	TEST REPOR	Т		
FCC ID	2BEQO-BT103			
Test Report No:	TCT240612E028	$\left(\mathcal{C}^{\prime}\right)$		
Date of issue:	Jun. 20, 2024			
Testing laboratory :	SHENZHEN TONGCE TESTING	G LAB		
Testing location/ address:	2101 & 2201, Zhenchang Factor Subdistrict, Bao'an District, Sher People's Republic of China	-		
Applicant's name: :	SHENZHEN HAOCHENG TECH	INOLOGY CO., LTD		
Address:	501, Main Building, Qiaocheng N Gaofa Community, Shahe Stree city, 518000 China	•		
Manufacturer's name :	SHENZHEN HAOCHENG TECH	INOLOGY CO., LTD		
Address:	501, Main Building, Qiaocheng No.1 Plaza, No.2 shenyun Road, Gaofa Community, Shahe Street, Nanshan District, Shenzhen city, 518000 China			
Standard(s):	FCC CFR Title 47 Part 15 Subpa FCC KDB 558074 D01 15.247 M ANSI C63.10:2013		2	
Product Name::	SmartWatch			
Trade Mark:	N/A			
Model/Type reference :	BT103	(C)	(3)	
Rating(s):	Rechargeable Li-ion Battery DC	3.7V		
Date of receipt of test item	Jun. 12, 2024			
Date (s) of performance of test:	Jun. 12, 2024 ~ Jun. 20, 2024			
Tested by (+signature) :	Onnado YE	Onnado JANGCED		
Check by (+signature) :	Beryl ZHAO	RoyCom TCT	STING	

TONGCE TESTING LAB. This document may be altered or revised by SHENZHEN TONGCE TESTING LAB personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

Table of Contents

TCT通测检测 TESTING CENTRE TECHNOLOGY

1.	General Product Information	
	1.1. EUT description	3
	1.2. Model(s) list	3
	1.3. Operation Frequency	3
2.	Test Result Summary	1
3.	General Information	
	3.1. Test environment and mode	5
	3.2. Description of Support Units	5
4.	Facilities and Accreditations	3
	4.1. Facilities	6
	4.2. Location	6
	4.3. Measurement Uncertainty	6
5.	Test Results and Measurement Data	7
	5.1. Antenna requirement	7
	5.2. Conducted Emission	
	5.3. Conducted Output Power1	2
	5.4. Emission Bandwidth1	
	5.5. Power Spectral Density1	4
	5.6. Conducted Band Edge and Spurious Emission Measurement1	5
	5.7. Radiated Spurious Emission Measurement1	7
A	ppendix A: Test Result of Conducted Test	
A	ppendix B: Photographs of Test Setup	
-	ppendix C: Photographs of EUT	
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1. General Product Information

1.1. EUT description

Product Name:	SmartWatch		
Model/Type reference:	BT103		
Sample Number	TCT240612E027-0101		
Bluetooth Version:	V5.2 (This report is for BLE)		
Operation Frequency:	2402MHz~2480MHz		
Channel Separation:	2MHz		(\mathbf{c})
Data Rate:	LE 1M PHY, LE 2M PHY		
Number of Channel:	40		
Modulation Type:	GFSK		
Antenna Type:	Internal Antenna		
Antenna Gain:	-8.15dBi		
Rating(s):	Rechargeable Li-ion Battery DC	3.7V	

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

1.3. Operation Frequency

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz
Remark:	Channel 0, 1	9 & 39 ha	ave been tes	sted.	2		C

Report No.: TCT240612E028



2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3)	PASS
6dB Emission Bandwidth	§15.247 (a)(2)	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	§15.247(d)	PASS
Spurious Emission	§15.205/§15.209	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

Page 4 of 56

3. General Information

3.1. Test environment and mode

Conducted Emission	Radiated Emission
22.8 °C	24.8 °C
49 % RH	51 % RH
1010 mbar	1010 mbar
i i	
0x39	
	s transmitting by select /ith Fully-charged battery.
	22.8 °C 49 % RH 1010 mbar Bluetooth RF Test Tool (Rtl Version :5.3.1.80 RTLBTAF

above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case (Z axis) are shown in Test Results of the following pages.

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	EP-TA200	R37R55T6KL2SE3		SAMSUNG

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

• FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC Registration No.: 10668A-1
- SHENZHEN TONGCE TESTING LAB
- CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China TEL: +86-755-27673339

4.3. Measurement Uncertainty

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

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB



Test Results and Measurement Data 5.

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5.1. Antenna requirement

Standard requirement: FCC Part15 C Section 15.203 /247(c) 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi. **E.U.T Antenna:** The Bluetooth antenna is internal antenna which permanently attached, and the best case gain of the antenna is -8.15dBi. ntenna

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5.2. Conducted Emission

5.2.1. Test Specification

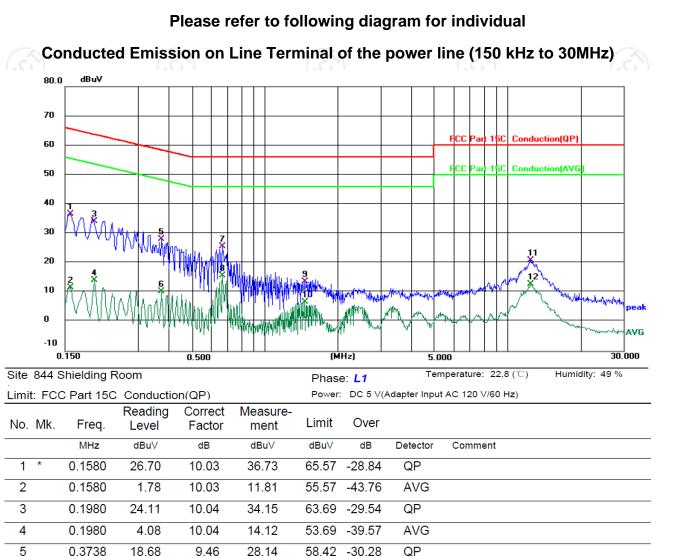
Frequency Range: 150 kHz to 30 MHz Receiver setup: RBW=9 kHz, VBW=30 kHz, Sweep time=auto Limits: Frequency range Limit (dBuV) (MHz) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: EUT Equipment Under Test Limit Charging + Transmitting Mode Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a 1 impedance stabilization network (L.I.S.N.). T provides a 500hm/50uH coupling impedance for measuring equipment. 2. The peripheral devices are also connected to the movement.	Test Requirement:	FCC Part15 C Section	15.207			
Receiver setup: RBW=9 kHz, VBW=30 kHz, Sweep time=auto Limits: Frequency range Limit (dBuV) (MHz) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: EU.T payment Under Test Limits: Formark EU.T payment Under Test Lib: Lib: Unit memory and the end to the maxim end to the end to the maxim end to the end	Test Method:	ANSI C63.10:2013				
Limits: Frequency range (MHz) Limit (dBuV) (Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Colspan="2"Colspan="2	Frequency Range:	150 kHz to 30 MHz				
Limits: Image: Construct of the second s	Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto				
Limits: 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image:		Frequency range	Limit (dBuV)		
0.5-5 56 46 5-30 60 50 Reference Plane Image: Setup: Image: Setup: Se		(MHz)	Quasi-peak	Average		
Test Setup: 5-30 60 50 Test Setup: E.U.T AC power Bocm LISN Filter AC power Filter AC power Filter AC power E.U.T Equipment Under Test LISN Line impedence Stabilization Network Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a l impedance stabilization network (L.I.S.N.). T provides a 500hm/50uH coupling impedance for measuring equipment. 2. The peripheral devices are also connected to the m power through a LISN that provides a 500hm/50 coupling impedance with 500hm termination. (Plear refer to the block diagram of the test setup a photographs). 3. Both sides of A.C. line are checked for maxim conducted interference. In order to find the maxim emission, the relative positions of equipment and al the interface cables must be changed according	Limits:	0.15-0.5	66 to 56*			
Test Setup: Reference Plane Image: Reference Plane Image: Reference Plane Image: Reference Plane Image: Reference Plane Reference Plane Image: Reference Plane Image: Reference Stabilization plane Image: Reference Stabilization plane Reference Stabilization Network EMI Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a limpedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the measuring equipment. 2. The peripheral devices are also connected to the measuring equipment. 3. Both sides of A.C. line are checked for maxim conducted interference. In order to find the maxim emission, the relative positions of equipment and al the interface cables must be changed according		0.5-5	56	46		
Test Setup: Image: Charge of the set of th		5-30	60	50		
Test Setup: Image: Charging + Transmitting Mode Test Mode: Charging + Transmitting Mode 1. The E.U.T is connected to an adapter through a l impedance stabilization network (L.I.S.N.). T provides a 500hm/50uH coupling impedance for measuring equipment. 2. The peripheral devices are also connected to the m power through a LISN that provides a 500hm/50uH coupling impedance for measuring equipment. 3. The peripheral devices are also connected to the m power through a LISN that provides a 500hm/50uH coupling impedance for measuring equipment. 3. Both sides of A.C. line are checked for maxim conducted interference. In order to find the maxim emission, the relative positions of equipment and al the interface cables must be changed according		Referenc	e Plane			
 Test Procedure: Test Procedure: Test Procedure: Test Procedure: The peripheral devices are also connected to the m power through a LISN that provides a 500hm/50 coupling impedance with 500hm termination. (Plear refer to the block diagram of the test setup a photographs). Both sides of A.C. line are checked for maxim emission, the relative positions of equipment and al the interface cables must be changed according 	Test Setup:	E.U.T AC powe		r —— AC power		
 impedance stabilization network (L.I.S.N.). T provides a 50ohm/50uH coupling impedance for measuring equipment. 2. The peripheral devices are also connected to the m power through a LISN that provides a 50ohm/50 coupling impedance with 50ohm termination. (Plearefer to the block diagram of the test setup a photographs). 3. Both sides of A.C. line are checked for maxim conducted interference. In order to find the maxim emission, the relative positions of equipment and al the interface cables must be changed according 		E.U.T: Equipment Under Test LISN: Line Impedence Stabilization N				
	Test Mode:	E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Na Test table height=0.8m Charging + Transmittir	etwork	0		
Test Result: PASS	Test Mode: Test Procedure:	 E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Na Test table height=0.8m Charging + Transmittin The E.U.T is connering impedance stabilizing provides a 500hm/5 measuring equipme The peripheral device power through a Line coupling impedance refer to the block photographs). Both sides of A.C. conducted interferent emission, the relative the interface cables 	etwork ng Mode cted to an adapte ation network 50uH coupling im nt. ces are also conne ISN that provides with 50ohm tern diagram of the line are checked nce. In order to fin e positions of equals s must be chang	(L.I.S.N.). This pedance for the ected to the main a 50ohm/50uh nination. (Please test setup and ed for maximum nd the maximum ipment and all co ged according to		

5.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)						
Equipment	Manufacturer	Model	Serial Number	Calibration Due		
EMI Test Receiver	R&S	ESCI3	100898	Jun. 29, 2024		
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	Jan. 31, 2025		
Line-5	тст	CE-05	/	Jul. 03, 2024		
EMI Test Software	Shurple Technology	EZ-EMC	1	1 60		



5.2.3. Test data



Note:

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9 10

11 12 0.3738

0.6700

0.6700

1.4578

1.4578

12.4019

12.4019

0.99

16.52

6.51

3.89

-3.11

10.28

2.12

9.46

9.19

9.19

9.96

9.96

10.64

10.64

10.45

25.71

15.70

13.85

6.85

20.92

12.76

Freq. = Emission frequency in MHz Reading level $(dB\mu V) = Receiver reading$ Corr. Factor (dB) = LISN factor + Cable loss Measurement $(dB\mu V) = Reading \, level \, (dB\mu V) + Corr. Factor (dB)$ Limit $(dB\mu V) = Limit$ stated in standard Margin (dB) = Measurement (dB μ V) – Limits (dB μ V) Q.P. =Quasi-Peak AVG =average * is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz

48.42 -37.97

56.00 -30.29

46.00 -30.30

56.00 -42.15

46.00 -39.15

60.00 -39.08

50.00 -37.24

AVG

QP

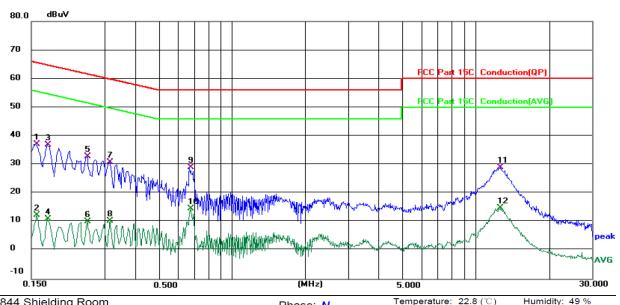
AVG

QP

AVG

QP

AVG



Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)

Site 844 Shielding Room Phase: N Limit: FCC Part 15C Conduction(QP) Power: DC 5 V(Adapter Input AC 120 V/60 Hz) Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment MHz dBuV dB dBuV dBuV dB Detector Comment 0.1580 27.21 37.22 65.57 -28.35 QP 10.01 1 2 0.1580 2.33 10.01 12.34 55.57 -43.23 AVG 3 0.1739 26.91 10.00 36.91 64.77 -27.86 QP 4 0.1739 0.97 10.00 10.97 54.77 -43.80 AVG 0.2540 QP 5 22.96 9.83 32.79 61.63 -28.84 0.2540 10.03 0.20 9.83 51.63 -41.60 AVG 6 7 0.3140 21.09 9.82 30.91 59.86 -28.95 QP 0.3140 0.52 9.82 10.34 49.86 -39.52 8 AVG 28.95 0.6780 56.00 -27.05 QP 9 19.80 9.15 0.6780 5.56 9.15 14.71 46.00 -31.29 AVG 10 QP 11 12.6660 18.34 10.63 28.97 60.00 -31.03 12 12.6660 4.29 10.63 14.92 50.00 -35.08 AVG

Note1:

Freq. = Emission frequency in MHz Reading level $(dB\mu V)$ = Receiver reading Corr. Factor (dB) = LISN factor + Cable loss Measurement $(dB\mu V)$ = Reading level $(dB\mu V)$ + Corr. Factor (dB)Limit $(dB\mu V)$ = Limit stated in standard Margin (dB) = Measurement $(dB\mu V)$ – Limits $(dB\mu V)$ Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Note2: Speed for 1M and 2M modulations of EUT have been tested, but the test data only show the worst case in this report, and we found the worst case is 2M speed modulation. Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Middle channel) was submitted only.



5.3. Conducted Output Power

5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)			
Test Method:	KDB 558074 D01 v05r02			
Limit:	30dBm			
Test Setup:				
Test Mode:	Refer to item 3.1			
Test Procedure:	 Set spectrum analyzer as following: a) Set the RBW ≥ DTS bandwidth. b) Set VBW ≥ 3 × RBW. c) Set span ≥ 3 x RBW d) Sweep time = auto couple. e) Detector = peak. f) Trace mode = max hold. g) Allow trace to fully stabilize. h) Use peak marker function to determine the peak amplitude level. 			
Test Result:	PASS			

5.3.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020B	MY50030427	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB	/	/
	$\left(\mathcal{O} \right)$	$\left(\mathcal{G} \right)$	$\langle \mathcal{O} \rangle$	

5.4. Emission Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB 558074 D01 v05r02
Limit:	>500kHz
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Refer to item 3.1
Test Procedure:	 Set to the maximum power setting and enable the EUT transmit continuously. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. Measure and record the results in the test report.
Test Result:	PASS

5.4.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020B	MY50030427	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB	<u> </u>	

5.5. Power Spectral Density

5.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074 D01 v05r02
Limit:	The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	
	Spectrum Analyzer EUT
Test Mode:	Refer to item 3.1
Test Procedure:	 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): 3 kHz ≤ RBW ≤ 100 kHz. Video bandwidth VBW ≥ 3 x RBW. In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW) Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level. Measure and record the results in the test report.
Test Result:	PASS

5.5.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum	Agilent	N9020B	MY50030427	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB	/	/
	ASCEILESI		/	1

5.6. Conducted Band Edge and Spurious Emission Measurement

5.6.1. Test Specification

TCT 通测检测 TESTING CENTRE TECHNOLOGY

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB 558074 D01 v05r02
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
Test Setup:	
	Spectrum Analyzer EUT
Test Mode:	Refer to item 3.1
Test Procedure:	 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the
	 maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d). 4. Measure and record the results in the test report. 5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Page 15 of 56



5.6.2. Test Instruments

-	Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spo An	ectrum alyzer	Agilent	N9020B	MY50030427	Jun. 28, 2024
	piner Box	Ascentest	AT890-RFB	/	1

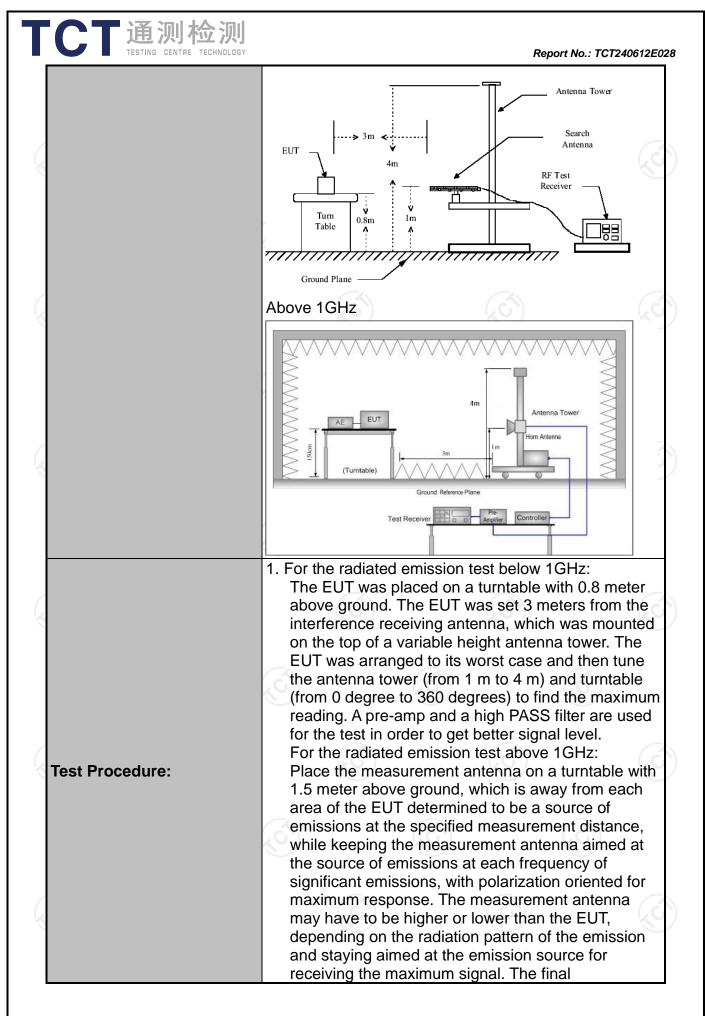
5.7. Radiated Spurious Emission Measurement

5.7.1. Test Specification

TCT 通测检测 TESTING CENTRE TECHNOLOGY

Test Requirement:	FCC Part15	C Sectior	15.209			No.
Test Method:	ANSI C63.10):2013				
Frequency Range:	9 kHz to 25 (GHz	Z			2
Measurement Distance:	3 m	X	9		R.)
Antenna Polarization:	Horizontal &	Vertical				
Operation mode:	Refer to item	n 3.1	((
	Frequency 9kHz-150kHz	Detector Quasi-peal		VBW 1kHz	Quasi	Remark i-peak Valu
Receiver Setup:	150kHz- 30MHz	Quasi-peal	9kHz	30kHz	Quasi	-peak Valu
	30MHz-1GHz	Quasi-peal Peak	K 120KHz 1MHz	300KHz 3MHz		i-peak Valu ak Value
	Above 1GHz	Peak	1MHz	10Hz		rage Value
	Frequen		Field Stro (microvolts	/meter)		asurement nce (meters
	0.009-0.4		2400/F(24000/F	,		300 30
	1.705-3	/	30	(XI 12)		30
	30-88		100		Ko	3
	88-216		150			3
Limit:	216-96	0	200			3
	Above 9	60	500			3
		((((°)		X
	Frequency		d Strength ovolts/meter)	Measure Distan (meter	ce	Detector
	Above 1CH	-	500	3		Average
	Above 1GHz	z	5000	3		Peak
	For radiated	emission	s below 30)MHz		
	Di	stance = 3m			Compute	
	t	\rightarrow		Pre -/	Amplifier	
Test setup:	0.8m	Turn table				
		Ground	1 Plane		teceiver	

Page 17 of 56

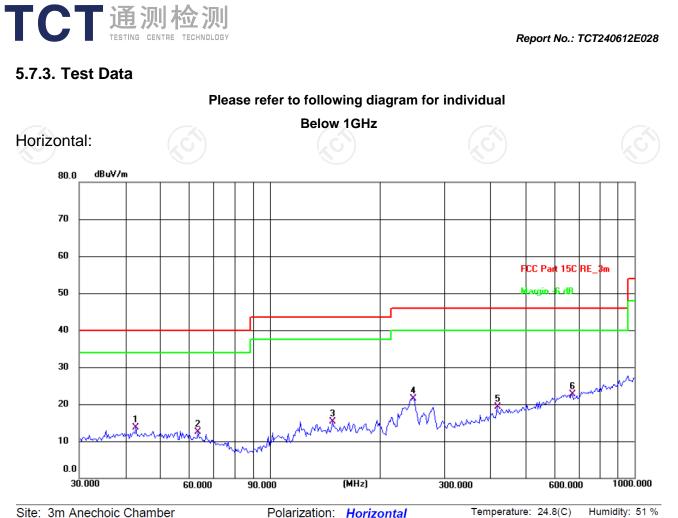


CT通测检测 TESTING CENTRE TECHNOLOGY	Report No.: TCT240612E0
	 measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. Use the following spectrum analyzer settings: Set RBW=120 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold; Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test mode:	Refer to section 3.1 for details
Test results:	PASS

5.7.2. Test Instruments

TCT 通测检测 TESTING CENTRE TECHNOLOGY

	Radiated Em	nission Test Site	e (966)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jun. 29, 2024
Spectrum Analyzer	R&S	FSQ40	200061	Jun. 29, 2024
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Jan. 31, 2025
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Jan. 31, 2025
Pre-amplifier	HP	8447D	2727A05017	Jun. 27, 2024
Loop antenna	Schwarzbeck	FMZB1519B	00191	Jul. 02, 2024
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 01, 2024
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 01, 2024
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 02, 2025
Antenna Mast	Keleto	RE-AM		
Coaxial cable	SKET	RC-18G-N-M	1	Jan. 31, 2025
Coaxial cable	SKET	RC_40G-K-M	1	Jan. 31, 2025
EMI Test Software	Shurple Technology	EZ-EMC		1

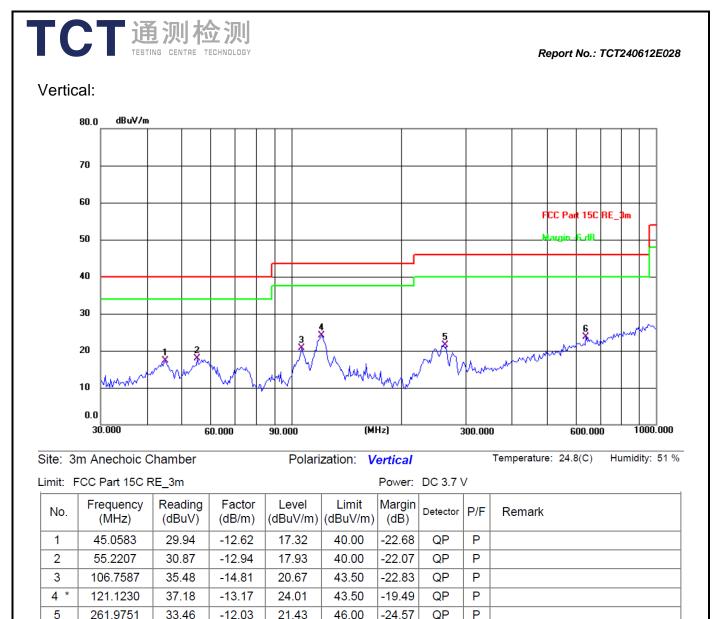


Site: 3m Anechoic Chamber

Polarization: Horizontal

Limit	t: F	CC Part 15C R	E_3m				Power:	DC 3.7 \	/	
N	0.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	P/F	Remark
1		42.8997	26.29	-12.53	13.76	40.00	-26.24	QP	Ρ	
2	2	63.5356	25.88	-13.44	12.44	40.00	-27.56	QP	Ρ	
3	3	148.4410	26.66	-11.31	15.35	43.50	-28.15	QP	Ρ	
4	ł	247.6818	34.13	-12.60	21.53	46.00	-24.47	QP	Ρ	
5	5	419.1081	27.18	-7.92	19.26	46.00	-26.74	QP	Ρ	
6	*	670.4892	26.14	-3.47	22.67	46.00	-23.33	QP	Ρ	

Page 21 of 56 Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com



Note: 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

46.00

 Speed for 1M and 2M modulations of EUT have been tested, but the test data only show the worst case in this report, and we found the worst case is 2M speed modulation. Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Middle channel) was submitted only.

-22.21

QP

Ρ

3. Freq. = Emission frequency in MHz

27.16

642.8612

6

- Measurement ($dB\mu V/m$) = Reading level ($dB\mu V$) + Corr. Factor (dB) Correction Factor= Antenna Factor + Cable loss – Pre-amplifier Limit ($dB\mu V/m$) = Limit stated in standard
 - Margin (dB) = Measurement (dB μ V/m) Limits (dB μ V/m)

-3.37

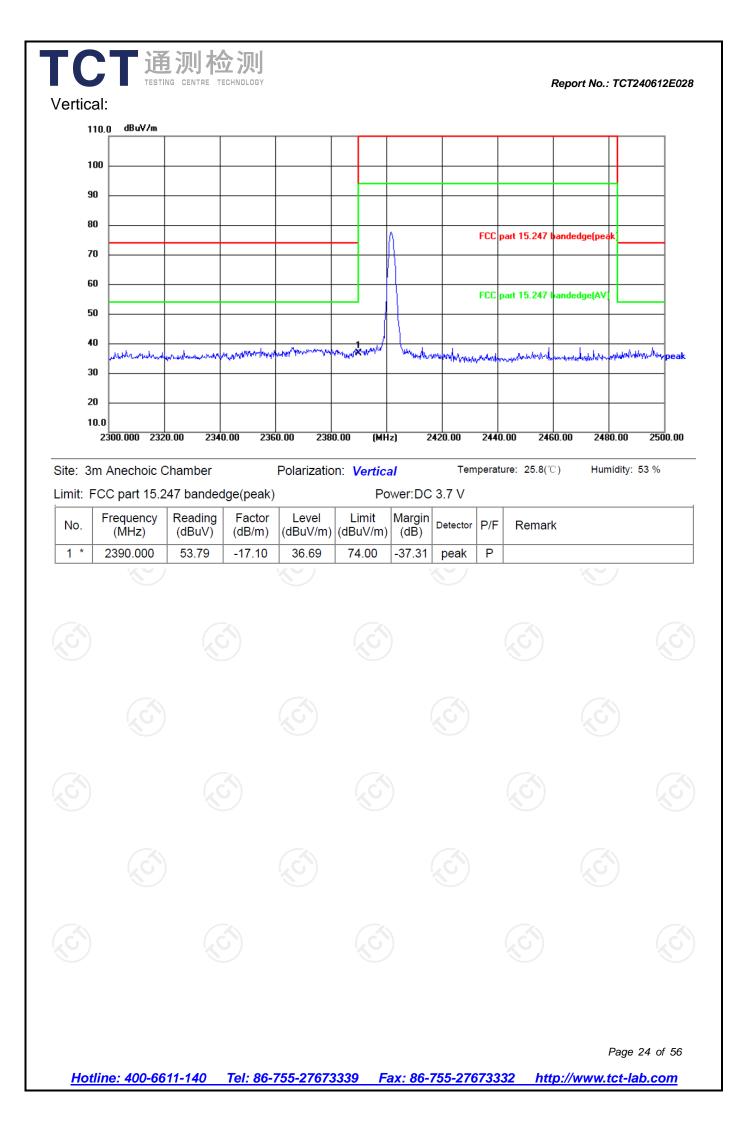
 * is meaning the worst frequency has been tested in the test frequency range

23.79

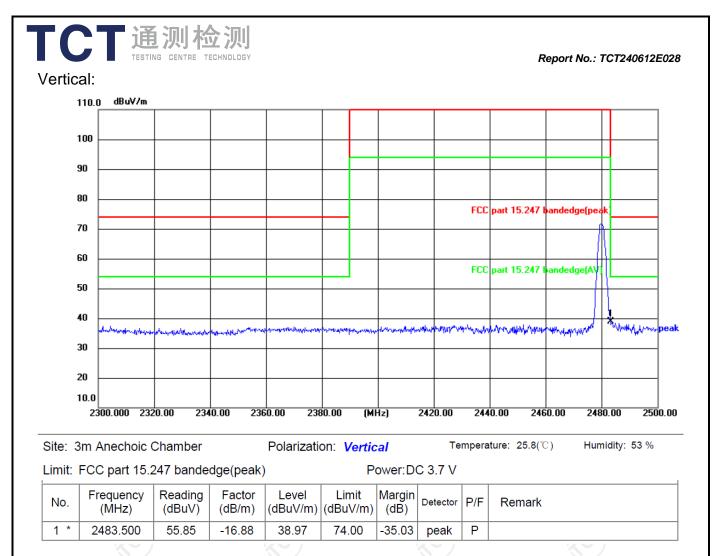
Page 22 of 56

	ntal:												
11	0.0 dBuV/m												
10	00												
90)												
80						٨			FCC	part 15.247	bandedge(pe	ak]	
70													
60									FCC	part 15.247	bandedge(AV		
50 40													
30	mondagene	www.www.wheelena	warden with the	atuan tenderandras	official starts	enter the sector	Multimet	handhadhad	w	14.	when a provident and the second	rendrandra	~
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20	1												_
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10 : 3r t: F).0 2300.000 23	Chamber		Polarizati	on: H	lorizon Pow nit Ma	tal er:DC		empera		°C) Hur		
10 : 3r	n Anechoic CC part 15 Frequency	Chamber 247 bande Reading	dge(peak	Polarizati	on: H	lorizon Pow hit Ma //m) (c	tal er:DC	т 3.7 V	empera	ature: 25.8('	°C) Hur		
10 : 3r t: F	n Anechoic CC part 15. Frequency (MHz)	Chamber 247 bande Reading (dBuV)	edge(peak Factor (dB/m)	Polarizati	on: H Lim (dBu\	lorizon Pow hit Ma //m) (c	tal er:DC argin dB)	To C 3.7 V Detector	empera	ature: 25.8('	°C) Hur		
10 : 3r t: F	n Anechoic CC part 15. Frequency (MHz)	Chamber 247 bande Reading (dBuV)	edge(peak Factor (dB/m)	Polarizati	on: H Lim (dBu\	lorizon Pow hit Ma //m) (c	tal er:DC argin dB)	To C 3.7 V Detector	empera	ature: 25.8('	°C) Hur		
10 : 3r t: F	n Anechoic CC part 15. Frequency (MHz)	Chamber 247 bande Reading (dBuV)	edge(peak Factor (dB/m)	Polarizati	on: H Lim (dBu\	lorizon Pow hit Ma //m) (c	tal er:DC argin dB)	To C 3.7 V Detector	empera	ature: 25.8('	°C) Hur		
10 : 3r t: F	n Anechoic CC part 15. Frequency (MHz)	Chamber 247 bande Reading (dBuV)	edge(peak Factor (dB/m)	Polarizati	on: H Lim (dBu\	lorizon Pow hit Ma //m) (c	tal er:DC argin dB)	To C 3.7 V Detector	empera	ature: 25.8('	°C) Hur		
10 : 3r t: F	n Anechoic CC part 15. Frequency (MHz)	Chamber 247 bande Reading (dBuV)	edge(peak Factor (dB/m)	Polarizati	on: H Lim (dBu\	lorizon Pow hit Ma //m) (c	tal er:DC argin dB)	To C 3.7 V Detector	empera	ature: 25.8('	°C) Hur		
10 3r t: F	n Anechoic CC part 15. Frequency (MHz)	Chamber 247 bande Reading (dBuV)	edge(peak Factor (dB/m)	Polarizati	on: H Lim (dBu\	lorizon Pow hit Ma //m) (c	tal er:DC argin dB)	To C 3.7 V Detector	empera	ature: 25.8('	°C) Hur		

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1	10.0 dBuV/m											
1	00											
	0											
	70							FCC	part 15.247	bandedge(p	eak]	
	io											
5	i0							FCC	part 15.247	bandedge(A		
4	10	www.www.welever	maharmahaham	nothing	marke	Marine Sector Marine Sector	obrana anti-	materia	a the of side on all when	hourstander	×	whatpor
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<u>.</u>	2300.000 232		40.00 23									
		Chamber		Polarizati			Te		40.00 246 ature: 25.8(%		480.00 umidity	
	2300.000 232 m Anechoic (Chamber		Polarizati	on: <i>Ho</i> Limit	Power:D	Te	empera				
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nit: 1 p.	2300.000 232 m Anechoic (FCC part 15.2 Frequency (MHz)	Chamber 247 bande Reading (dBuV)	dge(peak Factor (dB/m)	Polarizati) Level (dBuV/m)	on: H o Limit (dBuV/	t (dB)	Te C 3.7 V Detector	P/F	ature: 25.8(°			
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nit: 1 p.	2300.000 232 m Anechoic (FCC part 15.2 Frequency (MHz)	Chamber 247 bande Reading (dBuV)	dge(peak Factor (dB/m)	Polarizati) Level (dBuV/m)	on: H o Limit (dBuV/	t (dB)	Te C 3.7 V Detector	P/F	ature: 25.8(°			
it: I	2300.000 232 m Anechoic (FCC part 15.2 Frequency (MHz)	Chamber 247 bande Reading (dBuV)	dge(peak Factor (dB/m)	Polarizati) Level (dBuV/m)	on: H o Limit (dBuV/	t (dB)	Te C 3.7 V Detector	P/F	ature: 25.8(°			
it: I	2300.000 232 m Anechoic (FCC part 15.2 Frequency (MHz)	Chamber 247 bande Reading (dBuV)	dge(peak Factor (dB/m)	Polarizati) Level (dBuV/m)	on: H o Limit (dBuV/	t (dB)	Te C 3.7 V Detector	P/F	ature: 25.8(°			
nit: 1 p.	2300.000 232 m Anechoic (FCC part 15.2 Frequency (MHz)	Chamber 247 bande Reading (dBuV)	dge(peak Factor (dB/m)	Polarizati) Level (dBuV/m)	on: H o Limit (dBuV/	t (dB)	Te C 3.7 V Detector	P/F	ature: 25.8(°			
it: I	2300.000 232 m Anechoic (FCC part 15.2 Frequency (MHz)	Chamber 247 bande Reading (dBuV)	dge(peak Factor (dB/m)	Polarizati) Level (dBuV/m)	on: H o Limit (dBuV/	t (dB)	Te C 3.7 V Detector	P/F	ature: 25.8(°			



Note: Speed for 1M and 2M modulations of EUT have been tested, but the test data only show the worst case in this report, and we found the worst case is 2M speed modulation.



Margin

 $(d\bar{B})$

-8.60

-10.24

-8.08

-9.35

Margin

(dB)

-7.89

-9.39

-9.30

-9.95

Above 1GHz Low channel: 2402 MHz AV Correction **Emission Level** Peak Frequency Ant. Pol. Peak limit AV limit reading reading Factor Peak AV H/V (MHz) (dBµV/m) (dBµV/m) (dBµV) (dBuV) (dB/m) (dBµV/m) (dBµV/m) 45.40 4804 Н 44.74 0.66 74 54 ------Н 34.26 74 7206 ---9.50 43.76 ---54 Н ------------------___ 4804 V 45.26 0.66 45.92 74 --------54

9.50

Correction

Factor

(dB/m)

1.33

10.22

1.33

10.22

Middle channel: 2440 MHz

High channel: 2480 MHz

H/V

Н

Н

Н

V

V

V

Frequency Ant. Pol.

(MHz)

4960

7440

4960

7440

V

V

35.15

Peak

reading

(dBµV)

44.78

34.39

43.37

33.83

AV

reading

(dBµV)

7206

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maalo ona		/ 1011 12							
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Peak		Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
4880	Н	44.74		0.99	45.73		74	54	-8.27
7320	Н	34.92		9.87	44.79		74	54	-9.21
	Н			<u> </u>	/				
			K0						
4880	V	45.27		0.99	46.26	<u> </u>	74	54	-7.74
7320	V	34.53		9.87	44.40		74	54	-9.60
	V								

44.65

4-

Emission Level

AV

(dBµV/m)

·---

Peak

dBµV/m)

46.11

44.61

44.70

44.05

74

Peak limit

(dBµV/m)

74

74

74

74

54

AV limit

(dBµV/m)

54

54

54

54

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss - Pre-amplifier

2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)

3. The emission levels of other frequencies are very lower than the limit and not show in test report.

4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

5. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

6. Speed for 1M and 2M modulations of EUT have been tested, but the test data only show the worst case in this report, and we found the worst case is 2M speed modulation.

7. All the restriction bands are compliance with the limit of 15.209.

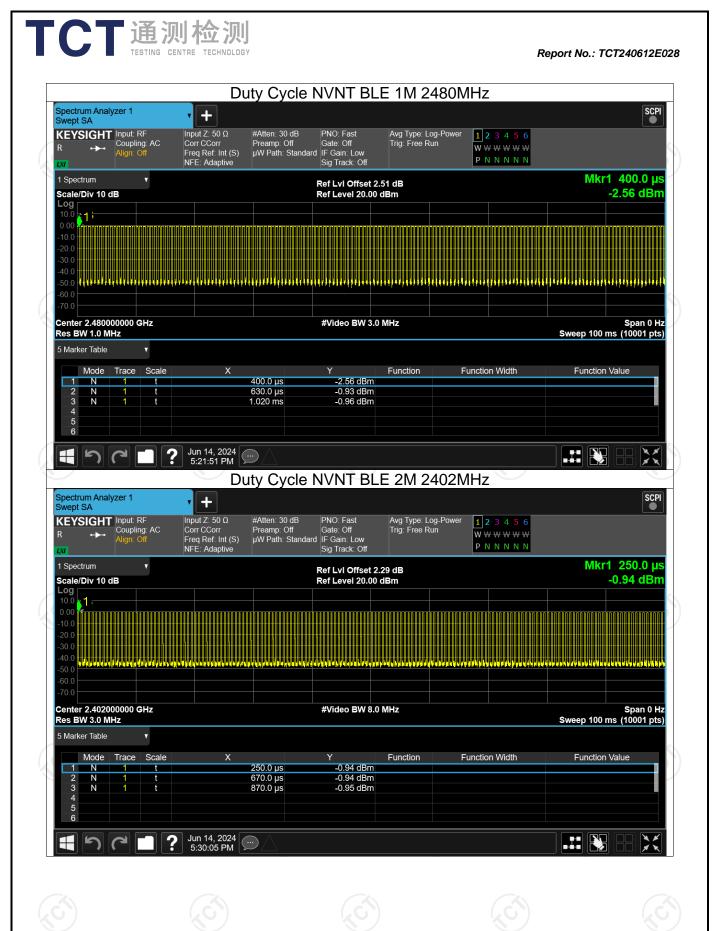


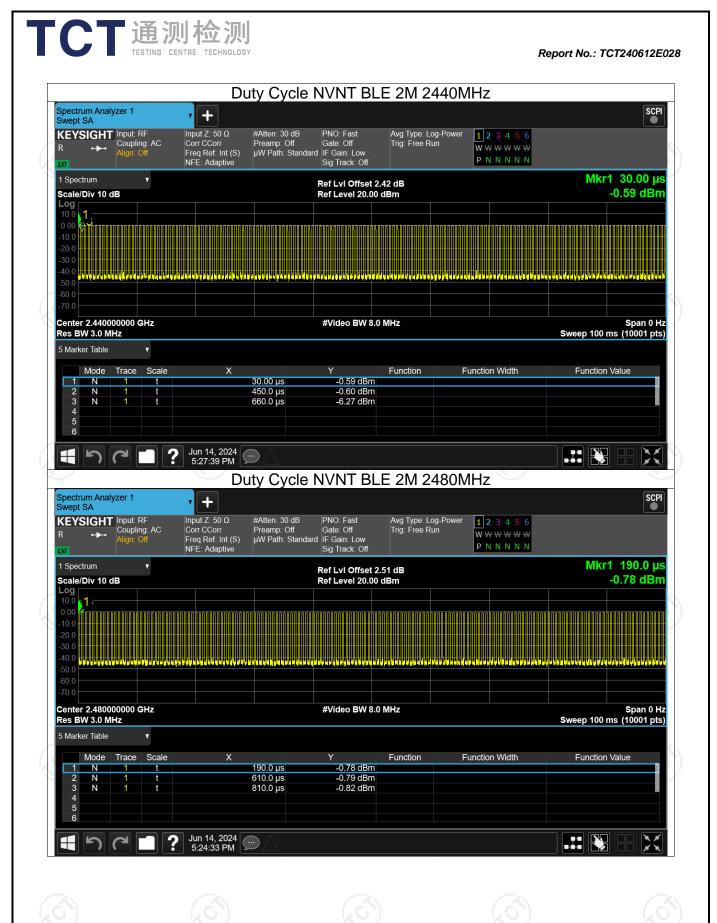
Appendix A: Test Result of Conducted Test

	(é		Duty Cycle		
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT NVNT NVNT NVNT NVNT NVNT	BLE 1M BLE 1M BLE 1M BLE 2M BLE 2M BLE 2M	2402 2440 2480 2402 2440 2440 2480	64.80 64.79 64.80 34.95 35.21 34.41	1.88 1.88 1.88 4.57 4.53 4.63	2.56 2.56 2.56 5 4.76 5
Hotline: 40	00- <u>6611-140</u>	Tel: 86-755-27673	339 Fax: 86-755-		e 28 of 56

Report No.: TCT240612E028 **Test Graphs** Duty Cycle NVNT BLE 1M 2402MHz Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Adaptive KEYSIGHT Input: RF R +++ Coupling: AC Avg Type: Log-Power Trig: Free Run #Atten: 30 dB PNO: Fast 1 2 3 4 5 6 Preamp: Off Gate: On μW Path: Standard IF Gain: Low Sig Track: Off ₩₩₩₩₩₩ R **...** PNNNN Mkr1 200.0 µs 1 Spectrum Ref LvI Offset 2.29 dB -10.59 dBm Scale/Div 10 dB Ref Level 20.00 dBm _00 0.00 Center 2.402000000 GHz Res BW 2.0 MHz Span 0 Hz Sweep 100 ms (10001 pts) #Video BW 6.0 MHz 5 Marker Table Mode Trace Scale Y Function Function Width Function Value х 200.0 µs -10.59 dBm 430.0 μs 820.0 μs -1.28 dBm -1.27 dBm Ν N t 4 5 6 Jun 14, 2024 5:17:23 PM ? \mathbf{X} C う Duty Cycle NVNT BLE 1M 2440MHz SCPI Spectrum Analyzer 1 + Swept SA KEYSIGHT Input: RF Input Z: 50 Ω #Atten: 30 dB PNO: Fast Avg Type: Log-Power 1 2 3 4 5 6 Corr CCorr Freq Ref: Int (S) NFE: Adaptive Preamp: Off Gate: Off µW Path: Standard IF Gain: Low Sig Track: Off Coupling: AC Trig: Free Run ----**w** ₩ ₩ ₩ ₩ ₩ PNNNNN Mkr1 450.0 µs 1 Spectrum ۷ Ref LvI Offset 2.42 dB Ref Level 20.00 dBm -0.84 dBm Scale/Div 10 dB _og 1-***** ▋<mark>╢╢╢╿╿╿</mark> Center 2.440000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 100 ms (10001 pts) #Video BW 3.0 MHz 5 Marker Table . Function Function Width Function Value Trace Scale Mode Х Y -0.84 dBm 450.0 µs -0.77 dBm -0.83 dBm 23 N N 680.0 µs 1.070 ms 4 5 6 Jun 14, 2024 ... 5:19:58 PM う 2 ? XX

Page 29 of 56





Page 31 of 56

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Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	-1.18	30	Pass
NVNT	BLE 1M	2440	-0.66	30	Pass
NVNT	BLE 1M	2480	-0.83	30	Pass
NVNT	BLE 2M	2402	-0.88	30	Pass
NVNT	BLE 2M	2440	-0.52	30	Pass
NVNT	BLE 2M	2480	-0.74	30	Pass

Maximum Conducted Output Power

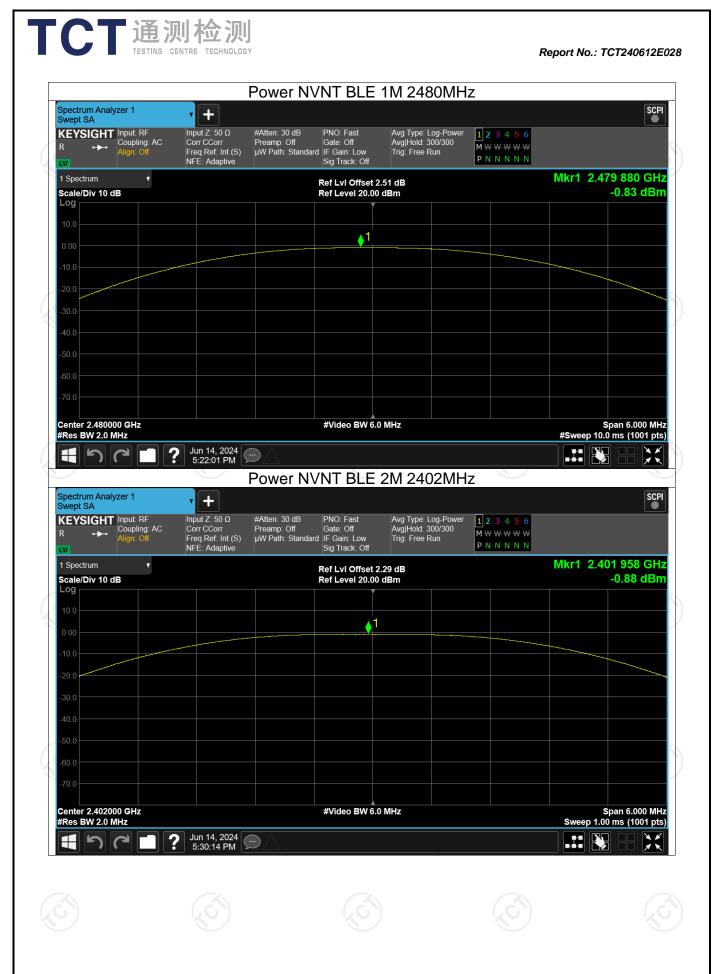


TCT通测检测 TESTING CENTRE TECHNOLOGY



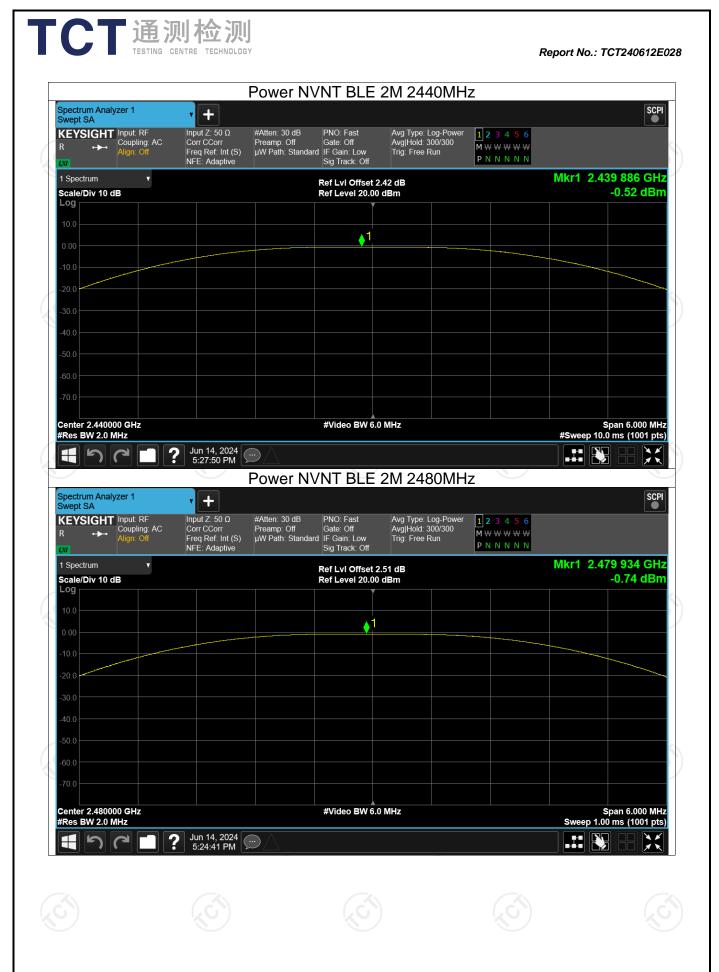
Report No.: TCT240612E028 **Test Graphs** Power NVNT BLE 1M 2402MHz Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Adaptive REYSIGHT Input: RF Coupling: AC #Atten: 30 dB Avg Type: Log-Power Avg|Hold: 400/400 Trig: Free Run PNO: Fast Gate: Off 1 2 3 4 5 6 Preamp: Off Gate: Οπ μW Path: Standard IF Gain: Low Sig Track: Off **----**PNNNN Mkr1 2.401 826 GHz 1 Spectrum Ref LvI Offset 2.29 dB -1.18 dBm Scale/Div 10 dB Ref Level 20.00 dBm Loc ♦1 Center 2.402000 GHz #Res BW 2.0 MHz #Video BW 6.0 MHz Span 6.000 MHz #Sweep 10.0 ms (1001 pts) **?** Jun 14, 2024 5:17:37 PM \mathbf{X} ょう Power NVNT BLE 1M 2440MHz SCPI Spectrum Analyzer 1 + ۲ Swept SA REYSIGHT Input: RF Coupling: AC Avg Type: Log-Power Avg|Hold: 300/300 Trig: Free Run Input Z: 50 Ω #Atten: 30 dB PNO: Fast 1 2 3 4 5 6 Corr CCorr Freq Ref: Int (S) NFE: Adaptive Preamp: Off Gate: Off µW Path: Standard IF Gain: Low Sig Track: Off **⊷** M ₩ ₩ ₩ ₩ ₩ PNNNN 1 Spectrum Mkr1 2.439 802 GHz Ref LvI Offset 2.42 dB Ref Level 20.00 dBm -0.66 dBm Scale/Div 10 dB Log 1 Center 2.440000 GHz #Video BW 6.0 MHz Span 6.000 MHz #Res BW 2.0 MHz #Sweep 10.0 ms (1001 pts) **?** Jun 14, 2024 5:20:08 PM ょる X

Page 33 of 56



Page 34 of 56

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Page 35 of 56

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		Page 36 of 56

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Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict		
NVNT	BLE 1M	2402	0.657	0.5	Pass		
NVNT	BLE 1M	2440	0.655	0.5	Pass		
NVNT	BLE 1M	2480	0.658	0.5	Pass		
NVNT	BLE 2M	2402	1.089	0.5	Pass		
NVNT	BLE 2M	2440	1.121	0.5	Pass		
NVNT	BLE 2M	2480	1.110	0.5	Pass		

-6dB Bandwidth

Report No.: TCT240612E028



Report No.: TCT240612E028 **Test Graphs** -6dB Bandwidth NVNT BLE 1M 2402MHz Spectrum Analyzer 1 Occupied BW SCPI + REYSIGHT Input: RF Coupling: AC Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Adaptive Center Freq: 2.402000000 GHz Avg|Hold: 300/300 Radio Std: None Trig: Free Run Atten: 30 dB Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low -**-**--Mkr3 2.402335000 GHz 1 Graph Ref LvI Offset 2.29 dB -7.89 dBm Scale/Div 10.0 dB Ref Value 22.29 dBm $\sqrt{1}$ <u></u>3 Center 2.402000 GHz #Res BW 100.00 kHz Span 3 MHz Sweep 1.33 ms (10001 pts) #Video BW 300.00 kHz 2 Metrics Measure Trace Trace 1 Occupied Bandwidth 1.0396 MHz Total Power 5.01 dBm Transmit Freq Error 6.340 kHz 99.00 % % of OBW Power x dB Bandwidth 656.9 kHz x dB -6.00 dB Jun 14, 2024 5:18:01 PM \mathbf{X} ? ょる -6dB Bandwidth NVNT BLE 1M 2440MHz Spectrum Analyzer 1 Occupied BW SCPI + REYSIGHT Input: RF Coupling: AC Input Z: 50 Ω Atten: 30 dB Trig: Free Run Center Freq: 2.440000000 GHz Corr CCorr Freq Ref: Int (S) NFE: Adaptive Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low Avg|Hold: 400/400 Radio Std: None **---**-Mkr3 2.440332000 GHz 1 Graph Ref LvI Offset 2.42 dB Ref Value 22.42 dBm ۷ -7.35 dBm Scale/Div 10.0 dB Δ1 3 Center 2.440000 GHz #Res BW 100.00 kHz #Video BW 300.00 kHz Span 3 MHz Sweep 1.00 ms (1001 pts) 2 Metrics v Measure Trace Trace 1 Occupied Bandwidth 1.0431 MHz 5.63 dBm Total Power % of OBW Power 99.00 % Transmit Freq Error 4.566 kHz -6.00 dB x dB Bandwidth 654.7 kHz x dB Jun 14, 2024 ... 5:20:26 PM う 2 ? XX Page 37 of 56

Report No.: TCT240612E028 -6dB Bandwidth NVNT BLE 1M 2480MHz Spectrum Analyzer 1 Dccupied BW SCPI + Input Z: 50 Ω Corr CCorr Center Freq: 2.480000000 GHz Avg|Hold: 400/400 Radio Std: None REYSIGHT Input: RF Coupling: AC Atten: 30 dB Trig: Free Run Gate: Off Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low Freq Ref: Int (S) NFE: Adaptive Mkr3 2.480333000 GHz 1 Graph Ref Lvi Offset 2.51 dB Ref Value 22.51 dBm -7.34 dBm Scale/Div 10.0 dB 61 3 7 49 67 5 Center 2.480000 GHz #Res BW 100.00 kHz #Video BW 300.00 kHz Span 3 MHz Sweep 1.00 ms (1001 pts) 2 Metrics ۷ Measure Trace Trace 1 Occupied Bandwidth 1.0473 MHz Total Power 5.25 dBm Transmit Freq Error 3.976 kHz % of OBW Power 99.00 % x dB Bandwidth 658.0 kHz x dB -6.00 dB Jun 14, 2024 5:22:20 PM **4**522? \mathbf{X} -6dB Bandwidth NVNT BLE 2M 2402MHz Spectrum Analyzer 1 Occupied BW SCPI + KEYSIGHT Input: RF Input Z: 50 Ω Atten: 30 dB Trig: Free Run Center Freq: 2.402000000 GHz Coupling: AC Corr CCorr Freq Ref: Int (S) Avg|Hold: 400/400 Radio Std: None Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low R **→**→ NFE: Adaptive Mkr3 2.402562000 GHz 1 Graph Ref Lvi Offset 2.29 dB Ref Value 22.29 dBm Scale/Div 10.0 dB -6.75 dBm <u>51</u> **⊘**2 <mark>∖</mark>3 Center 2.402000 GHz #Res BW 100.00 kHz #Video BW 300.00 kHz Span 4 MHz Sweep 1.00 ms (1001 pts) 2 Metrics Measure Trace Trace 1 Occupied Bandwidth 2.0721 MHz 5.53 dBm Total Power 17.504 kHz Transmit Freg Error % of OBW Power 99.00 % -6.00 dB x dB Bandwidth 1.089 MHz x dB Jun 14, 2024 5:30:35 PM ? \mathbf{X} - n c -····

Report No.: TCT240612E028 -6dB Bandwidth NVNT BLE 2M 2440MHz Spectrum Analyzer 1 Dccupied BW SCPI + Input Z: 50 Ω Corr CCorr Center Freq: 2.440000000 GHz Avg|Hold: 400/400 Radio Std: None REYSIGHT Input: RF Coupling: AC Atten: 30 dB Trig: Free Run Gate: Off Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low Freq Ref: Int (S) NFE: Adaptive Mkr3 2.440578000 GHz 1 Graph Ref LvI Offset 2.42 dB Ref Value 22.42 dBm -6.75 dBm Scale/Div 10.0 dB Λ^{1} 3 37.6 47.667.6 Center 2.440000 GHz #Res BW 100.00 kHz #Video BW 300.00 kHz Span 4 MHz #Sweep 10.0 ms (1001 pts) 2 Metrics ۷ Measure Trace Trace 1 Occupied Bandwidth 2.0637 MHz Total Power 6.20 dBm Transmit Freq Error 17.417 kHz % of OBW Power 99.00 % x dB Bandwidth 1.121 MHz x dB -6.00 dB Jun 14, 2024 5:28:13 PM **4**522? \mathbf{X} -6dB Bandwidth NVNT BLE 2M 2480MHz Spectrum Analyzer 1 Occupied BW SCPI + KEYSIGHT Input: RF Input Z: 50 Ω Atten: 30 dB Trig: Free Run Center Freq: 2.480000000 GHz Coupling: AC Corr CCorr Freq Ref: Int (S) Avg|Hold: 400/400 Radio Std: None Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low R **→**→ NFE: Adaptive Mkr3 2.480572000 GHz 1 Graph Ref Lvi Offset 2.51 dB Ref Value 22.51 dBm Scale/Div 10.0 dB -6.82 dBm \wedge ▲3 7.49 47.5 Center 2.480000 GHz #Res BW 100.00 kHz #Video BW 300.00 kHz Span 4 MHz Sweep 1.00 ms (1001 pts) 2 Metrics Measure Trace Trace 1 Occupied Bandwidth 2.0538 MHz 5.79 dBm Total Power 16.906 kHz Transmit Freq Error % of OBW Power 99.00 % 1.110 MHz -6.00 dB x dB Bandwidth x dB Jun 14, 2024 5:25:00 PM ? \mathbf{X} - n c -····

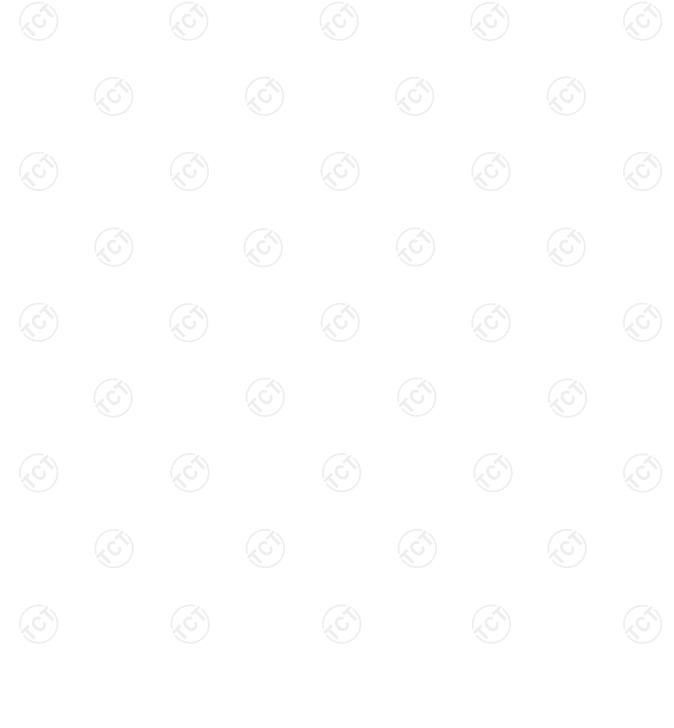
Page 39 of 56

Report No.: TCT240612E028

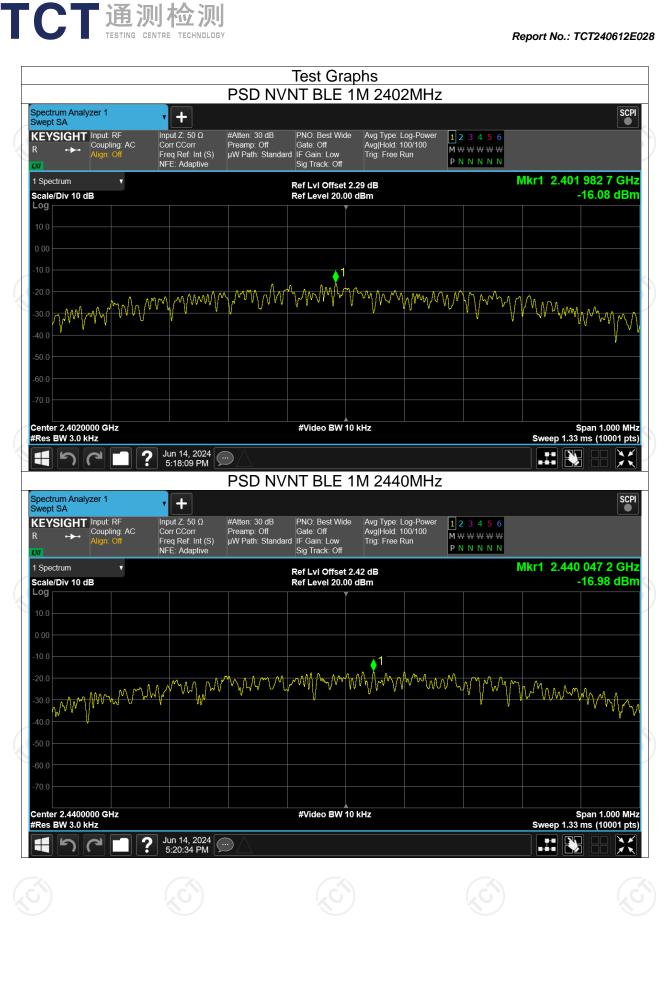
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict			
NVNT	BLE 1M	2402	-16.08	8	Pass			
NVNT	BLE 1M	2440	-16.98	8	Pass			
NVNT	BLE 1M	2480	-15.24	8	Pass			
NVNT	BLE 2M	2402	-19.06	8	Pass			
NVNT	BLE 2M	2440	-18.51	8	Pass			
NVNT	BLE 2M	2480	-18.52	8	Pass			

Maximum Power Spectral Density Level

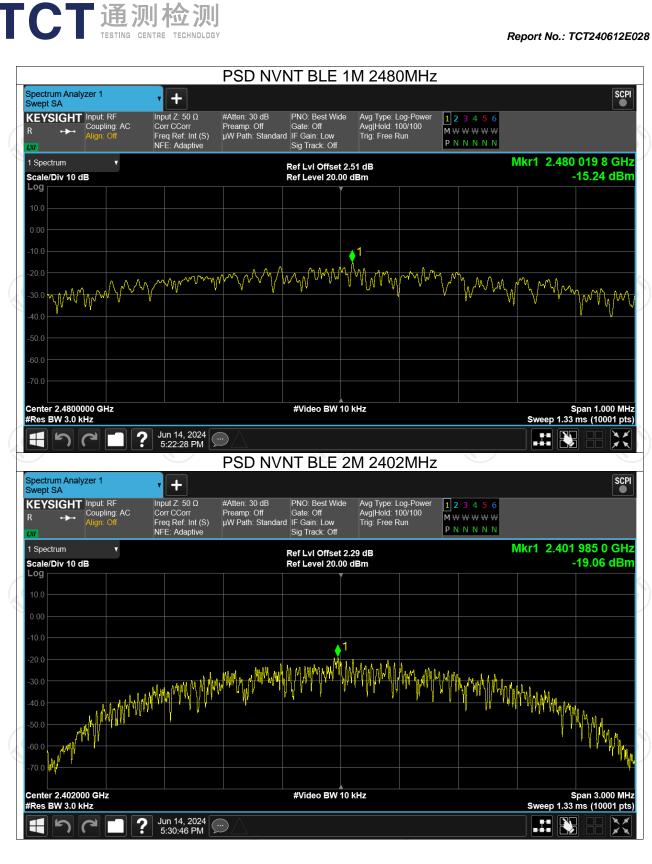
TCT通测检测 TESTING CENTRE TECHNOLOGY



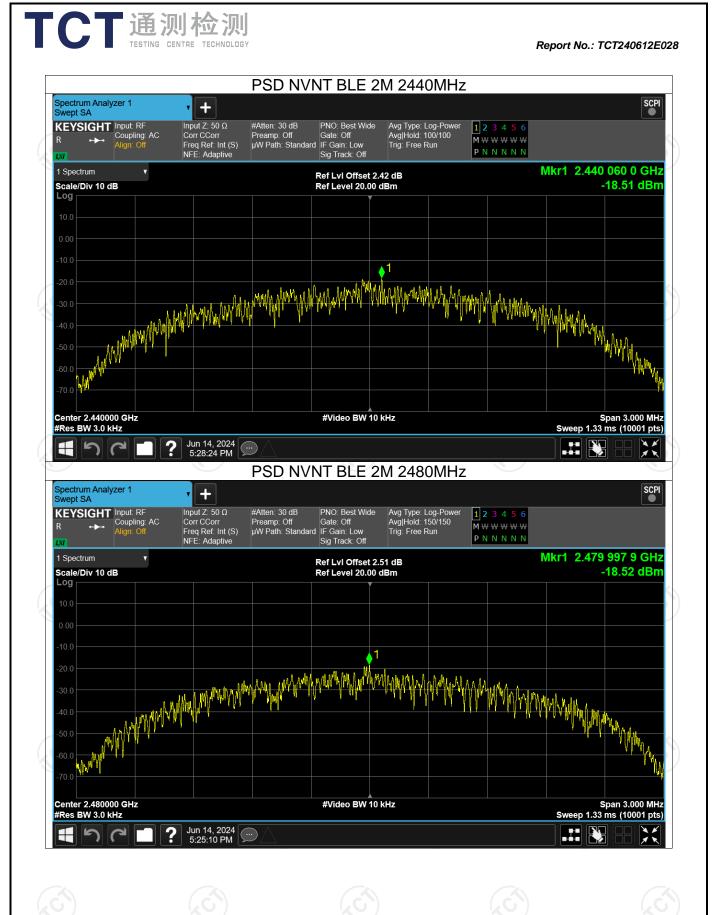
Page 40 of 56



Page 41 of 56



Page 42 of 56



Page 43 of 56

Condition	Mode	Frequency (M	Band Edg 1Hz) Ma	x Value (dB	c) Limit	(dBc) Verdic
NVNT	BLE 1M	2402		-52.12	-2	
NVNT	BLE 1M	2480		-52.85	-2	
NVNT	BLE 2M	2402		-52.23		20 Pass
NVNT	BLE 2M	2480		-52.99	-2	20 Pass

Report No.: TCT240612E028

TCT通测检测 TESTING CENTRE TECHNOLOGY

Band Edge NVNT BLE 1M 2402MHz Ref Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Adaptive KEYSIGHT Input: RF R +++ Coupling: AC PNO: Best Wide Gate: Off Avg Type: Log-Power Avg|Hold: 2000/2000 Trig: Free Run #Atten: 30 dB 1 2 3 4 5 6 Preamp: Off Gate: Off μW Path: Standard IF Gain: Low **----**ΡΝΝΝΝ Sig Track: Off Mkr1 2.402 000 GHz 1 Spectrum Ref LvI Offset 2.29 dB -1.26 dBm Scale/Div 10 dB Ref Level 20.00 dBm Loc 1 ~~~ vil. nnn Center 2.402000 GHz #Res BW 100 kHz #Video BW 300 kHz Span 8.000 MHz Sweep 1.00 ms (1001 pts) Jun 14, 2024 5:18:30 PM ? \mathbf{X} う 7 (Band Edge NVNT BLE 1M 2402MHz Emission SCPI Spectrum Analyzer 1 + Swept SA REYSIGHT Input: RF Coupling: AC Avg Type: Log-Power Avg|Hold: 2000/2000 Trig: Free Run Input Z: 50 Ω #Atten: 30 dB PNO: Fast 1 2 3 4 5 6 Corr CCorr Freq Ref: Int (S) NFE: Adaptive Preamp: Off Gate: Off µW Path: Standard IF Gain: Low Sig Track: Off **→**→ M ₩ ₩ ₩ ₩ ₩ 1 Spectrum Mkr1 2.402 0 GHz ۷ Ref LvI Offset 2.29 dB Ref Level 20.00 dBm -1.16 dBm Scale/Div 10 dB _og DL1 -2 \\ <mark>4</mark> **∂**3 b Stop 2.40600 GHz Sweep 1.00 ms (1001 pts) Start 2.30600 GHz #Video BW 300 kHz #Res BW 100 kHz 5 Marker Table v Function Function Width Function Value Trace Scale Mode Y 2.402 0 GHz 2.400 0 GHz 2.390 0 GHz -1.16 dBm -56.06 dBm -56.49 dBm -53.38 dBm N N 2 3 4 5 6 N 2.328 0 GHz Jun 14, 2024 5:18:48 PM う C ? XX

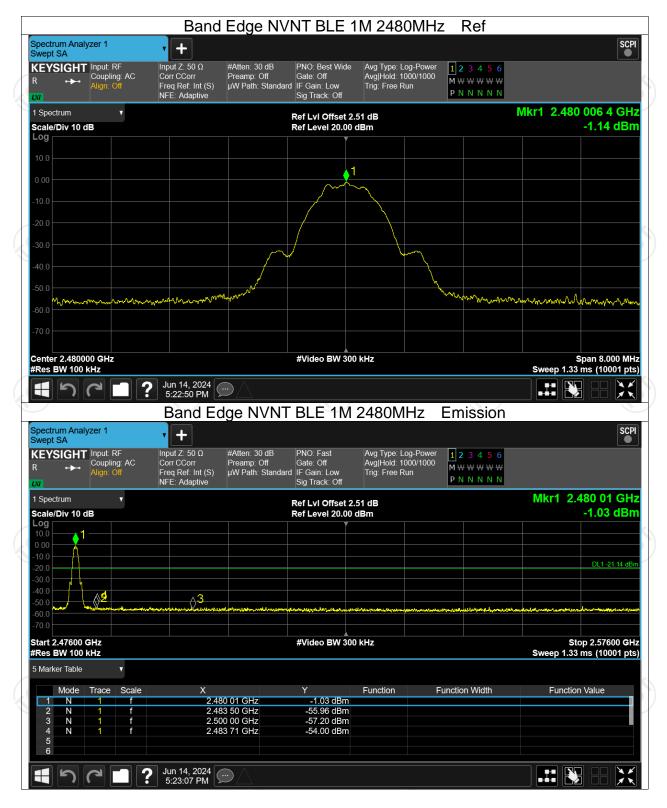
Test Graphs

Report No.: TCT240612E028

Page 45 of 56

1

Report No.: TCT240612E028



Page 46 of 56



Page 47 of 56

Report No.: TCT240612E028

Band Edge NVNT BLE 2M 2480MHz Ref Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr REYSIGHT Input: RF Coupling: AC #Atten: 30 dB PNO: Best Wide Avg Type: Log-Power Avg|Hold: 2000/2000 1 2 3 4 5 6 Preamp: Off Gate: On µW Path: Standard IF Gain: Low Sig Track: Off M ₩ ₩ ₩ ₩ ₩ Freq Ref: Int (S) NFE: Adaptive Trig: Free Run PNNNN Mkr1 2.480 020 8 GHz 1 Spectrum Ref LvI Offset 2.51 dB Ref Level 20.00 dBm -1.03 dBm Scale/Div 10 dB Loa 1 mmm month montom mannow Center 2.480000 GHz #Res BW 100 kHz #Video BW 300 kHz Span 8.000 MHz Sweep 1.33 ms (10001 pts) Jun 14, 2024 5:25:50 PM ? Ŋ H 3 (Band Edge NVNT BLE 2M 2480MHz Emission SCPI Spectrum Analyzer 1 + Swept SA KEYSIGHT Input: RF Input Z: 50 Ω #Atten: 30 dB PNO: Fast Avg Type: Log-Power 1 2 3 4 5 6 Avg|Hold: 2000/2000 Trig: Free Run Coupling: AC Corr CCorr Freq Ref: Int (S) Preamp: Off Gate: Off µW Path: Standard IF Gain: Low **M** ₩ ₩ ₩ ₩ R + NFE: Adaptive Sig Track: Off Mkr1 2.480 02 GHz 1 Spectrum Ref Lvi Offset 2.51 dB Ref Level 20.00 dBm Scale/Div 10 dB -0.95 dBm .og DL1 -21.03 dE **∂2** | **∆**4 **∂**3 Start 2.47600 GHz #Res BW 100 kHz Stop 2.57600 GHz Sweep 1.33 ms (10001 pts) #Video BW 300 kHz 5 Marker Table v Function Width Function Value Trace Scale Y Function Mode Х 2.480 02 GHz 2.483 50 GHz 2.500 00 GHz -0.95 dBm 2 3 4 Ν -56.24 dBm -56.36 dBm Ν f N 2.487 42 GHz -54.03 dBm 5 6 Jun 14, 2024 ... 5:26:23 PM \mathbf{X} ち P ?

Page 48 of 56

Report No.: TCT240612E028

Report	No.:	TCT240612E028
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Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict		
NVNT	BLE 1M	2402	-41.77	-20	Pass		
NVNT	BLE 1M	2440	-41.72	-20	Pass		
NVNT	BLE 1M	2480	-41.94	-20	Pass		
NVNT	BLE 2M	2402	-41.44	-20	Pass		
NVNT	BLE 2M	2440	-42.22	-20	Pass		
NVNT	BLE 2M	2480	-41.95	-20	Pass		
	5						

Conducted RF Spurious Emission



TCT 通测检测 TESTING CENTRE TECHNOLOGY







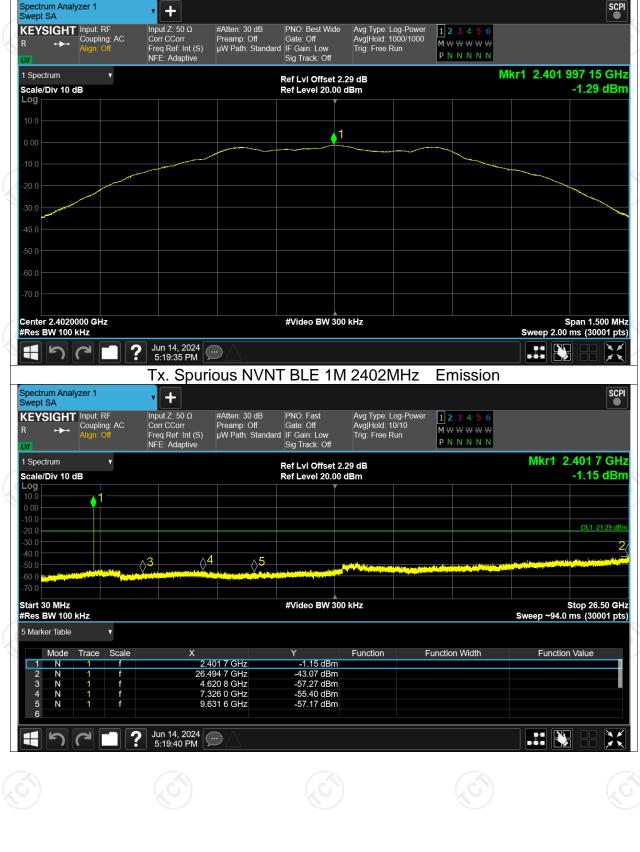




Page 49 of 56

Tx. Spurious NVNT BLE 1M 2402MHz Ref SCPI 1 2 3 4 5 6 MWWWWW PNNNN

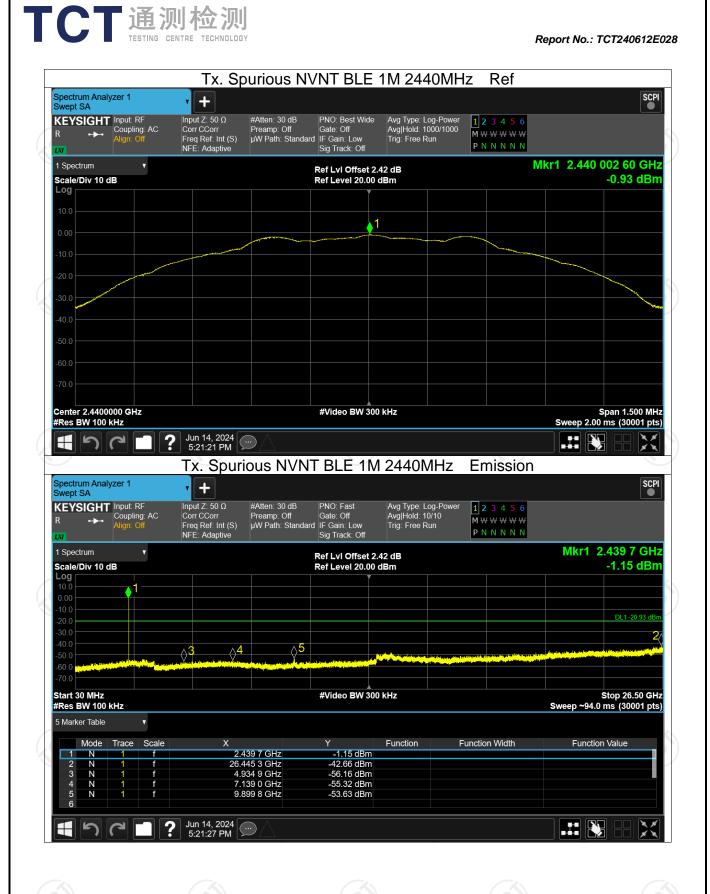
Report No.: TCT240612E028



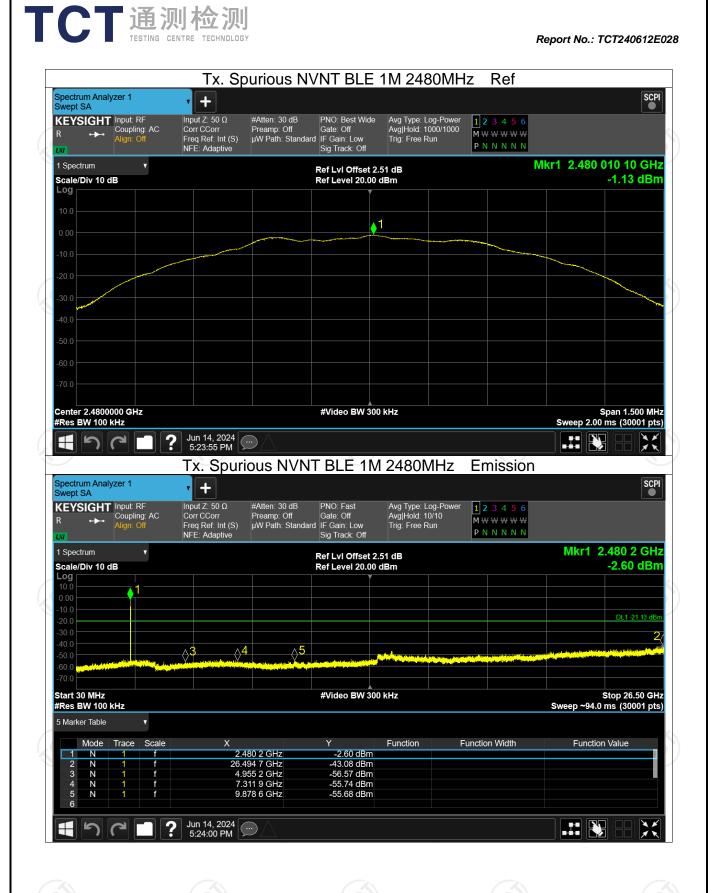
Test Graphs

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Page 50 of 56



Page 51 of 56



Page 52 of 56

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

Report No.: TCT240612E028 Tx. Spurious NVNT BLE 2M 2402MHz Ref Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr REYSIGHT Input: RF Coupling: AC Avg Type: Log-Power Avg|Hold: 1000/1000 Trig: Free Run #Atten: 30 dB PNO: Best Wide 1 2 3 4 5 6 #Atten: 50 Preamp: Off Gate: Οιτ μW Path: Standard IF Gain: Low Sig Track: Off M ₩ ₩ ₩ ₩ ₩ Freq Ref: Int (S) NFE: Adaptive PNNNN Mkr1 2.402 007 3 GHz 1 Spectrum Ref LvI Offset 2.29 dB -1.19 dBm Scale/Div 10 dB Ref Level 20.00 dBm Loa 1 Center 2.402000 GHz #Res BW 100 kHz Span 3.000 MHz Sweep 2.00 ms (30001 pts) #Video BW 300 kHz Jun 14, 2024 5:32:00 PM XX ? Ŋ H 3 (Tx. Spurious NVNT BLE 2M 2402MHz Emission SCPI Spectrum Analyzer 1 + v Swept SA KEYSIGHT Input: RF Input Z: 50 Ω #Atten: 30 dB PNO: Fast Avg Type: Log-Power 1 2 3 4 5 6 Coupling: AC Corr CCorr Freq Ref: Int (S) Preamp: Off Gate: Off µW Path: Standard IF Gain: Low Avg|Hold: 10/10 Trig: Free Run **M** ₩ ₩ ₩ ₩ R +-NFE: Adaptive Sig Track: Off Mkr1 2.401 7 GHz 1 Spectrum ۷ Ref Lvi Offset 2.29 dB Ref Level 20.00 dBm -2.90 dBm Scale/Div 10 dB Log DL1 -21.19 dB 2 **≬**5 **∆**4 ₿ Start 30 MHz #Res BW 100 kHz Stop 26.50 GHz Sweep ~94.0 ms (30001 pts) #Video BW 300 kHz 5 Marker Table v Function Width Function Value Trace Scale Function Mode х 2.401 7 GHz 26.484 1 GHz 4.958 7 GHz 7.245 7 GHz 9.541 6 GHz -2.90 dBm -42.64 dBm -56.07 dBm -55.00 dBm N N 2 3 4 f N 5 6 -57.28 dBm Jun 14, 2024 ... 5:32:05 PM ... P \mathbf{X} 5 ? Γ1

Page 53 of 56

Tx. Spurious NVNT BLE 2M 2440MHz Ref Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr REYSIGHT Input: RF Coupling: AC Avg Type: Log-Power Avg|Hold: 1000/1000 Trig: Free Run #Atten: 30 dB PNO: Best Wide 1 2 3 4 5 6 #Atten: 50 Preamp: Off Gate: Οιτ μW Path: Standard IF Gain: Low Sig Track: Off M ₩ ₩ ₩ ₩ ₩ Freq Ref: Int (S) NFE: Adaptive PNNNN Mkr1 2.440 018 5 GHz 1 Spectrum Ref LvI Offset 2.42 dB -0.82 dBm Scale/Div 10 dB Ref Level 20.00 dBm Loa 1 Center 2.440000 GHz #Res BW 100 kHz Span 3.000 MHz Sweep 2.00 ms (30001 pts) #Video BW 300 kHz Jun 14, 2024 5:29:12 PM \mathbf{X} ? Ŋ H 3 (Tx. Spurious NVNT BLE 2M 2440MHz Emission SCPI Spectrum Analyzer 1 + v Swept SA KEYSIGHT Input: RF Input Z: 50 Ω #Atten: 30 dB PNO: Fast Avg Type: Log-Power 1 2 3 4 5 6 Coupling: AC Corr CCorr Freq Ref: Int (S) Preamp: Off Gate: Off µW Path: Standard IF Gain: Low Avg|Hold: 10/10 Trig: Free Run **M** ₩ ₩ ₩ ₩ R +-NFE: Adaptive Sig Track: Off Mkr1 2.439 7 GHz 1 Spectrum ۷ Ref Lvi Offset 2.42 dB Ref Level 20.00 dBm -6.77 dBm Scale/Div 10 dB Log 1 DL1 -20.82 dE 8 **≬**5 **∆**4 **∂**3 Start 30 MHz #Res BW 100 kHz Stop 26.50 GHz Sweep ~94.0 ms (30001 pts) #Video BW 300 kHz 5 Marker Table v Y Function Width Function Value Trace Scale Function Mode х 2.439 7 GHz 26.200 0 GHz 4.687 8 GHz 7.166 3 GHz 9.905 1 GHz -6.77 dBm -43.04 dBm -57.14 dBm -54.25 dBm N N 2 3 4 f N 5 6 -56.23 dBm Jun 14, 2024 ... 5:29:17 PM う P XX ? Γ1

Page 54 of 56

Report No.: TCT240612E028



Page 55 of 56

