## Radio Test Report

Report No.: CTA231114012W02

Issued for

## WHOOP INTERNATIONAL TRADING LIMITED

Flat-B 8/F Chong Gming Building 72 Cheung Sha Wan Road, Kowloon, Hong Kong

Product Name: 10.1 inch Quad Core 4G Tablet PC

Brand Name: ROVER

Model Name: R10

Series Model(s): N/A

FCC ID: 2AP7LTAB10US

Test Standards: FCC Part 15.247

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#### **TEST RESULT**

	TEST RESSET
Applicant's Name:	WHOOP INTERNATIONAL TRADING LIMITED
Address:	Flat-B 8/F Chong Gming Building 72 Cheung Sha Wan Road, Kowloon, Hong Kong
Manufacturer's Name:	Shenzhen Teleone Technology Co.,Ltd
Address:	Tower B 5/F, Shanshui Building, Nanshan Yungu Innovation Industry Park, 4093 Liuxian Avenue, Shenzhen, China
<b>Product Description</b>	CTA.
Product Name:	10.1 inch Quad Core 4G Tablet PC ROVER
Brand Name:	ROVER
Model Name:	R10
Series Model(s):	N/A
Test Standards	FCC Part15.247
Test Procedure	ANSI C63.10-2013
under test (EUT) is in compliance sample identified in the report. This report shall not be reproduce	been tested by CTA, the test results show that the equipment with the FCC requirements. And it is applicable only to the tested d except in full, without the written approval of CTA, this document, personal only, and shall be noted in the revision of the document.
Date of Test	
Date of receipt of test item:	29 Mar. 2023
Date (s) of performance of tests.:	
Date of Issue:	28 Oct. 2023
Test Result:	28 Oct. 2023 Pass
Testing Enginee	(Zoey Cao)
Technical Mana	ager: Stry Von

Authorized Signatory: (Eric Wang) CTA TESTING

GTA TESTING

(Amy Wen)

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APPENDIX 2-PHOTOS OF TEST SETUP

CTA TESTING

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# Revision History

		Revision Hi	story	TES!
Rev.	Issue Date	Report No.	Effect Page	Contents
00	28 Oct. 2023	CTA231114012W02	ALL	Initial Issue

CTATESTING

#### 1. SUMMARY OF TEST RESULTS

	Meas Guidance v05r02.  FCC Part 15.247,Subpart C		Cas	
Standard Section	Test Item	Judgment	Remark	
15.207	Conducted Emission	PASS		
15.247(a)(1)	Hopping Channel Separation	PASS	TESTIN	3
15.247(a)(1)&(b)(1)	Output Power	PASS	TP	
15.209	Radiated Spurious Emission	PASS		
15.247(d)	Conducted Spurious & Band Edge Emission	PASS		
15.247(a)(1)(iii)	Number of Hopping Frequency	PASS		
15.247(a)(1)(iii)	Dwell Time	PASS		
15.247(a)(1)	Bandwidth	PASS		
15.205	Restricted bands of operation	PASS	-	TA
Part 15.247(d)/part 15.209(a)	Band Edge Emission	PASS	- 6	
15.203	Antenna Requirement	PASS		

#### NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2013.



#### 1.1 TEST FACTORY

Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an

District, Shenzhen, China

FCC test Firm Registration Number: 517856 IC test Firm Registration Number: 27890

A2LA Certificate No.: 6534.01

IC CAB ID: CN0127

#### 1.2 MEASUREMENT UNCERTAINTY

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

Test	Range	Measurement Uncertainty
Radiated Emission	30~1000MHz	4.06 dB
Radiated Emission	1~18GHz	5.14 dB
Radiated Emission	18-40GHz	5.38 dB
Conducted Disturbance	0.15~30MHz	2.14 dB
Output Peak power	30MHz~18GHz	0.55 dB
Power spectral density	/	0.57 dB
Spectrum bandwidth		1.1%
Radiated spurious emission (30MHz-1GHz)	30~1000MHz	4.10 dB
Radiated spurious emission (1GHz-18GHz)	1~18GHz	4.32 dB
Radiated spurious emission (18GHz-40GHz)	18-40GHz	5.54 dB
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#### 2. GENERAL INFORMATION

#### 2.1 GENERAL DESCRIPTION OF THE EUT

	E P	
Product Name	10.1 inch Quad Core 4G Tablet PC	
Brand Name	ROVER	
Model Name	R10	
Series Model(s)	N/A	
Model Difference	N/A CIP	
Channel List	Please refer to the Note 3.	
Bluetooth	Frequency:2402 – 2480 MHz Modulation: GFSK(1Mbps), π/4-DQPSK(2Mbps), 8DPSK(3Mbps)	
Bluetooth Configuration	BR+EDR	
Antenna Type	PIFA	
Antenna Gain	1.18dBi	
Adapter	Input: AC 100-240V 0.3A 50/60Hz Output: DC 5V 1500mA	CTAT
Battery	Rated Voltage:3.8V Charge Limit Voltage:4.35 V Capacity: 5100mAh	CTA,
Hardware version number	J866B_610&310_D4F_V1.0	
Software version number	ROVER_R10_13_V01_20231201	
Connecting I/O Port(s)	Please refer to the Note 1.	

#### Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- 2. The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of INS S problems such as the accuracy of the test results will be borne by the customer.



_
Frequency (MHz)
2456
2457
2458
2459
2460
2461
2462
2463
2464
2465
2466
2467
2468
2469
2470
2471
2472
2473
2474
2475
2476
2477
2478
2479
2480



#### 2.2 DESCRIPTION OF THE TEST MODES

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

Worst Mode	Description	Data Rate/Modulation
Mode 1	TX CH00	1Mbps/GFSK
Mode 2	TX CH39	1Mbps/GFSK
Mode 3	TX CH78	1Mbps/GFSK
Mode 4	TX CH00	2 Mbps/π/4-DQPSK
Mode 5	TX CH39	2 Mbps/π/4-DQPSK
Mode 6	TX CH78	2 Mbps/π/4-DQPSK
Mode7	TX CH00	3 Mbps/8DPSK
Mode 8	TX CH39	3 Mbps/8DPSK
Mode 9	TX CH78	3 Mbps/8DPSK
Mode 10	Hopping	GFSK
Mode 11	Hopping	π/4-DQPSK
Mode 12	Hopping	8DPSK

#### Note:

- (1) The measurements are performed at all Bit Rate of Transmitter, the worst data was
- (2) We tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/60Hz is shown in the report.
  - (3) The battery is fully-charged during the radiated and RF conducted test.

#### For AC Conducted Emission

-CAID	Test Case	
AC Conducted Emission	Mode 13 : Keeping BT TX	TING
2.3 FREQUENCY HOPPING SYS	TEM REQUIREMENTS	CTATES

#### 2.3 FREQUENCY HOPPING SYSTEM REQUIREMENTS

#### (1)Standard and Limit

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

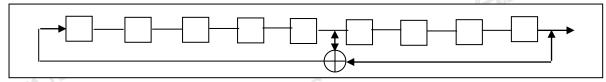


The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

(2)The Pseudorandom sequence may be generated in a nin-stage shift register whose 5<sup>th</sup> and 9<sup>th</sup> stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first one of 9 consecutive ones: i.e. the shift register is initialized with nine ones.

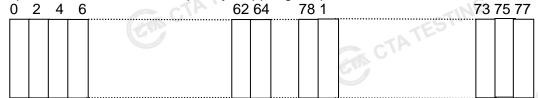
Numver of shift register stages:9

Length of pseudo-random sequence:29-1=511bits Longest sequence of zeros: 8(non-inverted signal)



Liner Feedback Shift Register for Generator of the PRBS sequence

An example of Pseudorandom Frequency Hoppong Sequence as follow:



Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies ini synchronization with the transmitted signals.

#### (3) Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

This device was tested with a bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements FCC Part 15.247 rule.

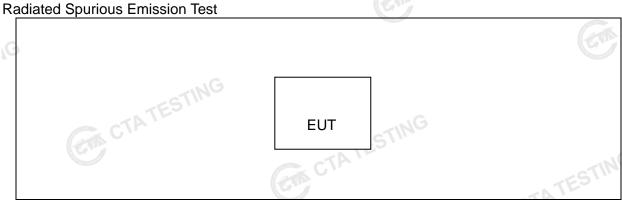
#### 2.4 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

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

TE	TING	est program: Bluetooth	1
(Control software)	Packet type:	Packet type:	Packet type:
Parameters(1/2/3Mbps)	DH1:4:27	DH3:11:183	DH5:15:339
	2DH1:20:54	2DH3:26:367	2DH5:30:679
	3DH1:24:83	3DH3:27:552	3DH5:31:1021

RF Function	Туре	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
	. Ca	GFSK		9	
BT	BR+EDR	π/4-DQPSK	1.18	9	Engineering mode
CTA.		8DPSK		9	
,	(A)	CTATE		TATESTI	NG

2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



Conducted Emission Test AC Plug C-1 E-1 **EUT** Adapter CTATEST

#### 2.6 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	Adapter	N/A	YMK-12W050150	N/A	N/A
C-1	USB Cable	N/A	N/A	95cm	NO
			CIN CIN		TESTING
				G	CTA.

#### Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note	
N/A	N/A	N/A	N/A	N/A	N/A	
		CTA	120		ING	
		The state of the s		CTATES		
						CATES
G Note	a·	,			(CIM)	

#### Note:

- (1) For detachable type I/O cable should be specified the length in cm in <code>"Length\_"</code> column.
- (2) "YES" is means "with core"; "NO" is means "without core". CTATES!



#### 2.7 EQUIPMENTS LIST

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2023/08/02	2024/08/01
LISN	R&S	ENV216	CTA-314	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESPI	CTA-307	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESCI	CTA-306	2023/08/02	2024/08/01
Spectrum Analyzer	Agilent	N9020A	CTA-301	2023/08/02	2024/08/01
Spectrum Analyzer	R&S	FSP	CTA-337	2023/08/02	2024/08/01
Vector Signal generator	Agilent	N5182A	CTA-305	2023/08/02	2024/08/01
Analog Signal Generator	R&S	SML03	CTA-304	2023/08/02	2024/08/01
WIDEBAND RADIO COMMUNICATIO N TESTER	CMW500	R&S	CTA-302	2023/08/02	2024/08/01
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2023/08/02	2024/08/01
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2024/10/16
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2024/10/12
Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2024/10/16
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/07	2024/08/06
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2023/08/02	2024/08/01
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2023/08/02	2024/08/01
Directional coupler	NARDA	4226-10	CTA-303	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2023/08/02	2024/08/01
Automated filter bank	Tonscend	JS0806-F	CTA-404	2023/08/02	2024/08/01
Power Sensor	Agilent	U2021XA	CTA-405	2023/08/02	2024/08/01
Amplifier	Schwarzbeck	BBV9719	CTA-406	2023/08/02	2024/08/01
		CTAT!	E3,	TA	ESTING

Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date
EMI Test Software	Tonscend	TS®JS32-RE	5.0.0.2	N/A	N/A
EMI Test Software	Tonscend	TS®JS32-CE	5.0.0.1	N/A	N/A
RF Test Software	Tonscend	TS®JS1120-3	3.1.65	N/A	N/A
RF Test Software	Tonscend	TS®JS1120	3.1.46	N/A	N/A
			ı	CAN CAN	

#### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

#### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

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.

	Conducted Emis	Conducted Emissionlimit (dBuV)			
FREQUENCY (MHz)	Quasi-peak	Average			
0.15 -0.5	66 - 56 *	56 - 46 *			
0.50 -5.0	56.00	46.00			
5.0 -30.0	60.00	50.00			

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

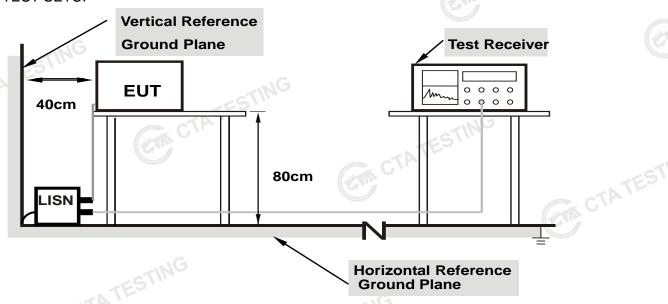
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz
CTA TESTING	= CTATESTING



#### 3.1.2 TEST PROCEDURE

- a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN is at least 80 cm from the nearest part of EUT chassis.
- CTATESTING e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 3.1.3 TEST SETUP



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

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

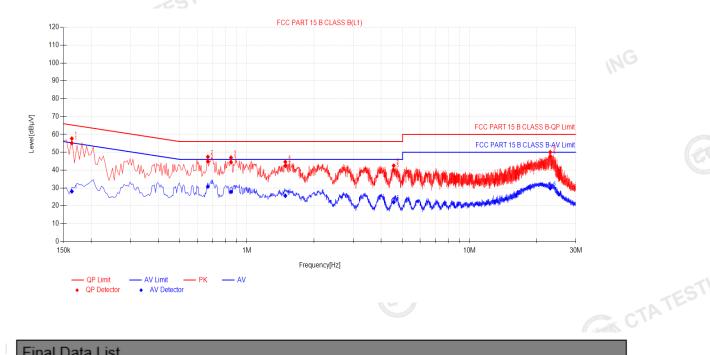
#### 3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was CTATESTING tested and used to collect the included data.



#### 3.1.5 TEST RESULT

3.1.5 TEST RESUL	_T	( sells			61
Temperature:	25.5(C)	Relative Humidity:	43%RH	C	TATES
Test Voltage:	AC 120V/60Hz	Phase:	L	To a large de la l	
Test Mode:	Mode 13				



Final	Data Lis	t									
NO.	Freq. [MHz]	Factor (dB)	QP Reading(dB,	QP Value IdBUVI	QP Limit IdBUSQ	QP Margin [dB]	AV Reading IdBuVJ	AV Value IdBUVJ	AV Limit IdBUSQ	AV Margin (dB)	Verdict
1	0.1635	10.50	44.61	55.11	65.28	10.17	17.58	28.08	55.28	27.20	PA88
2	0.6675	10.50	34.35	44.85	56.00	11.15	20.24	30.74	46.00	15.26	PASS
3	0.8475	10.50	33.95	44.45	56.00	11.55	17.34	27.84	46.00	18.16	PASS
4	1.4865	10.50	31.97	42.47	56.00	13.53	15.12	25.62	46.00	20.38	PASS
5	4.56	10.50	29.51	40.01	56.00	15.99	11.55	22.05	46.00	23.95	PASS
6	23.019	10.50	37.06	47.56	60.00	12.44	19.35	29.85	50.00	20.15	PASS

Note:1).QP Value ( $dB\mu V$ )= QP Reading ( $dB\mu V$ )+ Factor (dB)

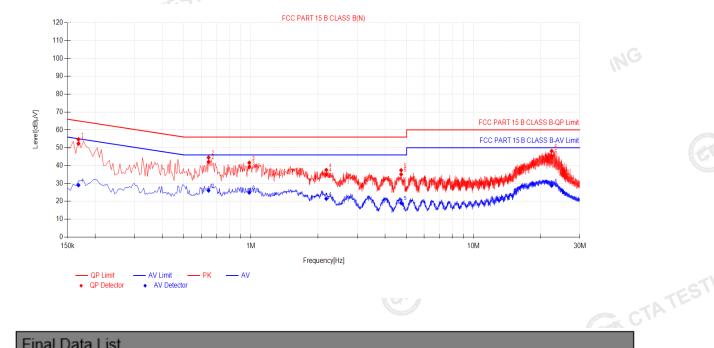
- 2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
- 3).  $QPMargin(dB) = QP Limit (dB\mu V) QP Value (dB\mu V)$
- (dBµ 4).  $AVMargin(dB) = AV Limit (dB\mu V) - AV Value (dB\mu V)$



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					-61
Temperature:	26.2(C)	Relative Humidity:	54%RH	C	TATES
Test Voltage:	AC 120V/60Hz	Phase:	N	2117	
Test Mode:	Mode 13				

Report No.: CTA231114012W02



Final	l Data Lis	t									
NO.	Freq. [MHz]	Factor (dB)	QP Reading(dB,	QP Value IdBUVJ	QP Limit IdBUVJ	QP Margin [dB]	AV Reading IdBubQ	AV Value IdBUVQ	AV Limit IdBUSQ	AV Margin (dB)	Verdict
1	0.168	10.50	41.81	52.31	65.06	12.75	18.57	29.07	55.06	25.99	PASS
2	0.645	10.50	31.63	42.13	56.00	13.87	15.57	26.07	46.00	19.93	PASS
3	0.9825	10.50	28.68	39.18	56.00	16.82	14.43	24.93	46.00	21.07	PA88
4	2.1795	10.50	24.65	35.15	56.00	20.85	10.97	21.47	46.00	24.53	PASS
5	4.7265	10.50	24.58	35.08	56.00	20.92	8.58	19.08	46.00	26.92	PA88
6	22.407	10.50	34.89	45.39	60.00	14.61	18.34	28.84	50.00	21.16	PA88

Note:1).QP Value ( $dB\mu V$ )= QP Reading ( $dB\mu V$ )+ Factor (dB)

- 2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
- 3). QPMargin(dB) = QP Limit (dB $\mu$ V) QP Value (dB $\mu$ V)
- 4). AVMargin(dB) = AV Limit (dBμV) AV Value (dBμV)



#### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205 (a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(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

#### LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

(dBuV/n		
PEAK	AVERAGE	TESI
74	54	CIL
		A STATE OF THE STA
	PEAK 74	PEAK AVERAGE

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41	CTING		
CTATI		TATESTING	TATESTING
	CV.		TATES

## For Radiated Emission

Spectrum Peremeter	Cotting
Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AV
Start Frequency	9 KHz/150KHz(Peak/QP/AV)
Stop Frequency	150KHz/30MHz(Peak/QP/AV)
C. M. C.	200Hz (From 9kHz to 0.15MHz)/
B / VB (emission in restricted	9KHz (From 0.15MHz to 30MHz);
band)	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz)

Spectrum Parameter	Setting			
Attenuation	Auto			
Detector	Peak/QP			
Start Frequency	30 MHz(Peak/QP)			
Stop Frequency	1000 MHz (Peak/QP)			
RB / VB (emission in restricted	120 KHz / 300 KHz			
band)	120 KHZ / 300 KHZ			

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	1 MHz / 3 MHz(Peak)
band)	1 MHz/1/T MHz(AVG)

## For Restricted band

Spectrum Parameter	Setting	
Detector	Peak/AV	
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz	
Start/Stop Frequency	Upper Band Edge: 2476 to 2500 MHz	
RB / VB	1 MHz / 3 MHz(Peak)	
KB/VB	1 MHz/1/T MHz(AVG)	
	CTATI	
,G		

Receiver Pa	arameter	Setting	
Attenua	ation	Auto	(a) (a)
Start ~ Stop I	Frequency	9kHz~90kHz / RB 200Hz for PK & AV	CIA
Start ~ Stop	Frequency	90kHz~110kHz / RB 200Hz for QP	0.500
Start ~ Stop	Frequency	110kHz~490kHz / RB 200Hz for PK & AV	
Start ~ Stop	requency	490kHz~30MHz / RB 9kHz for QP	
Start ~ Stop	Frequency	30MHz~1000MHz / RB 120kHz for QP	

#### 3.2.2 TEST PROCEDURE

- a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported. CTATESTING

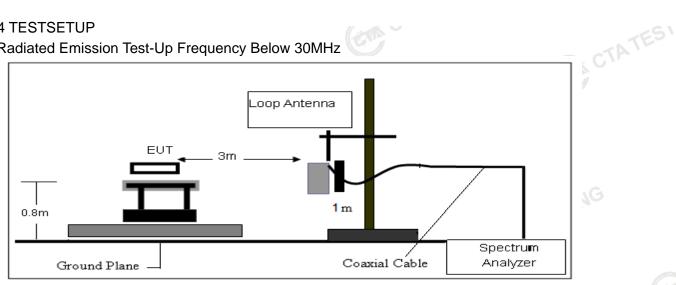
## 3.2.3 DEVIATION FROM TEST STANDARD

No deviation.

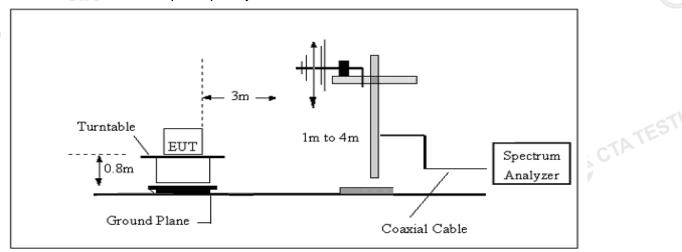


#### 3.2.4 TESTSETUP

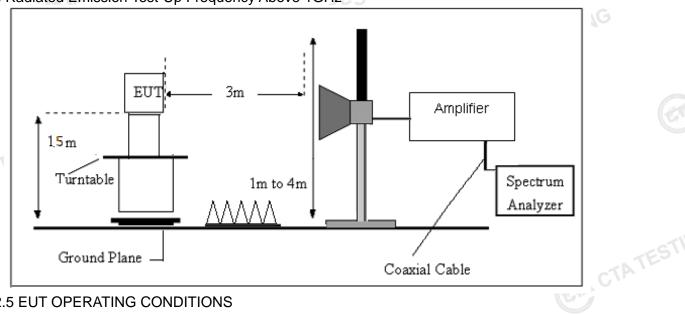
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



## (C) Radiated Emission Test-Up Frequency Above 1GHz



#### 3.2.5 EUT OPERATING CONDITIONS

of this Please refer to section 3.1.4 of this report.



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#### 3.2.6 FIELD STRENGTH CALCULATION

the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CI - AG

FS = RA + AF + CL - AG

Where

FS = Field Strength

FS = Field Strength CL = Cable Attenuatio RA = Reading Amplitu AG = Amplifier Gain		ble Loss)				
AF = Antenna Factor For example			CTA			ATESTING
Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1
Factor=AF+CL-AG	GW C	TATESTIN	(G	- CITA	TESTING	

#### 3.2.7 TEST RESULTS

#### (9KHz-30MHz)

3.2.7 TEST RES	ULTS	(ETA)		
(9KHz-30MHz)				
Temperature:	23.1(C)	Relative Humidity:	60%RH	
Test Voltage:	DC 3.8V	Test Mode:	TX Mode	
	TEST		_	

Freq.	Reading	Limit	Margin	State	Toot Dooult
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F	Test Result
		(24)			PASS
				C	PASS

#### Note:

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

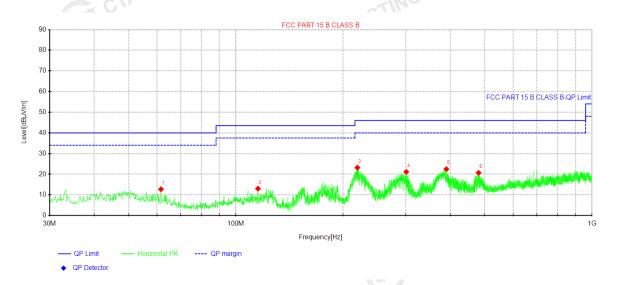
Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits (dBuv) + distance extrapolation factor. CTATESTING



#### (30MHz-1000MHz)

(30MHz-1000MHz)		(EVA			TESI
Temperature:	23.1(C)	Relative Humidity:	60%RH	C	TAI
Test Voltage:	DC 3.8V	Phase:	Horizontal	The same of the sa	
Test Mode:	Mode 1/2/3/4/5/6/7/8 (Mode 8	worst mode)			



						25 11030			
Suspe	ected Data	List							
NO.	Freq.	Reading	Level	Factor	Limit	Margin	Height	Angle	Dolority
NO.	[MHz]	[dBµ∨]	[dBµ√/m]	[dB/m]	[dBµ√/m]	[dB]	[cm]	[°]	Polarity
1	61.6462	31.40	12.75	-18.65	40.00	27.25	100	108	Horizontal
2	115.36	32.65	13.03	-19.62	43.50	30.47	100	310	Horizontal
3	219.392	42.00	23.17	-18.83	46.00	22.83	100	172	Horizontal
4	300.993	38.46	21.13	-17.33	46.00	24.87	100	132	Horizontal
5	390.112	38.03	22.47	-15.56	46.00	23.53	100	350	Horizontal
6	480.443	35.25	20.68	-14.57	46.00	25.32	100	318	Horizontal
								CTF	11-
e:1).Le	evel (dBµ	V/m)= Read	ding (dBµ∖	/)+ Facto	or (dB/m)				

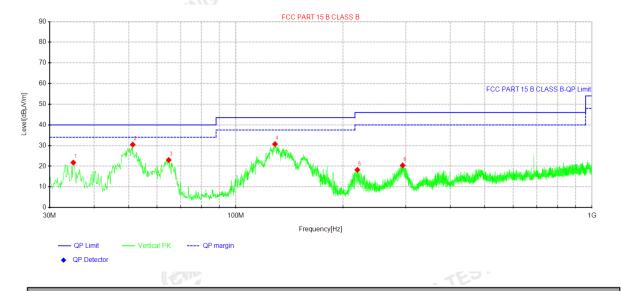
Note:1).Level ( $dB\mu V/m$ )= Reading ( $dB\mu V$ )+ Factor (dB/m)

- 2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) Pre Amplifier gain (dB)
- 3). Margin(dB) = Limit (dB $\mu$ V/m) Level (dB $\mu$ V/m)
- 4). All modes have been tested, only show the worst case. CTATESTING



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Temperature:	23.1(C)	Relative Humidity:	60%RH	TESI
Test Voltage:	DC 3.8V	Phase:	Vertical	YE.
Test Mode:	Mode 1/2/3/4/5/6/7/8 (Mode 8	worst mode)		



Susp	Suspected Data List										
NO.	Freq.	Reading	Level	Factor	Limit	Margin	Height	Angle	Polarity		
NO.	[MHz]	[dBµ∨]	[dBµ√/m]	[dB/m]	[dBµ√/m]	[dB]	[cm]	[°]	Polarity		
1	34.9712	39.62	21.77	-17.85	40.00	18.23	100	51	Vertical		
2	51.34	46.79	30.44	-16.35	40.00	9.56	100	58	Vertical		
3	64.7988	42.50	23.01	-19.49	40.00	16.99	100	130	Vertical		
4	128.818	51.92	30.72	-21.20	43.50	12.78	100	360	Vertical		
5	219.392	37.07	18.24	-18.83	46.00	27.76	100	246	Vertical		
6	293.961	37.84	20.41	-17.43	46.00	25.59	100	262	Vertical		

Note:1).Level ( $dB\mu V/m$ )= Reading ( $dB\mu V$ )+ Factor (dB/m)

- 2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) Pre Amplifier gain (dB)

  3). Margin(dB) = Limit (dBµV/m) Level (dBµV/m)

  4). All modes have been tested, only show the worst case.



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(1GHz~25GHz) Spurious emission Requirements

(1GHz	z~25GHz)	Spurious	emissio	on Requir	ements					
Frequency	Meter Reading	Amplifier	Loss	Antenna Factor	Corrected Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Common
				Low Ch	annel (8DPSK/	(2402 MHz)				
3264.64	61.06	44.70	6.70	28.20	-9.80	51.26	74.00	-22.74	PK	Vertical
3264.64	51.43	44.70	6.70	28.20	-9.80	41.63	54.00	-12.37	AV	Vertical
3264.66	61.72	44.70	6.70	28.20	-9.80	51.92	74.00	-22.08	PK	Horizontal
3264.66	50.00	44.70	6.70	28.20	-9.80	40.20	54.00	-13.80	AV	Horizontal
4804.57	59.26	44.20	9.04	31.60	-3.56	55.70	74.00	-18.30	PK	Vertical
4804.57	49.34	44.20	9.04	31.60	-3.56	45.78	54.00	-8.22	AV C	Vertical
4804.50	59.29	44.20	9.04	31.60	-3.56	55.73	74.00	-18.27	PK	Horizontal
4804.50	50.51	44.20	9.04	31.60	-3.56	46.95	54.00	-7.05	AV	Horizontal
5359.74	49.35	44.20	9.86	32.00	-2.34	47.01	74.00	-26.99	PK	Vertical
5359.74	40.33	44.20	9.86	32.00	-2.34	37.98	54.00	-16.02	AV	Vertical
5359.59	47.57	44.20	9.86	32.00	-2.34	45.23	74.00	-28.77	PK	Horizontal
5359.59	39.02	44.20	9.86	32.00	-2.34	36.68	54.00	-17.32	AV	Horizontal
7205.81	54.91	43.50	11.40	35.50	3.40	58.31	74.00	-15.69	PK	Vertical
7205.81	44.51	43.50	11.40	35.50	3.40	47.91	54.00	-6.09	AV	Vertical
7205.66	54.24	43.50	11.40	35.50	3.40	57.64	74.00	-16.36	PK	Horizontal
7205.66	43.82	43.50	11.40	35.50	3.40	47.22	54.00	-6.78	AV	Horizontal
7				Middle C	hannel (8DPSk	(/2441 MHz)		JAIG		
3264.62	62.30	44.70	6.70	28.20	-9.80	52.50	74.00	-21.50	PK	Vertical
3264.62	50.21	44.70	6.70	28.20	-9.80	40.41	54.00	-13.59	AV	Vertical
3264.56	61.83	44.70	6.70	28.20	-9.80	52.03	74.00	-21.97	PK	Horizontal
3264.56	50.65	44.70	6.70	28.20	-9.80	40.85	54.00	-13.15	AV	Horizontal
4882.52	59.42	44.20	9.04	31.60	-3.56	55.86	74.00	-18.14	PK	Vertical
4882.52	49.77	44.20	9.04	31.60	-3.56	46.21	54.00	-7.79	AV	Vertical
4882.56	59.06	44.20	9.04	31.60	-3.56	55.50	74.00	-18.50	PK	Horizontal
4882.56	49.33	44.20	9.04	31.60	-3.56	45.77	54.00	-8.23	AV	Horizontal
5359.59	48.08	44.20	9.86	32.00	-2.34	45.74	74.00	-28.26	PK	Vertical
5359.59	40.39	44.20	9.86	32.00	-2.34	38.04	54.00	-15.96	AV	Vertical
5359.64	47.82	44.20	9.86	32.00	-2.34	45.48	74.00	-28.52	PK	Horizontal
5359.64	38.04	44.20	9.86	32.00	-2.34	35.69	54.00	-18.31	AV	Horizontal
7323.86	54.44	43.50	11.40	35.50	3.40	57.84	74.00	-16.16	PK	Vertical
7323.86	44.63	43.50	11.40	35.50	3.40	48.03	54.00	-5.97	AV	Vertical
7323.84	54.76	43.50	11.40	35.50	3.40	58.16	74.00	-15.84	PK	Horizontal
7323.84	44.31	43.50	11.40	35.50	3.40	47.71	54.00	-6.29	AV	Horizontal



				High Chan	nel (8DPSK	/2480 MHz)				
3264.66	60.84	44.70	6.70	28.20	-9.80	51.04	74.00	-22.96	PK	Vertical
3264.81	51.81	44.70	6.70	28.20	-9.80	42.01	54.00	-11.99	AV	Vertical
3264.70	61.65	44.70	6.70	28.20	-9.80	51.85	74.00	-22.15	PK	Horizontal
3264.72	50.46	44.70	6.70	28.20	-9.80	40.66	54.00	-13.34	AV	Horizontal
4960.54	58.54	44.20	9.04	31.60	-3.56	54.98	74.00	-19.02	PK	Vertical
4960.29	50.26	44.20	9.04	31.60	-3.56	46.70	54.00	-7.30	AV	Vertical
4960.39	58.76	44.20	9.04	31.60	-3.56	55.20	74.00	-18.80	PK	Horizontal
4960.36	50.06	44.20	9.04	31.60	-3.56	46.50	54.00	-7.50	AV	Horizontal
5359.68	49.16	44.20	9.86	32.00	-2.34	46.82	74.00	-27.18	PK	Vertical
5359.73	39.04	44.20	9.86	32.00	-2.34	36.70	54.00	-17.30	AV	Vertical
5359.75	47.87	44.20	9.86	32.00	-2.34	45.53	74.00	-28.47	PK	Horizontal
5359.83	39.37	44.20	9.86	32.00	-2.34	37.02	54.00	-16.98	AV	Horizontal
7439.72	54.75	43.50	11.40	35.50	3.40	58.15	74.00	-15.85	PK	Vertical
7439.96	43.95	43.50	11.40	35.50	3.40	47.35	54.00	-6.65	AV	Vertical
7439.82	54.17	43.50	11.40	35.50	3.40	57.57	74.00	-16.43	PK	Horizontal
7439.84	44.00	43.50	11.40	35.50	3.40	47.40	54.00	-6.60	AV	Horizontal

#### Note:

- 1) Scan with GFSK, π/4-DQPSK, 8DPSK, the worst case is 8DPSK Mode.
- 2) Factor = Antenna Factor + Cable Loss Pre-amplifier. Emission Level = Reading + Factor
- 3) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



#### Restricted band Requirements

#### 8DPSK

tricted ba	and Req	uirement	:S								CTATES
					8DPSK		and the same of th			A CONTRACTOR OF THE PARTY OF TH	CTA
	Meter			Antenna	Orrected	Emission					
Frequency	Reading	Amplifier	Loss	Factor	Factor	Level	Limits	Margin	Detector	Comment	
(MHz)	(dBµV)	(dB)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
2390.00	67.51	43.80	4.91	25.90	-12.99	54.52	74.00	-19.48	PK	Vertical	1
2390.00	53.25	43.80	4.91	25.90	-12.99	40.26	54.00	-13.74	AV	Vertical	1
2390.00	69.39	43.80	4.91	25.90	-12.99	56.40	74.00	-17.60	PK	Horizontal	1
2390.00	53.39	43.80	4.91	25.90	-12.99	40.40	54.00	-13.60	AV	Horizontal	
2483.50	70.21	43.80	5.12	25.90	-12.78	57.43	74.00	-16.57	PK	Vertical	1
2483.50	52.24	43.80	5.12	25.90	-12.78	39.46	54.00	-14.54	AV	Vertical	1
2483.50	69.15	43.80	5.12	25.90	-12.78	56.37	74.00	-17.63	PK	Horizontal	
2483.50	53.01	43.80	5.12	25.90	-12.78	40.23	54.00	-13.77	AV	Horizontal	

Note: GFSK, π/4-DQPSK, 8DPSK of the nohopping and hopping mode all have been test, the worst case is 8DPSK of the nohopping mode, this report only show the worst case.



#### 4. CONDUCTED SPURIOUS & BAND EDGE EMISSION

#### 4.1 LIMIT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### **4.2 TEST PROCEDURE**

on either an RF conducted or a radiated measurement. 4.2 TEST PROCEDURE					
Spectrum Parameter	Setting				
Detector	Peak				
Start/Stop Frequency	30 MHz to 10th carrier harmonic				
RB / VB (emission in restricted band)	100 KHz/300 KHz				
Trace-Mode:	Max hold				

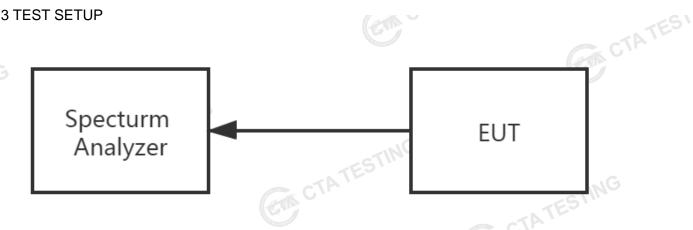
For Band edge

or Dana eage				
Spectrum Parameter	Setting			
Detector	Peak			
Start/Stap Eraguanay	Lower Band Edge: 2300 – 2407 MHz			
Start/Stop Frequency	Upper Band Edge: 2475 – 2500 MHz			
RB / VB (emission in restricted band)	100 KHz/300 KHz			
Trace-Mode:	Max hold			

For Hopping Band edge

Spectrum Parameter	Setting			
Detector	Peak			
Start/Stan Fraguency	Lower Band Edge: 2300- 2403 MHz			
Start/Stop Frequency	Upper Band Edge: 2479 – 2500 MHz			
RB / VB (emission in restricted band)	100 KHz/300 KHz			
Trace-Mode:	Max hold			
CTATESTING				

#### 4.3 TEST SETUP



The EUT is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Tune the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, the span is set to be greater than RBW.

#### 4.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

#### 4.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.

#### 5. NUMBER OF HOPPING CHANNEL

#### 5.1 LIMIT

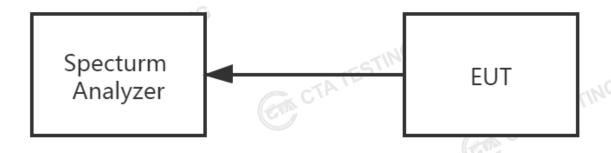
5. NUMBER OF HO	PPING CHANNEL				-ES1
5.1 LIMIT					TATL
	FCC Pa	art 15.247,Subpa	rt C	H.E.A.	
Section	Test Item	Limit	FrequencyRange (MHz)	Result	
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS	

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating FrequencyRange
RB	300KHz
VB	300KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### **5.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 300KHz, VBW=300KHz, Sweep time = Auto.

#### 5.3 TEST SETUP



#### 5.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

#### 5.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.



#### AVERAGE TIME OF OCCUPANCY

#### 6.1 LIMIT

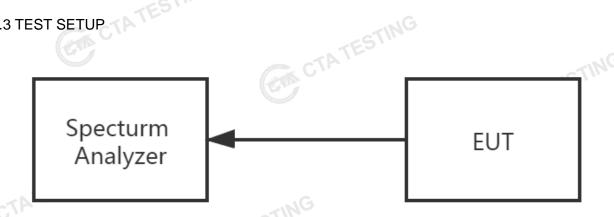
6. AVERAGE TIME OF OCCUPANCY						
6.1 LIMIT					CTATL	
	F	CC Part 15.247,Subpart	С	H.C.N.		
Section	Test Item	Limit	FrequencyRange (MHz)	Result		
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS		

#### **6.2 TEST PROCEDURE**

- a. The transmitter output (antenna port) was connected to the spectrum analyzer.

  b. Set RBW =1MHz/VBW =3MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to
- f Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i DH5 Packet permit maximum 1600/79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So the number of pulses in the observation period of 31.6 seconds is  $3.37 \times 31.6 = 106.6$ .
- j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So the number of pulses in the observation period of 31.6 seconds is  $5.06 \times 31.6 = 160$ .
- k DH1 Packet permit maximum 1600 / 79 / 2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So the number of pulses in the observation period of 31.6 seconds is  $10.12 \times 31.6 = 320$ .

#### 6.3 TEST SETUP



#### 6.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

#### 6.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1. Lite CTATESTING



#### 7. HOPPING CHANNEL SEPARATION MEASUREMEN

#### **7.1 LIMIT**

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 2400-2483.5 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.

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El Lawrence But I have	
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> 20 dB Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 7.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- C. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

#### 7.3 TEST SETUP



The EUT was programmed to be in continuously transmitting mode.

#### 7.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.



#### 8. BANDWIDTH TEST

#### 8.1 LIMIT

8. BANDWIDTH TES	ST			GATE C	TATES
	FCC	C Part15 15.247,Subp	art C		
Section	Test Item	Limit	FrequencyRange (MHz)	Result	
15.247 (a)(1)	Bandwidth	N/A	2400-2483.5	PASS	

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in GIN CTATEST the block diagram below.
- b. Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

#### 8.3 TEST SETUP



#### 8.4 EUT OPERATION CONDITIONS

CTATESTING Please refer to section 3.1.4 of this report.

#### 8.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.

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#### 9. OUTPUT POWER TEST

#### 9.1 LIMIT

WER TEST				-651
				TATE
	FCC Part 15.247,Subpart	С		
Test Item	G Limit	Frequency Range (MHz)	Result	
TEST	1 W or 0.125W	· Ca		
Output Power	if channel separation > 2/3 bandwidthprovided thesystems operatewith an output power no greater than 125 mW(20 97dBm)	2400-2483.5	PASS	
	Test Item Output	FCC Part 15.247,Subpart  Test Item  Limit  1 W or 0.125W  if channel separation > 2/3 bandwidthprovided thesystems operatewith an output power no greater	FCC Part 15.247,Subpart C  Test Item  Limit  1 W or 0.125W  if channel separation > 2/3 bandwidthprovided thesystems operatewith an output power no greater  Frequency Range (MHz)  2400-2483.5	FCC Part 15.247,Subpart C  Test Item Limit Frequency Range (MHz) Result  1 W or 0.125W  if channel separation > 2/3 bandwidthprovided thesystems operatewith an

#### 9.2 TEST PROCEDURE

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

- a) Use the following spectrum analyzer settings:
- 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel. CTA TESTING
- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW ≥ RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.
- b) Allow trace to stabilize.
- c) Use the marker-to-peak function to set the marker to the peak of the emission.
- d) The indicated level is the peak output power, after any corrections for external attenuators and
- e) A plot of the test results and setup description shall be included in the test report.
- NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DSS bandwidth and shall use a fast-responding diode detector.

#### 9.3 TEST SETUP



#### 9.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

### 9.5 TEST RESULTS

Note: The test data please refer to APPENDIX 1.

CTATESTING

## 10. ANTENNA REQUIREMENT

#### 10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

### 10.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.

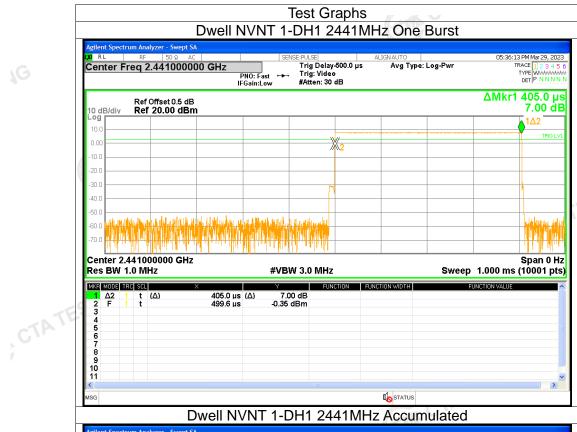
# Report No.: CTA231114012W02

## **APPENDIX 1-TEST DATA**

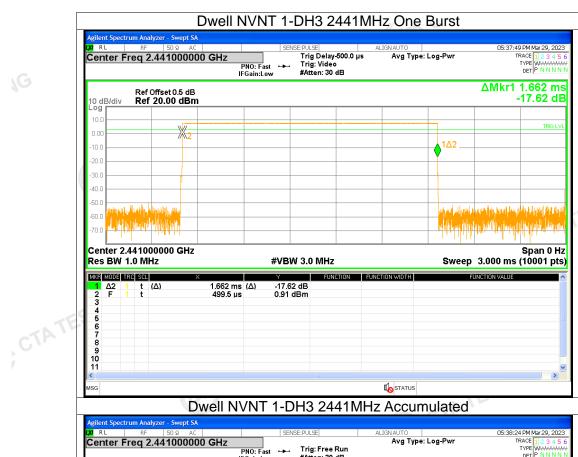
# 1. Dwell Time

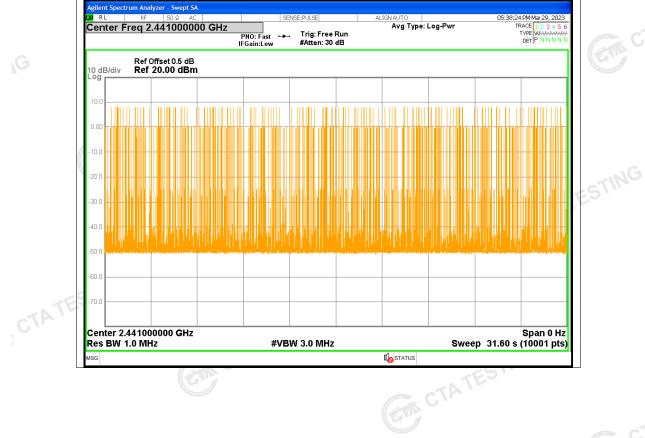
	NDIX 1-	TEST DATA						
Condition	Mode	Frequency	Pulse	Total Dwell	Burst	Period	Limit	Verdict
		(MHz)	Time (ms)	Time (ms)	Count	Time (ms)	(ms)	
NVNT	1-DH1	2441	0.405	127.575	315	31600	<=400	Pass
NVNT	1-DH3	2441	1.662	255.948	154	31600	<=400	Pass
NVNT	1-DH5	2441	2.909	299.627	103	31600	<=400	Pass
NVNT	2-DH1	2441	0.398	126.166	317	31600	<=400	Pass
NVNT	2-DH3	2441	1.65	280.5	170	31600	<=400	Pass
NVNT	2-DH5	2441	2.899	310.193	107	31600	<=400	Pass
NVNT	3-DH1	2441	0.396	124.74	315	31600	<=400	Pass
NVNT	3-DH3	2441	1.646	246.9	150	31600	<=400	Pass
NVNT	3-DH5	2441	2.898	321.678	111	31600	<=400	Pass



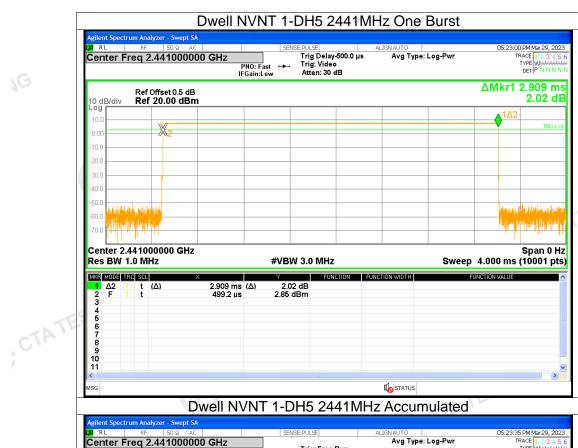


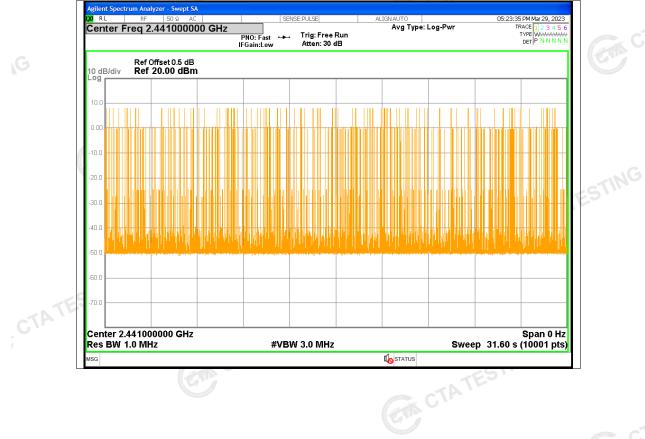




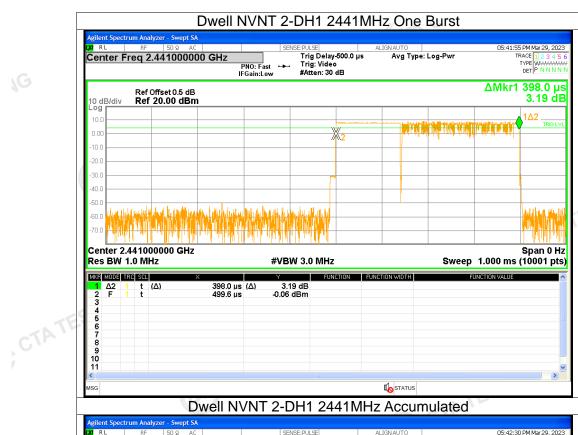


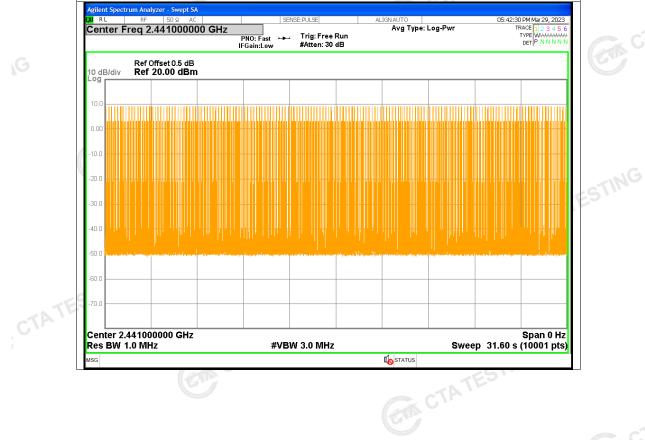




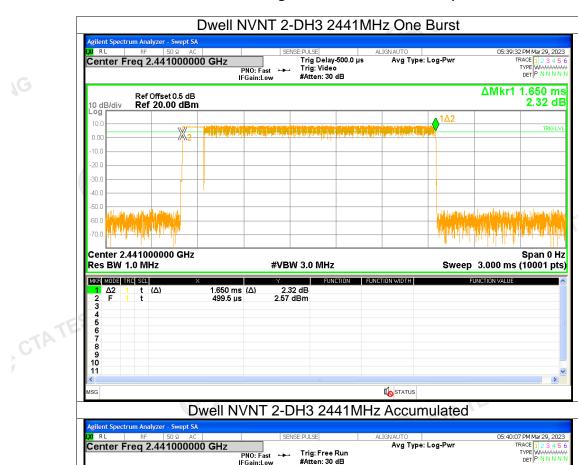


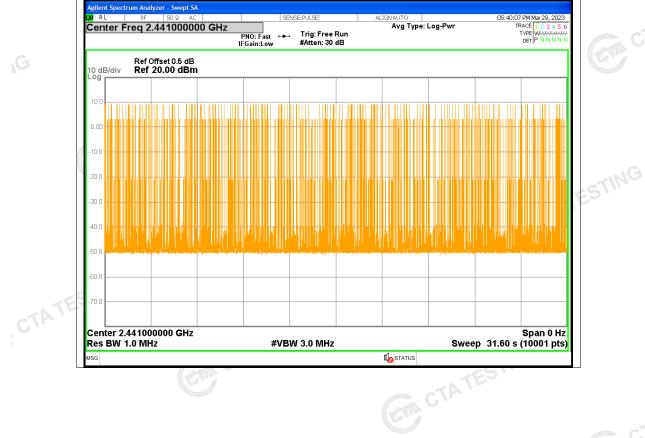




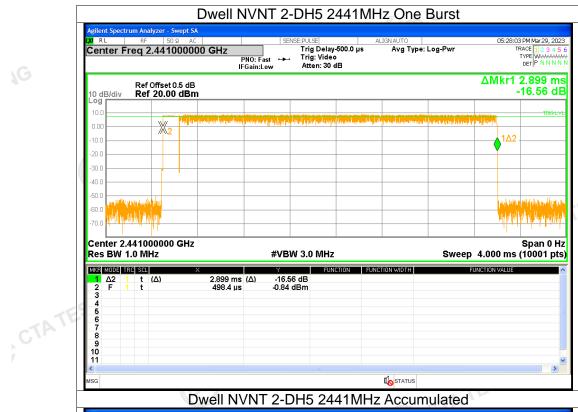


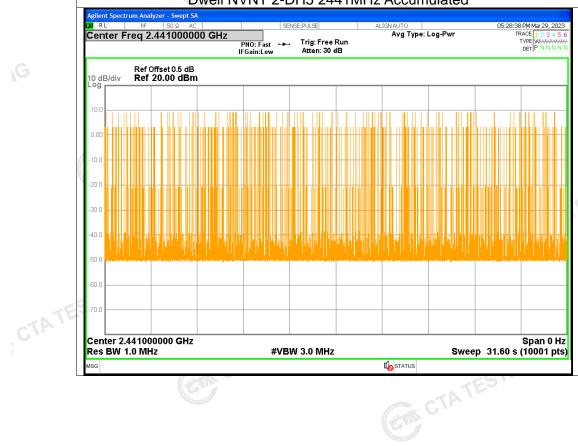




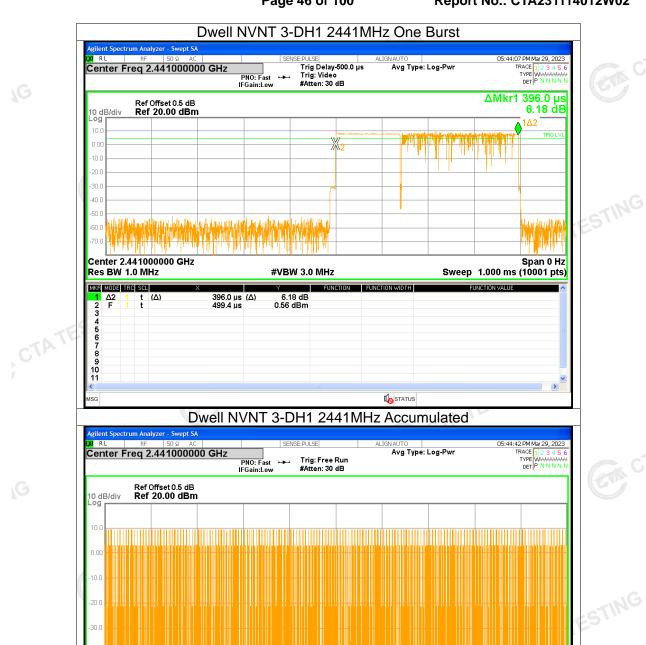












#VBW 3.0 MHz

40.0

Center 2.441000000 GHz

Res BW 1.0 MHz

CTATE

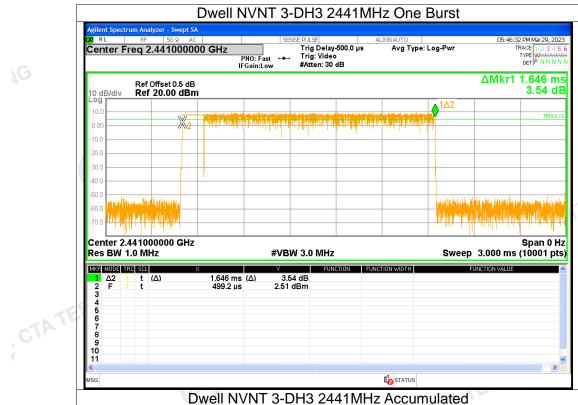


CTATES

STATUS

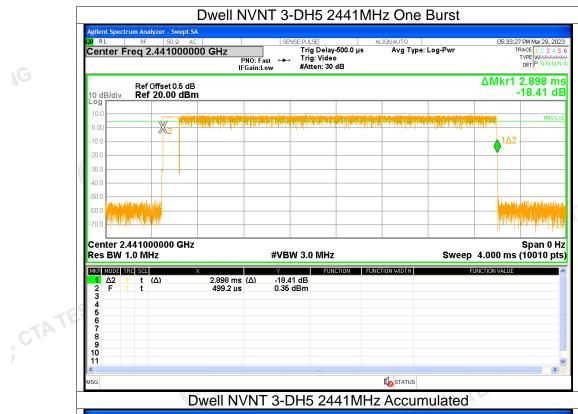
Span 0 Hz

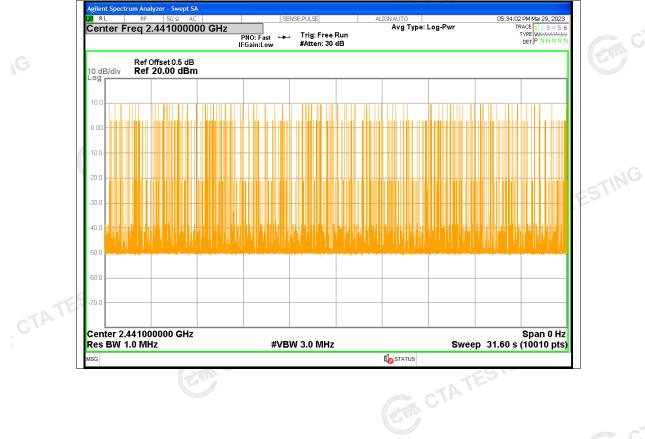
Sweep 31.60 s (10001 pts)











2. Maximum Average Conducted Output Power

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict	CTATES
NVNT	1-DH5	2402	5.63	<=20.97	Pass	
NVNT	1-DH5	2441	6.62	<=20.97	Pass	(3) wall
NVNT	1-DH5	2480	5.37	<=20.97	Pass	
NVNT	2-DH5	2402	4.88	<=20.97	Pass	
NVNT	2-DH5	2441	5.97	<=20.97	Pass	
NVNT	2-DH5	2480	4.92	<=20.97	Pass	
NVNT	3-DH5	2402	4.78	<=20.97	Pass	1 C1
NVNT	3-DH5	2441	6.01	<=20.97	Pass	TING
NVNT	3-DH5	2480	4.68	<=20.97	Pass	
				CVA C	TA	



