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Report No.: KS2211S5058E01

	TEST REPORT		
Report No:	KS2211S5058E01		
FCC ID:	2A9HH-DT3NEW		
Applicant:	Shenzhen Xinkeyun Technology Co.,Ltd		
Address:	8/F,Block C,Han's Innovation Building,Xili Road, Nanshan District,Shenzhen,China		
Manufacturer:	Shenzhen Xinkeyun Technology Co.,Ltd		
Address:	8/F,Block C,Han's Innovation Building,Xili Road, Nanshan District,Shenzhen,China		
Product Name:	Smart watch		
Trademark:	DTNO.1		
Model/Type reference:	DT3 NEW,DT3 NEW+ ,C87S		
Standard:	47 CFR Part 15.247		
Date of Receipt:	November 22, 2022		
Date of Test Date:	November 22, 2022 to December 5, 2022		
Date of issue:	December 7, 2022		
Test result:	Pass		
Prepared by: (Printed name + Signature)	Spencer Ou Spencer Ow		
Approved by: (Printed name + Signature)	Spencer Ow Sky Dong Sky Dong		
Testing Laboratory Name: Address	KSIGN(Guangdong) Testing Co., Ltd. West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China		

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

47 CFR Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

1.2. Report Version

Revised No.	Date of issue	Description	
01	December 7, 2022	Original	
No.	V V	Z. Z.	
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	X 200		





1.3. Test Description

Test Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15.247	Part 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.247	47 CFR 15.207(a)	Pass
Occupied Bandwidth	47 CFR Part 15.247	47 CFR 15.215(c)	Pass
Maximum Conducted Output Power	47 CFR Part 15.247	47 CFR 15.247(b)(1)	Pass
Channel Separation	47 CFR Part 15.247	47 CFR 15.247(a)(1)	Pass
Number of Hopping Frequencies	47 CFR Part 15.247	47 CFR 15.247(a)(1)(iii)	Pass
Dwell Time	47 CFR Part 15.247	47 CFR 15.247(a)(1)(iii)	Pass
Emissions in non-restricted frequency bands	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Band Edge Emissions	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Radiated Spurious Emission	47 CFR Part 15.247	15.247(c)&15.209	Pass





1.4. Test Facility

KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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

CNAS-Lab Code: L13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. 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 the

identified field of testing

ISED#: 25693 CAB identifier.: CN0096

KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

FCC-Registration No.: 294912 Designation Number: CN1328

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.



1.5. Measurement Uncertainty

Test Items	Measurement Uncertainty
Output Power, Conducted	± 1.4dB
Spurious Emissions, Conducted	± 3.3dB
RSE (1-18GHz)	± 4.68dB
RSE (30-1000MHz)	± 5.7dB
RSE (18-40GHz)	± 5.18dB

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





2. GENERAL INFORMATION

2.1. General Description Of EUT

	• / N/k
Product Name:	Smart watch
Trademark:	DTNO.1
Model / Type reference:	DT3 NEW, DT3 NEW+ ,C87S
Model Difference:	The difference between the product model is only the color and appearance is not the same, the different model name is for the market demand. Other power supply mode, internal structure, circuit and key components are the same, does not affect the safety and electromagnetic compatibility performance
Power Supply:	The battery supplies 3.7V DC, and the adapter supplies 5V DC
Power Adaptor:	DC 5V
Operation Frequency:	2402MHz to 2480MHz
Number of Channels:	79
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Antenna Type:	Internal Antenna
Antenna Gain:	-2.09dB

2.2. Accessory Equipment Information

The EUT was tested as an independent device.

2.3. Description of Test Modes

No.	Title	Description of Mode
Test Mode1	TX-GFSK (Non-Hopping)	Keep the EUT in continuously transmitting mode (non-hopping) with GFSK modulation.
Test Mode2	TX-Pi/4DQPSK (Non-Hopping)	Keep the EUT in continuously transmitting mode (non-hopping) with Pi/4DQPSK modulation.
Test Mode3	TX-8DPSK (Non-Hopping)	Keep the EUT in continuously transmitting mode (non-hopping) with 8DPSK modulation.
Test Mode4	TX-GFSK (Hopping)	Keep the EUT in continuously transmitting mode (hopping) with GFSK modulation,.
Test Mode5	TX-Pi/4DQPSK (Hopping)	Keep the EUT in continuously transmitting mode (hopping) with Pi/4DQPSK modulation.
Test Mode6	TX-8DPSK (Hopping)	Keep the EUT in continuously transmitting mode (hopping) with 8DPSK modulation.

2023-03-04

2023-03-04

2023-03-04

2023-03-04

2023-03-04

3344A00337

MY50142520

157282

101798



Supply

RF Control Unit

Analog Signal Generator Vector Signal Generator

Wideband Radio

Communication Tester
Spectrum Analyzer

2.4. Measurement Instruments List

Occupied Bandwidth					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until	
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04	
Audio Analyzer	R&S	UPL16	100001	2023-03-04	
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23	
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2023-03-04	
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2023-03-04	
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04	
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2023-03-04	
Hygrothermograph	Anymetre	JB913	<u> </u>	2023-03-07	
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04	
Spectrum Analyzer	MP HP	8593E	3831U02087	2023-03-04	
Dual Output DC Power	Agilent	E3646A	MY40009992	2023-03-04	

JS0806-2

83752A

N5182A

CMW500

FSV40-N

Tonscend

HP

Agilent

R&S

R&S

Maximum Conducted Output Power					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until	
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04	
Audio Analyzer	R&S	UPL16	100001	2023-03-04	
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23	
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2023-03-04	
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2023-03-04	
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04	
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2023-03-04	
Hygrothermograph	Anymetre	JB913	/ 1	2023-03-07	
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04	
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04	
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04	
RF Control Unit	Tonscend	JS0806-2	1 (h)	2023-03-04	
Analog Signal Generator	HP 🕢	83752A	3344A00337	2023-03-04	
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04	
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04	

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 Spectrum Analyzer
 R&S
 FSV40-N
 101798
 2023-03-04

Channel Separation						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until		
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04		
Audio Analyzer	R&S	UPL16	100001	2023-03-04		
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23		
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2023-03-04		
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2023-03-04		
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04		
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2023-03-04		
Hygrothermograph	Anymetre	JB913	1	2023-03-07		
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04		
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04		
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04		
RF Control Unit	Tonscend	JS0806-2	I (m)	2023-03-04		
Analog Signal Generator	HP	83752A	3344A00337	2023-03-04		
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04		
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04		
Spectrum Analyzer	R&S	FSV40-N	101798	2023-03-04		

Number of Hopping Frequencies					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until	
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04	
Audio Analyzer	R&S	UPL16	100001	2023-03-04	
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23	
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2023-03-04	
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2023-03-04	
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04	
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2023-03-04	
Hygrothermograph	Anymetre	JB913	1	2023-03-07	
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04	
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04	
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04	
RF Control Unit	Tonscend	JS0806-2	12	2023-03-04	
Analog Signal Generator	HP XX	83752A	3344A00337	2023-03-04	
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04	
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04	

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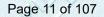
 Spectrum Analyzer
 R&S
 FSV40-N
 101798
 2023-03-04

Dwell Time						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until		
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04		
Audio Analyzer	R&S	UPL16	100001	2023-03-04		
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23		
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2023-03-04		
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2023-03-04		
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04		
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2023-03-04		
Hygrothermograph	Anymetre	JB913	1	2023-03-07		
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04		
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04		
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04		
RF Control Unit	Tonscend	JS0806-2	I (m)	2023-03-04		
Analog Signal Generator	HP	83752A	3344A00337	2023-03-04		
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04		
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04		
Spectrum Analyzer	R&S	FSV40-N	101798	2023-03-04		

_	Emissions in non-restricted frequency bands			
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04
Audio Analyzer	R&S	UPL16	100001	2023-03-04
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2023-03-04
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2023-03-04
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2023-03-04
Hygrothermograph	Anymetre	JB913	1	2023-03-07
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04
RF Control Unit	Tonscend	JS0806-2	1	2023-03-04
Analog Signal Generator	HP XX	83752A	3344A00337	2023-03-04
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04

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 Spectrum Analyzer
 R&S
 FSV40-N
 101798
 2023-03-04

Emissions around the fundamental				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2023-04-12
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2023-03-04
Color Signal Generator	Philips	PM5418	672926	2023-03-04
Broadcast Television Signal Generator	R&S	SFE100	141038	2023-03-04
Analog Signal Generator	Agilent	8648A	3847M00445	2023-03-04
EMI Test Receiver	R&S	ESR	102525	2023-03-04
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2023-03-29
Pre-Amplifier	EMCI	EMC051835SE	980662	2023-03-04
Spectrum Analyzer	Keysight	N9020A	MY46471971	2023-03-04
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2023-03-05

Emissions in restricted frequency bands (below 1GHz)				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2023-04-12
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2023-03-04
Color Signal Generator	Philips	PM5418	672926	2023-03-04
Broadcast Television Signal Generator	R&S	SFE100	141038	2023-03-04
Analog Signal Generator	Agilent	8648A	3847M00445	2023-03-04
EMI Test Receiver	R&S	ESR	102525	2023-03-04
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2023-03-29
Pre-Amplifier	EMCI	EMC051835SE	980662	2023-03-04
Spectrum Analyzer	Keysight	N9020A	MY46471971	2023-03-04
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2023-03-05

Emissions in restricted frequency bands (above 1GHz)				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2023-04-12
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2023-03-04
Color Signal Generator	Philips	PM5418	672926	2023-03-04
Broadcast Television Signal Generator	R&S	SFE100	141038	2023-03-04
Analog Signal Generator	Agilent	8648A	3847M00445	2023-03-04
EMI Test Receiver	R&S	ESR	102525	2023-03-04
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2023-03-29
Pre-Amplifier	EMCI (EMC051835SE	980662	2023-03-04
Spectrum Analyzer	Keysight	N9020A	MY46471971	2023-03-04
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2023-03-05

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3. Evaluation Results (Evaluation)

3.1. Antenna requirement

Test Requirement:

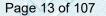
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

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3.1.1. Conclusion:

The antenna gain is -2.09dB, the directional gain of the antenna less than 6dBi. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used. Antenna structure please refer to the EUT internal photographs antenna photo.

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4. Radio Spectrum Matter Test Results (RF)

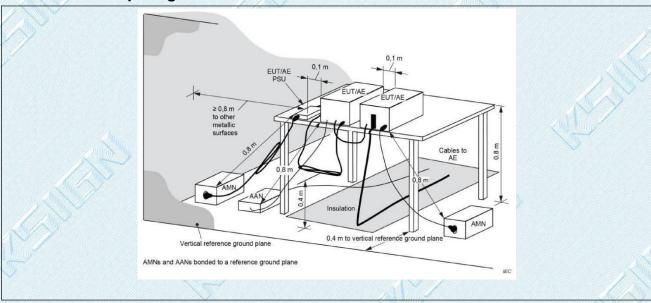
4.1. Conducted Emission at AC power line

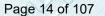
Test Requirement:	Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).			
	Frequency of emission (MHz)	Conducted limit (dBµV)		
	~	Quasi-peak	Average	
	0.15-0.5	66 to 56*	56 to 46*	
Test Limit:	0.5-5	56	46	
Z 200	5-30	60	50	
	*Decreases with the logarithm of the frequency.			
Test Method:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices			

4.1.1. E.U.T. Operation:

Operating Environment:	
Temperature:	23.8 °C
Humidity:	54.9 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1

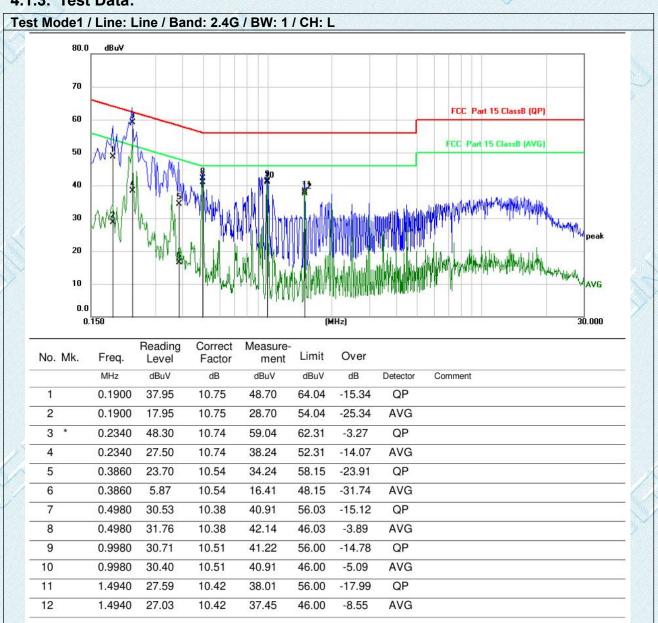
4.1.2. Test Setup Diagram:

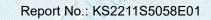




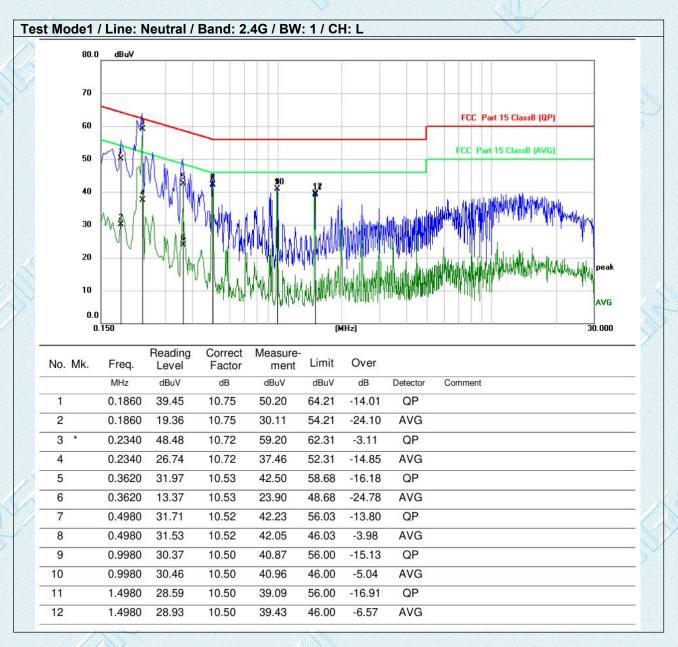


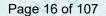
4.1.3. Test Data:







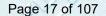




K516N[®]

4.2. Occupied Bandwidth

4.2. Occupied Ba	nawiati
Test Requirement:	Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
Test Limit:	Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
Test Method:	Occupied bandwidth—relative measurement procedure
	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "-xx dB down" requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the
Procedure:	reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the "-xx dB down amplitude" using [(reference value) - xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "-xx dB down amplitude" determined in step h). If a marker is below this "-xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "-xx dB down amplitude" determined in step h). Reset the marker-delta function and
	move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission





bandwidth.

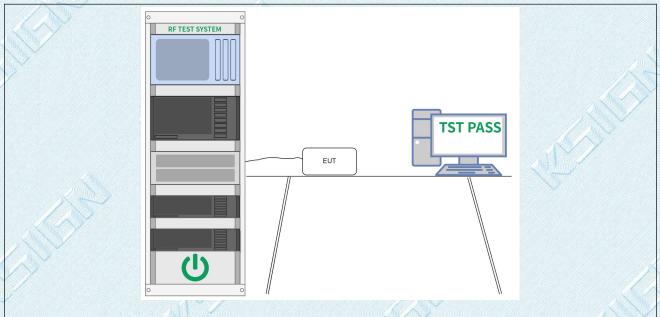
k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Report No.: KS2211S5058E01

4.2.1. E.U.T. Operation:

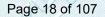
Operating Environment:	
Temperature:	24.5 °C
Humidity:	52.6 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

4.2.2. Test Setup Diagram:



4.2.3. Test Data:

Please Refer to Appendix for Details.





4.3. Maximum Conducted Output Power

Section 1990	
Test Requirement:	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Test Limit:	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Test Method:	Output power test procedure for frequency-hopping spread-spectrum (FHSS) devices
	This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test: a) Use the following spectrum analyzer settings: 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel. 2) RBW > 20 dB bandwidth of the emission being measured. 3) VBW >= RBW.
Procedure:	4) Sweep: Auto. 5) Detector function: Peak. 6) Trace: Max hold. b) Allow trace to stabilize. c) Use the marker-to-peak function to set the marker to the peak of the emission.
	 d) The indicated level is the peak output power, after any corrections for external attenuators and cables. e) A plot of the test results and setup description shall be included in the test report. NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.
431 EUT Operation	

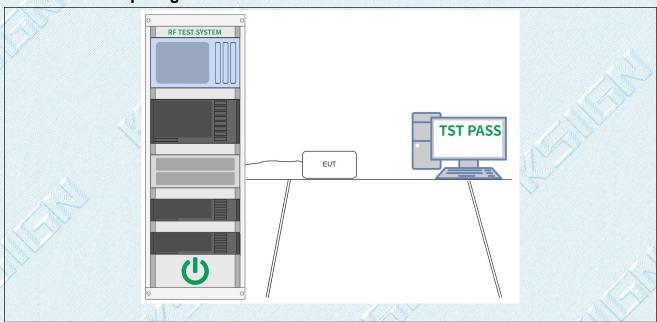
4.3.1. E.U.T. Operation:

Operating Environment:		
Temperature:	24.9 °C	
Humidity:	44.7 %	
Atmospheric Pressure:	102 kPa	
Final test mode:	Test Mode1, Test Mode2, Test Mode3	



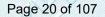


4.3.2. Test Setup Diagram:



4.3.3. Test Data:

Please Refer to Appendix for Details.





4.4. Channel Separation

Scarce Medical Control of the Contro	
Test Requirement:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.
Test Limit:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.
Test Method:	Carrier frequency separation
Procedure:	The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings: a) Span: Wide enough to capture the peaks of two adjacent channels. b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel. c) Video (or average) bandwidth (VBW) ≥ RBW. d) Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.

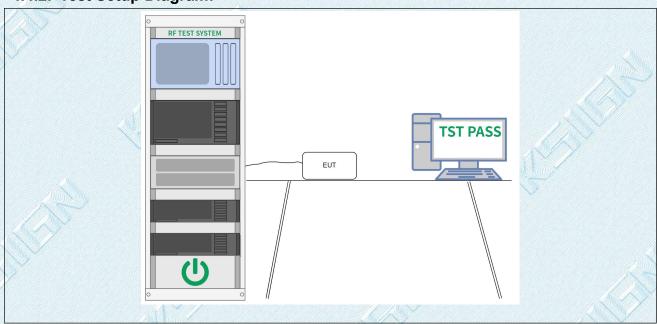
4.4.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.9 °C
Humidity:	44.7 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode4, Test Mode5, Test Mode6

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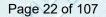
Report No.: KS2211S5058E01

4.4.2. Test Setup Diagram:



4.4.3. Test Data:

Please Refer to Appendix for Details.





4.5. Number of Hopping Frequencies

Test Requirement:	Fequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Limit:	Fequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Method:	Number of hopping frequencies
Procedure:	The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings: a) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen. b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller. c) VBW ≥ RBW.
	d) Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize. It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

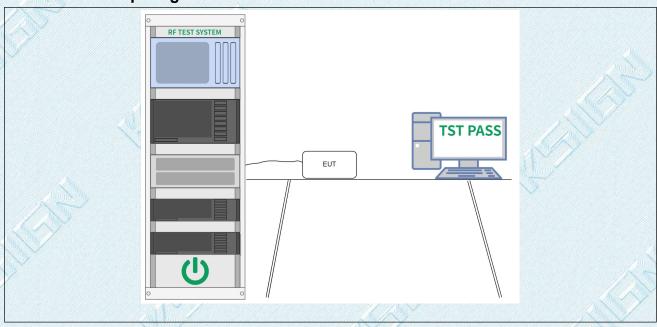
4.5.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.9 °C
Humidity:	44.7 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode4, Test Mode5, Test Mode6



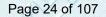


4.5.2. Test Setup Diagram:



4.5.3. Test Data:

Please Refer to Appendix for Details.





4.6. Dwell Time

4.0. Dwell fille		
Test Requirement:	Fequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.	
Test Limit:	Fequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.	
Test Method:	Time of occupancy (dwell time)	
	The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings: a) Span: Zero span, centered on a hopping channel. b) RBW shall be <= channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel. c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an	
Procedure:	adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel. d) Detector function: Peak. e) Trace: Max hold. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.	
	Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation: (Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) × (period specified in the requirements /	
	analyzer sweep time) The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation. The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.	

4.6.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.9 °C
Humidity:	44.7 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode4, Test Mode5, Test Mode6

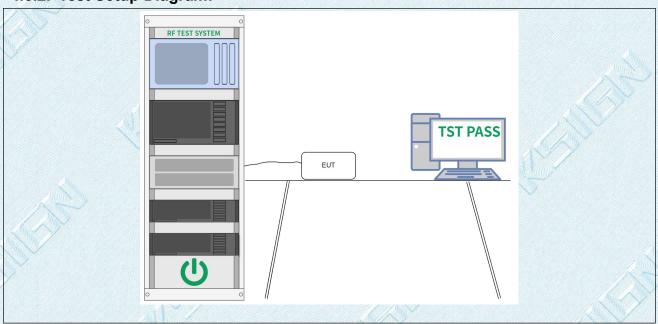
TRF EMC_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China



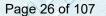


4.6.2. Test Setup Diagram:



4.6.3. Test Data:

Please Refer to Appendix for Details.



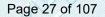


4.7. Emissions in non-restricted frequency bands

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 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.
Conducted spurious emissions test methodology
Conducted spurious emissions shall be measured for the transmit frequency, per 5.5 and 5.6, and at the maximum transmit powers. Connect the primary antenna port through an attenuator to the spectrum analyzer input; in the results, account for all losses between the unlicensed wireless device output and the spectrum analyzer. The instrument shall span 30 MHz to 10 times the operating frequency in GHz, with a resolution bandwidth of 100 kHz, video bandwidth of 300 kHz, and a coupled sweep time with a peak detector. The band 30 MHz to the highest frequency may be split into smaller spans, as long as the entire spectrum is covered.

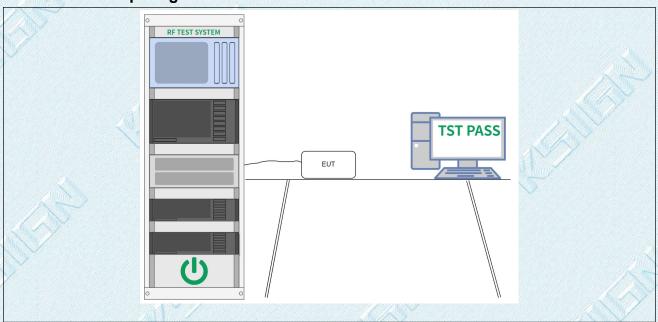
7.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.9 °C
Humidity:	44.7 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3, Test Mode4, Test Mode5, Test Mode6



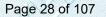


4.7.2. Test Setup Diagram:



4.7.3. Test Data:

Please Refer to Appendix for Details.



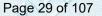


4.8. Band Edge Emissions(Radiated)

Test Requirement:	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)).`		
	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
	30-88	100 **	3
	88-216	150 **	3
Test Limit:	216-960	200 **	3
	Above 960	500	3
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.		
Test Method:	Radiated emissions tests		
Procedure:	ANSI C63.10-2013 section	on 6.6.4	

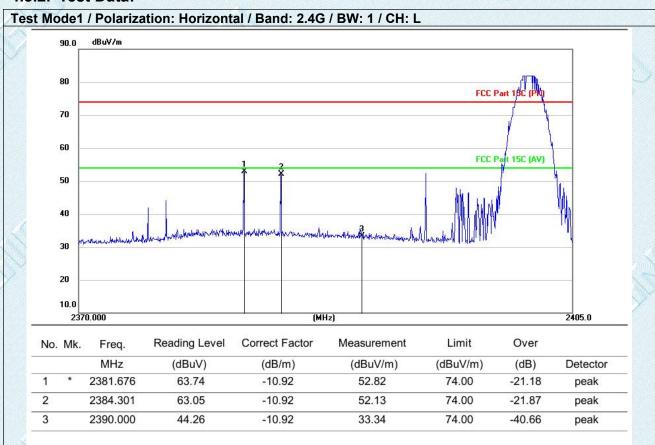
4.8.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24 °C
Humidity:	48.6 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

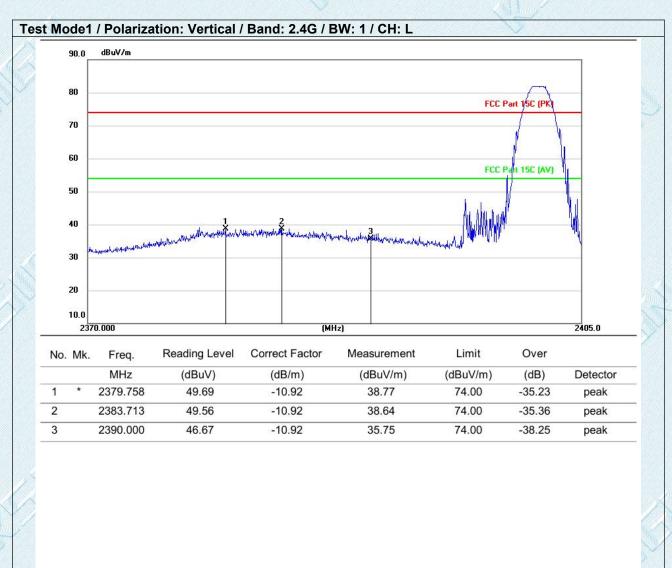




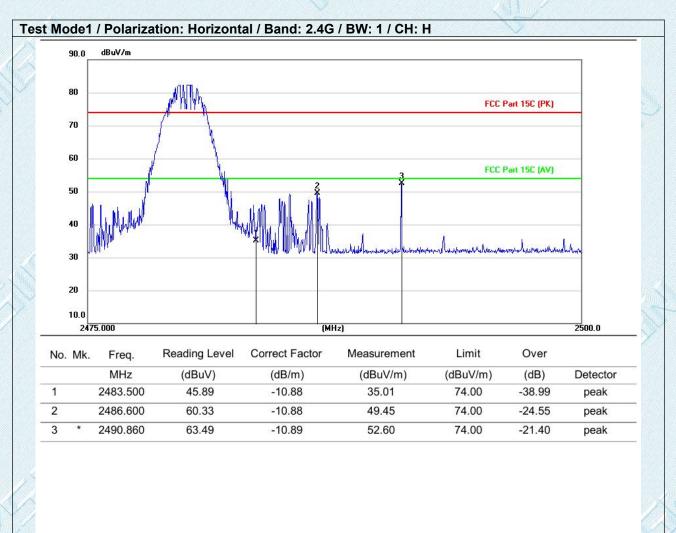
4.8.2. Test Data:



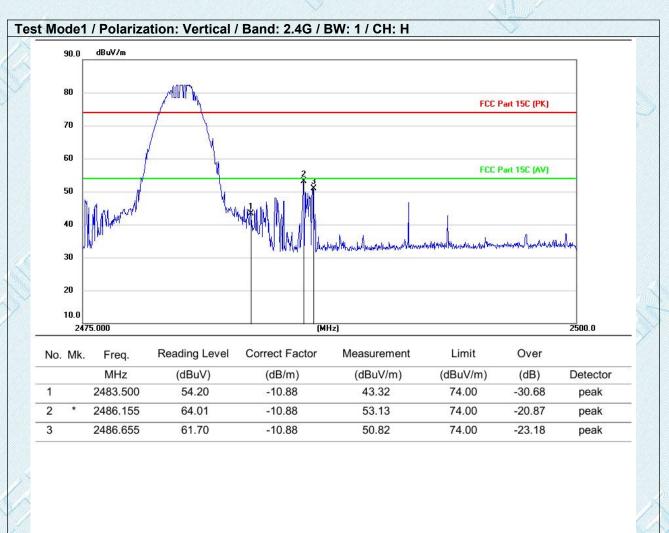




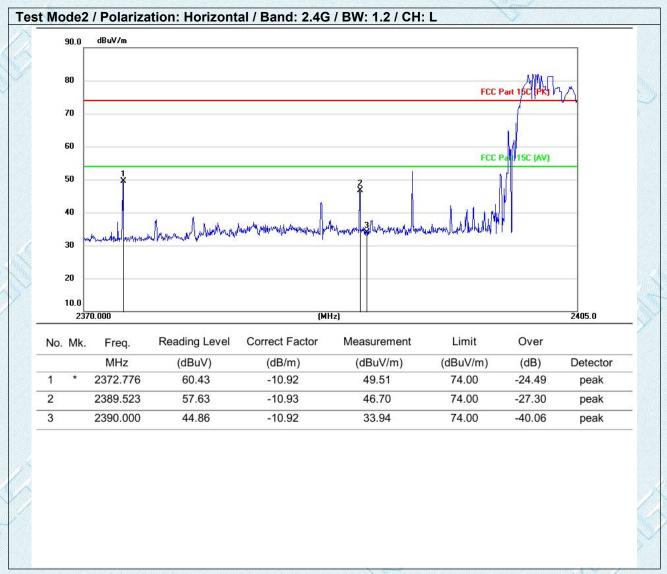


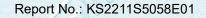




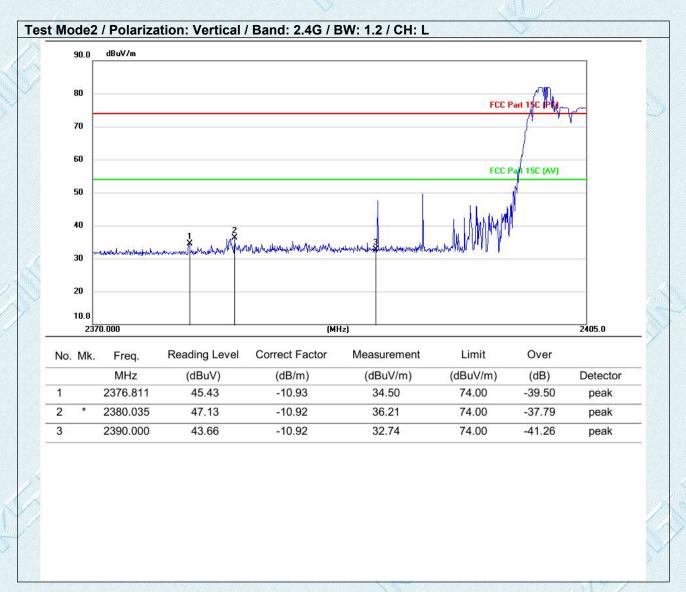




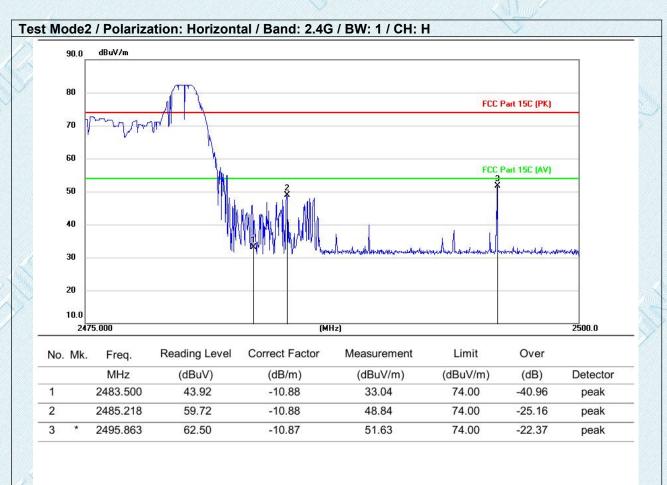




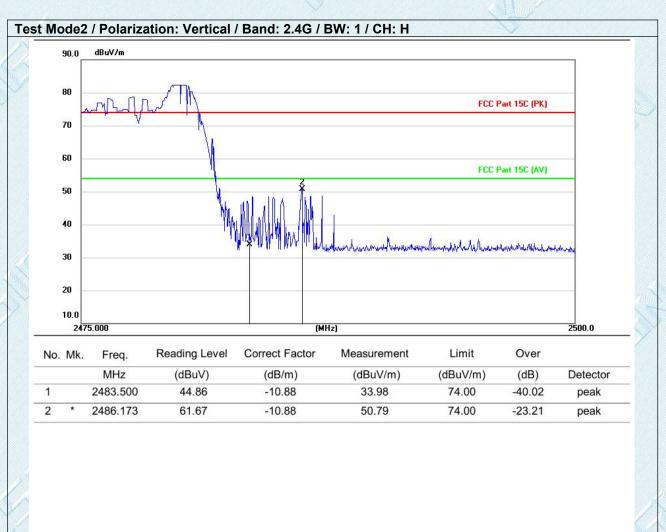














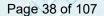


4.9. Radiated Spurious Emissions (below 1GHz)

Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as define 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)(see § 15.205(c)).				
	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		
No	30-88	100 **	3		
\	88-216	150 **	3		
Test Limit:	216-960	200 **	3		
	Above 960	500	3		
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.				
Test Method:	Radiated emissions test	s	\mathcal{A}^{\vee}		
Procedure:	ANSI C63.10-2013 sect	ion 6.6.4			

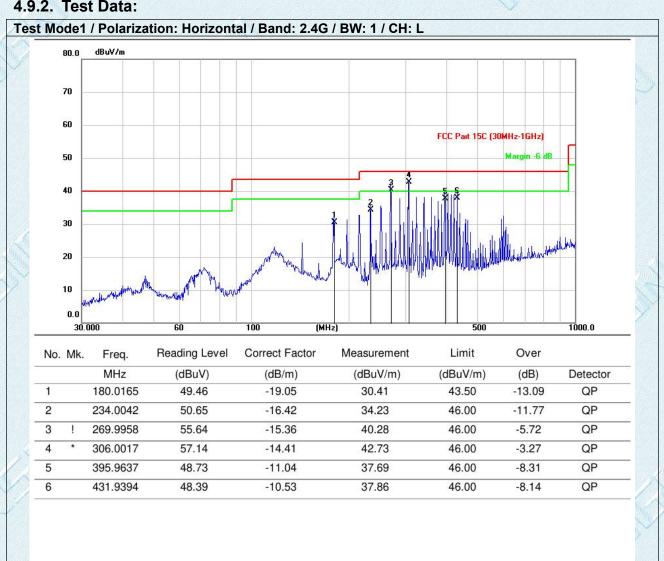
4.9.1. E.U.T. Operation:

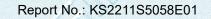
Operating Environment:	
Temperature:	24 °C
Humidity:	48.6 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1



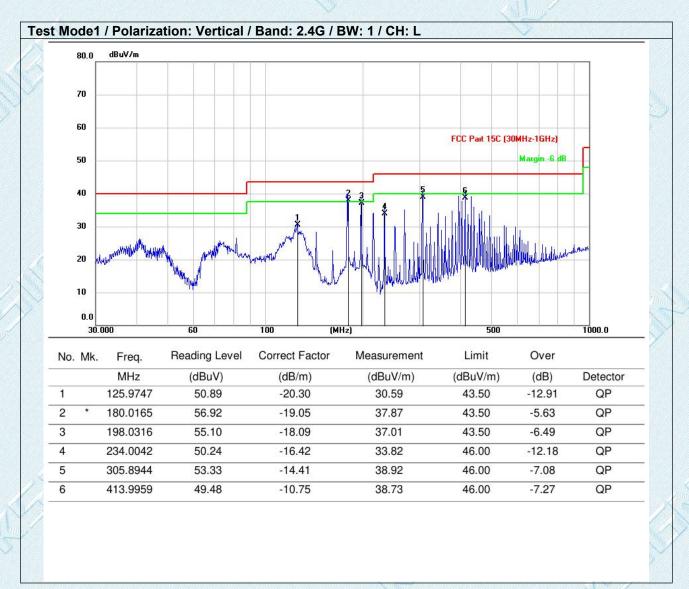


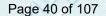
4.9.2. Test Data:













4.10. Radiated Spurious Emissions (above 1GHz)

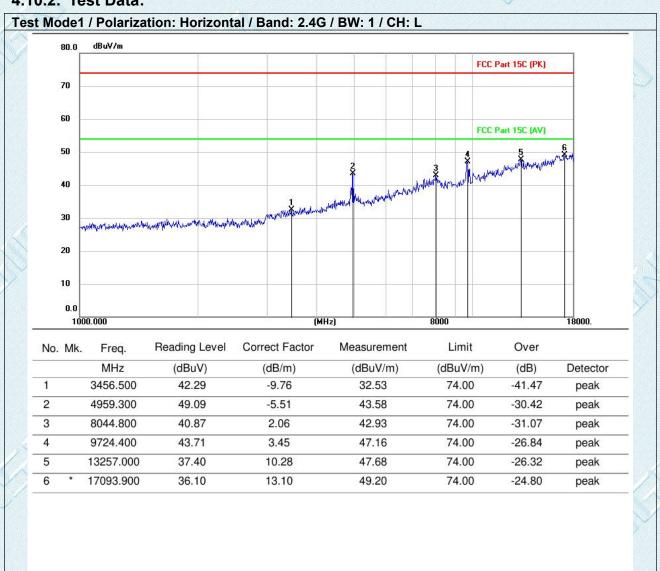
Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as define 15.205(a), must also comply with the radiated emission limits specified in \$ 15.209(a)(see § 15.205(c)).`				
N	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)		
₹ Miles	0.009-0.490	2400/F(kHz)	300		
N39	0.490-1.705	24000/F(kHz)	30		
	1.705-30.0	30	30		
No.	30-88	100 **	3		
	88-216	150 **	3		
Test Limit:	216-960	200 **	3		
	Above 960	500	3		
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.				
Test Method:	Radiated emissions test	s			
Procedure:	ANSI C63.10-2013 sect	on 6.6.4			

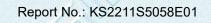
4.10.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24 °C
Humidity:	48.6 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

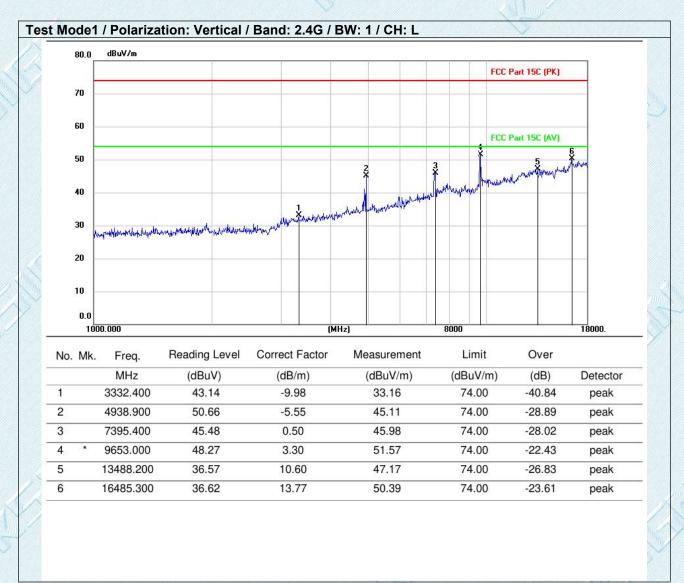


4.10.2. Test Data:



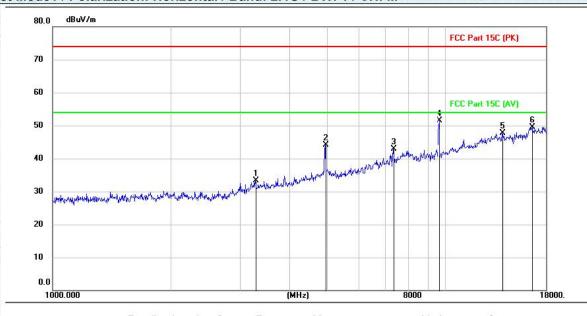




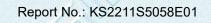




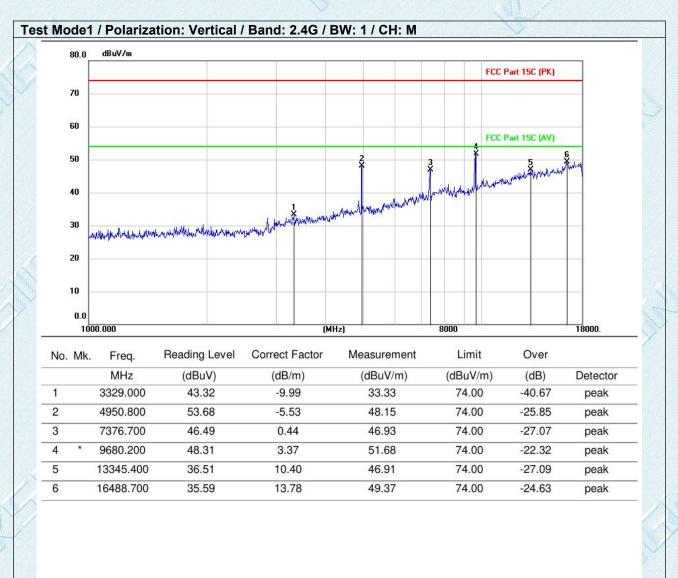
Report No.: KS2211S5058E01 Test Mode1 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: M



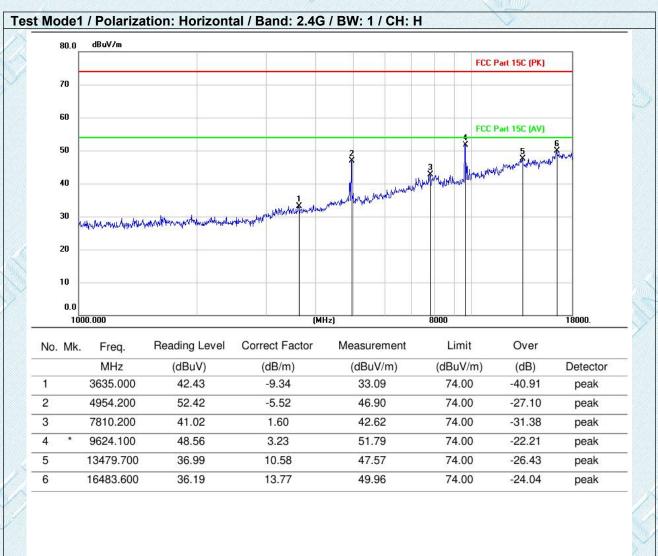
No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
	MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1	3286.500	43.46	-10.07	33.39	74.00	-40.61	peak
2	4955.900	49.70	-5.52	44.18	74.00	-29.82	peak
3	7364.800	42.56	0.41	42.97	74.00	-31.03	peak
4 *	9651.300	48.11	3.30	51.41	74.00	-22.59	peak
5	13938.700	36.54	11.16	47.70	74.00	-26.30	peak
6	16634.900	35.90	13.60	49.50	74.00	-24.50	peak

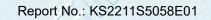




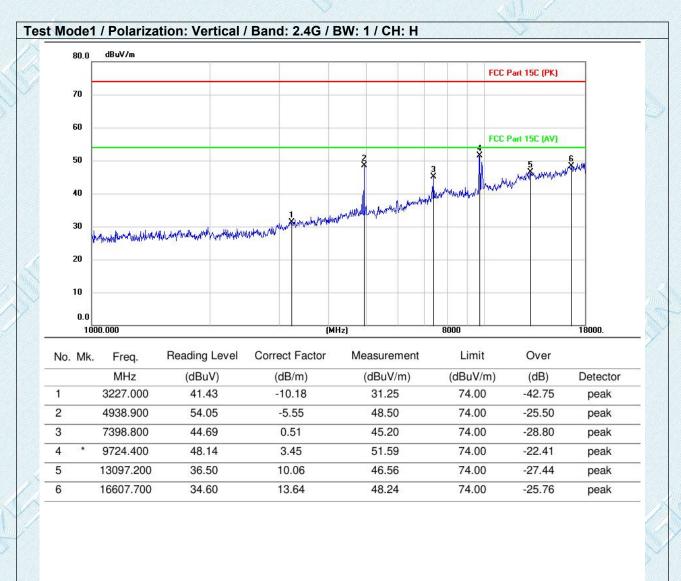


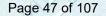






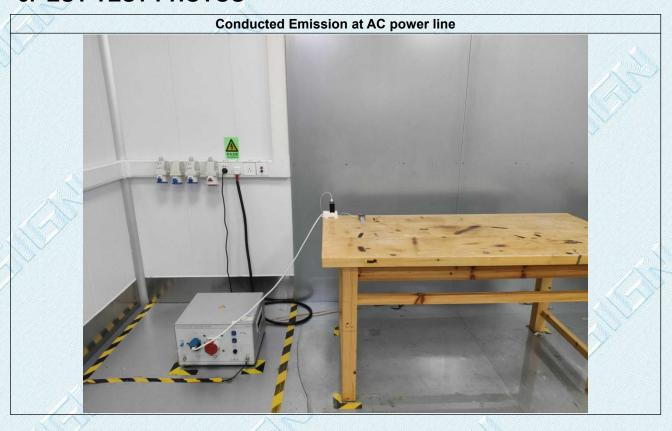






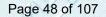


5. EUT TEST PHOTOS





TRF EMC_R1



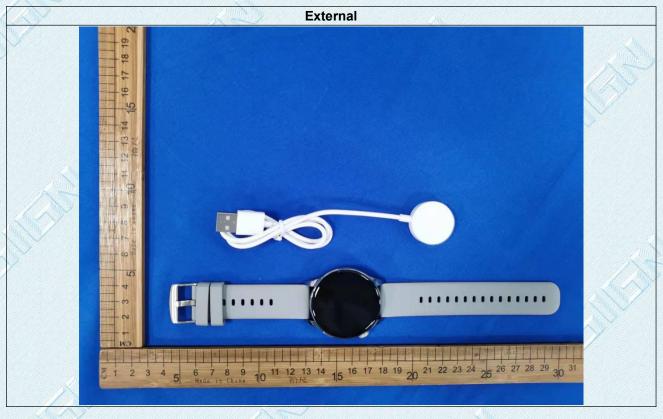






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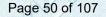
6. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

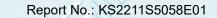




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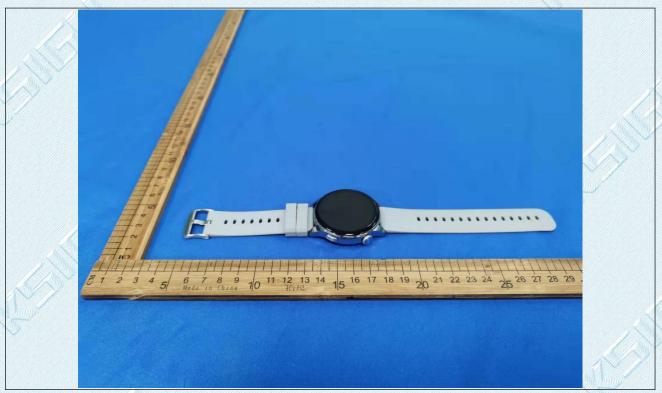
Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: info@gdksign.cn Web: www.gdksign.com













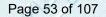


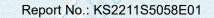


















TRF EMC_R1







TRF EMC_R1