

# **RADIO TEST REPORT**

Product	:	Wireless SOM Module
Model Name	:	SB35
FCC ID	:	YAISB35
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.247)
<b>Received Date</b>	:	2022/6/15
Test Date	:	2022/6/16 ~ 2022/7/6
Issued Date	:	2022/8/1
Applicant	:	InnoComm Mobile Technology Corporation 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park, Hsinchu, Taiwan, 300092
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan



The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.



# **REVISION HISTORY**

# Original Test Report No.: 4790446225-US-R3-V0

Rev.	Test report No. 4790446225-US-R3-V0	Date	Page revised	Contents
Original	4790446225-US-R3-V0	2022/8/1	-	Initial issue



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## **1.** Attestation of Test Results

APPLICANT:	InnoComm Mobile Technology Corporation 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park, Hsinchu, Taiwan, 300092
MANUFACTURER:	InnoComm Mobile Technology Corporation 3F, No. 6, Hsin Ann Rd., Hsinchu Science Park, Hsinchu, Taiwan, 300092
EUT DESCRIPTION:	Wireless SOM Module
BRAND:	InnoComm
MODEL:	SB35
SAMPLE STAGE:	Design Verification Test sample
DATE of TESTED:	2022/6/16 ~ 2022/7/6

APPLICABLE STANDARDS				
STANDARD	<b>Test Results</b>			
FCC 47 CFR PART 15 Subpart C (Section 15.247)	PASS			

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu Project Handler Date : 2022/8/1

Approved and Authorized By:

Eric Lee Date : 2022/8/1 Senior Laboratory Engineer



# 2. Summary of Test Results

Summary of Test Results					
FCC Clause	FCC Clause Test Items				
15.247(a)(1) (iii)	Number of Hopping Frequency Used	PASS			
15.247(a)(1) (iii)	Dwell Time on Each Channel	PASS			
15.247(a)(1)	<ol> <li>Hopping Channel Separation</li> <li>Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System</li> </ol>	PASS			
15.247(b)	Conducted Output Power	PASS			
15.247(d)	Antenna Port Emission	PASS			
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS			
15.207	AC Power Conducted Emission	PASS			
15.203	Antenna Requirement	PASS			



# 3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB558074 D01 Meas Guidance v05r02, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013.

# 4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.			
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan			
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.			



# 5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±2.9 dB
RF Conducted	9 kHz - 40GHz	±2.4 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.8 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.8 dB



# 6. Equipment under Test

# **6.1. Description of EUT**

Product	Wireless SOM Module	
Brand Name	InnoComm	
Model Name	SB35	
<b>Operating Frequency</b>	2402MHz ~ 2480MHz	
Modulation	GFSK, $\pi/4$ -DQPSK and 8DPSK	
Transfer Rate	Up to 3 Mbps	
Number of Channel	79	
Maximum Output Power	3.15 dBm	
Normal Voltage	3.8Vdc	
Sample ID	5059965	

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.



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# 6.2. Channel List

79 channels are provided for BT-EDR mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (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	-	-

# **6.3.** Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	20~27°C/ 51~69%RH	3.8Vdc	2022/06/16~ 2022/06/24	Rex Chen
Radiated Spurious Emission	966-2	20~27°C/ 51~69%RH	3.8Vdc	2022/06/16~ 2022/07/06	Rex Chen
AC power Line Conducted Emission	SR1	20~27°C/ 51~69%RH	3.8Vdc	2022/06/16~ 2022/06/24	Rex Chen

FCC Test Firm Registration Number: 498077

# Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan Telephone :+886-2-7737-3000 Facsimile (FAX ) :+886-3-583-7948

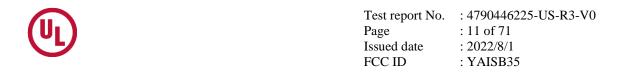


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# 6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)+(1)	Walsin	RFDPA171300SBLB801	Dipole	2.4GHz: 5 5GHz: 5
2	Chain (0)+(1)	InnoComm	PCA5016-2B	PCB	2.4GHz: 3.78 5GHz: 4.76

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.



# 6.5. Test Mode Applicability and Tested Channel Detail

- The fundamental of the dipole antenna was investigated in two orthogonal (lay and stand), it was determined that stand mode was worst-case. Therefore, all final radiated testing was performed with the dipole antenna in stand mode.
- The fundamental of the PCB Antenna was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that X-Y axis were worst-case. Therefore, PCB Antenna all final radiated tests were performed with the X-Y axis.
- The Packet Type for DH1, DH3, and DH5 have all been pre-tested, the fundamental worst case of the Packet Type was found in the DH5. Therefore, only DH5 Packet Type is recorded in the report. (Except Dwell Time).
- The modulation and bandwidth are similar for  $\pi/4$ -DQPSK mode and 8DPSK mode, therefore investigated 8DPSK mode to representative mode in test report.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- 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).
- Since the DUT is a Bluetooth device, the AFH mode and non-AFH mode follow the Bluetooth timing protocol, and the same timing level has the same time interval, but the non-AFH mode has worse results, therefore only the test data of this type were recorded in this report.

Test Item	Modulation Type	Available Channel	Test Channel	Packet Type
Radiated Emissions	GFSK	0 to 78	0,39,78	DH5
(Above 1GHz)	8DPSK	0 to 78	0,39,78	3DH5
Radiated Emissions (Below 1GHz)	GFSK	0 to 78	0	DH5
AC Power Line Conducted Emission	GFSK	0 to 78	0	DH5
Antenna Port Conducted	GFSK	0 to 78	0,39,78	DH1*,DH3*,DH5
Measurement	8DPSK	0 to 78	0,39,78	3DH1*,3DH3*, 3DH5

\* Only for Dwell Time on Each Channel test



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#### Simultaneously transmission condition:

Condition	Technology			
1	BT-LE	WLAN (2GHz)		
2	BT-LE	WLAN (5GHz)		

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.



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# 6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
GFSK(DH5)	2.880	5.000	0.5760	2.40	510Hz
8DPSK(3DH5)	2.860	4.980	0.5743	2.41	510Hz

GFSK(DH5)	8DPSK(3DH5)	
Spectrum	Spectrum	E
RefLevel 10.00 dBm  RBW 1 MHz	RefLevel 10.00 dBm	(*
Att 20 dB  SWT 20 ms  VBW 1 MHz	Att 20 dB	
Count 400/400 TDF	Count 400/400 TDF	
GFSK(DH5)  1Pk View	8DPSK(3DH5)  1Pk View	
M1 M2 M3 M1[1] 1.99 d 5.63000	M1 M2 M31[1]	1.78 dBm 5:06800 ms
0 dBm M2[1] 1/78 d 8.51000	0 dBm M2[1]	2.53 dBm 9.52000 ms
-10 dBm	-10 dBm	1.02000 113
-20 dBm	-20 dBm	
-30 d8m-	-30 dBm	
-4C dBm-	-40 dBm	
udal dem nundi lanaka katika	alifadilan bundataran bahandar bundataran	
-60 dBm	-eo gBm - Bit.c.b.de.ed cidate beneater a binue sature	
-70 dBm	-70 dBm	
-80 dBm	-80 dBm	
CF 2.402 GHz 2001 pts 2.0 m	CF 2.402 GHz 2001 pts	2.0 ms/
Marker	Marker	
Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         5.63 ms         1.99 dBm	Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         6.66 ms         1.78 dBm         1	
M2 1 8.51 ms 1.79 dbm	M2 1 9.52 ms 2.53 dBm	
M3 1 10.63 ms 2.00 dBm	M3 1 11.64 ms 1.83 dBm	



# 7. Test Equipment

	Test Equipment List							
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date			
	Radiated Spurious Emission							
Spectrum Analyzer	Keysight	N9010A	MY56070827	2021/11/9	2022/11/8			
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2021/12/10	2022/12/9			
Loop Antenna	ETS lindgren	6502	00213440	2021/12/23	2022/12/22			
Trilog- Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT- N0538	2022/2/8	2023/2/7			
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2021/12/13	2022/12/12			
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2021/12/17	2022/12/16			
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2022/6/7	2023/6/6			
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2022/2/16	2023/2/15			
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2022/5/17	2023/5/16			
Cables	Hanyitek	K1K50-UP0264- K1K50-2500	170214-4 & 170425-2	2021/12/3	2022/12/2			
Cables	Hanyitek	K1K50-UP0264- K1K50-2500	170214-1 & 170214-2	2021/12/3	2022/12/2			



Test Equipment List						
Equipment	Manufacturer	Manufacturer Model No. Serial No.		Cal. Date	Expired date	
	Antenna	a Port Conduc	ted Measuremen	t		
Spectrum Analyzer	Rohde & Schwarz	FSV40	101490	2021/9/7	2022/9/6	
Pulse Power Sensor	Anritsu	MA2411B	1531202	2021/12/22	2022/12/21	
Power Meter	Anritsu	ML2495A	1645002	2021/12/22	2022/12/21	
	АС ро	wer Line Con	ducted Emission			
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2021/11/15	2022/11/14	
Two-Line V- Network	Rohde & Schwarz	ENV216	102136	2021/8/30	2022/8/29	
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2021/8/26	2022/8/25	
Cables	TITAN	CFD200	T0732ACFD20 020A300-1	2022/3/16	2023/3/15	

UL Software					
Description Name Version					
Radiated measurement	e3	6.191211 (V6)			
Conducted measurement	RF-Conducted-FCC 15247	ver 1.0			
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2			



# 8. Description of Test Setup

# Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
А	Laptop	DELL	Latitude E5470	3JFKWF2	Provided by Lab
В	Test Tool	InnoComm	SB52-IO-004	Label	Supplied by client
С	AC Adapter	EDAC	EA10681G-120	NA	Supplied by client

# I/O Cables

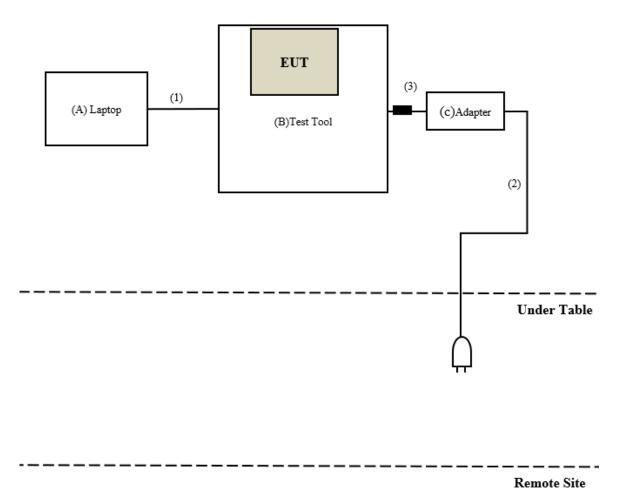
ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	Micro USB Cable	WONDER	WA-W07UA	1.44	Provided by Lab
2	Power Cable	NA	NA	1.75	Supplied by client
3	DC Cable	NA	NA	1	Supplied by client, with core

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# Test Setup

Controlled using a bespoke application (Typing RF command by adb tool (version 1.0.32)) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

# Setup Diagram for Test





# 9. Test Results

# 9.1. Channel Bandwidth

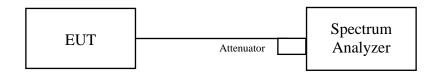
# **Requirements**

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

# 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 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

# <u>Test Setup</u>



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.



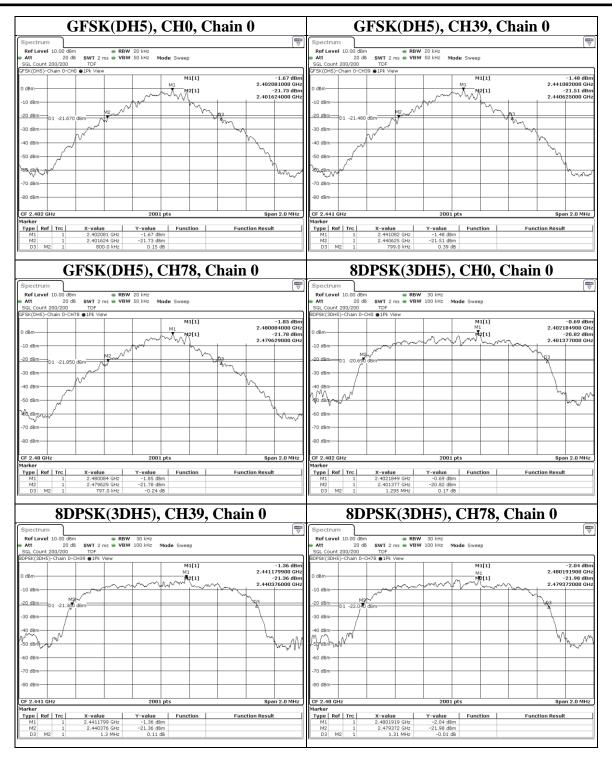
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# Test Data

Mode	СН	Freq (MHz)	20dB BW (MHz)	Limit (MHz)	Result
GFSK(DH5)	0	2402	0.800	N/A	Pass
GFSK(DH5)	39	2441	0.799	N/A	Pass
GFSK(DH5)	78	2480	0.797	N/A	Pass
8DPSK(3DH5)	0	2402	1.295	N/A	Pass
8DPSK(3DH5)	39	2441	1.300	N/A	Pass
8DPSK(3DH5)	78	2480	1.310	N/A	Pass



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# 9.2. Conducted Output Power

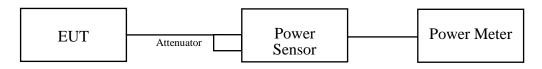
## **Requirements**

The Maximum Output Power Measurement is 125mW.

## **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.

# **Test Setup**



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.



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# Test Data

# **Peak Power**

#### **BT GFSK**

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	2.065	3.15	20.97	PASS
39	2441	2.042	3.10	20.97	PASS
78	2480	2.032	3.08	20.97	PASS

#### **BT 8DPSK**

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	1.991	2.99	20.97	PASS
39	2441	1.919	2.83	20.97	PASS
78	2480	2	3.01	20.97	PASS

# **Average Power (Reference Only)**

#### **BT GFSK**

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.837	2.64
39	2441	1.862	2.70
78	2480	1.816	2.59

#### **BT 8DPSK**

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.879	2.74
39	2441	1.807	2.57
78	2480	1.816	2.59



# 9.3. Hopping Channel Separation

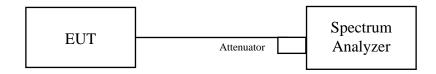
## **Requirements**

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

#### 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.
- 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.

## Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

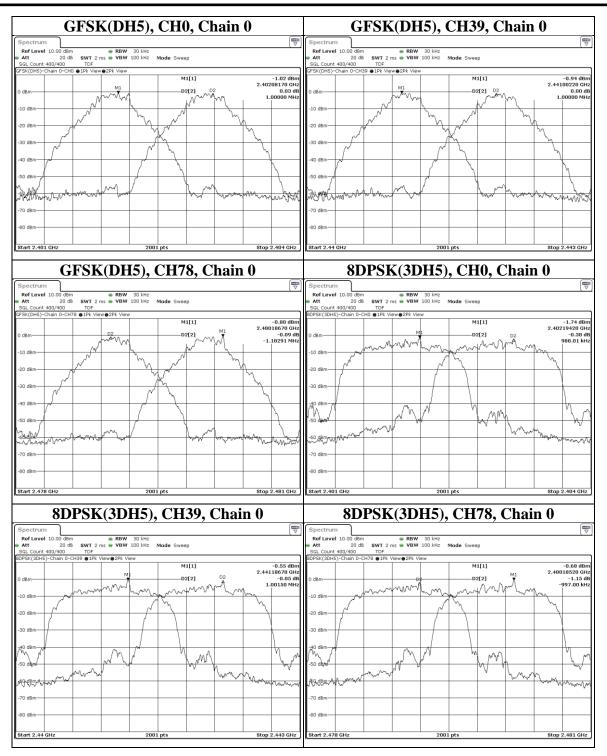
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# Test Data

Mode	СН	Freq (MHz)	Channel Separation (MHz)	> Limit (MHz)
GFSK(DH5)	0	2402	1	0.533
GFSK(DH5)	39	2441	1	0.533
GFSK(DH5)	78	2480	1.183	0.531
8DPSK(3DH5)	0	2402	0.988	0.863
8DPSK(3DH5)	39	2441	1.002	0.867
8DPSK(3DH5)	78	2480	0.997	0.873



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# 9.4. Number of Hopping Frequency Used

## **Requirements**

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

## 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.

### **Test Setup**



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.



# Test Data

There are 79 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

GFSK(DH5), FHSS, Chain 0	8DPSK(3DH5), FHSS, Chain 0	
Spectrum	Spectrum	
Ref Level 15.00 dBm	RefLevel 15.00 dBm   RBW 100 kHz	
Att 25 dB SWT 8 ms  VBW 300 kHz Mode Sweep SGL Count 5000/5000 TDF	Att 25 dB SWT 8 ms  VBW 300 kHz Mode Sweep SGL Count 5000/5000 TDF	
FSK(DHS)-Chain 0-FHSS @1Pk View	BDPSK(3DH5)-Chain 0-FHSS  PIk View	
10 dBm M1[1] 1.63 dBr		L.90 dBm
10 dBm 2.4798730 GH	2.1071	1830 GH2
· 김희사 영제 영제에서 이 방법이 있는 것이 같이 많은 것이 아니지 않는 것이 아니지 않는 것이 가지 않는다. 것은 아니지 않는 것이 나는 것이 아니지 않는다. 것은 아니지 않는 것이 아니지 않는		1994
-10 dem	-10 dBm	
-50 66W 7 14 14 14 14 14 14 14 14 14 14 14 14 14	-20 dBm	
\$0 dBm	-80 dBm	
		1
40 dBm	-40 dBm-	
50 dBm	50 dBm-	1
		ştin.
-60 dBm	-60 dBm	
-70 dBm-	-70 dBm-	
-80 dBm	-80 dBm	
Start 2.4 GHz 8001 pts Stop 2.4835 GHz	Hz Start 2.4 GHz 8001 pts Stop 2.48	335 GHz



# 9.5. Dwell Time on Each Channel

## **Requirements**

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.

## 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. 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.
- f. Measure the maximum time duration of one single pulse.
- A Period Time = (channel number)\*0.4
  For normal mode:
  DH1 Time Slot: Reading \* (1600/2)\*31.6/(channel number)
  DH3 Time Slot: Reading \* (1600/4)\*31.6/(channel number)
  DH5 Time Slot: Reading \* (1600/6)\*31.6/(channel number)
  For AFH mode:
  DH1 Time Slot: Reading \* (800/2)\*31.6/(channel number)
  DH3 Time Slot: Reading \* (800/4)\*31.6/(channel number)
  DH5 Time Slot: Reading \* (800/4)\*31.6/(channel number)

## Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

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# Test Data

Mode	Freq (MHz)	Length of transmission time (ms)	Dwell Time (ms)	Limit (ms)	Result
GFSK(DH1)	2441	0.365	116.800	400	Pass
GFSK(DH3)	2441	1.600	256.000	400	Pass
GFSK(DH5)	2441	2.840	302.933	400	Pass
8DPSK(3DH1)	2441	0.385	123.200	400	Pass
8DPSK(3DH3)	2441	1.625	260.000	400	Pass
8DPSK(3DH5)	2441	2.860	305.067	400	Pass



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GFSK(DH1), CH39, Chain 0         GFSK(DH3), CH39, Chain (           Spectrum         Spectrum           Ret avail 0.00 dbm         # BW 1 M42           * Att         10 db * BWT 10 ms * VW 3 M42           CFSK(DH2)-Chain 0-CH29 #10 Vew         * BW 1 10 ms           10 dbm         M Ma           10 dbm         <	-10.94 dBm 3.01000 ms -19.99 dBm 4.61000 ms 
Ref Level 0.00 dem       • BRW 1164: • Att         Att       10 db SWT 10 ms       • BRW 1164: • Att         Old B. SWT 10 ms       • BRW 1164: • Att       • Att       • Old B. SWT 10 ms       • BRW 1164: • Att         Old B. SWT 10 ms       • BRW 1164: • Att       • Att       • Old B. SWT 10 ms       • BRW 1164: • Att       • Att       • Old B. SWT 10 ms       • BRW 1164: • Att       • Att       • Old B. SWT 10 ms       • MI[1]       • III State         10 dbm       M1 M2       M1[4]       -10.66 dbm       -10.	-10.94 dBm 3.01000 ms -19.99 dBm 4.61000 ms 
Att       10 db = SWT 10 ms • VBW 3 Mtc         FSR(M1)-Chain 0-CH39 • DFk VBW       M1 ft1       -10.66 dbm         10 dbm       M1 ft1       -10.66 dbm         20 dbm       M1 ft1       -10.86 dbm         30 dbm       M1 ft1       -10.86 dbm         30 dbm       M1 ft1       -10.86 dbm         30 dbm       -10 dbm       M1 ft1         40 dbm       -10 dbm       -10 dbm         40 dbm       -10 dbm       -10 dbm         50 dbm       -10 dbm       -10 dbm         40 dbm       -10 dbm       -10 dbm	3.01000 ms 10.99 40m 4.01000 ms 1.00 ms/ n Result
M1 M2       M1[1]       -10.86 dm         20 dm       -10.30 dm       -10.30 dm         20 dm       -10.45 dm       -10.56 dm         30 dm       -10.45 dm       -10.45 dm         40 dm       -10.45 dm	3.01000 ms 10.99 40m 4.01000 ms 1.00 ms/ n Result
10 dBm       M1 M2       3.3000 ms         20 dBm       0 dBm       0 dBm         40 dBm       0 dBm       0 dBm         9 dBm       0 d	3.01000 ms 10.99 40m 4.01000 ms 1.00 ms/ n Result
20 dem       -0 dem       -0 dem       -0 dem         -0 dem       -0 dem       -0 dem       -0 dem	+.0100d ms
20 dBm	1.0 ms/
40 dbm       -40 dbm       -40 dbm       -40 dbm         50 dbm       -60 dbm       -60 dbm       -60 dbm         70 dbm       -70 dbm       -70 dbm       -70 dbm         70 dbm       -70 dbm	1.0 ms/
40 dBm       -40 dBm       -40 dBm       -40 dBm         40 dBm       -60 dBm       -60 dBm       -60 dBm         40 dBm       -60 dBm       -60 dBm       -60 dBm         70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -90 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm         -70 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm       -70 dBm      <	1.0 ms/
-30 dBm	1.0 ms/
-0 dBm	1.0 ms/
-0 dBm	1.0 ms/
-70 dBm	1.0 ms/
All of dem     All of dem       d0 dem     d0 dem       d0 dem     fill dem       d0 de	1.0 ms/
All of dem     All of dem       d0 dem     d0 dem       d0 dem     fill dem       d0 de	1.0 ms/
a0 dbm       a0 dbm       a dbm       <	1.0 ms/
CF 2.441 GHz         2001 pts         1.0 ms/           Marker         Type   Ref   Trc         X-value         Y-value         Function         Function           Marker         Type   Ref   Trc         X-value         Y-value         Function         Function           Mit         1         3.353 ms         1.06 dbm         Function         Function         Function           Mit         1         3.895 ms         -1.1.6 dbm         Function         Function         Function           Spectrum         For Lavel 0.00 dbm         BBW 1 MHz         Spectrum         For Lavel 5.00 dbm         FBW 1 MHz           Att         10 db SWT 20 ms         FBW 1 MHz         For Lavel 5.00 dbm         For Lavel 5.00 dbm         For Lavel 5.00 dbm           Att         10 db SWT 20 ms         FBW 1 MHz         For Lavel 5.00 dbm         For Lavel 5.00 dbm         For Lavel 5.00 dbm           Att         10 db SWT 20 ms         FBW 1 MHz         For Lavel 5.00 dbm	n Result
CF 2.441 GHz         2001 pts         1.0 ms/           Marker         Type [Ref   Trc         X-value         Y-value         Function         Function           Mit         1         3.53 ms         -1.0.66 dBm         Marker         Type [Ref   Trc         X-value         Y-value         Function           Mit         1         3.30 ms         -10.66 dBm         Function         Function         Function           Mit         1         3.30 ms         -10.66 dBm         Function         Function         Function           Mit         1         3.30 ms         -10.64 dBm         Function         Function           Mit         1         3.30 ms         -10.64 dBm         Function         Function           Mit         1         3.00 ms         -10.64 dBm         Function         Function           Spectrum         File         Function         Function         Function         Function           Spectrum         For Lavel 5.00 dBm         Function         Function         Function         Function           Spectrum         For Lavel 5.00 dBm         Function         Function         Function         Function           GFSK(DMS)-Chain 0-CH39 @ IPL View         Mit         Function	n Result
Marker         Marker           Type [Ref Trc         X-value         Function         Function Result           M1         1         3.63 ms         -10.86 dm         Function           M2         1         3.695 ms         -11.15 dbm         Function           GFSK(DH5), CH39, Chain 0           Spectrum           Ref Lavel 0.00 dbm         8WT 20 ms         9 kW 1 MHz           Att         10 db         9 kWT 20 ms         9 kW 3 MHz           GESK(DF)-chain O-CH39 9 IPk View         M1[1]         -11.16 dbm         e kWT 20 ms           M1         M2         -11.16 dbm         M1[1]         -11.16 dbm           0         M1         M2         M1[1]         M1[1]           0         M1	n Result
Type [Ref   Trc         X-value         Y-value	0
M1         1         3.0.1 ms         -10.94 dem           M2         1         3.0.1 ms         -10.94 dem           GFSK(DH5), CH39, Chain 0         Spectrum         Spectrum           Ref lavel 0.00 dem         • BBW 1 MHz         • BBW 1 MHz           GSR(DH5)-Chain 0-CH39 • DPk View         • BBW 1 MHz         • BBW 1 MHz           GSR(DH5)-Chain 0-CH39 • DPk View         • M1[1]         • 7.73000 ms           M1         M2         • 11.16 dem         • M1[1]           M2         · 0 dem         · 0 dem         · 0 dem           M1         M2         · 0 dem         · 0 dem         · 0 dem	0
GFSK(DH5), CH39, Chain 0       Spectrum       Ref Lavel 0.00 dBm     RBW 1 MHz       att     10 dBm       Att     10 dB       Spectrum     15 dB       Spectrum     10 dBm       M1     M2       M1     7.73000 ms       -10.16 dBm     M1       -10 dBm     M1       -10 dBm     M1	
Spectrum         Spectrum           Ref Lavel 0.00 d8m              • R8W 1 MHz               • Ref Lavel 5.00 d8m             • R8W 1 MHz               • Ref Lavel 5.00 d8m             • R8W 1 MHz             • Att             10 d8 • SWT 20 ms             • VBW 3 MHz               For Lavel 5.00 d8m             • Att             15 d8 • SWT 10 ms             • VBW 3 MHz                 • Att             10 d8 • SWT 20 ms             • VBW 3 MHz               • Att             15 d8 • SWT 10 ms             • VBW 3 MHz                 • FSK(DH5)-Chain 0-CH39 • IPk View               • M1[1]               • 11.16 d8m               • M1[1]               • Att               0 d8m               • M1[1]               • 0 d8m               • 0 d8m               • M2[1]               • 0 d8m               • 0 d8m               • M1[1]               • 0 d8m	
Spectrum         Spectrum           Ref Lavel 0.00 d8m              • R8W 1 MHz               • Ref Lavel 5.00 d8m             • R8W 1 MHz               • Ref Lavel 5.00 d8m             • R8W 1 MHz             • Att             10 d8 • SWT 20 ms             • VBW 3 MHz               For Lavel 5.00 d8m             • Att             15 d8 • SWT 10 ms             • VBW 3 MHz                 • Att             10 d8 • SWT 20 ms             • VBW 3 MHz               • Att             15 d8 • SWT 10 ms             • VBW 3 MHz                 • FSK(DH5)-Chain 0-CH39 • IPk View               • M1[1]               • 11.16 d8m               • M1[1]               • Att               0 d8m               • M1[1]               • 0 d8m               • 0 d8m               • M2[1]               • 0 d8m               • 0 d8m               • M1[1]               • 0 d8m	
Spectrum         Spectrum           Ref Level 0.00 dBm              • RBW 1 MHz               • Ref Level 0.00 dBm             • RBW 1 MHz               • Ref Level 0.00 dBm             • RBW 1 MHz               • Ref Level 0.00 dBm             • RBW 1 MHz               • Ref Level 0.00 dBm             • RBW 1 MHz               • Ref Level 0.00 dBm             • Att             15 dB • SWT 10 ms             • VBW 3 MHz            ESK(DH5)-Chain 0-CH39 • IDFk View               • M1(11)               -11.16 dBm               • M1               • M2               • M1	
Ref Level 0.00 dBm         ● RBW 1 MHz                Att             10 dB ● SWT 20 ms ● VBW 3 MHz               Ref Level 5.00 dBm             ● Att             15 dB ● SWT 10 ms ● VBW 3 MHz                 SFX(DH5)-Chain 0-CH39 ● IDF. View               If IIII               If IIII                 Lig dBm               M1             M2[1]               -11.16 dBm               M1 MI[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]                M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M1[1]               M2[1]               M2[1]               M2[1]               M2[1]                M2[1]	$\nabla$
Att         10 dB ● SWT 20 ms ● VBW 3 MHz         ➡ Att         15 dB ● SWT 10 ms ● VBW 3 MHz           GFSK(DH5)-Chain 0-CH39 ● IPk View         SDPSK(3DH1)-Chain 0-CH39 ● IPk View         SDPSK(3DH1)-Chain 0-CH39 ● IPk View	
M1[1]         -11.16 dbm         0 dbm         M1[1]           .10 dbm         M2[1]         -11.06 dbm         0 dbm         M1[1]           .00 dbm         M2[1]         -10.06 dbm         M1[1]         M2[1]	
_10 dBm M1 M2 7,73000 ms 0 dBm M2[1] A[1] A[1] A[1] A[1] A[1] A[1] A[1] A	
-10 dBm	-10.97 dBm 4.30500 ms
	-10.74 dBm
-2d dBm	4.690 <b>0</b> 0ms
-20 dBm	
-30 dBm	
-40 dem	
-40 dBm	
-51 dbm	
-6¢ d8m	
-60 dBm	
-79 and the second seco	براعد الماعت الماعين
00.0800	فيراط فقاصده وأعدا
-90 dbm	
-90 dem	
CF 2.441 GHz 2001 pts 2.0 ms/ CF 2.441 GHz 2001 pts	1.0 ms/
Marker Marker	
Type         Ref         Trc         X-value         Y-value         Function         Function Result         Trg         X-value         Y-value         Function         Function           M1         1         7.73 ms         -11.16 dBm         M1         1         4.305 ms         -10.97 dBm         -10.97 dBm<	1 Result
M2 1 10.57 ms -11.21 dBm M2 1 4.69 ms -10.74 dBm	
8DPSK(3DH3), CH39, Chain 0 8DPSK(3DH5), CH39, Chain	0
Spectrum Spectrum	
Speciality         Operating         Operating           Refixed Stool Bm         RBW 1 MHz         Refixed Stool Bm         RBW 1 MHz	
■ Att 15 dB ● SWT 10 ms ● VBW 3 MHz ■ Att 15 dB ● SWT 20 ms ● VBW 3 MHz	
80P5K(20H3)-Chain 0-CH39 @1Pk View	-11.03 dBm
0 dBm 1.57500 ms 0 dBm 1.57500 ms	3.63000 ms
1000 M2	-9.55 dBm 6.490001115
-20 dBm	
-30 dbm	
40 dbm	
-50 dBm	
-70 dam water and water and water and a second a second and a second a s	and the state of the second
90 GBW	
-90 dBm 0 dBm	
GF 2.441 GHz 2001 pts 1.0 ms/ GF 2.441 GHz 2001 pts	2.0 ms/
Marker Type Ref Trc X-value Function Function Result Type Ref Trc X-value Function Function Function Result Type Ref Trc X-value Function Function	n Result
M1 1 1.575 ms -11.04 dBm M1 1 3.63 ms -11.03 dBm	
M2 1 3.2 ms -9.46 dBm M2 1 6.49 ms -9.55 dBm	



## 9.6. Conducted Out of Band Emission

#### **Requirements**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b) (3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209 (a) is not required.

#### 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.

## Test Setup

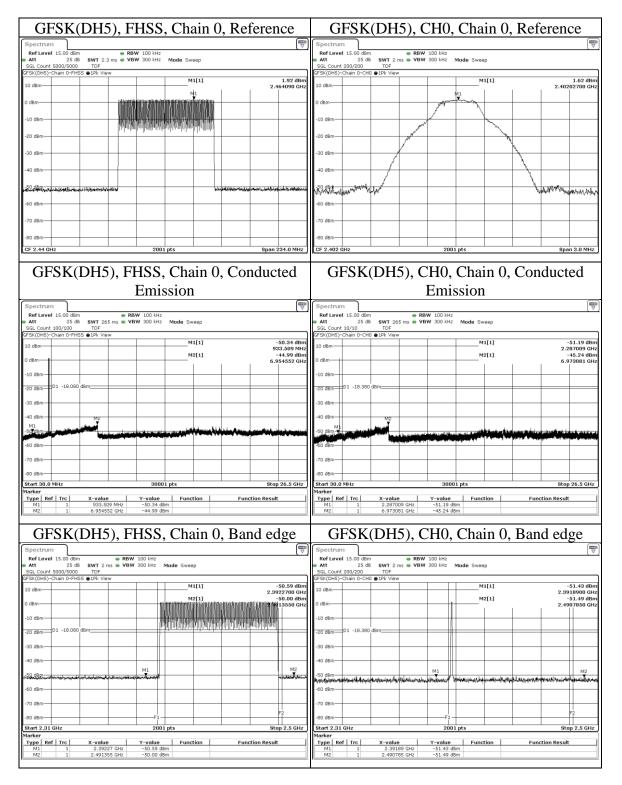


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.



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## <u>Test Data</u>



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GFSK(DH5), CH39, Chain 0, Reference	GFSK(DH5), CH78, Chain 0, Reference
Spectrum	Spectrum
Ref Level 15.00 dBm	Ref Level 15.00 dBm
Att 25 dB SWT 2 ms VBW 300 kHz Mode Sweep     SGL Count 200/200 TDF	Att 25 dB SWT 2 ms      VBW 300 kHz Mode Sweep SGL Count 200/200 TDF
GFSK(DH5)-Chain 0-CH39 @1Pk View M1[1] 1.54 dBm	GFSK(DH5)-Chain 0-CH78 @1Pk View M1[1] 1.80 dBm
10 dBm 2.44101950 GHz	10 dBm 2.48003300 GHz
0 dBm	0 dBm
-10 dBm	-10 dBm
-10 dBm	-10 OBIN
-20 dBm	-20 dBm
-30 dBm	-30 dBm
-40 dBm-	-40 dBm
SP 202 to a solo and a	- FRISPEr value with the way of t
-60 dBm	-60 dBm
-70 dBm	-70 dBm
-80 dBm	-80 dBm
-80 UBIT CF 2.441 GHz 2001 pts Span 3.0 MHz	-80 08/11         CF 2.48 GHz         2001 pts         Span 3.0 MHz
	Les and and the source span 3.0 minz j
GFSK(DH5), CH39, Chain 0, Conducted	GFSK(DH5), CH78, Chain 0, Conducted
Emission	Emission
Spectrum 🕎	Spectrum 🕎
RefLevel 15.00 dBm      RBW 100 kHz     Att 25 dB SWT 265 ms VBW 300 kHz Mode Sweep	RefLevel 15.00 dBm      RBW 100 kHz     Att 25 dB SWT 265 ms      VBW 300 kHz Mode Sweep
SGL Count 10/10 TDF GFSK(DHS)-Chain 0-CH39 @1Pk View	SGL Count 10/10 TDF GFSK(DH5)-Chain 0-CH78  PV View
10-10- M1[1] -51.05 dBm	10 db_ M1[1] -50.52 dBm
M2[1] -45.81 dBm	M2[1] -45.41 dBm
0 dBm 6.638677 GHz	0 dBm 6.966905 GHz
-10 dBm	-10 dBm
-20 dBm D1 -18.460 dBm	-20 dBm D1 -18.200 dBm
-30 dBm	-30 dBm
-40 dBm	-40 dBm
M1 Athen	M1 Juli-Juli
"50 dBm	"60 d8m-
-70 dBm	-70 dBm
-80 dBm	-80 dBm
Start 30.0 MHz 30001 pts Stop 26.5 GHz	Start 30.0 MHz         30001 pts         Stop 26.5 GHz
Marker Type Ref Trc X-value Y-value Function Function Result	Marker Type   Ref   Trc   X-value   Y-value   Function   Function Result
M1         1         757.043 MHz         -51.05 dBm           M2         1         6.638677 GHz         -45.81 dBm	M1         1         2.296714 GHz         -50.52 dBm           M2         1         6.966905 GHz         -45.41 dBm
GFSK(DH5), CH39, Chain 0, Band edge	GFSK(DH5), CH78, Chain 0, Band edge
Spectrum 🕎	Spectrum 🕎
RefLevel 15.00 dBm	RefLevel 15.00 dBm ● RBW 100 kHz ● Att 25 dB SWT 2 ms ● VBW 300 kHz Mode Sweep
SGL Count 200/200 TDF	SGL Count 200/200 TDF
GFSK(DH5)-Chain 0-CH39 ●1Pk View 10 dBm	GFSK(DH5)-Chain 0-CH78 ●1Pk View 10 dBm
M2[1] -51.29 dBm	2.3967350 GH2 M2[1] -51.39 dBm
0 dBm 2.4905000 GHz	0 dBm 2.4917350 GHz
-10 dBm	-10 dBm
-20 dBm D1 -18.460 dBm	-20 dBm-01 -18.200 dBm
-30 dBm	-30 dBm
-40 dBm	-40 dBm
	M1 M2
-SD dam	-50 com an interpretenting and an inder and in the interpretential of the first with the second strategies and interpretentiation of the second strategies and the second stra
-60 dBm	-60 dBm
-70 dBm-	-70 dBm
-80 dBm - F1 - F1	-80 dBm F1
-80 d8m - F1 - F2 Start 2.31 GHz 2001 pts Store 2.5 GH2	Start 2.31 GHz         2001 pts         Stop 2.5 GHz
80 d8m         F1         F2           Start 2.31 GHz         2001 pts         Stop 2.5 GHZ           Marker         Type [Ref   Trc   X-value         Y-value         Function	Start 2.31 GHz         2001 pts         Stop 2.5 GHz           Marker         Type [kef   Trc         X-value         Function         Function Result
-80 dBm F1 F1 F2 Stort 2.31 GHz 2001 pts Stop 2.5 GHz Marker	Start 2.31 GHz 2001 pts Stop 2.5 GHz Marker



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8DPSK(3DH5), FHSS, Chain 0, Reference	8DPSK(3DH5), CH0, Chain 0, Reference
	Spectrum III
RefLevel 15.00 dBm      RBW 100 kHz     Att 25 dB SWT 2.3 ms      VBW 300 kHz Mode Sweep	RefLevel 15.00 dBm ● RBW 100 kHz ● Att 25 dB SWT 2 ms ● VBW 300 kHz Mode Sweep
SGL Count 5000/5000 TDF BDPSK(3DH5)-Chain 0-FHSS @1Pk View	SGL Count 200/200 TDF 8DPSK(3DH5)-Chain 0-CH0 ●1Pk View
M1[1] 1.75 dBm	M1[1] 1.36 dBm
10 dBm 2.432160 GHz	10 dBm 2.40202250 GHz
	0 dBm
-10 dBm-	-10 dBm
-20 dBm	-20 dBm
-30 dBm	-30 dBm
-30 UDII	"30 UBII"
-40 dBm	-40 dBm WWW
ED JD	porter with the second se
anightestingeneralisteringeneralisteringeneralisteringen	Veh code, a let
-60 dBm	-60 dBm
70.40	70.40-
-70 dBm	-70 dBm
-80 dBm-	-80 dBm
CF 2.44 GHz 2001 pts Span 234.0 MHz	CF 2.402 GHz 2001 pts Span 3.0 MHz
0	
8DPSK(3DH5), FHSS, Chain 0, Conducted	8DPSK(3DH5), CH0, Chain 0, Conducted
Emission	Emission
Spectrum	Spectrum 🕎
Ref Level 15.00 dBm	Ref Level 15.00 dBm
Att 25 dB SWT 265 ms VBW 300 kHz Mode Sweep SGL Count 100/100 TDF	Att 25 dB SWT 265 ms ● VBW 300 kHz Mode Sweep SGL Count 10/10 TDF
8DPSK(3DH5)-Chain 0-FHSS @1Pk View	8DPSK(3DH5)-Chain 0-CH0 @1Pk View
10 dBm M1[1] -49.99 dBm 2.229657 GHz	10 dBm
0 dBm M2[1] -44.42 dBm 6.953670 GHz	0 dBm M2[1] -46.15 dBm 6.890142 GHz
-10 dBm-	-10 dBm
-20 dBm D1 -18.250 dBm	-20 dBm D1 -18.640 dBm
-30 dBm	-30 dBm
-40 dBm M2	-40 dBm
-60 dBm	-60 dBm
-70 dBm	-70 dBm
-80 dBm-	-80 dBm-
Start 30.0 MHz 30001 pts Stop 26.5 GHz	Start 30.0 MHz 30001 pts Stop 26.5 GHz
Marker	Marker
Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.229657 GHz         -49.99 dBm	Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         1.703786 GHz         ~51.50 dBm
M2 1 6.95367 GHz -44.42 dBm	M2 1 6.890142 GHz -46.15 dBm
	$0$ DD $0$ W (2D US) CUO CI $\cdot$ 0 D 1 1
8DPSK(3DH5), FHSS, Chain 0, Band edge	8DPSK(3DH5), CH0, Chain 0, Band edge
Spectrum 🐺	Spectrum 🕎
RefLevel         15.00 dBm         Image: RBW         100 kHz           Att         25 dB         SWT 2 ms         VBW         300 kHz         Mode         Sweep	Ref Level         15.00 dBm         RBW         100 kHz           Att         25 dB         SWT 2 ms         VBW         300 kHz         Mode         Sweep
SGL Count 5000/5000 TDF	SGL Count 200/200 TDF
8DPSK(3DH5)-Chain 0-FHSS ●1Pk View 10-40	8DPSK(3DH5)-Chain 0-CH0 ●1Pk View 10-40- M1[1] -51.86 dBm
10 dBm 23970200 GHz 2.3970200 GHz 49.61 dBm	10 dBm 23962600 GHz 23962600 GHz M2[1] -50.52 dBm
0 dBm	0 dBm 2.4918300 GHz
-10 dBm	-10 dBm
-20 dBm D1 -18.250 dBm	-20 dBm
-30 dBm	-30 dBm
-40 dBm	-40 dBm-
M1 M2	-50 dBm M1
	Barrison and Barrison and Contraction and a grant and a start and a
-60 dBm-	-60 dBm
-70 dBm	-70 dBm-
-80 dBm F1	-80 dBm
Start 2.31 GHz 2001 pts Stop 2.5 GHz	Start 2.31 GHz         2001 pts         Stop 2.5 GHz
Marker Type   Ref   Trc   X-value   Y-value   Function   Function Result	Marker           Type         Ref         Trc         X-value         Y-value         Function         Function Result
M1 1 2.39702 GHz -50.62 dBm	M1 1 2.39626 GHz -51.86 dBm
M2 1 2.492875 GHz -49.61 dBm	M2 1 2.49183 GHz -50.52 dBm



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	8DPSK(3DH5), CH78, Chain 0, Reference		
Spectrum	Spectrum		
Ref Level 15.00 dBm      RBW 100 kHz			
SGL Count 200/200 TDF	Att 25 dB SWT 2 ms      VBW 300 kHz Mode Sweep     SGL Count 200/200 TDF     T		
3DPSK(3DH5)-Chain 0-CH39 ●1Pk View M1[1] 2.04 dBi	BDPSK(3DH5)-Chain 0-CH78 ●1Pk View m M1[1] 1.80 dBm		
10 dBm 2.44118440 GH	10 dBm 2.47986510 GHz		
0 dBm	avenue for the former for the former former		
-10 dBm	-10 dBm		
-20 dBm	-20 dBm		
-30 dBm	-30 dBm		
-40 dBm AMD W	-40 dBm // // //		
No. Alter	and the second sec		
sacon for high history	South and the second se		
-60 dBm	-60 dBm		
-70 dBm	-70 dBm		
-70 dbm	-70 dbm		
-80 dBm-	-80 dBm		
CF 2.441 GHz 2001 pts Span 3.0 MHz	CF 2.48 GHz 2001 pts Span 3.0 MHz		
B approximate approximate			
ODDCV(2DUS) CU20 Chain O Car desta	ODDCK(2DUS) CU70 Chain O Carlented		
8DPSK(3DH5), CH39, Chain 0, Conducted	8DPSK(3DH5), CH78, Chain 0, Conducted		
Emission	Emission		
Spectrum	Spectrum 🕎		
Ref Level 15.00 dBm	RefLevel 15.00 dBm		
Att 25 dB SWT 265 ms	Att 25 dB SWT 265 ms      VBW 300 kHz Mode Sweep     SGL Count 10/10 TDF     TDF		
8DPSK(3DH5)-Chain D-CH39  1Pk View	8DPSK(3DH5)-Chain 0-CH78  1Pk View		
10 dBm M1[1] -50.39 dBr 1.798196 GH			
M2[1] -45.53 dB	n M2[1] -45.28 dBm		
0 dBm 6.989845 GH	6.961611 GHz		
-10 dBm	-10 dBm		
-20 dBm 01 -17.960 dBm	-20 dBm D1 -18.200 dBm		
-20 dBm	-20 dBm		
-30 dBm	-30 dBm		
-40 dBm	-40 dBm		
M1 M2			
E60 dBm	CO dBm		
-70 dBm-	-70 dBm		
-80 dBm	-80 dBm-		
Start 30.0 MHz 30001 pts Stop 26.5 GHz	Start 30.0 MHz 30001 pts Stop 26.5 GHz		
Marker	Marker		
Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         1.798196 GHz         -50.39 dBm         -50.39 dBm <t< th=""><th>Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         860.276 MHz         -51.25 dBm         <td< th=""></td<></th></t<>	Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         860.276 MHz         -51.25 dBm         -51.25 dBm <td< th=""></td<>		
M2 1 6.989845 GHz -45.53 dBm M2 1 6.961611 GHz -45.28 dBm			
8DPSK(3DH5), CH39, Chain 0, Band edge	8 8DPSK(3DH5), CH78, Chain 0, Band edge		
Spectrum			
Ref Level 15.00 dBm  RBW 100 kHz	Ref Level 15.00 dBm   RBW 100 kHz		
Att 25 dB SWT 2 ms VBW 300 kHz Mode Sweep	Att 25 dB SWT 2 ms VBW 300 kHz Mode Sweep		
SGL Count 200/200 TDF BDPSK(3DH5)-Chain 0-CH39 @1Pk View	SGL Count 200/200 TDF 8DPSK(3DH5)-Chain 0-CH78 ●1Pk View		
10 dbg M1[1] -51.10 dB	m 10 / M1[1] -51.67 dBm		
2.3935050 GH M2[1] -51.43 dBi	2.3993000 GHZ		
0 dBm 2.4944900 GH			
-10 dBm	-10 dBm		
-20 dBm 01 -1/.960 dBm	-20 dBm D1 -18.200 dBm		
-30 dBm	-30 dBm		
-40 dBm	-40 dBm		
-40 dBm	-40 dBm-		
	-50 dam Ma Ma -50 dam Ma Managara (1994) มาการการการการการการการการการการการการการ		
-50 dBm M1 M2			
50 08m - San and the way and a second and for the san and the san			
-50 dBm	-70 dBm		
-50 dam winnelsenne starmannen herringen geringen in frijdere fordingen ander son herringen in herringen ander son de			
-30 cm -30 cm	F2		
-30 Bm- -30 Bm- -70 Bm- -70 Bm- -80 Bm- -70 Bm- -80 Bm- -70 Bm- -80 Bm- -70 Bm- -80 Bm- -70 Bm- -80 Bm- -71 Bm- -81			
- 50 cm - 50 cm - 50 cm - 70 cm - 7	-80 dBm         F1         F2           Start 2.31 GHz         2001 pts         Start 2.5 GHz           Marker         Start 2.10 GHz         Start 2.10 GHz		
-50 dBm -50 dBm -70 dB	80 dbm         F1         F2           Start 2.31 GHz         2001 pts         Stap 2.5 GHz           Marker         1         Type [ Ref   Trc   X-value         Y-value         Function Result		
-30 Bm -30 Bm -30 Bm -70 Bm -70 Bm -70 Bm -70 Bm -71 Btot 2 2001 pts Stop 2.5 GH2 Marker	-80 dBm F1 Start 2.31 GHz 2001 pts Stop 2.5 GHz Marker		



# 9.7. Radiated Spurious Emission

### **Requirements**

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:

Frequency(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.



## **Test Procedures**

[For  $9 \text{ kHz} \sim 30 \text{ MHz}$ ]

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter a. 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. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

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

[For above 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters (for  $30MHz \sim 1GHz$ ) / 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. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Ouasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- f. The test-receiver system was set to peak and average detects 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.
- 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.

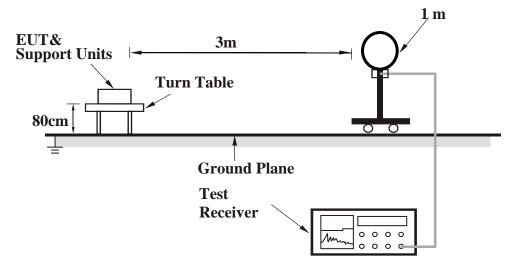
Configuration	Average			
Configuration	RBW	VBW		
Bluetooth	1MHz	Refer to section 6.6 for duty cycle.		

- 4. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
- 5. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
- 6. Test data of Margin(dB) = Result value (dBuV/m) Limit value (dBuV/m).
- 7. Test data of Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) Preamp Factor (dB).
- 8. Test data of Notation "@" = Fundamental Frequency
- 9. Test data of Notation " \* " = The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

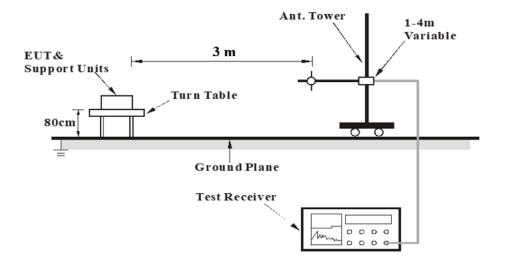
(UL)	Test report No. Page Issued date FCC ID	: 4790446225-US-R3-V0 : 39 of 71 : 2022/8/1 : YAISB35
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## **Test Setup**

<Frequency Range 9 kHz ~ 30 MHz>

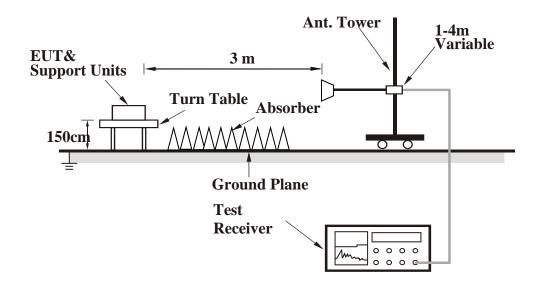


<Frequency Range 30 MHz ~ 1 GHz >



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<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.



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# Test Data

**Dipole Antenna** 

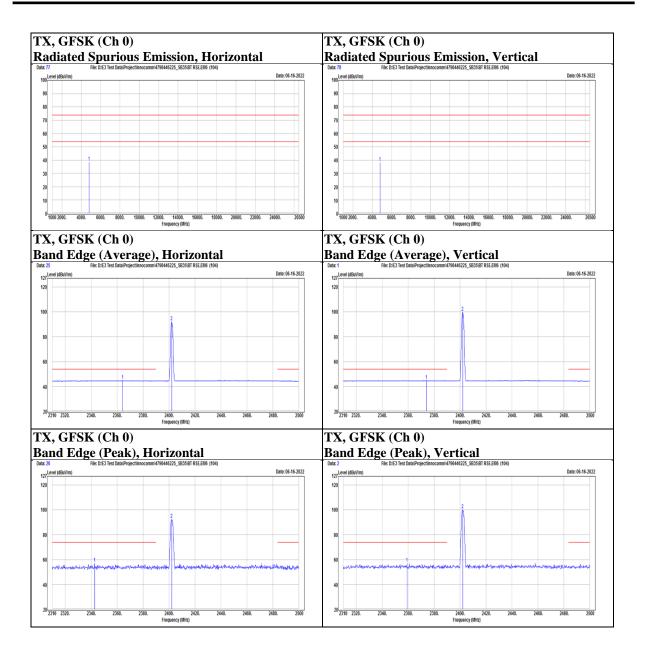
#### Above 1 GHz

Mode	GFSK	Channel	0

Polarization Notation	Frequency	Reading	Correct	Result	Limit	Margin	Domont	
	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark
		2342.68	41.07	15.9	56.97	74	-17.03	PK
		2364.15	28.81	15.87	44.68	54	-9.32	AVG
Horizontal	@	2402	76.58	15.8	92.38	N/A	N/A	PK
	@	2402	76.24	15.8	92.04	N/A	N/A	AVG
	*	4804	36.33	2.33	38.66	74	-35.34	PK
Vertical		2359.02	41.11	15.88	56.99	74	-17.01	PK
		2374.03	28.9	15.85	44.75	54	-9.25	AVG
	@	2402	84.11	15.8	99.91	N/A	N/A	PK
	@	2402	83.9	15.8	99.7	N/A	N/A	AVG
	*	4804	35.92	2.33	38.25	74	-35.75	РК



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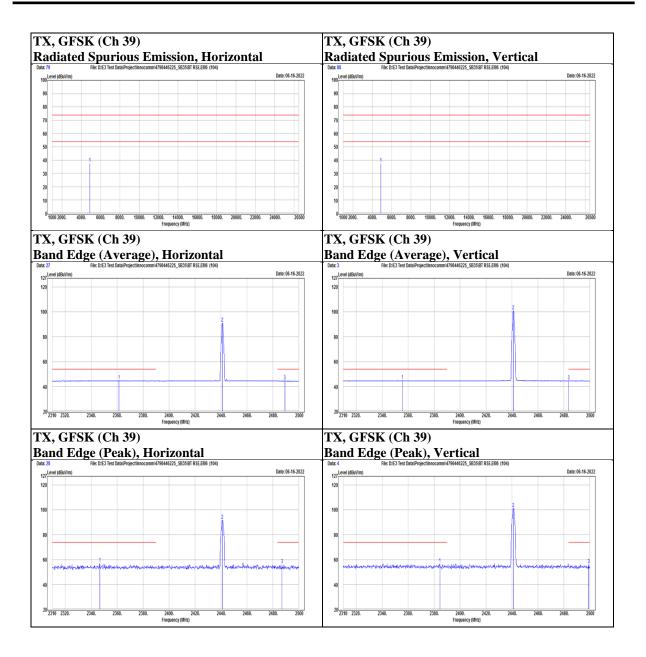


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Mode G	FSK Channel 39							
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
TOTATIZATION	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kellark
		2346.67	41.25	15.9	57.15	74	-16.85	PK
		2361.49	28.79	15.87	44.66	54	-9.34	AVG
	@	2441	75.64	15.94	91.58	N/A	N/A	PK
Horizontal	@	2441	74.92	15.94	90.86	N/A	N/A	AVG
		2487.08	40.27	15.66	55.93	74	-18.07	PK
		2489.17	28.88	15.64	44.52	54	-9.48	AVG
	*	4882	35.16	2.41	37.57	74	-36.43	PK
		2355.6	28.91	15.89	44.8	54	-9.2	AVG
		2384.48	40.72	15.83	56.55	74	-17.45	PK
	@	2441	85.2	15.94	101.14	N/A	N/A	PK
Vertical	@	2441	84.82	15.94	100.76	N/A	N/A	AVG
		2483.66	28.87	15.68	44.55	54	-9.45	AVG
		2499.05	40.6	15.56	56.16	74	-17.84	PK
	*	4882	35.1	2.41	37.51	74	-36.49	PK



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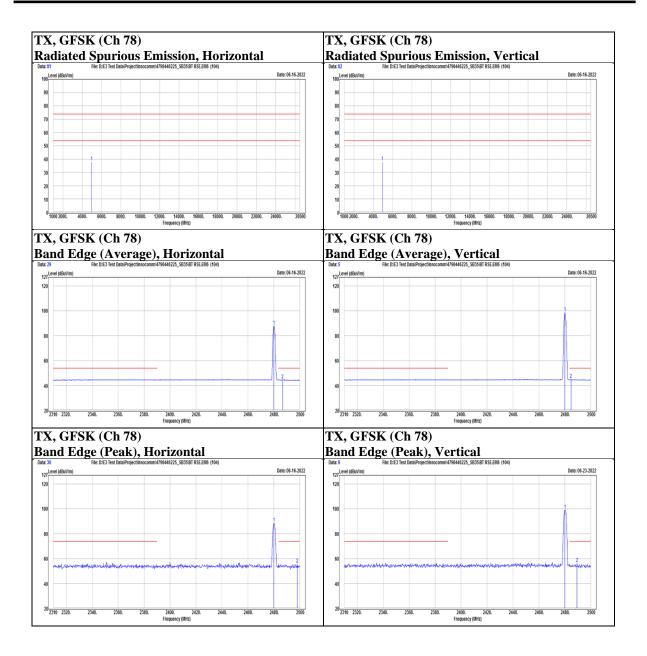




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Mode GI	FSK	K Channel 78						
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
FOIAITZALIOII	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kennark
	@	2480	72.82	15.72	88.54	N/A	N/A	PK
	@	2480	72.24	15.72	87.96	N/A	N/A	AVG
Horizontal		2486.7	28.82	15.66	44.48	54	-9.52	AVG
		2497.91	40.09	15.57	55.66	74	-18.34	PK
	*	4960	35.59	2.43	38.02	74	-35.98	PK
	@	2480	83.36	15.72	99.08	N/A	N/A	PK
	@	2480	82.89	15.72	98.61	N/A	N/A	AVG
Vertical		2484.61	29.15	15.67	44.82	54	-9.18	AVG
		2489.36	40.32	15.64	55.96	74	-18.04	PK
	*	4960	35.5	2.43	37.93	74	-36.07	PK





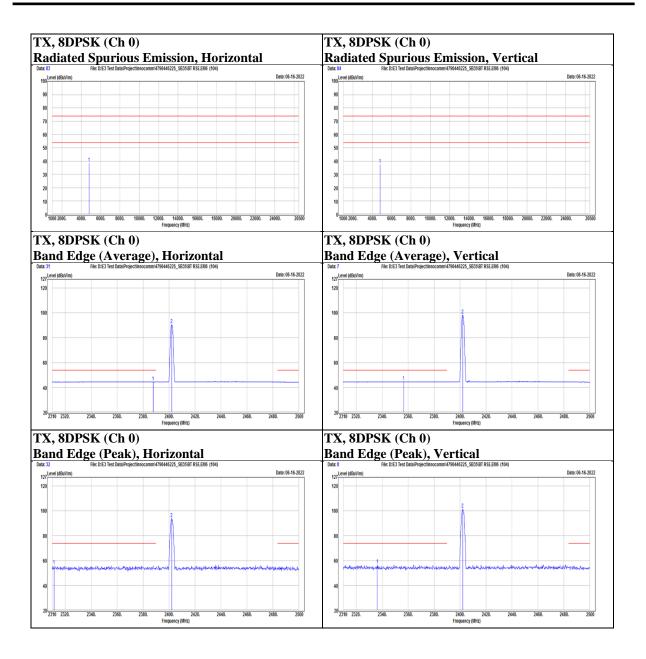


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Mode 8D	PSK Channel 0							
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
FOIAIIZATIOII	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kemark
		2311.33	40.1	15.84	55.94	74	-18.06	PK
		2387.71	28.83	15.82	44.65	54	-9.35	AVG
Horizontal	@	2402	78.13	15.8	93.93	N/A	N/A	PK
	@	2402	74.89	15.8	90.69	N/A	N/A	AVG
	*	4804	36.36	2.33	38.69	74	-35.31	PK
		2336.22	40.99	15.89	56.88	74	-17.12	PK
		2356.55	28.8	15.89	44.69	54	-9.31	AVG
Vertical	@	2402	85.6	15.8	101.4	N/A	N/A	PK
	@	2402	82.42	15.8	98.22	N/A	N/A	AVG
	*	4804	35.24	2.33	37.57	74	-36.43	PK



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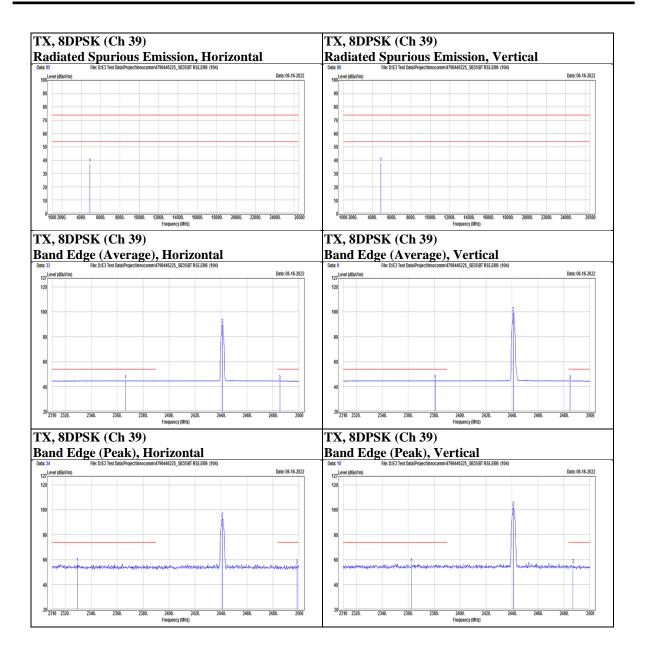


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Mode 8I	Mode 8DPSK Channel 39							
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
Tolarization	rotation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark
		2329.57	41.31	15.88	57.19	74	-16.81	PK
		2366.43	28.85	15.86	44.71	54	-9.29	AVG
	@	2441	77.41	15.94	93.35	N/A	N/A	PK
Horizontal	@	2441	74.09	15.94	90.03	N/A	N/A	AVG
		2485.37	28.79	15.67	44.46	54	-9.54	AVG
		2498.48	40.22	15.57	55.79	74	-18.21	PK
	*	4882	34.96	2.41	37.37	74	-36.63	PK
		2362.63	40.91	15.88	56.79	74	-17.21	PK
		2380.87	28.95	15.84	44.79	54	-9.21	AVG
	@	2441	86.3	15.94	102.24	N/A	N/A	PK
Vertical	@	2441	83.57	15.94	99.51	N/A	N/A	AVG
		2484.8	28.88	15.67	44.55	54	-9.45	AVG
		2487.08	40.36	15.66	56.02	74	-17.98	PK
	*	4882	35.46	2.41	37.87	74	-36.13	РК



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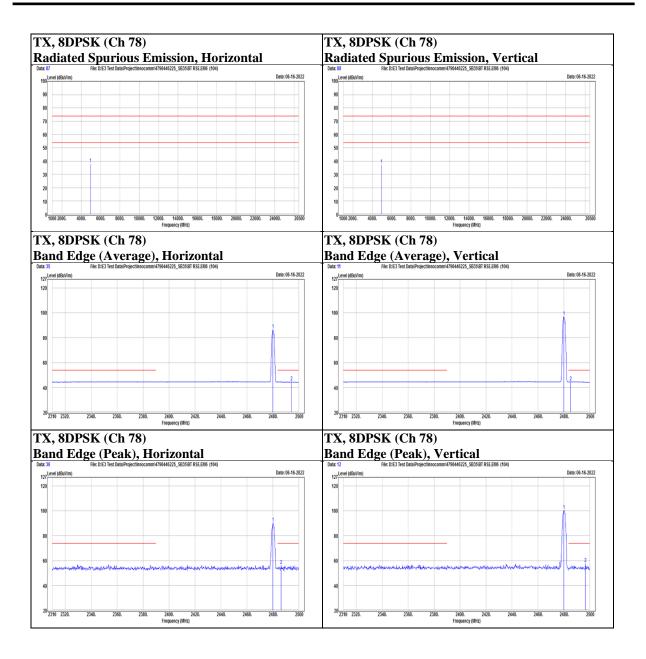


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Mode 8D	PSK Channel 78							
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
FOIAIIZATIOII	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kemark
	@	2480	74.61	15.72	90.33	N/A	N/A	PK
	@	2480	70.64	15.72	86.36	N/A	N/A	AVG
Horizontal		2486.32	40.41	15.67	56.08	74	-17.92	PK
		2494.3	28.86	15.6	44.46	54	-9.54	AVG
	*	4960	35.47	2.43	37.9	74	-36.1	PK
	@	2480	84.57	15.72	100.29	N/A	N/A	PK
	@	2480	81.25	15.72	96.97	N/A	N/A	AVG
Vertical		2485.18	28.96	15.67	44.63	54	-9.37	AVG
		2496.58	42.1	15.57	57.67	74	-16.33	PK
	*	4960	34.81	2.43	37.24	74	-36.76	PK



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## Below 1 GHz

Mode	GFSK	Channel	0

Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
Folarization Notation	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark
		159.98	37.54	-11.11	26.43	43.5	-17.07	РК
		191.02	43.37	-13.2	30.17	43.5	-13.33	РК
Horizontal		203.63	46.63	-13.99	32.64	43.5	-10.86	РК
PK		228.85	41.63	-12.78	28.85	46	-17.15	РК
		263.77	40.92	-11.27	29.65	46	-16.35	РК
		312.27	38.58	-9.7	28.88	46	-17.12	РК
		72.68	41.31	-14.62	26.69	40	-13.31	РК
		148.34	37.96	-11.57	26.39	43.5	-17.11	РК
Vertical		296.75	38.89	-10.13	28.76	46	-17.24	РК
vertical		323.91	37.51	-9.23	28.28	46	-17.72	РК
		359.8	36.56	-8.3	28.26	46	-17.74	
		424.79	37.85	-6.39	31.46	46	-14.54	РК

K, GFS	SK (Ch 0)			TX, GFSK (Ch 0)							
	d Spurious Em		ontal	Radiated						al	
101	File: D:/E3 Test Data/Project/Innocomm/4790	0446225_SB35/BT RSE.EM6 (104)		Data: 102	File: D:IE3 Test Data Pro	ject'Innocommi4	790446225_SB35	BT RSE.EM6 (1	04)		
Level (dBuV/m)			Date: 06-21-2022	80 Level (dBuV/m)							Date: 06-21-2022
				70							
				60							
			-648	50							-648
									_		
				40							
	3										
	2 4 5 6			30 1	3 4	-5 Ĭ					
					i						
				20							
				10							
30 100.	200. 300. 400.	500. 600. 700.	800. 900. 1000	0 30 100.	200. 300.	400.	500.	600.	700.	800.	900. 1000
		Frequency (MHz)	000 000 1000	00 100.	100. July	400.	Frequency (MH		1 1 1 1		1000

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	FCC ID	I AISDSS

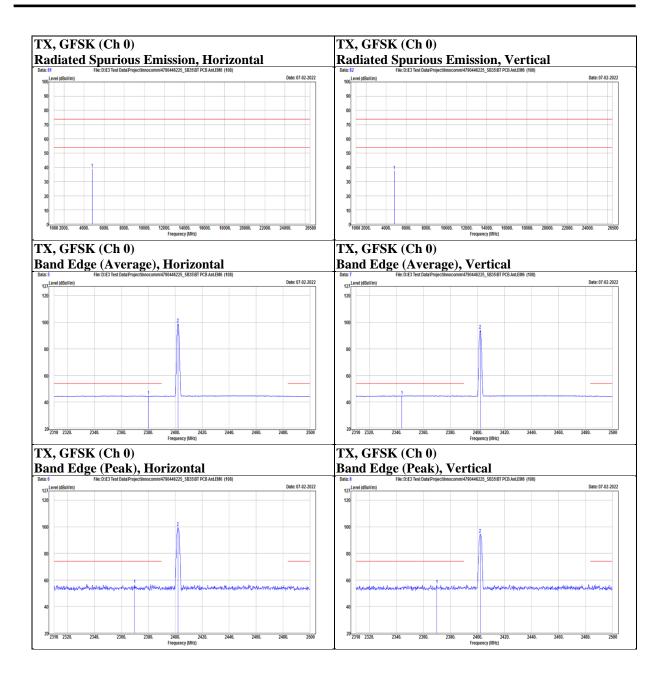
#### **PCB** Antenna

#### Above 1 GHz

Mode GI	Channel 0								
					-				
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Domort	
Folalization	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark	
		2369.85	40.86	15.86	56.72	74	-17.28	PK	
		2380.11	28.86	15.84	44.7	54	-9.3	AVG	
Horizontal	@	2402	83.78	15.8	99.58	N/A	N/A	PK	
	@	2402	83.13	15.8	98.93	N/A	N/A	AVG	
	*	4804	36.61	2.33	38.94	74	-35.06	PK	
		2344.01	28.89	15.89	44.78	54	-9.22	AVG	
		2369.85	40.47	15.86	56.33	74	-17.67	PK	
Vertical	@	2402	78.7	15.8	94.5	N/A	N/A	РК	
	@	2402	78.39	15.8	94.19	N/A	N/A	AVG	
	*	4804	35.27	2.33	37.6	74	-36.4	PK	



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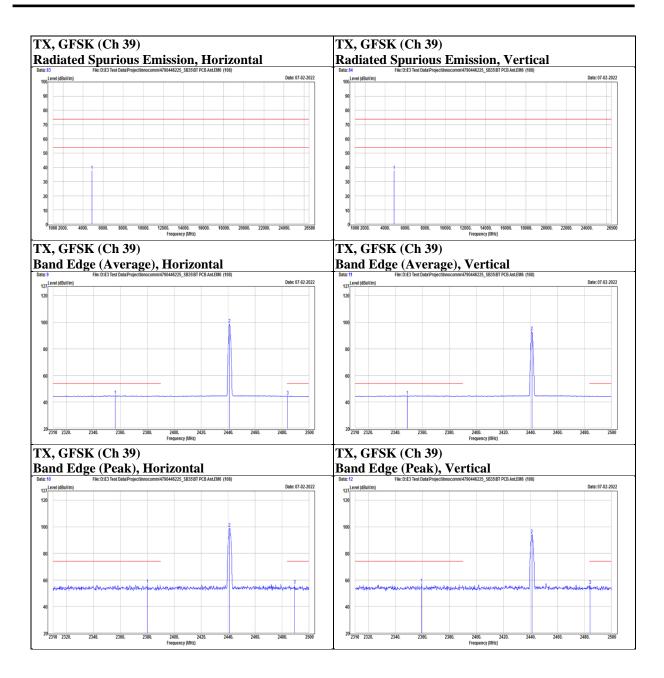


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	I CC ID	

Mode GFSK				Chanr	nel 39			
			-					
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
FOIAITZALIOII	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kemark
		2356.17	28.97	15.9	44.87	54	-9.13	AVG
		2380.11	40.78	15.84	56.62	74	-17.38	РК
	@	2441	83	15.94	98.94	N/A	N/A	PK
Horizontal	@	2441	82.78	15.94	98.72	N/A	N/A	AVG
		2484.04	28.93	15.68	44.61	54	-9.39	AVG
		2489.36	40.77	15.64	56.41	74	-17.59	PK
	*	4882	35.26	2.41	37.67	74	-36.33	PK
		2348.76	28.89	15.9	44.79	54	-9.21	AVG
		2359.21	41.28	15.88	57.16	74	-16.84	PK
Vertical	@	2441	78.19	15.94	94.13	N/A	N/A	PK
vertical	@	2441	76.97	15.94	92.91	N/A	N/A	AVG
		2484.04	40.48	15.68	56.16	74	-17.84	PK
	*	4882	35.29	2.41	37.7	74	-36.3	PK



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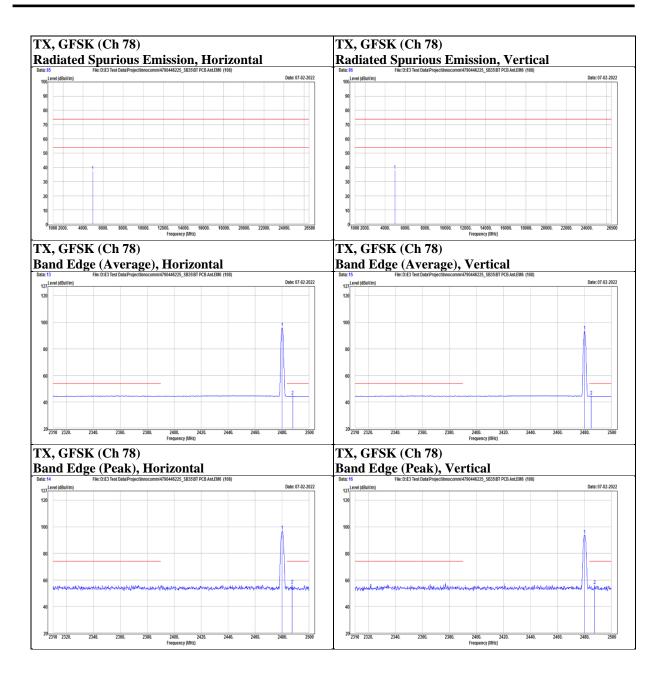


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Mode G	Channel 78							
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
Folalization	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark
	@	2480	81.44	15.72	97.16	N/A	N/A	PK
	@	2480	80.37	15.72	96.09	N/A	N/A	AVG
Horizontal		2487.46	40.56	15.66	56.22	74	-17.78	PK
		2487.84	28.88	15.65	44.53	54	-9.47	AVG
	*	4960	34.86	2.43	37.29	74	-36.71	PK
	@	2480	78.23	15.72	93.95	N/A	N/A	PK
	@	2480	77.89	15.72	93.61	N/A	N/A	AVG
Vertical		2484.99	28.88	15.67	44.55	54	-9.45	AVG
		2487.46	40.36	15.66	56.02	74	-17.98	PK
	*	4960	35.59	2.43	38.02	74	-35.98	PK



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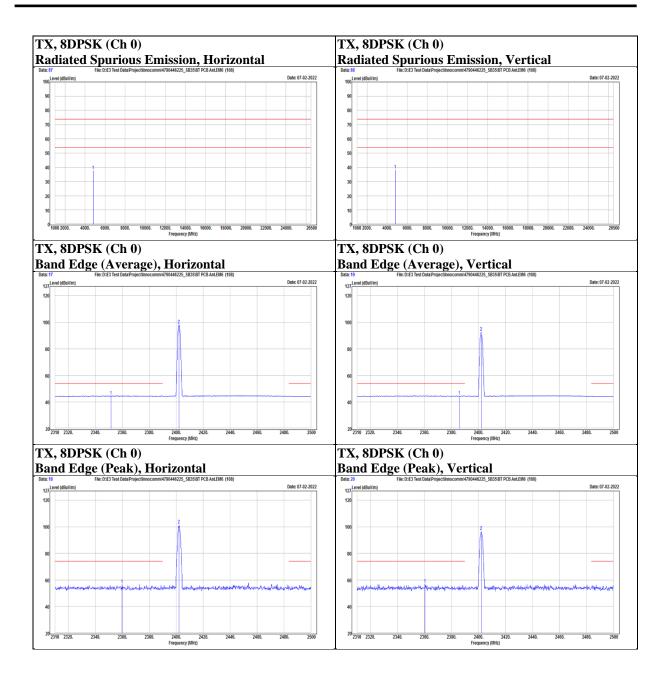


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Mode 8D	OPSK		Channel 0					
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
roianzation	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kemark
		2351.61	28.82	15.9	44.72	54	-9.28	AVG
		2359.78	40.81	15.88	56.69	74	-17.31	РК
Horizontal	@	2402	85.8	15.8	101.6	N/A	N/A	РК
	@	2402	82.22	15.8	98.02	N/A	N/A	AVG
	*	4804	35.37	2.33	37.7	74	-36.3	PK
		2360.35	41.02	15.88	56.9	74	-17.1	PK
		2385.81	28.94	15.83	44.77	54	-9.23	AVG
Vertical	@	2402	80.95	15.8	96.75	N/A	N/A	PK
	@	2402	77.04	15.8	92.84	N/A	N/A	AVG
	*	4804	35.78	2.33	38.11	74	-35.89	РК



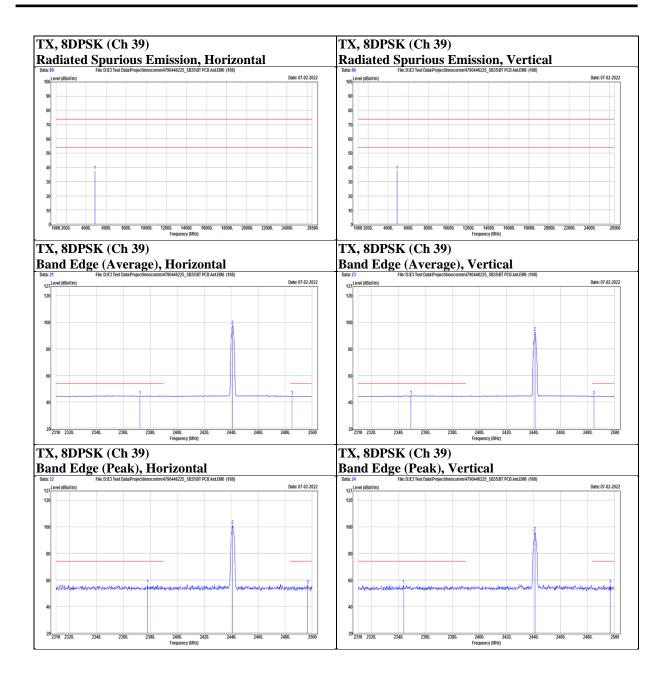
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	FCC ID	: IAISD33

Mode 8DPSK Channel 39								
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
1 Olarization	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark
		2372.32	28.88	15.85	44.73	54	-9.27	AVG
		2378.02	40.73	15.84	56.57	74	-17.43	PK
	@	2441	85.27	15.94	101.21	N/A	N/A	PK
Horizontal	@	2441	81.61	15.94	97.55	N/A	N/A	AVG
		2485.18	28.87	15.67	44.54	54	-9.46	AVG
		2496.77	40.93	15.57	56.5	74	-17.5	PK
	*	4882	35.28	2.41	37.69	74	-36.31	PK
		2343.82	40.4	15.89	56.29	74	-17.71	PK
		2349.14	28.99	15.9	44.89	54	-9.11	AVG
	@	2441	80.1	15.94	96.04	N/A	N/A	PK
Vertical	@	2441	76.66	15.94	92.6	N/A	N/A	AVG
		2484.61	28.87	15.67	44.54	54	-9.46	AVG
		2496.77	41.1	15.57	56.67	74	-17.33	PK
	*	4882	35.22	2.41	37.63	74	-36.37	РК





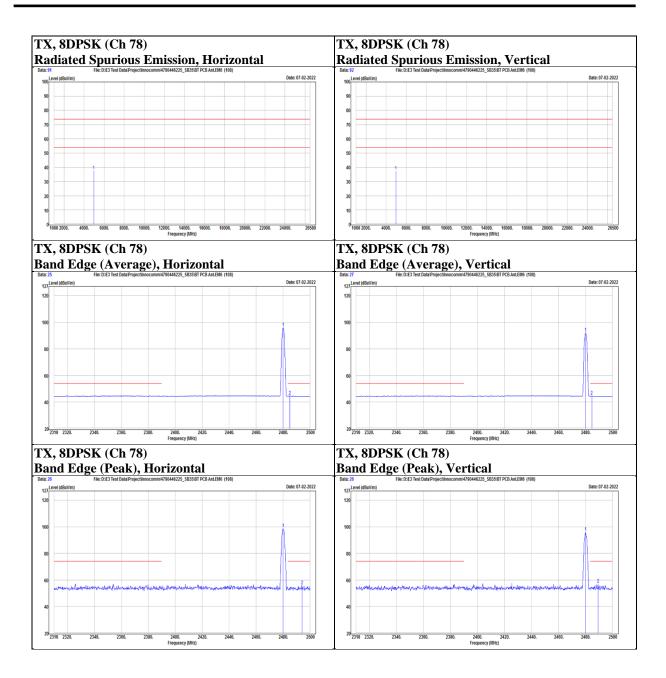


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Mode 8D		Chanr	nel 78					
Polarization	Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
FOIAITZATIOIT	Notation	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Kennark
	@	2480	82.99	15.72	98.71	N/A	N/A	PK
	@	2480	80.19	15.72	95.91	N/A	N/A	AVG
Horizontal		2484.99	28.95	15.67	44.62	54	-9.38	AVG
		2494.11	40.18	15.6	55.78	74	-18.22	PK
	*	4960	35.32	2.43	37.75	74	-36.25	PK
	@	2480	80.32	15.72	96.04	N/A	N/A	PK
Vertical	@	2480	76.53	15.72	92.25	N/A	N/A	AVG
		2484.61	28.96	15.67	44.63	54	-9.37	AVG
		2489.36	41.32	15.64	56.96	74	-17.04	РК
	*	4960	35.02	2.43	37.45	74	-36.55	PK



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#### **Below 1 GHz**

Mode	GFSK	Channel	0

Polarization	Notation	Frequenc y	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
		167.74	38.26	-11.22	27.04	43.5	-16.46	PK
		213.33	38.77	-13.47	25.3	43.5	-18.2	РК
Horizontal		263.77	38.57	-11.27	27.3	46	-18.7	РК
Horizoittai		315.18	44.9	-9.57	35.33	46	-10.67	PK
		346.22	43.43	-8.67	34.76	46	-11.24	PK
		425.76	36.21	-6.37	29.84	46	-16.16	PK
		72.68	41.01	-14.62	26.39	40	-13.61	PK
		83.35	45.21	-17.18	28.03	40	-11.97	PK
Vertical		159.98	37.12	-11.11	26.01	43.5	-17.49	PK
		244.37	35.57	-12.03	23.54	46	-22.46	РК
		355.92	38.28	-8.47	29.81	46	-16.19	РК
		426.73	34.9	-6.35	28.55	46	-17.45	РК

K, GFS	K (Ch 0)		<b></b>		TX, GF	SK (C	Ch 0)			· · ·		
	Spurious E			al	Radiate							
107	File: D:\E3 Test Data/Project/Innoco	nm\4790446225_SB35\BT	PCB Ant.EM6 (108)		Data: 108		8 Test Data Project Inn	ocomm/4790446	225_SB35/BT PCB	Ant.EM6 (108)		
Level (dBuVim)				Date: 07-06-2022	80 Level (dBuVim)							Date: 07-06-2022
					70							
					10							
					60							
				-6dB	50							-6dB
					40							
	4 5											
		6					5					
	1 2 3	1			30 12	3	Ĭ	1				
	i i i i i						4					
					20							
					10							
30 100.	200. 300. 40		600. 700.	300. 900. 1000	0 30 100	. 200.	300.		500. 600	. 700.	800.	900. 1000
		Frequency (MHz)						F	uency (MHz)			



#### 9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted: KDB 414788 D01 OATS and Chamber Correlation Justification

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.



# 9.8. AC Power Line Conducted Emission

## **Requirements**

Engunnar (MHz)	Conducted limit (dBµV)				
Frequency (MHz)	Quasi-peak	Average			
0.15 - 0.5	66 - 56	56 - 46			
0.50 - 5.0	56	46			
5.0 - 30	60	50			

Note:

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

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

## **Test Procedures**

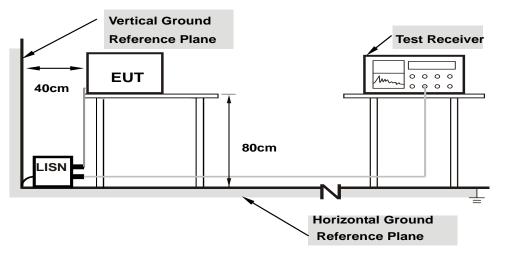
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

#### NOTE:

- 1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.
- 2. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
- 3. Test data of Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB).
- 4. Test data of Margin(dB) = Result value (dBuV) Limit value (dBuV).
- 5. Test data of Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).

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# **Test Setup**



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

For the actual test configuration, please refer to the Setup Configurations.



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AVG

QP

AVG

QP

AVG

QP

AVG

-29.80

-36.98

-30.48

-36.87

-31.23

-38.30

-31.38

# Test Data

0.6227

1.0684

1.0684

1.8194

1.8194

3.0441

3.0441

6

7

8

9

10

11

12

-3.34

-0.53

-4.03

-0.44

-4.80

-1.90

-4.98

19.54

19.55

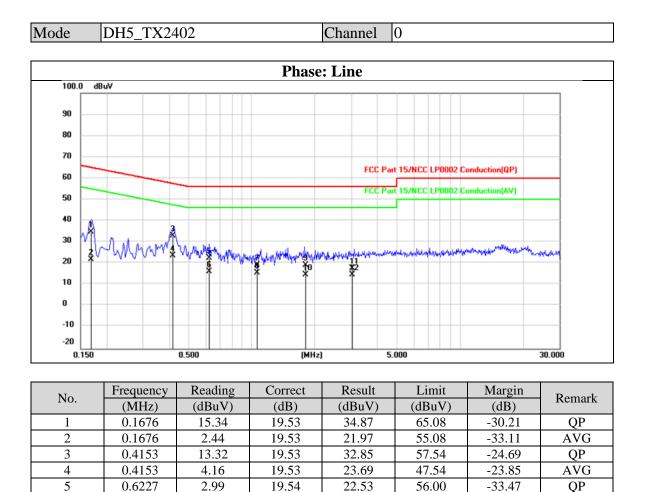
19.55

19.57

19.57

19.60

19.60



16.20

19.02

15.52

19.13

14.77

17.70

14.62

46.00

56.00

46.00

56.00

46.00

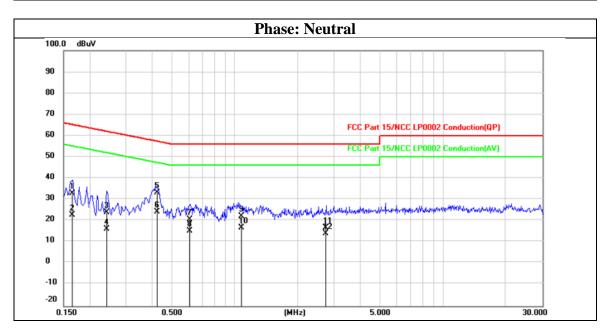
56.00

46.00



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```
Mode
       DH5_TX2402
                                 Channel 0
```



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1648	13.41	19.53	32.94	65.22	-32.28	QP
2	0.1648	3.09	19.53	22.62	55.22	-32.60	AVG
3	0.2407	4.43	19.53	23.96	62.07	-38.11	QP
4	0.2407	-3.37	19.53	16.16	52.07	-35.91	AVG
5	0.4195	13.61	19.53	33.14	57.46	-24.32	QP
6	0.4195	4.82	19.53	24.35	47.46	-23.11	AVG
7	0.6052	1.19	19.54	20.73	56.00	-35.27	QP
8	0.6052	-4.20	19.54	15.34	46.00	-30.66	AVG
9	1.0687	2.58	19.54	22.12	56.00	-33.88	QP
10	1.0687	-2.85	19.54	16.69	46.00	-29.31	AVG
11	2.7252	-2.96	19.58	16.62	56.00	-39.38	QP
12	2.7252	-5.48	19.58	14.10	46.00	-31.90	AVG

# **END OF REPORT**