

Report No: JYTSZE201200102

# FCC REPORT

Applicant:	TECNO MOBILE LIMITED
Address of Applicant:	FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31- 35 SHAN MEI STREET FOTAN NT
Equipment Under Test (E	EUT)
Product Name:	Mobile Phone
Model No.:	KF8
Trade mark:	TECNO
FCC ID:	2ADYY-KF8
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	01 Dec., 2020
Date of Test:	01 Dec., to 23 Dec., 2020
Date of report issued:	24 Dec., 2020
Test Result:	PASS *

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



#### Bruce Zhang Laboratory Manager

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

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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# 2 Version

Version No.	Date	Description
00	24 Dec., 2020	Original

Tested by:

11 Jang

Test Engineer

Date: 24 Dec., 2020

Reviewed by:

Winner Thang

Project Engineer

Date: 24 Dec., 2020

Project No.: JYTSZE2012001



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# 4 Test Summary

Test Items	Section in CFR 47	Result			
Antenna requirement	15.203 & 15.247 (b)	Pass			
AC Power Line Conducted Emission	15.207	Pass			
Conducted Peak Output Power	15.247 (b)(3)	Pass			
6dB Emission Bandwidth 99% Occupied 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			
Remark:         1. Pass: The EUT complies with the essential requirements in the standard.         2. N/A: Not Applicable					

2. N/A: Not Applicable.

3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).

Test Method:

ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02



# 5 General Information

## 5.1 Client Information

Applicant:	TECNO MOBILE LIMITED
Address:	FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-35 SHAN MEI STREET FOTAN NT
Manufacturer:	TECNO MOBILE LIMITED
Address:	FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-35 SHAN MEI STREET FOTAN NT
Factory:	SHENZHEN TECNO TECHNOLOGY CO., LTD.
Address:	101, Building 24, Waijing Industrial Park, Fumin Community, Fucheng Street, Longhua District, Shenzhen City, P.R.China

## 5.2 General Description of E.U.T.

Product Name:	Mobile Phone
Model No.:	KF8
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps & 2Mbps
Antenna Type:	Internal Antenna
Antenna gain:	1.2 dBi
Power supply:	Rechargeable Li-ion Polymer Battery DC3.85V-4900mAh
AC adapter:	Model: U100TSA
	Input: AC100-240V, 50/60Hz, 0.3A
	Output: DC 5.0V, 2000mA
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:

In section 15.31(*m*), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test. Channel No. 0, 20 & 39 were selected as Lowest, Middle and Highest channel.



## 5.3 Test environment and mode

## **Operating Environment:**

Operating Environment.	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation

Radiated Emission: The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) 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 are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.

## 5.4 Description of Support Units

The EUT has been tested as an independent unit.

## 5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

## 5.6 Laboratory Facility

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

## • FCC - Designation No.: CN1211

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

#### • ISED – CAB identifier.: CN0021

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

#### • A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <u>https://portal.a2la.org/scopepdf/4346-01.pdf</u>

## 5.7 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd. Address: No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366 Email: info@ccis-cb.com, Website: <u>http://www.ccis-cb.com</u>



# 5.8 Test Instruments list

Radiated Emission:						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
3m SAC	SAEMC	9m*6m*6m	966	07-21-2020	07-20-2021	
Loop Antenna	SCHWARZBECK	FMZB1519B	044	03-07-2020	03-06-2021	
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-07-2020	03-06-2021	
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-07-2020	03-06-2021	
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-20-2020	06-19-2021	
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-18-2020	11-17-2021	
EMI Test Software	AUDIX	E3	١	/ersion: 6.110919t	)	
Pre-amplifier	HP	8447D	2944A09358	03-07-2020	03-06-2021	
Pre-amplifier	CD	PAP-1G18	11804	03-07-2020	03-06-2021	
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-05-2020	03-04-2021	
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2020	11-17-2021	
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-05-2020	03-04-2021	
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2020	03-06-2021	
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2020	03-06-2021	
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2020	03-06-2021	
RF Switch Unit	MWRFTEST	MW200	N/A	N/A	N/A	
Test Software	MWRFTEST	MTS8200	Version: 2.0.0.0			

Conducted Emission:						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-05-2020	03-04-2021	
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-05-2020	03-04-2021	
LISN	CHASE	MN2050D	1447	03-05-2020	03-04-2021	
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	06-18-2020	07-17-2021	
Cable	HP	10503A	N/A	03-05-2020	03-04-2021	
EMI Test Software	AUDIX	E3	١	/ersion: 6.110919b	)	

Conducted method:						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
Spectrum Analyzer	Keysight	N9010B	MY60240202	11-27-2020	11-26-2021	
Vector Signal Generator	Keysight	N5182B	MY59101009	11-27-2020	11-26-2021	
Analog Signal Generator	Keysight	N5173B	MY59100765	11-27-2020	11-26-2021	
Power Detector Box	MWRF-test	MW100-PSB	MW201020JYT	11-27-2020	11-26-2021	
Simulated Station	Rohde & Schwarz	CMW270	102335	11-27-2020	11-26-2021	
RF Control Box	MWRF-test	MW100-RFCB	MW200927JYT	N/A	N/A	
PDU	MWRF-test	XY-G10	N/A	N/A	N/A	
Test Software	MWRF-tes	MTS 8310	Version: 2.0.0.0			
DC Power Supply	Keysight	E3642A	MY60296194	11-27-2020	11-26-2021	
Temperature Humidity Chamber	ZhongZhi	CZ-C-150D	ZH16491	09-23-2020	09-22-2021	



# 6 Test results and Measurement Data

# 6.1 Antenna requirement:

-	
Standard requirement:	FCC Part 15 C Section 15.203 /247(b)
responsible party shall be u antenna that uses a unique	be designed to ensure that no antenna other than that furnished by the sed with the device. The use of a permanently attached antenna or of an coupling to the intentional radiator, the manufacturer may design the unit an be replaced by the user, but the use of a standard antenna jack or bited
15.247(b) (4) requirement: (4) The conducted output po antennas with directional ga section, if transmitting anter power from the intentional re	ower limit specified in paragraph (b) of this section is based on the use of ains that do not exceed 6 dBi. Except as shown in paragraph (c) of this anas of directional gain greater than 6 dBi are used, the conducted output adiator shall be reduced below the stated values in paragraphs (b)(1), tion, as appropriate, by the amount in dB that the directional gain of the
E.U.T Antenna:	
The BLE antenna is an Interr antenna is 1.2 dBi.	hal antenna which cannot replace by end-user, the best-case gain of the



## 6.2 Conducted Emission

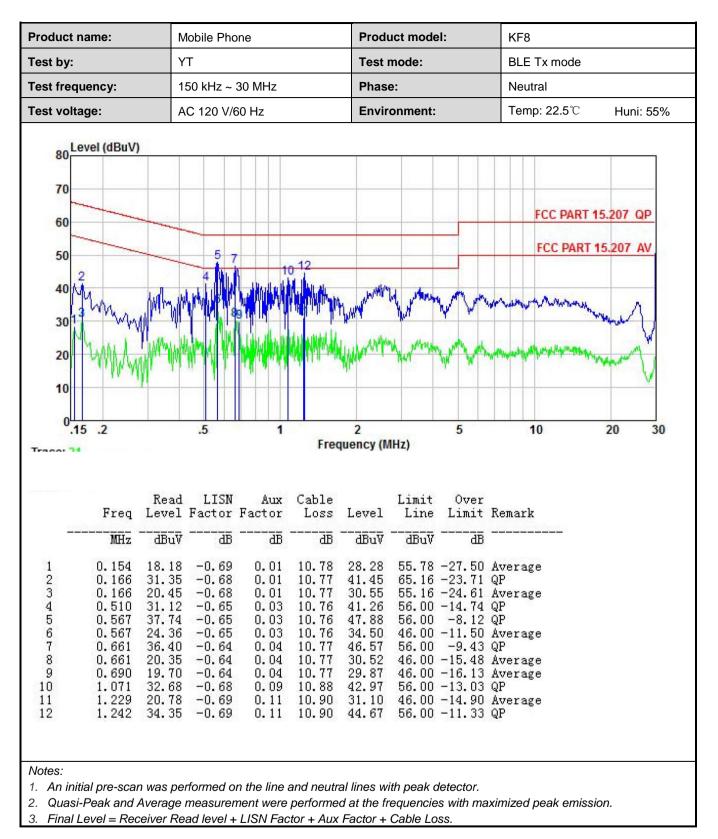
Test Requirement:	FCC Part 15 C Section 15.207	7						
Test Frequency Range:	150 kHz to 30 MHz							
Class / Severity:	Class B							
Receiver setup:	RBW=9kHz, VBW=30kHz							
Limit:	Frequency range (MHz)	Limit (	dBuV)					
	, , , , , , , , , , , , , , , , ,	Quasi-peak	Average					
	0.15-0.5	66 to 56*	56 to 46*					
	0.5-5	56	46					
	5-30	60	50					
	* Decreases with the logarithm							
Test procedure:	<ol> <li>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10(latest version) on conducted measurement.</li> </ol>							
Test setup:	AUX Equipment Test table/Insulation plane	80cm	– AC power					
	Remark: E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Net Test table height=0.8m							
Test Instruments:	Refer to section 5.9 for details							
Test mode:	Refer to section 5.3 for details							
Test results:	Passed							



#### **Measurement Data:**

roduct name:	Mobile Phone	Product model:	KF8		
est by:	YT	Test mode:	BLE Tx mode		
est frequency:	150 kHz ~ 30 MHz	Phase:	Line		
est voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Huni: 55%		
80 Level (dBuV) 70 60 50 40 2 40 2 40 2 40 2 40 2 40 10 0 15 2	3 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		FCC PART 15.207 QP FCC PART 15.207 AV		
-15 .2	.5	Frequency (MHz)	10 20 30		
	ad LISN Aux el Factor Factor	Cable Limit Over Loss Level Line Limit F	Remark		
MHz dB					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	10. 78       30. 53       55. 78 $-25. 25$ $4$ 10. 77       40. 15 $65. 56$ $-25. 41$ $6$ 10. 76       46. 84 $56. 00$ $-9. 16$ $6$ 10. 76       37. 03 $46. 00$ $-8. 97$ $4$ 10. 76       38. 27 $46. 00$ $-7. 73$ $4$ 10. 77 $46. 15$ $56. 00$ $-9. 85$ $6$ 10. 77 $36. 19$ $46. 00$ $-9. 81$ $4$ 10. 81 $31. 84$ $46. 00$ $-14. 16$ $4$ 10. 88 $42. 85$ $56. 00$ $-13. 15$ $6$ 10. 88 $31. 77$ $46. 00$ $-14. 23$ $4$ 10. 90 $43. 21$ $56. 00$ $-12. 79$ $6$ 10. 92 $40. 75$ $56. 00$ $-15. 25$ $6$	QP QP Average Average Average Average QP Average QP		







# 6.3 Conducted Output Power

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)					
Limit:	30dBm					
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table					
	Ground Reference Plane					
Test Instruments:	Refer to section 5.9 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					



## 6.4 Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)					
Limit:	>500kHz					
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table					
	Ground Reference Plane					
Test Instruments:	Refer to section 5.9 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					



## 6.5 Power Spectral Density

Test Requirement:	FCC Part 15 C Section 15.247 (e)
Limit:	8 dBm/3kHz
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed



# 6.6 Band Edge

## 6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed



## 6.6.2 Radiated Emission Method

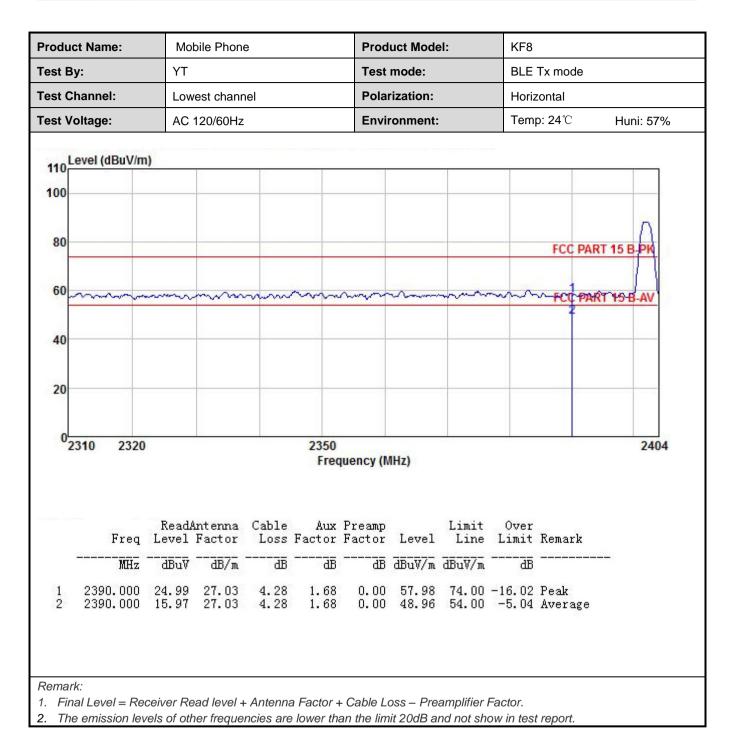
Test Requirement:	FCC Part 15 C Section 15.205 and 15.209								
Test Frequency Range:	2310 MHz to 2390 MHz and 2483.5MHz to 2500 MHz								
Test Distance:	3m								
Receiver setup:	Frequency	Detector		RBW		/BW	Remark		
	Above 1GHz	Peak		1MHz		MHz	Peak Value		
		RMS	Limit	1MHz		MHz	Average Value Remark		
Limit:	FrequencyLimit (dBuV/m @3m)RemarkAbave 40U54.00Average Value								
	Above 10	GHz –		74.00			Peak Value		
Test Procedure:	<ul> <li>the groun to determ</li> <li>2. The EUT antenna, tower.</li> <li>3. The anter the groun Both horiz make the</li> <li>4. For each case and meters ar to find the</li> <li>5. The test-r Specified</li> <li>6. If the emis the limit s of the EU have 10 c</li> </ul>	d at a 3 met ine the positives set 3 m which was n and height is d to determine zontal and ver measurement suspected enthe and the rota ta enthe the and the rota ta enthe maximum of receiver systic Bandwidth ver ssion level of pecified, the T would be in d margin wer	ter ca tion c neters noun s varie ine th ertica ent. emiss tenna able v readil tem v with I of the en tes repor ould	amber. The tal of the highest is away from the ted on the top ed from one maximum val polarizations sion, the EUT a was turned from maximum Hol EUT in peak sting could be rted. Otherwis	ble was radiation of a neter value s of the was a b heigom 0 of ak De d Mode stopp the the pone by	as rotati tion. erference variable to four of the fi he anter arrangee the fin he anter degrees tect Fur de was 10 bed and emission y one us	e-height antenna meters above eld strength. nna are set to d to its worst n 1 meter to 4 s to 360 degrees nction and 0 dB lower than I the peak values ons that did not sing peak, quasi-		
Test setup:		LUT umtable) Gr Test Receiv	3m Same Same Same Same Same Same Same Same		Antenna Tr	ower			
Test Instruments:	Refer to section	on 5.9 for de	tails						
Test mode:	Refer to section	on 5.3 for de	tails						
Test results:	Passed								



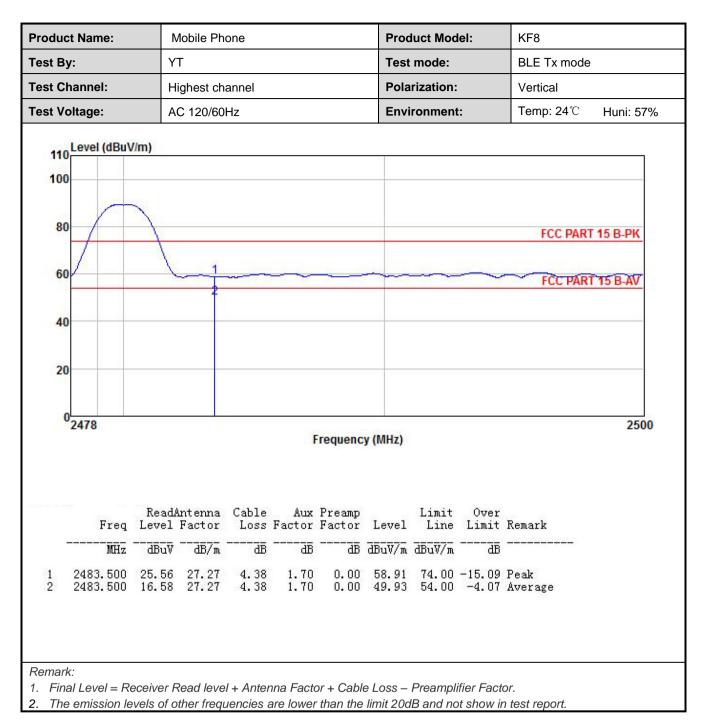
#### 1M PHY:

oduct Name:	Mobile Phon	e			Product	Model:	KF8	KF8						
est By:	YT Test mode: BLE Tx mode						Test mode: BLE Tx mode				T Test mode: BLE Tx mode			
est Channel:	Lowest chanr	nel			Polarization:			tical						
est Voltage:	AC 120/60Hz	<u>.</u>			Environn	nent:	Ter	<b>np: 24</b> ℃	Huni: 57%					
Lovel (dRu)//m)														
110 Level (dBuV/m)						Y								
100														
									~					
80							F	CC PART 15	B-PK					
									1					
60	mm	mm	mm	mm	mm	mm	mmp	CC PART 1	B-AV					
								f						
40														
20														
20														
0														
2310 2320			2350 Frequ	ency (MH	7)				2404					
				,	-,									
f Freq Le	eadAntenna vel Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark						
MHz c	BuV	 dB	<u>a</u> ē	<u>d</u> B	dBuV/m	dBuV/m	āB							
	.55 27.03	4.28	1.68	0.00	57.54	74.00	-16.46	Peak						
2 2390.000 15	.40 27.03	4.28	1.68	0.00	48.39	54.00	-5.61	Average						

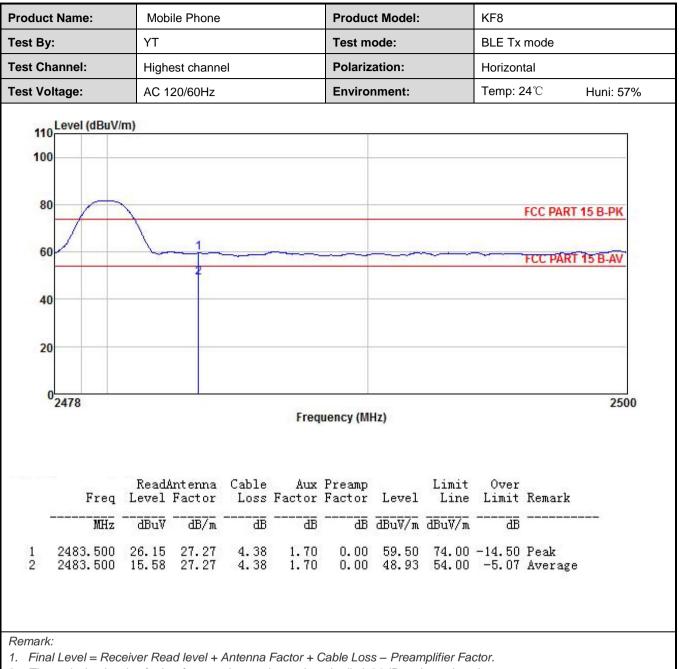












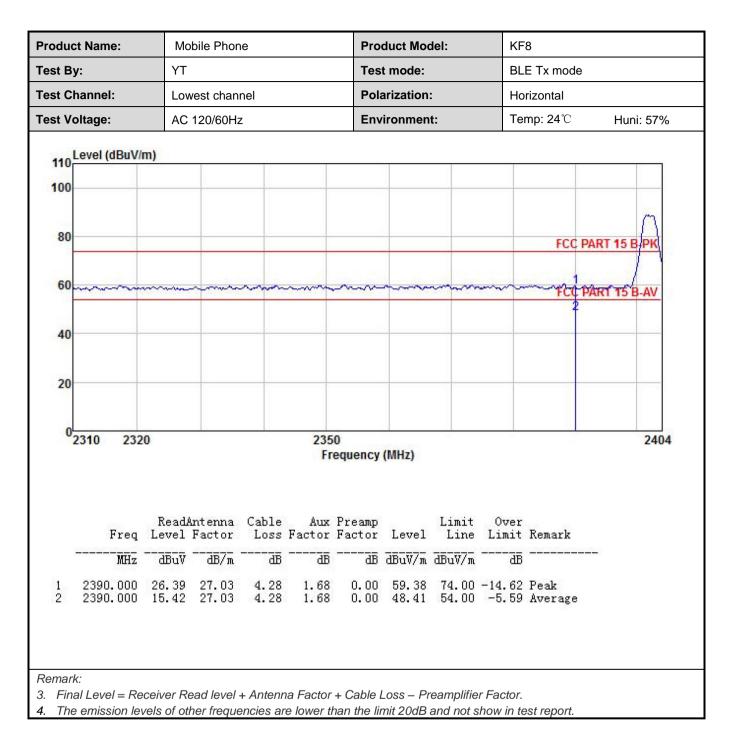
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.



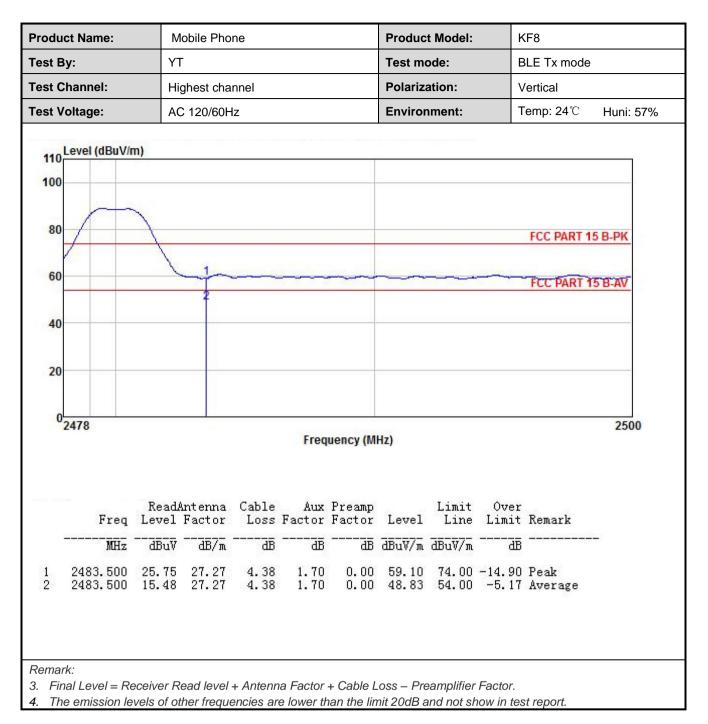
#### 2M PHY:

oduc	t Name:	M	obile Pho	ne			Produ	ict Mode	l:	KF8		
est By	/:	YT	YT Test mode: BLE Tx mode							BLE Tx mode		
est Ch	nannel:	Lo	west cha	nnel			Polari	Polarization:		Vertical		
est Vo	oltage:	AC	120/60⊦	lz			Envir	onment:		<b>Temp: 24</b> ℃	Huni: 57%	
110	Level (dBuV	/m)										
100												
											n	
80										FCC PA	RT 15 B PK	
	1.0		1.0.1								- 1 1	
60	hann	han	mm	unn	~~~~	m	han	www	mm	TT-FCC PAT	RT 15 B-AV	
40												
20												
C	2310 233	20			23						2404	
					F	requency	(MHZ)					
	Free	ReadA Level		Cable	Aux	Preamp Factor	Lorral	Limit	Over Limit	Report		
1	MHz								dB			
1	2390.000	27.05	27.03	4.28				74.00		Peak		
2	2390.000	16.91	27.03	4.28	1.68	0.00	49.90	54.00	-4.10	Average		
emark		. –		A .	_	<b>.</b>			<b>_</b>			
Fina	al Level = Re	ceiver Re	ead level	+ Anten	na ⊢acto	r + Cable	I OSS - P	reamplifi	er Factor	•		

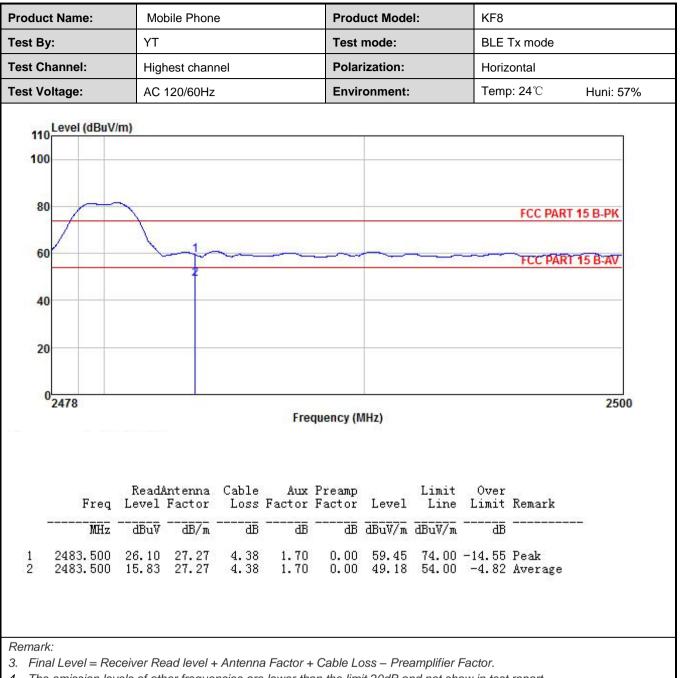












4. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.



# 6.7 Spurious Emission

## 6.7.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed



## 6.7.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.205 and 15.209							
Test Frequency Range:	9kHz to 25GHz							
Test Distance:	3m							
Receiver setup:	Frequency	Detecto	or	RBW	VB	W	Remark	
	30MHz-1GHz	Quasi-pe	eak	120KHz	300	≺Нz	Quasi-peak Value	
		Peak		1MHz	3M	Hz	Peak Value	
	Above 1GHz	RMS		1MHz	ЗM	Hz	Average Value	
Limit:	Frequency Limit (dBuV/m @3m) Rema						Remark	
	30MHz-88M	Hz		40.0		G	Quasi-peak Value	
	88MHz-216N			43.5		C	Quasi-peak Value	
	216MHz-960			46.0			Quasi-peak Value	
	960MHz-1G	Hz		54.0		G	Quasi-peak Value	
	Above 1GH	17		54.0			Average Value	
				74.0			Peak Value table 0.8m(below	
	<ol> <li>1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data</li> </ol>							
Test setup:		3m				Antenna Search Antenn Test eiver –	1	



## Report No: JYTSZE201200102

	AE EUT Horn Arlenna Tower Horn Arlenna Tower Ground Reference Plane Test Receiver				
Test Instruments:	Refer to section 5.9 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				
Remark:	<ol> <li>Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.</li> <li>9 kHz to 30MHz is lower than the limit 20dB, so only shows the data of above 30MHz in this report.</li> </ol>				

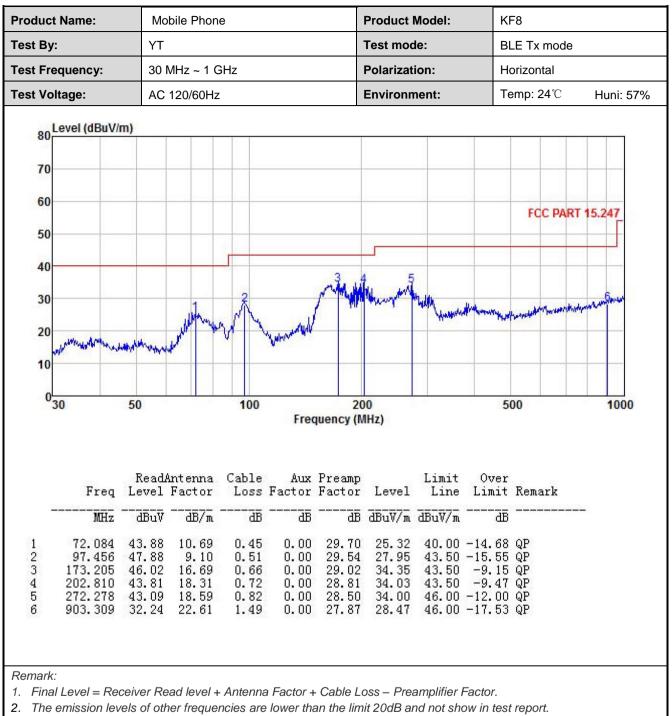


#### Measurement Data (worst case):

## Below 1GHz:

roduct Name:	Name: Mobile Phone			Product Model:			KF8		
est By:	YT	Test mode:			В	LE Tx mo	ode		
est Frequency:	30 MHz ~ 1	GHz		Polarizat	tion:	V	Vertical		
est Voltage:	AC 120/60H	Z		Environment: Te			emp: 24°C	C Hu	ni: 57%
80 Level (dBuV/m) 70 60 50 40 30 J	Marrier Milling		AL AM		M	Allystan	FCC PA	RT 15.247	
030 50	)	100	200 Frequency (M			50	0	10	00
0 <sub>30</sub> 50	) ReadAntenna evel Factor	Cable	Frequency (M Aux Preamp	Hz)	Limit Line	Over			00
030 50	ReadAntenna	Cable	Frequency(M Aux Preamp ctor Factor	Hz)	Line	Over Limit	Remark		00





3. The Aux Factor is a notch filter switch box loss, this item is not used.



#### Above 1GHz

#### 1M PHY:

			Т		el: Lowest cl				
				1	or: Peak Valu	Je			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	47.56	30.78	6.80	2.44	41.81	45.77	74.00	-28.23	Vertical
4804.00	49.89	30.78	6.80	2.44	41.81	48.10	74.00	-25.90	Horizontal
				Detector:	Average Va	alue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	40.52	30.78	6.80	2.44	41.81	38.73	54.00	-15.27	Vertical
4804.00	41.39	30.78	6.80	2.44	41.81	39.60	54.00	-14.40	Horizontal
			Т	est chann	el: Middle ch	nannel			
				Detecto	or: Peak Val	ue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	48.95	30.96	6.86	2.47	41.84	47.40	74.00	-26.60	Vertical
4884.00	49.22	30.96	6.86	2.47	41.84	47.67	74.00	-26.33	Horizontal
				Detector:	Average Va	alue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	41.15	30.96	6.86	2.47	41.84	39.60	54.00	-14.40	Vertical
4884.00	42.37	30.96	6.86	2.47	41.84	40.82	54.00	-13.18	Horizontal
			Te		el: Highest c pr: Peak Val				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	49.89	31.11	6.91	2.49	41.87	48.53	74.00	-25.47	Vertical
4960.00	50.47	31.11	6.91	2.49	41.87	49.11	74.00	-24.89	Horizontal
				Detector:	Average Va	alue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	42.52	31.11	6.91	2.49	41.87	41.16	54.00	-12.84	Vertical
4960.00	43.39	31.11	6.91	2.49	41.87	42.03	54.00	-11.97	Horizontal
						+ Aux Factor			

2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.



#### 2M PHY:

	Test channel: Lowest channel								
				Detecto	or: Peak Valu	Je			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	49.78	30.78	6.80	2.44	41.81	47.99	74.00	-26.01	Vertical
4804.00	50.62	30.78	6.80	2.44	41.81	48.83	74.00	-25.17	Horizontal
				Detector:	Average Va	alue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	40.52	30.78	6.80	2.44	41.81	38.73	54.00	-15.27	Vertical
4804.00	41.33	30.78	6.80	2.44	41.81	39.54	54.00	-14.46	Horizontal
					el: Middle ch				
	Deed	Antonno	Cabla	1	or: Peak Val	ue	Limit	Over	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	50.56	30.96	6.86	2.47	41.84	49.01	74.00	-24.99	Vertical
4884.00	50.47	30.96	6.86	2.47	41.84	48.92	74.00	-25.08	Horizontal
				Detector:	Average Va	alue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	41.36	30.96	6.86	2.47	41.84	39.81	54.00	-14.19	Vertical
4884.00	42.59	30.96	6.86	2.47	41.84	41.04	54.00	-12.96	Horizontal
			-		1.1.12.1				
			IE		el: Highest c				
	Deed	Antonno	Cabla		or: Peak Val	ue I	l ine it	Over	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	49.95	31.11	6.91	2.49	41.87	48.59	74.00	-25.41	Vertical
4960.00	50.56	31.11	6.91	2.49	41.87	49.20	74.00	-24.80	Horizontal
				Detector:	Average Va	alue			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	42.52	31.11	6.91	2.49	41.87	41.16	54.00	-12.84	Vertical
4960.00	43.17	31.11	6.91	2.49	41.87	41.81	54.00	-12.19	Horizontal
Remark:	Val - Paasi	or Road law	ol + Anton	na Factor :	Cable Leas	+ Aux Factor	Droomolific	r Factor	
J. FINALLE	ver = Kecen	iei neau iev	71 + AIIIE()	$a = a \cup 0 + b$	·	- AUX EdCIOL		Facille	

3. Final Level =Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.

4. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.



# Appendix A – BLE -1M

# **Test Data**

#### Maximum Conducted Output Power

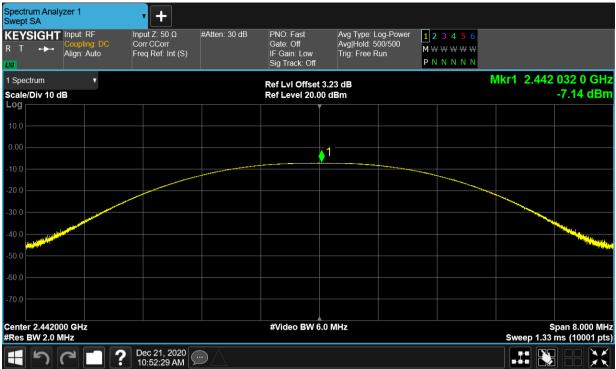
Condition	Mode	Frequency	Antenna	Conducted	Duty	Total	Limit	Verdict
		(MHz)		Power	Factor	Power	(dBm)	
				(dBm)	(dB)	(dBm)		
NVNT	BLE	2402	Ant1	-5.28	0	-5.28	30	Pass
NVNT	BLE	2442	Ant1	-7.143	0	-7.143	30	Pass
NVNT	BLE	2480	Ant1	-8.676	0	-8.676	30	Pass

## Power NVNT BLE 2402MHz Ant1





## Power NVNT BLE 2442MHz Ant1



## Power NVNT BLE 2480MHz Ant1



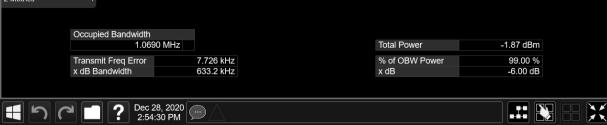


#### -6dB Bandwidth

Condition	Mode	Frequency	Antenna	-6 dB Bandwidth	Limit -6 dB	Verdict
		(MHz)		(MHz)	Bandwidth (MHz)	
NVNT	BLE	2402	Ant1	0.631	0.5	Pass
NVNT	BLE	2442	Ant1	0.633	0.5	Pass
NVNT	BLE	2480	Ant1	0.631	0.5	Pass

#### -6dB Bandwidth NVNT BLE 2402MHz Ant1





JianYan Testing Group Shenzhen Co., Ltd. No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366 Project No.: JYTSZE2012001



#### -6dB Bandwidth NVNT BLE 2480MHz Ant1

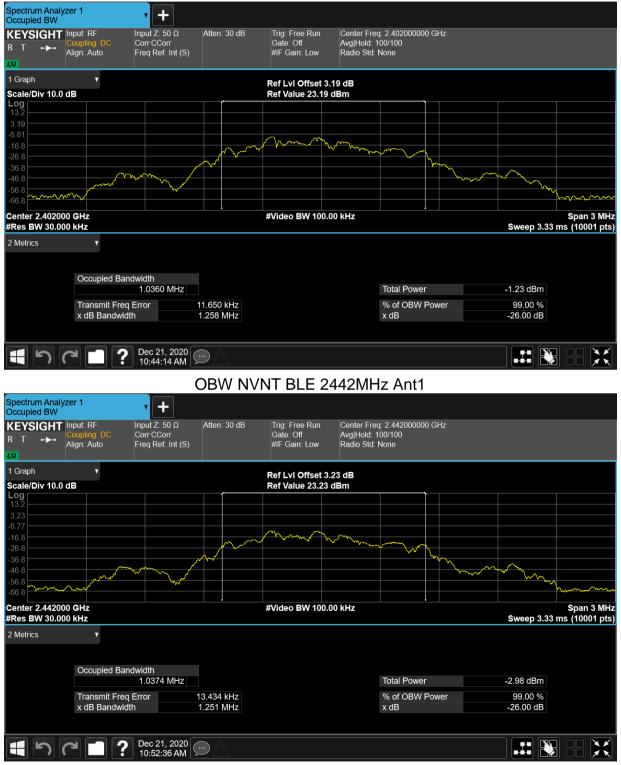




#### **Occupied Channel Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE	2402	Ant1	1.03597525
NVNT	BLE	2442	Ant1	1.037445684
NVNT	BLE	2480	Ant1	1.037860926

## OBW NVNT BLE 2402MHz Ant1



JianYan Testing Group Shenzhen Co., Ltd. No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366 Project No.: JYTSZE2012001



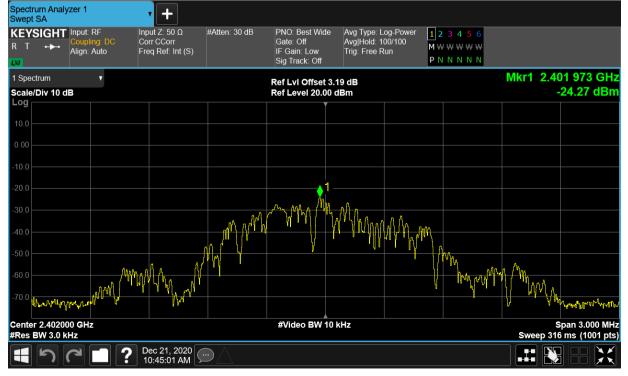
#### OBW NVNT BLE 2480MHz Ant1



#### **Maximum Power Spectral Density Level**

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	-24.273	8	Pass
NVNT	BLE	2442	Ant1	-26.146	8	Pass
NVNT	BLE	2480	Ant1	-27.675	8	Pass

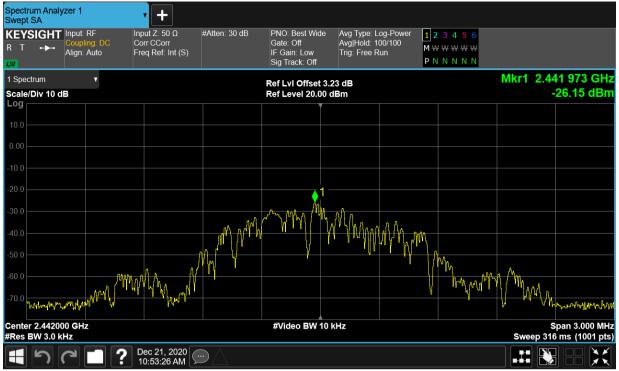
## PSD NVNT BLE 2402MHz Ant1



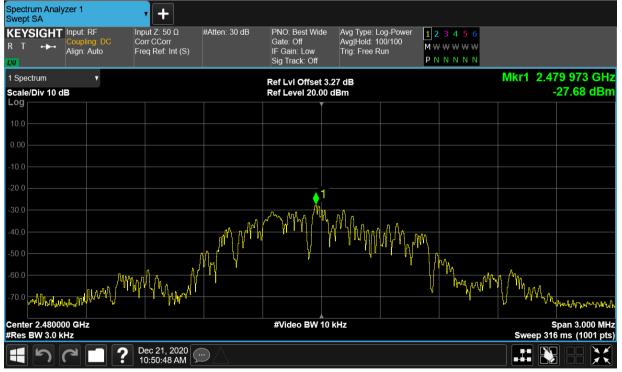
Project No.: JYTSZE2012001



### PSD NVNT BLE 2442MHz Ant1



# PSD NVNT BLE 2480MHz Ant1

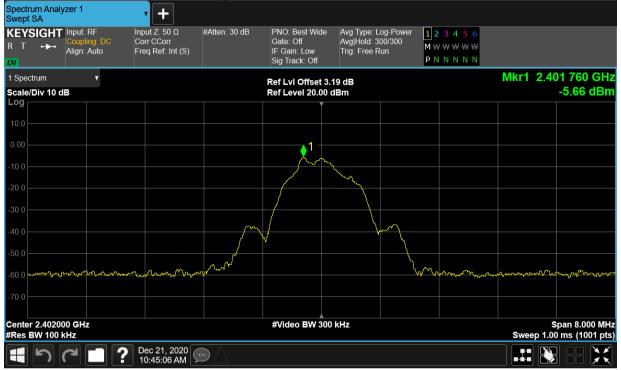




#### **Band Edge**

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-50.02	-20	Pass
NVNT	BLE	2480	Ant1	-46.59	-20	Pass

# Band Edge NVNT BLE 2402MHz Ant1 Ref

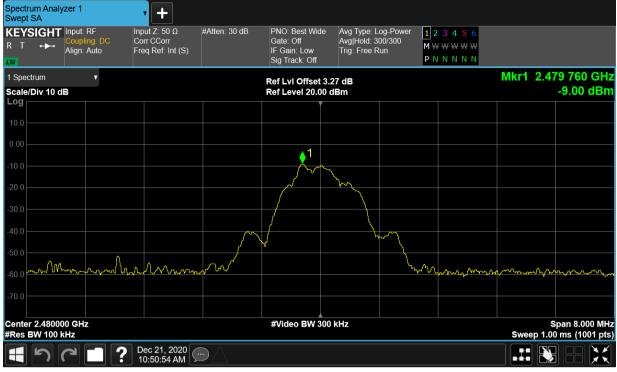


### Band Edge NVNT BLE 2402MHz Ant1 Emission

				. <u>g</u> e		-	-			
Spectrum Ana Swept SA			• +							
<b>KEYSIGH</b>	T Input: I	RF	Input Z: 50 Ω	#Atten: 30 dB	PNO: Fast	Avg Type: L		1 2 3 4 5 6		
RT +>-		ng: DC	Corr CCorr		Gate: Off	Avg Hold: 3		$M \oplus \oplus \oplus \oplus \oplus$		
	Align: .	Auto	Freq Ref: Int (S)		IF Gain: Low Sig Track: Off	Trig: Free F	lun	PNNNN		
LXI					Sig Track. Oil					
1 Spectrum		•			Ref LvI Offset	3 10 dB			Mkr1 2	.401 8 GHz
Scale/Div 10	dB				Ref Level 20.0					-5.57 dBm
Log										
10.0										
0.00										• '
-10.0										<u> </u>
-20.0										DL1 -25.65 dBm
-30.0										
-40.0					. 4					<u> </u>
-50.0					04				<u></u>	<u>2                               </u>
-60.0	manthermo		₩₩ <b>₽₩₩₽₩₩₽₩₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽</b>	᠋᠕ᢪᢩᡰᡊᡜᢢᢎᡊ᠋ᡀᢍᡒᡄᡊᢕᢛᡃᡳᢛᡪ᠆ᡱᡪᠶ	where the second of the second	and hyperson possible and the state	me	- Marine Contraction	anter the second server	muse im
-70.0										
Start 2.30600	CH-				#Video BW 3				Sta	op 2.40600 GHz
#Res BW 100					#VIGEO BVV 5					) ms (1001 pts)
									Jweep 5.00	/ ms (1001 pts)
5 Marker Table		•								
	<b>-</b>	0	×		Y		-		Europetica	N /- I
Mode 1 N	Trace	Scale	X 24	01 8 GHz	-5.574 dBm	Function	F	unction Width	Function	value
2 N		f		00 0 GHz	-58.47 dBn					
3 N	1	f		90 0 GHz	-57.70 dBm					
4 N	1	f		51 3 GHz	-55.69 dBm					
5										
6										
			D 01 0000	<u> </u>						
1	C		Dec 21, 2020 10:45:12 AM							
			10.45.12 AM							



## Band Edge NVNT BLE 2480MHz Ant1 Ref



# Band Edge NVNT BLE 2480MHz Ant1 Emission

	Input: F Couplin Align: A	ng: DC	Cor	ut Ζ: 50 Ω r CCorr q Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Lo Avg Hold: 30 Trig: Free Ri	)0/300	1 2 3 4 5 6 M W W W W P N N N N N		
Spectrum ale/Div 10 (	B	V				Ref LvI Offset Ref Level 20.0				Mkr1	2.479 8 G -8.99 dB
g						Ţ					
0.0											
.0											
.0											DL1 -29.00
.0			. 4								
0	_		-04	<u>}3</u>							
.0	hang Karanda	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		₺ <i>₶</i> ₽~₽₽~₩₽~₩₽		have been and the second of th	╱ <b>Ŧ</b> ₿ŗ₽⋍₼ <mark>₽</mark> ſ₽⋍⋆ϭ <sub>ϒ</sub> ┈ͻϺͻͷ·ͻϼϺ	การการสมายระจ	anife malassalles and	how por por	
.0											
rt 2.47600 es BW 100						#Video BW 3	00 kHz				60 ms (1001
larker Table		•									
	Trace	Scale		Х		Y	Function	Fu	Inction Width	Functi	on Value
Mode		f			79 8 GHz	-8.990 dBm					
1 N	1				00 E CU-	-58.44 dBm					
1 N 2 N	1	f			83 5 GHz						
1 N 2 N 3 N	1	f		2.5	00 0 GHz	-59.04 dBm					
1 N 2 N				2.5							
1 N 2 N 3 N 4 N	1	f		2.5	00 0 GHz	-59.04 dBm					



#### Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-44.02	-20	Pass
NVNT	BLE	2442	Ant1	-41.80	-20	Pass
NVNT	BLE	2480	Ant1	-36.18	-20	Pass



# Tx. Spurious NVNT BLE 2402MHz Ant1 Emission

Cale/Div 10 dB     Ref Level 20.00 dBm     -1       00 00 00 00 00 00 00 00 00 00 00 00 00	
Ref Level 20.00 dBm     -1       29     1 <td< th=""><th>2.402 G</th></td<>	2.402 G
3     4     5       3     4     5       4     5       4     7       4     1       6     1       2     N       1     1       2     N       1     1       1     1       2     N       1     1 <td>-14.98 dE</td>	-14.98 dE
1     1 <td></td>	
0       0	
0     3     4     5       1     3     4     5       Mode     Trace     Scale     X       1     N     1     f       2     N     1     f       2     N     1     f       2     N     1     f       3     N     1     f       2     N     1     f       3     N     1     f       3     N     1     f       3     N     1     f       4     N     1     f       5     N     1     f       9     0.643     6Hz     -54.07	
Mode     Trace     Scale     X     Y     Function     Function Width     Function V       1     N     1     f     23.776 GHz     -49.61 dBm     -49.61 dBm       3     N     1     f     7.346 GHz     -53.25 dBm     -54.55 dBm       5     N     1     f     9.643 GHz     -54.07 dBm     -54.07 dBm	
Mode     Trace     Scale     X     Y     Function     Function Width     Function V       1     N     1     f     23.776 GHz     -49.61 dBm     -49.61 dBm       2     N     1     f     23.776 GHz     -49.61 dBm     -49.61 dBm       3     N     1     f     7.346 GHz     -53.25 dBm     -53.25 dBm       4     N     1     f     9.643 GHz     -54.07 dBm     -54.07 dBm	DL1 -25.59
0     3     4     3     4     3       1     0     4     4     4     4       1     1     1     1     1     2     2     14.98 dBm       2     N     1     1     1     23.776 GHz     -49.61 dBm       3     N     1     1     7     7.346 GHz     -53.20 dBm       4     N     1     1     7     7.346 GHz     -54.07 dBm	
Mode     Trace     Scale     X     Y     Function     Function Width     Function N       1     N     1     f     23.776     GHz     -49.61     dBm       2     N     1     f     23.776     GHz     -49.61     dBm       3     N     1     f     7.346     GHz     -53.25     dBm       4     N     1     f     7.346     GHz     -54.07     dBm	<u>+</u> ^2
Mode         Trace         Scale         X         Y         Function         Function         Width         Function         Vidth         Function         Vid	and all and a stand and a st
Mode     Trace     Scale     X     Y     Function     Function     Video       Mode     Trace     Scale     X     Y     Function     Function     V       1     N     1     f     23.776     GHz     -49.61     dBm       2     N     1     f     23.776     GHz     -49.61     dBm       3     N     1     f     7.346     GHz     -54.50     dBm       4     N     1     f     7.346     GHz     -54.55     dBm       5     N     1     f     9.643     GHz     -54.07     dBm	
Mode         Trace         Scale         X         Y         Function         Function Width         Function Vidth         Functio Vidth         Func	
Mode         Trace         Scale         X         Y         Function         Function         Violation         Vi	Stop 25.00 0
Mode         Trace         Scale         X         Y         Function         Function Width         Function V           1         N         1         f         2.402 GHz         -14.98 dBm	2.49 s (1001
1         N         1         f         2.402 GHz         -14.98 dBm           2         N         1         f         23.776 GHz         -49.61 dBm           3         N         1         f         4.94 gHz         -53.20 dBm           4         N         1         f         7.346 GHz         -54.55 dBm           5         N         1         f         9.643 GHz         -54.07 dBm	
1         N         1         f         2.402 GHz         -14.98 dBm           2         N         1         f         23.776 GHz         -49.61 dBm           3         N         1         f         4.94 gHz         -53.20 dBm           4         N         1         f         7.346 GHz         -54.55 dBm           5         N         1         f         9.643 GHz         -54.07 dBm	
2         N         1         f         23.776 GHz         -49.61 dBm           3         N         1         f         4.949 GHz         -53.20 dBm           4         N         1         f         7.346 GHz         -54.55 dBm           5         N         1         f         9.643 GHz         -54.07 dBm	
3         N         1         f         4.949 GHz         -53.20 dBm           4         N         1         f         7.346 GHz         -54.55 dBm           5         N         1         f         9.643 GHz         -54.07 dBm	n Value
4         N         1         f         7.346 GHz         -54.55 dBm           5         N         1         f         9.643 GHz         -54.07 dBm	n Value
	n Value
6	n Value
	n Value
	n Value



# Tx. Spurious NVNT BLE 2442MHz Ant1 Ref



# Tx. Spurious NVNT BLE 2442MHz Ant1 Emission

ept SA	_		•							
T + <b>→</b> +	Input: F Couplir Align: A	ng: DC	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log Avg Hold: 10/ Trig: Free Ru	10	1 2 3 4 5 6 M₩₩₩₩₩₩ P N N N N N		
pectrum		•			Ref LvI Offset	3.23 dB		·	Mkr1	2.452 G
ale/Div 10	dB				Ref Level 20.00					-21.73 dE
<b>g</b>					Ĭ					
.0										
.0										
0		<u> </u>								DL1 -27.48
0										DL1-27.40
0	I		A <b>3</b>	۸ <b>. ۸</b> ۸	5					
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.0										
.0										
rt 30 MHz					#Video BW 30	00 kHz			Sweep ~:	Stop 25.00 ( 2.49 s (1001 )
es BW 100	kHz		,							
	kHz	v								
	kHz Trace	▼ Scale	x		Y	Function	Fi	unction Width	Functio	on Value
arker Table Mode 1 N	Trace	Scale		2.452 GHz	-21.73 dBm		Fi	unction Width	Functio	
larker Table Mode 1 N 2 N	Trace 1 1	Scale f	24	4.026 GHz	-21.73 dBm -49.28 dBm		Fi	unction Width	Functio	
larker Table Mode 1 N 2 N 3 N	Trace 1 1 1	Scale f f f	24	4.026 GHz 4.899 GHz	-21.73 dBm -49.28 dBm -52.99 dBm		Fi	unction Width	Functio	
larker Table Mode 1 N 2 N 3 N 4 N	Trace 1 1 1 1	Scale f f f f	24	4.026 GHz 4.899 GHz 7.246 GHz	-21.73 dBm -49.28 dBm -52.99 dBm -54.09 dBm		Fu	unction Width	Functio	
larker Table Mode 1 N 2 N 3 N	Trace 1 1 1	Scale f f f	24	4.026 GHz 4.899 GHz	-21.73 dBm -49.28 dBm -52.99 dBm		F	unction Width	Functio	
1 N 2 N 3 N 4 N 5 N	Trace 1 1 1 1	Scale f f f f	24 24 7 8	4.026 GHz 4.899 GHz 7.246 GHz	-21.73 dBm -49.28 dBm -52.99 dBm -54.09 dBm		F	unction Width	Functio	on Value



# Tx. Spurious NVNT BLE 2480MHz Ant1 Ref



# Tx. Spurious NVNT BLE 2480MHz Ant1 Emission

Log 10.0 0.00 -10.0 2.00 -30.0 -40.0 -50.0 -60.0 -70.0	
Ker Level 20.00 dBm     -12.       .00     .00     .00       .00     .00	
000000000000000000000000000000000000	
0.0     1<	36 dE
00     1 </td <td></td>	
000     000 <td></td>	
Mode     Trace     Scale     X     Y     Function     Function Width     Function Valu       1     N     1     f     2.477 GHz     -12.36 dBm     -12.36 dBm       2     N     1     f     5.498 GHz     -45.17 dBm       3     N     1     f     5.498 GHz     -45.17 dBm       3     N     1     f     5.498 GHz     -45.37 dBm       5     N     1     f     7.271 GHz     -53.36 dBm	
Mode     Trace     Scale     X     Y     Function     Function Width     Function Value       1     N     1     f     2.477 GHz     -12.36 dBm     -12.36 dBm       2     N     1     f     5.498 GHz     -45.17 dBm	L1 -28.99 (
Mode         Trace         Scale         X         Y         Function         Function Width         Function Value           1         N         1         f         2.477 GHz         -12.36 dBm         - <td>_1-28.99 (</td>	_1-28.99 (
Mode         Trace         Scale         X         Y         Function         Function Width         Function Value           1         N         1         f         2.477 GHz         -12.36 dBm         <	
Mode         Trace         Scale         X         Y         Function         Function         Width         Function         Value           1         N         1         f         2.477 GHz         -12.36 dBm         -	ware and the
Mode     Trace     Scale     X     Y     Function     Function Width     Function Value       1     N     1     f     2.477 GHz     -12.36 dBm	
es BW 100 kHz Sweep ~2.49 s Marker Table r Mode Trace Scale X Y Function Width Function Value 1 N 1 f 2.477 GHz -12.36 dBm 2 N 1 f 5.498 GHz -45.17 dBm 3 N 1 f 5.024 GHz -52.77 dBm 4 N 1 f 7.271 GHz -53.36 dBm 5 N 1 f 9.743 GHz -54.05 dBm	
Mode         Trace         Scale         X         Y         Function         Function Width         Function Value           1         N         1         f         2.477 GHz         -12.36 dBm              Function Width         Function Value               Function Width         Function Value                    Function Width         Function Value	25.00 C
I         N         1         f         2.477 GHz         -12.36 dBm           2         N         1         f         5.498 GHz         -45.17 dBm           3         N         1         f         5.024 GHz         -52.77 dBm           4         N         1         f         7.271 GHz         -53.36 dBm           5         N         1         f         9.743 GHz         -54.05 dBm	
2         N         1         f         5.498 GHz         -45.17 dBm           3         N         1         f         5.024 GHz         -52.77 dBm           4         N         1         f         7.271 GHz         -53.36 dBm           5         N         1         f         9.743 GHz         -54.05 dBm	ue
3         N         1         f         5.024 GHz         -52.77 dBm           4         N         1         f         7.271 GHz         -53.36 dBm           5         N         1         f         9.743 GHz         -54.05 dBm	
4         N         1         f         7.271 GHz         -53.36 dBm           5         N         1         f         9.743 GHz         -54.05 dBm	
5 N 1 f 9.743 GHz -54.05 dBm	
L つ C I ? Dec 21, 2020 💬	



# Appendix A – BLE -2M

# Test Data

### Maximum Conducted Output Power

Condition	Mode	Frequency	Antenna	Conducted	Duty	Total	Limit	Verdict
		(MHz)		Power	Factor	Power	(dBm)	
				(dBm)	(dB)	(dBm)		
NVNT	BLE	2402	Ant1	-5.832	0	-5.832	30	Pass
NVNT	BLE	2442	Ant1	-7.698	0	-7.698	30	Pass
NVNT	BLE	2480	Ant1	-9.304	0	-9.304	30	Pass

## Power NVNT BLE 2402MHz Ant1





# Power NVNT BLE 2442MHz Ant1



# Power NVNT BLE 2480MHz Ant1

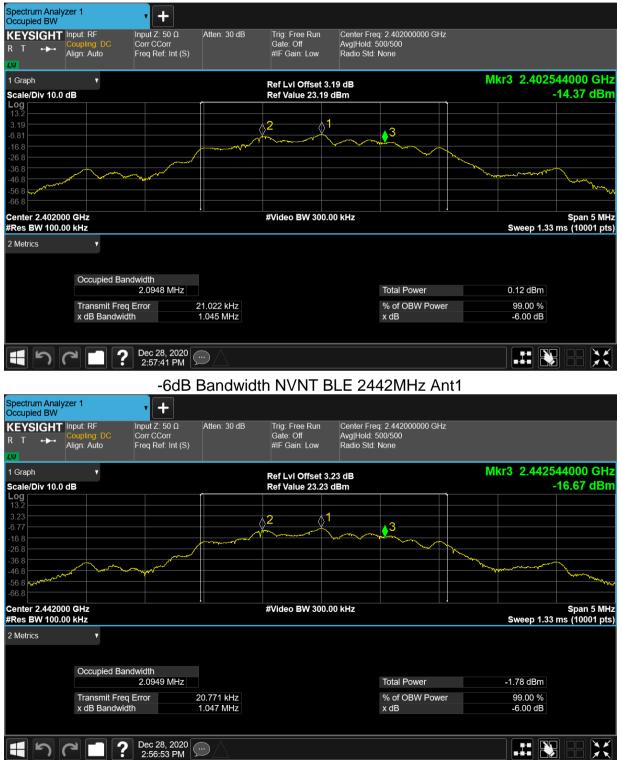




#### -6dB Bandwidth

Condition	Mode	Frequency	Antenna	-6 dB Bandwidth	Limit -6 dB	Verdict
		(MHz)		(MHz)	Bandwidth (MHz)	
NVNT	BLE	2402	Ant1	1.045	0.5	Pass
NVNT	BLE	2442	Ant1	1.047	0.5	Pass
NVNT	BLE	2480	Ant1	1.043	0.5	Pass

### -6dB Bandwidth NVNT BLE 2402MHz Ant1



JianYan Testing Group Shenzhen Co., Ltd. No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366 Project No.: JYTSZE2012001



### -6dB Bandwidth NVNT BLE 2480MHz Ant1

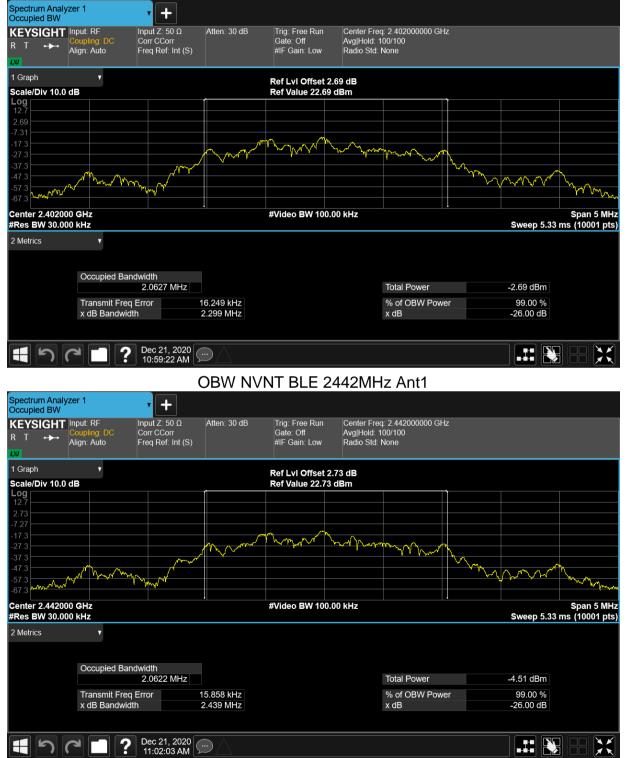




#### **Occupied Channel Bandwidth**

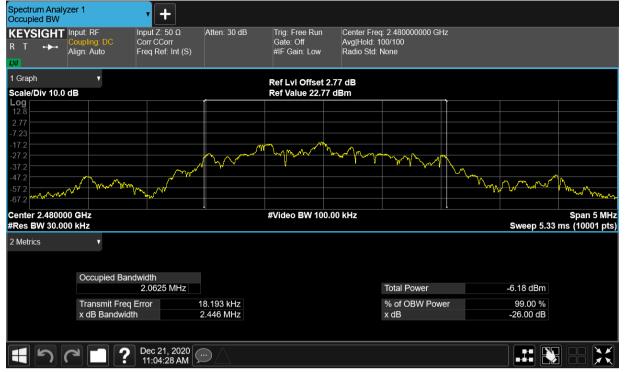
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE	2402	Ant1	2.062722291
NVNT	BLE	2442	Ant1	2.062230066
NVNT	BLE	2480	Ant1	2.062528216

### OBW NVNT BLE 2402MHz Ant1





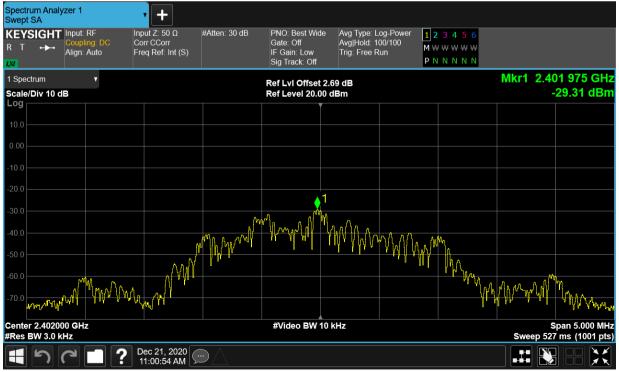
### OBW NVNT BLE 2480MHz Ant1



#### **Maximum Power Spectral Density Level**

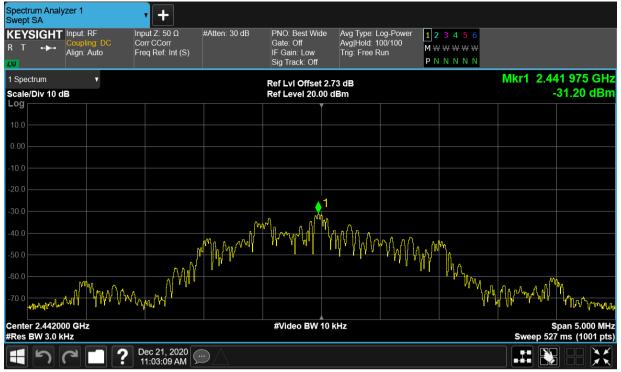
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	-29.311	8	Pass
NVNT	BLE	2442	Ant1	-31.198	8	Pass
NVNT	BLE	2480	Ant1	-32.741	8	Pass

## PSD NVNT BLE 2402MHz Ant1

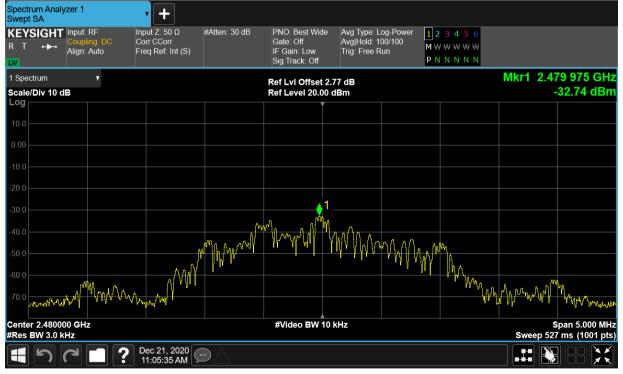




## PSD NVNT BLE 2442MHz Ant1



# PSD NVNT BLE 2480MHz Ant1





#### **Band Edge**

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-49.79	-20	Pass
NVNT	BLE	2480	Ant1	-46.57	-20	Pass





### Band Edge NVNT BLE 2402MHz Ant1 Emission

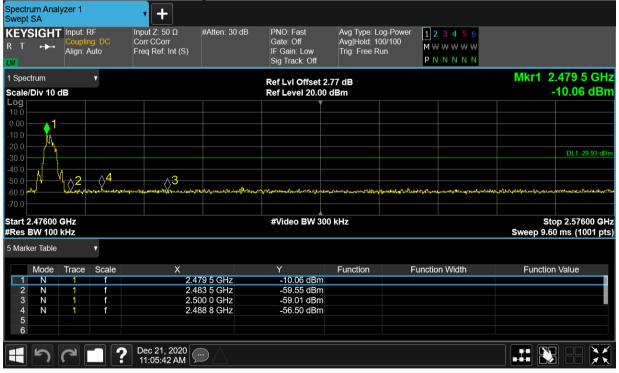
_					. <u>ge</u>						
Spectru Swept S	SA .	·		<b>•</b> +							
KEYS	IGHT	Input: I	RF	Input Z: 50 Ω	#Atten: 30 dB	PNO: Fast	Avg Type: L		1 2 3 4 5 6		
RT	••••	Coupli	ng: DC	Corr CCorr		Gate: Off	Avg Hold: 1		M ** ** ** **		
		Align: /	Auto	Freq Ref: Int (S)		IF Gain: Low	Trig: Free F	Run	PNNNN		
LXI						Sig Track: Off			PININININ		
1 Spectr	rum		•			Ref LvI Offset	2 60 dB			Mkr1	2.401 5 GH
Scale/E	)iv 10 c	IB				Ref Level 20.0					-6.43 dBn
Log											
10.0											
0.00											∮1
-10.0											
-20.0											DL1 -26.66 dBn
-30.0											$\wedge 2$
-40.0										4	+ <del>χ</del> μ
-50.0										ე <mark>4∧3</mark>	
-60.0 🟎	14 Concertant	margan	phonon-form	anger and the second	all and a strange of the second s	where and the second	hurdappedants ying	Allow Annul	parter and and a second s	had an and a second	www.conce by
-70.0											
Start 2.	30600 (	247				#Video BW 3	00 kHz			e	top 2.40600 GHz
#Res B						#VIGEO BVV 5					60 ms (1001 pts
5 Marke	r lable		•								
	Mode	Trace	Scale	Х		Y	Function	F	unction Width	Functio	on Value
1	Ν	1	f		01 5 GHz	-6.429 dBm					
2	N	1	f		00 0 GHz	-41.67 dBm					
3	N	1	f		90 0 GHz	-58.66 dBm					
4 5	Ν	1		2.3	85 5 GHz	-56.45 dBm					
5 6											
	5			Dec 21, 2020							
	- )			11:01:01 AM	$\mathbb{D}$						5 66 🕅







# Band Edge NVNT BLE 2480MHz Ant1 Emission





### Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-42.07	-20	Pass
NVNT	BLE	2442	Ant1	-40.53	-20	Pass
NVNT	BLE	2480	Ant1	-39.05	-20	Pass



5 Marker Table 🔹 🔻

		_		V	M			
	Mode	Trace	Scale	X	Ŷ	Function	Function Width	Function Value
1	Ν	1	f	2.412 GHz	-14.16 dBm			
2	Ν	1	f	25.679 GHz	-48.68 dBm			
3	Ν	1	f	4.768 GHz	-52.84 dBm			
4	N	1	f	7.071 GHz	-54.57 dBm			
5	Ν	1	f	9.480 GHz	-54.55 dBm			
6								
	ら	2		Dec 21, 2020				



# Tx. Spurious NVNT BLE 2442MHz Ant1 Ref



# Tx. Spurious NVNT BLE 2442MHz Ant1 Emission

Spectru Swept S KEYS R T		Input: f	ng: DC	Co	ut Z: 50 Ω rr CCorr q Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: I Avg Hold: 1 Trig: Free F	10/10	1 2 3 4 5 6 M \vee vee vee vee P N N N N N N		
1 Spect			T				Ref LvI Offset	2.73 dB			Mkr1	2.439 GHz
	Div 10 c	B					Ref Level 20.0	0 dBm				-8.50 dBm
Log 10.0							Ĭ					
0.00		<b>^</b> '1										
-10.0		<u> </u>										
-20.0												DL1 -28.54 dBm
-30.0		<mark></mark> †										DE1-20.34 (D)
-40.0	<mark>⊘2</mark> _				3 ⊘4	5						
-50.0		mandon	w-~~~~	~~~X	man	som enserver	ant the state of the second state of the secon	all and a second and a second and	-rul-marm	- the second and the second second	and the state and the state of	and the second sec
-70.0												
Start 3 #Res E	0 MHZ 3W 100	kH7					#Video BW 3	UU KHZ				Stop 26.50 GHz .57 s (1001 pts)
5 Marke			v									
	Mode	Trace	Scale		Х		Y	Function	Fi	unction Width	Function	n Value
1	N	1	f			.439 GHz	-8.501 dBm					
2	N	1	f f			904 MHz	-49.07 dBm					
3 4	N N	1 1	f f			.033 GHz .256 GHz	-53.52 dBm -54.58 dBm					
5	N	1	f			.797 GHz	-54.43 dBm					
6												
	5	6		<b>P</b> De 1'	ec 21, 2020 1:03:44 AM							







# Tx. Spurious NVNT BLE 2480MHz Ant1 Emission

Spectrum A Swept SA				• +							
KEYSIGI R T ↔	Col	ut: RF upling: DC jn: Auto	C	put Ζ: 50 Ω orr CCorr eq Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Avg Hold: Trig: Free	10/10	1 2 3 4 5 6 M \ \ \ \ \ \ \ \ \ \ \ \ \ P N N N N N N		
1 Spectrum		•				Ref Lvl Offset	2.77 dB			Mkr1	2.492 GH
Scale/Div 1	10 dB					Ref Level 20.0	0 dBm				-20.62 dBn
Log						T T					
10.0											
10.0		1									
20.0		<u>•</u>									
30.0											DL1 -30.05 dBi
40.0			0	3	4 • 5						2
50.0		a manager	Surla way	I am a source	4 05	manulation manual	ووالعدر ومعالم ومقدمه المالي	harden werden der	Proget of the second	and the state of t	al management of the second
60.0 <b></b>	whyter and										
70.0											
tart 30 MH Res BW 1						#Video BW 3	00 kHz				Stop 26.50 GH .57 s (1001 pt:
Marker Tat	ble	▼									
Mod	le Tra	ce Sca	le	Х		Y	Function	F	unction Width	Functio	n Value
1 N	1	f			.492 GHz	-20.62 dBm					
2 N					.209 GHz	-49.10 dBm					
3 N 4 N					.980 GHz .627 GHz	-53.00 dBm -54.72 dBm					
4 N 5 N					.027 GHz .771 GHz	-54.53 dBm					
6						01.00 dBi					
ר <del> </del>	5		?	Dec 21, 2020 11:06:17 AM							

-----End of report-----