

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel: +86-755- 27521059 Fax: +86-755- 27521011 Http://www.sz-ctc.org.cn

Г	EST REPORT					
Report No. ·····:	CTC20210023E11					
FCC ID:	2APPZ-I56A					
Applicant	Fanvil Technology Co., Ltd					
Address	-	10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, China				
Manufacturer	Fanvil Technology Co., Ltd					
Address······:	10/F Block A, Dualshine Global Scient Honglang North 2nd Road, Bao'an Dis					
Product Name······:	Indoor Station					
Trade Mark······:	Fanvil Fanvil					
Model/Type reference······:	i56A					
Listed Model(s) ······:	NA					
Standard:	FCC CFR Title 47 Part 15 Subpart C Section 15.247					
Date of receipt of test sample:	Jan. 15, 2021					
Date of testing	Jan. 16, 2021 to Jan. 30, 2021					
Date of issue	Feb. 3, 2021					
Result:	PASS					
Compiled by:						
(Printed name+signature)	Lucy Lan	Miller Ma				
Supervised by:		ndillor Ma				
(Printed name+signature)	Miller Ma	1110(8) 1110				
Approved by:		t al				
(Printed name+signature)	Walter Chen water chrs					
Testing Laboratory Name	Testing Laboratory Name CTC Laboratories, Inc.					
Address	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park,					
	Longhua District, Shenzhen, Guangdong, China					
This test report may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client						

This test report may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CTC. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CTC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.



Table of Contents

Page

1.	TEST	SUMMARY	. 3
2	1.1.	Test Standards	.3
2	1.2.	REPORT VERSION	.3
-	1.3.	TEST DESCRIPTION	
-	1.4.	TEST FACILITY	.5
-	1.5.	Measurement Uncertainty	
-	1.6.	ENVIRONMENTAL CONDITIONS	.6
2.	GENI	ERAL INFORMATION	. 7
2	2.1.	CLIENT INFORMATION	
2	2.2.	GENERAL DESCRIPTION OF EUT	.7
2	2.3.	OPERATION STATE	-
2	2.4.	Measurement Instruments List	.9
3.	TEST	ITEM AND RESULTS	11
3	3.1.	CONDUCTED EMISSION	11
3	3.2.	RADIATED EMISSION	14
3	3.3.	BAND EDGE EMISSIONS	45
3	3.4.	Occupied Channel Bandwidth and 20DB Bandwidth	
3	3.5.	CHANNEL SEPARATION	59
3	3.6.	NUMBER OF HOPPING CHANNEL	
3	3.7.	DWELL TIME	
3	3.8.	PEAK OUTPUT POWER	
3	3.9.	ANTENNA REQUIREMENT	35



1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revised No.	Date of issue	Description
01	Feb. 3, 2021	Original



1.3. Test Description

FCC Part 15 Subpart C (15.247)					
Toot How	Standard Section	Decult	T . (F .)		
Test Item	FCC	Result	Test Engineer		
Antenna Requirement	15.203	Pass	Lucy Lan		
Conducted Emission	15.207	Pass	Jon Huang		
Restricted Bands	15.205	Pass	Lucy Lan		
Hopping Channel Separation	15.247(a)(1)	Pass	Lucy Lan		
Dwell Time	15.247(a)(iii)	Pass	Lucy Lan		
Peak Output Power	15.247(b)(1)	Pass	Lucy Lan		
Number of Hopping Frequency	15.247(a)(iii)	Pass	Lucy Lan		
Band Edge Emissions	15.247(d)	Pass	Lucy Lan		
Radiated Spurious Emission	15.247(d)&15.209	Pass	Lucy Lan		
99% Occupied Bandwidth & 20dB Bandwidth	15.247(a)	Pass	Lucy Lan		

Note: The measurement uncertainty is not included in the test result.



Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

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

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) f or the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in th e identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Indus try Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (F CC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth		(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa



2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Fanvil Technology Co., Ltd	
Address:	10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, China	
Manufacturer:	Fanvil Technology Co., Ltd	
Address:	10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, China	

2.2. General Description of EUT

Product Name:	Indoor Station
Trade Mark:	Fanvil Fanvil
Model/Type reference:	i56A
Listed Model(s):	NA
Power supply:	12Vdc, 1A (optional) or 48Vdc, 0.3A (POE)
Hardware version:	N/A
Software version:	N/A
BT 5.0+BLE	
Modulation:	GFSK, π/4-DQPSK, 8-DPSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	1MHz
Antenna type:	FPC Antenna
Antenna gain:	3dBi



2.3. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT EDR, 79 channels are provided to the EUT. Channels 00/39/78 were selected for testing.

Operation Frequency List:

Channel	Frequency (MHz)
00	2402
01	2403
:	÷
38	2440
39	2441
40	2442
:	÷
77	2479
78	2480

Note: The display in grey were the channel selected for testing.

Test mode

For RF test items:

The engineering test program was provided and enabled to make EUT continuous transmit

For AC power line conducted emissions:

The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.

For Radiated spurious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.



2.4. Measurement Instruments List

Tonscer	Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 25, 2021	
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2021	
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 25, 2021	
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 25, 2021	
5	Power Sensor	Agilent	U2021XA	MY5365004	Dec. 25, 2021	
6	Power Sensor	Agilent	U2021XA	MY5365006	Dec. 25, 2021	
7	Simultaneous Sampling DAQ	Agilent	U2531A	TW54493510	Dec. 25, 2021	
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec. 25, 2021	
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 25, 2021	
10	Climate Chamber	ESPEC	MT3065	/	Dec. 25, 2021	
11	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 25, 2021	
12	300328 v2.2.2 test system	TONSCEND	v2.6	/	/	

Radiate	Radiated Emission and Transmitter spurious emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	
1	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 25, 2021	
2	High pass filter	micro-tranics	HPM50111	142	Dec. 25, 2021	
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 25, 2021	
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 25, 2021	
5	Loop Antenna	LAPLAC	RF300	9138	Dec. 25, 2021	
6	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 25, 2021	
7	Horn Antenna	Schwarzbeck	BBHA 9120D	647	Dec. 25, 2021	
8	Pre-Amplifier	HP	8447D	1937A03050	Dec. 25, 2021	
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 25, 2021	
10	Antenna Mast	UC	UC3000	N/A	N/A	
11	Turn Table	UC	UC3000	N/A	N/A	
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Dec. 25, 2021	
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Dec. 25, 2021	
14	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 25, 2021	
15	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Dec. 25, 2021	

CTC Laboratories, Inc.

中国国家认证认可监督管理委员会 EN

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn 近认可监督管理委员会 For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn



16	RF Connection Cable	Chengdu E-Microwave			Dec. 25, 2021
17	High pass filter	Compliance Direction systems	BSU-6	34202	Dec. 25, 2021
18	Attenuator	Chengdu E-Microwave	EMCAXX-10R NZ-3		Dec. 25, 2021
19	High and low temperature box	ESPEC	MT3065	12114019	Dec. 25, 2021

Conduc	ted Emission				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	Rohde & Schwarz	ENV216	101112	Dec. 25, 2021
2	LISN	Rohde & Schwarz	ENV216	101113	Dec. 25, 2021
3	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 25, 2021

Note:1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.



3.1. Conducted Emission

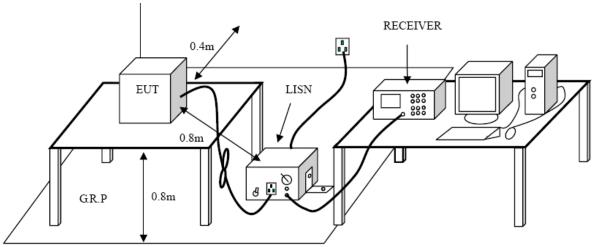
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207

	Limit (dBuV)				
Frequency range (MHz)	Quasi-peak	Average			
0.15-0.5	66 to 56*	56 to 46*			
0.5-5	56	46			
5-30	60	50			

* Decreases with the logarithm of the frequency.

Test Configuration



Test Procedure

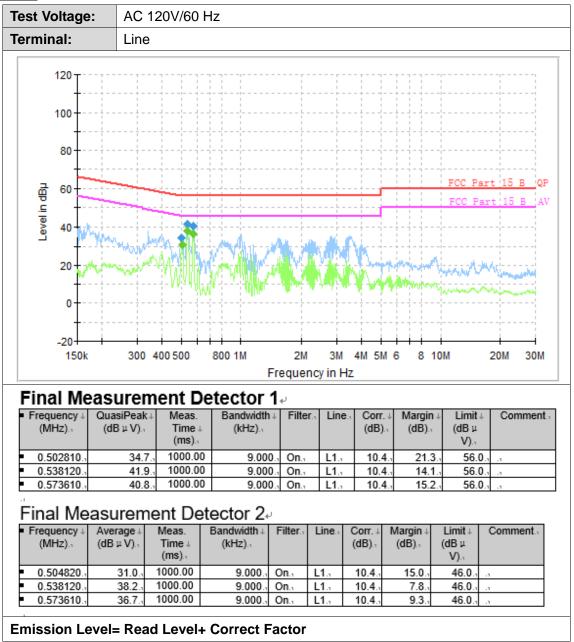
- 1. The EUT was setup according to ANSI C63.10:2013 requirements.
- 2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
- 3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
- 4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
- 5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- 6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode

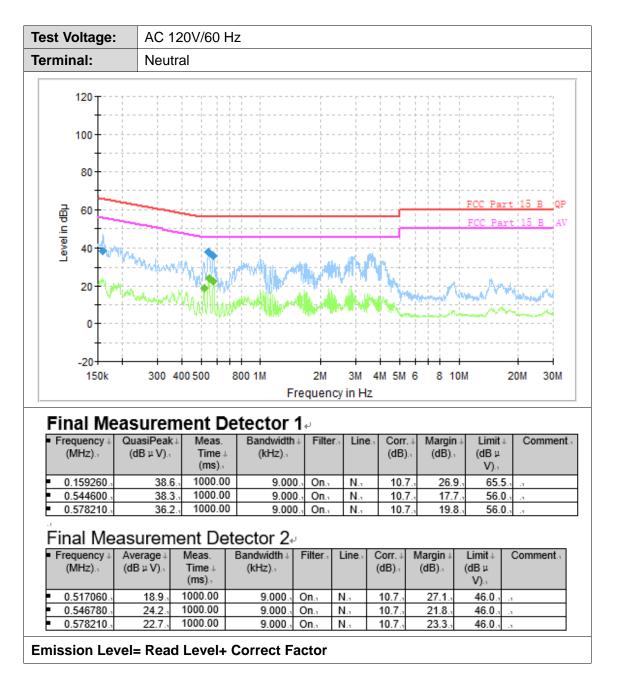
Please refer to the clause 2.3.

CTC Laboratories, Inc. 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel.: (86)755-27521059 中国国家认证认可监督管理委员会 CTC Laboratories, Inc. Fax: (86)755-27521011 Http://www.sz-ctc.org.cn For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <u>yz.cnca.cn</u>











<u>Limit</u>

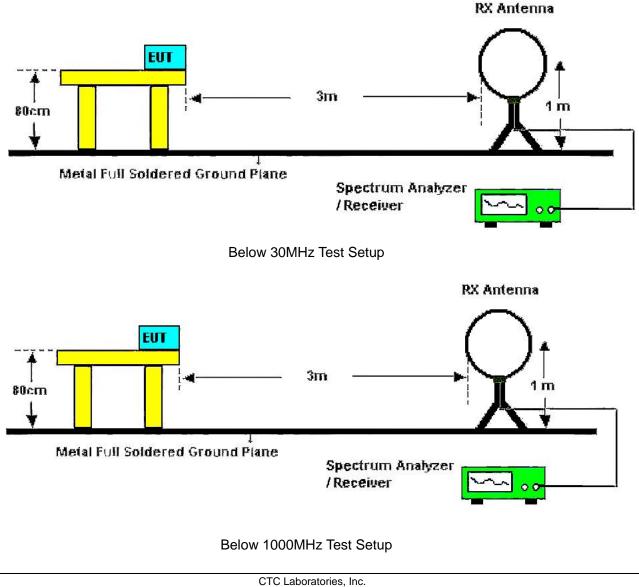
FCC CFR Title 47 Part 15 Subpart C Section 15.209

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 CUIT	54.00	Average
Above 1 GHz	74.00	Peak

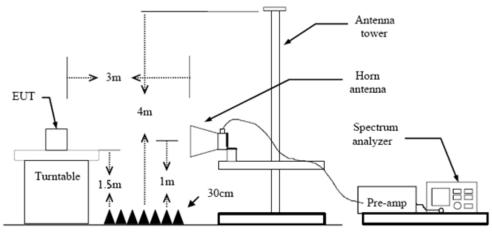
Conducted Emission limit: The highest point of the operating frequency waveform down 20dB Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration







Above 1GHz Test Setup

Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013
- 2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
- For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna 4. tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
- 5. Set to the maximum power setting and enable the EUT transmit continuously.
- 6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

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.

(3) From 1 GHz to 10^{th} harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW=3MHz RMS detector for Average value.

Test Mode

Please refer to the clause 2.3.

Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

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



	ol.	Hori	zontal					
90.0 d	BuV/m							
_						F	CC Part15 Cla	ss C
_							Margin	-6 dB
40								6
						*	5 X	Å.
		1		2	A	M	he has	AV July M
	manual ma	, M	ma	wow how may	Var Whenny	WW WW	A CONTRACTION OF THE	
week	water and the second	www.	The have	V. T				
10 30.000	40 50	60 7	70 80	(MHz)		00 400 5	00 600 70	0 1000.00
30.000	40 30	60 7	0 00	(MIIZ)	3	JU 400 3	00 800 70	0 1000.00
No.	Freque		Factor	Reading	Level	Limit	Margin	Detector
NO.	(MHz	z)	(dB/m)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	Detector
		/						
1	69.11	<i>′</i>	-20.24	37.67	17.43	40.00	-22.57	QP
1	69.11 180.64	ý 41	-20.24 -19.30	37.67 39.57	17.43 20.27	40.00 43.50	-22.57 -23.23	
		41 488	-					QP
2	180.64	41 488 931	-19.30	39.57	20.27	43.50	-23.23	QP QP
2	180.64 229.29	41 488 931 319	-19.30 -19.88	39.57 42.52	20.27 22.64	43.50 46.00	-23.23 -23.36	QP QP
2 3 4	180.64 229.29 400.43	41 488 931 319 458	-19.30 -19.88 -15.77	39.57 42.52 46.41	20.27 22.64 30.64	43.50 46.00 46.00	-23.23 -23.36 -15.36	QP QP QP



	l.	Vert	ical					
10.0 dBu	uV/m							
						FI	CC Part15 Cla	
							Margin	-6 dB
40								6 X
	į,			4			5 X	
	<u>~</u> Ĩ.ĭ.	× X		mm .			1. 44	Miller
1	Wr -	~ 1		1 hours		producted Alberrach	Ander Marke	No. Manuara
had a		- V I	1 L MV 1					
*		×	human		" Uhant	harden		
~		\sim	how	,	" Uhanb	Wighert and the contract		
*		~	Low .		Uhanb	yndud de alles		
0	40 50	60 7	0 80	(MHz)				0 1000.0
0 30.000	40 50	60 7	0 80	(MHz)	30		00 600 70	0 1000.0
30.000	40 50		0 80 Factor	(MHz) Reading			00 600 70	
- L		ncy			30	0 400 5 Limit		0 1000.0
30.000	Freque	ncy :)	Factor	Reading	Level	0 400 5 Limit	00 600 70 Margin	
30.000 No.	Frequer (MHz	ncy :) 15	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	∞ 400 5 Limit (dBuV/m)	00 600 70 Margin (dB)	Detector
30.000 No.	Frequer (MHz 41.42	ncy :) 15 14	Factor (dB/m) -17.40	Reading (dBuV) 45.22	Level (dBuV/m) 27.82	0 400 5 Limit (dBuV/m) 40.00	00 600 70 Margin (dB) -12.18	Detector QP
30.000 No. 1 2	Frequer (MHz 41.42 49.88	ncy :) 15 14 21	Factor (dB/m) -17.40 -17.77	Reading (dBuV) 45.22 43.39	Level (dBuV/m) 27.82 25.62	0 400 5 Limit (dBuV/m) 40.00 40.00	00 600 70 Margin (dB) -12.18 -14.38	Detector QP QP
30.000 No. 1 2 3	Frequer (MHz 41.42 49.88 68.87	ncy) 15 14 21 508	Factor (dB/m) -17.40 -17.77 -20.19	Reading (dBuV) 45.22 43.39 44.48	Level (dBuV/m) 27.82 25.62 24.29	0 400 5 Limit (dBuV/m) 40.00 40.00	Margin (dB) -12.18 -14.38 -15.71	Detector QP QP QP
30.000 No. 1 2 3 4	Frequer (MHz 41.42 49.88 68.87 139.85	ncy 15 14 21 508	Factor (dB/m) -17.40 -17.77 -20.19 -17.65	Reading (dBuV) 45.22 43.39 44.48 45.11	Level (dBuV/m) 27.82 25.62 24.29 27.46	0 400 5 Limit (dBuV/m) 40.00 40.00 40.00 43.50	Margin (dB) -12.18 -14.38 -15.71 -16.04	Detector QP QP QP QP

Page 17 of 85



4	bo	ve	1	Gł	Ηz
		••		<u> </u>	

	ol.	Hori	zontal					
est M	lode:	TX (GFSK Mode	2402MHz				
emar	'k:		eport for the cribed limit.		which more	than 10 dB I	pelow the	9
110.0 d	lBuV/m							
-					FCC Part	15 Class C 3M Abov	re-1G Peak	
60					FCC P	art15 Class C 3M Al	ove-16 AV	
	2 X							
_								
	*							
10.0								
1000.0	00 3500.00	6000.00	8500.00 110	000.00 13500.00) 16000.00 18	500.00 21000.0	0 2	6000.00 MHz
No.	Freque (MH		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
No. 1	Freque (MH 4803.	z)	Factor (dB/m) -2.82	Reading (dBuV) 36.14		Limit (dBuV/m) 54.00		

Remarks:



Ant. P	ol.	Vert	ical					
Test N	lode:	TX (GFSK Mode	2402MHz				
Rema	rk:		eport for the cribed limit.		vhich more t	han 10 dB t	below the	9
110.0	dBuV/m							
					FCC Par	t15 Class C 3M Abi	ove-16 Peak	
60					FCC	Part15 Class C 3M /	Above-16 AV	
	2						ADOTE-TO AT	
	\$							
	1							
10.0	.000 3500.00	6000.00	8500.00 11	1000.00 13500.0	0 16000.00 1	8500.00 21000.	00	26000.00 MHz
				-				
No.	Freque (MH		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4803	865	-2.82	36.14	33.32	54.00	-20.68	AVG
2	4804	216	-2.82	49.70	46.88	74.00	-27.12	peak
Remar	'ks:							

Page 19 of 85



Ant. Po	I.	Hori	zontal					
Test Mo	de:	тх с	GFSK Mode	e 2441MHz				
Remark	:		eport for th cribed limit	e emission v	which more t	than 10 dB t	below the	;
110.0 dBu	V/m							
					FCC Part	15 Class C 3M Abo	ve-16 Peak	
60					FCC P	art15 Class C 3M A	bove-1G AV	
	*							
	2X							
10.0								
1000.000	3500.00 6	00.00	8500.00 11	000.00 13500.00) 16000.00 18	8500.00 21000.0	JU 2	6000.00 MHz
			Frater	Destine		1 too th		
No.	Freque (MHz		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4881.6	59	-2.60	49.96	47.36	74.00	-26.64	peak
2	4881.9	995	-2.60	36.21	33.61	54.00	-20.39	AVG
Remark								

Page 20 of 85

Remarks:



Ant. Po	l.	Verti	ical					
Test Mo	de:	ТХ С	GFSK Mode	e 2441MHz				
Remark	:		eport for the cribed limit.	e emission v	which more t	than 10 dB I	below the	;
110.0 dB	luV/m							
					FCC Pa	nt15 Class C 3M Al	pove-16 Peak	
60					FCC	Part15 Class C 3M	Above-1G AV	
	1 X							
	ž							
10.0								
	0 3500.00	6000.00	8500.00 1	1000.00 13500.	00 16000.00	18500.00 21000).00	26000.00 MHz
No.	Freque (MH:		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4881.	659	-2.60	49.96	47.36	74.00	-26.64	peak
2	4881.	995	-2.60	36.21	33.61	54.00	-20.39	AVG
Remarks								

Page 21 of 85



Ant. Pol		Horiz	zontal							
Test Mo	de:	TX C	GFSK Mod	le 248	30MHz					
Remark	:		eport for t cribed lim		nission v	vhich m	nore t	han 10 dB l	below the	•
110.0 dBu	i∀/m									
						F	CC Part1	5 Class C 3M Abov	re-16 Peak	
60							FCC Pa	rt15 Class C 3M Al	bove-1G AV	
	1 X									
	×									
10.0	3500.00	5000.00	8500.00	1000.00	13500.00	16000.0	10 18	500.00 21000.0	0 26	000.00 MHz
No.	Freque (MH:		Factor (dB/m)		eading dBuV)	Lev (dBu\		Limit (dBuV/m)	Margin (dB)	Detector
1	4959.	308	-2.38	5	50.05	47.6	67	74.00	-26.33	peak
2	4960.	159	-2.38	3	36.33	33.9	95	54.00	-20.05	AVG
Remarks		Anten	na Factor	(dB/n	n)+Cabl	e Facto	or (dB)-Pre-ampli	ifier Facto	or

Page 22 of 85



Ant. Pol.

em	ark:			eport for the cribed limit.		vhich more t	han 10 dB t	pelow the	•
110.0	0 dBu	iV/m	pies						
						FCC Parl	15 Class C 3M Abo	ve-16 Peak	
60						FCC F	Part15 Class C 3M A	bove-16 AV	
		1	:						
		ž	2						
10.0									
10	000.000	3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000.0	0 2	6000.00 MH
10		Freque		8500.00 11 Factor	000.00 13500.0	0 16000.00 1 Level	21000.00 21000.0 Limit	^{10 2} Margin	
N		(MH	z)	(dB/m)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	Detecto
	1	4959.		-2.38	50.05	47.67	74.00	-26.33	peak
	2	4960.		-2.38	36.33	33.95	54.00	-20.05	AVG

Remarks:



Ant. Po	l.	Hori	zontal										
Test Mo		_		Mode 2402	PMHz								
Remark		No r		e emission v	which more t	han 10 dB t	pelow the	•					
60	uV/m		Image: Sector of the sector of th										
10.0	0 3500.00 E	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000.	00 2	26000.00 MHz					
			Fritz					T					
No.	Freque (MHz	-	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
1	4803.2	279	-2.82	35.51	32.69	54.00	-21.31	AVG					
2	4803.6	63	-2.82	49.58	46.76	74.00	-27.24	peak					
2													

Page 24 of 85

Remarks:



Ant. Pol		Verti	cal					
Test Mo	de:	TX 1	τ/4-DQPSł	K Mode 240	2MHz			
Remark	:		eport for th cribed limit		which more t	han 10 dB l	below the	9
110.0 dB	uV/m							
					FCC Part	15 Class C 3M Abo	ve-16 Peak	
60					FCC F	art15 Class C 3M A	bove-1G AV	
	ž							
	*							
10.0								
1000.00	0 3500.00	6000.00	8500.00 1	1000.00 13500.0	0 16000.00 1	8500.00 21000.0	0 2	6000.00 MHz
No.	Freque (MH		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4803.	'	-2.82	35.51	32.69	54.00	-21.31	AVG
2	4803.	663	-2.82	49.58	46.76	74.00	-27.24	peak

Page 25 of 85

Remarks:



Ant. Po	d.	Horiz	zontal									
Test Mo			π/4-DQF	PSK	Mode 2	2441	MHz					
Remarl	c :	No r		r the	e emissi			more t	han 10 dB	below the)	
110.0 dB	uV/m											
								FCC Par	t15 Class C 3M Ab	ove-16 Peak		
60 FCC Part15 Class C 3M Above-1G AV												
										—		
	ž					+						
10.0	3500.00 60	00.00	8500.00	110	000.00 13	3500.0	0 1600	0.00 1	8500.00 21000	100	26000.00 MHz	7
												-
No.	Frequer (MHz		Facto (dB/m		Readi (dBu	_	Le [.] (dBu		Limit (dBuV/m)	Margin (dB)	Detector	
1	4881.3	51	-2.6)	49.7	5	47	.15	74.00	-26.85	peak	
2	4882.2	60	-2.6	0	35.0	3	32	.43	54.00	-21.57	AVG	Ι
												_
				•	,	Cabl	e Fact	or (de	8)-Pre-ampl	ifier Facto	Dr	

Page 26 of 85

2.Margin value = Level -Limit value



Ant. Pol.	V	/ertical						
Test Mode:		⁻ X π/4-DQF	SK Mo	de 2441	MHz			
Remark:	N		the em		which more t	han 10 dB t	pelow the)
110.0 dBuV/m						15 Class C 3M Abov		
10.0	0.00 6000	.00 8500.00	11000.00	13500.00) 16000.00 18	3500.00 21000.0		6000.00 MHz
	requenc (MHz)		or Re	ading BuV)	Level	Limit (dBuV/m)	Margin (dB)	Detector
1 4	4881.35	1 -2.60) 4	9.75	47.15	74.00	-26.85	peak
2 4	4882.26	0 -2.60) 3	5.03	32.43	54.00	-21.57	AVG
Remarks:								I

Page 27 of 85



Ant. F	Pol.		Hori	zontal										
Test I	Mod	e:	ТХ	π/4-DQ	PSk	K Mode	2480	MHz						
Rema	ark:			eport fo			ion v	vhich	more	than 10) dB	below the	Э	
110.0	dBuV∕	m				_								
									FCC Par	t15 Class C	: ЗМ АЬ	ove-16 Peak		
60									FCC	Part15 Clas	s C 3M	Above-1G AV		
		1 X					_							
_														
_		2 X					_							
10.0														
1000.	000 3	500.00 6	000.00	8500.00	11	000.00 1	3500.0) 1600	0.00 1	8500.00	21000	.00	26000.00 MH	z
No		Freque (MH:	-	Fact (dB/r		Read (dBu	-		vel IV/m)	Lim (dBu\		Margin (dB)	Detector	
1		4959.	385	-2.3	88	48.7	75	46	.37	74.	00	-27.63	peak	Ι
2		4960.	269	-2.3	88	35.2	23	32	.85	54.	00	-21.15	AVG	Ι
	tor (dB/m)+	Cabl	e Fac	tor (dE	8)-Pre-	ampl	ifier Fact	or	

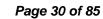
Page 28 of 85



Ant. Po		Verti	cal					
Test Mo	de:	TX 1	τ/4-DQPSK	Mode 2480	MHz			
Remark	:	No r			which more t	han 10 dB t	pelow the	•
	3uV/m				FCC Par	t15 Class C 3M Ab	ove-16 Peak	
60	1				FCC	Part15 Class C 3M	Above-16 AV	
10.0	0 3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000.	.00	26000.00 MHz
No.	Freque (MHz		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4959.3	<i>'</i>	-2.38	48.75	46.37	74.00	-27.63	peak
2	4960.2	269	-2.38	35.23	32.85	54.00	-21.15	AVG
Remark								

Page 29 of 85

Remarks:





Ant. Po	Ι.	Hori	zontal					
est Mo	de:	TX 8	B-DPSK Mo	de 2402MH	Z			
Remark			eport for th cribed limit	e emission \	which more	than 10 dB l	below the	Э
110.0 dBu	ıV/m							
					ELL Ba	rt15 Class C 3M Ab	ove.16 Peak	
						ITTO CIOSS C OM AD	UVC-TUT Cak	
60					FCC	Part15 Class C 3M	Above-16 AV	
	1 *				100			
	2 X							
10.0	3500.00	6000.00	8500.00 11	1000.00 13500.0	0 16000.00 1	18500.00 21000		26000.00 MH
No.	Freque (MH:		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4802.	822	-2.82	50.34	47.52	74.00	-26.48	peak
2	4803.	832	-2.82	35.42	32.60	54.00	-21.40	AVG



	l.	Verti	Vertical								
est Mo	ode:	TX 8	3-DPSK Mo	de 2402MHz	Z						
lemark	(:		eport for the cribed limit.	e emission v	vhich more t	han 10 dB t	pelow the	;			
10.0 dB	uV/m										
60						15 Class C 3M Abo					
0.0	2500.00	000.00	9500.00 11	000.00 12500.0	0 15000 00 1	9500.00 21000	00	26000.00 MI			
	0 3500.00 6	000.00	8500.00 11	000.00 13500.00	0 16000.00 1	8500.00 21000.	00	26000.00 M			
No.	Freque (MHz		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto			
No.		2)						Detector peak			

Remarks:



Ant. Pol.		Hori	zontal					
Test Mod	le:	ТХ 8	B-DPSK Mo	de 2441MH	z			
Remark:			eport for the cribed limit.		vhich more t	than 10 dB I	pelow the	9
110.0 dBuV	/m							
					FCC Par	t15 Class C 3M Abd	ove-1G Peak	
60					FCC	Part15 Class C 3M /	Above 15 AV	
	2					altij class c 3m /	40046-10 24	
	2 X							
	×							
10.0	2500.00	00.00	0500.00.11	000.00 13500.0	0 16000.00 1	8500.00 21000.	00	26000.00 MHz
1000.000	3500.00 60	00.00	8500.00 11	UUU.UU 135UU.U	U 16000.00 I	8500.00 21000.	00	26000.00 MHz
[]	Frequer		Factor	Reading	Level	Limit	Margin	T
No.	(MHz)	(dB/m)	(dBuV)		(dBuV/m)		Detector
1	4881.7	50	-2.60	35.12	32.52	54.00	-21.48	AVG
2	4883.2	93	-2.59	49.06	46.47	74.00	-27.53	peak
Remarks								

Page 32 of 85



Ant.	Pol	•	Vert	ical						
Test	Mo	de:	TX 8	B-DPSK M	ode 2441N	1Hz	Z			
Rem	ark	:		eport for the cribed limit		n v	which more	than 10 dB	below the	;
110.0	dBu	∀/m								
							FLL Pa	rt15 Class C 3M Ab	ove-IG Peak	
60										
							FCC	Part15 Class C 3M	Above-16 AV	
		2 X								
		1 X								
10.0										
100	0.000	3500.00	6000.00	8500.00	11000.00 135	00.00	0 16000.00	18500.00 21000	.00	26000.00 MHz
N	D.	Freque (MH		Factor (dB/m)	Readin (dBuV			Limit (dBuV/m)	Margin (dB)	Detector
	1	4881	· ·	-2.60	35.12	<i>,</i>	32.52	54.00	-21.48	AVG
		4883		-2.59	49.06	_	46.47	74.00	-27.53	peak
	-	1000	200	2.00	40.00		40.41	14.00	21.00	pour
Dom	معادة									

Page 33 of 85

Remarks:



Ant. Po	I.	Hori	Horizontal										
Test Mo	de:	TX 8	B-DPSK Mo	de 2480MH	Z								
Remark	:	No r pres	eport for the cribed limit	e emission v	vhich more t	han 10 dB t	pelow the	;					
110.0 dB	ıV/m												
					FCC Par	t15 Class C 3M Abc	ive-1G Peak						
60					FCC F	Part15 Class C 3M /	Above-16 AV						
	ž												
_	*												
10.0													
1000.000) 3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000.	00	26000.00 MHz					
	Freque	ncv	Factor	Reading	Level	Limit	Margin	T					
No.	(MHz	-	(dB/m)	(dBuV)		(dBuV/m)	(dB)	Detector					
1	4959.	558	-2.38	35.15	32.77	54.00	-21.23	AVG					
2	4960.0	005	-2.38	48.86	46.48	74.00	-27.52	peak					
Pemark													

Page 34 of 85

Remarks:



Ant. Pol		Verti						
Test Mo			B-DPSK Moo					
Remark	:		eport for the cribed limit.	emission v	hich more t	han 10 dB t	pelow the	!
	.W/m				FCC Par	t15 Class C 3M Ab	ove-16 Peak	
60	2X 1 X				FCC	Part15 Class C 3M .	Above-1G AV	
10.0) 3500.00 (6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000.	00	26000.00 MHz
No.	Freque (MHz		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4959.5	558	-2.38	35.15	32.77	54.00	-21.23	AVG
2	4960.0)05	-2.38	48.86	46.48	74.00	-27.52	peak
Remarks								

Page 35 of 85

Remarks:

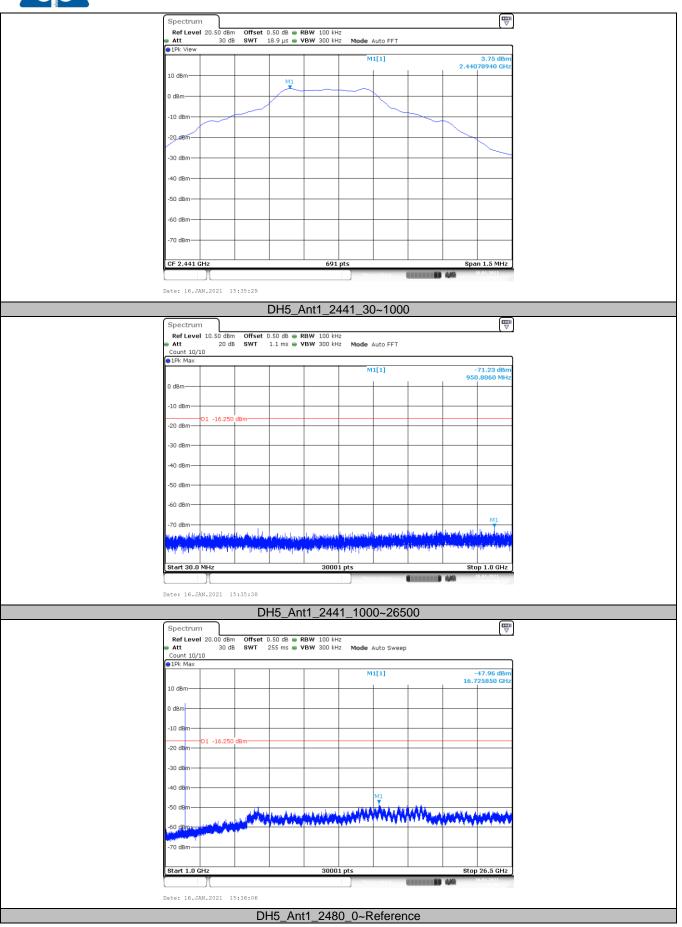


DH5_Ant1_2402_0~Reference

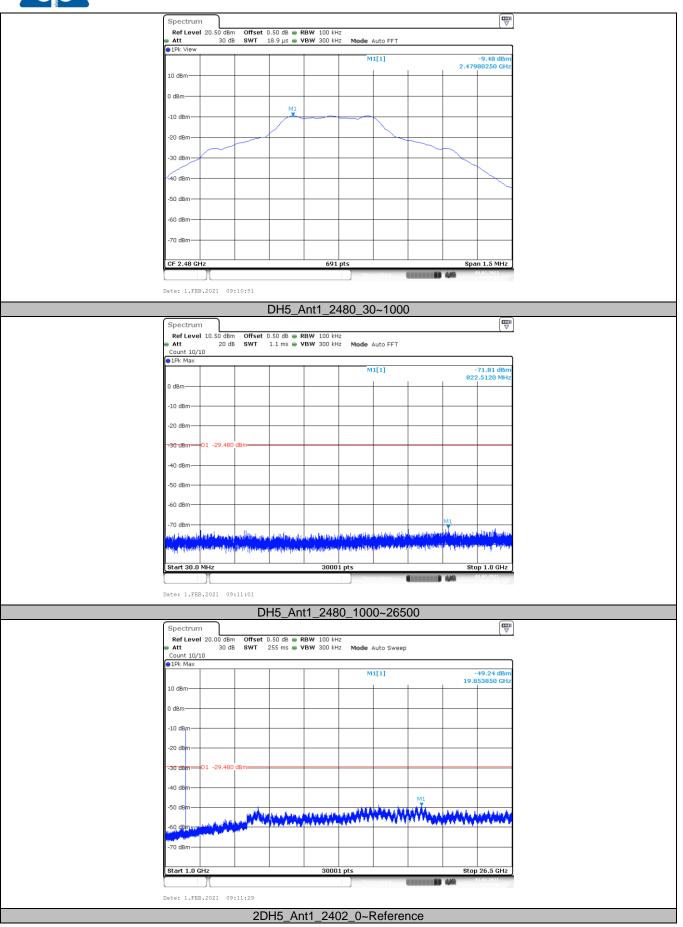
♥ Spectrum RefLevel 20.50 dBm Att 30 dB Offset 0.50 dB ● RBW 100 kHz SWT 18.9 µs ● VBW 300 kHz de Auto FFT ●1Pk Viev M1[1] 2.37 dBr 2.40210850 GH 10 dBn M1 0 dBm 10 dB 20 dB 30 dBm 40 dBn 50 dB -60 dBn 70 d8 Span 1.5 MHz CF 2.402 GHz 691 pts Date: 16.JAN.2021 15:32:11 DH5_Ant1_2402_30~1000 ₽ Spectrum Ref Level 10.50 dBm Offset 0.50 dB RBW 100 kHz Att 20 dB SWT 1.1 ms VBW 300 kHz Mode Auto FFT Count 10/10 -71.76 dB 936.1600 Mi 0 dBrr -10 dBm -17.63 -20 dBm-30 dB 40 dB -50 dBn 60 dB بغديك بالعادية Start 30.0 Mi 30001 pt Stop 1.0 GHz Date: 16.JAN.2021 15:32:21 DH5_Ant1_2402_1000~26500 Spectrum ♥ Offset 0.50 dB ● RBW 100 kHz SWT 255 ms ● VBW 300 kHz Ref Level 20.00 dBm Rei L. Att Count 10/10 30 dB Mode Auto Sweep ●1Pk Max -47.40 dBr 2.399950 GH 10 dBn 0 dB -10 di -20 df 30 0 40 d -50 dE ather and a second and a second and the second and a second 60 70 dBm Stop 26.5 GHz 30001 pts Start 1.0 GHz Date: 16.JAN.2021 15:32:53 DH5_Ant1_2441_0~Reference



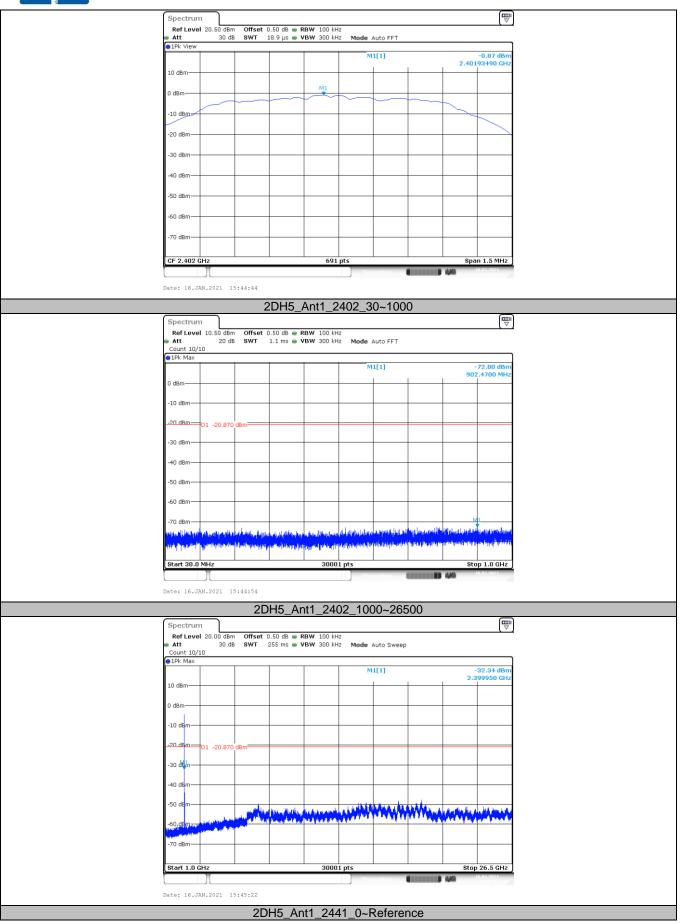








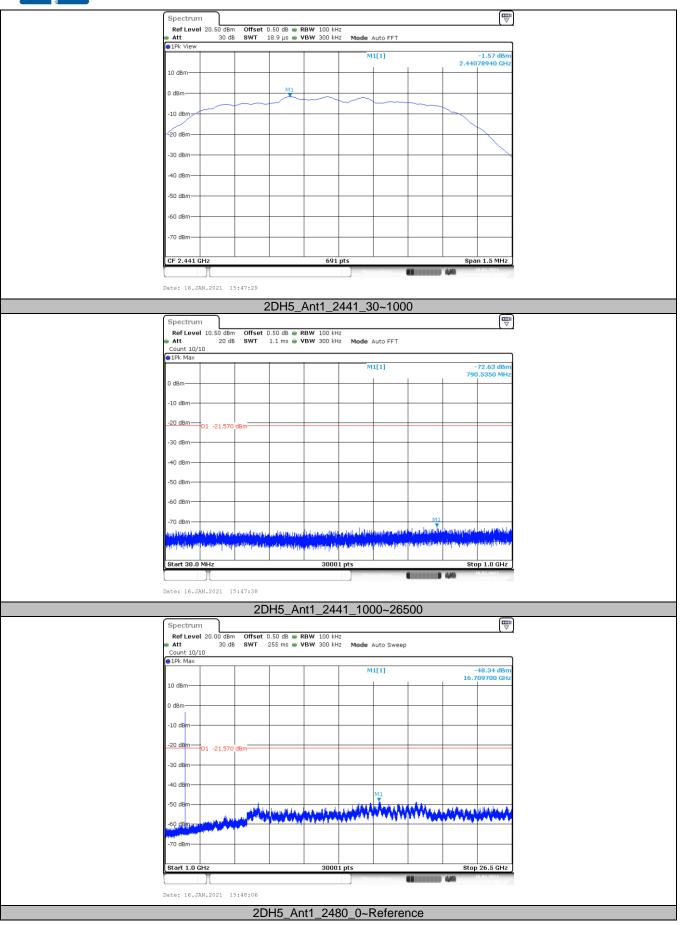




CTC Laboratories, Inc. 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel.: (86)755-27521059 下ax: (86)755-27521011 Http://www.sz-ctc.org.cn For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <u>vz.cnca.cn</u>



EN



CTC Laboratories, Inc. 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China Tel.: (86)755-27521059 中国国家认证认可监督管理委员会 CTC Laboratories, Inc. For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <u>vz.cnca.cn</u>



