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TEST REPORT

FCC ID: 2AASG-CR40

Product: Bluetooth Ring Scanner

Model No.: CR40-2D

Additional Model No.: CR40-1D,CRXX-2D,CRXX-1D (X stand for 0-9,A-Z)

Trade Mark: MINDEO

Report No.: FCC18070066A-BLE

Issued Date: Aug. 15, 2018

Issued for:

Shenzhen Minde Electronics Technology LTD.

5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan
District, Shenzhen, P.R. China

Issued By:

World Standardization Certification & Testing Group Co., Ltd.

Building A-B, Baoshi Science & Technology Park, Baoshi Road
Bao'an District, Shenzhen, Guangdong, China

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Note: The results contained in this report pertain only to the tested sample. This report shall not be reproduced, except in full, without written approval of World Standardization Certification & Testing Group Co.,Ltd. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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TABLE OF CONTENTS

		\wedge						www.wsct-cert	t.com
_		GENERAL II	NFORMATIC	N	WSGT		VSET.	3	VSET
	2.	GENERAL						4	
/	3.	Facilities an				\wedge	/	5	
W5E	7	3.1. ACCREDITA	10				/W	5//	
		3.2. TEST DESC						6	\bigvee
		3.3. DESCRIPTION	ON OF SUPPORT	UNITS (COND	UCTED MODE)			9	\wedge
	A	3.4. SUMMARY	OF TEST RESUL	TS	WETT		15/7	10 /	VSET
	4.	MEASUREN	ENT INSTR	UMENTS		/		11	
/	5.	ANTENNA F	EQUIREME	NT	,	<u>////</u>	/	12	
W5E	71	5.1. STANDARD A	PPLICABLE	AW5/T		V.5/-T		512	
		5.2. ANTENNA CO	NNECTOR CONSTR	UCTION	/		<u> </u>	12	\bigvee
	_	CONDUCTE						13	$/ \setminus$
	7.	SPURIOUS	EMISSIONS	<u> </u>	WSIT	M	75.T.	167	VSET
	8.	-6dB BAND	WIDTH TEST	ΓING		<u> </u>		24	
/	9.	MAXIMUM F	EAK OUTP	UT POWER	₹		/.	27	
W5E	10.	100 kHz Bar	dwidth of F	requency	Band Edge	VSET \	W	5/// 30	
		MAXIMUM C							\bigvee
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	7								
WSE	7	W5		WSET .	V	VSCT	W	SET	
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		_			4		4		
W5E		W5		WSET		VSET .		517	

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1. GENERAL INFORMATION

Bluetooth Ring Scanner
CR40-2D
CR40-1D,CRXX-2D,CRXX-1D (X stand for 0-9,A-Z)
Shenzhen Minde Electronics Technology LTD.
5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan District, Shenzhen, P.R. China
Shenzhen Minde Electronics Technology LTD.
5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan District, Shenzhen, P.R. China
July 23, 2018
July 24, 2018 to Aug.10, 2018
FCC CFR Title 47 Part 15 Subpart C Section 15.247

The above equipment has been tested by World Standardization Certification & Testing Group Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	(Pu Shixi)	Date: Aug.15, 2018
Check By:	Qin Shui quan (Qin Shuiquan)	Date: Aug. 15, 2018 Certification & Continuon & Continuo & Con
Annual Rui	confinition	Date: Aug. 15 - Jord Solomon S
Approved By:	(Wang Fengbing)	Date. W * pri

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Report No. FCC18070066A-BLE

Page 3 of 47

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2. GENERAL DESCRIPTION OF EUT

L. OLIV	ZIVIZ BZSSIM HOIT SI ZOI
Equipment Type:	Bluetooth Ring Scanner
Test Model:	CR40-2D
Additional Model:	CR40-1D,CRXX-2D,CRXX-1D (X stand for 0-9,A-Z)
Trade Mark	MINDEO
Applicant:	Shenzhen Minde Electronics Technology LTD.
Address:	5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan District, Shenzhen, P.R. China
Manufacture	er: Shenzhen Minde Electronics Technology LTD.
Address:	5th Floor, Section 1,25th Block,No.5,Keji Xi Road, Keji Yuan, Nanshan District, Shenzhen, P.R. China
Hardware version:	N/A
Software version:	N/A
Extreme Ten Tolerance:	^{np.} -20℃ to +50℃
Battery information:	Li-Polymer Battery : EN131824 Voltage: 3.7V Capacity: 380mAh W5CT Limited Charge Voltage: 4.2V
Adapter Information:	N/A
Operating Frequency:	2402-2480MHz W5CT W5CT
Channels:	40
Channel Spacing:	2MHz WSET WSET WSET
Modulation Type:	GFSK
Antenna Typ	pe: Integral Antenna
Antenna gair	n: 3.12dBi

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3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group Co., Ltd

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

Registration Number: 366353

3.1. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA
NVLAP (The certificate registration number is NVLAP LAB CODE:600142-0)
VCCI (The certificate registration number is C-4790, R-3684, G-837)

Canada INDUSTRY CANADA

(The certificated registration number is 7700A-1)

China CNAS (The certificated registration number is L3732)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.wsct-cert.com

Report No.: FCC18070066A-BLE

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Page 5 of 47

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3.2. TEST DESCRIPTION

3.2.1. MEASUREMENT UNCERTAINTY

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

level of c	confidence	e of approximately 95 %。		
WSET	No.	Item	Uncertainty	WSET
\searrow	1	Conducted Emission Test	±3.2dB	
	2	RF power,conducted	±0.16dB	
WSE	3	Spurious emissions, conducted	±0.21dB W5CT	WSET
	4	All emissions,radiated(<1G)	±4.7dB	
	5	All emissions,radiated(>1G)	±4.7dB	
WSCT	6	Temperature W577	±0.5°C/5/7°	WSCT
	7	Humidity	±2%	
X		\times	$\langle $	X
WSE	7	WSET WS	ET WSET	WSCT
X		X X	X	X
WSET	W	WSCT WSCT	WSET	WSET
	/			
X		\times	$\langle $	X
WSI		WSET	ET WSET	WSET
X		X	X	X
WSET	W	SET WSET	WSET	WSET
	/			
X		\times	(X	X
WSL		WSET	ET WSET	WSET
X		× ×	X	X
WSET	No.	SET WSET	WSET	WSET
	1		1	
X		\times	(X	X
Aug.		Aug -	ET WSET	Aug and a second
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Tight	Sting	X	X	X
PWSIT	0			







3.2.2. DESCRIPTION OF TEST MODES

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

×	Pretest Mode	Description
	Mode 1	CH00
51	Mode 2	W5/CH20 W5/T
	Mode 3	CH39
	Mode 4	Normal

57	For Conducted Emission	
	Description	Final Test Mode
	Normal	Mode 4
	· ·	

For Radiated Emission							
Final Test Mode	De	escription					
Mode 1		CH00					
Mode 2	X	CH20					
Mode 3		CH39					

Note:

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- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) Record the worst case of each test item in this report.
- (3)When we test it, the duty cycle ≥ 98%

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WSET WSET

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3.2.3. Table of Parameters of Text Software Setting

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

	power selection is for the going to be fixed on the					
WSET	Test software Version	N/A W551	N N	SCT	WSET	
	VOIGION					
	Frequency	2402 MHz	2440 MHz	2480 MHz		
	Parameters(1Mbps)	DEF	DEF	DEF		WSET
WSET	3.2.4. CONFIGURATION	ON OF SYSTEM		SET	WSET	
	W5ET	75.67 EU		WSET		WSFI
WSET	WSET	X	th Ring Scanner)	SET	WSET	
	WSET	75.57	WSET	WSET		WSEI
WSET	WSET	WSG	N W	SET	WSET	
	WSET	VSET	WSET	WSET		WSEI
WSET	WSET	WSE		SET	WSET	
		VICT	WELT	West.		X

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Note:

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3.3. DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Adapter	//	HNEM050200UE	/	1

The support equipment was authorized by Declaration of Confirmation.

WSET	(2) (3)	For detacha "YES" is me	able type I/O ca eans "shielded"	ble should be "with core"; "I	e specified the NO" is means '	length in cm "unshielded"	"without core	column. e".	
	WS		WSET		WSET		WSET	,	WSET
WSET		WS		WSET		WSET		WSET	
	WS		WSE		WSET		WSET	,	WSEI
WSEI		WS		WSET		WSET		WSET	
	WS		WSI		WSET		WSET	,	WSEI
WSET		WS		WSET		WSET	,	WSET	
	Utings		WSG		WSET		WSET		WSET
1/2	certification	n & A	1						

Report No.: FCC18070066A-BLE







3.4. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

		FCC Part15 (15.247) , Subpart 0		
	Standard Section	Test Item	Judgment	Remark
	15.203	Antenna Requirement	PASS	\times
	15.207	Conducted Emission	PASS	5/7
/	15.209, 15.205, 15.247(d)	Spurious Emission	PASS	
	15.247(a) (2)	6dB Bandwidth Testing	PASS	
7	15.247(b) (3)	Maximum Peak Output Power	PASS	Wisi
	15.247(d)	100 KHz Bandwidth of Frequency Band Edge	PASS	X
/	15.247(e)	Maximum Conducted Power Spectral Density	PASS	SET°

NOTE: (1)" N/A" denotes test is not applicable in this test report.

			A A A A A A A A A A A A A A A A A A A		
WSE	T W	SET	WSLT	WSET	WSET
WSET	W5ET*	WSET			(SET)
WSI		5.57	WSET	WSET	WSET
WSET	WSET	WSET			15ET
dification		SET	WSET	WSET	WSET

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Page 10 of 47

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4. MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibrati on Due.	V
EMI Test Receiver	R&S	ESCI	100005	08/19/2017	08/18/2018	
LISN	AFJ	LS16	16010222119	08/19/2017	08/18/2018	
LISN(EUT)	Mestec	AN3016	04/10040	08/19/2017	08/18/2018	
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	08/19/2017	08/18/2018	
Coaxial cable	Megalon	LMR400	N/A	08/12/2017	08/11/2018	1
GPIB cable	Megalon	GPIB	N/A	08/12/2017	08/11/2018	
Spectrum Analyzer	R&S	FSU	100114	08/19/2017	08/18/2018	
Pre Amplifier	H.P.	HP8447E	2945A02715	10/13/2017	10/12/2018	
Pre-Amplifier	CDSI	PAP-1G18-38	<i>_</i>	10/13/2017	10/12/2018	
Bi-log Antenna	SUNOL Sciences	JB3	A021907	09/13/2017	09/12/2018	
9*6*6 Anechoic	WSET	-/W5	-	08/21/2017	08/20/2018	1
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	-\/	09/13/2017	09/12/2018	
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	08/23/2017	08/22/2018	
Cable W5	TIME MICROWAVE	LMR-400	N-TYPE04	04/25/2018	04/24/2019	Ļ
System-Controller	ccs	N/A	N/A	N.C.R	N.C.R	
Turn Table	ccs	N/A	N/A	N.C.R	N.C.R	
Antenna Tower	ccs	N/A W 5	N/A	N.C.R	N.C.R	ľ
RF cable	Murata	MXHQ87WA3000	-	08/21/2017	08/20/2018	
Loop Antenna	EMCO	6502	00042960	08/22/2017	08/21/2018	
Horn Antenna	SCHWARZBECK	BBHA 9170	11235 []	08/19/2017	08/18/2018	
Power meter	Anritsu	ML2487A	6K00003613	08/23/2017	08/22/2018	
Power sensor	Anritsu	MX248XD		08/19/2017	08/18/2018	
	EQUIPMENT EMI Test Receiver LISN LISN(EUT) Universal Radio Communication Tester Coaxial cable GPIB cable Spectrum Analyzer Pre Amplifier Pre-Amplifier Bi-log Antenna 9*6*6 Anechoic Horn Antenna Horn Antenna Cable System-Controller Turn Table Antenna Tower RF cable Loop Antenna Horn Antenna Horn Antenna	EQUIPMENT EMI Test Receiver LISN LISN(EUT) Universal Radio Communication Tester Coaxial cable Megalon GPIB cable Spectrum Analyzer Pre Amplifier Bi-log Antenna 9*6*6 Anechoic Horn Antenna Compliance ENGINEERING Horn Antenna System-Controller CCS Antenna Tower RES Megalon Res Megalon Res Megalon SUNOL Sciences 9*6*6 Anechoic COMPLIANCE ENGINEERING SCHWARZBECK TIME MICROWAVE CCS Antenna Tower CCS RF cable Murata Loop Antenna EMCO Horn Antenna SCHWARZBECK Power meter Anritsu	EQUIPMENT EMI Test Receiver LISN AFJ LS16 LISN(EUT) Mestec AN3016 Universal Radio Communication Tester Coaxial cable Megalon GPIB cable Megalon GPIB Spectrum Analyzer Pre Amplifier H.P. HP8447E Pre-Amplifier COSI Bi-log Antenna SUNOL Sciences JB3 9*6*6 Anechoic Horn Antenna COMPLIANCE ENGINEERING Horn Antenna SCHWARZBECK System-Controller CCS N/A Antenna Tower RF cable Megalon R&S CMU 200 CMPLIANCE ENGINEERING CE18000 BHA9120D CABLE TIME MICROWAVE LMR-400 System-Controller CCS N/A Antenna Tower CCS N/A Antenna Tower CCS MU 200 CMU	EQUIPMENT MANUPACTURER MODEL NUMBER EMI Test Receiver R&S ESCI 100005 LISN AFJ LS16 16010222119 LISN(EUT) Mestec AN3016 04/10040 Universal Radio Communication Tester R&S CMU 200 1100.0008.02 Coaxial cable Megalon LMR400 N/A GPIB cable Megalon GPIB N/A Spectrum Analyzer R&S FSU 100114 Pre Amplifier H.P. HP8447E 2945A02715 Pre-Amplifier CDSI PAP-1G18-38 Bi-log Antenna SUNOL Sciences JB3 A021907 9*6*6 Anechoic Horn Antenna CCMPLIANCE ENGINEERING CE18000 Horn Antenna SCHWARZBECK BBHA9120D 9120D-631 Cable TIME MICROWAVE LMR-400 N-TYPE04 System-Controller CCS N/A N/A Antenna Tower CCS	EQUIPMENT MANUFACTURER MODEL NUMBER Date EMI Test Receiver R&S ESCI 100005 08/19/2017 LISN AFJ LS16 16010222119 08/19/2017 LISN(EUT) Mestec AN3016 04/10040 08/19/2017 Universal Radio Communication Tester R&S CMU 200 1100.0008.02 08/19/2017 Coaxial cable Megalon LMR400 N/A 08/12/2017 GPIB cable Megalon GPIB N/A 08/12/2017 Spectrum Analyzer R&S FSU 100114 08/19/2017 Pre Amplifier H.P. HP8447E 2945A02715 10/13/2017 Pre-Amplifier CDSI PAP-1G18-38 10/13/2017 Bi-log Antenna SUNOL Sciences JB3 A021907 09/13/2017 Horn Antenna SCHWARZBECK BBHA9120D 9120D-631 08/23/2017 Horn Antenna SCHWARZBECK BBHA9120D 9120D-631 08/23/2017 Cable TIME MICROWAVE	EQUIPMENT MANUFACTURER MODEL NUMBER Date on Due. EMI Test Receiver R&S ESCI 100005 08/19/2017 08/18/2018 LISN AFJ L\$16 16010222119 08/19/2017 08/18/2018 LISN(EUT) Mestec AN3016 04/10040 08/19/2017 08/18/2018 Universal Radio Communication Tester R&S CMU 200 1100.0008.02 08/19/2017 08/18/2018 Coaxial cable Megalon LMR400 N/A 08/12/2017 08/11/2018 GPIB cable Megalon GPIB N/A 08/12/2017 08/11/2018 Spectrum Analyzer R&S FSU 100114 08/19/2017 08/18/2018 Pre Amplifier H.P. HP8447E 2945A02715 10/13/2017 08/18/2018 Pre-Amplifier CDSI PAP-1G18-38 10/13/2017 10/12/2018 Bi-log Antenna SUNOL Sciences JB3 A021907 09/13/2017 09/12/2018 Horn Antenna COMPLIANCE ENGINEERING

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5. ANTENNA REQUIREMENT

5.1. Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2. Antenna Connector Construction

The EUT's antenna Integral Antenna, The antenna's gain is 3.12dBi and meets the requirement.

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Antenna

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6. CONDUCTED EMISSIONS

6.1.1. Applicable Standard

The specification used was with the FCC Part 15.207 limits.

6.1.2. Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

6.1.3	Test Conditions	
- U. I.U.	1 CSt Collatticities	

	WELT	MEETT	WELT	WSIT	WS
/	Temperature:	26 °C	1		
	Relative	60%			
	Humidity:	/		\wedge	
0	ATM Pressure:	100.0kPa		ACC CT	West of the second
- 1	Voltage	120V/60Hz		VSLI	AND HALL

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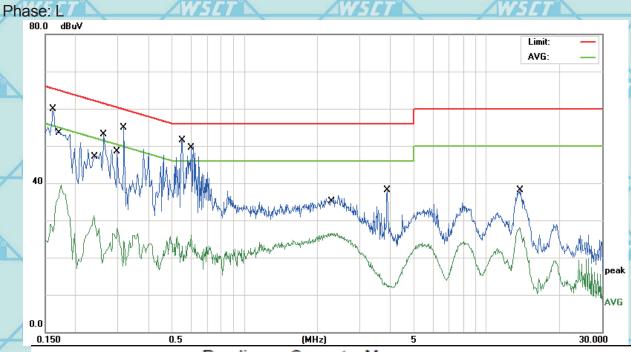






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6.1.4. TEST RESULTS



	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBu∀	dB	dBuV	dBu∀	dB	Detector
1	1	*	0.1620	41.51	10.44	51.95	65.36	-13.41	QP
	2		0.1740	28.96	10.44	39.40	54.76	-15.36	AVG
Ĺ	3		0.2380	20.83	10.43	31.26	52.16	-20.90	AVG
•	4		0.2620	27.68	10.43	38.11	61.36	-23.25	QP
	5		0.2980	17.53	10.42	27.95	50.30	-22.35	AVG
1	6		0.3180	26.64	10.42	37.06	59.76	-22.70	QP
	7		0.5540	27.10	10.39	37.49	56.00	-18.51	QP
4	8		0.6020	15.63	10.39	26.02	46.00	-19.98	AVG
Į.	9		2.2700	16.25	10.28	26.53	46.00	-19.47	AVG
•	10		3.8820	10.48	10.25	20.73	56.00	-35.27	QP
	11		13.6580	18.03	10.16	28.19	50.00	-21.81	AVG
	12		13.7100	22.11	10.16	32.27	60.00	-27.73	QP

Remark: All of the Tx modes have been investigated, and only worst mode is presented in this report.

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Limit:
AVG:

AVG:

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBu∀	dBu∀	dB	Detector
1		0.1700	27.51	10.44	37.95	54.96	-17.01	AVG
2		0.2180	20.01	10.43	30.44	52.89	-22.45	AVG
3	*	0.2260	38.47	10.43	48.90	62.59	-13.69	QP
4		0.2860	29.66	10.42	40.08	60.64	-20.56	QP
5		0.2860	16.54	10.42	26.96	50.64	-23.68	AVG
6		0.3899	22.18	10.41	32.59	58.06	-25.47	QP
7		0.3899	14.93	10.41	25.34	48.06	-22.72	AVG
8		0.4660	18.56	10.40	28.96	56.58	-27.62	QP
9		1.6980	12.02	10.31	22.33	46.00	-23.67	AVG
10		1.9140	13.91	10.29	24.20	56.00	-31.80	QP
11		5.0700	11.68	10.23	21.91	50.00	-28.09	AVG
12		6.5740	12.80	10.22	23.02	60.00	-36.98	QP

Remark: All of the Tx modes have been investigated, and only worst mode is presented in this report.







7. SPURIOUS EMISSIONS

7.1.1. Test Equipment 5

Please refer to section 4 this report.

7.1.2. Test Procedure

The out of band emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part Subpart C limits.

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

Both horizontal and vertical antenna polarities were tested

And performed pretest to three orthogonal axis. The worst case emissions were reported

7.1.3. Environmental Conditions

Temperature:	26 °C	
Relative	55%	March
Humidity:		VALIA
ATM Pressure:	100.0kPa	

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7.1.4. Radiated Test Setup

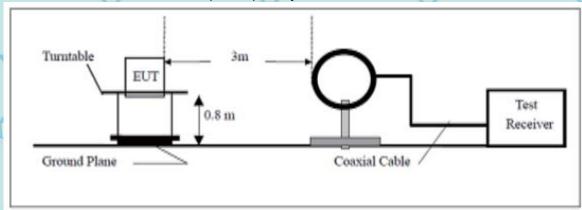
The system was investigated from 9 KHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were

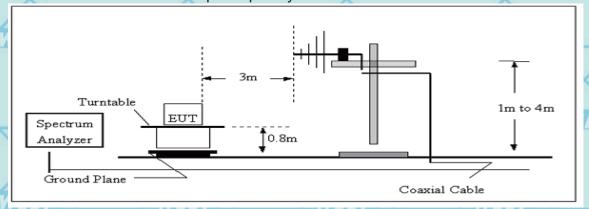
set with the following configurations:

\	Frequency Range	RBW	Video B/W	Detector	
7	9KHz-30MHz W5 67	9kHz W5	30 kHz	QP	WSCT
	30 MHz – 1000 MHz	100 kHz	300 kHz	QP	
	1000 MHz – 25 GHz	1 MHz	3 MHz	PK	
	1000 MHz – 25 GHz	1 MHz	10 Hz	Ave	

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



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



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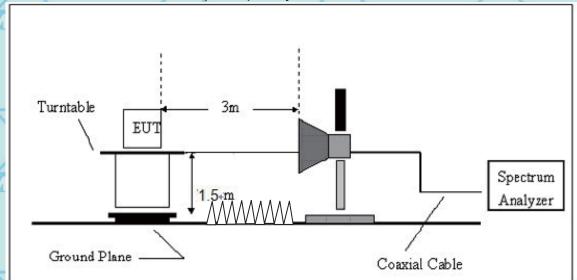
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Page 17 of 47





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



For the accrual test configuration, please refer to the related items-photos of Testing.

	WSET	WSET	WSET	WSET	WSET
/	WSET	$\langle \ \rangle$			527
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_	\times	CT W5			SET
	WSET	WSET	WSET	WSET	WSET
7	\times	WS.			SET
	X	WSCT	WSET	WSET	WSET
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7.1.5. Radiated Emission Limit

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Radiated Emission Test Result

Test Mode: Transmitting

	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
ı	30-88	100**	3
ı	88–216	150**	3
	216-960	200**	3
	Above 960	500	3

Note:

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

7.1.6. Test result:

From 9KHz to 30MHz

NOTE: 9KHz-30MHz the measurements were greater than 20dB below the limit.

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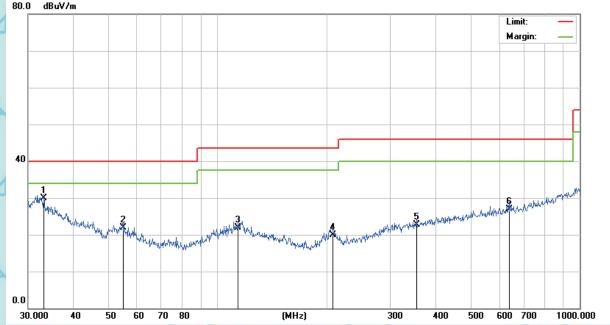




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Frequency from 30MHz to 1GHz





4	No.	Mk.	Freq.	Level	Factor	ment	Limit	Over	44
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
	1	* /	33.2112	26.26	3.57	29.83	40.00	-10.17	QP
	2	1	54.8348	27.43	-5.59	21.84	40.00	-18.16	QP
	3	- 10	113.7143	24.18	-2.23	21.95	43.50	-21.55	QP
	4		208.5803	26.47	-6.61	19.86	43.50	-23.64	QP
	1 5	4	354.1831	24.54	-1.80	22.74	46.00	-23.26	QP
	6	1 19	638.3686	25.57	1.40	26.97	46.00	-19.03	QP

Remark: All of the TX modes have been investigated, and only worst mode is presented in this report.

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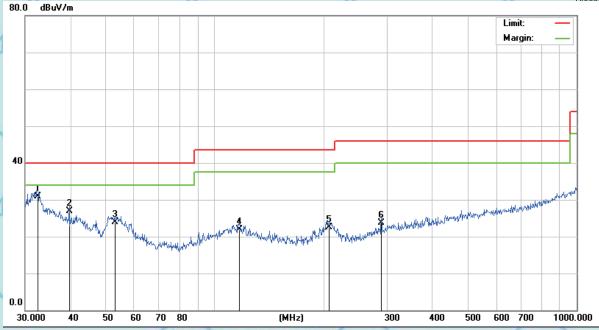


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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	THE
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	32.5198	27.06	3.83	30.89	40.00	-9.11	QP
2	1	39.7146	26.88	0.09	26.97	40.00	-13.03	QP
3		53.1313	29.35	-5.39	23.96	40.00	-16.04	QP
4	3	116.9495	24.38	-2.54	21.84	43.50	-21.66	QP
115	7	207.1226	29.23	-6.68	22.55	43.50	-20.95	QP
6		289.0021	26.46	-2.77	23.69	46.00	-22.31	QP

Remark: All of the TX modes have been investigated, and only worst mode is presented in this report.

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7.1.7. From 1GHz to 25GHz:

Operation Mode:	Channel 0	Measured Distance:	3m
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity:	65 %

Freq.	Ant.Pol	Emission Level(dBuV)			nit _{5[7}	Over(dB)	
(MHz)				3m(dB	BuV/m)		
	H/V	PK	AV	PK	AV	PK	AV
4804	V	60.05	41.26	74	54	-13.95	-12.74
7206	V	58.42	39.73	74	54	-15.58	-14.27
4804	H	59.10	39.63	74	54	-14.90	-14.37
7206	H/	58.11	39.11	74	54	-15.89	-14.89

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+ Probe Factor +Cable Loss.
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Operation Mode:	Channel 20	Measured Distance:	3m W5/7
Frequency Range:	Above 1GHz	Temperature :	28℃
Test Result:	PASS	Humidity:	65 %

_	Freq. (MHz)	Ant.Pol	Emission Level(dBuV		Limit 3m(dBuV/m)	Over(dB)	
		H/V	PK	AV	PK	AV	PK	AV
	4880	V	58.01	39.20	74	54	-15.99	-14.80
	7320	V	59.37	40.84	74	54	-14.63	-13.16
\	4880	WSHT	58.63	39.33	74	54	-15.37	-14.67
	7320	Н	59.63	40.63	74	54	-14.37	-13.37

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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A	Operation Mode:	Chan	nel 39	Measured Distance:	3m
	Frequency Range:	Abov	e 1GHz	Temperature :	28℃
	Test Result:	PASS		Humidity:	65 %

Freq.	Ant.Pol	Emission	Level(dBuV	Limit 3m(dBuV/m)	Over	(dB)/5/7
(MHz)							
X	H/V	PK	AV	PK	AV	PK	AV
4960	V	60.09	39.19	74	54	-13.91	-14.81
7440	V	58.94	40.50	74	54	-15.06	-13.50
4960	H	58.59	40.11	74	54	-15.41	-13.89
7440	\H/	59.11	40.11	74	54	-14.89	-13.89

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
- (3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

WSET	WSET	WSLT	WSET	WSET	
WSL		X	WSET	WSET	WSET
WSET	WSET	WSLT	WSET	WSU	
WSL		X	WSET	WSET	WSET
WSET	WSET	WSLT	WSET	WSET	

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8. -6dB BANDWIDTH TESTING

8.1.1. Test Equipment

Please refer to Section 4 this report.

8.1.2. Test Procedure

- Set EUT in the transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=100KHz,VBW≥RBW, Span=3MHz,Sweep=auto.
- 4. Mark the peak frequency and -6dB(upper and lower)frequency.
- 5. Repeat until all the rest channels are investigated.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

8.1.3. Environmental Conditions

Temperature:	26 °C
Relative	55%
Humidity:	WSLI
ATM Pressure:	100.0kPa

8.1.4. Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

	least 500 kHz.				
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= 177-757					
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WSE	WSET	WSEI	WSL	T WS	
	X	X	X	X	X







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8.1.5. Test Result: Pass.

Please refer to the following tables

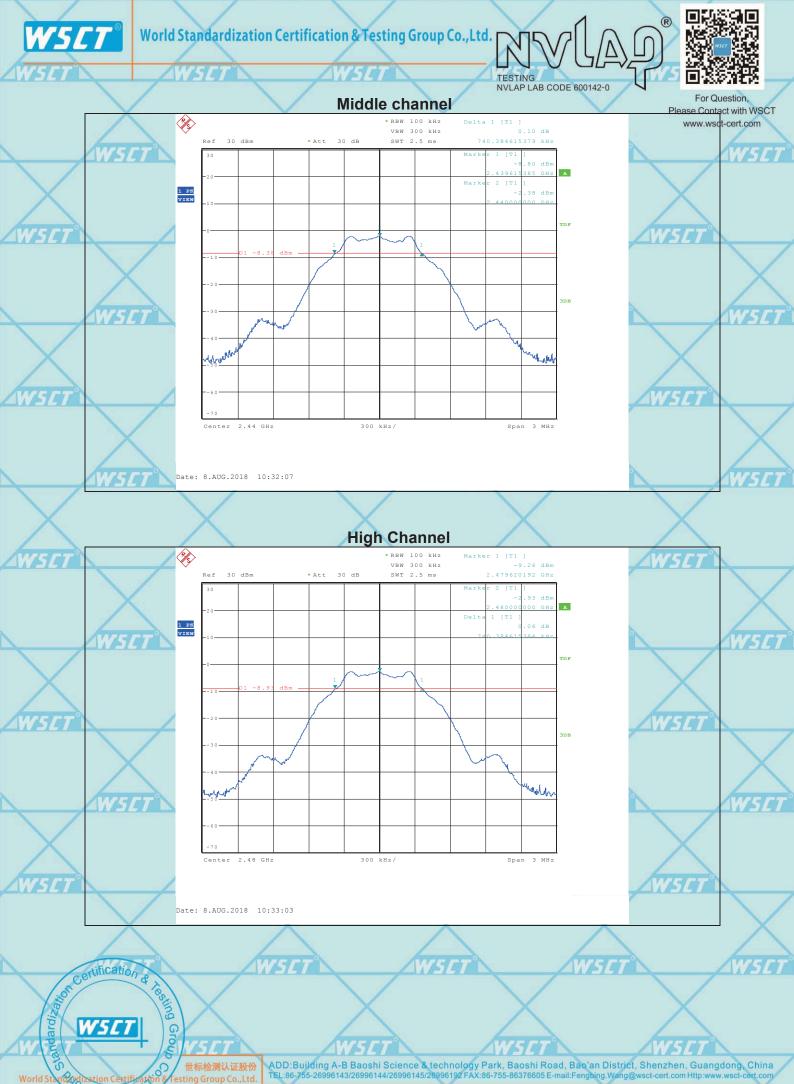
	Channel Frequency (MHz)	Data Rate (Mbps)	6dB Bandwidth (kHz)	Limit (kHz)	Ref. Plot	
	2402	1	735.58	>500	PLOT 1	
I	2440	1	740.38	>500	PLOT 2	
	2480	1	740.38	>500	PLOT 3	





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9. MAXIMUM PEAK OUTPUT POWER

9.1.1. Test Equipment

Please refer to Section 4 this report.

9.1.2. Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
 - 3. Set the RBW =1MHz, VBW ≥3RBW, span≥1.5*6dbbandwith.
 - Sweep time = auto couple, Detector = peak, Trace mode = max hold.
 - 4. Record the maximum power from the spectrum analyzer.
 - 5. The maximum peak power shall be less 1 Watt (30dBm).

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

9.1.3. Environmental Conditions

Temperature:	26 °C °	WSCT
Relative	55%	
Humidity:		
ATM Pressure:	100.0kPa	

9.1.4. Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

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9.1.5. Test Result

	AV2L/	AVEL A		AV3L1		
	Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Power (dBm)	Limit (dBm)	
7	Low	2402	1	-0.84	30	
	Middle	2440	1)	-1.22	30	
	High	2480	M199	-1.81	30	



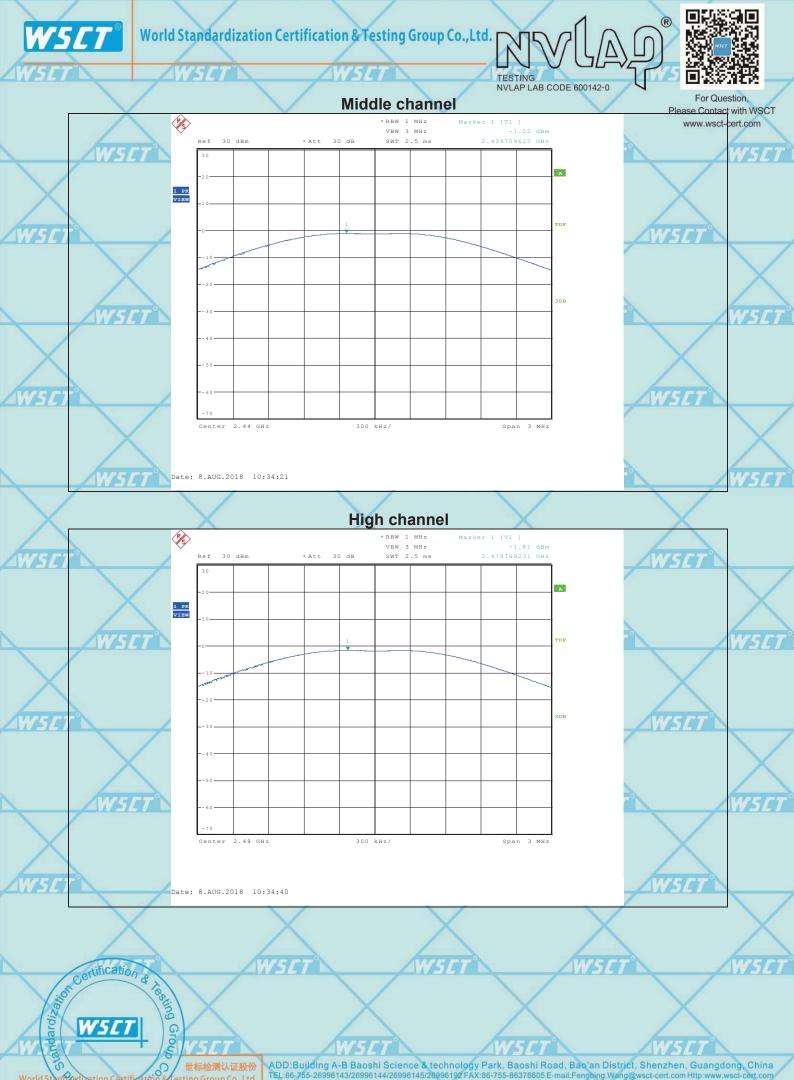
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10. 100 kHz Bandwidth of Frequency Band Edge

10.1.1. Test Equipment

Please refer to Section 4 this report.

10.1.2. Test Procedure

The out of band emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part Subpart C limits.

10.1.3. Environmental Conditions

	Temperature:	26 °C
4	Relative	55%
	Humidity:	
	ATM Pressure:	100.0kPa

10.1.4. Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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10.1.5. Test Result: PASS

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/	Indica	ted		Toblo	Anter	nna	Co	rrection F	actor	FCC	Part 15.24	7	
7	Frequency (MHz)	Receiver Reading (dB _µ V/m)	IPK/AVI	Table Angle Jegree	Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	
				//	_ow Cl	hanne	l (240)	2MHz)					
	2390	41.87	AV	225	1.5	V	30.3	4.1	33.1	43.17	54	10.83	
	2390	40.55	AV	90	2	Н	30.3	4.1	33.1	39.25	54	12.15	6
/	2390	59.83	PK	180	1.5	V	30.3	4.1	33.1	61.13	74	12.87	a.a.
	2390	61.14	PK	270	2	XH	30.3	4.1	33.1	62.44	74	11.56	
				H	High C	hanne	l (248	0MHz)					
7	2483.5	41.10	AV	360	AW	5/	31	4.4	32.7	43.80	54	10.20	÷
	2483.5	40.11	AV	90	2	Н	31	4.4	32.7	42.81	54	11.19	
	2483.5	60.45	PK	180	1	V	31	4.4	32.7	63.15	74	10.85	
	2483.5	59.83	PK	225	2	Н	31	4.4	32.7	62.53	74	11.47	N/

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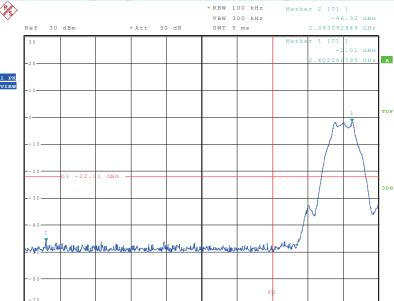


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Conducted Emission Measurement:

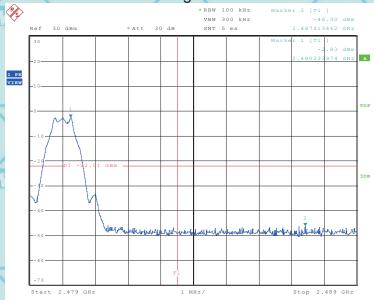
Low channel





High channel





Date: 8.AUG.2018 10:36:49

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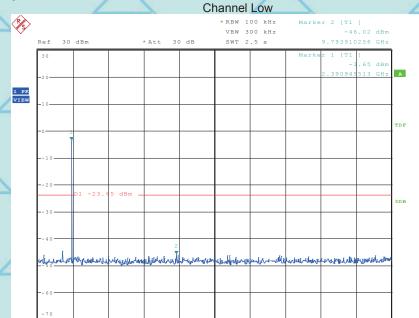


Stop 25 GHz



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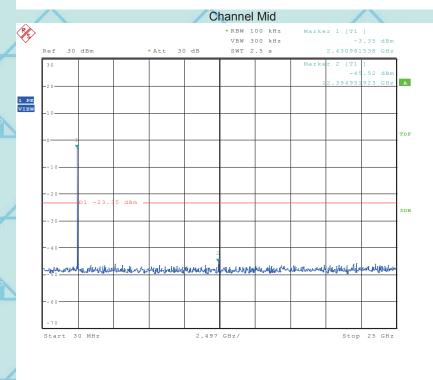
Conducted spurious emissions



2.497 GHz/

Date: 8.AUG.2018 10:37:38

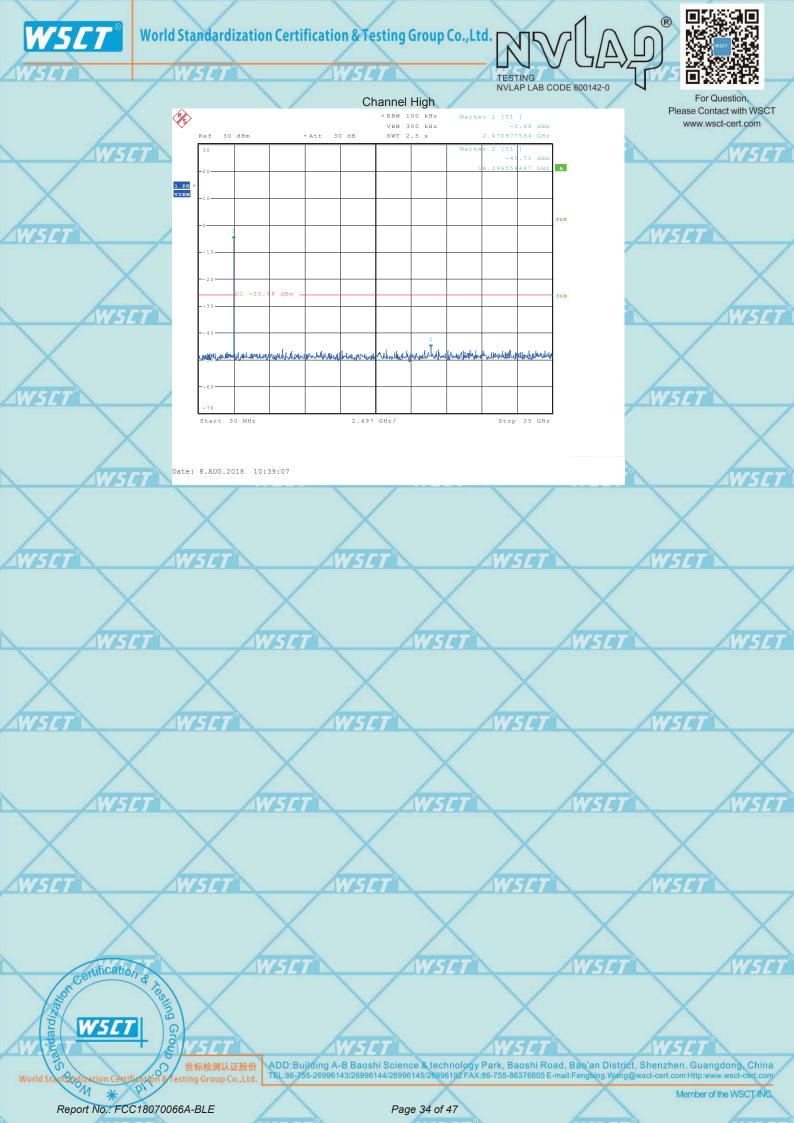
Start 30 MHz



Date: 8.AUG.2018 10:38:28

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11. MAXIMUM CONDUCTED POWER SPECTRAL DENSITY

11.1.1. Test Equipment

Please refer to Section 4 this report.

11.1.2. Test Procedure

- 1, This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.
- 2, Set analyzer center frequency to DTS channel center frequency.
- 3, Set the RBW to:3 kHz ≦RBW ≦100 kHz, Set the VBW ≧3 RBW, Detector = peak. Sweep time = auto couple
- 4, Trace mode = max hold, Allow trace to fully stabilize.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

11.1.3. Environmental Conditions

Temperature:	25 °C5[] W5[]
Relative	55%
Humidity:	X
ATM Pressure:	100.0kPa

11.1.4. Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

世标检测认证股份 Testing Group Co.,Ltd.

DD:Building A-B Baoshi Science & technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, Chin





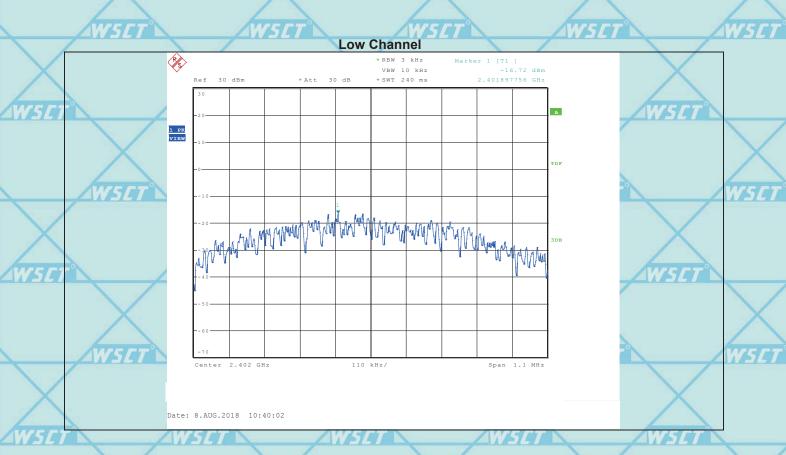


For Question,
Please Contact with WSCT
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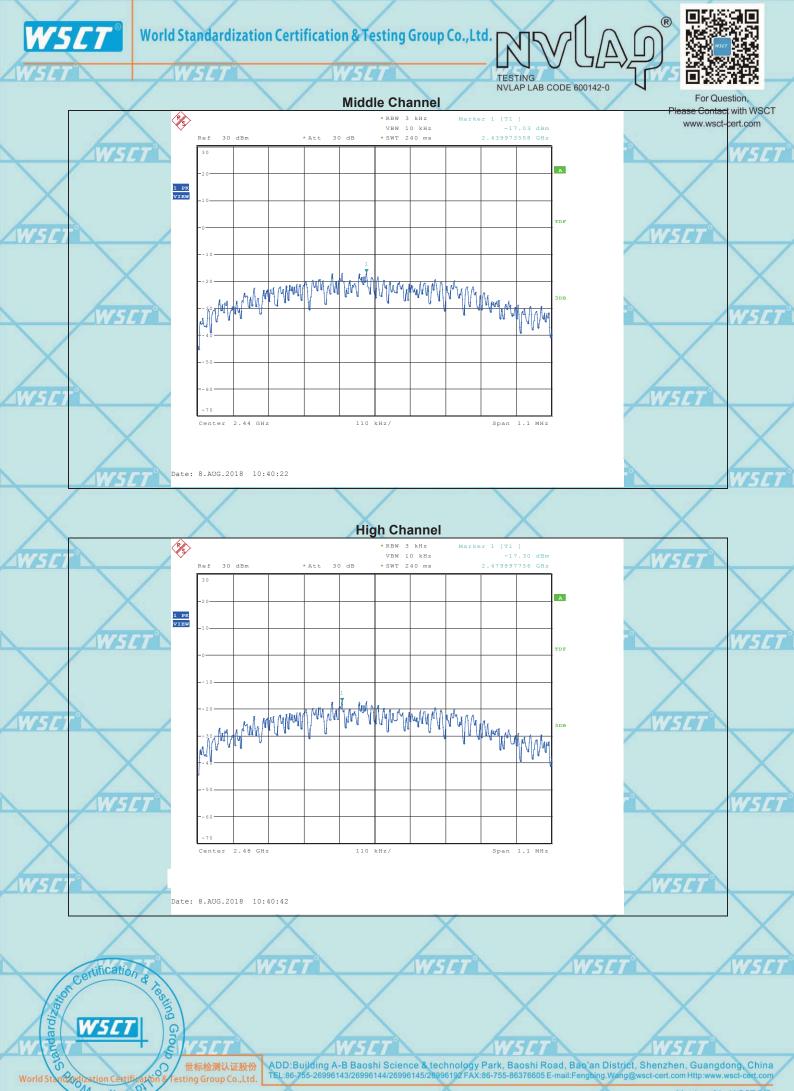
11.1.5. Test Result

PASS

	Channel Frequency (MHz)	Data Rate (Mbps)	PSD (dBm/3kHz)	Limit (dBm/3kHZ)	RESULT
	2402	1	-16.72	8	Compliant
A	2440 W5L	1	-17.03	8	Compliant
	2480	1	-17.30	8	Compliant



WSET WSET WSET WSET WSET WSET WSET





12. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST





W5ET

WSIT

WSET°

RADIATED EMISSION TEST

WSET

WCLT

WSLT°

WSET"

(Frequency from 30MHz to 1GHz)

 \rightarrow

WSET

WSI

VSCT WSCT

Certification

AWSET

WSIT

AWSLI

WSET"

WSET

W5/7

4W5€

WSC WSC

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Page 38 of 47



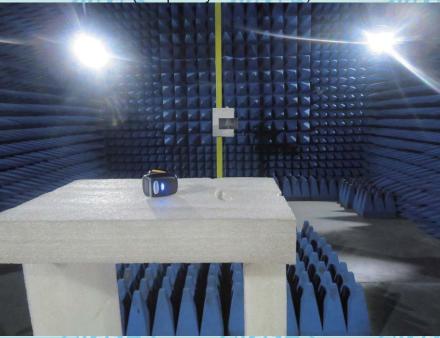




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RADIATED EMISSION TEST

(Frequency above 1GHz)



W5ET°

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Wister Wister Wister

WSET WSET WSET WSET WSET

WSCT WSCT WSCT WSCT

WSET WSET WSET WSET WSET

WSCT WSCT WSCT WSCT

WSET WSET WSET

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Page 39 of 47

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13. PHOTOGRAPHS OF EUT

Appearance photograph of EUT

CALL S S T S 9 10 11 12 13 14 15 16 17 18 15

32 INCH 1 2 3 4 16 5 STANGES STELL 6 7

WSCI

CT WSCT

Appearance photograph of EUT

WISTER

WSET

WSET

WSET°

WSET

WSET

SET

WEET

世标检测认证股份











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Appearance photograph of EUT

Internal photograph of EUT









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Internal photograph of EUT

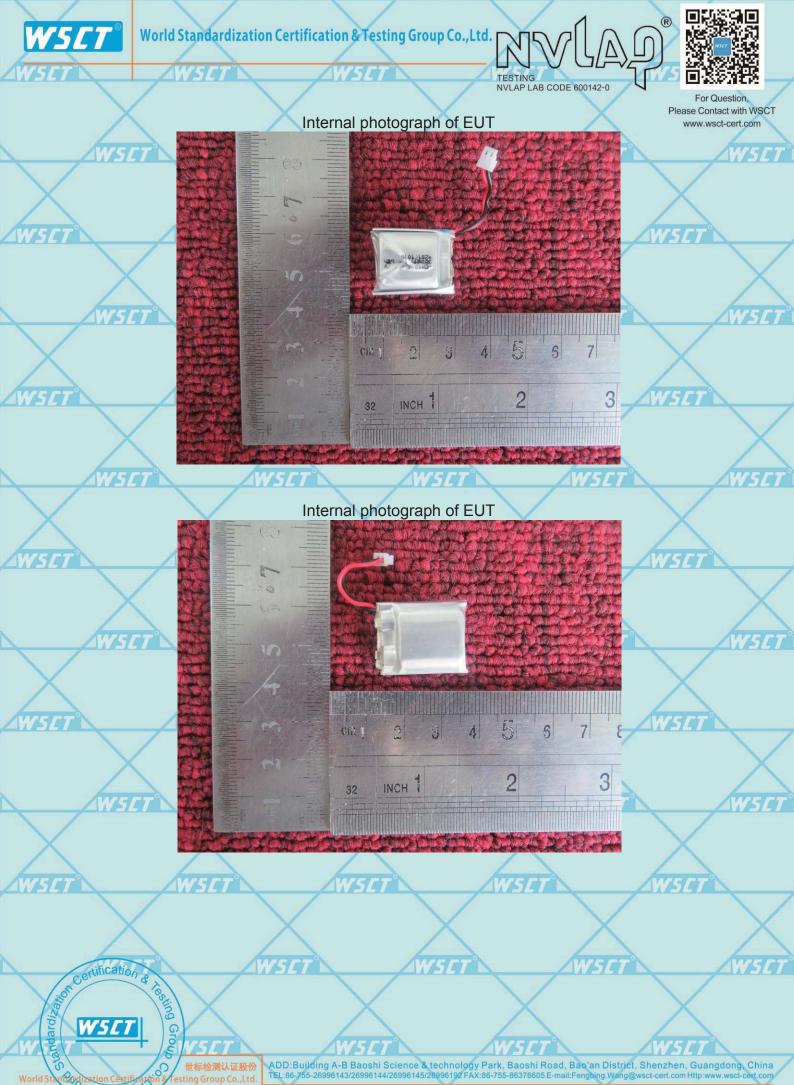
10 11 12

Internal photograph of EUT

10 11 12 13 14

INCH T

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Internal photograph of EUT





Internal photograph of EUT

---END OF REPORT---

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