

Report No.: SHR/2021/4000501 Page: 1 of 56

# FCC TEST REPORT

Application No:	HR/2021/40005			
Applicant:	HUAWEI DEVICE CO., LTD.			
Address of Applicant	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China			
Manufacturer:	HUAWEI DEVICE CO., LTD.			
Address of Manufacturer	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China			
EUT Description:	Smart Watch			
Model No.:	TIA-B09			
FCC ID:	2ATEYTIA-B09			
Trade Mark:	HUAWEI			
Standards:	47 CFR FCC Part 2, Subpart J			
	47 CFR Part 15, Subpart C			
Date of Receipt:	2020/11/17			
Date of Test:	2021/3/15 to 2021/3/31			
Date of Issue:	2021/4/19			
Test Result:	PASS *			

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

Authorized Signature:

\*

Derele yang

Derek Yang Wireless Laboratory Manager



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# 1 Version

Revision Record					
Version Chapter Date Modifier Remark					
01		2021/4/19		Original	

Authorized for issue by:	
Prepared By	Dee . Zheng (Dee Zheng) / Engineer
Checked By	Jim Huang) / Reviewer



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SGS-CSTC Standards Technical Services Co., Ltd.Shenzhen Branch

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# 2 Test Summary

Test Item	Test Requirement	Test method	Test Result	Result	Test Lab*
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Clause 4.2	PASS	В
Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.3	PASS	А
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.4	PASS	A
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.5	PASS	А
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.6	PASS	А
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS	А
Radiated Spurious Emissions	15.205/15.209	ANSI C63.10 2013	Clause 4.8	PASS	В
Restricted bands around fundamental frequency (Radiated Emission)	15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS	В

Remark: All test were performed by Lab A and B.

Parts of test items above were subcontracted to Lab B.

Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. Test engineer:Dee Zheng,Swing Hu,Habit Zeng, Leah Chen,Ken Liu,Andy Yao



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Remark:

This test report (Report No.: SHR/2021/4000501) is based on the original test report (Report No.: HR/2021/1000801) issued on 2021-01-17.

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan was performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report only radiated spurious emissions were performed based on the worst case of the original report with report number HR/2021/1000801 and other test data in this report are based on the previous report with report number HR/2021/1000801.



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# **3** General Information

# 3.1 Client Information

Applicant:	HUAWEI DEVICE CO., LTD.
Address of Applicant:	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China
Manufacturer:	HUAWEI DEVICE CO., LTD.
Address of Manufacturer:	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China

# 3.2 Test Location

#### Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch			
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China			
Post code:	518057			

#### Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086



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# 3.3 Test Facility

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

Lab A:

#### A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

#### • VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

#### FCC – Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

#### Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

#### A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01. Designation Number: CN1271.



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# 3.4 General Description of EUT

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EUT Description:	Smart Watch		
Model No.:	TIA-B09		
Trade Mark:	HUAWEI		
Hardware Version:	R2		
Software Version:	1.7.0.1		
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 2 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 0 to 39.		
Bluetooth Version:	Bluetooth V5.0 LE		
Modulation Type:	GFSK		
Number of Channel:	40		
Sample Type:	Portable Device, Module		
Antenna Type:	External, 🛛 Integrated		
Antenna Gain:	-3.0dBi		
Power Supply:	AC/DC Adapter; Battery; PoE:; Other:		
	Li-ion Battery: HB351731EFW;		
	Li-ion Polymer Battery Capacity: 180mAh		
Accessories:	Rated Voltage: 3.87V		
	Cut off Voltage: 4.45V		
	Discharge Voltage: 3.0V		

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

Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

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Channel	Frequency
The lowest channel (CH0)	2402MHz
The middle channel (CH19)	2440MHz
The highest channel (CH39)	2480MHz

# 3.5 Test Environment

Operating Environment			
Temperature:	25.0 °C		
Humidity:	50 % RH		
Atmospheric Pressure:	101.32 KPa		

# 3.6 Description of Support Units

The EUT has been tested independent unit.



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# 4 Test results and Measurement Data

# 4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)

#### 15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -3.0dBi.



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Test Requirement:	47 CFR Part 15C Section 15.207							
Test Method:	ANSI C63.10: 2013							
Test Frequency Range:	150kHz to 30MHz							
	- (111)	Limit (dBuV)						
	Frequency range (MHz)	Quasi-peak	Average					
	0.15-0.5	66 to 56*	56 to 46*					
Limit:	0.5-5	56	46					
	5-30	60	50					
	* Decreases with the logarit	hm of the frequency.						
Test Procedure:	<ol> <li>The mains terminal distur</li> <li>The EUT was connected Stabilization Network) w power cables of all othe which was bonded to the for the unit being measu multiple power cables to exceeded.</li> <li>The tabletop EUT was p reference plane. And for horizontal ground referent</li> <li>The test was performed EUT shall be 0.4 m from reference plane was bon 1 was placed 0.8 m fro ground reference plane in This distance was betw other units of the EUT LISN 2.</li> <li>In order to find the maxin of the interface cables n ANSI C63.10: 2013 on c</li> </ol>	bance voltage test was condi- bance voltage test was condi- l to AC power source through which provides a $50\Omega/50\mu$ H + er units of the EUT were con- e ground reference plane in t- ured. A multiple socket outle baced upon a non-metallic ta- placed upon a non-metallic ta- floor-standing arrangement, nce plane. with a vertical ground reference in the vertical ground reference inded to the horizontal ground for LISNs mounted on top of green the closest points of the and associated equipment we num emission, the relative po- nust be changed according to onducted measurement.	Lacted in a shielded room. In a LISN 1 (Line Impedance $5\Omega$ linear impedance. The nected to a second LISN 2, he same way as the LISN 1 t strip was used to connect rating of the LISN was not able 0.8m above the ground the EUT was placed on the ence plane. The rear of the e plane. The vertical ground d reference plane. The LISN under test and bonded to a the ground reference plane. e LISN 1 and the EUT. All vas at least 0.8 m from the positions of equipment and all					
Test Setup:	Shielding Room	Te	st Receiver					

# 4.2 AC Power Line Conducted Emissions

SG



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Test Mode:	Transmitting with GFSK modulation. Charge +Transmitting mode.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass



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#### **Measurement Data**

An initial pre-scan was performed on the live and neutral lines with peak detector.

# Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



#### **Test Graph**

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Туре
1	0.1638	10.10	27.68	65.27	37.59	15.25	55.27	40.02	L
2	0.5203	10.10	28.81	56.00	27.19	17.31	46.00	28.69	L
3	0.8307	10.10	21.41	56.00	34.59	15.22	46.00	30.78	L
4	6.8096	10.10	24.71	60.00	35.29	20.01	50.00	29.99	L
5	14.4095	10.11	19.32	60.00	40.68	12.20	50.00	37.80	L
6	23.6816	10.11	22.82	60.00	37.18	15.21	50.00	34.79	L



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#### **Test Graph**

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Туре
1	0.1857	10.10	25.21	64.22	39.01	14.11	54.22	40.11	Ν
2	0.5186	10.10	26.19	56.00	29.81	15.97	46.00	30.03	Ν
3	1.9262	10.10	24.33	56.00	31.67	15.93	46.00	30.07	Ν
4	6.8248	10.10	23.94	60.00	36.06	16.30	50.00	33.70	Ν
5	14.5097	10.11	24.50	60.00	35.50	13.60	50.00	36.40	N
6	24.6751	10.11	21.31	60.00	38.69	12.29	50.00	37.71	Ν



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### Test on the worst case:



#### **Test Graph**

Final	Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict	
1	0.1684	36.36	65.04	28.68	23.22	55.04	31.82	PASS	
2	0.2561	30.33	61.56	31.23	14.92	51.56	36.64	PASS	
3	0.7205	30.75	56.00	25.25	14.87	46.00	31.13	PASS	
4	1.1792	22.60	56.00	33.40	11.09	46.00	34.91	PASS	
5	6.9164	15.85	60.00	44.15	8.37	50.00	41.63	PASS	
6	18.6237	28.22	60.00	31.78	16.15	50.00	33.85	PASS	



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#### **Test Graph**

Final	Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict	
1	0.1647	35.68	65.23	29.55	26.46	55.23	28.77	PASS	
2	0.2921	29.22	60.46	31.24	18.68	50.46	31.78	PASS	
3	0.7073	29.95	56.00	26.05	15.89	46.00	30.11	PASS	
4	1.0504	27.34	56.00	28.66	18.28	46.00	27.72	PASS	
5	1.3132	25.42	56.00	30.58	16.98	46.00	29.02	PASS	
6	18.9226	23.55	60.00	36.45	13.78	50.00	36.22	PASS	

Remarks:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.



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# 4.4 Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)			
Test Method:	ANSI C63.10 :2013 Section 11.9.1.1			
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Limit:	30dBm			
Test Mode:	Transmitting with GFSK modulation.			
Instruments Used:	Refer to section 6 for details.			
Test Results:	Pass			

#### 4.4.1 Test Results

#### Measurement Data of Peak Power:

GFSK mode						
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result			
Lowest	4.49	30.00	Pass			
Middle	4.46	30.00	Pass			
Highest	4.40	30.00	Pass			



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# 4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)				
Test Method:	ANSI C63.10: 2013 Section 11.8 Option 2				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Limit:	≥ 500 kHz				
Test Mode:	Transmitting with GFSK modulation.				
Instruments Used:	Refer to section 6 for details.				
Test Results:	Pass				

#### 4.5.1 Test Results

SG

Mode	Test Channel	99% Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
GFSK	Lowest	1.03	0.68	≥500	Pass
	Middle	1.04	0.69	≥500	Pass
	Highest	1.06	0.71	≥500	Pass



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Ref L	evel	30.00 dBm	) Offset	1.00 dB (	RBW	100 kHz						
🗎 Att		40 dB	e swt	10 ms (	● VBW :	300 kHz	Mode /	Auto S	weep			
😑 1Pk M	lax											
							M1	[1]				4.15 dBm
00 40											2.402	00430 GHz
20 aBm							ndl	в				6.00 dB
10 dBm							Bw				677.3000	100000 kHz
10 0011						M1	Qf	actor				3546.5
0 dBm-				Т	1/~	$-\gamma$		2				
o ubiii							ſ	$\leq$				
-10 dBr	n								~			
10 001				/								
-20 dBr	n											
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-30 dBr	n-+-				_							
-40 dBr	n											
-50 dBr	n-+-											
-60 dBr	n-+-											
CF 2.4	02 GF	lz				691 pts	;				Spa	n 3.0 MHz
Marker												
Type	Ref	Trc	X-value	.	Y-va	lue	Functi	on l		Fund	tion Result	1
M1		1	2.40200	43 GHz	4.	15 dBm	ndB (	down				677.3 kHz
Τ1		1	2.40164	83 GHz	-1.	88 dBm		ndB				6.00 dB
Т2		1	2.40232	56 GHz	-1.	86 dBm	Q fa	actor				3546.5
								Mea	asurina			1
	1											- //

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# 4.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)				
Test Method:	ANSI C63.10 :2013 Section 11.10.2				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Limit:	≤8.00dBm/3kHz				
Test Mode:	Transmitting with GFSK modulation.				
Instruments Used:	Refer to section 6 for details.				
Test Results:	Pass				

#### 4.6.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
	Lowest	-10.59	≤8.00	Pass
GFSK	Middle	-10.90	≤8.00	Pass
	Highest	-11.19	≤8.00	Pass



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-10.59 dBn 2.40196820 GH





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4.6.2.3



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# 4.7 Band-edge for RF Conducted Emissions

SG

Test Requirement:	47 CFR Part 15C Section 15.247 (d)				
Test Method:	ANSI C63.10: 2013 Section 11.13				
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table				
	Ground Reference Plane				
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.				
Test Mode:	Transmitting with GFSK modulation.				
Instruments Used:	Refer to section 6 for details.				
Test Results:	Pass				



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# 4.8 Spurious RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)			
Test Method:	ANSI C63.10: 2013 Section 11.11			
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.			
Test Mode:	Transmitting with GFSK modulation.			
Instruments Used:	Refer to section 6 for details.			
Test Results:	Pass			



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#### Remark:

Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205					
Test Method:	ANSI C63.10 :2013 Section 11.12					
Test Site:	Measurement Distance:	3m (Semi-Anecho	oic Chambe	r)		
	Frequency	Detector	RBW	VBW	Remark	
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak	
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average	
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak	
Reasiver Setup	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak	
Receiver Setup.	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average	
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak	
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak	
		Peak	1MHz	3MHz	Peak	
	Above IGHZ	Peak	1MHz	10Hz	Average	
	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)	
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300	
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30	
	1.705MHz-30MHz	30	-	-	30	
	30MHz-88MHz	100	40.0	Quasi-peak	3	
Limit:	88MHz-216MHz	150	43.5	Quasi-peak	3	
	216MHz-960MHz	200	46.0	Quasi-peak	3	
	960MHz-1GHz	500	54.0	Quasi-peak	3	
	Above 1GHz	500	54.0	Average	3	
	Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					

# 4.9 Radiated Spurious Emission

SG



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	(3) For average measurement: use duty cycle correction factor method per 15.35(c).			
	Duty cycle = On time/100 milliseconds On time = N 1 *L 1 +N 2 *L 2 ++N n-1 *LN n-1 +N n *L n			
	Where N 1 is number of type 1 pulses, L 1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + 20*log(Duty cycle)			
	f. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.			
	<ul> <li>g. The test-receiver system was set to Peak Detect Function and Specific Bandwidth with Maximum Hold Mode.</li> </ul>			
	<ul> <li>h. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> <li>i. Test the EUT in the lowest channel (2402MHz),the middle channel (2440MHz),the Highest channel (2480MHz)</li> </ul>			
	for Transmitting mode, and found the X axis positioning which it is the worst case.			
	k. Repeat above procedures until all frequencies measured was complete.			
Exploratory Test Mode:	Transmitting with GFSK modulation. Charge + Transmitting mode.			
Final Test Mode:	Transmitting with GFSK modulation. Pretest the EUT at Charge + Transmitting mode, For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.			
Instruments Used:	Refer to section 6 for details.			
Test Results:	Pass			



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