TEST REPORT

		DT&C Co., Ltd.				
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1. Report	No : DRTFCC2012-0382	2				
2. Custom	er					
• Name	: HYUNDAI MOBIS CO.,	LTD.				
• Addre	ss : 203, Teheran-ro Gan	gnam-gu, Seoul, South Korea, 135-977				
3. Use of I	Report : FCC Original Gra	int				
	Name / Model Name : Dl : TQ8-DA330DJAN	SPLAY CAR SYSTEM / DA330DJAN				
	egulation(s): Part 15.247 thod Used : KDB558074	D01v05r02, ANSI C63.10-2013				
6. Date of	Test : 2020.10.05 ~ 2020	.11.23				
7. Locatior	7. Location of Test : 🛛 Permanent Testing Lab 🛛 On Site Testing					
8. Testing	Environment : See appen	ded test report.				
9. Test Re	sult : Refer to the attache	d test result.				
The results	shown in this test report refe	er only to the sample(s) tested unless otherwise stated.				
Affirmation	Tested by	Reviewed by				
	Name : JaeHyeok Bang	Name : JaeJin Lee (Signature)				
2020.12.08.						
		DT&C Co., Ltd.				
	Unconnected with KS Q ISO / IEC 17025 and KOLAS accreditation					

If this report is required to confirmation of authenticity, please contact to report@dtnc.net



Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2012-0382	Dec. 08, 2020	Initial issue	JaeHyeok Bang	JaeJin Lee



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1. General Information

1.1 Testing Laboratory

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site complies with the requirements of § 2.948 according to ANSI C63.4-2014.

- FCC & IC MRA Designation No. : KR0034

- ISED#: 5740A

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1.2 Testing Environment

Ambient Condition		
Temperature	+20 °C ~ +25 °C	
 Relative Humidity 	35 % ~ 45 %	

1.3 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Test items	Measurement uncertainty
Antenna-port conducted emission	0.9 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz Below)	4.9 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz ~ 18 GHz)	5.1 dB (The confidence level is about 95 %, k = 2)
Radiated emission (18 GHz Above)	5.3 dB (The confidence level is about 95 %, k = 2)

1.4 Details of Applicant

Applicant Name	HYUNDAI MOBIS CO., LTD.
Address	203, Teheran-ro Gangnam-gu, Seoul, South Korea, 135-977

1.5 Description of EUT

EUT	DISPLAY CAR SYSTEM
Model Name	DA330DJAN
Add Model Name ^{Note1}	DA330DJKN, DA330DLKN, DA330DLAN
Add Model Name Note1	DA331DJAN, DA331DJKN, DA331DLKN, DA331DLAN
Hardware Version	1.0
Software Version	1.0
Serial Number	Conducted : 96160M6850WK(DA330DJAN) Radiated: 96160M6850WK(DA330DJAN) 96160M6880WK(DA331DJAN)
Power Supply	DC 14.4 V
Frequency Range	2 402 MHz ~ 2 480 MHz
Modulation Technique (data rate)	GFSK(1 Mbps), π/4DQPSK(2 Mbps), 8DPSK(3 Mbps)
Number of Channels	79
Antenna Type	PCB Pattern Antenna
Antenna Gain	PK : -0.18 dBi

Note 1: Difference between models

	Model Name	Difference
Base model	DA330DJAN	NA
Add model	DA331DJAN, DA331DJKN, DA331DLKN, DA331DLAN	This model contains module approved under Part 22/24/27.(FCC ID: YZP-VL3010)
Add models	DA330DJKN, DA330DLKN, DA330DLAN	Same as base model

1.6 Declaration by the applicant / manufacturer

- NA

1.7 Information about the FHSS characteristics

- This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following :
 - A) The hopping sequence is pseudorandom
 - Note 1 : Pseudorandom Frequency Hopping Sequence Table as below:
 - Channel: 08, 24, 40, 56, 42, 54, 72, 09, 01, 11, 33, 41, 34, 42, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 41, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 52, 71, 08, 24, 06, 24, 48, 56, 45, 46, 70, 01, 72, 06, 25, 33, 12, 28, 49, 60, 45, 58, 74, 13, 05, 18, 37, 49 etc

The System receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchroniztation with the transmit ted signals.

- B) All channels are used equally on average
- C) The receiver input bandwidth equals the transmit bandwidth
- D) The receiver hops in sequenc e with the transmit signal
- 15.247(g) : In accordance with the Bluetooth Industry Standard, the system is designed to comply with all
 of the regulations in Section 15.247 when the transmitter is presented with a continuous data
 (or information) system.
- 15.247(h) : In accordance with the Bluetooth Industry Standard, the system does not coordinate its channels selection / hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.
- 15.247(h): The EUT employs Adaptive Frequency Hopping (AFH) which identifies sources of interference namely devices operating in 802.11 WLAN and excludes them from the list of available channels. The process of re-mapping reduces the number of test channels from 79 channels to a minimum number of 20 channels.

1.8 Test Equipment List

Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY50410357
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY48011700
Spectrum Analyzer	Agilent Technologies	N9020A	20/06/24	21/06/24	US47360812
DC Power Supply	Agilent Technologies	66332A	20/06/24	21/06/24	MY43000211
Multimeter	FLUKE	17B	19/12/16	20/12/16	26030065WS
Signal Generator	Rohde Schwarz	SMBV100A	19/12/16	20/12/16	255571
Signal Generator	ANRITSU	MG3695C	19/12/16	20/12/16	173501
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-1
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-2
Thermohygrometer	BODYCOM	BJ5478	20/07/01	21/07/01	N/A
HYGROMETER	TESTO	608-H1	20/01/21	21/01/21	34862883
Loop Antenna	ETS-Lindgren	6502	19/09/18	21/09/18	00226186
BILOG ANTENNA	Schwarzbeck	VULB 9160	19/04/23	21/04/23	9160-3362
Horn Antenna	ETS-Lindgren	3117	20/10/23	21/10/23	00143278
Horn Antenna	A.H.Systems Inc.	SAS-574	20/06/24	21/06/24	155
PreAmplifier	tsj	MLA-0118-B01-40	19/12/16	20/12/16	1852267
PreAmplifier	tsj	MLA-1840-J02-45	20/06/24	21/06/24	16966-10728
PreAmplifier	H.P	8447D	19/12/16	20/12/16	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935- 1000-15000-40SS	20/06/24	21/06/24	8
High Pass Filter	Wainwright Instruments	WHKX10-2838- 3300-18000-60SS	20/06/24	21/06/24	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	20/06/24	21/06/24	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	20/06/24	21/06/24	16012202
Attenuator	SRTechnology	F01-B0606-01	20/06/24	21/06/24	13092403
Attenuator	Aeroflex/Weinschel	56-3	20/06/24	21/06/24	Y2370
Attenuator	SMAJK	SMAJK-2-3	20/06/24	21/06/24	2
BlueTooth Tester	TESCOM	TC-3000B	19/12/16	20/12/16	3000B640046
Power Splitter	Anritsu	K241B	20/06/24	21/06/24	020611
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2488B MA2491A	20/01/02	21/01/02	0910025 0845333
Cable	Junkosha	MWX241	20/01/13	21/01/13	G-04
Cable	Junkosha	MWX241	20/01/13	21/01/13	G-07
Cable	DT&C	Cable	20/01/13	21/01/13	G-13
Cable	DT&C	Cable	20/01/13	21/01/13	G-14
Cable	HUBER+SUHNER	SUCOFLEX 104	20/01/13	21/01/13	G-15
Cable	Radiall	TESTPRO3	20/01/16	21/01/16	M-01
Cable	Junkosha	MWX315	20/01/16	21/01/16	M-05
Cable	Junkosha	MWX221	20/01/16	21/01/16	M-06
Cable	DT&C	Cable	20/01/13	21/01/13	RF-18
Test Software	tsj	Raidated Emission Measurement	NA	NA	Version 2.00.0177

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017. Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

1.9 Summary of Test Results

FCC Part RSS Std.	Parameter	Limit (Using in 2 400~ 2 483.5 MHz)	Test Condition	Status Note 1
	Carrier Frequency Separation	>= 25 kHz or >= Two thirds of the 20 dB BW, whichever is greater.		с
15.247(a)	Number of Hopping Frequencies	>= 15 hops		С
	20 dB Bandwidth	N/A		С
	Dwell Time	=< 0.4 seconds		С
15.247(b)	Transmitter Output Power	=< 1 Watt , if CHs >= 75 Others =< 0.125 W Others =< 0.125 W For Conducted Power. =< 0.5 Watt For e.i.r.p	Conducted	С
15.247(d)	Conducted Spurious Emissions	The radiated emission to any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density.		с
15.247(d) 15.205 15.209	Radiated Spurious Emissions	FCC 15.209 Limits (Reference to section 7)	Radiated	с
15.207	AC Conducted Emissions	FCC 15.207 Limits (Reference to section 8)	AC Line Conducted	NA Note3
15.203	Antenna Requirements	FCC 15.203 (Reference to section 9)	-	с
With OAT	ted emission tests below 30 MHz were	e performed on semi-anechoic cham	ber which is co	rrelated

Note 4: The conducted test item were performed the base model.(MN: DA330DJAN)

The radiated test item were performed both "MN: DA330DJAN" and "MN: DA331DJAN"



1.10 Conclusion of worst-case and operation mode

The EUT has three types of modulation (GFSK, π /4DQPSK and 8DPSK). Therefore all applicable requirements were tested with all the modulations. And packet type was tested at the worst case(DH5).

Tested frequency information,

- Hopping Function : Enable

	TX Frequency (MHz)	RX Frequency (MHz)
Hopping Band	2 402 ~ 2 480	2 402 ~ 2 480

- Hopping Function : Disable

	TX Frequency (MHz)	RX Frequency (MHz)
Lowest Channel	2 402	2 402
Middle Channel	2 441	2 441
Highest Channel	2 480	2 480



2. Maximum Peak Output Power Measurement

2.1 Test Setup

Refer to the APPENDIX I.

2.2 Limit

FCC Requirements

The maximum peak output power of the intentional radiator shall not exceed the following :

- §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2 400 MHz - 2 483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.
- 2. §15.247(b)(1), For frequency hopping systems operating in the 2 400 2 483.5 MHz employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5 725 MHz 5 805 MHz band : 1 Watt. For all other frequency hopping systems in the 2 400 MHz 2 483.5 MHz band: 0.125 watts.

IC Requirements

 RSS-247(5.4) (b), For FHSS operating in the band 2 400 MHz – 2 483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels, the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p shall not exceed 4 W, except as provided in section 5.4(e)

2.3 Test Procedure

- 1. The RF output power was measured with a spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency, A spectrum analyzer was used to record the shape of the transmit signal.
- 2. The peak output power of the fundamental frequency was measured with the spectrum analyzer using ;

Span = approximately 5 times of the 20 dB bandwidth, centered on a hopping channel

 $RBW \ge 20 \text{ dB BW}$ $VBW \ge RBW$ Sweep = auto Detector function = peak Trace = max hold

2.4 Test Results

Modulation	Tested Channel		verage Power	Peak Output Power		
Woddiation	rested onamer	dBm	mW	dBm	mW	
	Lowest	1.91	1.55	2.27	1.69	
<u>GFSK</u>	Middle	2.90	1.95	3.27	2.12	
	Highest	2.67	1.85	3.28	2.13	
	Lowest	-2.63	0.55	-1.32	0.74	
<u>π/4DQPSK</u>	Middle	-1.33	0.74	0.02	1.00	
	Highest	-1.51	0.71	0.18	1.04	
	Lowest	-2.63	0.55	-0.93	0.81	
<u>8DPSK</u>	Middle	-1.32	0.74	0.41	1.10	
	Highest	-1.52	0.70	0.58	1.14	

Note 1: The average output power was tested using an average power meter for reference only. Note 2: See next pages for actual measured spectrum plots.



Lowest Channel & Modulation : GFSK



Peak Output Power

Middle Channel & Modulation : GFSK





Highest Channel & Modulation : GFSK



Peak Output Power

Lowest Channel & Modulation : π/4DQPSK





Middle Channel & Modulation : π/4DQPSK



Peak Output Power

Highest Channel & Modulation : π/4DQPSK







Lowest Channel & Modulation : 8DPSK



Peak Output Power

Middle Channel & Modulation : 8DPSK





Highest Channel & Modulation : 8DPSK





3. 20 dB BW

3.1 Test Setup

Refer to the APPENDIX I.

3.2 Limit

Limit : Not Applicable

3.3 Test Procedure

- 1. The 20 dB bandwidth was measured with a spectrum analyzer connected to RF antenna Connector (conducted measurement) while EUT was operating in transmit mode. The analyzer center frequency was set to the EUT carrier frequency, using the analyzer.
- 2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using below setting:
 - RBW = 1 % to 5 % of the 20 dB BW
 - $VBW \ge 3 \times RBW$

Span = between two times and five times the 20 dB bandwidth

Sweep = auto

Detector function = peak

Trace = max hold

3.4 Test Results

Modulation	Tested Channel	20 dB BW (MHz)
	Lowest	0.954
<u>GFSK</u>	Middle	0.957
	Highest	0.953
	Lowest	1.344
<u>π/4DQPSK</u>	Middle	1.351
	Highest	1.347
	Lowest	1.344
<u>8DPSK</u>	Middle	1.346
	Highest	1.346





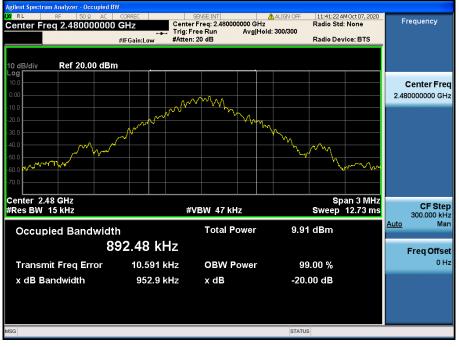
Lowest Channel & Modulation : GFSK



20 dB BW

Middle Channel & Modulation : GFSK Occunied BM r servsk:INT| ▲ALIGN OFF Center Freq: 2.441000000 GHz Trig: Free Run Avg|Hold: 300/300 #Atten: 20 dB 11:38:43 AM Oct 07, 2020 Radio Std: None Center Freq 2.441000000 GHz Frequency #IFGain:Low Radio Device: BTS Ref 20.00 dBm **Center Freq** 2.441000000 GHz \mathbb{V} ۸ĥ Center 2.441 GHz #Res BW 15 kHz Span 3 MHz Sweep 12.73 ms CF Step 300.000 kHz #VBW 47 kHz Auto Mar Occupied Bandwidth Total Power 9.96 dBm 898.17 kHz Freq Offset 0 Hz 8.933 kHz 99.00 % Transmit Freq Error **OBW Power** x dB Bandwidth 956.6 kHz x dB -20.00 dB STATUS

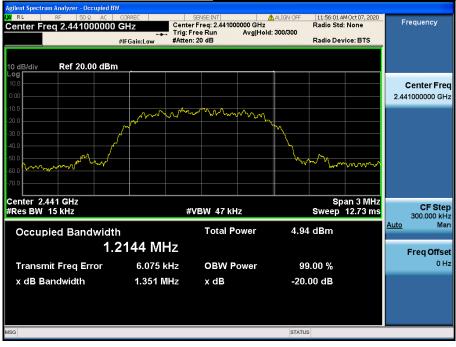
Highest Channel & Modulation : GFSK



20 dB BW

Lowest Channel & Modulation : π/4DQPSK Occunied BM r servsk:INT| ▲ALIGN OFF Center Freq: 2.402000000 GHz Trig: Free Run Avg|Hold: 300/300 #Atten: 30 dB 11:53:22 AM Oct 07, 2020 Radio Std: None Center Freq 2.402000000 GHz Frequency #IFGain:Low Radio Device: BTS Ref 20.00 dBm **Center Freq** 2.402000000 GHz nm whowwo m Center 2.402 GHz #Res BW 15 kHz Span 3 MHz Sweep 12.73 ms CF Step 300.000 kHz #VBW 47 kHz Auto Mar Occupied Bandwidth Total Power 3.57 dBm 1.2129 MHz Freq Offset 0 Hz 1.613 kHz 99.00 % Transmit Freq Error **OBW Power** x dB Bandwidth 1.344 MHz x dB -20.00 dB STATUS

Middle Channel & Modulation : π/4DQPSK



20 dB BW

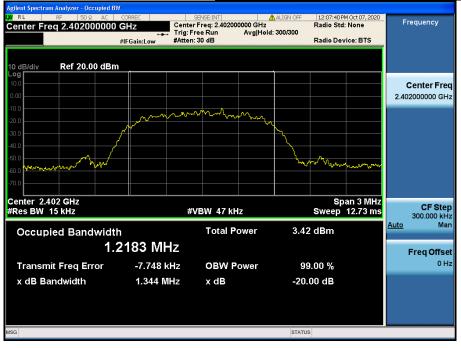
Highest Channel & Modulation : π/4DQPSK cunied BM Lenvel:INT ALIGN OF Center Freq: 2.48000000 GHz Trig: Free Run Avg|Hold: 300/300 #Atten: 20 dB 11:58:42 AM Oct 07, 2020 Radio Std: None Center Freq 2.480000000 GHz Frequency #IFGain:Low Radio Device: BTS Ref 20.00 dBm **Center Freq** 2.48000000 GHz when \mathcal{W} 200 ~^ mo Center 2.48 GHz #Res BW 15 kHz Span 3 MHz Sweep 12.73 ms CF Step 300.000 kHz #VBW 47 kHz Auto Mar Occupied Bandwidth Total Power 5.02 dBm 1.2133 MHz Freq Offset 0 Hz 99.00 % Transmit Freq Error 9.258 kHz **OBW Power** x dB Bandwidth 1.347 MHz x dB -20.00 dB STATUS



TDt&C

20 dB BW

Lowest Channel & Modulation : 8DPSK



20 dB BW

Middle Channel & Modulation : 8DPSK Occunied BM r servsk:INT| ▲ALIGN OFF Center Freq: 2.441000000 GHz Trig: Free Run Avg|Hold: 300/300 #Atten: 20 dB 12:10:20 PM Oct 07, 2020 Radio Std: None Center Freq 2.441000000 GHz Frequency #IFGain:Low Radio Device: BTS Ref 20.00 dBm **Center Freq** 2.441000000 GHz ~~ Center 2.441 GHz #Res BW 15 kHz Span 3 MHz Sweep 12.73 ms CF Step 300.000 kHz #VBW 47 kHz Auto Mar Occupied Bandwidth Total Power 4.84 dBm 1.2179 MHz Freq Offset OBW Power 0 Hz 99.00 % Transmit Freq Error -3.451 kHz x dB Bandwidth 1.346 MHz x dB -20.00 dB STATUS

Highest Channel & Modulation : 8DPSK





4. Carrier Frequency Separation

4.1 Test Setup

Refer to the APPENDIX I.

4.2 Limit

Limit : ≥ 25 kHz or ≥ Two-Thirds of the 20 dB BW whichever is greater.

4.3 Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the markerdelta function was recorded as the measurement results.

The spectrum analyzer is set to :

Span = wide enough to capture the peaks of two adjacent channels

RBW = Start with the RBW set to approximately 30 % of the channel spacing; adjust as necessary to best identify the center of each individual channel.

 $VBW \ge RBW$ Sweep = auto Detector function = peak Trace = max hold

4.4 Test Results

FH mode

Hopping Mode	Modulation	Peak of reference channel(MHz)	Peak of adjacent Channel(MHz)	Test Result (MHz)
	GFSK	2 441.014	2 442.013	0.999
Enable	π/4DQPSK	2 440.010	2 441.012	1.002
	8DPSK	2 441.010	2 442.012	1.002

AFH mode

Hopping Mode	Modulation	Peak of reference channel(MHz)	Peak of adjacent Channel(MHz)	Test Result (MHz)
	GFSK	2 441.015	2 442.013	0.998
Enable	π/4DQPSK	2 441.014	2 442.012	0.998
	8DPSK	2 441.008	2 442.009	1.001

Note 1 : See next pages for actual measured spectrum

- Minimum Standard :

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2 400 - 2 483.5 MHz band may have hopping channel, arrive the are concreted by 25 kHz or two thirds of the 20 dB bandwidth of the

channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

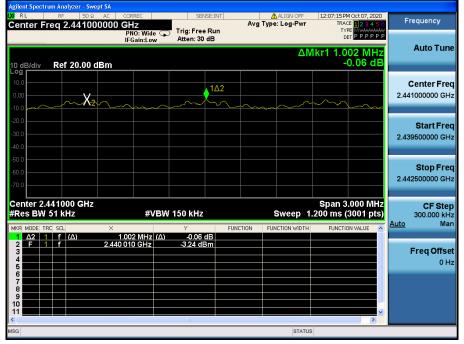


Carrier Frequency Separation (FH) <u>Hopping mode : Enable & GFSK</u>

Agilent Spectrum Analyzer - Swept SA				
X/ RL RF 50Ω AC Center Freq 2.441000000	CORREC SENSE:INT	ALIGN OFF 11: Avg Type: Log-Pwr	52:59 AM Oct 07, 2020 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide Trig: Free Run IFGain:Low Atten: 30 dB			Auto Tune
10 dB/div Ref 20.00 dBm		ΔΜ	kr1 999 kHz -0.02 dB	Auto Tune
Log 10.0 0.00 -10.0	Xm		142	Center Freq 2.441000000 GHz
-20.0				Start Freq 2.439500000 GHz
-50.0				Stop Freq 2.442500000 GHz
Center 2.441000 GHz #Res BW 51 kHz	#VBW 150 kHz	Sweep 1.200	oan 3.000 MHz ms (3001 pts)	CF Step 300.000 kHz Auto Man
3 4 5 6 7 8 9 10 11	999 kHz (Δ) 0.02 dB 1 014 GHz 2.12 dBm			Freq Offset 0 Hz
MSG		STATUS		

Carrier Frequency Separation (FH)

Hopping mode : Enable & π/4DQPSK





Carrier Frequency Separation (FH) <u>Hopping mode : Enable & 8DPSK</u>

Agilent Spectrum Analyzer - Swej <mark>XI</mark> RL RF 50 Ω	AC CORREC	SENSE:INT	ALIGN OFF	12:25:24 PM Oct 07, 2020	_
Center Freq 2.44100	0000 GHz PNO: Wide 🔾	Trig: Free Run	Avg Type: Log-Pwr	TRACE 123456 TYPE MWWWWW	Frequency
	IFGain:Low	Atten: 30 dB		DETPPPP	Auto Tune
			ΔN	1kr1 1.002 MHz	Auto Tune
10 dB/div Ref 20.00 d	Bm			-0.09 dB	
10.0				14.0	Center Freq
0.00				1∆2	2.441000000 GHz
-10.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
-20.0					Start Fred
-30.0					2.439500000 GHz
-40.0					2.40000000000
-50.0					
-60.0					Stop Freq
-70.0					2.442500000 GHz
				On an 2 000 Mile	
Center 2.441000 GHz #Res BW 51 kHz	#VBW	/ 150 kHz	Sweep 1	Span 3.000 MHz 200 ms (3001 pts).	CF Step 300.000 kHz
MKR MODE TRC SCL	×		CTION FUNCTION WIDTH	FUNCTION VALUE	Auto Man
1 Δ2 1 f (Δ)	1.002 MHz (Δ)	-0.09 dB	In the nort with the		
2 F 1 f	2.441 010 GHz	-3.21 dBm			Freq Offset
4					0 Hz
6					
7 8					
9					
11					
< ISG		111	STATUS		
186			STATUS		



Carrier Frequency Separation (AFH)

Hopping mode : Enable & GFSK



Carrier Frequency Separation (AFH)

Hopping mode : Enable & π/4DQPSK





Carrier Frequency Separation (AFH)

Hopping mode : Enable & 8DPSK

RL	um Analyzer - Swi RF 50 Ω r eq 2.4410(AC CO	RREC	SENSE	Av	ALIGN OFF	12:57:03 PM (TRACE	Oct 07, 2020	Frequency	У
0 dB/div	Ref 20.00	IF	NO: Wide Ģ Gain:Low	Atten: 30 dl		ΔΝ	DET	PPPPP	Auto T	[une
.og 10.0 0.00				X	<u></u>			~~~	Center 2.441000000	
20.0 30.0 40.0									Start 2.439500000	
50.0 60.0 70.0									Stop 2.442500000	
enter 2.4 Res BW		×	#VBV	V 150 kHz Y	FUNCTION	Sweep 1	Span 3.0 .200 ms (3 FUNCTION	001 pts)	CF 9 300.000 <u>Auto</u>	
1 Δ2 1 2 F 1 3 4 5		1.00 2.441 00	01 MHz (Δ) 08 GHz	0.01 dE -3.33 dBn	8 1 				Freq O	ffse 0 H
6 7 8 9 0										
G				III		STATUS	;			



5. Number of Hopping Frequencies

5.1 Test Setup

Refer to the APPENDIX I.

5.2 Limit

Limit : >= 15 hops

5.3 Procedure

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

To get higher resolution, two frequency ranges for FH mode within the 2 400 MHz \sim 2 483.5 MHz were examined.

The spectrum analyzer is set to :		
Span for FH mode = 50 MHz	Start Frequency = 2 391.5 MHz,	Stop Frequency = 2 441.5 MHz
	Start Frequency = 2 441.5 MHz,	Stop Frequency = 2 491.5 MHz
Span for AFH mode = 30 MHz	Start Frequency = 2 426.0 MHz,	Stop Frequency = 2 456.0 MHz
RBW = To identify clearly the indi or the 20 dB bandwidth, w		ess than 30 % of the channel spacing
VBW ≥ RBW	Sweep = auto	
Detector function = peak	Trace = max hold	

5.4 Test Results

FH mode

Hopping mode	Modulation	Test Result (Total Hops)
	GFSK	79
Enable	π/4DQPSK	79
	8DPSK	79

AFH mode

Hopping mode	Modulation	Test Result (Total Hops)
	GFSK	20
Enable	π/4DQPSK	20
	8DPSK	20

Note 1 : See next pages for actual measured spectrum plots.

- Minimum Standard :

At least 15 hopes



Number of Hopping Frequencies 1(FH) Hopping mode : Enable & GFSK

XI RL	F		Ω AC	CORREC			NSE:INT		Avg		ALIGN OF		TRA	AM Oct 07, 20 ACE 1234 (PE M WWW)	5.6	Frequency
10 dB/di	iv R	ef 20.00	dBm	PNO: F	ast 🕞 .ow	Trig: Fre Atten: 30					Mk	(r2	2.441	DETPPP	P P	Auto Tune
- og 10.00 0.00			^¹ ////∖	M	M	ww	γγγ	γM	M	M		NΛ			Ŷ	Center Free 2.416500000 GH:
20.0																Start Free 2.391500000 GH:
-50.0		ka af y lag∑nordings (any														Stop Fred 2.441500000 GH:
Start 2 Res B	SW 270	0 kHz	×			/ 820 kHz		FUNC	TION		Sweep) 1.	Stop 2.4 000 ms FUNCT	4150 GI (3001 pi ION VALUE	ts)	CF Step 5.000000 MH <u>Auto</u> Mar
1 N 2 N 3 4 5 6				2 000 GH I 000 GH		1.85 d 2.87 d									н	Freq Offset 0 Hz
7 8 9 10 11															~	
SG					_			_			ST.	ATUS				

Number of Hopping Frequencies 2(FH) Hopping mode : Enable & GFSK

RL RF 50 Ω AC enter Freq 2.466500000	CORREC GHZ PNO: Fast	Trig: Free Run	ALIGN OFF	11:49:30 AM Oct 07, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
dB/div Ref 20.00 dBm	IFGain:Low	Atten: 30 dB	Mkr2	2.480 000 GHz 2.94 dBm	Auto Tun
					Center Fre 2.466500000 G⊦
0.0					Start Fre 2.441500000 GF
0.0					Stop Fre 2.491500000 GH
tart 2.44150 GHz Res BW 270 kHz	#VBW	820 kHz	Sweep 1	Stop 2.49150 GHz .000 ms (3001 pts)	CF Ste 5.000000 MH <u>Auto</u> Ma
1 N 1 f 2.44	2 000 GHz 0 000 GHz	2.90 dBm 2.94 dBm			Freq Offs 0 F
7					
9 0 1				~	



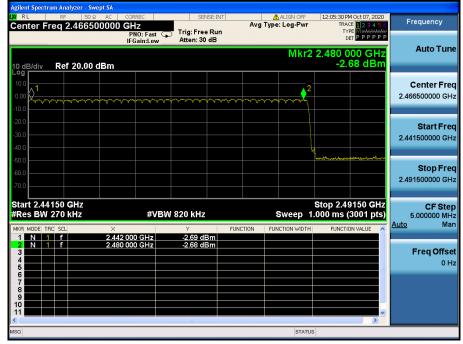
Number of Hopping Frequencies 1(FH)

Hopping mode : Enable & π/4DQPSK

RL enter	_R ⊧ Freq 2.4′	50 Ω AC	CORREC GHZ	SENSE:	Avg	ALIGN OFF		oct 07, 2020 1 2 3 4 5 6 M	Frequency
0 dB/div	Ref 20	.00 dBm	PNO: Fast (IFGain:Low	Trig: Free Ru Atten: 30 dB		Mkr2	DET	PPPPPP	Auto Tune
				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			v~~~~	Center Freq 2.416500000 GHz
-20.0 -30.0 -40.0									Start Freq 2.391500000 GHz
-50.0 -60.0 -70.0	terneterneterienen	mdrad ⁰⁴							<b>Stop Freq</b> 2.441500000 GHz
	89150 GH: V 270 kHz		#VB	W 820 kHz	FUNCTION	Sweep 1	Stop 2.441 .000 ms (30	001 pts)	CF Step 5.000000 MHz <u>Auto</u> Man
1 N 2 N 3 4 5 6	1 f 1 f		2 000 GHz I 000 GHz	-4.15 dBm -2.74 dBm					Freq Offset 0 Hz
7 8 9 10 11									
WSG						STATUS	3		

### Number of Hopping Frequencies 2(FH)

#### Hopping mode : Enable & π/4DQPSK





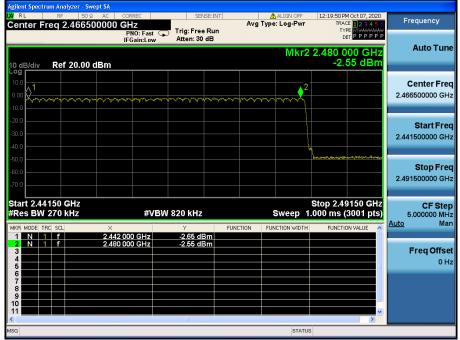
#### Number of Hopping Frequencies 1(FH)

#### Hopping mode : Enable & 8DPSK

Agilent Spectrum <mark>X/</mark> RL Center Free	RF 50 :	Ω AC	CORREC	SENSE	Av	ALIGN OFF g Type: Log-Pwr	TRAC	4 Oct 07, 2020 CE 123456	Frequency
10 dB/div	Ref 20.00	dBm	PNO: Fast O IFGain:Low	Atten: 30 d		Mkr2	DI 2.441 0		Auto Tune
10.0 0.00		¢1	~~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Center Fred 2.416500000 GH:
-20.0 -30.0 -40.0									Start Free 2.391500000 GH:
-50.0 <b></b>	en ese and ese and est								Stop Fred 2.441500000 GHz
Start 2.3915 #Res BW 27	O KHZ	×		W 820 kHz Y	FUNCTION	Sweep 1	.000 ms (	150 GHz 3001 pts)	CF Step 5.000000 MHz <u>Auto</u> Mar
3 4 5 6	f f		000 GHz 000 GHz	-4.14 dBn -2.85 dBn	1 1 				Freq Offset 0 Hz
7 8 9 10 11				111					
ISG						STATU	s		

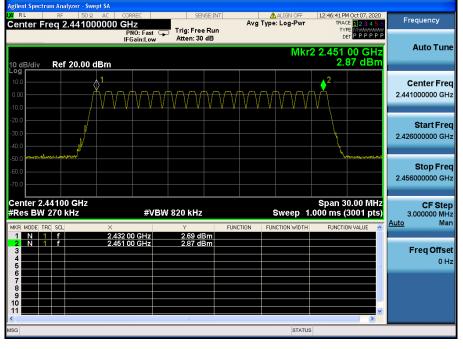
### Number of Hopping Frequencies 2(FH)

#### Hopping mode : Enable & 8DPSK



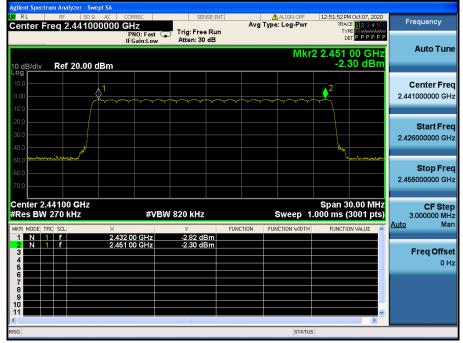
#### Number of Hopping Frequencies 1(AFH)

#### Hopping mode : Enable & GFSK



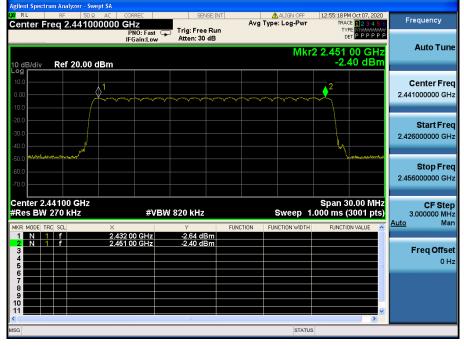
#### Number of Hopping Frequencies 1(AFH)

#### Hopping mode : Enable & π/4DQPSK



#### Number of Hopping Frequencies 1(AFH)

#### Hopping mode : Enable & 8DPSK



### 6. Time of Occupancy (Dwell Time)

#### 6.1 Test Setup

Refer to the APPENDIX I.

#### 6.2 Limit

The maximum permissible time of occupancy is 400 ms within a period of 400 ms multiplied by the number of hopping channels employed.

#### 6.3 Test Procedure

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to :

Center frequency = 2 441 MHz

Span = zero

RBW = 1 MHz (RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel)

VBW ≥ RBW

Detector function = peak

Trace = max hold

#### 6.4 Test Results

FH mode

Hopping mode	Packet Type	Number of hopping Channels	Burst On Time (ms)	Period (ms)	Test Result (sec)
Enable	DH 5	79	2.880	3.750	0.307
	2 DH 5	79	2.880	3.750	0.307
	3 DH 5	79	2.880	3.750	0.307

AFH mode

Hopping mode	Packet Type	Number of hopping Channels	Burst On Time (ms)	Period (ms)	Test Result (sec)
Enable	DH 5	20	2.880	3.750	0.154
	2 DH 5	20	2.880	3.750	0.154
	3 DH 5	20	2.880	3.750	0.154

Note 1 : Dwell Time = 0.4 × Hopping channel × Burst ON time ×

((Hopping rate ÷ Time slots) ÷ Hopping channel)

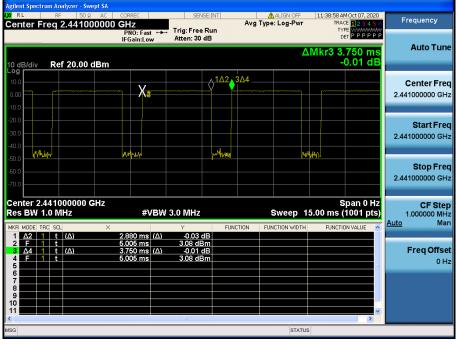
- Time slots for DH5 = 6 slots (TX = 5 slot / RX = 1 slot)
- Hopping Rate = 1600 for FH mode & 800 for AFH mode

Note 2 : See next pages for actual measured spectrum plots.



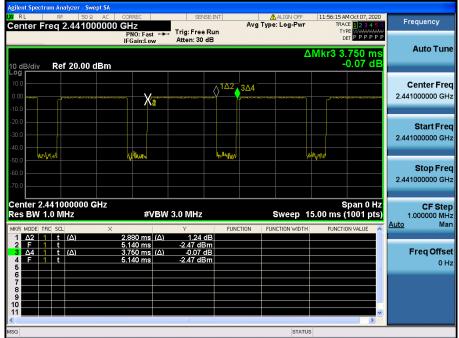
#### Hopping mode : Enable & DH5

#### Time of Occupancy (FH)



#### Time of Occupancy (FH)

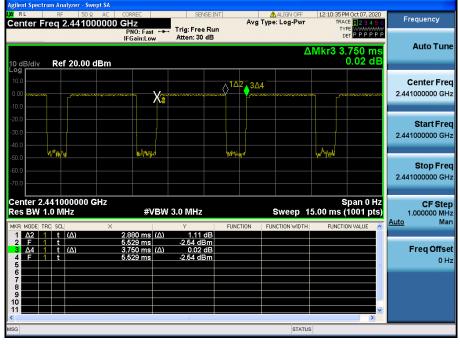
#### Hopping mode : Enable & 2-DH5





#### Hopping mode : Enable & 3-DH5

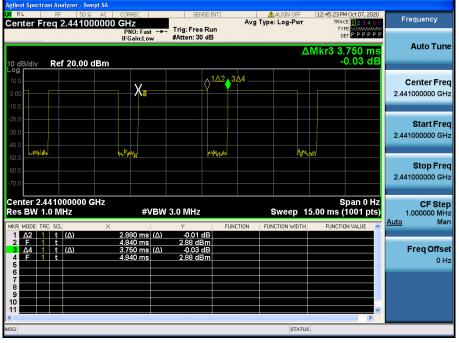
#### Time of Occupancy (FH)





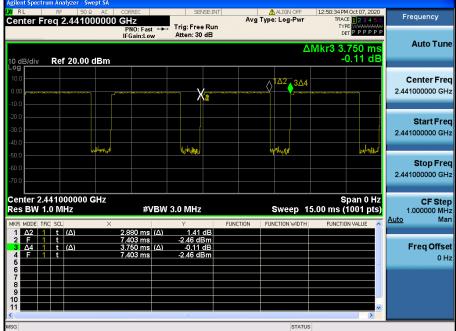
# Hopping mode : Enable & DH5

# Time of Occupancy (AFH)



# Time of Occupancy (AFH)

# Hopping mode : Enable & 2-DH5





# Time of Occupancy (AFH)

# Hopping mode : Enable & 3-DH5

Agreent Spectrum Analyzer - Swept SA VX RL RF 50 Ω AC Center Freq 2.441000000		SENSE: JNT	ALIGN OFF	12:54:00 PM Oct 07, 2020 TRACE 12 3 4 5 6 TYPE WWWWWW	Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast ↔ IFGain:Low	Atten: 30 dB	Δ	Mkr3 3.750 ms 0.06 dB	Auto Tune
10.0	X			10-110-111-110-11-11-11-11-11-11-11-11-1	Center Freq 2.441000000 GHz
-20.0 -20.0 -30.0 -40.0		u ⁿ una	hated		Start Freq 2.441000000 GHz
-50.0 424		ыцич ⁴ чи			<b>Stop Freq</b> 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 1	Span 0 Hz 5.00 ms (1001 pts)	<b>CF Step</b> 1.000000 MHz <u>Auto</u> Man
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2.880 ms (Δ) 4.181 ms 3.750 ms (Δ) 4.181 ms	2.06 dB -2.54 dBm 0.06 dB -2.54 dBm			<b>Freq Offset</b> 0 Hz
7					
MSG			STATUS	3	



# 7. Transmitter Radiated Spurious Emissions and Conducted Spurious Emission

# 7.1 Test Setup

Refer to the APPENDIX I.

#### 7.2 Limit

According to §15.247(d), 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 section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section §15.205(a), must also comply the radiated emission limits specified in section §15.205(c))

According to § 15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
0.009 ~ 0.490	2 400 / F (kHz)	300
0.490 ~ 1.705	24 000 / F (kHz)	30
1.705 ~ 30.000	30	30
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 MHz - 72 MHz, 76 MHz - 88 MHz,

174 MHz - 216 MHz or 470 - 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

According to § 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.414 25 ~ 8.414 75	108 ~ 121.94	1 300 ~ 1 427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1 435 ~ 1 626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.173 5 ~ 2.190 5	12.519 75 ~ 12.520 25	149.9 ~ 150.05	1 645.5 ~ 1 646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.576 75 ~ 12.577 25	156.524 75 ~ 156.525 25	1 660 ~ 1 710	8.025 ~ 8.5	22.01 ~ 23.12
4.177 25 ~ 4.177 75	13.36 ~ 13.41	156.7 ~ 156.9	1 718.8 ~ 1 722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.207 25 ~ 4.207 75	16.42 ~ 16.423	162.012 5 ~ 167.17	2 200 ~ 2 300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 310 ~ 2 390	10.6 ~ 12.7	36.43 ~ 36.5
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 483.5 ~ 2 500	13.25 ~ 13.4	Above 38.6
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	2 655 ~ 2 900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 260 ~ 3 267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 332 ~ 3 339		
8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 240	3 345.8 ~ 3 358		
			3 600 ~ 4 400		

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1 000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.



# 7.3. Test Procedures

#### 7.3.1. Test Procedures for Radiated Spurious Emissions

- 1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 or 3 meter away from the interference-receiving antenna.
- For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.
- 4. The antenna is a broadband antenna, and its height 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.
- 5. 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 table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 6. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 7. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### **Measurement Instrument Setting**

- Frequencies less than or equal to 1 000 MHz The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
- Frequencies above 1 000 MHz
   The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
   The result of Average measurement is calculated using PK result and duty correction factor.



#### 7.3.2. Test Procedures for Conducted Spurious Emissions

- 1. The transmitter output was connected to the spectrum analyzer.
- 2. The **reference level** of the fundamental frequency was measured with the spectrum analyzer using RBW = 100 kHz, VBW = 300 kHz.
- 3. The conducted spurious emission was tested each ranges were set as below.

Frequency range : 9 kHz ~ 30 MHz RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40 001

Frequency range : 30 MHz ~ 10 GHz, 10 GHz ~ 25 GHz RBW = 1 MHz, VBW = 3 MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40 001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 kHz, VBW = 300 kHz)

If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SPAN = 100 MHz and BINS = 2001 to get accurate emission level within 100 kHz BW.

Also the path loss for conducted measurement setup was used as described on the Appendix I of this test report.



# 7.4. Test Results

# 7.4.1. Radiated Emissions

#### Test Notes.

1. The radiated emissions were investigated 9 kHz to 25 GHz. And no other spurious and harmonic emissions were found below listed frequencies.

2. Information of Distance Factor

For finding emissions, measurements may be performed at a distance closer than that specified in the regulations.

In this case, the distance factor is applied to the result.

- Calculation of distance factor

At frequencies below 30 MHz = 40 log( tested distance / specified distance )

At frequencies at or above 30 MHz = 20 log( tested distance / specified distance )

When distance factor is "N/A", the measurements were performed at the specified distance and distance factor is not applied. 3. DCCF Calculation. (DCCF = Duty Cycle Correction Factor)

- Time to cycle through all channels = Δt = T [ms] X 20 minimum hopping channels , where T = pulse width = 2.88 ms

- 100 ms /  $\Delta t$  [ms] = H -> Round up to next highest integer, to account for worst case, H' = 100 / ( 2.88 X 20 ) = 1.74 = 2

- The Worst Case Dwell Time = T [ms] x H' = **2.88 ms X 2** = **5.76 ms** 

- DCCF = 20 Log(The Worst Case Dwell Time / 100 ms) dB = 20 log( 5.76 / 100 ) = -24.79 dB

4. Sample Calculation.

Margin = Limit - Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL + HL + AL - AG

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, HL = High pass filter Loss,

AL = Attenuator Loss, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

#### 9 kHz ~ 25 GHz Data (Modulation : GFSK) & MN: DA330DJAN

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.15	V	Х	PK	50.05	8.45	N/A	N/A	58.50	74.00	15.50
2 389.15	V	Х	AV	50.05	8.45	-24.79	N/A	33.71	54.00	20.29
4 804.50	V	Х	PK	48.92	1.59	N/A	N/A	50.51	74.00	23.49
4 804.50	V	Х	AV	48.92	1.59	-24.79	N/A	25.72	54.00	28.28

#### Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 881.51	V	Х	PK	49.63	2.31	N/A	N/A	51.94	74.00	22.06
4 881.51	V	Х	AV	49.63	2.31	-24.79	N/A	27.15	54.00	26.85

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 484.13	V	Х	PK	48.82	9.09	N/A	N/A	57.91	74.00	16.09
2 484.13	V	Х	AV	48.82	9.09	-24.79	N/A	33.12	54.00	20.88
4 959.83	V	Х	PK	48.96	2.61	N/A	N/A	51.57	74.00	22.43
4 959.83	V	Х	AV	48.96	2.61	-24.79	N/A	26.78	54.00	27.22



#### 9 kHz ~ 25 GHz Data (Modulation : $\pi/4DQPSK$ ) & MN: DA330DJAN

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 388.73	V	Х	PK	48.63	8.45	N/A	N/A	57.08	74.00	16.92
2 388.73	V	Х	AV	48.63	8.45	-24.79	N/A	32.29	54.00	21.71
4 804.28	V	Х	PK	49.57	1.59	N/A	N/A	51.16	74.00	22.84
4 804.28	V	Х	AV	49.57	1.59	-24.79	N/A	26.37	54.00	27.63
<ul> <li>Middle Ch</li> </ul>	annel									
Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		Position		•			-			•
(MHz)	Pol	Position (Axis)	Mode	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)

#### ıч

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 483.78	V	Х	PK	48.81	9.09	N/A	N/A	57.90	74.00	16.10
2 483.78	V	Х	AV	48.81	9.09	-24.79	N/A	33.11	54.00	20.89
4 960.05	V	Х	PK	49.44	2.61	N/A	N/A	52.05	74.00	21.95
4 960.05	V	Х	AV	49.44	2.61	-24.79	N/A	27.26	54.00	26.74

#### 9 kHz ~ 25 GHz Data (Modulation : <u>8DPSK</u>) & MN: DA330DJAN

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.54	V	Х	PK	49.56	8.46	N/A	N/A	58.02	74.00	15.98
2 389.54	V	Х	AV	49.56	8.46	-24.79	N/A	33.23	54.00	20.77
4 804.39	V	Х	PK	49.53	1.59	N/A	N/A	51.12	74.00	22.88
4 804.39	V	Х	AV	49.53	1.59	-24.79	N/A	26.33	54.00	27.67

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 881.83	V	Х	PK	49.74	2.32	N/A	N/A	52.06	74.00	21.94
4 881.83	V	Х	AV	49.74	2.32	-24.79	N/A	27.27	54.00	26.73

#### Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 483.94	V	Х	PK	49.45	9.09	N/A	N/A	58.54	74.00	15.46
2 483.94	V	Х	AV	49.45	9.09	-24.79	N/A	33.75	54.00	20.25
4 959.78	V	Х	PK	49.03	2.61	N/A	N/A	51.64	74.00	22.36
4 959.78	V	Х	AV	49.03	2.61	-24.79	N/A	26.85	54.00	27.15



# 9 kHz ~ 25 GHz Data (Modulation : <u>8DPSK</u>) & MN: DA331DJAN

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.93	V	Х	PK	49.22	9.09	N/A	N/A	58.31	74.00	15.69
2483.93	V	Х	AV	49.22	9.09	-24.79	N/A	33.52	54.00	20.48
4959.77	V	Х	PK	48.66	2.61	N/A	N/A	51.27	74.00	22.73
4959.77	V	Х	AV	48.66	2.61	-24.79	N/A	26.48	54.00	27.52





#### Low Band-edge



#### Lowest Channel & Modulation : GFSK

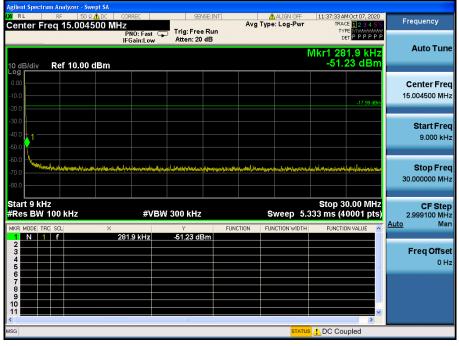
#### Low Band-edge

# Hopping mode & Modulation : GFSK





# Lowest Channel & Modulation : GFSK



Agilent Spectr										
Center F		50 Ω AC 0	ORREC	SENSE		ALIGI		TRA	M Oct 07, 2020 CE 12345	Frequency
Genter I	04 0.01		PNO: Fast C FGain:Low	Trig: Free F Atten: 20 d	Run	• •	-	TY	PE MWWWWWWW	+
		1	-Gain:Low	Atten. 20 u	-		Milent	7 042	74 GHz	Auto Tun
10 dB/div	Ref 10	.00 dBm					WIKIS		74 GH2 38 dBm	
Log 0.00		Q1								Center Fre
-10.0										5.015000000 GH
-20.0									-17.99 dBm	
-30.0										
-40.0			2			<u>4 43</u>				Start Fre
-50.0			$\mathbb{L}$		ورور مالي واللوام من الم	γ. γ.			ter ti alleri ander	30.000000 MH
-60.0										
-70.0										Stop Fre
-80.0										10.000000000 GH
-00.0										
Start 30 N								Stop 10	.000 GHz	CF Ste
#Res BW			#VB	W 3.0 MHz		Swee	ep 18.		0001 pts)	997.000000 MH Auto Ma
MKR MODE TH	RC SCL	X 2.402	11 GHz	⊻ 2.20 dBr	FUNCTION	FUNCTION	WIDTH	FUNCTI	DN VALUE	
2 N 1	f	3.301	16 GHz	-46.99 dBn	1					
3 N 1 4 N 1	f	7.068	57 GHz 46 GHz	-47.82 dBn -47.95 dBn	1					Freq Offs 0 H
5 N 1	f	7.843	74 GHz	-48.38 dBn	1				=	
7										
8										
10										
<									>	
MSG							STATUS			



# Lowest Channel & Modulation : GFSK



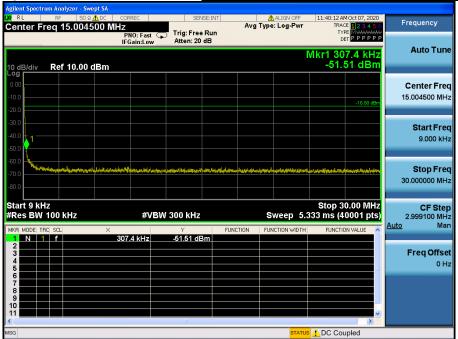


#### **Reference for limit**

# Middle Channel & Modulation : GFSK



# Conducted Spurious Emissions <u>Middle Channel & Modulation : GFSK</u>





# Middle Channel & Modulation : GFSK



Agilent Spect													
Center F	_{RF} rea 17	່ ^{50 ຊ}		RREC		INSE:INT			ALIGN OFF	TRA	M Oct 07, 2020 CE <u>1 2 3 4 5</u> (	Freque	ncy
			р	NO: Fast Gain:Low	Trig: Fre					T) E			
									Mkr3 2	21.009 2	250 GHz	Aut	o Tune
10 dB/div Log	Ref 1	10.00 d	Bm							-39.	06 dBm		
0.00												Cent	er Freg
-10.0												17.5000000	•
-20.0						-					-16.80 dBm		
-30.0									3—	<u>2</u>		Sta	rt Frea
-40.0				des	and a supportabilities.		Li parte de la composition de la compos			L_Y	and the second second	10.0000000	
-50.0								1					
-60.0												Sto	p Freq
-70.0												25.0000000	
-80.0													
Start 10.0										Stop 25	.000 GHz	c	F Step
#Res BW	1.0 M	Hz		#V	BW 3.0 MH2			s	weep 40	0.00 ms (4	0001 pts	1.500000 Auto	000 GHz Man
MKR MODE T	RC SCL		× 24.207 25	0.047	۲ -35.41 d	Rm	FUNCTIO	N FU	NCTION WIDTH	FUNCTI	ON VALUE	Auto	Wan
2 N 4	f		22.683 62	5 GHz	-38.10 d	Bm						Erog	Offect
3 N 4	1 f		21.009 25	UGHZ	-39.06 d	Bm						Freq	0ffset 0 Hz
5 6											=		
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9													
11											~		
MSG					110				STATU	8	>		
mod									STATO				



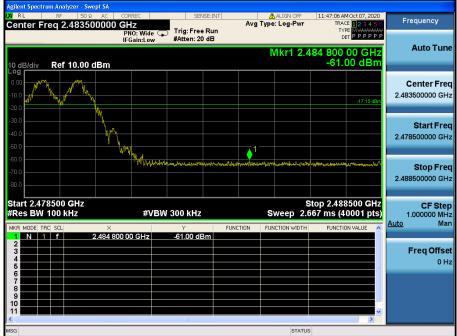
#### **High Band-edge**

# Highest Channel & Modulation : GFSK



# High Band-edge

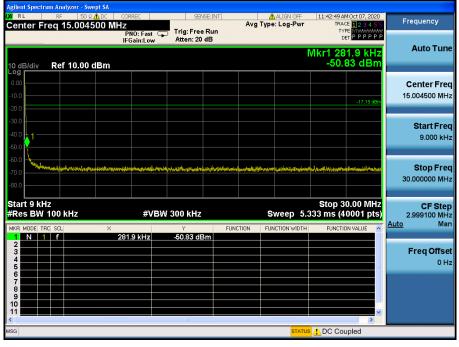
# Hopping mode & Modulation : GFSK







# Highest Channel & Modulation : GFSK



Agilent Spectrum Analyzer - Swept					
Center Freq 5.0150000		SENSE:IN	ALIGN OFF	11:43:14 AM Oct 07, 2020 TRACE 123456	Frequency
	PNO: Fast IFGain:Low	Trig: Free Run Atten: 20 dB	1	DET PPPP	
	IFGalli.Low	TREET. LV VD	Mk	5 9.024 93 GHz	Auto Tune
10 dB/div Ref 10.00 dB				-48.15 dBm	
	V1				Center Freq
-10.0					5.015000000 GHz
-20.0				-17.15 dBm	
-30.0					
-40.0	32		4	5	Start Freq 30.000000 MHz
-50.0	Y. Y.				30.000000 WHZ
-60.0					
-70.0					Stop Freq
-80.0					10.00000000 GHz
				04 40.000 OU	
Start 30 MHz #Res BW 1.0 MHz	#V	BW 3.0 MHz	Sweep 18	Stop 10.000 GHz 8.67 ms (40001 pts)	CF Step 997.000000 MHz
MKR MODE TRC SCL	Х	Y	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 2 N 1 f	2.480 13 GHz 3.096 77 GHz	3.17 dBm -46.79 dBm			
3 N 1 f	2.637 40 GHz	-47.85 dBm			Freq Offset
5 N 1 f	6.415 04 GHz 9.024 93 GHz	-47.85 dBm -48.15 dBm		=	0 Hz
6					
8					
10					
11 <		TH CONTRACTOR		×	
MSG			STATU	s	





# Highest Channel & Modulation : GFSK





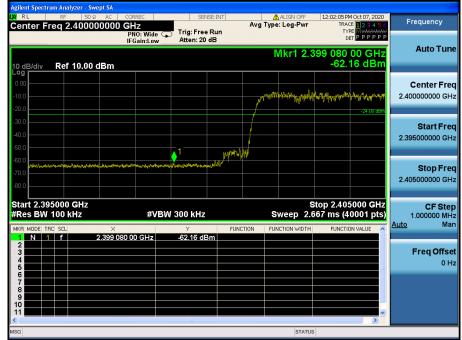
#### Low Band-edge

# Lowest Channel & Modulation : π/4DQPSK



# Low Band-edge

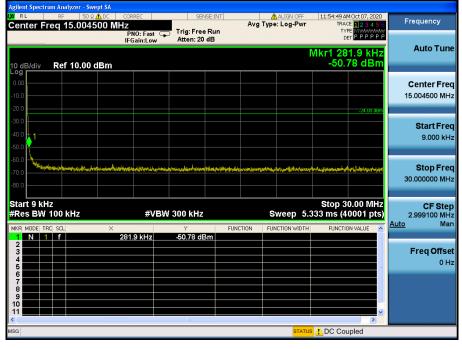
# Hopping mode & Modulation : π/4DQPSK







# Lowest Channel & Modulation : π/4DQPSK



XI RL		AC CORREC	ast 😱 Trig: Free	Run	ALIGN OFF	11:55:14 AM C TRACE TYPE DET	ct 07, 2020 1 2 3 4 5 6 9 9 9 9 9 9 9	Frequency
10 dB/div	Ref 10.00		Low Addition		Mkı	5 3.213 4 -48.17		Auto Tune
Log 0.00 -10.0 -20.0		1 					-24.00 dBm	Center Freq 5.015000000 GHz
-30.0	11 ki ma basuddi		5	<u></u>	<u>}</u> 4	¢ ²	-24.00 dBm	Start Freq 30.000000 MHz
-60.0 -70.0 -80.0								<b>Stop Freq</b> 10.000000000 GHz
Start 30 N #Res BW	1.0 MHz	X	#VBW 3.0 MHz	FUNCTION	Sweep 18	Stop 10.0 8.67 ms (400 FUNCTION	001 pts)	<b>CF Step</b> 997.000000 MHz <u>Auto</u> Man
1 N 1 2 N 1 3 N 1 4 N 1 5 N 1 6	f f f f	2.402 36 GI 8.108 19 GI 6.359 70 GI 7.158 55 GI 3.213 42 GI	Hz -47.63 dB Hz -48.06 dB Hz -48.14 dB	m m m				<b>Freq Offset</b> 0 Hz
/ 8 9 10 11							~	
WSG					STATU	s		





# Lowest Channel & Modulation : π/4DQPSK



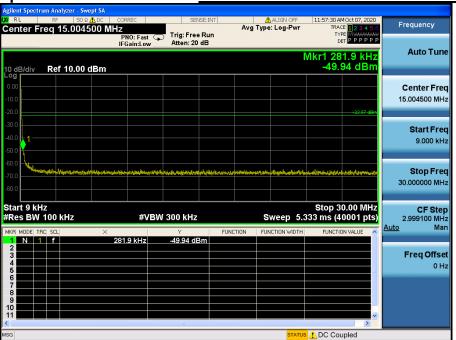


## Reference for limit

# Middle Channel & Modulation : π/4DQPSK



# Conducted Spurious Emissions <u>Middle Channel & Modulation : π/4DQPSK</u>





# Middle Channel & Modulation : π/4DQPSK

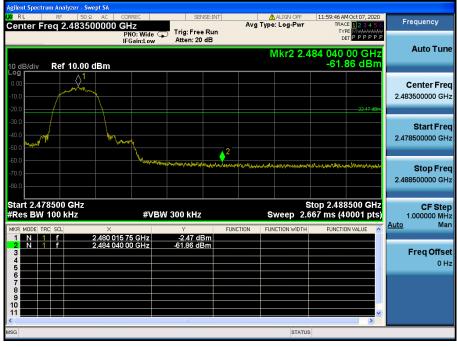


Agilent Spectrum Analyzer - Swept SA				
Center Freq 17.50 Ω AC CORREC	SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	11:58:20 AM Oct 07, 2020 TRACE 123456	Frequency
PNO: Fast IFGain:Lov	Trig: Free Run Atten: 20 dB	• •	TYPE MWWWWWW DET P P P P P P	
		Mkr3 1	7.098 750 GHz	Auto Tune
10 dB/div Ref 10.00 dBm			-41.80 dBm	
Log				Center Freq
-10.0				17.50000000 GHz
-20.0			-22.57 dBm	
-30.0	3		<u></u>	Start Freq
-40.0		and some fallering state being strategy and some first the state of the source of the		10.000000000 GHz
-50.0				
-60.0				Stop Freq
-70.0				25.000000000 GHz
-80.0				
Start 10.000 GHz			Stop 25.000 GHz	CF Step
	/BW 3.0 MHz		.00 ms (40001 pts)	1.50000000 GHz Auto Man
MKR MODE TRC SCL X 1 N 1 f 24.922 375 GHz	Y FUN -34.79 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> murr
2 N 1 f 23.528 500 GHz 3 N 1 f 17.098 750 GHz	-38.29 dBm -41.80 dBm			Freq Offset
4	41.00 dBm			0 Hz
8				
9				
			~	
MSG		STATUS	3	



#### **High Band-edge**

# Highest Channel & Modulation : π/4DQPSK



## High Band-edge

# Hopping mode & Modulation : π/4DQPSK







# <u>Highest Channel & Modulation : π/4DQPSK</u>

Agilent Spectrum <mark>X/</mark> RL Center Fred	RF 50 Ω	🛕 DC 📔 COR	REC		ISE:INT		ALIGN OFF e: Log-Pwr	TRA	M Oct 07, 2020 E <b>1 2 3 4 5 6</b>	Frequency
10 dB/div	lef 10.00 (	PI IFG	IO: Fast Gain:Low	Trig: Free Atten: 20				₀ <mark>//kr1 28</mark>	1.9 kHz 49 dBm	Auto Tune
-10.0										Center Fred 15.004500 MHz
-30.0										Start Fred 9.000 kH
-60.0 -70.0 -80.0	iniperantian of the provide income	white Hunnes	yaşılar <u>ış</u> indüşi	und an stranger and the state	(nathing many and the second	alubeiteiteiteetee	naraya jiyi isyon da da yak	ne minne ditet	estilation bestremments	Stop Free 30.000000 MH:
Start 9 kHz #Res BW 10	SCL	×		<b>300 kHz</b> Y	FUN		weep 5.3	333 ms (4	0.00 MHz 0001 pts) DN VALUE	CF Step 2.999100 MH Auto Mar
1 N 1 2 3 4 5	f	281.	9 kHz	-51.49 di	3m					Freq Offse 0 H:
6 7 8 9 10 11										
< ISG							STATUS	DC Cou	upled	

Agilent Spectrum Analyzer - Swej						
RL RF 50 Ω     Center Freq 5.01500		SENSE:INT		ALIGN OFF pe: Log-Pwr	12:00:34 PM Oct 07, 2020 TRACE 123456	Frequency
	PNO: Fast 🕞 IFGain:Low	Trig: Free Run Atten: 20 dB			DET PPPPP	
10 dB/div Ref 10.00 d	Bm			Mkr	5 6.254 27 GHz -48.20 dBm	Auto Tune
Log 0.00 -10.0 -20.0	1 					Center Freq 5.015000000 GHz
-30.0 -40.0 -50.0	34		5_	2		Start Freq 30.000000 MHz
-60.0 -70.0 -80.0						<b>Stop Freq</b> 10.00000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBV	V 3.0 MHz		Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Step 997.000000 MHz
MKR MODE TRC SCL	× 2.480 13 GHz	⊻ -0.68 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	7.436 21 GHz 2.805 15 GHz 3.517 26 GHz 6.254 27 GHz	47.51 dBm 47.91 dBm 48.06 dBm 48.20 dBm				<b>Freq Offset</b> 0 Hz
7 8 9 9 10 11					~	
MSG		Ш		STATUS	>	



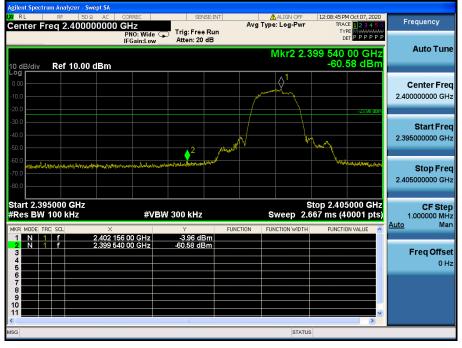
#### Highest Channel & Modulation : π/4DQPSK





#### Low Band-edge

# Lowest Channel & Modulation : 8DPSK



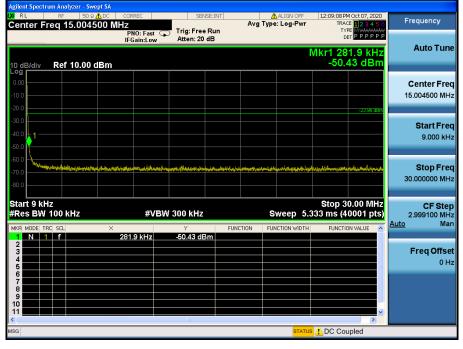
# Low Band-edge

# Hopping mode & Modulation : 8DPSK





## Lowest Channel & Modulation : 8DPSK



lgilent Spectru VI R L	um Analyzer - Sv RF 50 S				ALIGN OFF	10,00,010	1 Oct 07, 2020	
		00000 GHz PNO: Fast	Trig: Free Rur Atten: 20 dB	Avg	Type: Log-Pwr	TRAC	E 1 2 3 4 5 6 E MWWWWW T P P P P P P	Frequency
10 dB/div	Ref 10.00	IFGain:Low	Atten: 20 dB		Mkr	5 2.673		Auto Tune
-10.00		1 					2231395 (defm	Center Fred 5.015000000 GH;
-30.0		53			A	2 ²		Start Free 30.000000 MH:
-60.0 -70.0 -80.0								Stop Free 10.000000000 GH
Start 30 N #Res BW	1.0 MHz	#V	BW 3.0 MHz	FUNCTION	Sweep 18	.67 ms (4	.000 GHz 0001 pts)	CF Step 997.000000 MH <u>Auto</u> Mar
1 N 1 2 N 1 3 N 1 4 N 1 5 N 1	f f f f	2.402 36 GHz 8.344 48 GHz 2.789 95 GHz 7.263 48 GHz 2.673 30 GHz	-1.92 dBm -47.57 dBm -47.75 dBm -47.89 dBm -48.01 dBm					Freq Offse 0 H
6 7 8 9 10 11								
< ISG			TH		STATUS		>	



# Lowest Channel & Modulation : 8DPSK



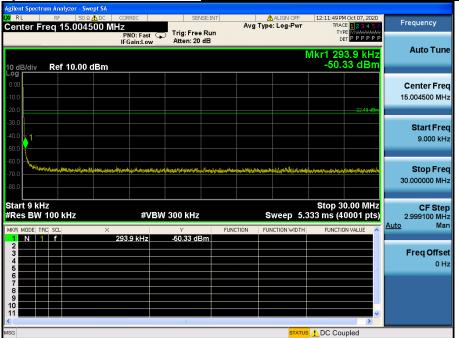


#### Reference for limit





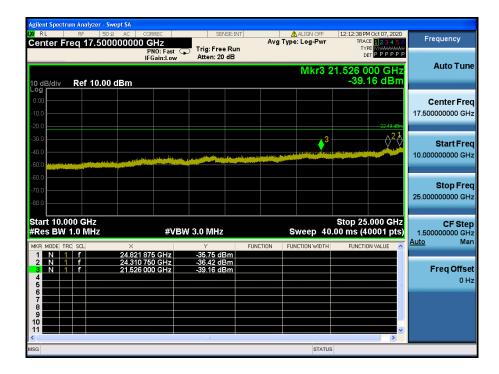
# Conducted Spurious Emissions <u>Middle Channel & Modulation : 8DPSK</u>





# Middle Channel & Modulation : 8DPSK

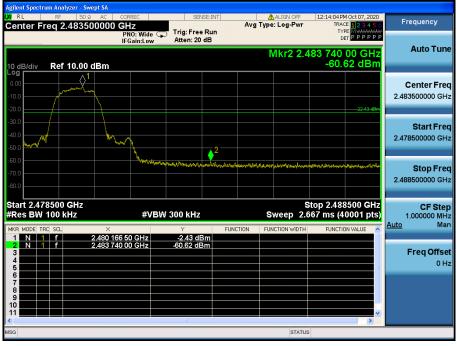






#### **High Band-edge**

# Highest Channel & Modulation : 8DPSK



# High Band-edge

# Hopping mode & Modulation : 8DPSK





# Highest Channel & Modulation : 8DPSK

Frequency	M Oct 07, 2020		🛕 ALIGN OFF		SENSE: IN	CORREC		- F	RL
	CE	TY	Type: Log-Pwr		Trig: Free Run Atten: 20 dB	PNO: Fast C	15.004500 M	ter Freq	ent
Auto Tur	1.9 kHz 11 dBm	Mkr1 28			Atten: 20 dB	IFGain:Low	f 10.00 dBm	3/div R	0 dE
<b>Center Fr</b> 15.004500 Mi									. <b>og</b> 0.00 10.0 20.0
Start Fre 9.000 ki								1	-20.0 -30.0 -40.0 -50.0
<b>Stop Fr</b> 30.000000 M	an a	مورندور اور مورا الجم الروريدور الروريدور الم	ayun dastalat aristiti	heller og skale for	eserente had de la companya de la co	erentka, sizor e hándrajy	rian, Alingia di mataka	h hanna tha han an a	60.0 70.0 80.0
2.999100 M	0.00 MHz 0001 pts)		Sweep 5.3		300 kHz	#VB	kHz	t9 kHz sBW 100	
Auto M	ON VALUE	FUNCTI	FUNCTION WIDTH	FUNCTION	Y -52.11 dBm	281.9 kHz	. ×	MODE TRC SI	
Freq Offs 0									2 3 4 5
									6 7 8 9
	~				ш				10 11
	upled	L DC Co	STATUS						SG

Agilent Spectrum Analyzer - Swept SA				
IXI         RF         50 Ω         AC         CORREC           Center Freq 5.015000000 GHz	SENSE:INT	ALIGN OFF	12:14:51 PM Oct 07, 2020 TRACE 123456	Frequency
PNO: Fast	Trig: Free Run Atten: 20 dB			
		Mkr	5 5.139 13 GHz	Auto Tune
10 dB/div Ref 10.00 dBm			-48.46 dBm	
				Center Freq
-10.0				5.015000000 GHz
-20.0				
-30.0				
-40.0	<u>5</u> 2	4		Start Freq 30.000000 MHz
-50.0			and provide the state with state of and	30.000000 MH2
-60.0				
-70.0				Stop Freq
-80.0				10.00000000 GHz
Start 30 MHz #Res BW 1.0 MHz #VBW	/ 3.0 MHz	Sweep 18	Stop 10.000 GHz 67 ms (40001 pts)	CF Step 997.000000 MHz
MKR MODE TRC SCL X		TION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 2.480 13 GHz 2 N 1 f 5.288 18 GHz	-0.49 dBm -47.86 dBm			
3 N 1 f 2.645 63 GHz 4 N 1 f 6.365 19 GHz	-48.01 dBm -48.15 dBm			Freq Offset
5 N 1 f 5.139 13 GHz	-48.46 dBm		=	0 Hz
10				
11			×	
MSG		STATUS		



# Highest Channel & Modulation : 8DPSK



# 8. Transmitter AC Power Line Conducted Emission

## 8.1 Test Setup

NA

## 8.2 Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

	Conducted Limit (dBuV)						
Frequency Range (MHz)	Quasi-Peak	Average					
0.15 ~ 0.5	66 to 56 *	56 to 46 *					
0.5 ~ 5.0	56	46					
5 ~ 30	60	50					

* Decreases with the logarithm of the frequency

## 8.3 Test Procedures

Conducted emissions from the EUT were measured according to the ANSI C63.10.

- The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
- 2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
- 3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
- 4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

# 8.4 Test Results

NA



# 9. Antenna Requirement

Describe how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.

#### Conclusion: Comply

The antenna is printed on the PCB. (Refer to Internal Photo file.) Therefore this E.U.T Complies with the requirement of §15.203

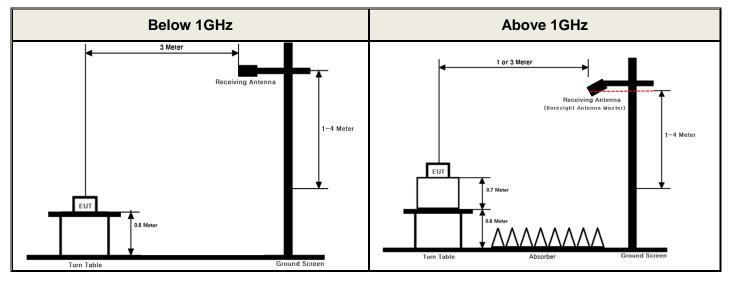
#### - Minimum Standard :

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.

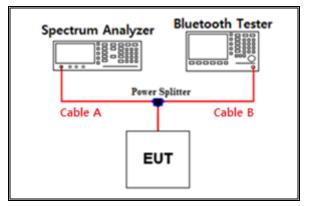
# **APPENDIX I**

#### Test set up diagrams

#### Radiated Measurement



#### Conducted Measurement



#### Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
0.03	6.71	15	12.89
1	7.85	20	14.55
2.402 & 2.440 & 2.480	8.93	25	16.69
5	9.56	-	-
10	11.02	-	-

Note 1 : The path loss from EUT to Spectrum analyzer were measured and used for test. Path loss (S/A's Correction factor) = Cable A + Power splitter

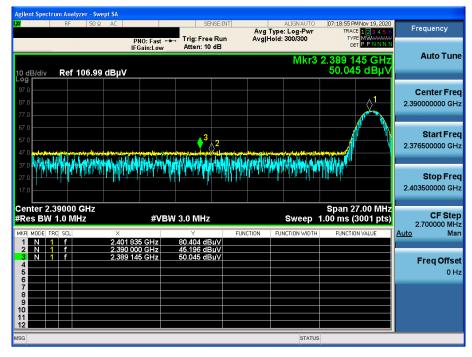


# **APPENDIX II**

## Unwanted Emissions (Radiated) Test Plot & MN: DA330DJAN

#### GFSK & Lowest & X & Ver

#### **Detector Mode : PK**



#### GFSK & Highest & X & Ver

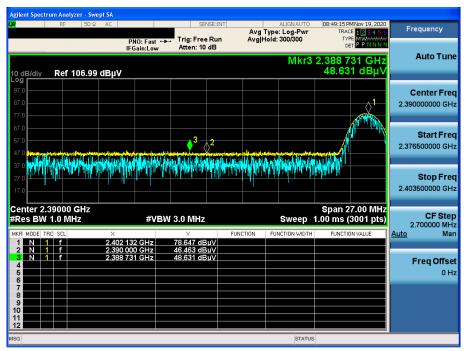


#### **Detector Mode : PK**

**Detector Mode : PK** 

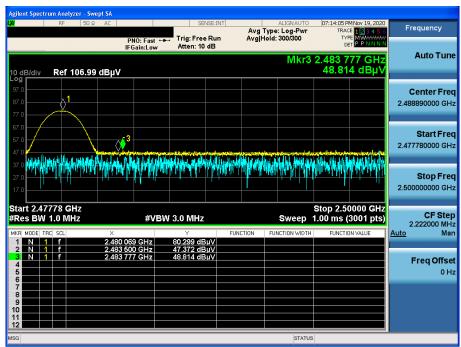


#### $\pi$ /4DQPSK & Lowest & X & Ver



#### Detector Mode : PK

#### $\pi/4DQPSK$ & Highest & X & Ver



**Detector Mode : PK** 

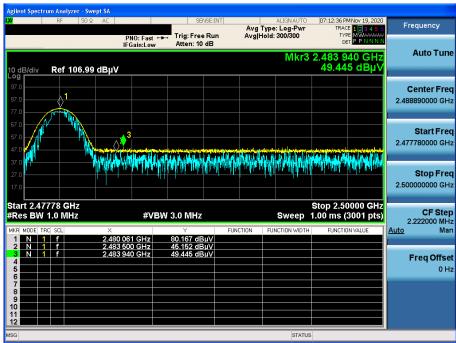


# 8DPSK & Lowest & X & Ver



#### **Detector Mode : PK**

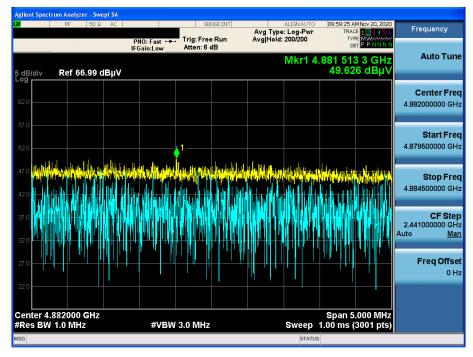
# 8DPSK & Highest & X & Ver





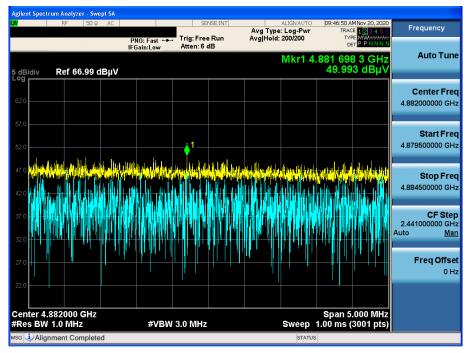
#### GFSK & Middle & X & Ver

# Detector Mode : PK



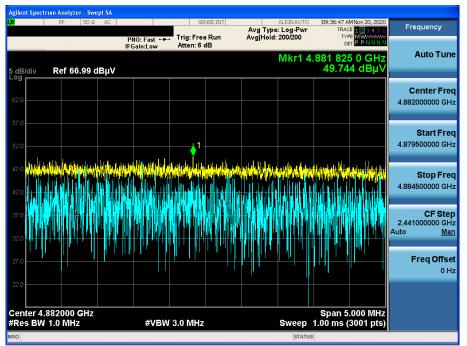
#### $\pi/4DQPSK$ & Middle & X & Ver

# **Detector Mode : PK**





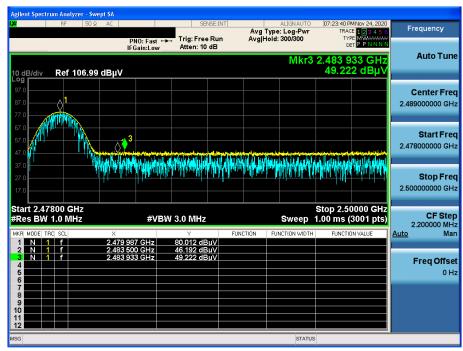
# 8DPSK & Middle & X & Ver



# Unwanted Emissions (Radiated) Test Plot & MN: DA331DJAN

#### 8DPSK & Highest & X & Ver

#### **Detector Mode : PK**



# 8DPSK & Highest & X & Ver

#### **Detector Mode : PK**

