

RF TEST REPORT

For

Guangzhou Pinzhong Electronic Technology Co.,Ltd.

Product Name: BEITONG KunPeng 20 Intelligent Gaming
Controller

Test Model(s).: BTP-KP20

Report Reference No. : DACE241030023RL001

FCC ID : 2AWMK-BTP-KP20

Applicant's Name : Guangzhou Pinzhong Electronic Technology Co.,Ltd.

Address Room 611-612, Greenland Center of Financial City, No. 662, Huangpu

Avenue Middle Road, Tianhe District, Guangzhou City

Testing Laboratory: Shenzhen DACE Testing Technology Co., Ltd.

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Address : Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen,

Guangdong, China

Test Specification Standard : 47 CFR Part 15.247

Date of Receipt : October 30, 2024

Date of Test : October 30, 2024 to November 5, 2024

Data of Issue : November 5, 2024

Result : Pass

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Apply for company information

Applicant's Name	:	Guangzhou Pinzhong Electronic Technology Co.,Ltd.
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Product Name		BEITONG KunPeng 20 Intelligent Gaming Controller
Test Model(s)		BTP-KP20
Series Model(s)	•	N/A
Test Specification Standard(s)	Ŧ	47 CFR Part 15.247

NOTE1:

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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Report No.: DACE241030023RL001

Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	DACE241030023RL001	November 5, 2024
	1		

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

47 CFR Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

1.2 Summary of Test Result

Item	Standard	Method	Requirement	Result
Antenna requirement	47 CFR Part 15.247		47 CFR 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.247	ANSI C63.10-2013 section 6.2	47 CFR 15.207(a)	Pass
Occupied Bandwidth	47 CFR Part 15.247	ANSI C63.10-2013, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(a)(2)	Pass
Maximum Conducted Output Power	47 CFR Part 15.247	ANSI C63.10-2013, section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(b)(3)	Pass
Power Spectral Density	47 CFR Part 15.247	ANSI C63.10-2013, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(e)	Pass
Emissions in non-restricted frequency bands	47 CFR Part 15.247	ANSI C63.10-2013 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass
Band edge emissions (Radiated)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass
Emissions in frequency bands (below 1GHz)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass
Emissions in frequency bands (above 1GHz)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass

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2 GENERAL INFORMATION

2.1 Client Information

Applicant's Name : Guangzhou Pinzhong Electronic Technology Co.,Ltd.

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Avenue Middle Road, Tianhe District, Guangzhou City

Manufacturer : Guangzhou Pinzhong Electronic Technology Co.,Ltd.

Address : Room 611-612, Greenland Center of Financial City, No. 662, Huangpu

Avenue Middle Road, Tianhe District, Guangzhou City

2.2 Description of Device (EUT)

Product Name:	BEITONG KunPeng 20 Intelligent Gaming Controller
Model/Type reference:	BTP-KP20
Series Model:	N/A
Trade Mark:	BEITONG
Power Supply:	DC 5V/0.5A from adapter Battery:DC3.7V 600mAh
Operation Frequency:	2402MHz to 2480MHz
Number of Channels:	40
Modulation Type:	GFSK
Antenna Type:	PCB
Antenna Gain:	1.6dBi
Hardware Version:	V1.0
Software Version:	V1.0

(Remark:The Antenna Gain is supplied by the customer.DACE is not responsible for This data and the related calculations associated with it)

Operation	Operation Frequency each of channel						
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

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Frequency (MHz)
BLE
2402MHz
2440MHz
2480MHz
-

2.3 Description of Test Modes

No	Title	Description
TM1	Lowest channel	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation.
TM2	Middle channel	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation.
TM3	Highest channel	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation.

2.4 Description of Support Units

Title	Manufacturer	Model No.	Serial No.
AC-DC adapter	HUAWEI TECHNOLOGY	HW100400C01	0

2.5 Equipments Used During The Test

Conducted Emission at AC power line						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Power absorbing clamp	SCHWARZ BECK	MESS- ELEKTRONIK	1	2024-03-25	2025-03-24	
Electric Network	SCHWARZ BECK	CAT5 8158	CAT5 8158#207	2023-12-12	2024-12-11	
Cable	SCHWARZ BECK	1	61	2024-03-20	2025-03-19	
Pulse Limiter	SCHWARZ BECK	VTSD 9561-F Pulse limiter 10dB Attenuation	561-G071	2023-12-12	2024-12-11	
50ΩCoaxial Switch	Anritsu	MP59B	M20531	2023-12-12	2024-12-11	
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607K 03-102109- MH	2024-06-12	2025-06-11	
L.I.S.N	R&S	ESH3-Z5	831.5518.52	2023-12-12	2024-12-11	
L.I.S.N	SCHWARZ BECK	NSLK 8126	05055	2024-06-14	2025-06-13	
Pulse Limiter	CYBERTEK	EM5010A	1	2024-09-27	2025-09-26	
EMI test software	EZ -EMC	EZ	V1.1.42	2023-12-12	2024-12-11	

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Occupied Bandwidth

Maximum Conducted Output Power

Power Spectral Density

Emissions in non-restricted frequency bands

Emissions in non-recarding bands							
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date		
RF Test Software	TACHOY	RTS-01	V1.0.0	2023-12-12	2024-12-11		
Power divider	MIDEWEST	PWD-2533	SMA-79	2023-05-11	2026-05-10		
RF Sensor Unit	Tachoy Information Technology(she nzhen) Co.,Ltd.	TR1029-2	000001	2023-12-12	2024-12-11		
Wideband radio communication tester	R&S	CMW500	113410	2024-06-12	2025-06-11		
Signal Generator	Keysight	N5181A	MY48180415	2023-12-11	2024-12-10		
Signal Generator	Keysight	N5182A	MY50143455	2023-12-12	2024-12-11		
Spectrum Analyzer	Keysight	N9020A	MY53420323	2023-12-12	2024-12-11		

Band edge emissions (Radiated)

Emissions in frequency bands (below 1GHz)

Emissions in frequency bands (above 1GHz)

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test software	Farad	EZ -EMC	V1.1.42	2023-12-12	2024-12-11
Positioning Controller	1	MF-7802	1	2023-12-12	2024-12-11
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2024-06-14	2026-06-13
Cable(LF)#2	Schwarzbeck	1	C 1	2024-02-19	2025-02-18
Cable(LF)#1	Schwarzbeck	1 3	1	2024-02-19	2025-02-18
Cable(HF)#2	Schwarzbeck	AK9515E	96250	2024-03-20	2025-03-19
Cable(HF)#1	Schwarzbeck	SYV-50-3-1	/	2024-03-20	2025-03-19
Power amplifier(LF)	Schwarzbeck	BBV9743	9743-151	2024-06-12	2025-06-11
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2024-06-12	2025-06-11
Wideband radio communication tester	R&S	CMW500	113410	2024-06-12	2025-06-11
Spectrum Analyzer	R&S	FSP30	1321.3008K40 -101729-jR	2024-06-12	2025-06-11
Test Receiver	R&S	ESCI 3	1166.5950K03 -101431-Jq	2024-06-13	2025-06-12
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2024-09-28	2026-09-27

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2.6 Statement Of The Measurement Uncertainty

Test Item		Measurement Uncertainty	
Conducted Disturbance (0.15~30MHz)	VI-	±3.41dB	
Occupied Bandwidth		±3.63%	
RF conducted power		±0.733dB	
RF power density		±0.234%	
Conducted Spurious emissions		±1.98dB	
Radiated Emission (Above 1GHz)	J	±5.46dB	1/1
Radiated Emission (Below 1GHz)		±5.79dB) -

Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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3 Evaluation Results (Evaluation)

V1.0

3.1 Antenna requirement

Test Requirement:

Refer to 47 CFR Part 15.203, 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.

3.1.1 Conclusion:



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4 Radio Spectrum Matter Test Results (RF)

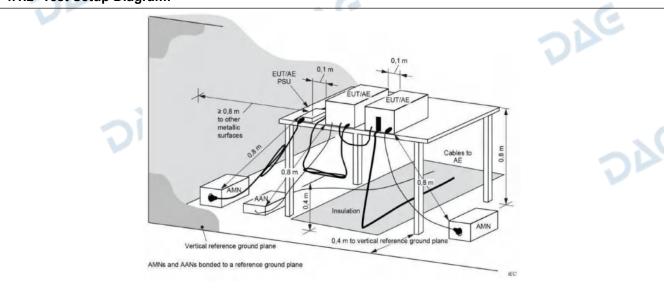
4.1 Conducted Emission at AC power line

Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b)and (c)of this section, 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 µH/50 ohms line impedance stabilization network (LISN).						
Test Limit:	Frequency of emission (MHz)	Conducted limit (dBµV)					
		Quasi-peak	Average				
	0.15-0.5	66 to 56*	56 to 46*				
	0.5-5	56	46				
	5-30	60	50				
\	*Decreases with the logarithm of the frequency.						
Test Method:	ANSI C63.10-2013 section 6.2						
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices						

4.1.1 E.U.T. Operation:

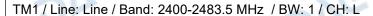
Operating Enviro	Operating Environment:							
Temperature:	23.1 °C		Humidity:	54 %	A	tmospheric Pressure:	102 kPa	
Pretest mode:	Pretest mode: T							
Final test mode:		TM1						

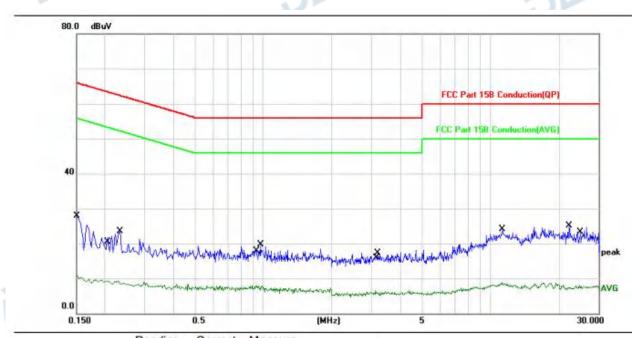
4.1.2 Test Setup Diagram:



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4.1.3 Test Data:



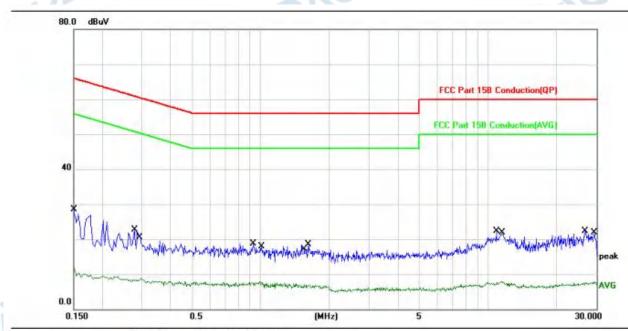


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	17.78	10.13	27.91	65.99	-38.08	QP	
2		0.1500	0.97	10.13	11.10	55.99	-44.89	AVG	
3		0.2020	-0.80	10.12	9.32	53.52	-44.20	AVG	
4		0.2340	13.37	10.10	23.47	62.30	-38.83	QP	
5		0.9260	-2.20	10.10	7.90	46.00	-38.10	AVG	
6		0.9700	9.60	10.11	19.71	56.00	-36.29	QP	
7		3.1340	-3.63	10.07	6.44	46.00	-39.56	AVG	
8		3.2020	7.23	10.07	17.30	56.00	-38.70	QP	
9		11.2820	13.67	10.36	24.03	60.00	-35.97	QP	
10		11.2820	-1.42	10.36	8.94	50.00	-41.06	AVG	
11	*	22.2300	14.54	10.64	25.18	60.00	-34.82	QP	
12		24.7500	-2.69	10.73	8.04	50.00	-41.96	AVG	

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TM1 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	18.36	10.13	28.49	65.99	-37.50	QP	
2		0.1500	2.05	10.13	12.18	55.99	-43.81	AVG	
3		0.2779	12.59	10.10	22.69	60.88	-38.19	QP	
4		0.2980	-1.19	10.10	8.91	50.30	-41.39	AVG	
5	*	0.9260	8.66	10.10	18.76	56.00	-37.24	QP	
6		0.9980	-2.19	10.11	7.92	46.00	-38.08	AVG	
7		1.5460	-2.99	10.04	7.05	46.00	-38.95	AVG	
8		1.6140	8.38	10.04	18.42	56.00	-37.58	QP	
9		10.8540	11.89	10.34	22.23	60.00	-37.77	QP	
10	-	11.5140	-2.54	10.37	7.83	50.00	-42.17	AVG	
11		26.8020	11.50	10.86	22.36	60.00	-37.64	QP	
12		29.3380	-3.19	11.05	7.86	50.00	-42.14	AVG	

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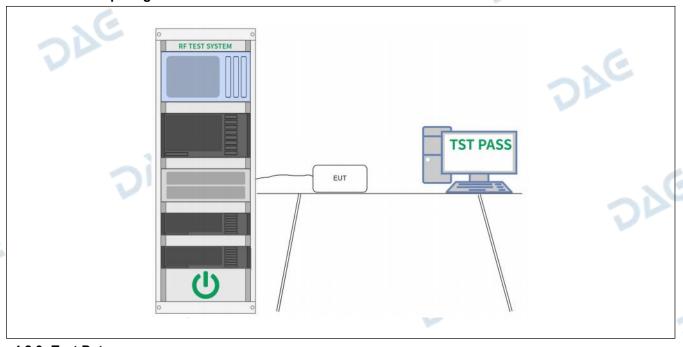
4.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10-2013, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW >= [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.2.1 E.U.T. Operation:

Operating Envir	Operating Environment:							
Temperature:	23.1 °C		Humidity:	54 %	Atmospheric Pressure: 102 kPa			
Pretest mode:	Pretest mode:				. 6			
Final test mode:			TM2, TM3					

4.2.2 Test Setup Diagram:



4.2.3 Test Data:

Please Refer to Appendix for Details.

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4.3 Maximum Conducted Output Power

4.5 Maximum Condo	
Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Method:	ANSI C63.10-2013, section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power Note: Per ANSI C63.10-2013, if there are two or more antnnas, the conducted powers at Core 0, Core 1,, Core i were first measured separately, as shown in the section above(this product olny have one antenna). The measured values were then summed in linear power units then converted back to dBm. Per ANSI C63.10-2013 Section 14.4.3.2.3, the directional gain is calculated using the following formula, where GN is the gain of the nth antenna and NANT, the total number of antennas used. For correlated unequal antenna gain Directional gain = 10*log[(10G1/20 + 10G2/20 + + 10GN/20)2 / NANT] dBi For completely uncorrelated unequal antenna gain Directional gain = 10*log[(10G1/10 + 10G2/10 + + 10GN/10)/ NANT] dBi Sample Multiple antennas Calculation: Core 0 + Core 1 +Core i. = MIMO/CDD (i is the number of antennas) (#VALUE! mW + mW) = #VALUE! mW = dBm Sample e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted Power (dBm) + Ant gain (dBi)

Report No.: DACE241030023RL001

4.3.1 E.U.T. Operation:

Operating Envir	Operating Environment:							
Temperature:	23.1 °C		Humidity:	54 %	-	Atmospheric Pressure:	102 kPa	- 2/
Pretest mode:			TM2, TM3					
Final test mode: TM		TM1,	TM2, TM3					

4.3.2 Test Setup Diagram:

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E-mail: service@dace-lab.com

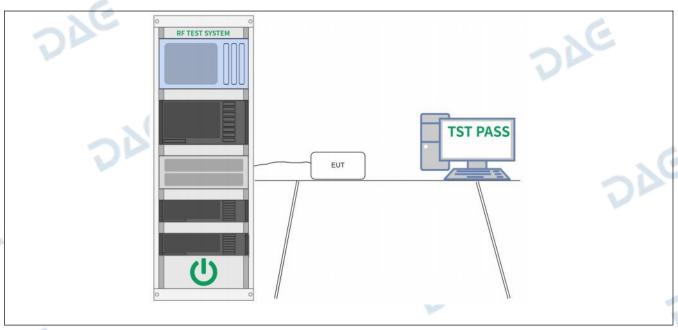
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4.3.3 Test Data:

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Please Refer to Appendix for Details.

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4.4 Power Spectral Density

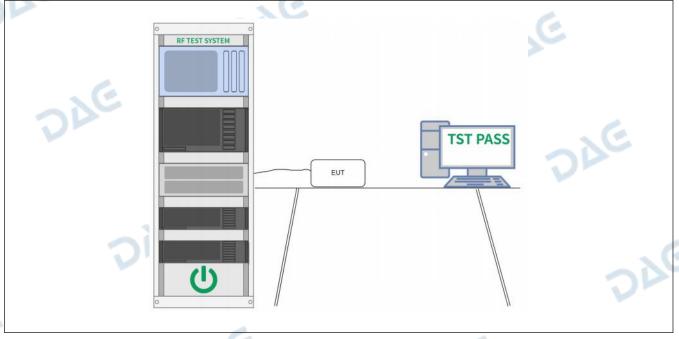
V1.0

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	ANSI C63.10-2013, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission

4.4.1 E.U.T. Operation:

Operating Enviro	Operating Environment:										
Temperature:	23.1 °C		Humidity:	54 %	Atmospheric Pressure:	102 kPa					
Pretest mode: TM1, TM2, TM3					V	4					
Final test mode: TM1, TM2, TM3											

4.4.2 Test Setup Diagram:



4.4.3 Test Data:

Please Refer to Appendix for Details.

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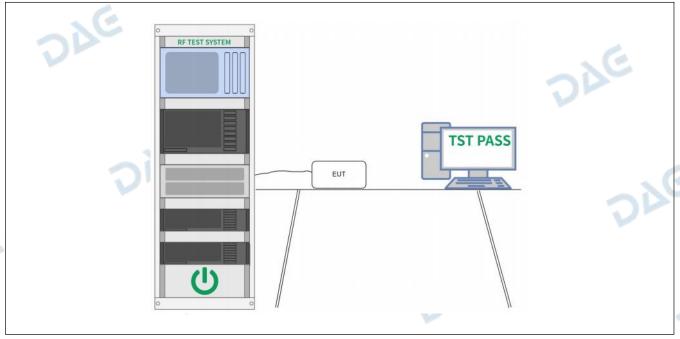
4.5 Emissions in non-restricted frequency bands

Test Requirement:	47 CFR 15.247(d), 15.209, 15.205
Test Limit:	Refer to 47 CFR 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 § 15.209(a) is not required.
Test Method:	ANSI C63.10-2013 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3

4.5.1 E.U.T. Operation:

Operating Environment	Operating Environment:									
Temperature:	23.1 °C H		Humidity:	54 %	Atmospheric Pressure:	102 kPa				
Pretest mode: TM1, TM2, TM3			TM2, TM3			6				
Final test mode: TM1, TM2, TM3			TM2, TM3							

4.5.2 Test Setup Diagram:



4.5.3 Test Data:

Please Refer to Appendix for Details.

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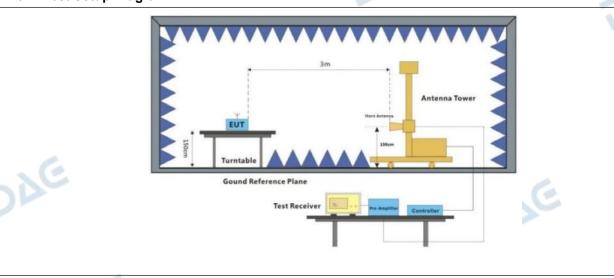
4.6 Band edge emissions (Radiated)

Test Requirement:	restricted bands, as defi	(d), In addition, radiated emission ned in § 15.205(a), must also con I in § 15.209(a)(see § 15.205(c)).	mply with the radiated
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
1	Above 960	500	3
J.E	radiators operating under 54-72 MHz, 76-88 MHz, these frequency bands if and 15.241. In the emission table about The emission limits shown and 10–490 kHz and above	paragraph (g), fundamental emiser this section shall not be located 174-216 MHz or 470-806 MHz. It is permitted under other sections ove, the tighter limit applies at the wn in the above table are based disi-peak detector except for the free 1000 MHz. Radiated emission linents employing an average dete	d in the frequency bands However, operation within of this part, e.g., §§ 15.231 be band edges. on measurements equency bands 9–90 kHz, mits in these three bands
Test Method:	ANSI C63.10-2013 sect KDB 558074 D01 15.24	ion 6.10 7 Meas Guidance v05r02	
Procedure:	ANSI C63.10-2013 sect	ion 6.10.5.2	1.C

4.6.1 E.U.T. Operation:

Operating Envir	onment:					
Temperature:	nperature: 23.1 °C Humidity:				Atmospheric Pressure:	102 kPa
Pretest mode: TM1, TM2, TM3			TM2, TM3		. 6	
		TM2, TM3		270		

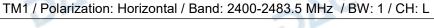
4.6.2 Test Setup Diagram:

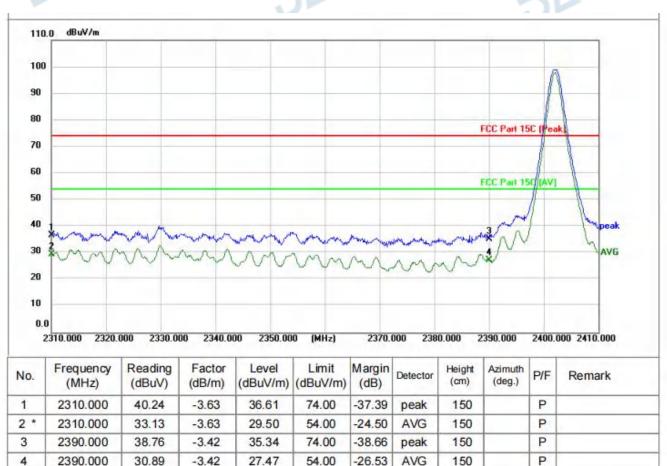


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4.6.3 Test Data:





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TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L dBuV/m 110.0 100 90 80 FCC Part 15C (P 70 60 FCC Part 15C (AV) 50 40 30 AVG 20 10 0.0 2330.000 2340.000 2350.000 (MHz) 2370.000 2380.000 2390.000 2400.000 2410.000

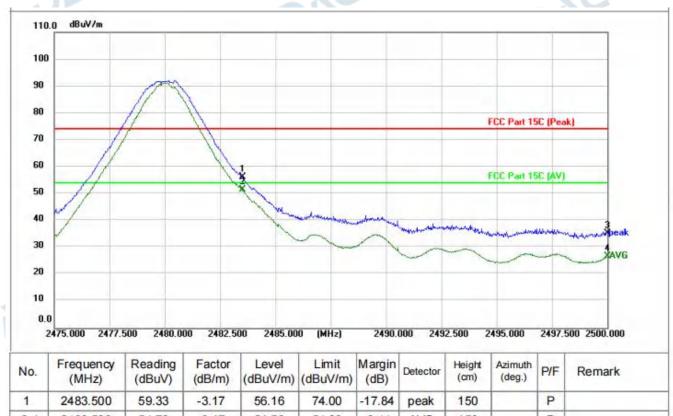
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	36.65	-3.63	33.02	74.00	-40.98	peak	150		Р	
2 *	2310.000	28.41	-3.63	24.78	54.00	-29.22	AVG	150		P	
3	2390.000	36.20	-3.42	32.78	74.00	-41.22	peak	150		Р	
4	2390.000	26.40	-3.42	22.98	54.00	-31.02	AVG	150	İ	Р	

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TM3 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	59.33	-3.17	56.16	74.00	-17.84	peak	150		Р	
2 *	2483.500	54.73	-3.17	51.56	54.00	-2.44	AVG	150		Р	
3	2500.000	38.55	-3.13	35.42	74.00	-38.58	peak	150		Р	
4	2500.000	29.84	-3.13	26.71	54.00	-27.29	AVG	150		Р	

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3

4

2500.000

2500.000

35.36

25.10

-3.13

-3.13

32.23

21.97

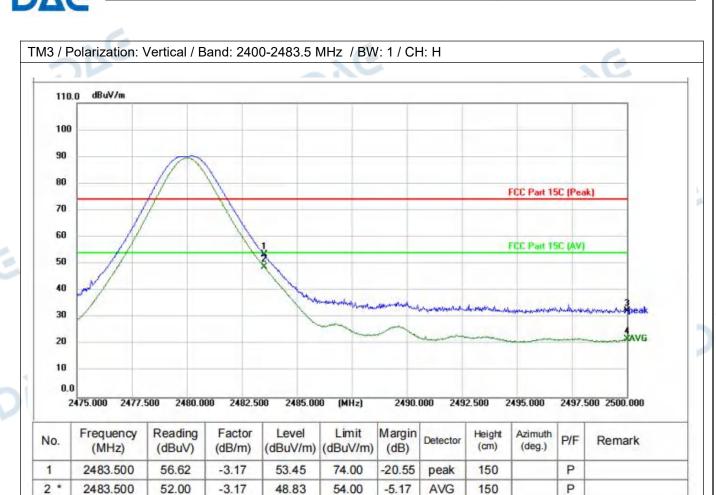
Report No.: DACE241030023RL001

P

P

150

150



Note: The test software only records the worst height and cannot record the worst angle. Only the worst situation is displayed in the test report.

74.00

54.00

-41.77

-32.03

peak

AVG

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4.7 Emissions in frequency bands (below 1GHz)

Test Requirement:	restricted bands, as defined	In addition, radiated emissions w in § 15.205(a), must also comply § 15.209(a)(see § 15.205(c)).`	hich fall in the with the radiated
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
	The emission limits shown i employing a CISPR quasi-p 110–490 kHz and above 10	the tighter limit applies at the ban in the above table are based on meak detector except for the freque 00 MHz. Radiated emission limits is employing an average detector.	neasurements ency bands 9–90 kHz, in these three bands
Test Method:	ANSI C63.10-2013 section (KDB 558074 D01 15.247 M	6.6.4	
Procedure:	above the ground at a 3 or 360 degrees to determine the b. For above 1GHz, the EU above the ground at a 3 me degrees to determine the poc. The EUT was set 3 or 10 which was mounted on the d. The antenna height is var determine the maximum val polarizations of the antenna e. For each suspected emist the antenna was tuned to he below 30MHz, the antenna	was placed on the top of a rotation meter semi-anechoic chamber, where position of the highest radiation was placed on the top of a rotate ter fully-anechoic chamber. The table ter fully-anechoic chamber and the highest radiation. The table term of the highest radiation meters away from the interference of the field strength. Both horizing are set to make the measurements was to make the measurements on, the EUT was arranged to its sights from 1 meter to 4 meters (find the measurements).	The table was rotated in. ing table 1.5 meters able was rotated 360 ine-receiving antenna, ower. is above the ground to expend and vertical int. is worst case and then or the test frequency of the rotatable table
	f. The test-receiver system of Bandwidth with Maximum H g. If the emission level of the specified, then testing could reported. Otherwise the emitested one by one using peareported in a data sheet. h. Test the EUT in the lowes i. The radiation measureme Transmitting mode, and four j. Repeat above procedures Remark:	to 360 degrees to find the maximulars set to Peak Detect Function a cold Mode. E EUT in peak mode was 10dB lobe stopped and the peak values ssions that did not have 10dB mak, quasi-peak or average method to channel, the middle channel, the this are performed in X, Y, Z axis pand the X axis positioning which it until all frequencies measured was, through pre-scan found the work.	wer than the limit of the EUT would be argin would be red as specified and then the Highest channel. Positioning for its the worst case.

Report No.: DACE241030023RL001

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channel. Only the worst case is recorded in the report.

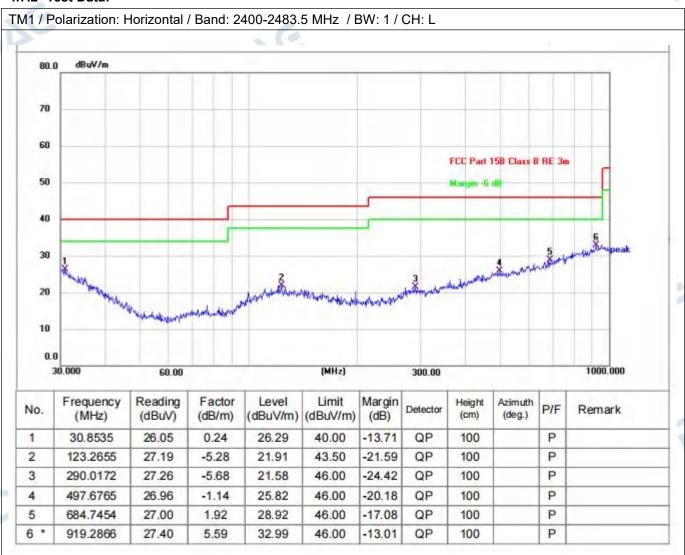
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Final Test Level =Receiver Reading + Antenna Factor + Cable Factor "C Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown.

4.7.1 E.U.T. Operation:

Operating Environment	Operating Environment:										
Temperature:	23.1 °C	_ >	Humidity:	54 %	Atmospheric Pressure:	102 kPa					
Pretest mode:		TM1			. 6						
Final test mode:	1	TM1			270						

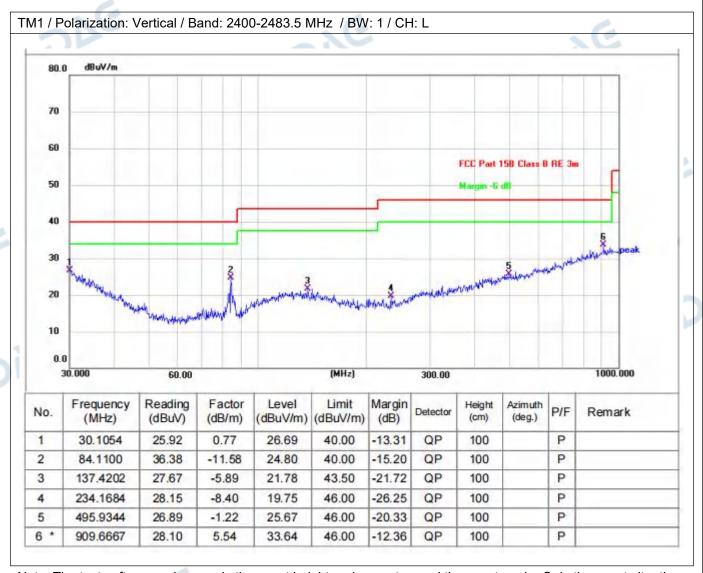
4.7.2 Test Data:



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Note: The test software only records the worst height and cannot record the worst angle. Only the worst situation is displayed in the test report.

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4.8 Emissions in frequency bands (above 1GHz)

Test Requirement:		ns which fall in the restricted ban with the radiated emission limits	
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
	The emission limits shown in employing a CISPR quasi-p 110–490 kHz and above 100	the tighter limit applies at the band the above table are based on meak detector except for the frequency MHz. Radiated emission limits are made and average detector.	neasurements ency bands 9–90 kHz, in these three bands
Test Method:	ANSI C63.10-2013 section (KDB 558074 D01 15.247 M	6.6.4	
Procedure:	above the ground at a 3 or 360 degrees to determine the b. For above 1GHz, the EU above the ground at a 3 me degrees to determine the poc. The EUT was set 3 or 10 which was mounted on the to d. The antenna height is var determine the maximum val polarizations of the antenna e. For each suspected emist the antenna was tuned to he	was placed on the top of a rotat meter semi-anechoic chamber be position of the highest radiation was placed on the top of a rotater fully-anechoic chamber. The trustion of the highest radiation, meters away from the interference op of a variable-height antenna tried from one meter to four meters are set to make the measurements on, the EUT was arranged to its eights from 1 meter to 4 meters (for was tuned to heights 1 meter) and	The table was rotated n. ing table 1.5 meters able was rotated 360 ce-receiving antenna, ower. s above the ground to zontal and vertical nt. s worst case and then for the test frequency of
	was turned from 0 degrees of the test-receiver system of the Bandwidth with Maximum H g. If the emission level of the specified, then testing could reported. Otherwise the emittested one by one using peareported in a data sheet. h. Test the EUT in the lowes i. The radiation measurement Transmitting mode, and four j. Repeat above procedures Remark:	to 360 degrees to find the maxim was set to Peak Detect Function a	um reading. and Specified wer than the limit of the EUT would be argin would be re- d as specified and then e Highest channel. cositioning for is the worst case. as complete.

Report No.: DACE241030023RL001

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channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Final Test Level =Receiver Reading + Antenna Factor + Cable Factor "C Preamplifier Factor

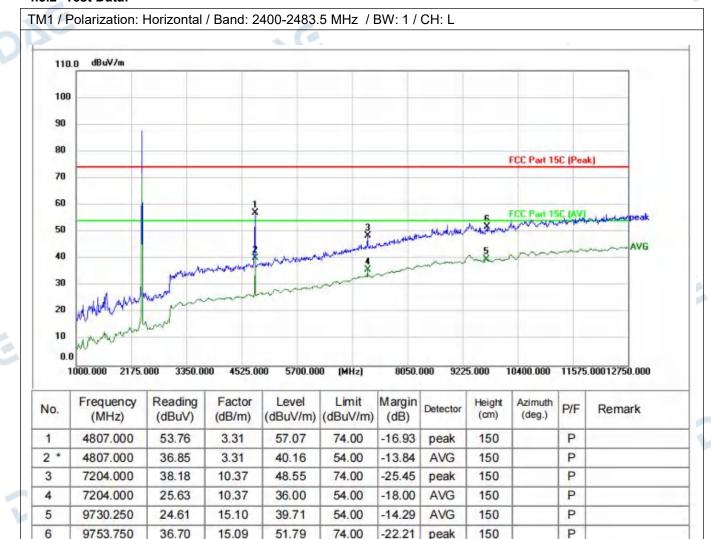
Report No.: DACE241030023RL001

3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown.

4.8.1 E.U.T. Operation:

Operating Envir	Operating Environment:										
Temperature:	23.1 °C	- >	Humidity:	54 %	Atmospheric Pressure:	102 kPa					
Pretest mode: TM1			TM2, TM3		. 6						
Final test mode:	TM1,	TM2, TM3		200							

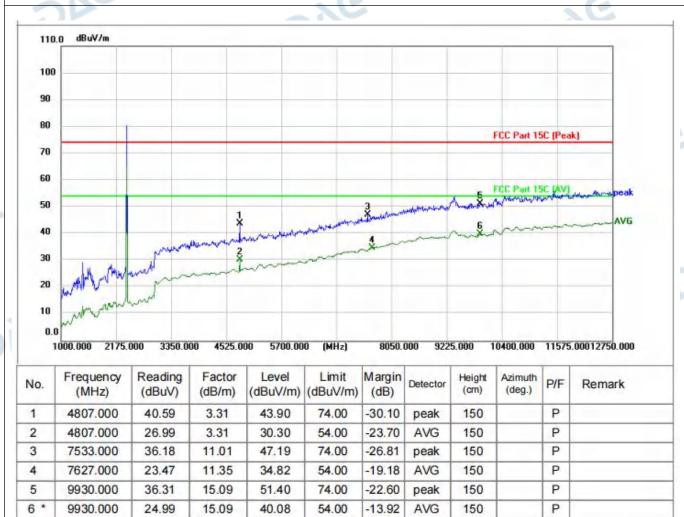
4.8.2 Test Data:



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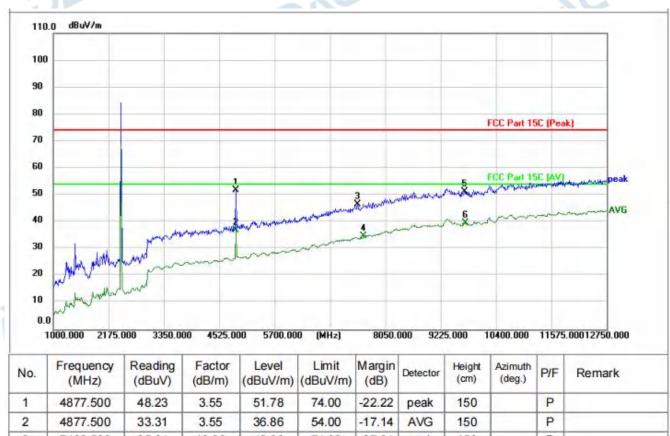
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



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TM2 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: M

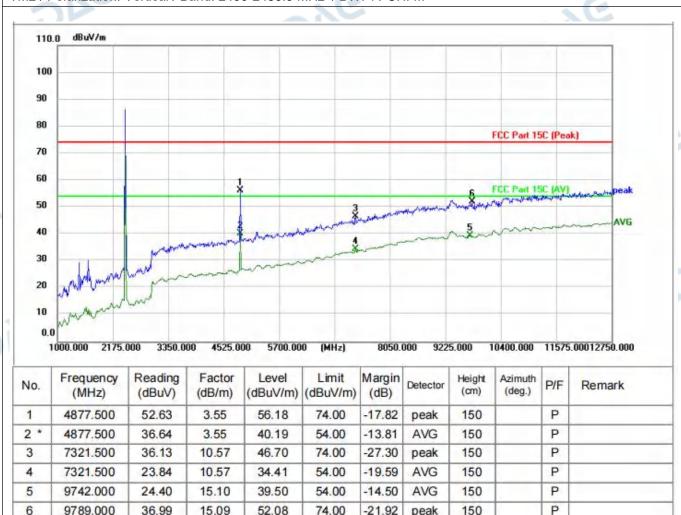


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4877.500	48.23	3.55	51.78	74.00	-22.22	peak	150		P	
2	4877.500	33.31	3.55	36.86	54.00	-17.14	AVG	150		Р	
3	7462.500	35.84	10.82	46.66	74.00	-27.34	peak	150		Р	
4	7591.750	23.55	11.22	34.77	54.00	-19.23	AVG	150		P	
5	9730.250	36.29	15.10	51.39	74.00	-22.61	peak	150		Р	
6 *	9742.000	24.63	15.10	39.73	54.00	-14.27	AVG	150		P	

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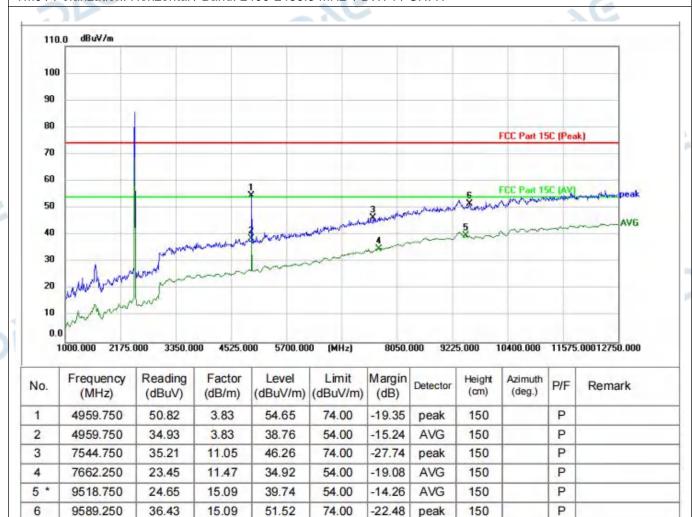


TM2 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: M





TM3 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: H



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3

4

5

6

7380.250

7392.000

9918.250

10024.000

35.49

23.59

36.48

24.68

10.67

10.70

15.08

15.15

46.16

34.29

51.56

39.83

Report No.: DACE241030023RL001

TM3 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: H dBuV/m 110.0 100 90 80 FCC Part 15C (Peak) 70 60 50 AVG 40 30 20 10 3350.000 4525.000 5700.000 8050.000 9225.000 10400.000 11575.00012750.000 Frequency Reading Factor Level Limit Margin Height Azimuth P/F Detector No. Remark (MHz) (dBuV) (dB/m) (dBuV/m) (dBuV/m) (dB) (cm) (deg.) 4959.750 42.42 P 3.83 46.25 74.00 -27.75150 1 peak 4959.750 28.04 3.83 31.87 54.00 -22.13 AVG P 2 150

Note: The test software only records the worst height and cannot record the worst angle. Only the worst situation is displayed in the test report.

74.00

54.00

74.00

54.00

-27.84

-19.71

-22.44

-14.17

peak

AVG

peak

AVG

150

150

150

150

P

P

P

P

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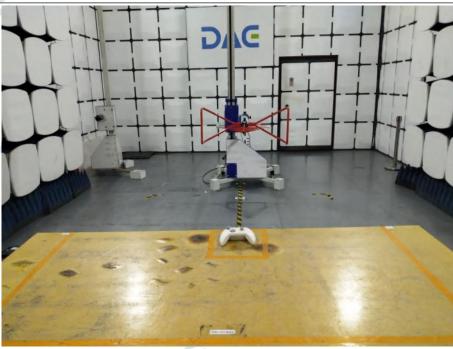


5 TEST SETUP PHOTOS

Conducted Emission at AC power line



Emissions in frequency bands (below 1GHz)



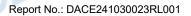
102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China

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6 PHOTOS OF THE EUT

External





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E-mail: service@dace-lab.com

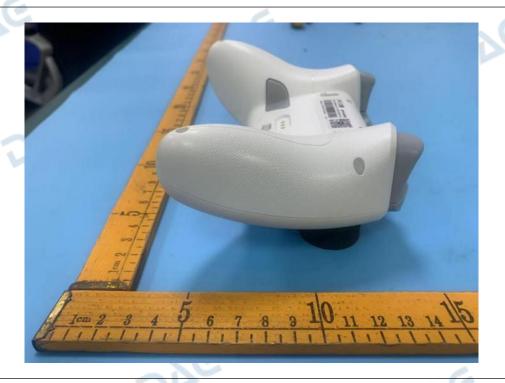
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Internal



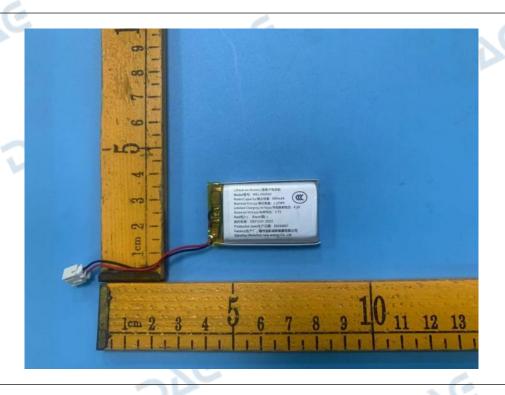
Web: http://www.dace-lab.com

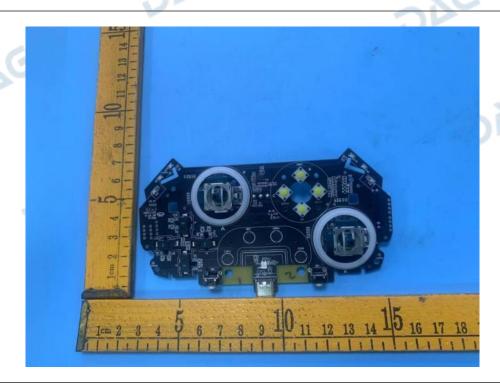
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102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China

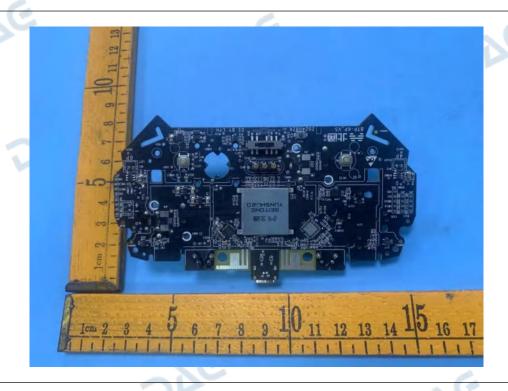
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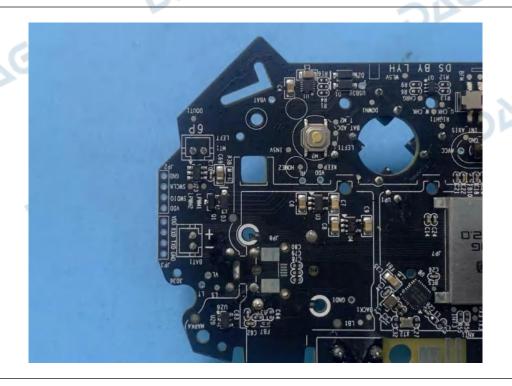
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Appendix

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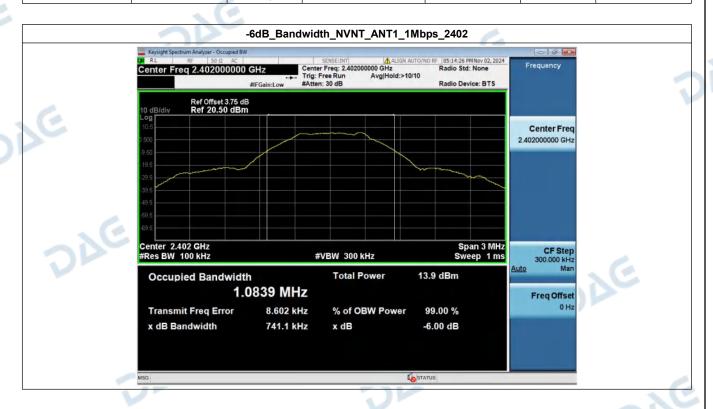


HT241029012--BTP-KP20--BLE--FCC FCC_BLE (Part15.247) Test Data

1. -6dB Bandwidth

V1.0

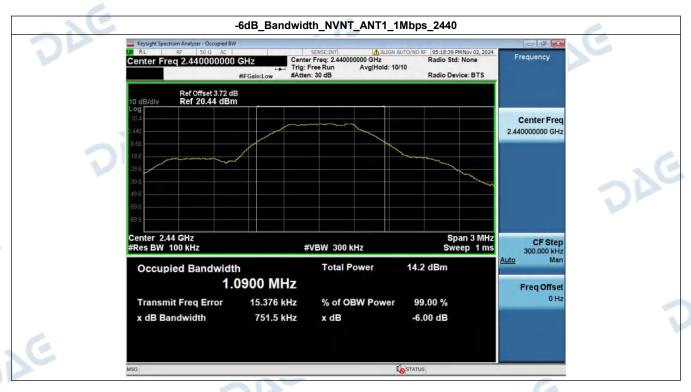
Condition	Antenna	Rate	Frequency (MHz)	-6dB BW(kHz)	limit(kHz)	Result
NVNT	ANT1	1Mbps	2402.00	741.08	500	Pass
NVNT	ANT1	1Mbps	2440.00	751.51	500	Pass
NVNT	ANT1	1Mbps	2480.00	753.65	500	Pass
NVNT	ANT1	2Mbps	2402.00	1378.22	500	Pass
NVNT	ANT1	2Mbps	2440.00	1376.93	500	Pass
NVNT	ANT1	2Mbps	2480.00	1379.02	500	Pass

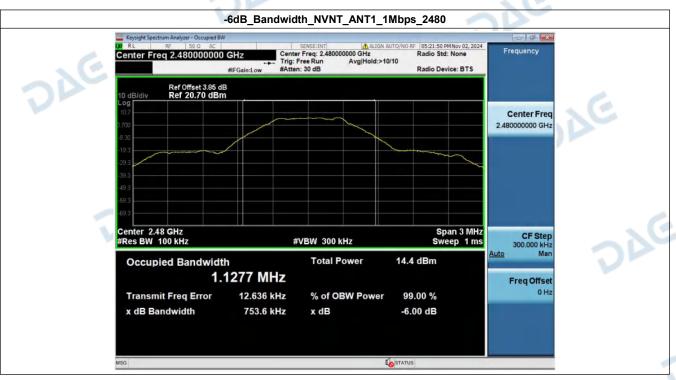


102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China

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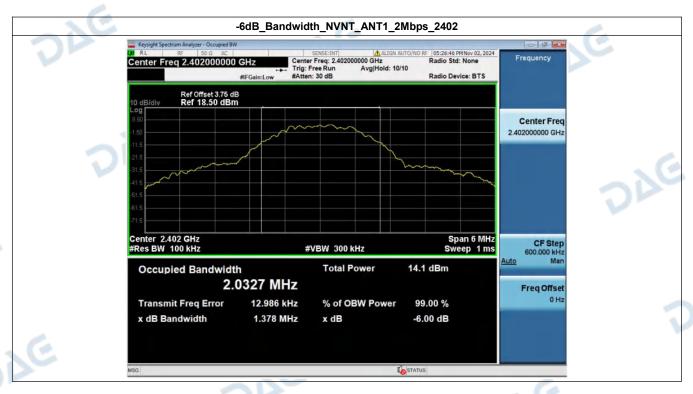


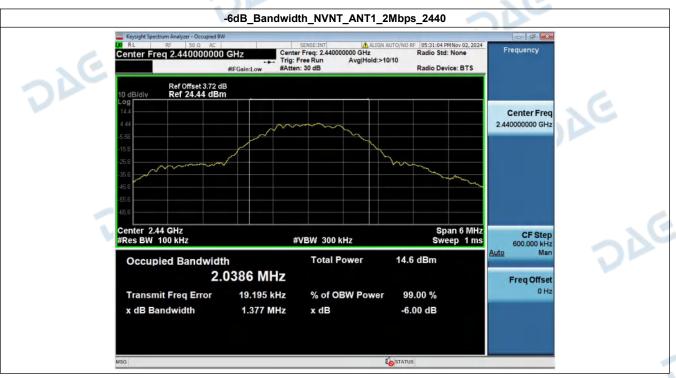


102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China

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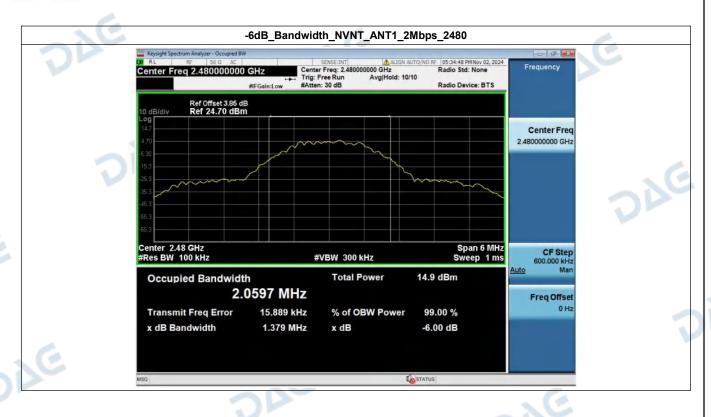


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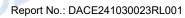
V1.0



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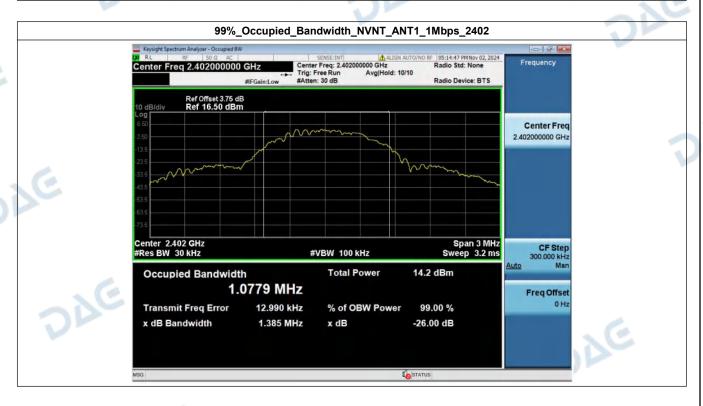
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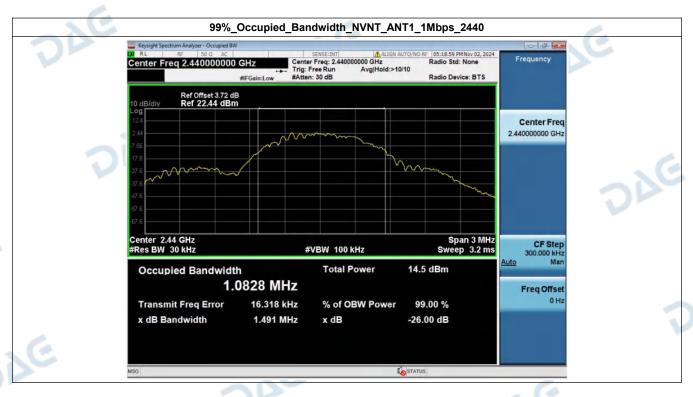
Condition	Antenna	Rate	Frequency (MHz)	99%%BW(MHz)
NVNT	ANT1	1Mbps	2402.00	1.078
NVNT	ANT1	1Mbps	2440.00	1.083
NVNT	ANT1	1Mbps	2480.00	1.127
NVNT	ANT1	2Mbps	2402.00	2.056
NVNT	ANT1	2Mbps	2440.00	2.061
NVNT	ANT1	2Mbps	2480.00	2.086

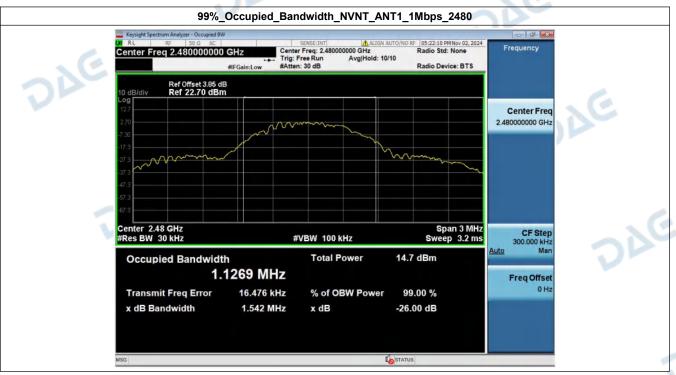


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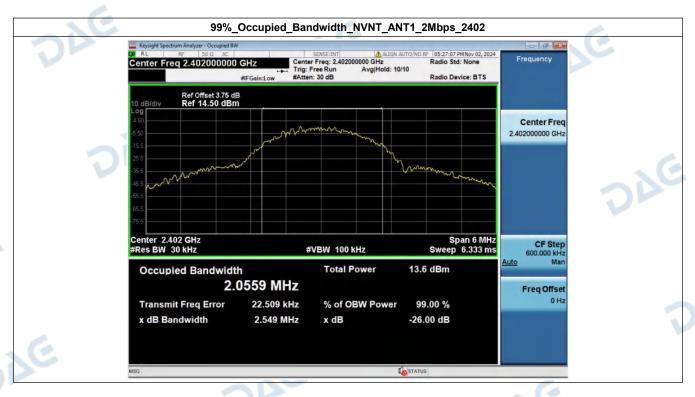


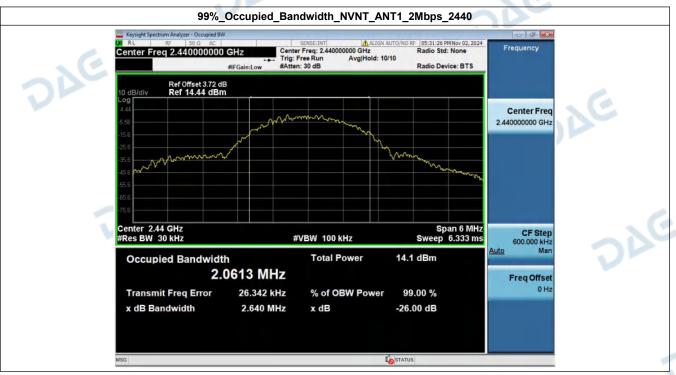




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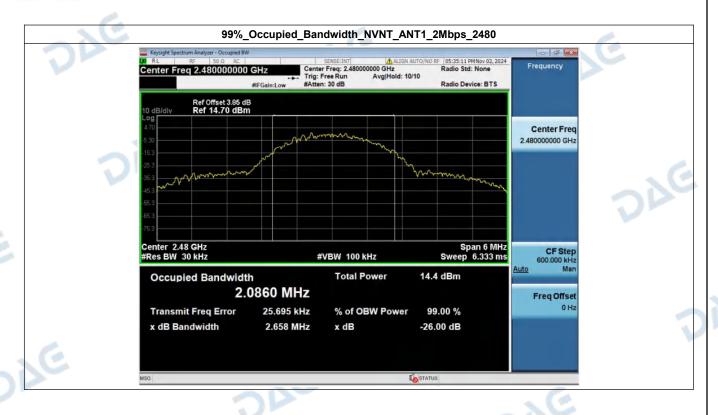
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V1.0



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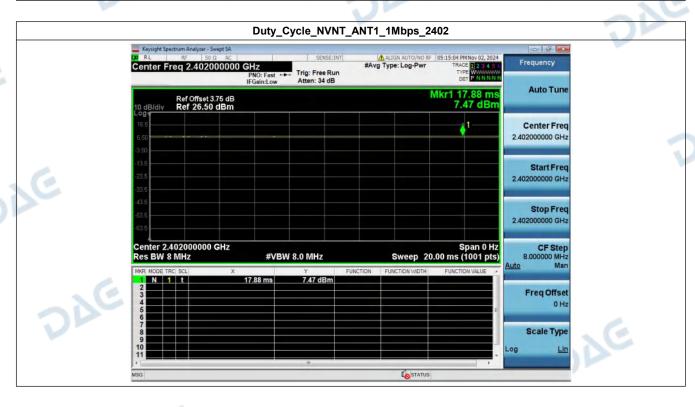
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3. Duty Cycle

Condition	Antenna	Rate	Frequency (MHz)	Dutycycle(%)	Duty_factor
NVNT	ANT1	1Mbps	2402.00	100	0.00
NVNT	ANT1	1Mbps	2440.00	100	0.00
NVNT	ANT1	1Mbps	2480.00	100	0.00
NVNT	ANT1	2Mbps	2402.00	100	0.00
NVNT	ANT1	2Mbps	2440.00	100	0.00
NVNT	ANT1	2Mbps	2480.00	100	0.00

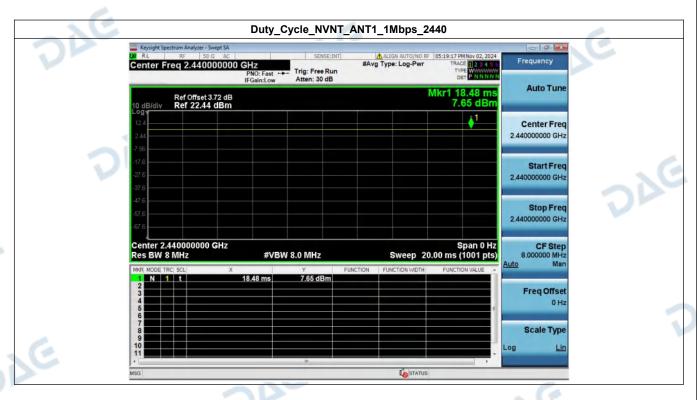


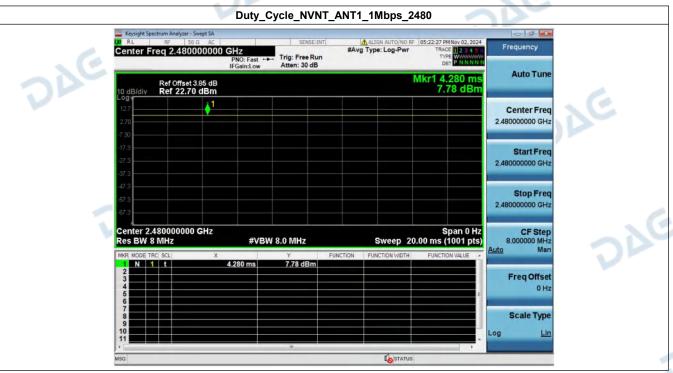
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V1.0



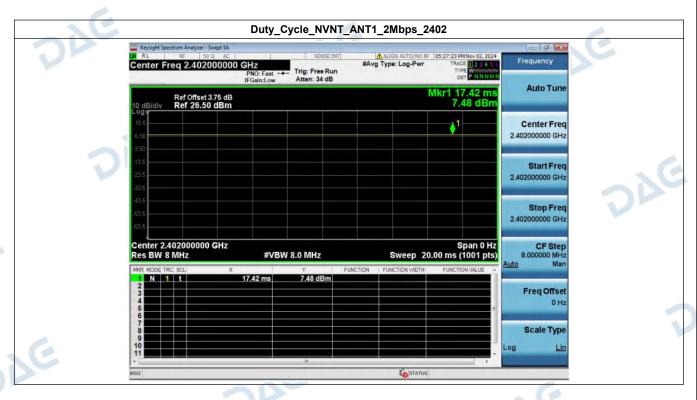


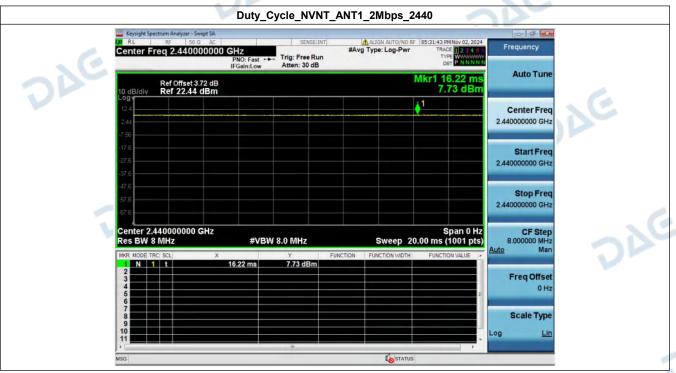
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V1.0





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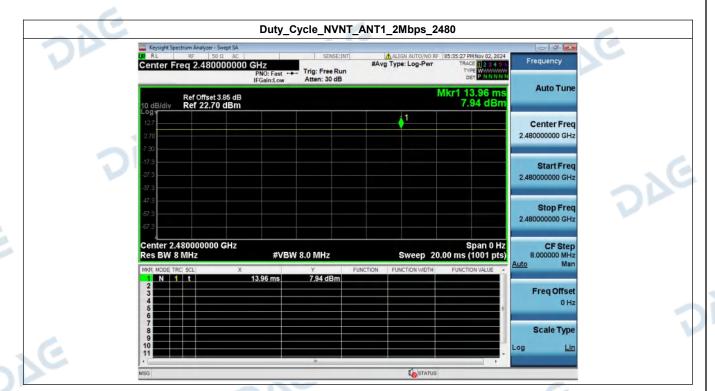


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V1.0



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4. Peak Output Power

V1.0

Condition	Antenna	Rate	Frequency (MHz)	Max. Conducted Power(dBm)	Max. Conducted Power(mW)	Limit(mW)	Result
NVNT	ANT1	1Mbps	2402.00	7.40	5.49	1000	Pass
NVNT	ANT1	1Mbps	2440.00	7.68	5.86	1000	Pass
NVNT	ANT1	1Mbps	2480.00	7.85	6.09	1000	Pass
NVNT	ANT1	2Mbps	2402.00	7.42	5.51	1000	Pass
NVNT	ANT1	2Mbps	2440.00	7.76	5.97	1000	Pass
NVNT	ANT1	2Mbps	2480.00	7.89	6.15	1000	Pass

5. Power Spectral Density

Condition	Antenna	Rate	Frequency (MHz)	Power Spectral Density(dBm)	Limit(dBm/3kHz)	Result
NVNT	ANT1	1Mbps	2402.00	-8.77	8	Pass
NVNT	ANT1	1Mbps	2440.00	-8.57	8	Pass
NVNT	ANT1	1Mbps	2480.00	-8.32	8	Pass
NVNT	ANT1	2Mbps	2402.00	-13.24	8	Pass
NVNT	ANT1	2Mbps	2440.00	-12.81	8	Pass
NVNT	ANT1	2Mbps	2480.00	-12.37	8	Pass



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DAG

V1.0



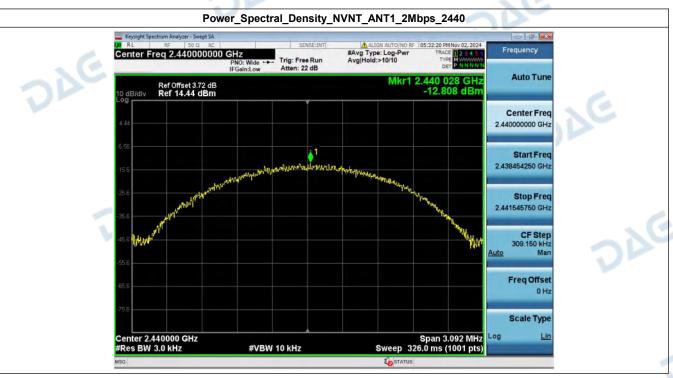




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V1.0





Center 2.480000 GHz #Res BW 3.0 kHz

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#VBW 10 kHz

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Report No.: DACE241030023RL001

Scale Type

Span 3.129 MHz Sweep 329.9 ms (1001 pts)

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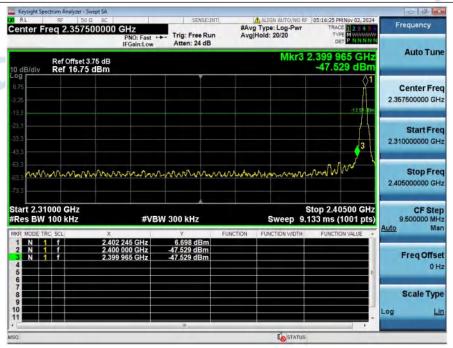


6. Bandedge

Condition	Antenna	Rate	TX_Frequency (MHz)	Max. Mark Frequency (MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	1Mbps	2402.00	2399.965	-47.529	-13.542	Pass
NVNT	ANT1	1Mbps	2480.00	2486.575	-50.053	-13.073	Pass
NVNT	ANT1	2Mbps	2402.00	2399.965	-28.749	-15.313	Pass
NVNT	ANT1	2Mbps	2480.00	2484.575	-45.741	-14.486	Pass







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V1.0







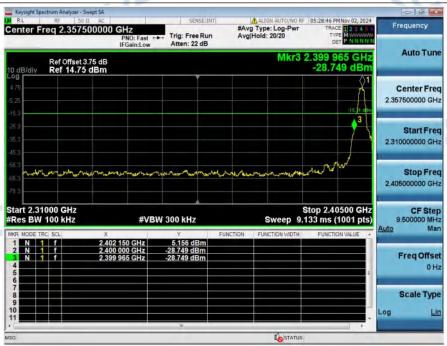
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V1.0

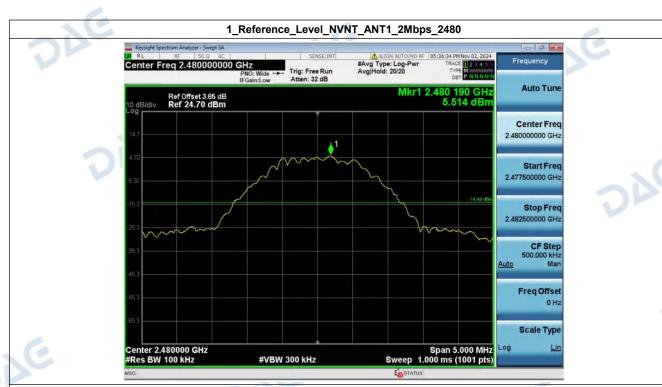






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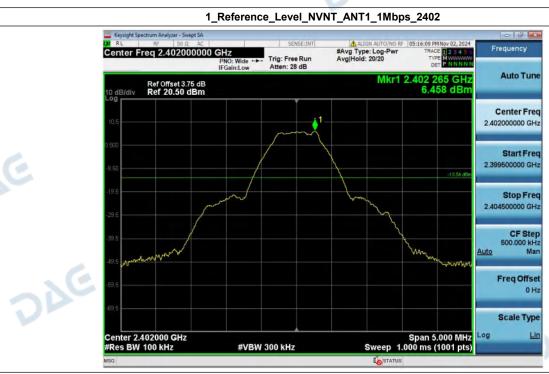
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7. Spurious Emission

V1.0

Condition	Antenna	Rate	TX_Frequency(MHz)	Spurious MAX.Value(dBm)	Limit	Result
NVNT	ANT1	1Mbps	2402.00	-39.817	-13.542	Pass
NVNT	ANT1	1Mbps	2440.00	-36.781	-13.210	Pass
NVNT	ANT1	1Mbps	2480.00	-32.336	-13.073	Pass
NVNT	ANT1	2Mbps	2402.00	-42.105	-15.313	Pass
NVNT	ANT1	2Mbps	2440.00	-39.425	-14.774	Pass
NVNT	ANT1	2Mbps	2480.00	-35.587	-14.486	Pass







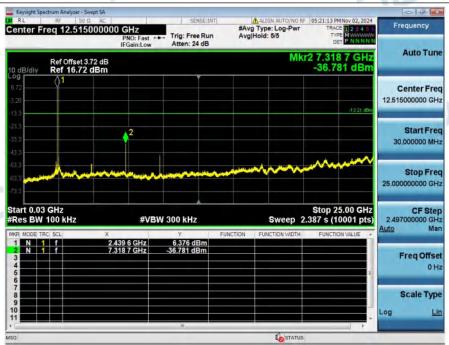
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DAG

V1.0





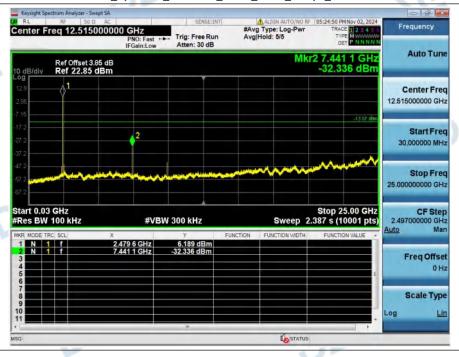


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V1.0



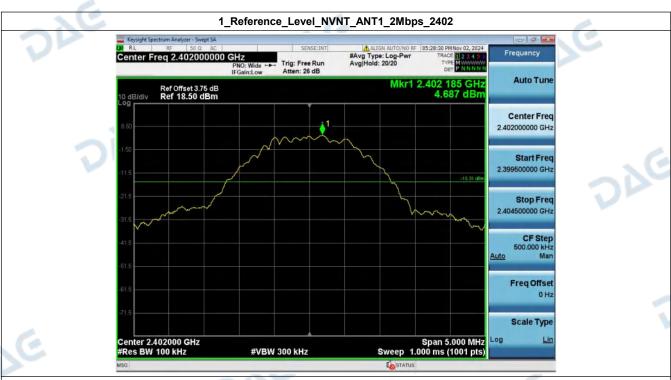




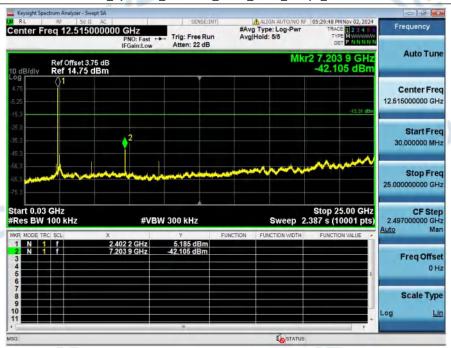
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V1.0





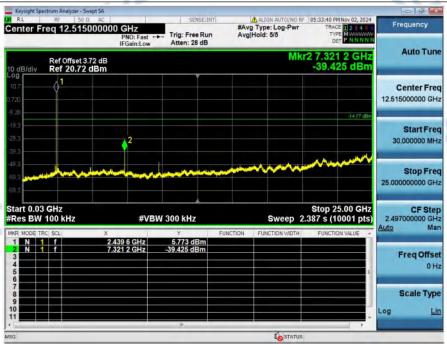


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