



FCC RADIO TEST REPORT

FCC ID: 2AHP625BT

Product : BT smart watch

Trade Name : N/A

Model Name : SW25BTLF

Serial Model : N/A

Prepared for

Tomstar Industrial Limited

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BaoAn street, Xixiang, BaAn district, Shenzhen, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name Tomstar Industrial Limited
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Manufacture's Name Tomstar Industrial Limited
Address Room 512-515, HuaFeng International Commercial Building,
No.4018 BaoAn street, Xixiang, BaAn district, Shenzhen, China

Product description

Product name BT smart watch

Model and/or type reference SW25BTLF

Serial Model N/A

Standards FCC Part15.247

Test procedure ANSI C63.4-2009

This device described above has been tested by AiT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests Mar. 12, 2016 ~ Mar. 24, 2016

Date of Issue Mar. 24, 2016

Test Result **Pass**

Testing Engineer : 

(Seal Chen)

Technical Manager : 

(Jackie Deng)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

DongGuan Yaxu(AiT) Technology Limited
No. 22,JinQianLing Street 3, JiTiGang Village, Huang-Jiang Town, DongGuan, Guangdong,
523757 China.

FCC Registration No.: 248337

1.2 MEASUREMENT UNCERTAINTY

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 %** .

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	BT smart watch	
Model Name	SW25BTLF	
Serial Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a BT smart watch	
	Operation Frequency:	2402~2480MHz
	Modulation Type:	GFSK
	Bluetooth version:	4.0 BLE
	Bit Rate of Transmitter	1 Mbps
	Number Of Channel	40CH
	Antenna Designation:	Please see Note 3.
	Output Power(Conducted):	5.49dBm(PK)
	Antenna Gain (dBi)	0dbi
Channel List	Please refer to the Note 2.	
Ratings	DC 3.7V	
Adapter	M/N:HK05001000F, Input:100-240V, 50/60Hz, 0.5A, Output:DC 5V, 1A	
Battery	DC 3.7V, 180mAh	
BT versions	V4.0 BLE because the firmware limitation, this product only supports BT4.0 BLE. And users can not enable other RF function by themselves.	
HW	6.2BB	
SW	V1.1	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel	Frequency (MHz)
00	2402
01	2404
.....
38	2478
39	2480

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
.						

A	N/A	N/A	Internal antenna	Pogo pin connector	0	BT Antenna
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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
Mode 2	CH19
Mode 3	CH39
Mode 4	BT link

For Conducted Emission	
Final Test Mode	Description
Mode 4	BT link

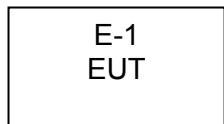
For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39

Note:

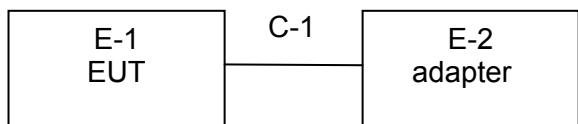
- (1) The measurements are performed at the highest, middle, lowest available channels.
Test performed by fully-charged battery.
- (2) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%. measurements are performed according to the KDB 558074 D01 DTS Meas Guidance v03r04

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Emission Test



Conducted Spurious Emission Test



2.4 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	Brand	Model/Type No.	Series No.	Note
E-1	BT smart watch	N/A	SW25BTLF	N/A	EUT
E-2	Adapter	HUIKE	HK05001000F	N/A	this adapter is not marketed with EUT. Any taken from the test laboratory for test.

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.8m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

AC power line conducted test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI Test Receiver	R&S	ESCI	100124	2015.06.29	2016.06.28
2	LISN	Kyoritsu	KNW-242	8-837-4	2015.06.29	2016.06.28
3	LISN	Kyoritsu	KNW-407	8-1789-3	2015.06.29	2016.06.28
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.06.29	2016.06.28

Radiation Test equipment

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2015.06.29	2016.06.28
2	EMI Measuring Receiver	R&S	ESR	101660	2015.12.12	2016.12.11
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2015.06.29	2016.06.28
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2015.12.02	2016.12.01
5	TRILOG Super Broadband test Antenna	SCHWARZBEC K	VULB9160	9160-3206	2015.12.03	2016.12.02
6	Broadband Horn Antenna	SCHWARZBEC K	BBHA9120D	452	2015.12.03	2016.12.02
7	SHF-EHF Horn	SCHWARZBEC K	BBHA9170	BBHA917036 7	2015.12.03	2016.12.02
8	Loop Antenna	ARA	PLA-1030/B	1029	2015.03.20	2016.03.19
9	Radiated Cable 1# (30MHz-1GHz)	FUJIKURA	5D-2W	01	2016.01.04	2017.01.03
10	Radiated Cable 2# (1GHz -25GHz)	FUJIKURA	10D2W	02	2015.12.25	2016.12.24
11	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2016.01.04	2017.01.03
12	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A
13	Power Mete	Anritsu	ML2487B	110553	2015.07.10	2016.07.09



14	Power Sensor	Anritsu	MA2411B	100345	2015.07.10	2016.07.09
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Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

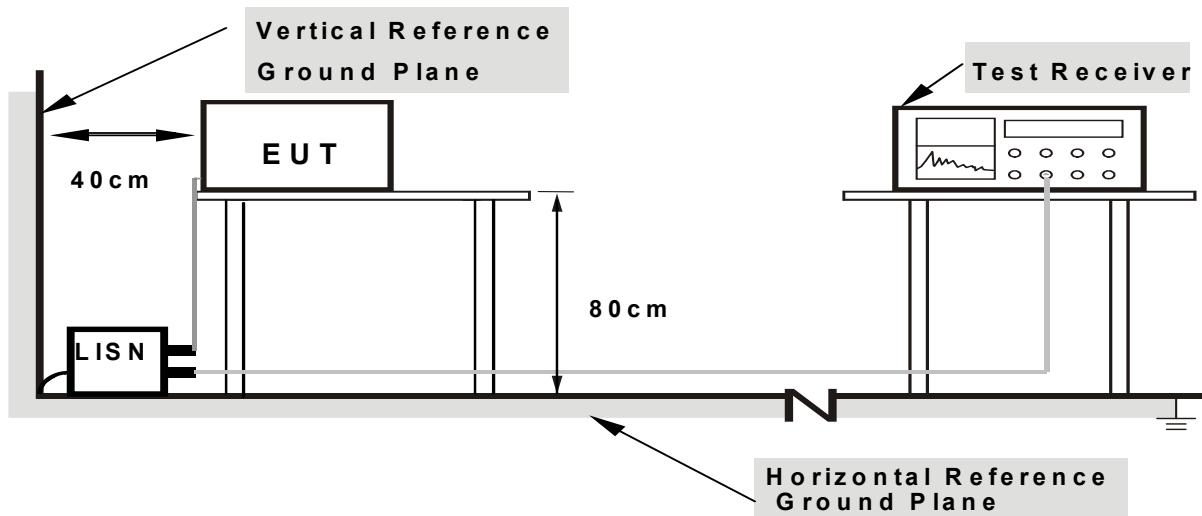
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note:

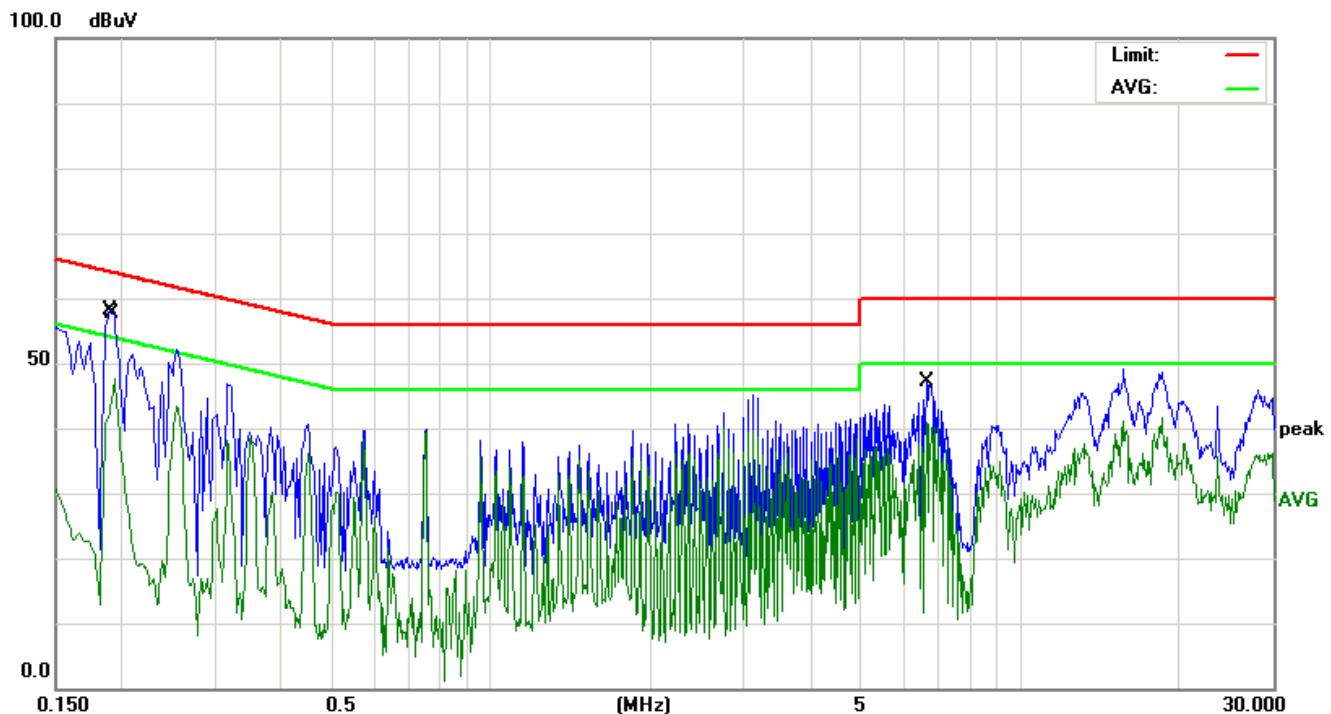
1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

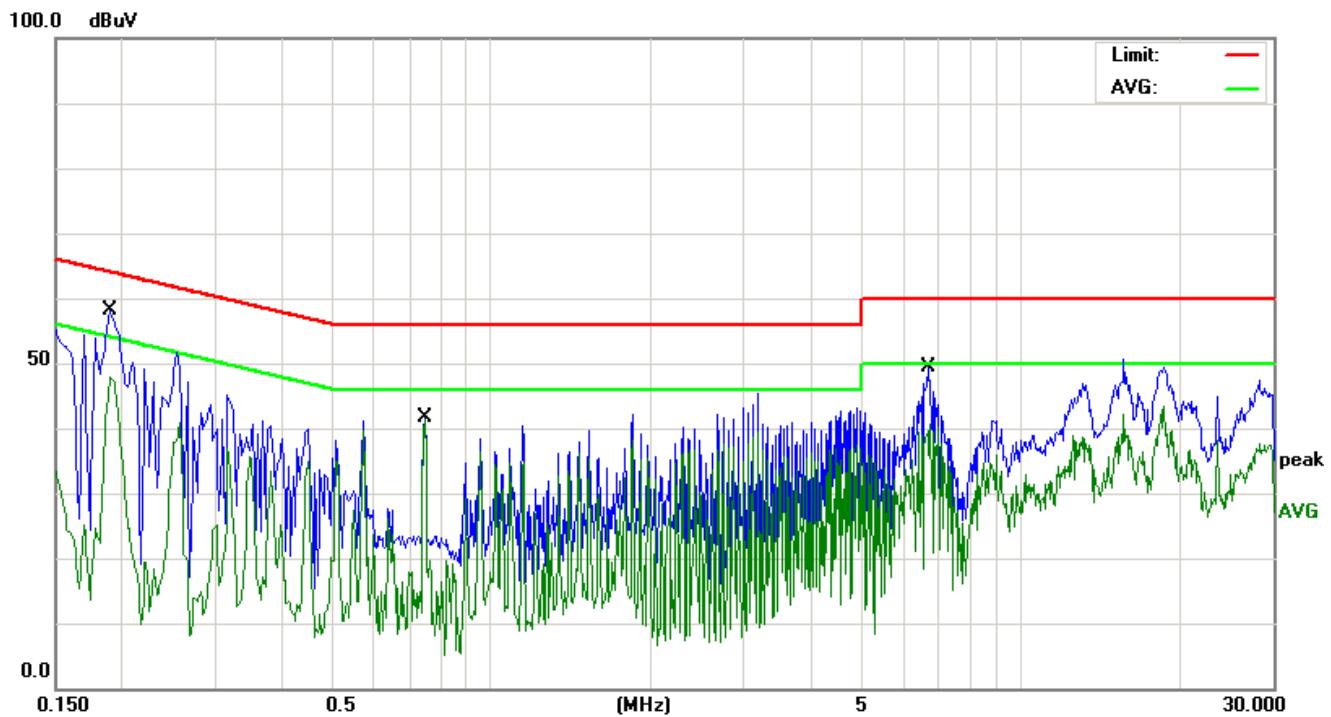
3.1.6 TEST RESULTS

EUT:	BT smart watch	Model Name. :	SW25BTLF
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V by adapter AC120V/60Hz
Test Mode :	4	Phase:	L



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dB			
1	*	0.1900	47.62	10.44	58.06	64.03	-5.97	QP	
2		0.1940	37.19	10.44	47.63	53.86	-6.23	AVG	
3		6.6338	36.34	10.66	47.00	60.00	-13.00	QP	
4		6.6338	30.27	10.66	40.93	50.00	-9.07	AVG	

EUT:	BT smart watch	Model Name. :	SW25BTLF
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V by adapter AC120V/60Hz
Test Mode :	4	Phase:	N



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
			MHz	dBuV	dB	dBuV	dB		
1		0.1900	47.78	10.44	58.22	64.03	-5.81		QP
2		0.1900	37.38	10.44	47.82	54.03	-6.21		AVG
3		0.7500	31.27	10.41	41.68	56.00	-14.32		QP
4	*	0.7500	30.91	10.41	41.32	46.00	-4.68		AVG
5		6.6940	38.77	10.66	49.43	60.00	-10.57		QP
6		6.7620	30.03	10.68	40.71	50.00	-9.29		AVG

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a)&A8.5, then the 15.209(a) limit in the table below has to be followed.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Frequencies (MHz)	Field Strength (micorvolts/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
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

- (1) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto

Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- 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: For radiated measurement test above 1GHz:

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

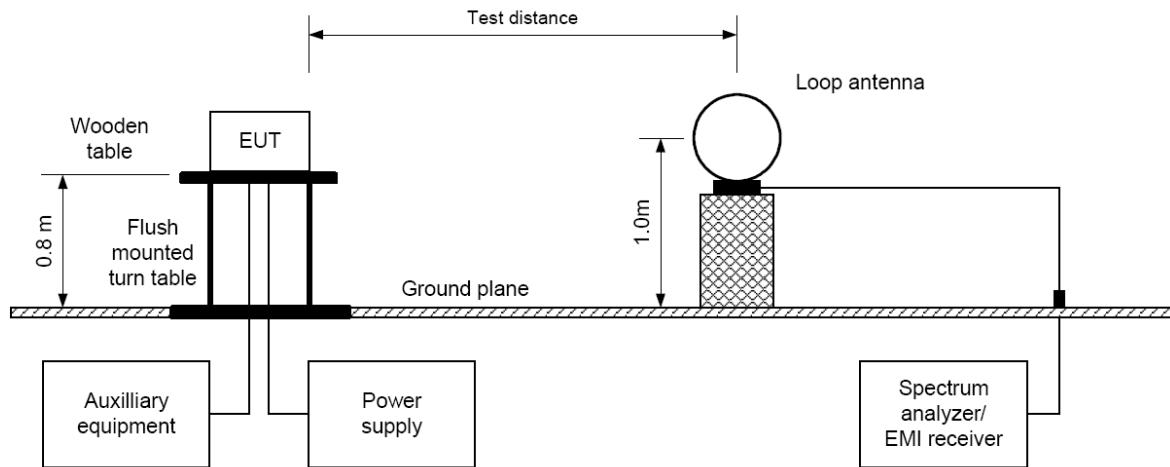
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

3.2.3 DEVIATION FROM TEST STANDARD

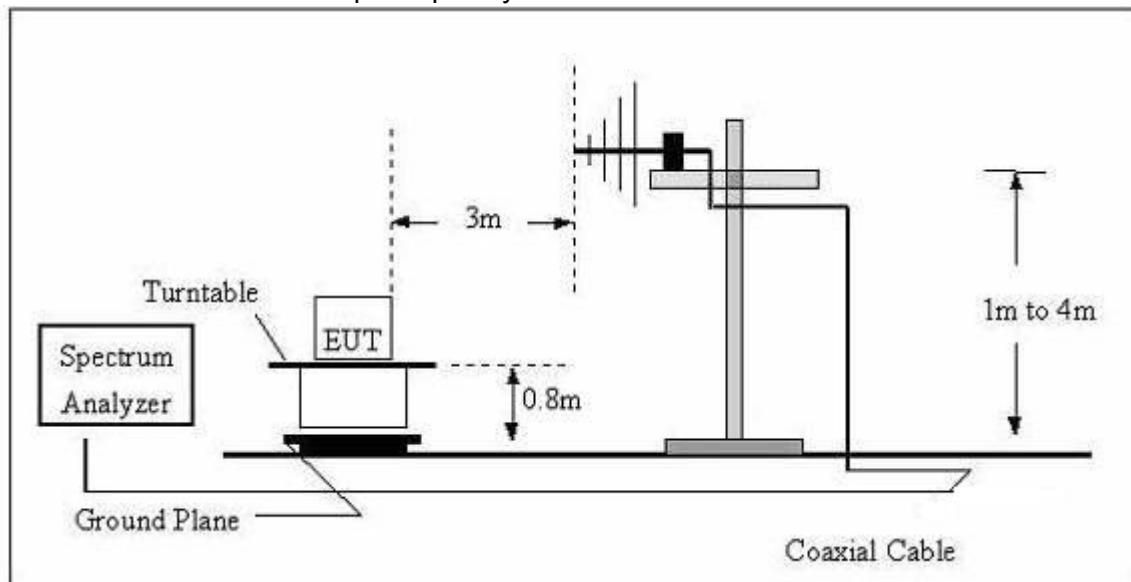
No deviation

3.2.4 TEST SETUP

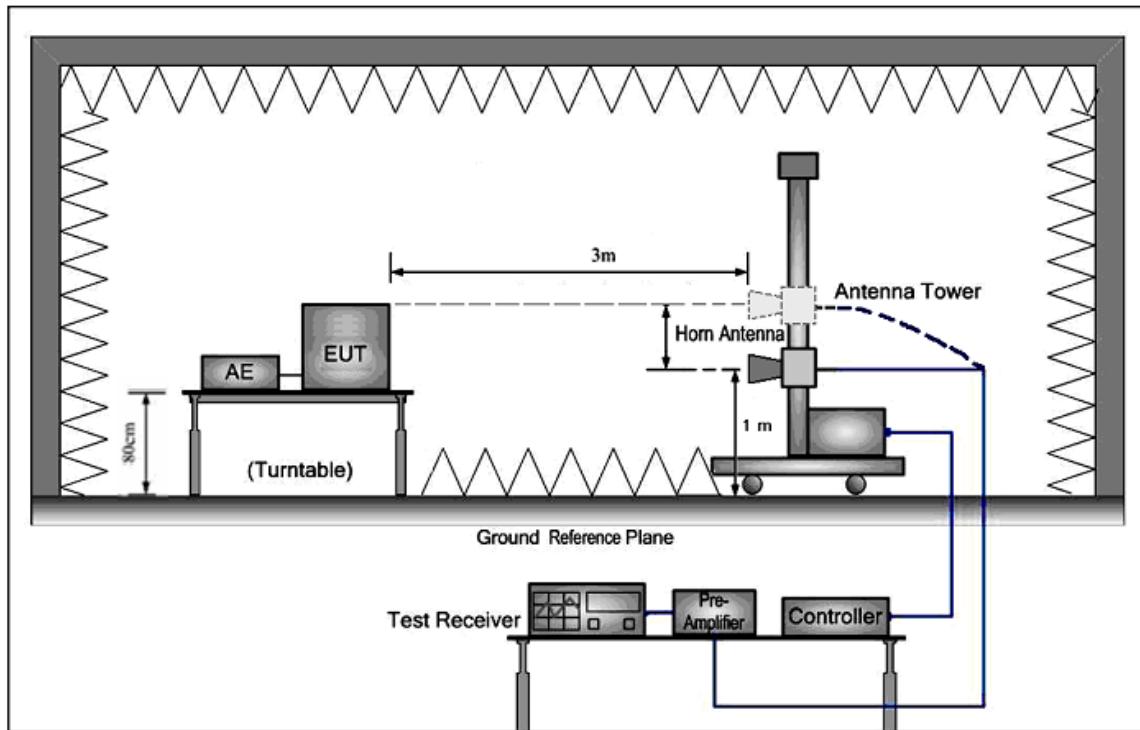
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	BT smart watch	Model Name. :	SW25BTLF
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V by battery
Test Mode :	TX	Polarization :	--

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State
--	--	--	--	P/F
--	--	--	--	P
--	--	--	--	P

NOTE:

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

Distance extrapolation factor = $40 \log \left(\frac{\text{specific distance}}{\text{test distance}} \right) \text{dB}$;
Limit line = specific limits(dBuV) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	BT smart watch	Model Name :	SW25BTLF
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V by battery
Test Mode :	TX 2440(worse-case)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	71.8319	18.94	6.24	25.18	40	-14.82	QP
V	132.685	22.07	11.95	34.02	40	-5.98	QP
V	227.6905	19.54	10.36	29.9	40	-10.1	QP
V	303.5437	20.31	14.58	34.89	47	-12.11	QP
H	56.7917	18.67	5.66	24.33	40	-15.67	QP
H	189.0743	25.37	8.86	34.23	40	-5.77	QP
H	227.6906	24.66	10.36	35.02	40	-4.98	QP
H	303.5437	26.69	14.58	41.27	47	-5.73	QP

Remark:

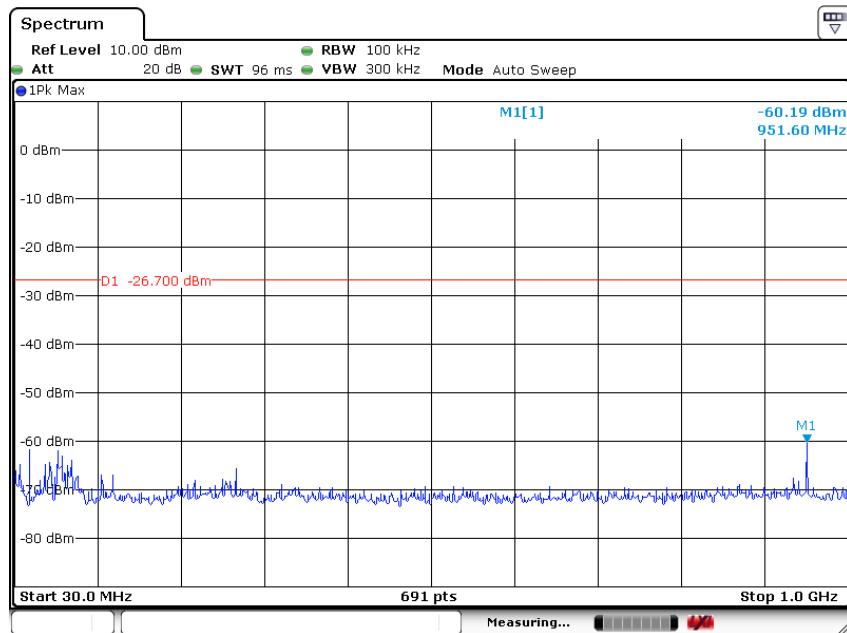
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

3.2.8 TEST RESULTS (1GHZ~ 10TH HARMONIC)

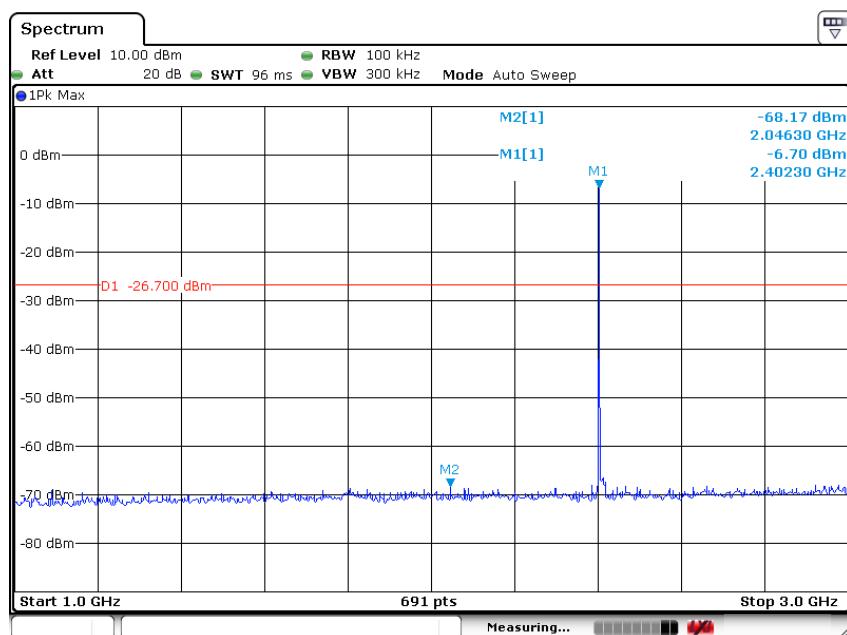
Frequency (MHz)	Reading (dB μ V)	Factor (dB)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector (PK/QP/AV)	Polar (H/V)
Low Channel (2402 MHz)-Above 1G							
4804	58.87	1.58	60.45	74	-13.55	Pk	Vertical
4804	46.32	1.58	47.9	54	-6.1	AV	Vertical
7206.14	55.21	1.02	56.23	74	-17.77	Pk	Vertical
7206.14	44.78	1.02	45.8	54	-8.2	AV	Vertical
4804.08	52.64	0.57	53.21	74	-20.79	Pk	Horizontal
4804.08	45.35	0.57	45.92	54	-8.08	AV	Horizontal
7206.05	49.68	0.14	49.82	74	-24.18	Pk	Horizontal
7206.05	33.26	0.14	33.4	54	-20.6	AV	Horizontal
Mid Channel (2440 MHz)-Above 1G							
4880.02	56.38	1.76	58.14	74	-15.86	Pk	Vertical
4880.02	47.15	1.76	48.91	54	-5.09	AV	Vertical
7320.14	52.66	1.15	53.81	74	-20.19	Pk	Vertical
7320.14	41.05	1.15	42.2	54	-11.8	AV	Vertical
4880.05	49.78	0.68	50.46	74	-23.54	Pk	Horizontal
4880.05	31.25	0.68	31.93	54	-22.07	AV	Horizontal
7320.42	45.22	0.27	45.49	74	-28.51	Pk	Horizontal
7320.42	29.68	0.27	29.95	54	-24.05	AV	Horizontal
High Channel (2480MHz)- Above 1G							
4960.04	56.67	1.82	58.49	74	-15.51	Pk	Vertical
4960.04	43.16	1.82	44.98	54	-9.02	AV	Vertical
7440.11	54.22	1.37	55.59	74	-18.41	Pk	Vertical
7440.11	41.37	1.37	42.74	54	-11.26	AV	Vertical
4960.05	50.37	0.74	51.11	74	-22.89	Pk	Horizontal
4960.05	34.65	0.74	35.39	54	-18.61	AV	Horizontal
7440.37	43.15	0.46	43.61	74	-30.39	Pk	Horizontal
7440.37	34.28	0.46	34.74	54	-19.26	AV	Horizontal

Conducted Spurious Emissions at Antenna Port:

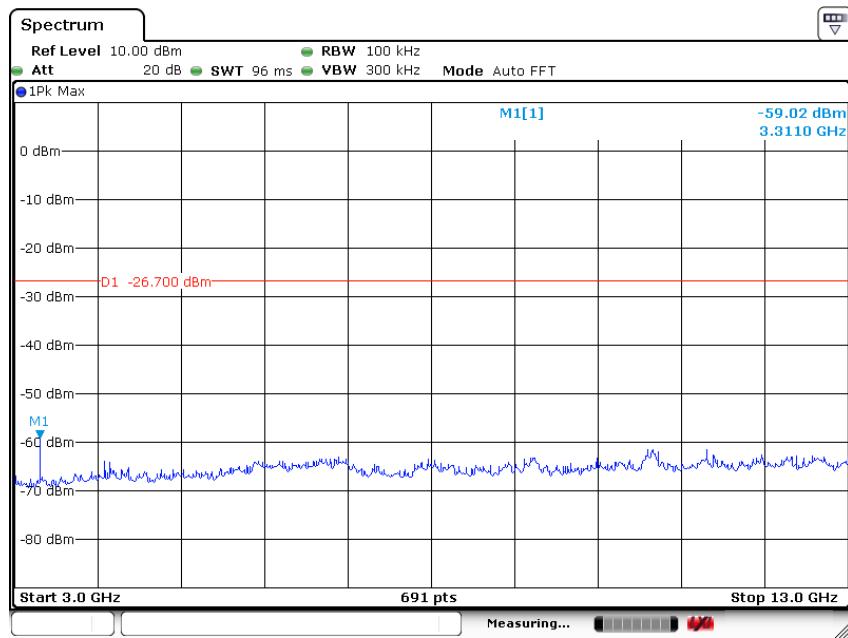
Low Channel



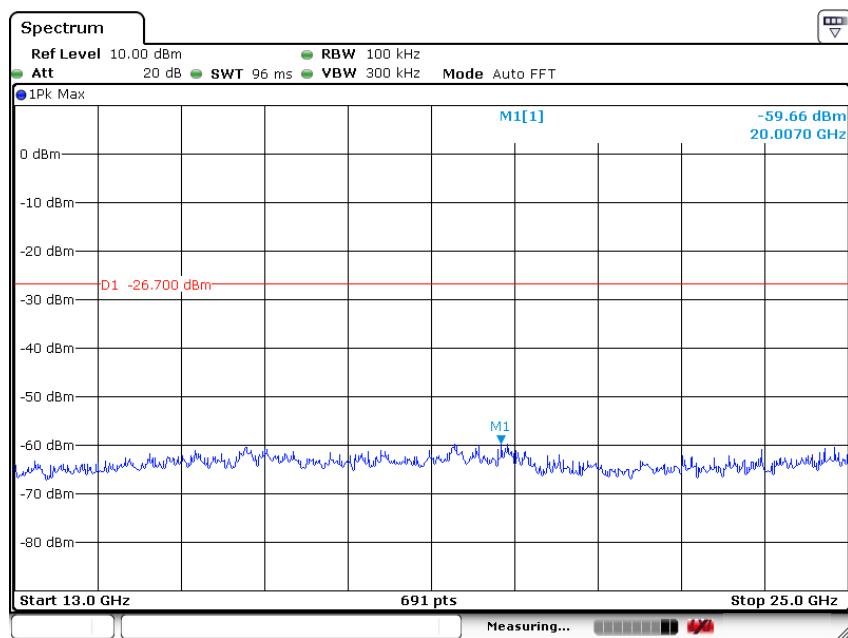
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Date: 24.MAR.2016 11:46:25

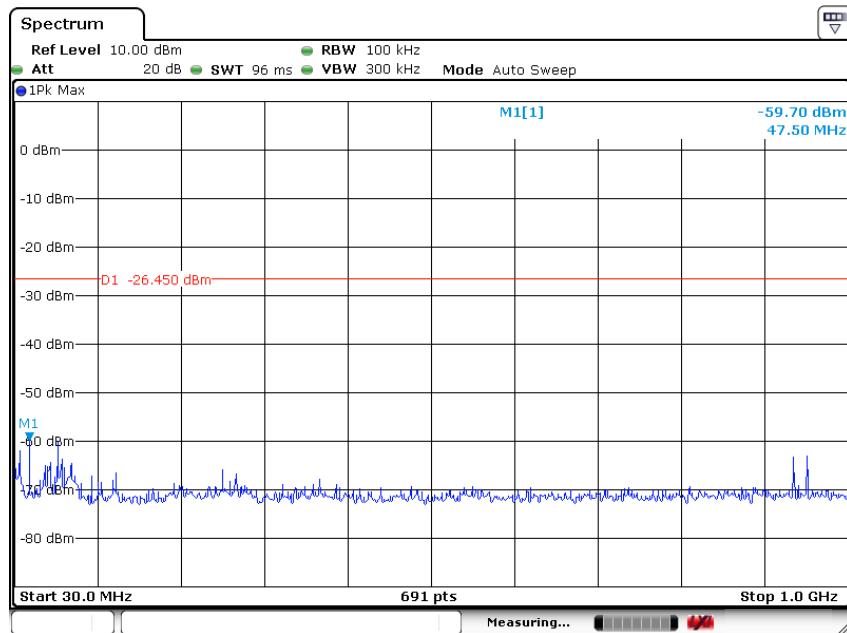


Date: 24 MAR .2016 11:47:16

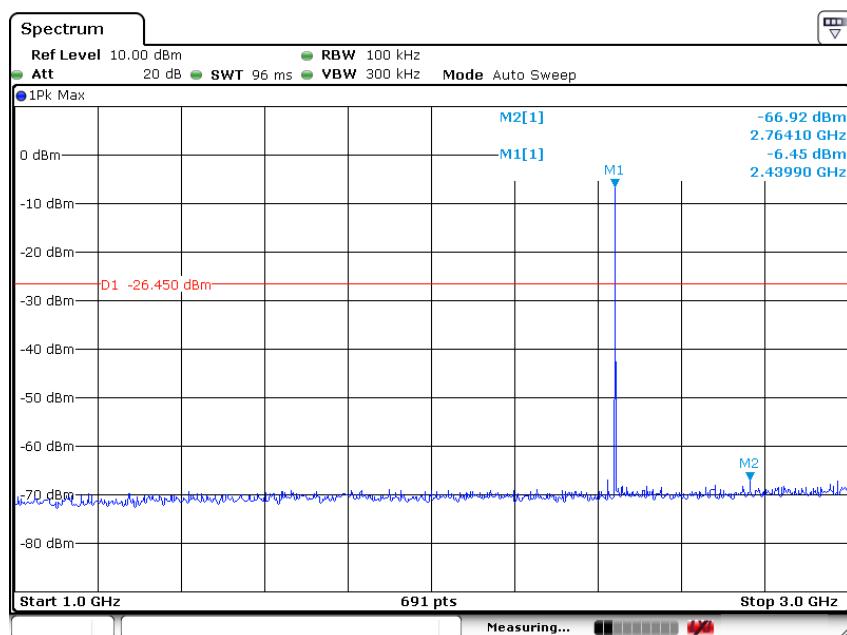


Date: 24 MAR .2016 11:48:34

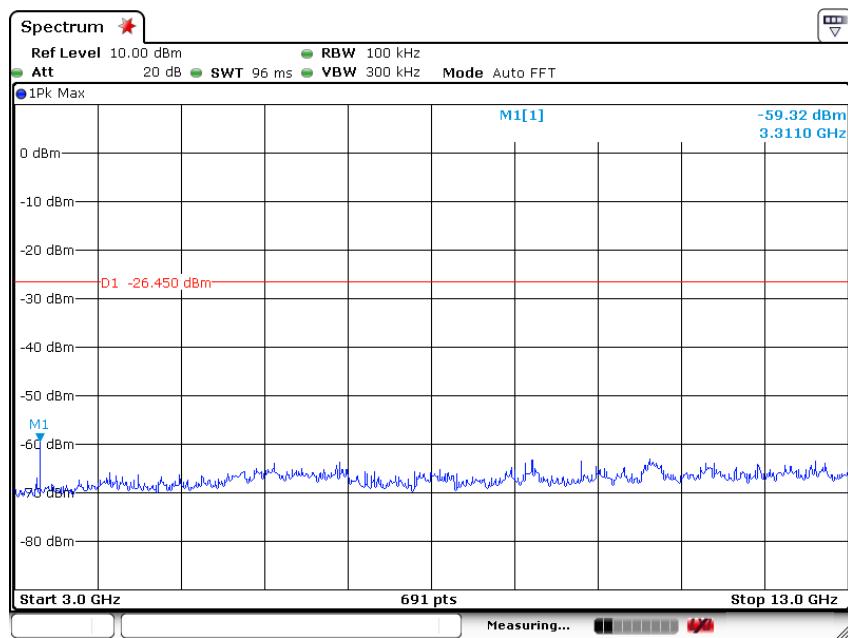
Middle Channel



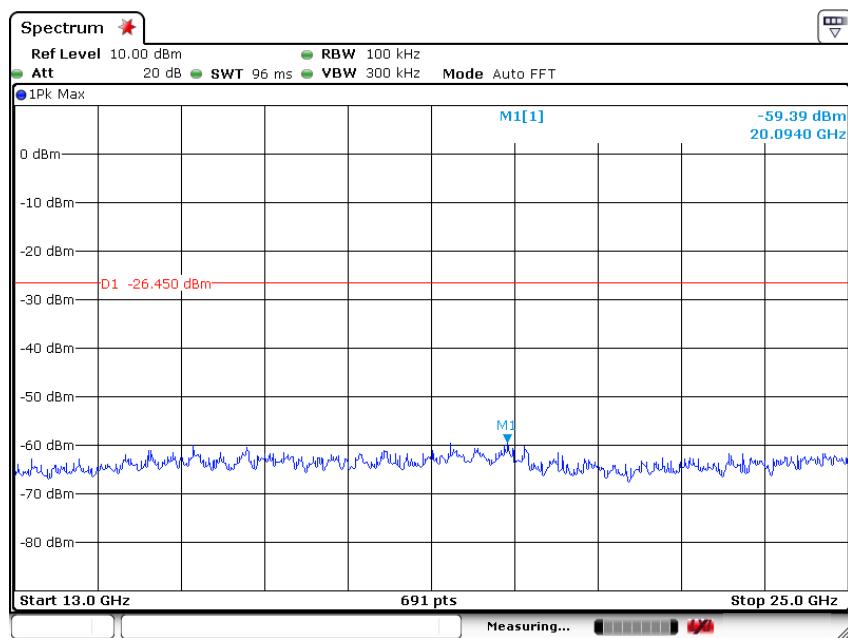
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Date: 24.MAR.2016 11:52:09

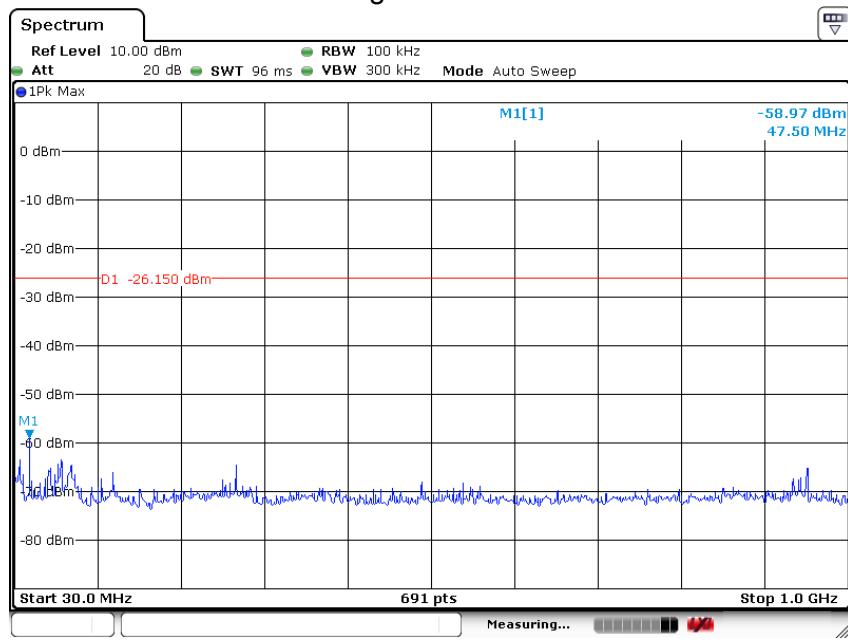


Date: 24.MAR.2016 11:55:46

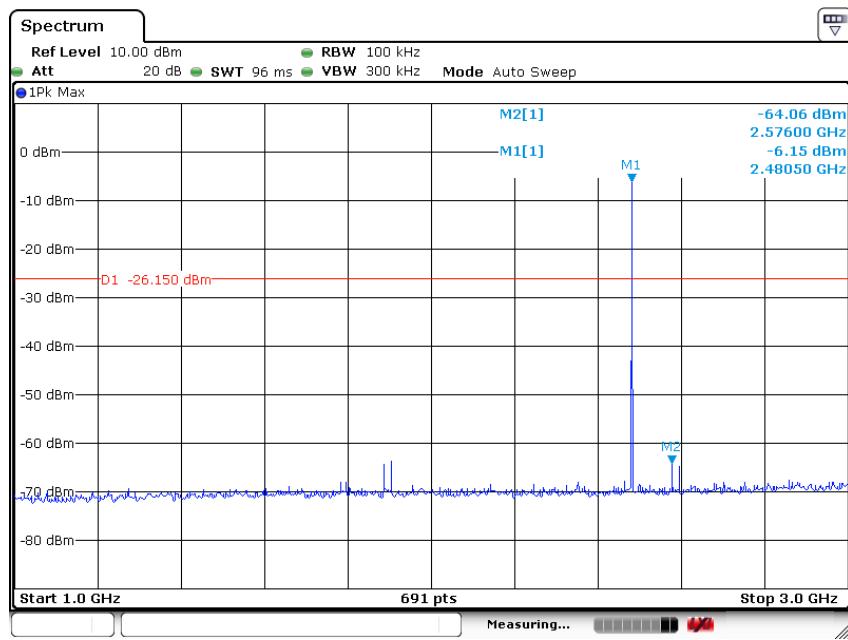


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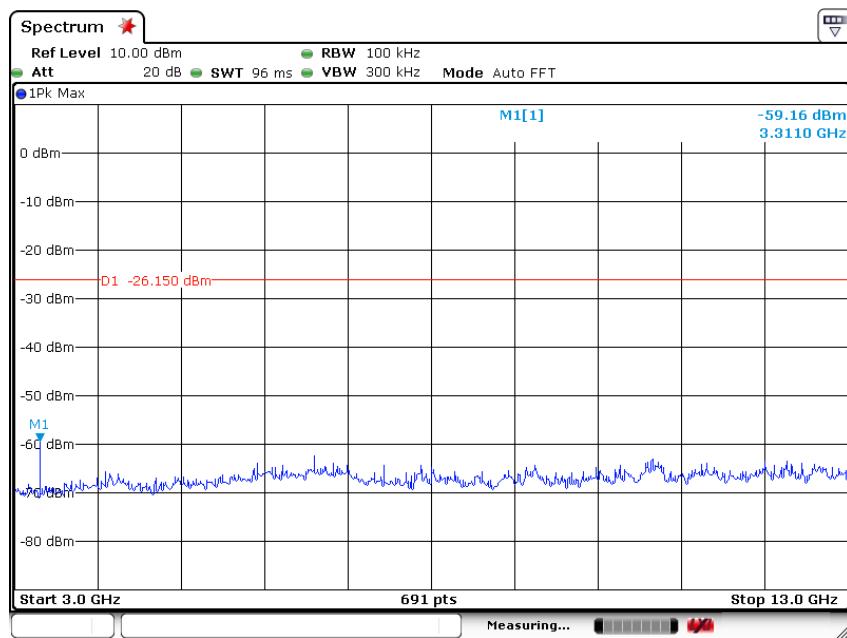
High Channel



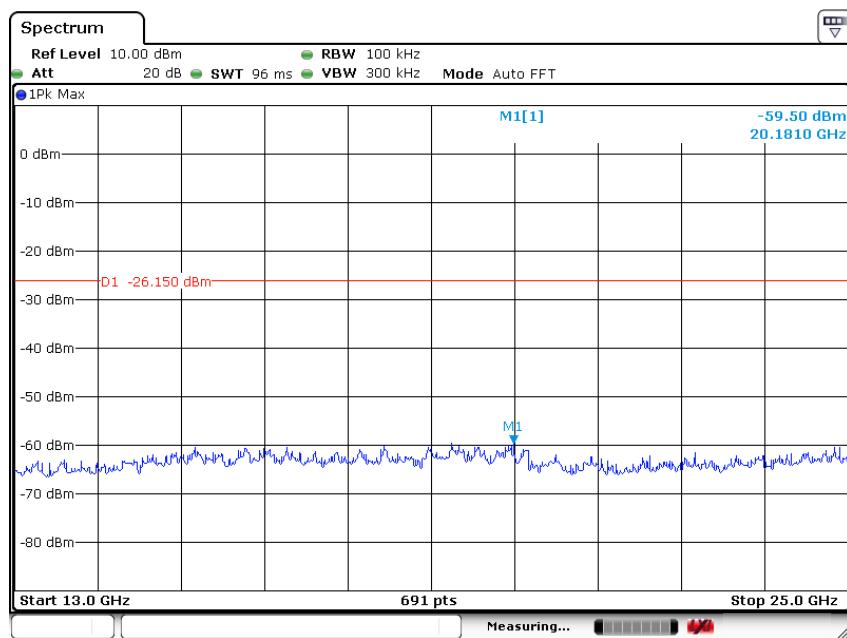
Date: 24.MAR.2016 12:05:08



Date: 24.MAR.2016 12:12:48



Date: 24.MAR.2016 12:14:26



Date: 24.MAR.2016 12:15:48

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C&A8.2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247&A8.2	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

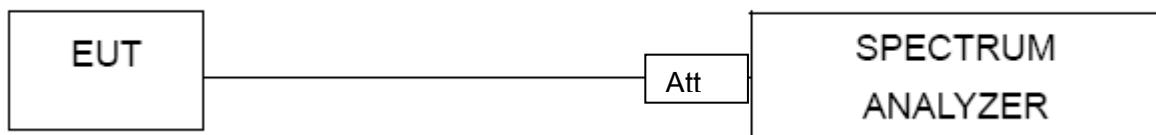
4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW \geq 3 kHz.
4. Set the VBW \geq 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

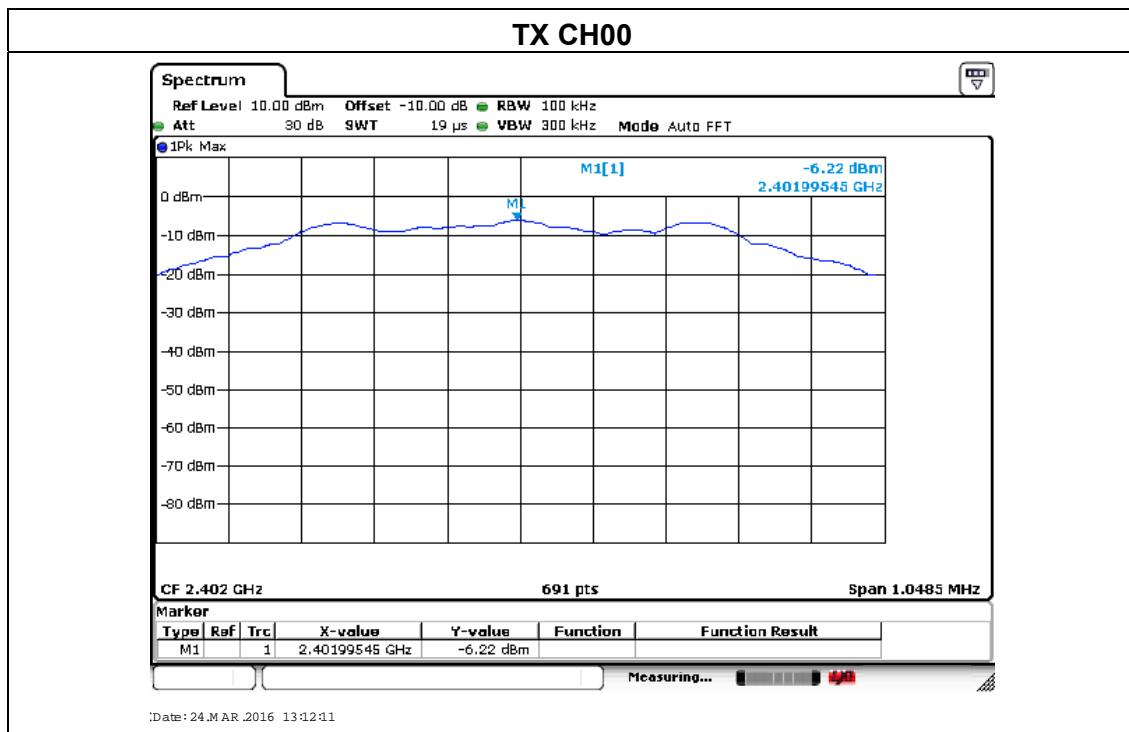
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

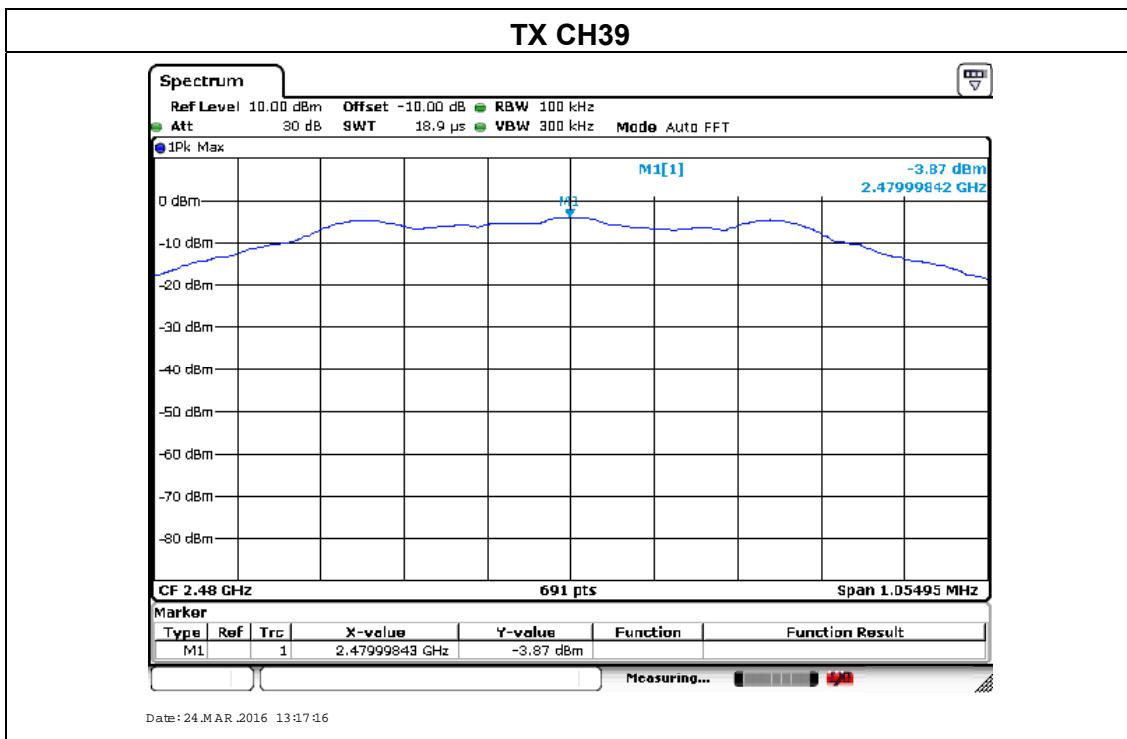
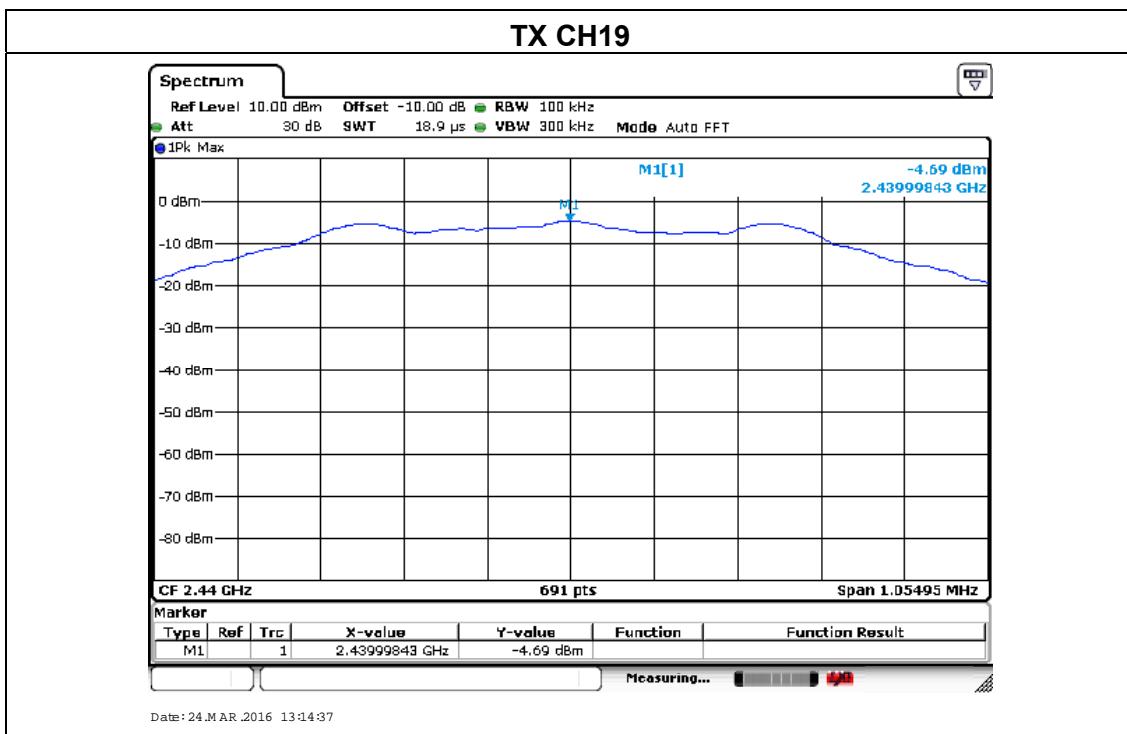
4.1.5 TEST RESULTS

EUT :	BT smart watch	Model Name :	SW25BTLF
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH00, CH19, CH39		

Note: The relevant measured result has the offset with cable loss already.

Frequency	Power Density (dBm/100kHz)	Limit (dBm/3 kHz)	Result
2402 MHz	-6.22	8	PASS
2440 MHz	-4.69	8	PASS
2480 MHz	-3.87	8	PASS





5. BANDWIDTH TEST

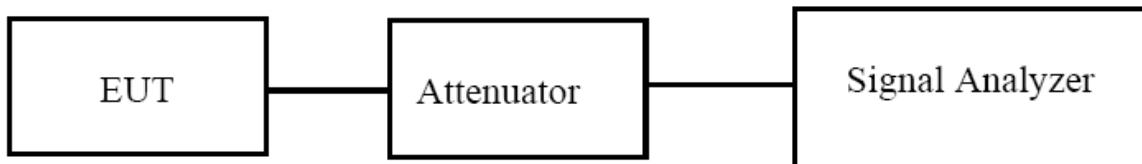
5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C&A8.2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2) &A8.2	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

According to KDB 558074 D01 DTS Meas Guidance v03r04

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



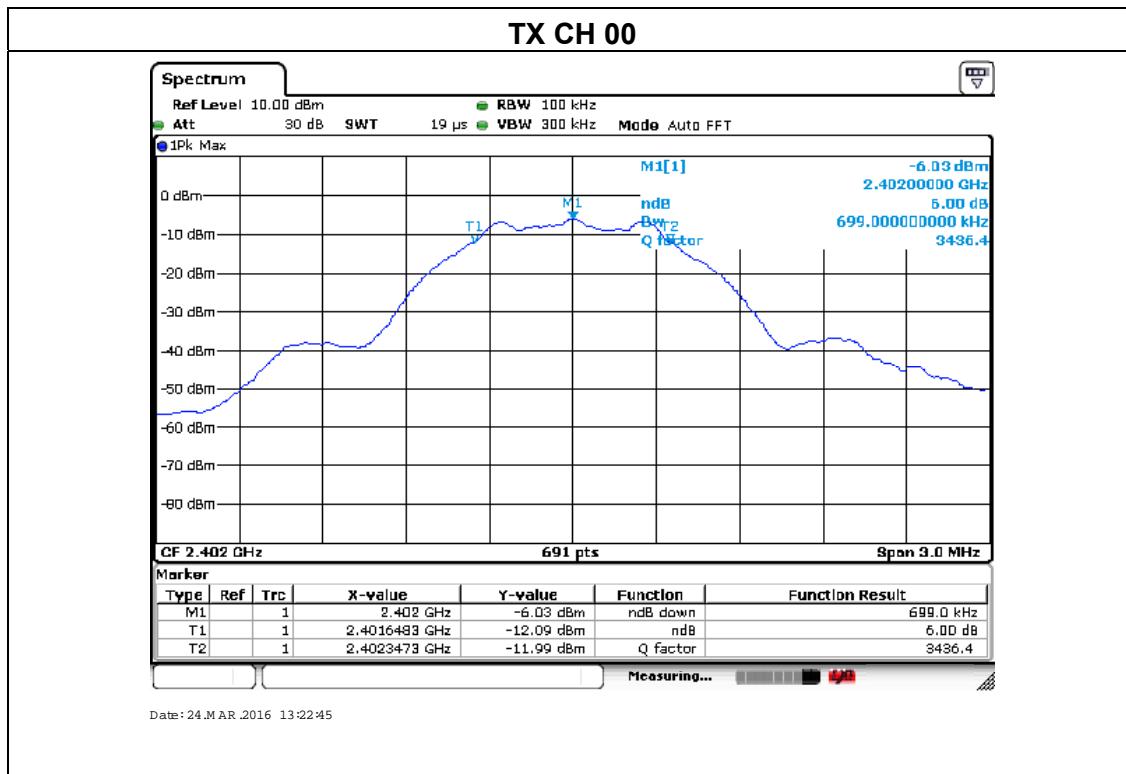
5.1.2 EUT OPERATION CONDITIONS

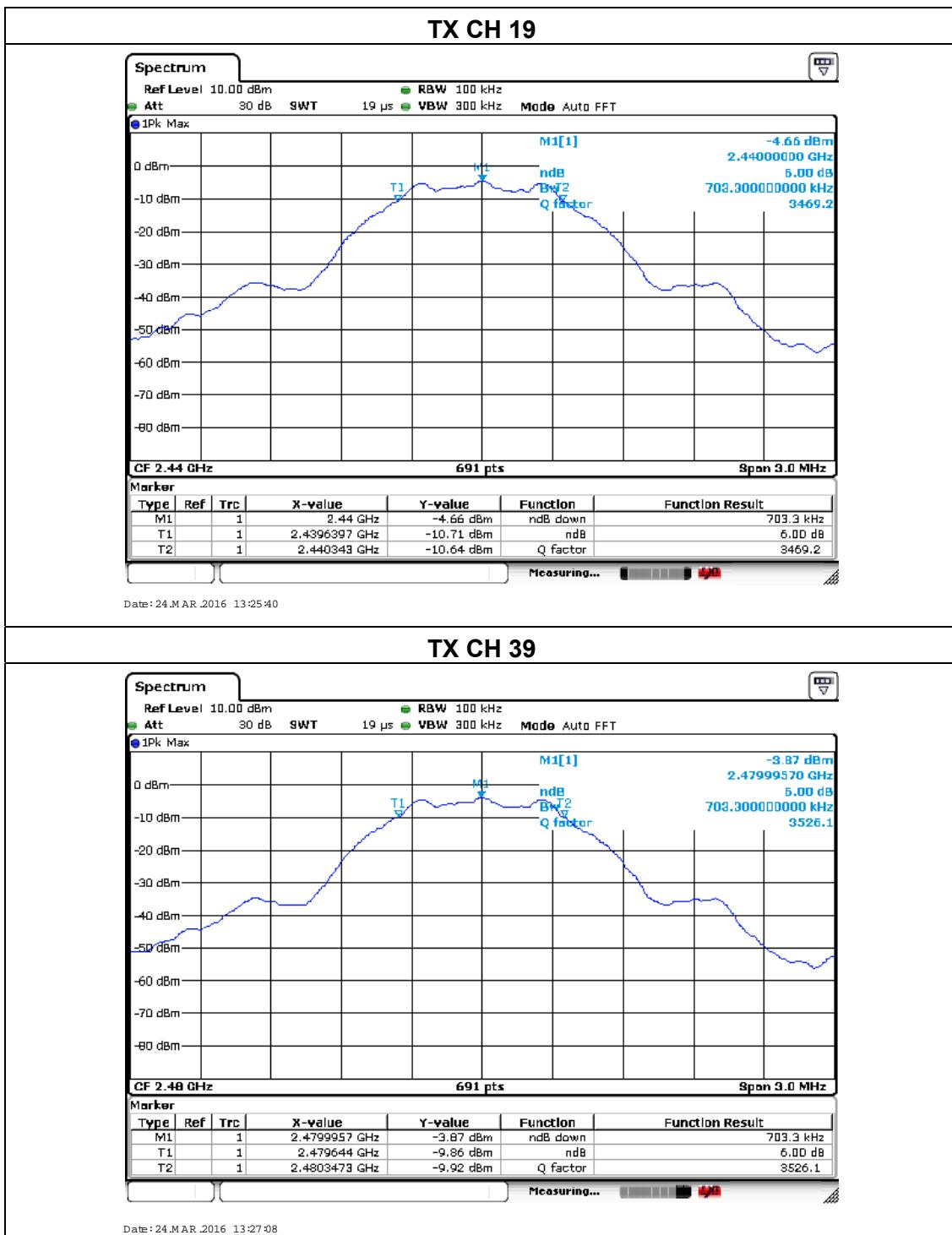
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.3 TEST RESULTS

EUT :	BT smart watch	Model Name :	SW25BTLF
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH00, CH19, CH39		

Channel	Frequency (MHz)	6dB bandwidth (kHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2402	699.00	/	>500	Pass
Middle	2440	703.30	/	>500	Pass
High	2480	703.30	/	>500	Pass





6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C &A8.4				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) &A8.4	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

- The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

EUT :	BT smart watch	Model Name :	SW25BTLF
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode		

TX Mode				
Test Channel	Frequency (MHz)	Maximum	Conducted Output Power (PK)	LIMIT dBm
CH00	2402		4.60	30
CH19	2440		5.49	30
CH39	2480		5.23	30

7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE 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)&A1.1 is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a)&A8.5, must also comply with the radiated emission limits specified in §15.209(a) &A1.1 (see §15.205(c)) &A8.5.

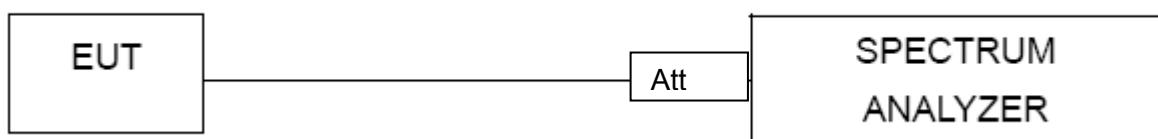
TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

7.1 DEVIATION FROM STANDARD

No deviation.

7.2 TEST SETUP



7.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.4 TEST RESULTS

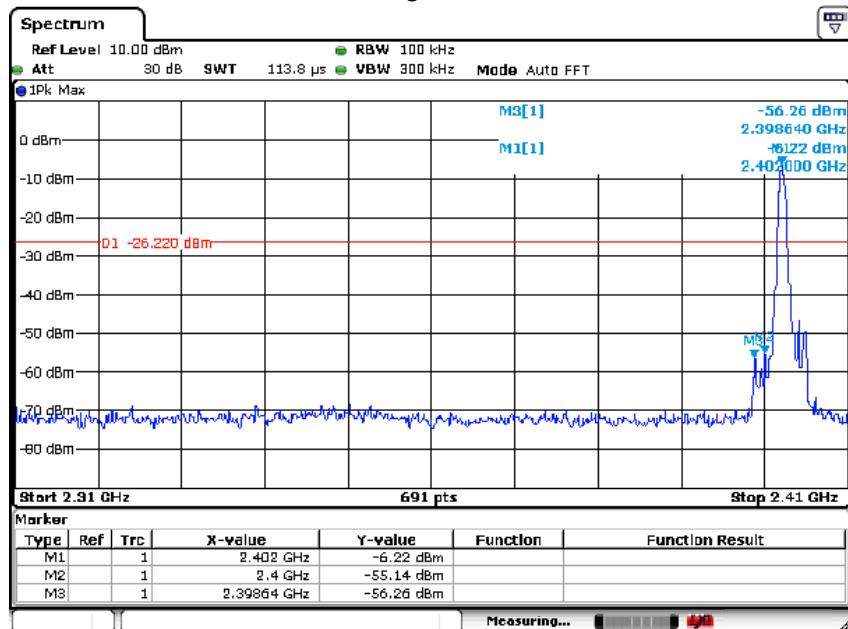
EUT :	BT smart watch	Model Name :	SW25BTLF
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
2390.00	50.04	20	Pass
2483.50	60.45	20	Pass

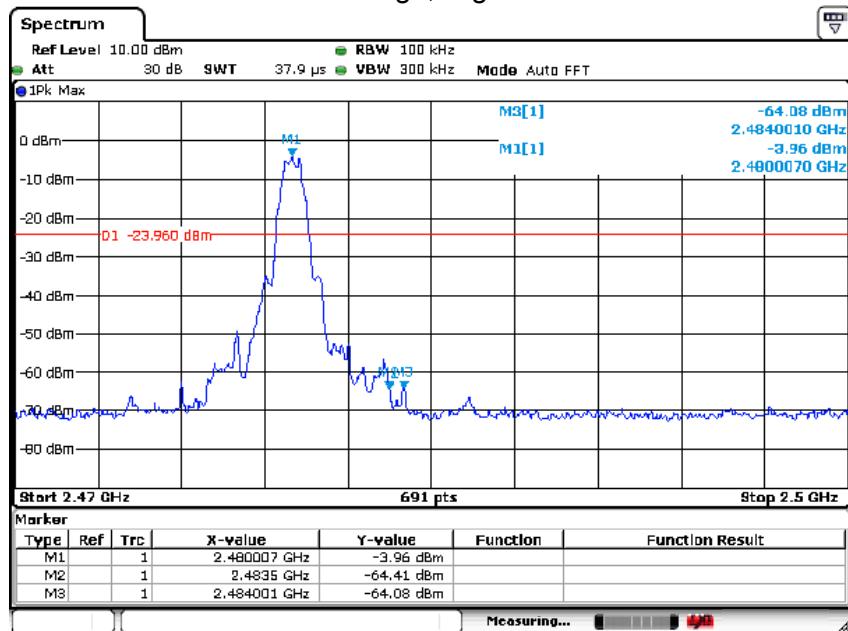
Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type	Comment
2390	50.27	1.05	51.32	74	-22.68	peak	Vertical
2390	49.37	1.05	50.42	74	-23.58	peak	Horizontal
2483.5	47.65	1.29	48.94	74	-25.06	peak	Vertical
2483.5	45.67	1.29	46.96	74	-27.04	peak	Horizontal

Note: Test method to see chapter 3.2 . When PK value is lower than the Average value limit, average not record.

Band Edge, Left Side



Band Edge, Right Side



8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, 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.

8.2 EUT ANTENNA

The EUT antenna is Internal antenna with “pogo pin” antenna connector..

9. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos

