249466 GHz Narker 4 [11] - 4426 GBm	-69	Channel Att 30 dB 11 dB		VBW 300 kHz		X VERIT Marker 1 [T1] 2.4 Marker 2 [T1] 14.6 Marker 3 [T1] 15.7 Marker 4 [T1]
ef 31 dBm	AE 30 dB	RBW 100 kHz VBW 300 kHz SWT 20 ms	Hopp [T1] MP VEW	Marker 1 [11] 246761 GHz Marker 2 [11] - 6 C dBm 248300 GHz Marker 3 [11] - 43.45 dBm 249466 GHz Narker 4 [11] - 44.26 dBm	-69	Channel Att 30 dB 11 dB		VBW 300 kHz		X VERT
ef 31 dBm	AE 30 dB	RBW 100 kHz VBW 300 kHz	Hopp [T1] MP VEW	Marker 1 [11] 246761 GHz Marker 2 [11] - 6 C dBm 248300 GHz Marker 3 [11] - 43.45 dBm 249466 GHz Narker 4 [11] - 44.26 dBm	59- Start 30 HH d_High 31- 7- 8- 9- 10- 10- 10- 10- 10- 10- 10- 10	Channel Att 30 dB 11 dB		VBW 300 kHz		Z VERT



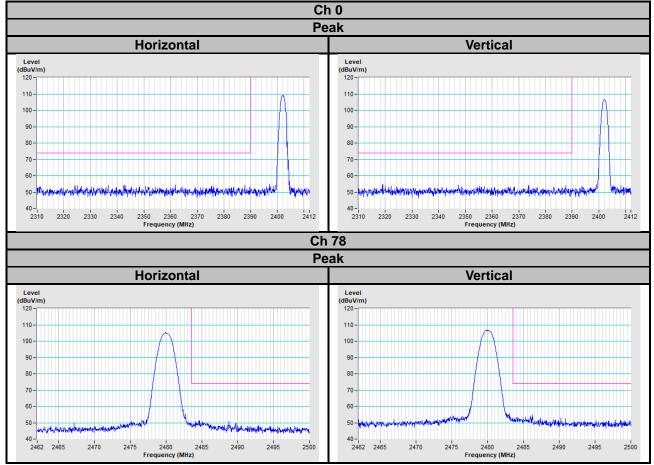
5 Pictures of Test Arrangements

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

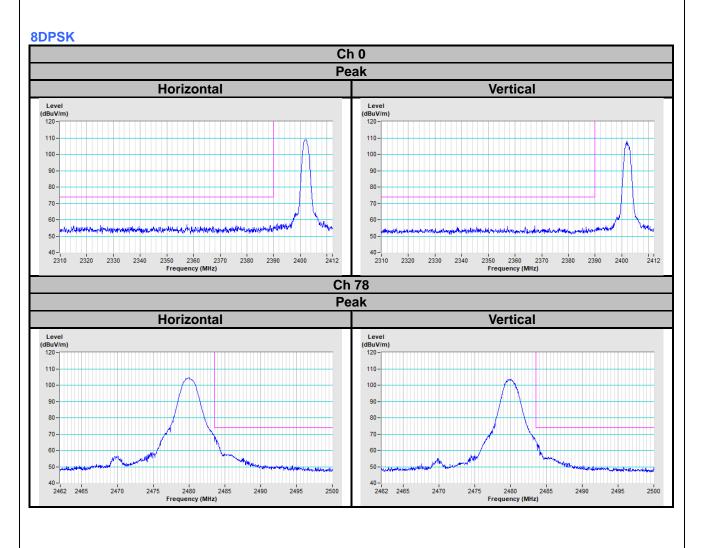


Annex A- Band Edge Measurement

GFSK









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:

Lin Kou EMC/RF Lab Tel: 886-2-26052180 Fax: 886-2-26051924 Hsin Chu EMC/RF/Telecom Lab Tel: 886-3-6668565 Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab Tel: 886-3-3183232 Fax: 886-3-3270892

Email: <u>service.adt@tw.bureauveritas.com</u> Web Site: <u>www.bureauveritas-adt.com</u>

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

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