

FCC Radio Test Report FCC ID: 2ASCK-1

Original Grant

Report No.	:	TB-FCC164284
Applicant	:	Dongguan Green Power One Co.,Ltd
Equipment Under Test	(EU	T)
EUT Name	:	PROCOMM2 BLUETOOTH EARBUDS
Model No.	:	TT-HFB-P2
Series Model No.	:	GBH01
Brand Name	÷	N/A
Receipt Date	63	2019-02-19
Test Date	:	2019-02-19 to 2019-02-25
Issue Date		2019-02-26
Standards	:	FCC Part 15: 2018, Subpart C(15.247)
Test Method	:	ANSI C63.10: 2013
Conclusions	:	PASS
		In the configuration tested, the EUT complied with the standards specified above, The EUT technically complies with the FCC requirements

Test/Witness Engineer

Engineer Supervisor

Engineer Manager

: IVAN SU : fogto.

: Jason xu

Ray Lai

Ivan Su

Jason Xu

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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Revision History

Report No.	Version	Description	Issued Date
TB-RF164284	Rev.01	Initial issue of report	2019-02-26
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1. General Information about EUT

1.1 Client Information

TOBY

Applicant	-	Dongguan Green Power One Co.,Ltd
Address :		No.26, Hongyun Street, Qingxi Town, Dongguan City, Guangdong province, China
Manufacturer : Dongguan Green Power One Co.,Ltd Address : No.26, Hongyun Street, Qingxi Town, Dongguan City, province, China		Dongguan Green Power One Co.,Ltd
		No.26, Hongyun Street, Qingxi Town, Dongguan City, Guangdong province, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name		PROCOMM2 BLUETOOTH EARBUDS			
Models No.		TT-HFB-P2 ,GBH01			
Model Difference	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is the difference in packing and model.			
MDB		Operation Frequency:	Bluetooth: 2402~2480 MHz		
E Star	~	Number of Channel:	Bluetooth: 79 Channels see Note 2		
Product	Nov N	Max Peak Output Power:	Bluetooth: 4.825dBm(GFSK)		
Description		Antenna Gain:	4.25dBi Ceramic Antenna		
BUNDER		Modulation Type:	GFSK (1 Mbps) Pi/4-DQPSK (2 Mbps) 8-DPSK (3 Mbps)		
Power Rating		DC 5.0V by USB. DC 3.7V by 310mAh Li-ion battery. V1.0			
Software Version					
Hardware Version		V1.0			
Connecting I/O Port(S)		Please refer to the User's Manual			

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



(2) Channel List:

Bluetooth Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455	61152	

(3) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested

TX Mode

Adapter	

EUT



1.4 Description of Support Units

	Equipment Information						
Name	Model	FCC ID/VOC	Manufacturer	Used "√"			
Adapter	YU1206		R				
		Cable Information					
Number	Shielded Type	Ferrite Core	Length	Note			
				24			

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

1	For Conducted Test	
Final Test Mode Description		Description
5	Mode 1	Supply electricity + TX Mode

For Radiated Test			
Final Test Mode	Description		
Mode 1	Supply electricity + TX GFSK Mode		
Mode 2	Supply electricity + TX Mode(GFSK) Channel 00/39/78		
Mode 3	Supply electricity + TX Mode(Pi/4-DQPSK) Channel 00/39/78		
Mode 4	Supply electricity +TX Mode(8-DPSK) Channel 00/39/78 Supply electricity + Hopping Mode(GFSK)		
Mode 5			
Mode 6	Supply electricity +Hopping Mode(Pi /4-DQPSK)		
Mode 7	Supply electricity + Hopping Mode(8-DPSK)		

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate. We have pretested all the test modes above.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

TX Mode: GFSK (1 Mbps)

TX Mode:Pi/4-DQPSK (2 Mbps)



TX Mode: 8-DPSK (3Mbps)

(2) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane as the normal use. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of Bluetooth mode.

Test Software Version			
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
Pi/4-DQPSK	DEF	DEF	DEF
8-DPSK	DEF	DEF	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB



1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.

FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 2				
Standard Section				
FCC	IC	- Test Item	Judgment	Remark
15.203	2	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A
15.247(d)	RSS 247 5.5	Band Edge	PASS	N/A
15.247(c)& 15.209	RSS 247 5.5	Radiated Spurious Emission	PASS	N/A
15.247(a)	RSS 247 5.1 (1)	99% Occupied Bandwidth & 20dB Bandwidth	PASS	N/A

Note: N/A is an abbreviation for Not Applicable.

3. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul.18, 2018	Jul. 17, 2019
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul.18, 2018	Jul. 17, 2019
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul.18, 2018	Jul. 17, 2019
LISN	Rohde & Schwarz	ENV216	101131	Jul.18, 2018	Jul. 17, 2019
Radiation Emissio	n Test	•			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul.18, 2018	Jul. 17, 2019
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul.18, 2018	Jul. 17, 2019
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.16, 2018	Mar. 15, 2019
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar.16, 2018	Mar. 15, 2019
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.16, 2018	Mar. 15, 2019
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar.16, 2018	Mar. 15, 2019
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 15, 2018	Jul. 14, 2019
Pre-amplifier	Sonoma	310N	185903	Mar.16, 2018	Mar. 15, 2019
Pre-amplifier	HP	8449B	3008A00849	Mar.16, 2018	Mar. 15, 2019
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.16, 2018	Mar. 15, 2019
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducte	ed Emission				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul.18, 2018	Jul. 17, 2019
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul.18, 2018	Jul. 17, 2019
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 15, 2018	Sep. 14, 2019
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 15, 2018	Sep. 14, 2019
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO26	Sep. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO29	Sep. 15, 2018	Sep. 14, 2019
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO31	Sep. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO33	Sep. 15, 2018	Sep. 14, 2019



4. Conducted Emission Test

- 4.1 Test Standard and Limit
 - 4.1.1Test Standard FCC Part 15.207
 - 4.1.2 Test Limit

Frequency	Maximum RF Line Voltage (dBμV)		
	Quasi-peak Level	Average Level	
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *	
500kHz~5MHz	56	46	
5MHz~30MHz	60	50	

Conducted Emission Test Limit

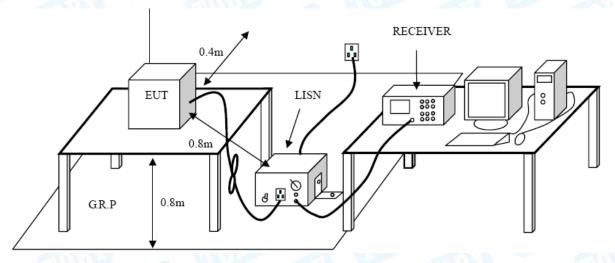
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please refer to the Attachment A.



5. Radiated Emission Test

- 5.1 Test Standard and Limit
 - 5.1.1 Test Standard
 - FCC Part 15.209
 - 5.1.2 Test Limit

Radiated Emission Limit (9 kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

Frequency (MHz)	Class B (dBuV/m)(at 3m)	
	Peak	Average
bove 1000	74	54

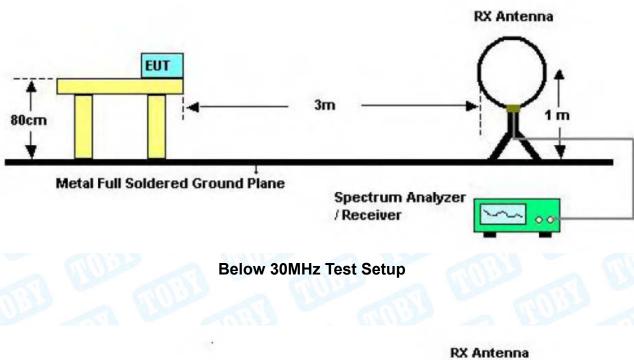
Note:

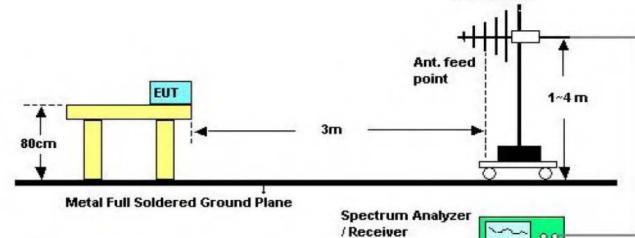
(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level (uV/m)



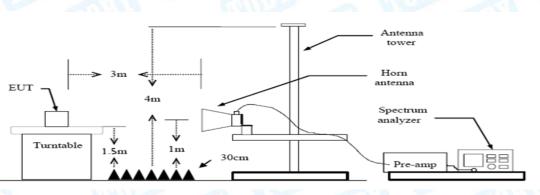
5.2 Test Setup





Below 1000MHz Test Setup





Above 1GHz Test Setup

5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) 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.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power in TX mode.

5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Please refer to the Attachment B.

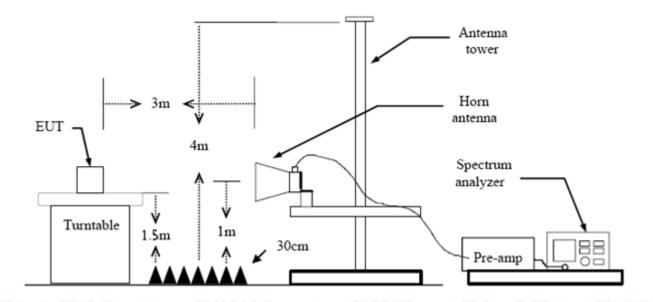


6. Restricted Bands Requirement

- 6.1 Test Standard and Limit
 - 6.1.1 Test Standard FCC Part 15.209 FCC Part 15.205
 - 6.1.2 Test Limit

Restricted Frequency Band (MHz)	Class B (dE	BuV/m)(at 3m)
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

6.2 Test Setup



6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.



- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) 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.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with AVG Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

All restriction bands have been tested, only the worst case is reported. Please refer to the Attachment C.

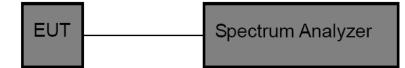


7. Number of Hopping Channel

- 7.1 Test Standard and Limit
 - 6.1.1 Test Standard
 - FCC Part 15.247 (a)(1)
 - 6.1.2 Test Limit

Section	Test Item	Limit	
15.247	Number of Hopping Channel	>15	

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 KHz, VBW=100 KHz, Sweep time= Auto.

7.4 EUT Operating Condition

The EUT was set to the Hopping Mode by the Customer.

7.5 Test Data

Please refer to the Attachment D.



8. Average Time of Occupancy

- 8.1 Test Standard and Limit
 - 8.1.1 Test Standard
 - FCC Part 15.247 (a)(1)
 - 8.1.2 Test Limit

Section	Test Item	Limit
15.247(a)(1)/ RSS-210	Average Time of	0.4.000
Annex 8(A8.1d)	Occupancy	0.4 sec

8.2 Test Setup



8.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz.
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the center frequency on any frequency would be measure and set the frequency span to zero.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.

8.4 EUT Operating Condition

The average time of occupancy on any channel within the Period can be calculated with formulas:

{Total of Dwell} = {Pulse Time} * (1600 / X) / {Number of Hopping Frequency} * {Period} {Period} = 0.4s * {Number of Hopping Frequency}

Note: X=2 or 4 or 6 (1DH1=2, 1DH3=4, 1DH5=6. 2DH1=2, 2DH3=4, 2DH5=6. 3DH1=2, 3DH3=4, 3DH5=6)

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

The EUT was set to the Hopping Mode by the Customer.

8.5 Test Data

Please refer to the Attachment E.

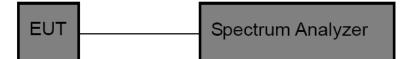


9. Channel Separation and Bandwidth Test

- 9.1 Test Standard and Limit
 - 9.1.1 Test Standard
 - FCC Part 15.247
 - 9.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Test item	Linint	riequency Range(Miriz)
Bandwidth	<=1 MHz (20dB bandwidth)	2400~2483.5
- RUL	>25KHz or >two-thirds of	
Channel Separation	the 20 dB bandwidth	2400~2483.5
	Which is greater	

9.2 Test Setup



9.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: Channel Separation: RBW=100 kHz, VBW=100 kHz. Bandwidth: RBW=30 kHz, VBW=100 kHz.
- (3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
 - (4) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:30 kHz, and Video Bandwidth:100 kHz. Sweep Time set auto.

9.4 EUT Operating Condition

The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Bandwidth Test.

9.5 Test Data

Please refer to the Attachment F.



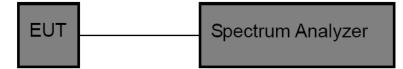
10. Peak Output Power Test

10.1 Test Standard and Limit

- 10.1.1 Test Standard FCC Part 15.247 (b) (1)
- 10.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	Hopping Channels>75 Power<1W(30dBm)	2400~2483.5
6000	Other <125 mW(21dBm)	

10.2 Test Setup



10.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:

Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz. RBW=3 MHz, VBW=3 MHz for bandwidth more than 1MHz.

10.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

10.5 Test Data

Please refer to the Attachment G.



11. Antenna Requirement

11.1 Standard Requirement

11.1.1 Standard

FCC Part 15.203

11.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.2 Antenna Connected Construction

The gains of the antenna used for transmitting is 4.25dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

11.3 Result

The	e EUT antenna is a Ceramic Antenna. It complies with the standard requirement
	Antenna Type
E.	Permanent attached antenna
	Unique connector antenna
	Professional installation antenna

TB-RF-074-1.0

Attachment A-- Conducted Emission Test Data

Temperature:	25 ℃	Relativ	e Humidity:	55%
Test Voltage:	AC 120V/60 Hz		-	29
Terminal:	Line	GILLE -		
Test Mode:	TX 8-DPSK Mode 2	2402MHz	12	A MUPP
Remark:	Only worse case is	reported		
90.0 dBu¥				
				QP: AVG:
				Avu
			4	
40 *				
to materia	not how how have the	The second second		
man		all the last the second second and a second second	unaterby the sector and the second sector and the second sector and the second sector and the second sector and	holdenter and the second se
	when have a superior	pression and the second second	and a market and a second s	AVI
-10				
0.150	0.5	(MHz)	5	30.000

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2180	21.44	9.58	31.02	62. 8 9	-31.87	QP
2		0.2180	8.51	9.58	18.09	52. 8 9	-34.80	AVG
3		0.2660	18.44	9.59	28.03	61.24	-33.21	QP
4		0.2660	8.00	9.59	17.59	51.24	-33.65	AVG
5		0.4620	21.08	9.60	30.68	56.66	-25.98	QP
6	*	0.4620	14.87	9.60	24.47	46.66	-22.19	AVG
7		0.8780	11.30	9.60	20.90	56.00	-35.10	QP
8		0.8780	5.34	9.60	14.94	46.00	-31.06	AVG
9		1.3300	11.74	9.60	21.34	56.00	-34.66	QP
10		1.3300	5.94	9.60	15.54	46.00	-30.46	AVG
11		2.0460	11.72	9.61	21.33	56.00	-34.67	QP
12		2.0460	5.94	9.61	15.55	46.00	-30.45	AVG



Temperature:	25 ℃	Rela	ative Humidity:	55%
Fest Voltage:	AC 120V/60 Hz		6032	
Terminal:	Neutral			33
Test Mode:	TX 8-DPSK Mod	le 2402MHz		1
Remark:	Only worse case	e is reported	mise -	muss
	man Manufarana			QP: AVG:
-10 0.150	0.5	(MHz)	5	30.000

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1660	24.50	9.64	34.14	65.15	-31.01	QP
2		0.1660	10.49	9.64	20.13	55.15	-35.02	AVG
3		0.2260	20.88	9.63	30.51	62.59	-32.08	QP
4		0.2260	10.66	9.63	20.29	52.59	-32.30	AVG
5		0.4740	19.95	9.58	29.53	56.44	-26.91	QP
6	*	0.4740	11.18	9.58	20.76	46.44	-25.68	AVG
7		0.5980	14.40	9.58	23.98	56.00	-32.02	QP
8		0.5980	7.33	9.58	16.91	46.00	-29.09	AVG
9		1.3660	12.87	9.60	22.47	56.00	-33.53	QP
10		1.3660	6.86	9.60	16.46	46.00	-29.54	AVG
11		2.1220	12.59	9.62	22.21	56.00	-33.79	QP
12		2.1220	6.76	9.62	16.38	46.00	-29.62	AVG



Attachment B-- Radiated Emission Test Data

9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz~1GHz

Temperature:	25℃	Relative Humidity:	55%				
Test Voltage:	DC 5V	10					
Ant. Pol. Horizontal							
Test Mode:	TX 8-DPSK Mode 2402MHz						
Remark:	Only worse case is reported						
80.0 dBuV/m							



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		33.5623	34.31	-15.68	18.63	40.00	-21.37	QP
2		134.5592	49.41	-22.46	26.95	43.50	-16.55	QP
3		155.9100	45.01	-21.10	23.91	43.50	-19.59	QP
4		168.4138	42.98	-20.58	22.40	43.50	-21.10	QP
5	*	261.9753	52.26	-16.95	35.31	46.00	-10.69	QP
6		282.9852	51.78	-16.53	35.25	46.00	-10.75	QP

*:Maximum data x:Over limit !:over margin



Temperature:	25 ℃		Relative H	lumidity:	55%	
est Voltage:	DC 5V		1100	50		NU.
Ant. Pol.	Vertical	0		-0	\mathcal{O}	
est Mode:	TX 8-DPSK M	ode 2402MHz	2			5
Remark:	Only worse cas	se is reported	inn's	31	10	and a
80.0 dBuV/m						
30 1 2 X X X X X X X X X X X X X X X X X X X	Market Market	1 5 M X	6 WM	(RF)FCC 15	5C 3M Radiation Margin -6 d	B F
20	0 60 70 80	(MHz)	300	400 50	0 600 700	1000.00

No.	Mk.	Freq.	Level	Factor	ment	Limit	O∨er	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		33.7986	44.27	-15.86	28.41	40.00	-11.59	QP
2	*	47.9940	52.00	-22.57	29.43	40.00	-10.57	QP
3		80.0806	44.90	-22.53	22.37	40.00	-17.63	QP
4		135.5062	49.08	-22.47	26.61	43.50	-16.89	QP
5		167.2368	43.98	-20.62	23.36	43.50	-20.14	QP
6		258.3264	43.96	-17.02	26.94	46.00	-19.06	QP

*:Maximum data x:Over limit !:over margin

Above 1GHz(Only worse case is reported)

em	perature:	25 ℃	Relative Humidity: 55%						
est	Voltage:	DC 5V	-00	88. "	5	1.50			
۸nt.	Pol.	Horizont	Horizontal						
est	: Mode:	TX GFS	K Mode	2402MHz					
Rem	nark:		No report for the emission which more than 10 dB below the prescribed limit.						
100.0) dBuV/m								
						(RF) FCC PART	15C (PEAK)		
	1 X					(RF) FCC PAR	T 15C (AVG)		
50	2								
	×								
0.0									

No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4802.500	42.21	14.42	56.63	74.00	-17.37	peak
2		4802.500	29.19	14.42	43.61	54.00	-10.39	AVG



Temp	erature:	25 ℃	Relative Humidity: 55%					
Test V	/oltage:	DC 5V						
Ant. F	Pol.	Vertical						
'est N	lode:	TX GFSK Mod	de 2402MHz					
Rema	rk:		No report for the emission which more than 10 dB below the prescribed limit.					
100.0	dBu∀/m							
			(RF) FCC PART 15C (PEAK)					
	2 X		(RF) FCC PART 15C (AVG)					
50	1 X							
0.0								

No	b. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4804.426	30.02	14.43	44.45	54.00	-9.55	AVG
2		4804.600	43.29	14.44	57.73	74.00	-16.27	peak



Tem	perature:	25 ℃		Relative	Humidity:	55%
Test	Voltage:	DC 5	/		1000	
Ant.	Pol.	Horizo	ontal			
Test	Mode:	TX GF	SK Mode 244	IMHz		
Rem	ark:		oort for the em	iission which mo	re than 10 dE	3 below the
100.0	dBu∀/m					
					(RF) FCC	PART 15C (PEAK)
	1 X	;			(RF) FC	C PART 15C (AVG)
50	2 X					
0.0						

No	. Mk.	Freq.	-	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4880.500	42.08	14.89	56.97	74.00	-17.03	peak
2	*	4883.314	30.30	14.91	45.21	54.00	-8.79	AVG



Гет	perature	:	25 ℃			<u> </u>	Relative	Humidity:	55%
ſest	Voltage	:	DC 5V	-	21		100		~
۹nt.	Pol.		Vertical	MR.				-01	2.6
ſest	Mode:		TX GFS	K Mode	2441MHz		2		
Remark:			No repo prescrib		emission	whic	h more th	nan 10 dB b	elow the
100.0	dBuV/m								
								(RF) FCC PAR	T 15C (PEAK)
		1 X						(RF) FCC PA	RT 15C (AVG)
50		2 X							
0.0									
L	00.000 3550.0)O 6'	100.00 865	0.00 112	00.00 13750.	00 10	6300.00 188	50.00 21400.00	265

No.	Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.928	44.00	14.91	58.91	74.00	-15.09	peak
2	*	4881.928	29.88	14.91	44.79	54.00	-9.21	AVG



Ten	nperatur	e:	25 ℃				Relative	e Humidity:	55%
Tes	t Voltage	e:	DC 5V	-			100		
Ant	. Pol.		Horizo	ntal		-		-01	31
Гes	t Mode:		TX GF	SK Mod	e 2480	MHz		2 3	
Rer	nark:			ort for th bed limit		sion wh	nich more	than 10 dB b	elow the
100.) dBu∀/m								
								(RF) FCC PART	15C (PEAK)
		1							
		×						(RF) FCC PAR	IT 15C (AVG)
50		2 X		_					
0.0									

No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.316	43.74	15.39	59.13	74.00	-14.87	peak
2	*	4959.316	29.94	15.39	45.33	54.00	-8.67	AVG



Гem	perature:		25° ℃			R	elative Humidity:	55%
Fes	est Voltage: Int. Pol. est Mode: emark:		DC 5V	R	51		60052	
4nt	Pol.		Vertical	MA				100 C
Fes	t Mode:		TX GFS	K Mode	2480M	Ηz		
Ren	nark:		No repo orescrib			on whic	h more than 10 dE	3 below the
100.0	dBuV/m							
							(RF) FCC	PART 15C (PEAK)
	1						(RF) FC	C PART 15C (AVG)
50	2	2						
0.0						_		

No	o. Mk	. Freq.			Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.090	42.82	15.39	58.21	74.00	-15.79	peak
2	*	4960.090	30.47	15.39	45.86	54.00	-8.14	AVG



ēm	perature:	25 ℃		Relative	Humidity:	55%
est	Voltage:	DC 5V		6	192	
۸nt.	Pol.	Horizon	tal		-0	\mathcal{O}
est	Mode:	TXPi/4-	DQPSK Mod	e 2402MHz		
Rem	nark:		ort for the emi bed limit.	ssion which more	than 10 dB	below the
100.0	dBuV/m					
					(RF) FCC PA	ART 15C (PEAK)
	1					
	×				(RF) FCC	PART 15C (AVG)
50	2 X					
0.0						

No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4804.192	43.84	14.43	58.27	74.00	-15.73	peak
2	*	4805.500	29.75	14.44	44.19	54.00	-9.81	AVG



Ter	nperatur	e:	25 ℃			Relative H	lumidity:	55%
Tes	st Voltage) :	DC 5V	-		60	0122	
An	t. Pol.		Vertica	NU		1		AN I
Tes	st Mode:		TXPi/4	DQPSK M	ode 240	2MHz		
Re	mark:			ort for the e bed limit.	emission	which more	than 10 dl	B below the
100.	0 dBuV/m							
							(RF) FCC	PART 15C (PEAK)
		1 X					(RF) FC	PART 15C (AVG)
50		2 X						
0.0								

No	. Mk	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4804.624	43.31	14.44	57.75	74.00	-16.25	peak
2	*	4804.624	29.46	14.44	43.90	54.00	-10.10	AVG



Temperature: Test Voltage:			25 ℃			Relative	Humidity:	55%		
			DC 5V							
nt.	Pol.		Horizontal							
est	Mode:		TXPi/4-DQPSK Mode 2441MHz							
Remark:			No report for the emission which more than 10 dB below the prescribed limit.							
100.0	dBuV/m									
-										
							(RF) FCC P/	(RF) FCC PART 15C (PEAK)		
		1 X					(RF) FCC I	PART 15C (AVG)		
50		2 X								
0.0										

No	. Mk	. Freq.	-	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.178	43.31	14.91	58.22	74.00	-15.78	peak
2	*	4881.178	29.74	14.91	44.65	54.00	-9.35	AVG



Ten	nperature:		25 ℃			Re	lative Humidity:	55%
Tes	st Voltage: DC 5V t. Pol. Vertical st Mode: TXPi/4-DQPSK Momentary mark: No report for the enprescribed limit.					600152		
Ant	. Pol.		Vertica	l N				21
Tes	t Mode:		TXPi/4	-DQPSI	K Mode 2	441MHz		
Rer	nark:					on which	more than 10 dB	below the
100.0	dBu¥/m							
							(RF) FCC P/	ART 15C (PEAK)
		2 X					(RF) FCC F	PART 15C (AVG)
50		1 X						
0.0	00.000 3550.00	61		50.00 1	1200.00 13	750.00 1630	0.00 18850.00 21400.	00 2650

No	No. Mk.		Freq.	-	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4	880.500	29.99	14.89	44.88	54.00	-9.12	AVG
2		4	881.088	44.47	14.91	59.38	74.00	-14.62	peak



Tem	perature:		25° ℃			210	Relative	Humidity:	55%
Test	Voltage:		DC 5V	-	01		100	132	
Ant.	Pol.		Horizor	ntal			10	-0	39
Test	Mode:		TXPi/4	-DQPSI	K Mode	2480M	Hz		
Rem	ark:			ort for tl bed limi		sion wh	ich more t	nan 10 dB b	elow the
100.0	dBu¥/m								
								(RF) FCC PAR	T 15C (PEAK)
-									
		1 X						(RF) FCC PA	RT 15C (AVG)
50		2 X							
						_			
						_			
0.0									

Nc	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4959.322	43.59	15.39	58.98	74.00	-15.02	peak
2	*	4961.392	30.35	15.40	45.75	54.00	-8.25	AVG



Tem	peratur	e:	25 ℃			Relativ	e Humidity:	55%
Tes	t Voltage	e :	DC 5V	-	20 -	6	082	
١nt	. Pol.		Vertica	1800			-0	3.9
es	t Mode:		TXPi/4	DQPSK	Mode 2480	MHz		
Ren	nark:			ort for the bed limit.	emission	which more	e than 10 dB b	elow the
100.0) dBu∀/m							
							(RF) FCC PAR	F 15C (PEAK)
		1						
		×					(RF) FCC PAF	RT 15C (AVG)
50		2 X						
0.0								

No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	
1		4960.972	43.45	15.40	58.85	74.00	-15.15	peak	
2	*	4960.972	29.99	15.40	45.39	54.00	-8.61	AVG	



Ten	nperature	e:	25 ℃			Relative I	Humidity:	55%	
Tes	t Voltage):	DC 5V	-00	20 0	Eng	1000		
4nt	. Pol.		Horizor	ntal			-6	89.	
Tes	t Mode:		TX 8-D	X 8-DPSK Mode 2402MHz					
Rer	nark:	prescribed limit.					below the		
100.0) dBuV/m								
							(RF) FCC PA	RT 15C (PEAK)	
		1 X					(RF) FCC P	ART 15C (AVG)	
50		2 X							
		~							
0.0									

No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4804.606	43.23	14.44	57.67	74.00	-16.33	peak
2	*	4804.606	29.41	14.44	43.85	54.00	-10.15	AVG



Tem	perature:	25 ℃			Relative H	umidity:	55%			
Test	Voltage:	DC 5V	-		101	100				
Ant.	Pol.	Vertica	Vertical							
Test	Mode:	TX 8-D	PSK Mod	e 2402M	Ηz					
Rem	ark:		ort for the bed limit.	emission	which more	than 10 dl	3 below the			
100.0	dBuV/m									
						(RF) FCC	PART 15C (PEAK)			
	1 X					(RF) FC	C PART 15C (AVG)			
50	2 X									
	^									
0.0										

No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.460	43.05	14.43	57.48	74.00	-16.52	peak
2	*	4804.264	30.23	14.43	44.66	54.00	-9.34	AVG



Tem	perature:	25 ℃		Relative	Humidity:	55%
Test	Voltage:	DC 5V		6	0125	
Ant.	Pol.	Horizor	ital		-6	00
Test	Mode:	TX 8-D	PSK Mode 24	141MHz		
Rem	ark:		ort for the emi bed limit.	ssion which more	e than 10 dB	below the
100.0	dBuV/m					
					(RF) FCC P/	ART 15C (PEAK)
-	1 X				(RF) FCC	PART 15C (AVG)
50	2 X					
-						
-						
0.0						

Nc	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.130	43.45	14.91	58.36	74.00	-15.64	peak
2	*	4882.186	30.28	14.91	45.19	54.00	-8.81	AVG



Ter	nperatur	e:	25 ℃			Relative H	umidity:	55%	
Tes	t Voltage	e:	DC 5V	-		100	132		
4n ¹	t. Pol.		Vertical	MAR			-6	an i	
Гes	t Mode:		TX 8-DF	PSK Mode	2441MH	z			
pres				No report for the emission which more than 10 dB below the prescribed limit.					
100.	0 dBuV/m								
								RT 15C (PEAK)	
		1 X							
50		^					(RF) FCC P	ART 15C (AVG)	
50		2 X							
0.0									

No	. Mk	Freq.		Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.172	43.75	14.91	58.66	74.00	-15.34	peak
2	*	4881.172	29.96	14.91	44.87	54.00	-9.13	AVG



Гетре	erature:	25 ℃		Relative Humidity:	55%		
lest V	oltage:	DC 5V		60033	~ ~		
Ant. P	ol.	Horizontal					
Test Mode: TX 8-DPSK Mode 2480MHz							
Remai	'k:	No report for the emission which more than 10 dB below the prescribed limit.					
100.0 d	Bu¥/m						
				(RF) FCC PAR	T 15C (PEAK)		
	1						
	×			(RF) FCC PA	RT 15C (AVG)		
50	2 X						
0.0							

No	. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4960.456	43.60	15.40	59.00	74.00	-15.00	peak
2	*	4960.456	30.05	15.40	45.45	54.00	-8.55	AVG



Temp	perature:	25 ℃		Relativ	ve Humidity:	55%
Test	Voltage:	DC 5V	1999	5	<u>MB2</u>	
Ant.	Pol.	Vertical				
Fest	Mode:	TX 8-DPS	SK Mode 2480	MHz	A 1	
Rem	ark:	No report prescribed		on which more	e than 10 dB b	elow the
100.0	dBuV/m					
					(RF) FCC PAR	IT 15C (PEAK)
	2 X					
	×				(RF) FCC PA	RT 15C (AVG)
50	1 X					
-						
0.0						

N	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4958.500	30.12	15.39	45.51	54.00	-8.49	AVG
2		4960.126	44.10	15.39	59.49	74.00	-14.51	peak

2

3

4

Х

*

Attachment C-- Restricted Bands Requirement Test Data

Temperature:	25 ℃		Relative Humic	dity: 55%			
Test Voltage:	DC 5V	GIL.	N A	NUL	1		
Ant. Pol.	Horizontal		Can be				
Test Mode:	TX GFSK Mode	K GFSK Mode 2402MHz					
Remark:	Only worse cas	nly worse case is reported					
110.0 dBuV/m							
				X			
			(RF) FCC PART 15C (PEA	K)		
50			n)	IF) FCC PART 15C (AV	6) (
				1 X 2	\downarrow		
	18.0449/www.www.analana.col/www.analanana/www.analanana.col/www.analananana.col/	•	annan tara tara tara tara tara tara tara		ľ		
-10 2312.000 2322.00	2332.00 2342.00 2	352.00 2362.00	2372.00 2382.00	2392.00	2412		
2312.000 2322.00	2332.00 2342.00 2	332.00 2362.00	2372.00 2362.00	2332.00	2412.		
No. Mk.	Reading Freq. Level	Correct Factor	Measure- ment Lim	nit Over			
	MHz dBuV	dB/m	dBuV/m dBu	IV/m dB	De		

Emission Le	vel= Read	Level+ Cor	rect Factor
-------------	-----------	------------	-------------

32.65

94.44

89.77

0.77

0.82

0.82

33.42

95.26

90.59

54.00

Fundamental Frequency

Fundamental Frequency

2390.000

2401.900

2402.000

AVG

peak

AVG

-20.58



Cemperature:	25° ℃	Relative Humidity:	55%
fest Voltage:	DC 5V	(TUP)	
Ant. Pol.	Vertical	1100	
est Mode:	TX GFSK Mode 2402MHz		10
Remark:	Only worse case is reported	ed	
110.0 dBuV/m			
			4
			×
			3
		(RF) FCC PAR	
60		(RF) FCC PAI	RT 15C (AVG)
		1 X	
		2	
		X	
10.0			

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.54	2.82	45.36	74.00	-28.64	peak
2		2390.000	32.34	2.82	35.16	54.00	-18.84	AVG
3	*	2402.000	74.36	2.87	77.23	Fundamental Frequency		AVG
4	Х	2402.200	92.21	2.87	95.08	Fundamental Frequency		peak



emperature:	25 ℃	Relative Humidity:	55%			
Fest Voltage:	DC 5V					
Ant. Pol.	Horizontal	117	55			
est Mode:	TX GFSK Mode 2480 MHz		-01			
Remark:	Only worse case is reported	MULD A				
110.0 dBuV/m						
60 3 ×	Image: select	(RF) FCC PAR	T 15C (PEAK) RT 15C (AVG)			
10.0	2495.00 2505.00 2515.00 2525.00	2535.00 2545.00 2555.00	2575.00			

No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2480.000	82.59	3.38	85.97	Fundamental Frequency		AVG
2	Х	2480.200	93.43	3.38	96.81	Fundamental Frequency		peak
3		2483.500	54.50	3.41	57.91	74.00	-16.09	peak
4		2483.500	41.89	3.41	45.30	54.00	-8.70	AVG



Temperature:	25 ℃	011	Relative Humidity:	55%			
Fest Voltage:	DC 5V	21	60000				
Ant. Pol.	Vertical			AL -			
lest Mode:	TX GFSK Mod	e 2480 MHz					
Remark:	Only worse cas	Only worse case is reported					
110.0 dBuV/m							
50 3				RT 15C (PEAK) ART 15C (AVG)			
-10							

No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.900	95.09	1.15	96.24	Fundamenta	al Frequency	peak
2	*	2479.900	87.70	1.15	88.85	Fundamenta	I Frequency	AVG
3		2483.500	53.09	1.17	54.26	74.00	-19.74	peak
4		2483.500	47.05	1.17	48.22	54.00	-5.78	AVG



emperature:	25 ℃	Relative Hu	umidity: 55%			
fest Voltage:	DC 5V					
Ant. Pol.	Horizontal		M1152			
est Mode:	TXPi/4-DQPSK Mo	ode 2402MHz				
Remark:	Only worse case is reported					
100.0 dBuV/m			3 X (RF) FCC PART 15C (PEAK)			
			(RF) FCC PART 15C (AVG)			
50						
0.0						

No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.05	2.82	44.87	74.00	-29.13	peak
2		2390.000	30.56	2.82	33.38	54.00	-20.62	AVG
3	Х	2402.200	95.33	2.87	98.20	Fundamental Frequency		peak
4	*	2402.200	82.23	2.87	85.10	Fundamental	Frequency	AVG



Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 5V	THUN -				
Ant. Pol.	Vertical					
Fest Mode:	TXPi/4-DQPSK Mode 2402M	ИНz	101			
Remark:	Only worse case is reported					
100.0 dBuV/m						
			3 X			
			4			
		(RF) FCC PAR	T 15C (PEAK)			
		(RF) FCC PAI	RT 15C (AVG)			
50		1 X				
		^ 2				
0.0						

No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	43.21	2.82	46.03	74.00	-27.97	peak
2		2390.000	32.59	2.82	35.41	54.00	-18.59	AVG
3	Х	2402.200	89.85	2.87	92.72	Fundamental	Frequency	peak
4	*	2402.200	76.70	2.87	79.57	Fundamental	Frequency	AVG



⁻ en	nperatur	re:	25 ℃		Relati	ive Humidity:	55%				
es	st Voltag	e:	DC 5V	Callor		RUPS					
۱nt	t. Pol.		Horizonta			1170					
es	st Mode:		TXPi/4-D	TXPi/4-DQPSK Mode 2480MHz							
Rer	mark:		Only wors	se case is repo	orted		3				
100.0											
ļ	X										
	2										
	\square					(RF) FCC PA	ART 15C (PEAK)				
ļ	\Box										
	3 X					(RF) FCC F	PART 15C (AVG)				
50											
ļ											
	/ · _ /	<u> </u>			$\rightarrow \rightarrow \rightarrow$						
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ļ											
0.0											

No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2480.000	91.39	3.38	94.77	Fundamenta	Frequency	peak
2	*	2480.000	78.35	3.38	81.73	Fundamenta	I Frequency	AVG
3		2483.500	53.18	3.41	56.59	74.00	-17.41	peak
4		2483.500	39.55	3.41	42.96	54.00	-11.04	AVG



Temperature:	25 ℃		Relative Humidity:	55%				
Fest Voltage:	DC 5V	032	CULU -					
Ant. Pol.	Vertical	1						
Test Mode:	TXPi/4-DQP	SK Mode 2480	MHz	IHz				
Remark:	Only worse	case is reported		a lu				
100.0 dBuV/m 2 X								
×								
1 X								
			(RF) FCC F	ART 15C (PEAK)				
2			(RF) FCC	PART 15C (AVG)				
50								
X								
0.0								

N	lo.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	2480.000	79.94	3.38	83.32	Fundamental	Frequency	AVG
2		Х	2480.200	92.96	3.38	96.34	Fundamental	Frequency	peak
3			2483.500	46.76	3.41	50.17	74.00	-23.83	peak
4			2483.500	41.30	3.41	44.71	54.00	-9.29	AVG



Temperature:	25 ℃	Relative Humidity:	55%						
Test Voltage:	DC 5V	CTUD -							
Ant. Pol.	Horizontal								
Test Mode:	TX 8-DPSK Mode 2402	TX 8-DPSK Mode 2402MHz							
Remark:	Only worse case is repo	orted							
110.0 dBu∀/m									
			4 ×						
			^						
			3 X						
		(RF) FCC	PART 15C (PEAK)						
60		(RF) FC	C PART 15C (AVG)						
			1						
			× /						
			2 X						
10.0									
2307.000 2317.00	2327.00 2337.00 2347.00 23	357.00 2367.00 2377.00 2387	.00 2407.00						

	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	41.63	2.82	44.45	74.00	-29.55	peak
2		2390.000	30.57	2.82	33.39	54.00	-20.61	AVG
3 '	ł	2402.000	82.19	2.87	85.06	Fundamenta	I Frequency	AVG
4)	X	2402.200	97.42	2.87	100.29	Fundamenta	I Frequency	peak



emperature:	25 °C	Relative Humidity:	55%
est Voltage:	DC 5V	THUR A	AU
nt. Pol.	Vertical		
est Mode:	TX 8-DPSK Mode 2402MHz		
emark:	Only worse case is reported		
00.0 dBu¥/m			
			3 ×
		(RF) FCC PAR	T 15C (PEAK)
F.0			RT 15C (AVG)
50		2 	
0.0			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	44.00	2.82	46.82	74.00	-27.18	peak
2		2390.000	32.34	2.82	35.16	54.00	-18.84	AVG
3	Х	2402.200	81.59	2.87	84.46	Fundamental	Frequency	peak
4	*	2402.200	68.56	2.87	71.43	Fundamental	Frequency	AVG



em	perature:	25 ℃		Relative Humidity:	55%
ſes	t Voltage:	DC 5V		TUN	AV
۹nt	. Pol.	Horizontal	1		323
lest	t Mode:	TX 8-DPSK M	ode 2480MHz		
Ren	nark:	Only worse ca	se is reported	MULL	A USE
100.0					
	X				
	2 X				
				(RF) FCC PAR	RT 15C (PEAK)
	3 X			(RF) FCC P	ART 15C (AVG)
50			_		
	/ 👌				
			^		
0.0					

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2480.000	91.79	3.38	95.17	Fundamental	Frequency	peak
2	*	2480.000	78.32	3.38	81.70	Fundamental	Frequency	AVG
3		2483.500	52.58	3.41	55.99	74.00	-18.01	peak
4		2483.500	39.33	3.41	42.74	54.00	-11.26	AVG



Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V	TUP	
Ant. Pol.	Vertical		122
Test Mode:	TX 8-DPSK Mode 2480)MHz	610
Remark:	Only worse case is repo	orted	a Use
100.0 dBuV/m			
1 X			
2 X		(RF) FCC P	PART 15C (PEAK)
		(RF) FCC	PART 15C (AVG)
50 X			
×			
0.0			
2475.000 2485.00	2495.00 2505.00 2515.00 25	525.00 2535.00 2545.00 2555.0	00 2575.00 Mł

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2480.000	84.96	3.38	88.34	Fundamental	Frequency	peak
2	*	2480.000	71.62	3.38	75.00	Fundamental	Frequency	AVG
3		2483.500	46.92	3.41	50.33	74.00	-23.67	peak
4		2483.500	35.76	3.41	39.17	54.00	-14.83	AVG



(2) Conducted Test

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX GFSK Mode 2402MHz/24	80 MHz	
Remark:	Only worse case is reported	Can B	multi
	Test Voltage: Test Mode:	Test Voltage: DC 5V Test Mode: TX GFSK Mode 2402MHz/244	Test Voltage: DC 5V Test Mode: TX GFSK Mode 2402MHz/2480 MHz

	Freq 2.3560	PN		j: Free Run en: 30 dB		e: Log-Pwr i:>100/100	TRACE 1 2 3 4 TYPE MWWW DET P N N N
0 dB/div	Ref Offset 3. Ref 23.61						Mkr1 2.402 1 GF -0.918 dB
13.6							
3.61							
5.39							<u> </u>
16.4							
26.4							-2 27 0
36.4							<u>2</u>
46.4		4					
56.4 Autom	مرابعهان والعاليات	ale	epennetelmenen marcon home	Burnhamalouseder	alaster and the second	wood and the second second	and
56.4							
	0600 GHz / 100 kHz		#VBW 30	0 kHz		Swee	Stop 2.40600 Gl 9.600 ms (1001 pl
		Х	Y	FUNCTION	FUNCTION WIDTH	F	UNCTION VALUE
IKR MODE 1	1 f	2.402 1 GHz 2.400 0 GHz	-0.918 dBm -44.210 dBm				
	1 f						
1 N 2 N 3 N	1 f 1 f	2.390 0 GHz	-56.204 dBm				
1 N 2 N 3 N 4 N 5			-56.204 dBm -52.979 dBm				
1 N 2 N 3 N 4 N 5 6 7		2.390 0 GHz	-56.204 dBm -52.979 dBm				
1 N 2 N 3 N 4 N 5 6 7 8		2.390 0 GHz	-56.204 dBm -52.979 dBm				
1 N 2 N 3 N 4 N 5 6 7		2.390 0 GHz	-56.204 dBm -52.979 dBm				

Keysight Spe		nalyzer - Swept SA								-			
	_R ⊧ eq 2.	75 Ω AC .52600000	00 GHz	PNO: Fast C		g: Free I ten: 30 d		ALI		e: Log-Pwr d:>100/100			20 PM Feb 19, 201 TRACE 1 2 3 4 5 TYPE M WWW DET P N N N
0 dB/div		Dffset 3.61 dE 23.61 dBm									N		479 8 GH I.161 dBn
13.6 3.61													
i.39													-15.82 dB
26.4													
36.4 1 4												0	
i6.4 i6.4		and the second	۲	el resource and	were readed	hikana	an a	Aures	vertapetro-horbs	urer and	∿-ranksteled	1 martin	()
tart 2.47 Res BW				#V	BW 30	0 kHz				S	weep	Stop 2 9.600 m	2.57600 GH is (1001 pt:
KR MODE TR	C SCL	;	2.479 8 GHz	Y		FUNG	CTION	FUNCT	ON WIDTH		FUN	CTION VALUE	
2 N 1 3 N 1 4 N 1	f f f		2.479 8 GH2 2.483 5 GH2 2.500 0 GH2 2.483 5 GH2	z -43.71 z -53.60	61 dBm 1 dBm 8 dBm 1 dBm								
5 6 7													
8 9 0													
						III							Þ
G									STATUS				



erature:	25 ℃	Relative Humidity:	55%
/oltage:	DC 5V	60182	~
Node:	GFSK Hopping Mode		
rk:	Only worse case is reported		
Ref 10 dB/div Ref 136	International Action of the second se	Avg Type: Log-Pwr Avg Hold:>100/100	2.406 0 GHz 8.590 dBm
-66.4 Start 2.30600 C #Res BW 100 k		Sweep 9.600	
1 N 1 f 2 N 1 f 3 N 1 f 4 N 1 f 5 1 f 6 1 f 7 1 g 9 1 1 10 1 1 11 1 1 11 1 1 12 1 1 10 1 1 10 1 1 10 1 1 10 1 1 10 1 1	2 406 0 GHz 8 590 dBm 2 400 0 GHz 4-1 809 dBm 2 390 0 GHz -54.337 dBm 2 375 9 GHz -47.473 dBm 	STATUS	
Keysight Spectrum Ar	alyzer - Swept SA 75 Ω AC CORREC SENSE:INT 5260000000 GHz PN0: Fast Trig: Free Ru IFGain:Low Atten: 30 dB	Avg Type: Log-Pwr	TRACE 2 3 4 5 6 TYPE MWWWW DET P NNNNN
10 dB/div Ref 13 6 3 61 -6.39 -16.4 -26.4 -66.4 -66.4 Start 2.47600 C	Эffset 3.61 dB 23.61 dBm	WWWWWWWWWWWWWWWWWWWWWWWWW	2.57600 GHz
#Res BW 100 k	Hz #VBW 300 kHz	Sweep 9.600	ms (1001 pts)
MKR MODE TRC. ScL. 1 N 1 f 2 N 1 f 3 N 1 f 4 N 1 f 5 6 6 6 7 8 9 9	X Y FUNCTION 2.476 1 GHz 9.726 dBm 2.483 5 GHz -54.092 dBm 2.500 0 GHz -50.818 dBm 2.491 9 GHz -49.171 dBm		



perature:	25 ℃		Relative Humidity:	55%
Voltage:	DC 5V	01	Comps.	
Mode:	TXPi/4-DQPS	K Mode 2402M	1Hz/2480 MHz	0.0
ark:	Only worse ca	ase is reported		
🚺 Keysight Spectrum A				
Center Freq 2	75 Ω AC CORREC 2.356000000 GHz PNC IFGa	SENSE:INT Trig: Free Run in:Low Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:20:55 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNN
Ref 10 dB/div Ref	Offset 3.61 dB 23.61 dBm		Mkr1	2.402 0 GHz -8.672 dBm
13.6				
3.61 -6.39				1
-16.4				28-84 dBm
-36.4				л и 2
-56.4 Andrew Allers		and the production of the second s	and the second	man M
-66.4 Start 2.30600	GHz		St	op 2.40600 GHz
#Res BW 100		#VBW 300 kHz		0 ms (1001 pts)
1 N 1 f 2 N 1 f 3 N 1 f	2.402 0 GHz 2.400 0 GHz 2.390 0 GHz	-8.672 dBm -50.521 dBm -55.598 dBm		
4 N 1 f 5 6	2.335 7 GHz	-53.769 dBm		
7				
10				
				•
MSG			STATUS	Þ
•	nalyzer - Swept SA 75 Ω AC CORREC	SENSE:INT	ALIGN AUTO	9:23:01 PM Feb 19, 2019
MSG MSG MSG Keysight Spectrum A	75 Ω AC CORREC 2.526000000 GHz PNC	sense:INT : Fast Trig: Free Run in:Low Atten: 30 dB		
Keysight Spectrum A	75 Ω AC CORREC 2.526000000 GHz PNC IFGa	: Fast 😱 Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:23:01 PM Feb 19, 2019 TRACE 1 2 3 4 5 6
Keysight Spectrum A	75 Ω AC CORREC 2.526000000 GHz PNC	: Fast 😱 Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:23:01 PM Feb 19, 2019 TRACE 2 3 4 5 6 TYPE MWWWW DET P N N N N 2.480 0 GHz
Keysight Spectrum A MSG Keysight Spectrum A Keysight Spectrum A RE Center Freq 2 10 clB/cliv Log	75 Ω AC CORREC 2.526000000 GHz PNC IFGa	: Fast 😱 Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:23:01 PM Feb 19, 2019 TRACE 2 3 4 5 6 TYPE MWWWW DET P N N N N 2.480 0 GHz
MSG MSG MSG MSG MSG MSG MSG MSG	75 Ω AC CORREC 2.526000000 GHz PNC IFGa	: Fast 😱 Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:23:01 PM Feb 19, 2019 TRACE 2 3 4 5 6 TYPE MWWWW DET P N N N N 2.480 0 GHz
MSG MSG RL RF Center Freq 2 10 dEJ/div Ref 10 dEJ/div Ref 13.6 3.61 4.6.33 4.6.4 4.06.4	250 AC CORREC 2.526000000 GHz PNC IFGa Offset 3.61 dB 23.61 dB 4 23.61 dB 4 23.61 dB	: Fast 😱 Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:23:01 PM Feb 19: 2019 TRACE 23 4 5 0 TYPE 02:34 5 0 TYPE 02:00 0 GHz -2:811 dBm
MSG MSG ML Ref Center Freq 2 13.6 3.61 -6.33 -16.4 -26.4	250 AC CORREC 2.526000000 GHz PNC IFGa Offset 3.61 dB 23.61 dB 4 23.61 dB 4 23.61 dB	: Fast 😱 Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	9:23:01 PM Feb 19: 2019 TRACE 23 4 5 0 TYPE 02:34 5 0 TYPE 02:00 0 GHz -2:811 dBm
MSG MSG MSG Center Freq 2 10 dB/div Ref 10 dB/div Ref 13.6 3.61 4.6.4 4.6.4 4.6.4	25.0 AC CORREC 2.526000000 GHz PNC IFGa Offset 3.61 dB 2.3.61 dB 3.61 dB 3.61 dB 3.61 dB 3.61 dB 3.61 dB 4.65	: Fast 😱 Trig: Free Run	ALIGN AUTO AUTO AY Type: Log-Pwr Avg Hoid:>100/100	9:23:01 PM Feb 19, 2019 TRACE []] 3:3 4 5 5 TYPE MANNANA DET P NN NN N 2:480 0 GHz -2.811 dBm -2.811 dBm
Keysight Spectrum A MSG MRL PF Center Freq 2 10 dB/div Ref 13.6 3.61 -6.33 -16.4 -66.4 Start 2.47600 0 #Res BW 100 1	215 0. AC CORREC 2.526000000 GHz PNC IFGa Offset 3.61 dB 23.61 dB 3.61 dB 3.61 dB 3.61 dB 4.52 dB 4.52 dB 5.52 dB 5.5	#VBW 300 kHz	ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mikr1 Mikr1	9:23:01 PM Feb 19, 2019 TRACE [] 3:3 4 5 5 TYPE [] 3:3 4 5 5 TYPE [] 4:3 4 5 5 Construction of the second of
MSG MSG MSG MSG MSG MSG MSG MSG	2350 AC CORREC 2.526000000 GHz PNC IFGa Offset 3.61 dB 2.3.61 dB 3.61 dB 3.61 dB 4.23.61 dB 4.23.61 dB 5.23.61 dB 5.25.61 dB 5	Fast Trig: Free Run Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 MIKr1	9:23:01 PM Feb 19, 2019 TRACE [] 3:3 4 5 5 TYPE [] 3:3 4 5 5 TYPE [] 4:3 4 5 5 Construction of the second of
Keysight Spectrum A Keysight Spectrum A R RF Center Freq 2 10 dE/div Ref 13.6 - 3.6.1 - -16.4 - -36.4 - -36.4 - -66.4 - Start 2.47600 #Res BW 100 MRR MODE TRCI SCLI N 1 N 1 2 N 1 3 N 1	2.52600000 GHz 2.526000000 GHz PNC IFGa Offset 3.61 dB 2.3.61 dB 3.61 dB 3.61 dB 4.23.61 dB 4.23.61 dB 5.23.61 dB 5.25.61 dB 5	Trig: Free Run Atten: 30 dB #VBW 3000 kHz Y FUNCTION -2.811 dBm	ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mikr1 Mikr1	9:23:01 PM Feb 19, 2019 TRACE [] 3:3 4 5 5 TYPE [] 3:3 4 5 5 TYPE [] 4:3 4 5 5 Construction of the second of
Image Image Image <td>2.52600000 GHz 2.52600000 GHz PNC IFG Offset 3.61 dB Offset 3.61 dB GHz GHz 2.480 0 GHz 2.483 5 GHz 2.</td> <td>Fast Trig: Free Run Atten: 30 dB #VBW 300 kHz #VBW 300 kHz Y FUNCTION -52.811 dBm -55.580 dBm -55.693 dBm</td> <td>ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mikr1 Mikr1</td> <td>9:23:01 PM Feb 19, 2019 TRACE [] 3:3 4 5 5 TYPE [] 3:3 4 5 5 TYPE [] 4:3 4 5 5 Construction of the second of</td>	2.52600000 GHz 2.52600000 GHz PNC IFG Offset 3.61 dB Offset 3.61 dB GHz GHz 2.480 0 GHz 2.483 5 GHz 2.	Fast Trig: Free Run Atten: 30 dB #VBW 300 kHz #VBW 300 kHz Y FUNCTION -52.811 dBm -55.580 dBm -55.693 dBm	ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mikr1 Mikr1	9:23:01 PM Feb 19, 2019 TRACE [] 3:3 4 5 5 TYPE [] 3:3 4 5 5 TYPE [] 4:3 4 5 5 Construction of the second of



erature:	25 ℃	61	Relative Hum	nidity:	55%
Voltage:	DC 5V	010	(dam)	2	
Mode:	Pi/4-DQPSK	Hopping Mode		-	2.5
ark:	Only worse c	ase is reported	t de la companya de		
Ref C 10 dB/div Ref C 13.6	75 Ω AC CORREC .356000000 GHz PN	O: Fast adin:Low Trig: Free Ru Atten: 30 dB		Mkr1 2	26:59 PM Feb 19, 2019 TRACE 12, 34 55 6 TYPE DET PINNINN 2.404 0 GHz 5.592 dBm
-46.4 -56.4 -56.4 Start 2.30600 G #Res BW 100 k		#VBW 300 kHz	Unorlan frankrindink		2.40600 GHz ms (1001 pts)
MRR MODE TRC; SCL 1 N 1 6 2 N 1 6 3 N 1 7 4 N 1 7 4 N 1 6 6 1 7 8 9 9 9 10 9 10 1 11 1 10	× 2.404 0 GHz 2.400 0 GHz 2.390 0 GHz 2.368 0 GHz 2.368 0 GHz	Y FUNCTIC 5 5592 dBm -49 408 dBm -54 580 dBm -51 151 dBm -	N FUNCTION WIDTH	FUNCTION VAL	
Ref C	75 Ω AC CORREC .526000000 GHz PN	O: Fast iain:Low Trig: Free Ru Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100		39:53 PM Feb 19, 2019 TRACE 23:4 3:6 TYPE NNNNN 2.477 0 GHz 7.037 dBm
10 dB/div Ref 0 dB/div Ref 13.6 1 -6.39 -16.4 -26.4					
Log 13.6 3.61 -6.39 -16.4					



perature:	25 ℃		Relative Humidity:	55%
Voltage:	DC 5V	ALL C	Composition 1	
: Mode:	TX 8-DPSK	Mode 2402MH	z/2480 MHz	20
nark:	Only worse	case is reported	t de la companya de	
	um Analyzer - Swept SA			
Center Free	RF 75 Ω AC CORREC q 2.356000000 GHz	PNO: Fast IFGain:Low IFGain:Low	Avg Type: Log-Pwr un Avg Hold:>100/100	0:00:56 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN
10 dB/div	Ref Offset 3.61 dB Ref 23.61 dBm		Mkr1	2.402 1 GHz -8.625 dBm
13.6				<u> </u>
-6.39				1
-16.4				28.76 dBm
-36.4				2
-46.4 -56.4 <mark>Marineta</mark>	ويحلوها والمحاصلين والمحمد ومطارحا والمحاصلين والمحاوية	Marthan - How Marthan	······································	marked h
-66.4				
Start 2.3060 #Res BW 10	00 kHz	#VBW 300 kHz	Sweep 9.60	op 2.40600 GHz 0 ms (1001 pts)
MKR MODE TRC 5 1 N 1 2 N 1	f 2.402 1 GH f 2.400 0 GH	Y FUNC z -8.625 dBm z -49.835 dBm	FION FUNCTION WIDTH FUNCTION V	/ALUE
3 N 1 4 N 1 5	f 2.390 0 GH f 2.363 2 GH	z -55.546 dBm z -53.680 dBm		_
6 7 8				
9				
11				
MSG		m	STATUS	
MSG			STATUS	
Keysight Spectrum	RF 75 Ω AC CORREC	III SENSE:INT	ALIGN AUTO 10: Avg Type: Log-Pwr	:03:54 PM Feb 19, 2019 TRACE 1 2 3 4 5 6
Keysight Spectrum	RF 75 Ω AC CORREC 2.526000000 GHz	SENSE:INT PNO: Fast Gain:Low Atten: 30 dB	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100	03:54 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N
MSG MSG WRL R Center Freq	RF 75 Ω AC CORREC 2.526000000 GHz	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019
Keysight Spectrum (X) RL R Center Freq 10 dB/div Re 13.6	RF 75 Ω AC CORREC 2.526000000 GHz	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN 2.479 8 GHZ
Keysight Spectrum (2) RL R Center Freq	RF 75 Ω AC CORREC 2.526000000 GHz	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN 2.479 8 GHZ
Keysight Spectrum (X) RL R Center Freq 10 dB/div Re 13 6 3 61 -6 39 -16.4	RF 75 Ω AC CORREC 2.526000000 GHz	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN 2.479 8 GHZ
Image: Niscipation Spectrum (Niscipation) Image: Niscipation Spectrum (Niscipation) Image: Niscipation Spectrum (Niscipation) Image: Niscipation) Image: Niscipation Spectrum (Niscipation) Image: Niscipation) Image: Niscipation Spectrum (Niscipation) Image: Niscipation) Image: Niscipation Spectrum (Nisc	F 175 0: AC CORREC 2.526000000 GHz I ef Offset 3.61 dB I ef 23.61 dB I	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	0:3:54 PM Feb 19, 2019 TRACE 2 3 4 5 0 TYPE 2 3 4 5 0 PNNNNN 2.479 8 GHz -2.793 dBm
Keysight Spectrum Msg Msg Center Freq 10 dB/dlv 136 361 -1 6.33 -16.4 -26.4	E 175 0. AC CORPEC 2.526000000 GHz ef Offset 3.61 dB ef 23.61 dBm	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	0:3:54 PM Feb 19, 2019 TRACE 2 3 4 5 0 TYPE 2 3 4 5 0 PNNNNN 2.479 8 GHz -2.793 dBm
Keysight Spectrum Keysight Spectrum Center Freq 10 dB/div Res 10 dB/div 10 dV 10 dV	F 175 0: AC CORREC 2.526000000 GHz I ef Offset 3.61 dB I ef 23.61 dB I	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	0:3:54 PM Feb 19, 2019 TRACE 2 3 4 5 0 TYPE 2 3 4 5 0 PNNNNN 2.479 8 GHz -2.793 dBm
Keysight Spectrum XX RL R Center Freq 10 dB/div Re 13 6 3 61 -6 39 -16 4 -26 4 -46 4	PF 75 0 AC CORREC 2.526000000 GHz Image: Construction of the second sec	PNO: Fast 😱 Trig: Free Ru	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 MKr1 2	0:3:54 PM Feb 19, 2019 TRACE 2 3 4 5 0 TYPE 2 3 4 5 0 PNNNNN 2.479 8 GHz -2.793 dBm
Keysight Spectrum MsG Keysight Spectrum M RL R Center Freq 10 dB/div Re 10 dB/div Re 10 dB/div 10 dB/d	PF 75 0 AC CORPEC 2.526000000 GHz Image: Construction of the second sec	PNO: Fast Goain:Low Trig: Free Ru Atten: 30 dB	ALIGN AUTO 10: Avg Type: Log-Pwr Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 12 34 5 G TYPE II 2 34 5 G DET P N N N N N DET P N N N N N 2.479 8 GHz -2.793 dBm -2.22 82 dBm -2.22 82 dBm -2.57600 GHz ms (1001 pts)
Keysight Spectrum Msg Msg Research Center Freq 10 dB/dlv 26 d -6.4 -6.4 -6.4 -6.4 Start 2.47600 #Res BW 1000 MRR MODE TRC SC 1 N 1 2 N 1 1 3 N 1 1 1	PF 175 00 AC CORREC 2.5260000000 GHz Image: Construction of the second	PNO: Fast Goain:Low Trig: Free Ru Atten: 30 dB	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 12 34 5 G TYPE II 2 34 5 G DET P N N N N N DET P N N N N N 2.479 8 GHz -2.793 dBm -2.22 82 dBm -2.22 82 dBm -2.57600 GHz ms (1001 pts)
Keysight Spectrum Msg Keysight Spectrum X R Center Freq 10 dB/div Reg R 136	PF 175 00 AC CORREC 2.5260000000 GHz Image: Construction of the second	PNO: Fast Goain:Low Trig: Free Ru Atten: 30 dB	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 12 34 5 G TYPE II 2 34 5 G DET P N N N N N DET P N N N N N 2.479 8 GHz -2.793 dBm -2.22 82 dBm -2.22 82 dBm -2.57600 GHz ms (1001 pts)
Image: Sector Revealed in the sector Image: Sector <th< td=""><td>PF 175 00 AC CORREC 2.5260000000 GHz Image: Construction of the second second</td><td>PNO: Fast Goain:Low Trig: Free Ru Atten: 30 dB</td><td>ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2</td><td>03:54 PM Feb 19, 2019 TRACE 12 34 5 G TYPE II 2 34 5 G DET P N N N N N DET P N N N N N 2.479 8 GHz -2.793 dBm -2.22 82 dBm -2.22 82 dBm -2.57600 GHz ms (1001 pts)</td></th<>	PF 175 00 AC CORREC 2.5260000000 GHz Image: Construction of the second	PNO: Fast Goain:Low Trig: Free Ru Atten: 30 dB	ALIGN AUTO 10: Avg Type: Log-Pwr n Avg Hold:>100/100 Mkr1 2	03:54 PM Feb 19, 2019 TRACE 12 34 5 G TYPE II 2 34 5 G DET P N N N N N DET P N N N N N 2.479 8 GHz -2.793 dBm -2.22 82 dBm -2.22 82 dBm -2.57600 GHz ms (1001 pts)



erature:	25 ℃	1110	Relative Humidity:	55%
/oltage:	DC 5V		60052	
Node:	8-DPSK Hopping	Mode		23
rk:	Only worse case	is reported		
Keysight Spectrum A				0:06:16 PM Feb 19, 2019
	75 Ω AC CORREC .356000000 GHz PNO: Fast	SENSE:INT Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hold:>100/100	0:06:16 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N
Ref	IFGain:Low Offset 3.61 dB 23.61 dBm	Atten: 30 dB	Mkr1	2.405 0 GHz -5.515 dBm
10 dB/div Ref	23.01 dBm			
3.61				
-16.4				.2 <mark>5,22 dBm</mark>
-36.4				
-56.4	นปักรุงกรุประชาญาณที่สุดการให้เหลือเป็นเป็นหาริการการที่สุดเหลือเป็นและเห	and yets of the state of the st	anout or an and the second	and the second
-66.4 Start 2.30600	247		Str	op 2.40600 GHz
#Res BW 100		VBW 300 kHz		0 ms (1001 pts)
1 N 1 f 2 N 1 f 3 N 1 f	2.405 0 GHz -5 2.400 0 GHz -55	5.515 dBm 5.810 dBm 5.067 dBm	PONCTION WIDTH PONCTION	ALUE
4 N 1 f 5 6		.606 dBm		E
7 8 9 10				
10 11 •		m		
11		III	STATUS	
11 MSG Keysight Spectrum A	75 Ω AC CORREC	m SENSE:INT	ALIGN AUTO 1	• • • • • • • • • • • • • • • • • • •
11 MSG Keysight Spectrum A		Trig: Free Run		
11 MSG	75 Ω AC CORREC .526000000 GHz PNO: Fast	Trig: Free Run	ALION AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100	0:15:37 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW
II Keysight Spectrum A K RL RF Center Freq 2 10 dB/div Ref 10 dB/div Ref	75 Ω AC CORREC 526000000 GHZ PNO: Fast IFGain:Low Offset 3.61 dB	Trig: Free Run	ALION AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100	0:15:37 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE WWWWW DET PNNNNN 2.476 0 GHz
II Keysight Spectrum A K RL RF Center Freq 2 10 dB/div Ref Log	75 Ω AC CORREC 526000000 GHZ PNO: Fast IFGain:Low Offset 3.61 dB	Trig: Free Run	ALION AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100	0:15:37 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE WWWWW DET PNNNNN 2.476 0 GHz
II MSG MSG MSG MSG MSG MSG MSG MSG	75 Ω AC CORREC 526000000 GHZ PNO: Fast IFGain:Low Offset 3.61 dB	Trig: Free Run	ALION AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100	0:15:37 PM Feb 19, 2019 TRACE 1 2 3 4 5 6 TYPE WWWWW DET PNNNNN 2.476 0 GHz
11 MSG III Keysight Spectrum A III RE Center Freq 2 10 dB/div Ref 13.6 1.6.3 1.16.4 -36.4	75 0 AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dB 23.61 dBm	Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1	0.15:37 PMFeb 19, 2019 TRACE 19, 23 4.5 G TYPE NUMBER 2.476 0 GHz -3.738 dBm
11 MSG Keysight Spectrum A Call RL RF Center Freq 2 13.6 3.61 -6.39 -16.4 -6.4 -6.4 -6.4 -6.4	75 0 AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dB 23.61 dBm	Trig: Free Run Atten: 30 dB	ALION AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100	0.15:37 PMFeb 19, 2019 TRACE 19, 23 4.5 G TYPE NUMBER 2.476 0 GHz -3.738 dBm
11 MSG IMSG IMSG <td>75 0. AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dB 23.61 dBm 4 3 4 3 Hz</td> <td>Trig: Free Run Atten: 30 dB</td> <td>ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hold:>100/100 Mkr1</td> <td>0:15:37 PMEb 19, 2019 TRACE [] 2 3 4 5 6 TYPE NUM W DET NUM W 2.476 0 GHz -3.738 dBm</td>	75 0. AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dB 23.61 dBm 4 3 4 3 Hz	Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hold:>100/100 Mkr1	0:15:37 PMEb 19, 2019 TRACE [] 2 3 4 5 6 TYPE NUM W DET NUM W 2.476 0 GHz -3.738 dBm
11 MSG MSG MSG MSG MSG MSG MSG MSG	75 Q. AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dB 23.61 dBm 4 3 4 3 4 4 3 Hz Hz X	Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hold:>100/100 Mkr1	0.15:37 PMEb 19, 2019 TRACE [] 2 3 4 5 G TYPE 2 4 4 5 G TYPE 2 4 4 5 G TYPE 2 4 5 G PHILLING 2.476 0 GHz -3.738 dBm -2312 dbp -2312 dbp -2312 dbp 0 bp 2.57600 GHz 0 ms (1001 pts)
11	75 0 AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dBm 23.61 dBm Hz .4 .3 .4 .3 .4 .3 .4 .3 .4 .3 .4 .3 .4 .3<	Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1	0.15:37 PMEb 19, 2019 TRACE [] 2 3 4 5 G TYPE 2 4 4 5 G TYPE 2 4 4 5 G TYPE 2 4 5 G PHILLING 2.476 0 GHz -3.738 dBm -2312 dbp -2312 dbp -2312 dbp 0 bp 2.57600 GHz 0 ms (1001 pts)
11	75 0 AC CORREC .526000000 GHz PNO: Fast IFGain:Low PMO: Fast IFGain:Low Offset 3.61 dBm 23.61 dBm Hz Hz CHZ 2.476 0 GHz -56 2.500 0 GHz	Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1	0.15:37 PMEb 19, 2019 TRACE [] 2 3 4 5 G TYPE 2 4 4 5 G TYPE 2 4 4 5 G TYPE 2 4 5 G PHILLING 2.476 0 GHz -3.738 dBm -2312 dbp -2312 dbp -2312 dbp 0 bp 2.57600 GHz 0 ms (1001 pts)
11 MSG WSG WSG MSG Start 2.47600 #Ref Start 2.47600 #REF Start 2.47600 #REF MR <mode< td=""> MSE MSE</mode<>	75 0 AC CORREC .526000000 GHz PNO: Fast IFGain:Low Offset 3.61 dBm 23.61 dBm Hz .4 .3 .4 .3 .4 .3 .4 .3 .4 .3 .4 .3 .4 .3<	Trig: Free Run Atten: 30 dB	ALIGN AUTO 1 Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1	0.15:37 PMFeb 19, 2019 TRACE [] 2 3 4 5 G TYPE 2 4 4 5 G TYPE 2 4 4 5 G TYPE 2 4 5 G PHILLING 2.476 0 GHz -3.738 dBm -2312 dbp -2312 dbp -2312 dbp -2312 dbp 0 ms (1001 pts)

Attachment D-- Number of Hopping Channel Test Data

Temperature:	25°	С	Relative Humidity:	55%
Test Voltage:	DC	5V		39
Test Mode:	Hop	oping Mode		613
Frequency Ran	ge	Test Mode	Quantity of Hopping Channel	Limit
		GFSK	79	
2402MHz~2480M	1Hz	Pi/4-DQPSK	79	>15
		8-DPSK	79	

GFSK Mode

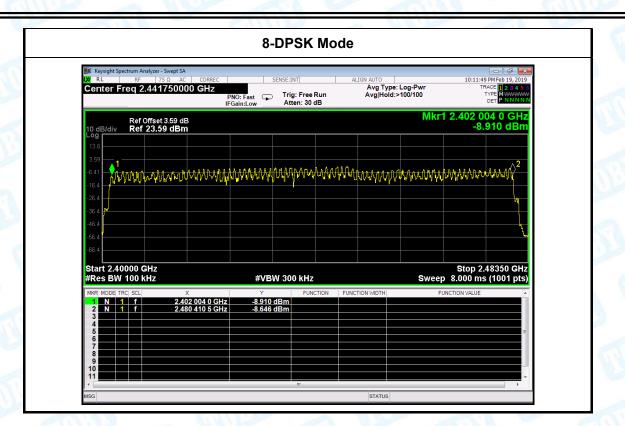
		2.44175000	F	PNO: Fast 😱 Gain:Low	Trig: Free F Atten: 30 c		Avg Hold:	>100/100		
dB/div		Offset 3.59 dE 23.59 dBm						Mkr	1 2.401 9 6.	20 5 GHz 740 dBm
	1 {\\\\\\\\\	1								
.4										
4										<u> </u>
art 2.4	40000 N 100			#VBW	/ 300 kHz			Sweet	Stop 2. 5 8.000 ms	48350 GHz (1001 pts)
es Bi			×)1 920 5 GHz	ү 6.740 d	Bm	TION FUNC	TION WIDTH	FI	UNCTION VALUE	
es Bi Mode N	1 f		79 993 0 GHz	9.620 d						
MODE	TRC SCL 1 f 1 f 1 f		79 993 0 GHz	9.620 d						=

Pi/4-DQPSK Mode



Keysight Spectrum Analyzer - Swept SA R L RF 75 Ω AC CORREC	SENSE:	INT	ALIGN AUTO			PM Feb 19, 2019
nter Freq 2.441750000 GHz		g: Free Run ten: 30 dB		pe: Log-Pwr d:>100/100		ACE 1 2 3 4 5 TYPE M
Ref Offset 3.59 dB dB/div Ref 23.59 dBm				Mki	1 2.402 0 3.	04 0 GHz 927 dBm
	VMMMMM	MAM		why why why	VH/adi/Wardwvf	MM 2
4						
4						
rt 2.40000 GHz es BW 100 kHz	#VBW 30	10 kHz		Swee	.Stop 2 p 8.000 ms	48350 GHz (1001 pts
MODE TRC SCL X	y 3.927 dBm	FUNCTION	FUNCTION WIDTH		FUNCTION VALUE	,
N 1 f 2.480 327 0 GH						





Attachment E-- Average Time of Occupancy Test Data

Temper	ature:	25℃ Relative Humidity:					
Test Vo	Itage:	DC	5V		1	233	
Test Mo	ode:	Нор	oping Mode (G	GFSK)			
Test	Chan	nel	Pulse	Total of Dwell	Period Time	Limit	Result
Mode		、	 , , ,				Result
mouo	(MH:	Z)	Time (ms)	(ms)	(s)	(ms)	
1DH1	244		0.397	(ms) 127.04	(s) 31.60	(ms) 400	PASS
	•	<i>.</i> 1					PASS PASS
1DH1	244	1 1	0.397	127.04	31.60	400	

1DH1 Total of Dwell= Pulse Time*(1600/2)*31.6/79

1DH3 Total of Dwell= Pulse Time*(1600/4)*31.6/79

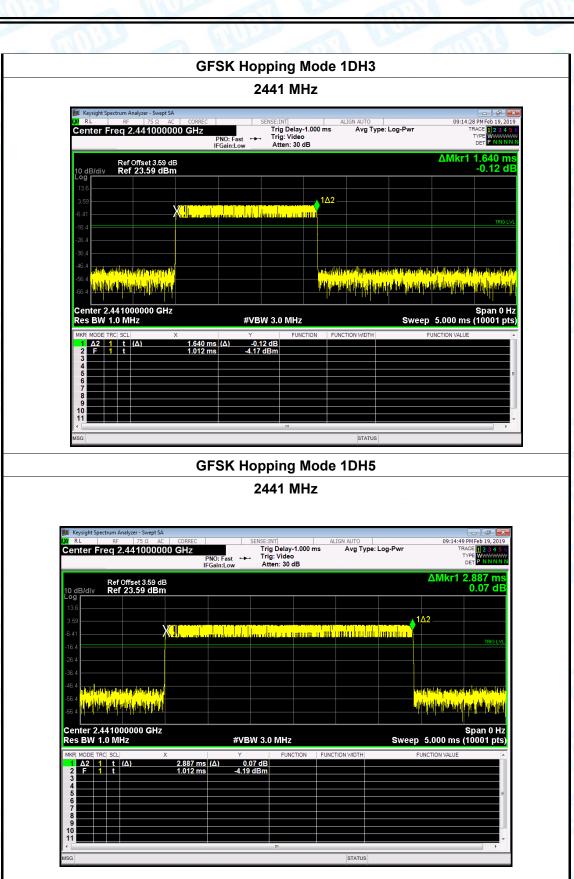
1DH5 Total of Dwell= Pulse Time*(1600/6)*31.6/79

GFSK Hopping Mode 1DH1

2441 MHz

	AC CORREC	SENSE		ALIGN AUTO		09:11:5	9 PM Feb 19, 20
enter Freq 2.441000		PNO: Fast ++ Tr	ig Delay-1.000 m ig: Video tten: 30 dB	s Avg Type	: Log-Pwr	Т	RACE 1 2 3 4 TYPE WWWW DET P N N N
Ref Offset 3.59 dB/div Ref 23.59 dE						ΔMkr1	397.0 j -0.19 d
og 3.6					_	1Δ2	
3.59					X ₂	<u>'</u>	
i.41							
6.4							TRIG I
6.4							
6.4							
6.4							
6.4	line Av			a territori de la compañía de la com		and the second list.	
6.4 WALFALLING MALE AL PORT	14 <mark>7 </mark> 14		والمستغلالة أكلينا الدرائلة	in ite alat patra he		فتراف القائلان فطالقا	
							· ·
enter 2.441000000 GH es BW 1.0 MHz	lz	#VBW 3.	0 MHz		Swee	p 5.000 ms	Span 0 (10001 p
enter 2.441000000 GF es BW 1.0 MHz	X	Y	FUNCTION	FUNCTION WIDTH	Swee	p 5.000 ms	Span 0 I (10001 p
enter 2.441000000 GF es BW 1.0 MHz R MODE TRC SCL 1 Δ2 1 t (Δ) 2 F 1 t		Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p
enter 2.441000000 GF es BW 1.0 MHz RR MODE TRCI SCL 1 A2 1 t (A) 2 F 1 t 3	Х 397.0 µs	Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p
enter 2.441000000 GF es BW 1.0 MHz GR MODE TRC: SCL 1 A2 1 t (Δ) 2 F 1 t 3 4 5 5	Х 397.0 µs	Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p
enter 2.441000000 GF es BW 1.0 MHz RR MODE TRC SCL 2 F 1 t 3 4 4 5 6 6 7	Х 397.0 µs	Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p
enter 2.441000000 GF es BW 1.0 MHz KR MODE TRC SCL 1 4 (A) 2 F 1 t 3 (A) 4 (Х 397.0 µs	Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p
Image: Constraint of the set of	Х 397.0 µs	Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p
enter 2.441000000 GF es BW 1.0 MHz	Х 397.0 µs	Υ (Δ) -0.19 dB	FUNCTION	FUNCTION WIDTH	Swee		Span 0 I (10001 p







Temper	ature:	25°	С	Re	lative Humidity:	55%	100
Test Vo	ltage:	DC	5V	01	60022		MU-2
Test Mo	ode:	Hop	oping Mode (F	Pi/4-DQPSK)		6.0	
Test	Chan	nel	Pulse	Total of Dwell	Period Time	Limit	D It
1							
Mode	(MH	z)	Time (ms)	(ms)	(s)	(ms)	Result
Mode 2DH1	(MH) 244	•	Time (ms) 0.3715	(ms) 118.88	(s) 31.60	(ms) 400	PASS
		1	. ,				
2DH1	244	1 1	0.3715	118.88	31.60	400	PASS

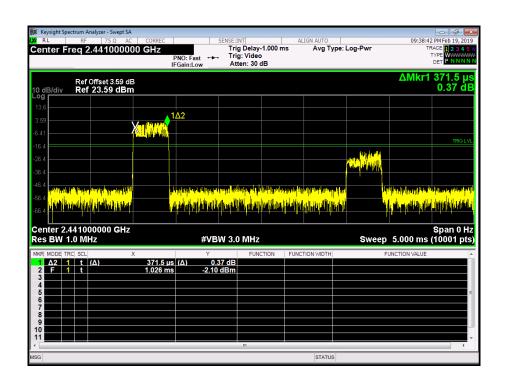
2DH1 Total of Dwell= Pulse Time*(1600/2)*31.6/79

2DH3 Total of Dwell= Pulse Time*(1600/4)*31.6/79

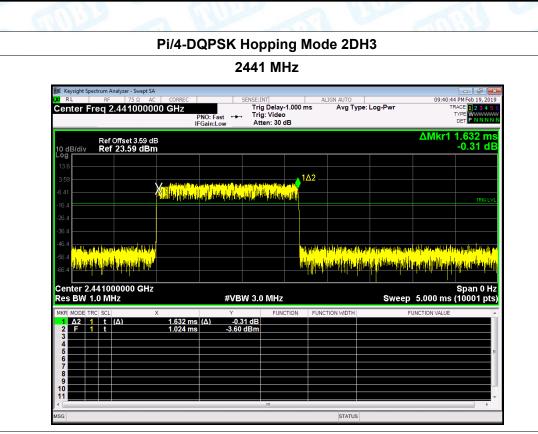
2DH5 Total of Dwell= Pulse Time*(1600/6)*31.6/79

Pi/4-DQPSK Hopping Mode 2DH1



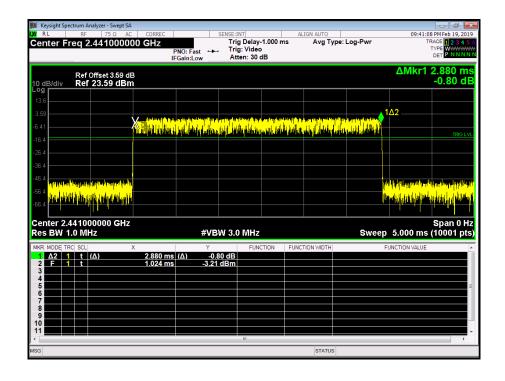






Pi/4-DQPSK Hopping Mode 2DH5

2441 MHz





Temper	ature:	25°	С	Re	lative Humidity:	55%	100
Test Vo	Itage:	DC	5V	BI	00000	-	MON S
Test Mo	ode:	Ho	oping Mode (8	B-DPSK)		193	
Test	Chan	nel	Pulse	Total of Dwell	Period Time	Limit	Desult
Mode	(MH	z)	Time (ms)	(ms)	(s)	(ms)	Result
Mode 1DH1	(MH) 244	•	Time (ms) 0.399	(ms) 127.68	(s) 31.60	(ms) 400	PASS
		1				. ,	
1DH1	244	1 1	0.399	127.68	31.60	400	PASS

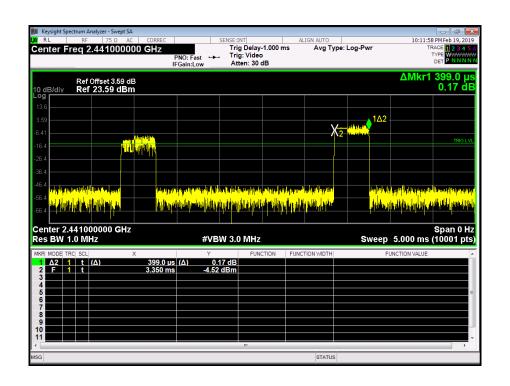
1DH1 Total of Dwell= Pulse Time*(1600/2)*31.6/79

1DH3 Total of Dwell= Pulse Time*(1600/4)*31.6/79

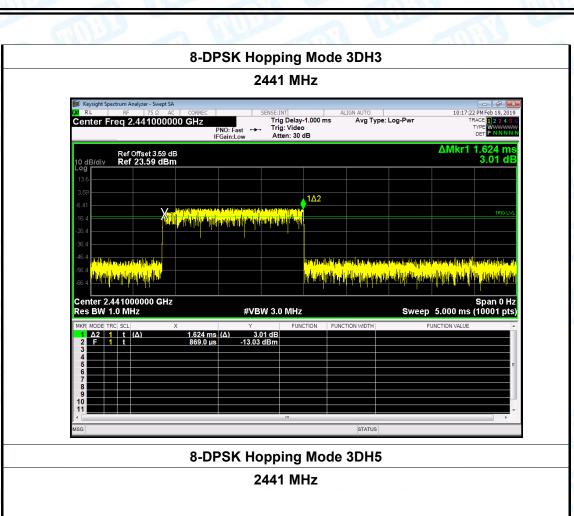
1DH5 Total of Dwell= Pulse Time*(1600/6)*31.6/79

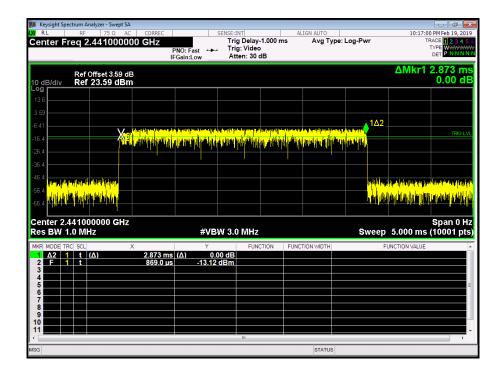
8-DPSK Hopping Mode 3DH1











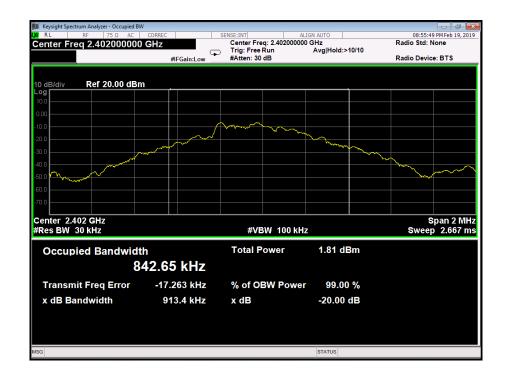
TOBY

Attachment F-- Channel Separation and Bandwidth Test

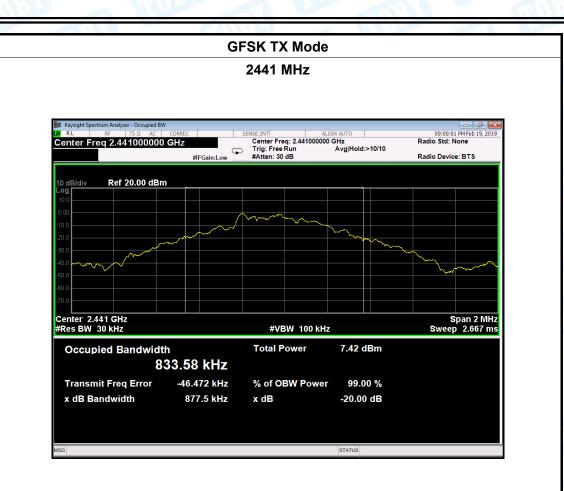
Data

	_			
Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	DC	; 5V		<00m
Test Mode:	ТΧ	Mode (GFSK)		
Channel frequei (MHz)	ncy	99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402		842.65	913.4	608.93
2441		833.58	877.5	585.00
2480		831.68	882.9	588.60
		CESK TY I	Mada	

GFSK TX Mode







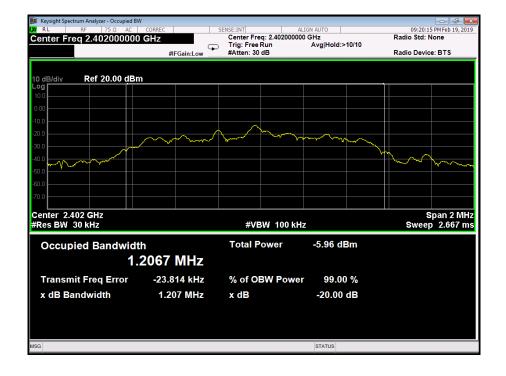
GFSK TX Mode 2480 MHz

Keysight Spectrum Analyzer - Occupied B				- # -
RL RF 75Ω AC enter Freq 2.480000000	CORREC	Center Freq: 2.48000000 Trig: Free Run	LIGN AUTO 10 GHz Avg Hold:>10/10	09:00:49 PM Feb 19, 201 Radio Std: None
	#IFGain:Low	#Atten: 10 dB		Radio Device: BTS
5 dB/div Ref 20.00 dBr	n			
.og 5.00				
10.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
25.0			Martin and and and and and and and and and an	
40.0				man marked
55.0				
70.0				
85.0				
-100				
-115				
Center 2.48 GHz				Enon 2 MH
#Res BW 30 kHz		#VBW 100 kH	Z	Span 2 MH: Sweep 2.667 ms
Occupied Bandwidt	th	Total Power	6.85 dBm	
8	31.68 kHz			
Transmit Freq Error	-48.844 kHz	% of OBW Powe	r 99.00 %	
	882.9 kHz	x dB	-20.00 dB	
x dB Bandwidth				
x dB Bandwidth	002.9 KHZ			
x dB Bandwidth	002.3 KHZ			
x dB Bandwidth	002.9 KHZ			

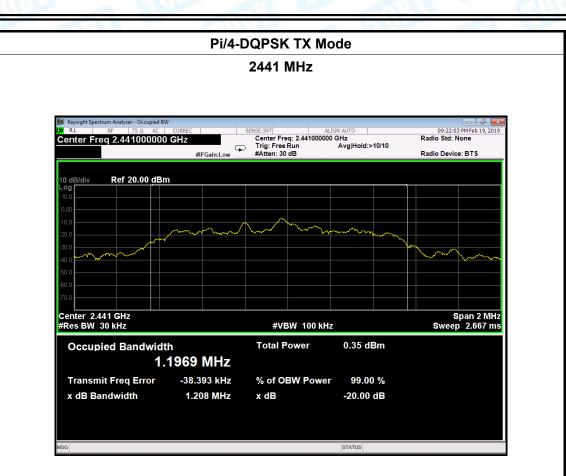


Temperature:	25°	C	Relative Humidity:	55%	
Test Voltage:	DC	5V	60032		
Test Mode:	ТΧ	Mode (Pi/4-DQPSK)		22	
Channel frequency (MHz)		99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)	
2402		1206.7	1207	804.67	
2441		1196.9	1208	805.33	
2480		1210.7	1210	806.67	
		DIVA DODSK	TV Mode		

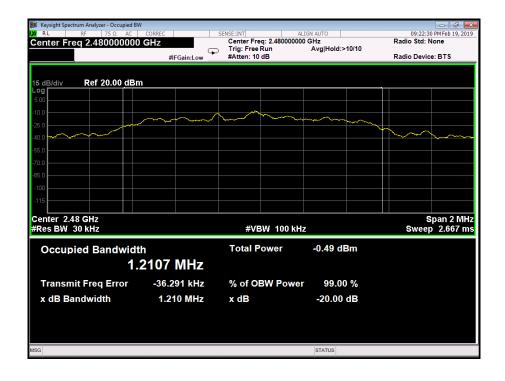
Pi/4-DQPSK TX Mode







Pi/4-DQPSK TX Mode





Temperature:	25°	С	Relative Humidity:	55%
Test Voltage:	DC	5V	0 0	01
Test Mode:	ТΧ	Mode (8-DPSK)		
Channel frequency (MHz)		99% OBW (kHz)	20dB Bandwidth (kHz)	20dB Bandwidth *2/3 (kHz)
2402		1174.0	1198	798.67
2441		1170.5	1223	815.33
2480		1174.4	1227	818.00
		8-DPSK TX	Mode	







8-DPSK TX Mode

Keysight Spectrum Analyzer - Occupied B R L RF 75 Ω AC	CORREC		IGN AUTO	10:03:22 PM Feb 19, 20
enter Freq 2.48000000		Center Freq: 2.48000000 Trig: Free Run) GHz Avg Hold:>10/10	Radio Std: None
	#IFGain:Low	#Atten: 10 dB	Arginola.2 Torio	Radio Device: BTS
5 dB/div Ref 20.00 dBr	n			
og				
.00				
0.0	0(m		
5.0			a second	
0.0				1 mm
5.0				
0.0				
5.0				
100				
115				
enter 2.48 GHz Res BW 30 kHz		#VBW 100 kH;	-	Span 2 MH
Res DW JU KHZ			2	Sweep 2.667 m
Occupied Bandwidt	h	Total Power	-0.23 dBm	
	1744 MHz			
Transmit Freq Error	-34.827 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	1.227 MHz	x dB	-20.00 dB	
G			STATUS	

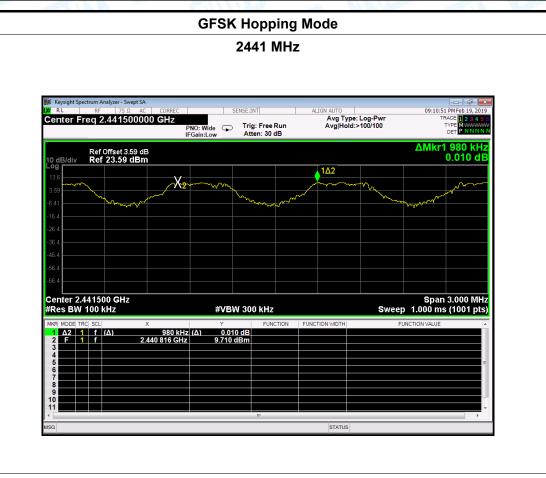


Temperature:	25 ℃		Relative H	umidity:	55%	
Test Voltage:	DC 5V			-6	00	
Test Mode:	Hopping N	Hopping Mode (GFSK)				
Channel frequ	uency	Separation Re	ad Value	Sep	aration Limit	
(MHz)		(kHz)			(kHz)	
2402		1170			913.4	
2441		980		877.5		
2480		1160			882.9	
		GESK Honnir	a Mode			

GFSK Hopping Mode







GFSK Hopping Mode 2480 MHz



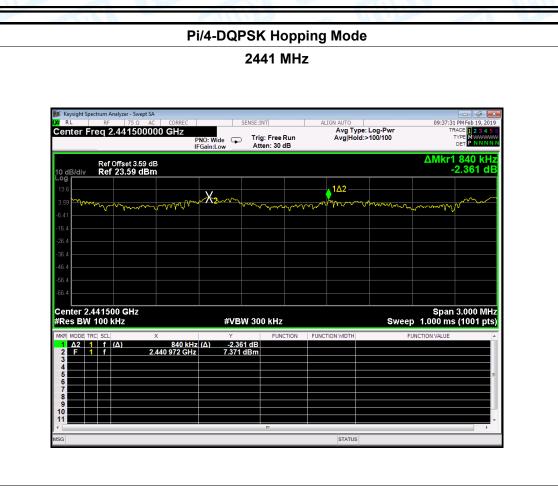


Temperature:	25 ℃		Relative H	lumidity:	55%		
Test Voltage:	DC 5V			6	00		
Test Mode:	Hopping I	Hopping Mode (Pi/4-DQPSK)					
Channel frequency Separation Read Value Separation				aration Limit			
(MHz)		(kHz)			(kHz)		
2402		820			804.67		
2441		840		805.33			
2480		990			806.67		
		DI/A DODCK Har	nina Mada				

Pi/4-DQPSK Hopping Mode

RL	RF	alyzer - Swept S 75 Ω A	C CORREC		SENSE:IN	r	AL	IGN AUTO		09:	26:20 PM Feb 19, 20
enter	Freq 2.	4025000	I	PNO: Wide 🕞 FGain:Low		Free Run en: 30 dB		Avg Typ Avg Hold	e: Log-Pwr :>100/100		TRACE 1 2 3 4 TYPE MWWW DET P NNN
dB/div		offset 3.61 c 23.61 dBi								ΔΜΙ	kr1 820 kH 1.580 d
2g 3.6								<u>1∆2</u> —			
.61		*	hurren	w Kgrow	· · · · · · · · · · · · · · · · · · ·	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.rd	horan a	m	m ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m. Mar
.39		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									
5.4	oper										
5.4 ~~~ 5.4	~~ ¹⁶										
5.4											
5.4											
	2.40250 V 100 k			#VF	W 300	kH7			Swe	Sp	an 3.000 Mi ms (1001 pt
R MODE	TRC SCL		Х	Y		FUNCTION	FUNCT	ION WIDTH		FUNCTION VAL	· ·
1 Δ2 2 F 3	1 f (1 f		820 kHz 2.401 990 GHz	(Δ) <u>1.5</u> <u>3.446</u>	80 dB dBm						
3											
5 6 7											
5 6 7 8 9											
4 5 6 7 8 9 0 1											





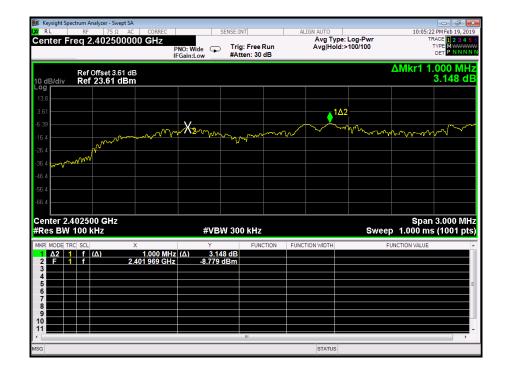
Pi/4-DQPSK Hopping Mode



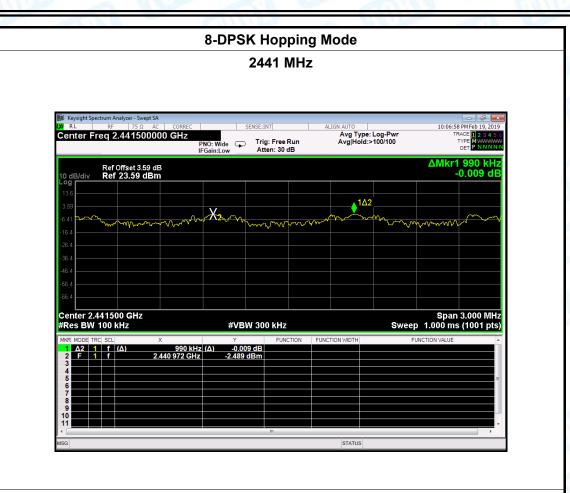


Temperature:	25 ℃		Relative H	lumidity:	55%	
Test Voltage:	DC 5V		a 19	-6	00	
Test Mode:	Hopping I	Mode (8-DPSK)				
Channel freq	uency	Separation Re	ad Value	Sep	aration Limit	
(MHz)		(kHz)			(kHz)	
2402		1000			798.67	
2441		990			815.33	
2480		1010			818.00	
		8-DPSK Honni	na Mode			

8-DPSK Hopping Mode





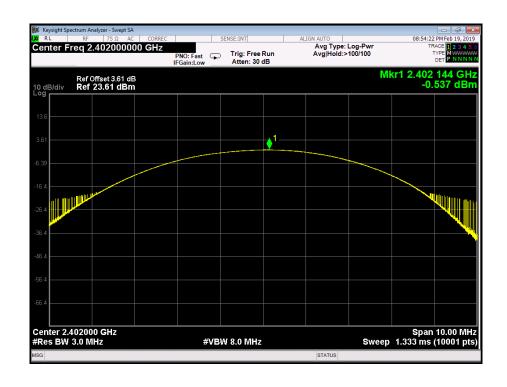


8-DPSK Hopping Mode 2480 MHz

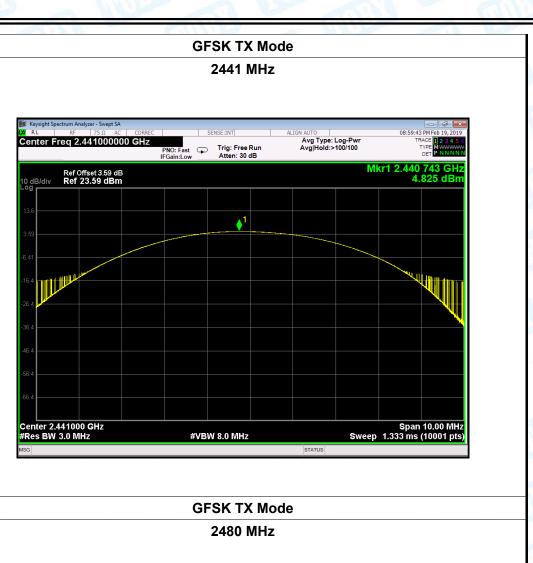
RL	RE	alyzer - Swept 9	AC CORREC		SENSE:1	NT	AL	IGN AUTO		10:12	:34 PM Feb 19, 20
			000 GHz					Avg Type:			TRACE 1 2 3 4
				PNO: Wide		g: Free Run		Avg Hold:>	100/100		
				IFGain:Low	At	ten: 30 dB					
	Paf 0	ffset 3.61	40							ΔMkr1	1.010 MH
0 dB/div		23.61 dB									-0.338 d
^{og}											
13.6											
3.61								<u></u> 1∆:	2		
5.39 ~~ ~			0.0	X2~	~			\sim			
	1 mm	ᡢᢩᠰᡘ᠆᠈᠕	m	v/~/ _/	Jun V	m	\sqrt{m}	, w	Mm m	m.	
6.4											
.4											www
36.4											· · · · · · · · · · · · · · · · · · ·
16.4											
56.4											
66.4											
										Spa	ın 3.000 MH
enter	2.47950	0 GHz									
	2.47950 N 100 ki			#	/BW 30	0 kHz			Swe	ep 1.000 n	ns (1001 pt
Res B	N 100 k		×				EUNCT		Swe	ep 1.000 n	· ·
Res B	N 100 K	Hz	X 1 010 MH	`	(0 KHZ FUNCTION	FUNCT	ION WIDTH	Swe	ep 1.000 n	· ·
Res B	N 100 K	Hz Δ)	× 1.010 MH 2.478 969 GH	z (Δ) -			FUNCT	ION WIDTH	Swe	ep 1.000 n	· ·
Res B KR MODE 1 A2 2 F 3	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	ION WIDTH	Swe	ep 1.000 n	· ·
Res Bi kr Mode 1 A2 2 F 3 4	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	TION WIDTH	Swe	ep 1.000 n	· ·
Res B KR MODE 1 A2 2 F 3	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	TION WIDTH	Swe	ep 1.000 n	· ·
Res BI 1 Δ2 2 F 3 4 5 6 7 —	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	TION WIDTH	Swe	ep 1.000 n	· ·
Res Bi	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	ION WIDTH	Swe	ep 1.000 n	· ·
Res Bi	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	ION WIDTH	Swe	ep 1.000 n	· ·
Res BI KR MODE 1 A2 2 F 3	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB	FUNCTION	FUNCT	ION WDTH	Swe	ep 1.000 n	· ·
Res Bi	V 100 k	Hz Δ)	1.010 MH	z (Δ) -).338 dB		FUNCT	ION WDTH	Swe	ep 1.000 n	· ·

Attachment G-- Peak Output Power Test Data

Temperature:	25 ℃		Relative Humidity:	55%
Test Voltage:	DC 5V	NUL I	1 4	BU -
Test Mode:	TX Mode	(GFSK)		
Channel frequen	cy (MHz)	Test Result	(dBm) L	.imit (dBm)
2402		-0.537	-0.537	
2441		4.825		30
2480		4.472		
		GFSK TX I	Node	
			-	



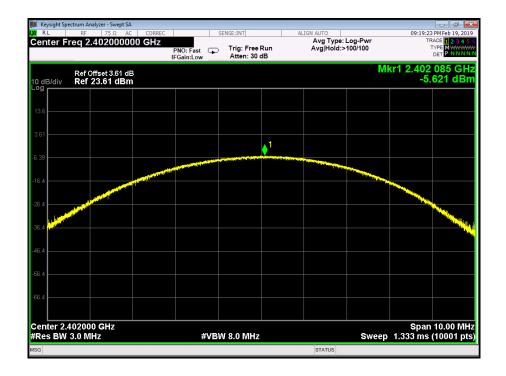




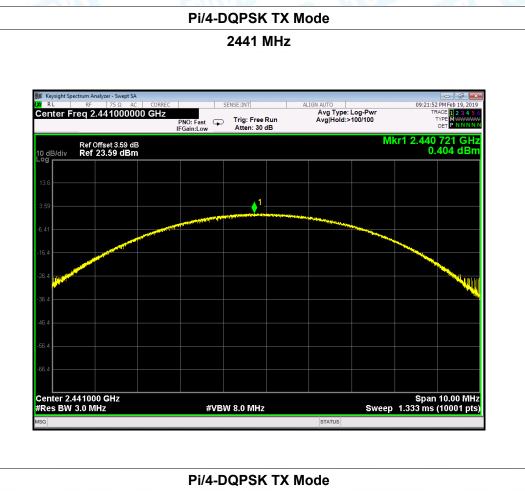




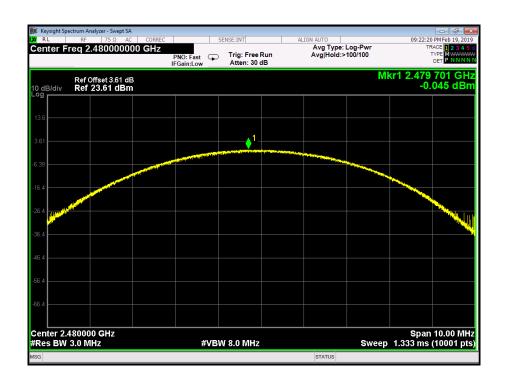
Temperature: 25°C		R	Relative Humidity:	55%	
Test Voltage:	DC 5V		60122		
Test Mode:	TX Mode	(Pi/4-DQPSK)			
Channel frequency (MHz)		Test Result (d	Bm) Li	Limit (dBm)	
2402		-5.621			
2441		0.404		21	
2480		-0.045			
		Pi/4-DQPSK TX	Mode		





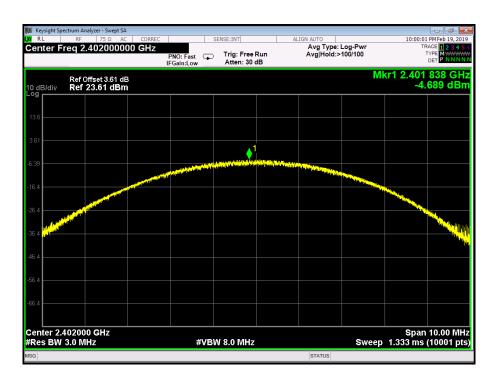


i/4-DQPSK TX Mo 2480 MHz

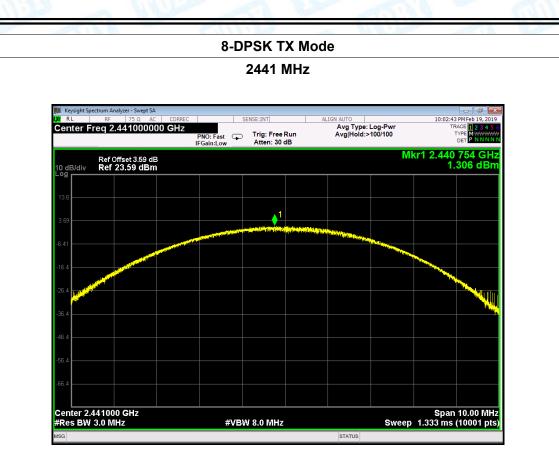




Temperature:	25 ℃	010	Relative Humidity:	55%	
Test Voltage:	DC 5V		0000	A N	
Test Mode:	TX Mode	(8-DPSK)			
Channel frequency (MHz)		Test Result (dBm)		Limit (dBm)	
2402		-4.689			
2441 2480		1.306		21	
		0.774			
		8-DPSK TX M	ode		
		2402 MHz			

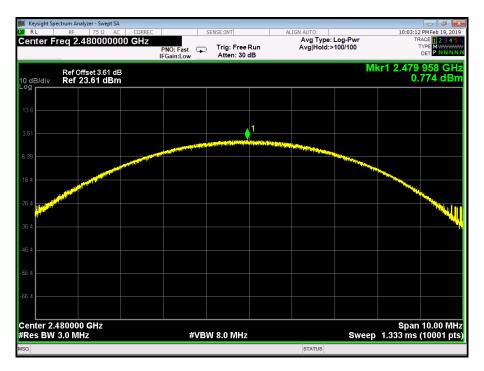






8-DPSK TX Mode





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