

FCC - TEST REPORT

Report Number : **68.950.18.0089.01** Date of Issue: March 20, 2018Model : **GE-W37H**

Product Type : Smart Bracelet

Applicant : Shenzhen Gold-East Electronic Co., Ltd.

Address : 6F, Bldg #11, Yusheng Industry Area, #467 Gushu, Xixiang,

: Bao'an District Shenzhen, China

Manufacturer : Shenzhen Gold-East Electronic Co., Ltd.

Address : 6F, Bldg #11, Yusheng Industry Area, #467 Gushu, Xixiang,

: Bao'an District Shenzhen, China

Test Result : Positive NegativeTotal pages including
Appendices : 26

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
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Road 2, Nanshan District
Shenzhen 518052
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FCC Registration No.: 514049

3 Description of the Equipment Under Test

Product:	Smart Bracelet
Model no.:	GE-W37H
FCC ID:	XJT-W37H
Options and accessories:	USB Cable
Rating:	5VDC (by charging dock) or 3.7VDC, 60mAh from Internal rechargeable lithium-ion battery
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	40
Modulation:	GFSK
Antenna Type:	Internal Antenna
Antenna Gain:	2.41dBi
Description of the EUT:	The Equipment Under Test (EUT) is Smart Bracelet supports BLE function.



4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2016 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 DTS Meas Guidance v04 and ANSI C63.10 (2013).

5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart C			
Test Condition		Pages	Test Result
§15.207	Conducted emission AC power port	--	N/A
§15.247(b)(1)	Conducted peak output power	10	Pass
§15.247(e)	Power spectral density	12	Pass
§15.247(a)(2)	6dB bandwidth	14	Pass
§15.247(a)(1)	20dB bandwidth and 99% Occupied Bandwidth	14	Pass
§15.247(a)(1)	Carrier frequency separation	--	N/A
§15.247(a)(1)(iii)	Number of hopping frequencies	--	N/A
§15.247(a)(1)(iii)	Dwell Time	--	N/A
§15.247(d)	Spurious RF conducted emissions	16	Pass
§15.247(d)	Band edge	21	Pass
§15.247(d) & §15.209 & §15.203	Spurious radiated emissions for transmitter	22	Pass
§15.203	Antenna requirement	See note 1	Pass

Note 1: N/A=Not Applicable.

Note 2: The EUT uses a Chip antenna, which gain is 2.41dBi. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section.

6 General Remarks

This submittal(s) (test report) is intended for FCC ID: XJT-W37H complies with Section 15.205, 15.209, 15.247 of the FCC Part 15, Subpart C rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: 4 March 2018

Testing Start Date: 5 March 2018

Testing End Date: 15 March 2018

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch. –

Reviewed by:



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EMC Project Manager

Prepared by:



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EMC Project Engineer

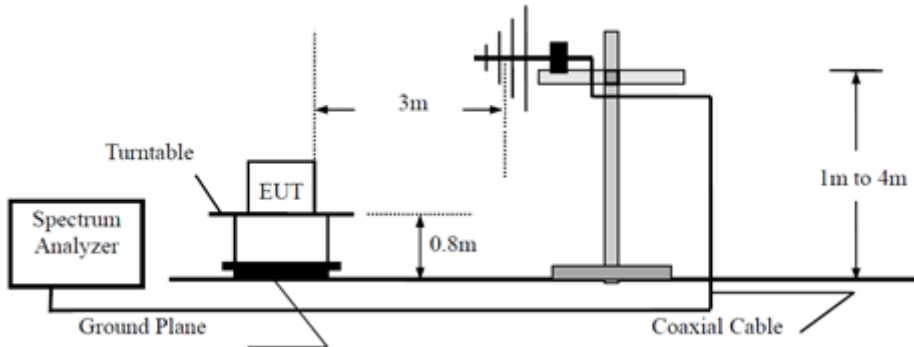
Tested by:



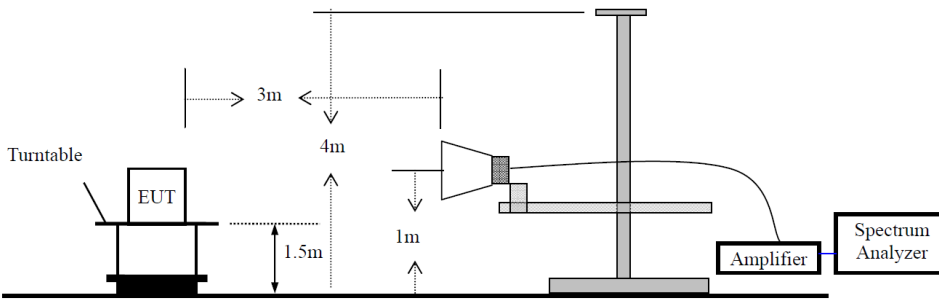
Tree Zhan
EMC Test Engineer

7 Test Setups

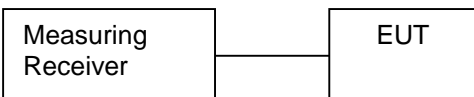
7.1 Below 1GHz



Above 1GHz



7.2 Conducted RF test setups



8 Systems test configuration

Auxiliary Equipment Used during Test:

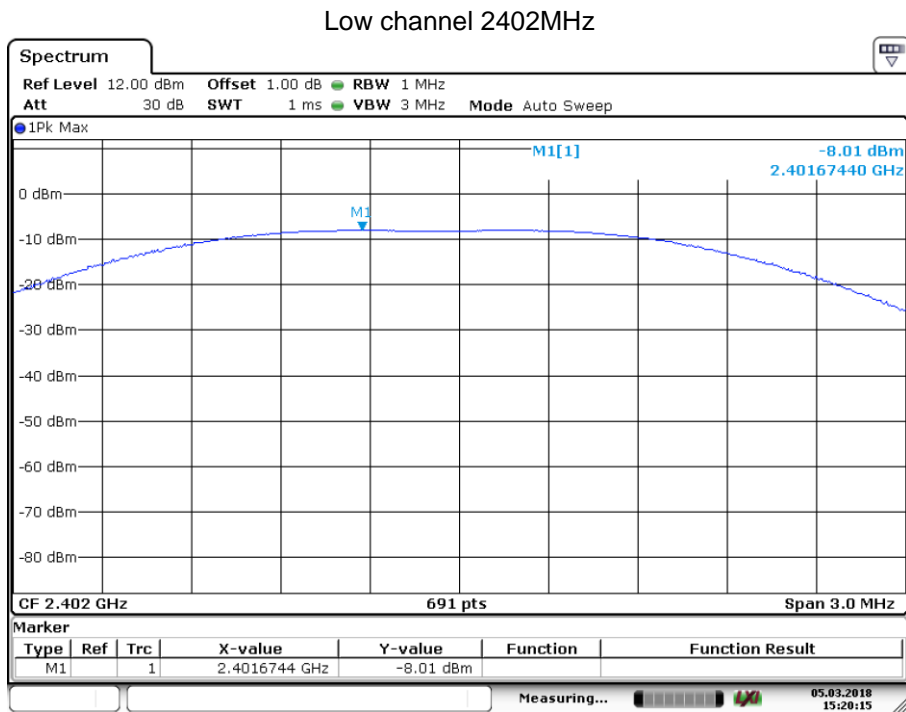
DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	Lenovo	X220	---

9 Technical Requirement

9.1 Conducted peak output power

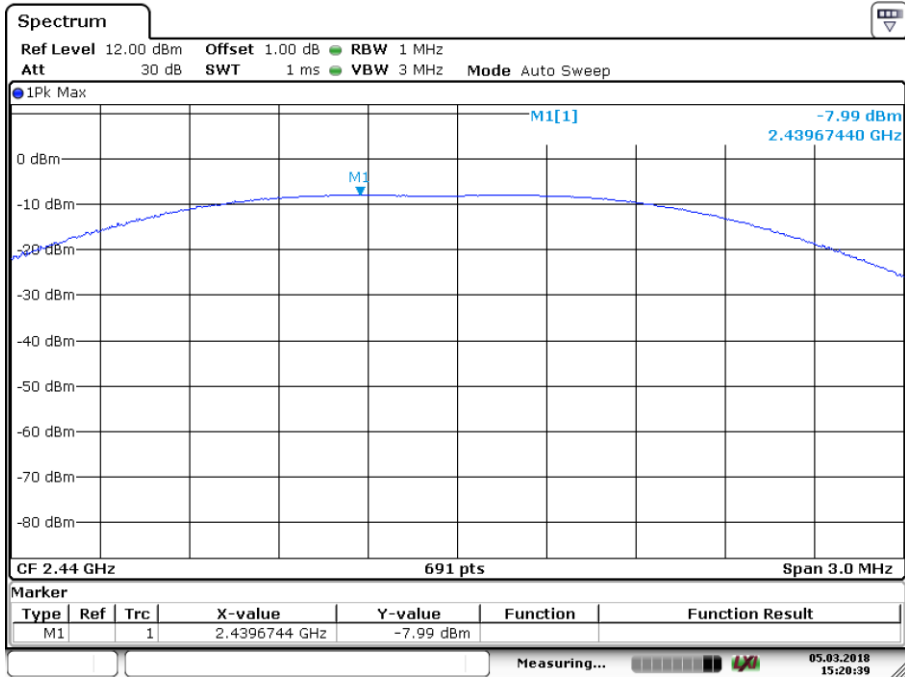
Test result as below table

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	-8.01	Pass
Middle channel 2440MHz	-7.99	Pass
High channel 2480MHz	-8.28	Pass



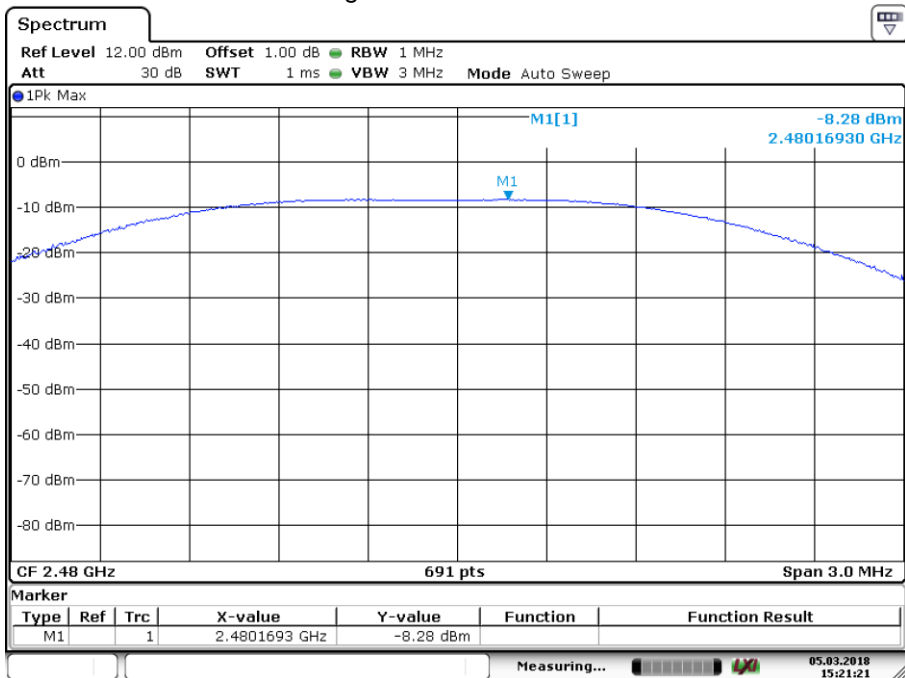
Date: 5.MAR.2018 15:20:15

Middle channel 2440MHz



Date: 5.MAR.2018 15:20:40

High channel 2480MHz



Date: 5.MAR.2018 15:21:21

9.2 Power spectral density

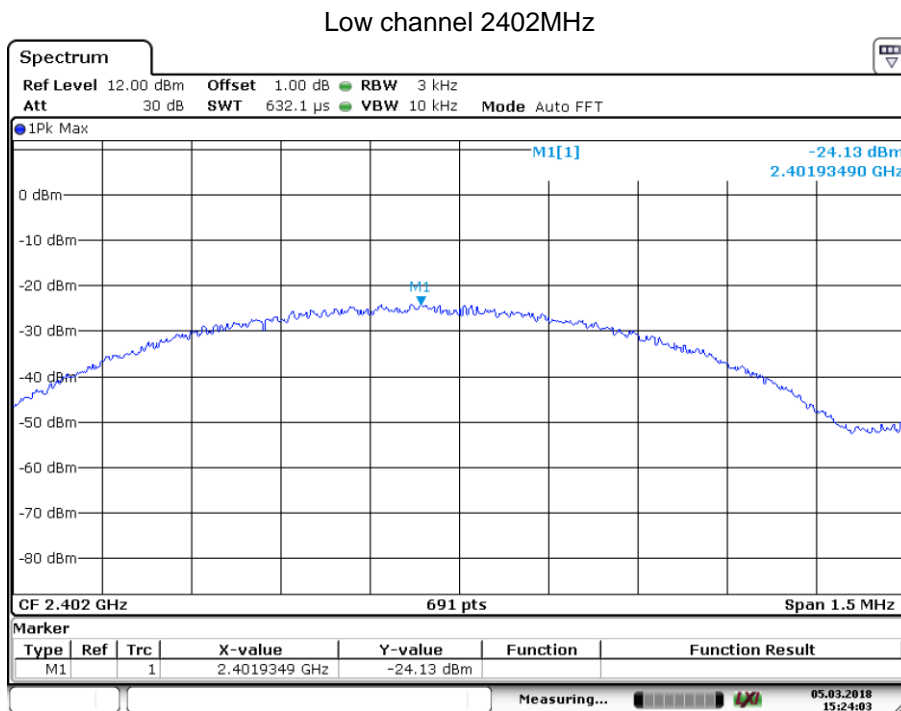
This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW≥3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.

other frequencies.

Test result

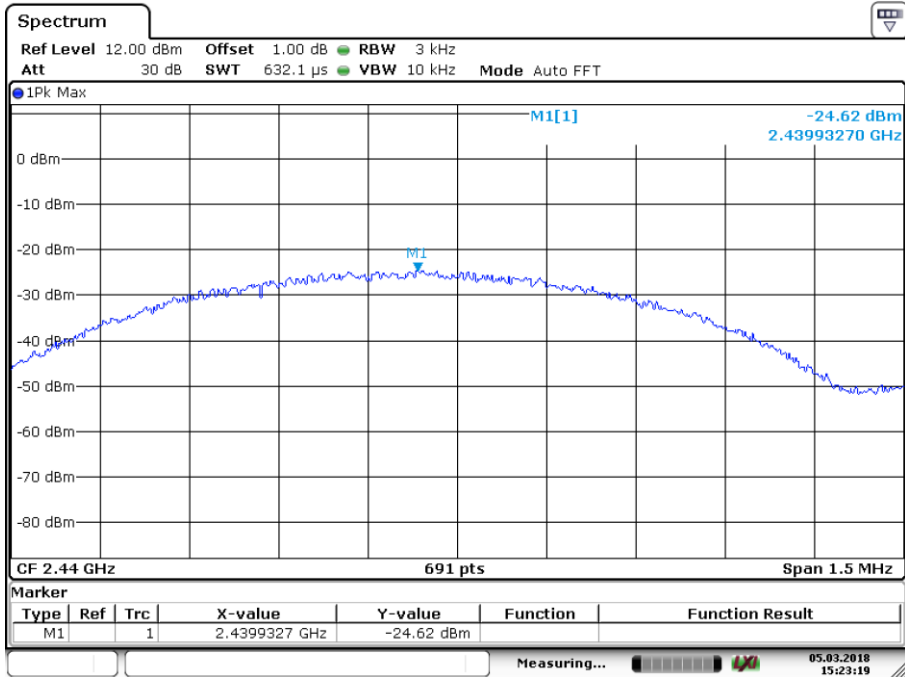
Frequency MHz	Power spectral density dBm	Result
Low channel 2402MHz	-24.13	Pass
Middle channel 2440MHz	-24.62	Pass
High channel 2480MHz	-24.97	Pass



Date: 5.MAR.2018 15:24:03

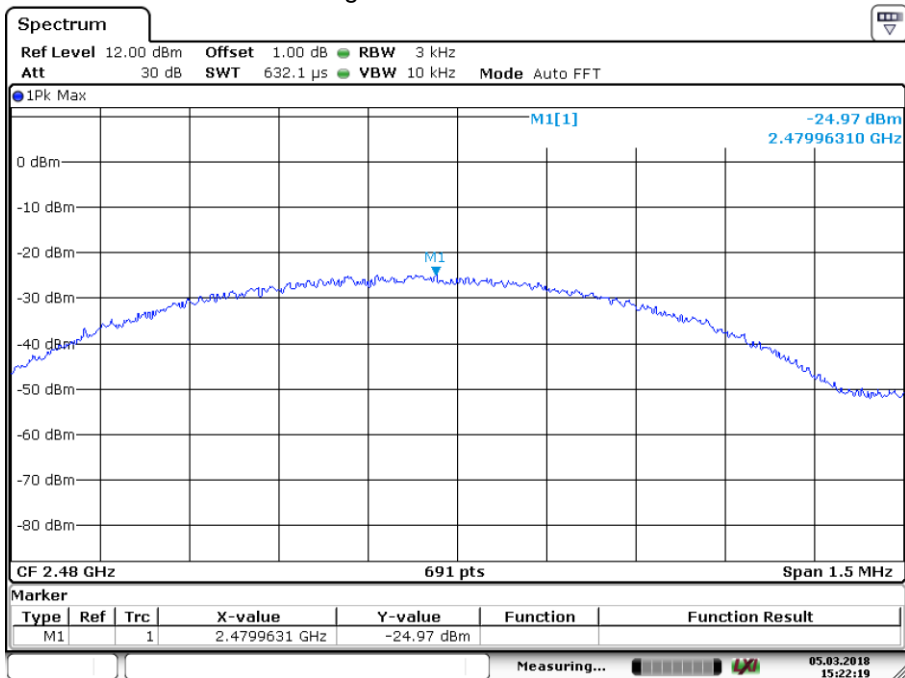


Middle channel 2440MHz



Date: 5.MAR.2018 15:23:19

High channel 2480MHz



Date: 5.MAR.2018 15:22:19

9.3 6 dB Bandwidth and 99% Occupied Bandwidth

Test Method

1. Use the following spectrum analyzer settings:
RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

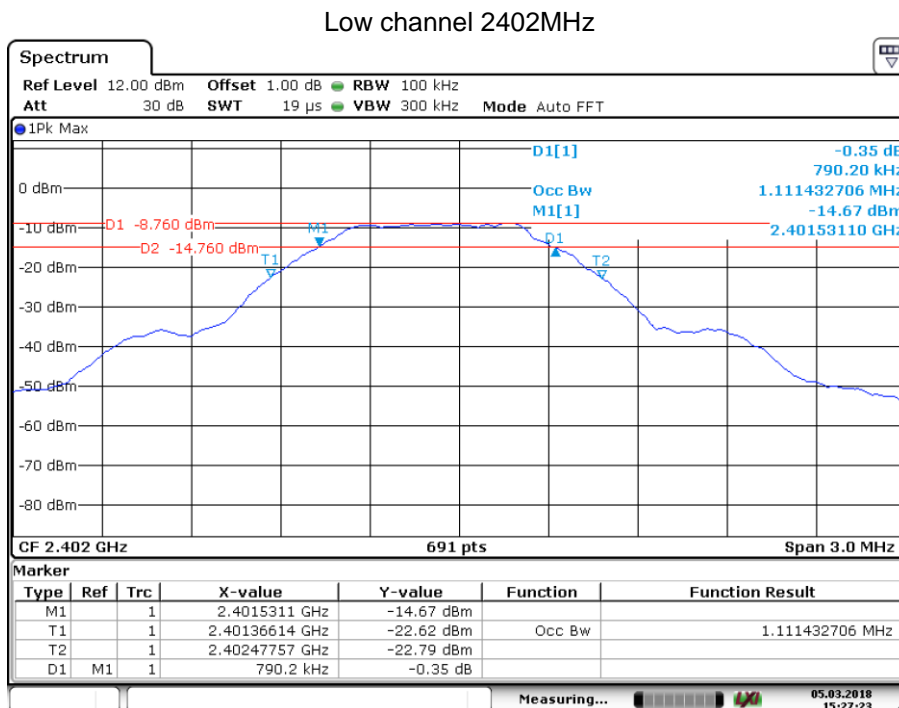
Limit

Limit [kHz]

≥500

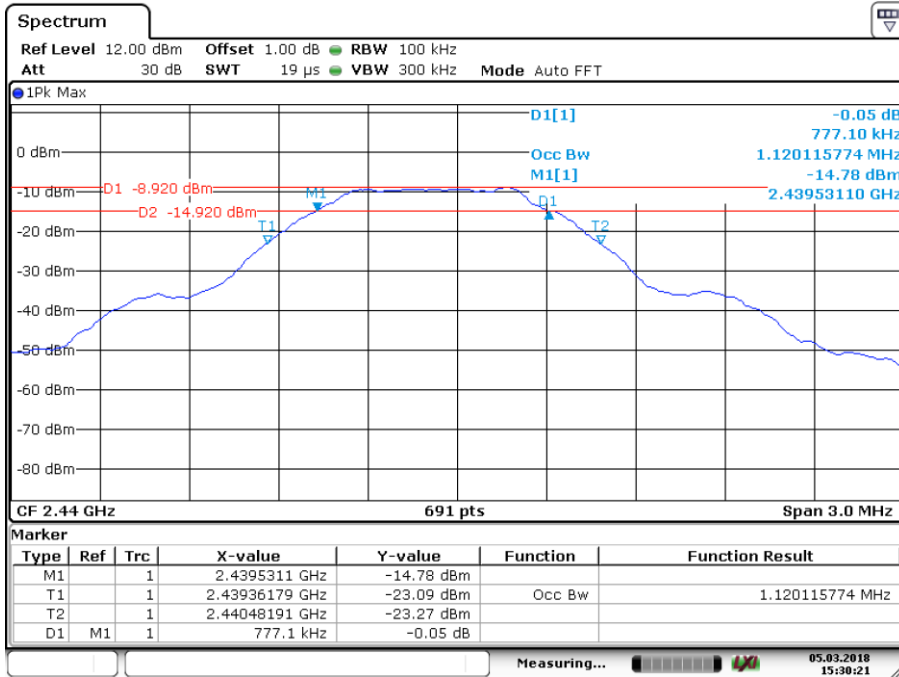
Test result

Frequency MHz	6dB bandwidth kHz	99% bandwidth kHz	Result
Low channel 2402MHz	790.2	1111.4	Pass
Middle channel 2440MHz	777.1	1120.1	Pass
High channel 2480MHz	686.0	1124.4	Pass



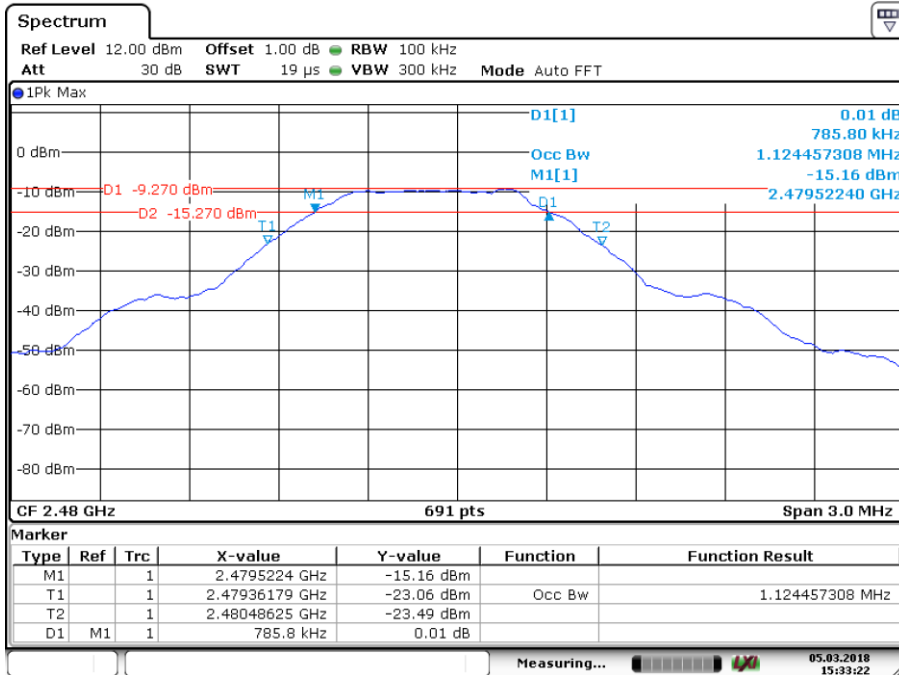
Date: 5.MAR.2018 15:27:23

Middle channel 2440MHz



Date: 5.MAR.2018 15:30:21

High channel 2480MHz



Date: 5.MAR.2018 15:33:22



9.4 Spurious RF conducted emissions

Test Method

1. Establish a reference level by using the following procedure:
 - a. Set RBW=100 kHz. VBW \geq 3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
 - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
 - a. Set the center frequency and span to encompass frequency range to be measured.
 - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.

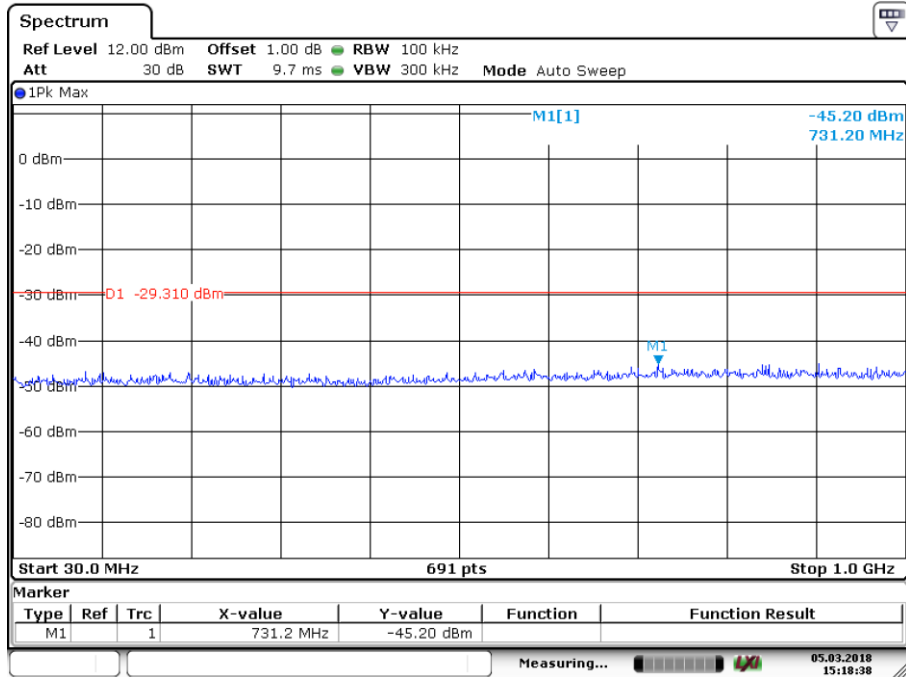
other frequencies.

Limit

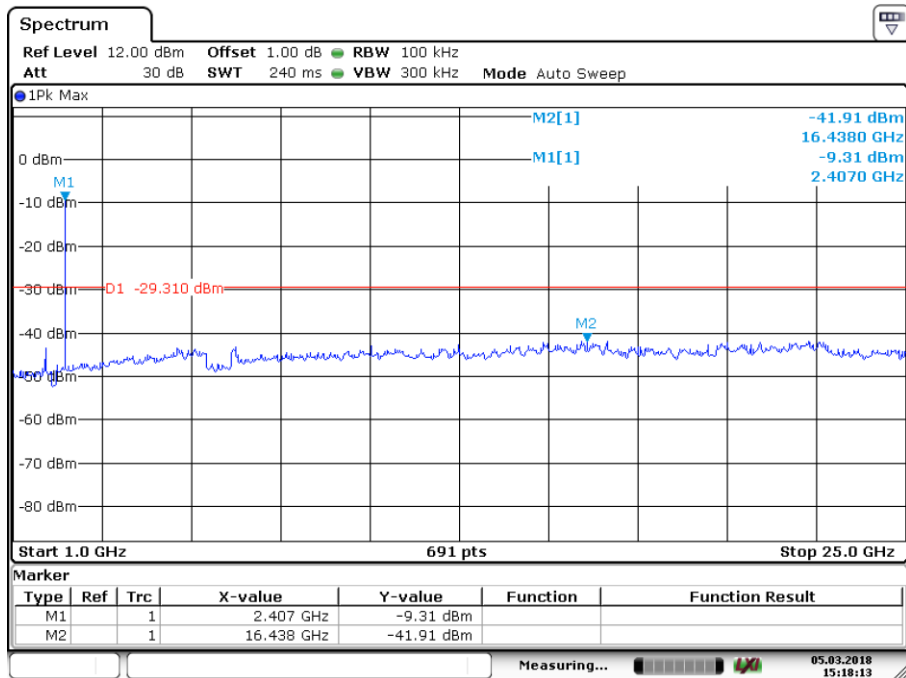
Frequency Range MHz	Limit (dBc)
30-25000	-20

Spurious RF conducted emissions

2402MHz

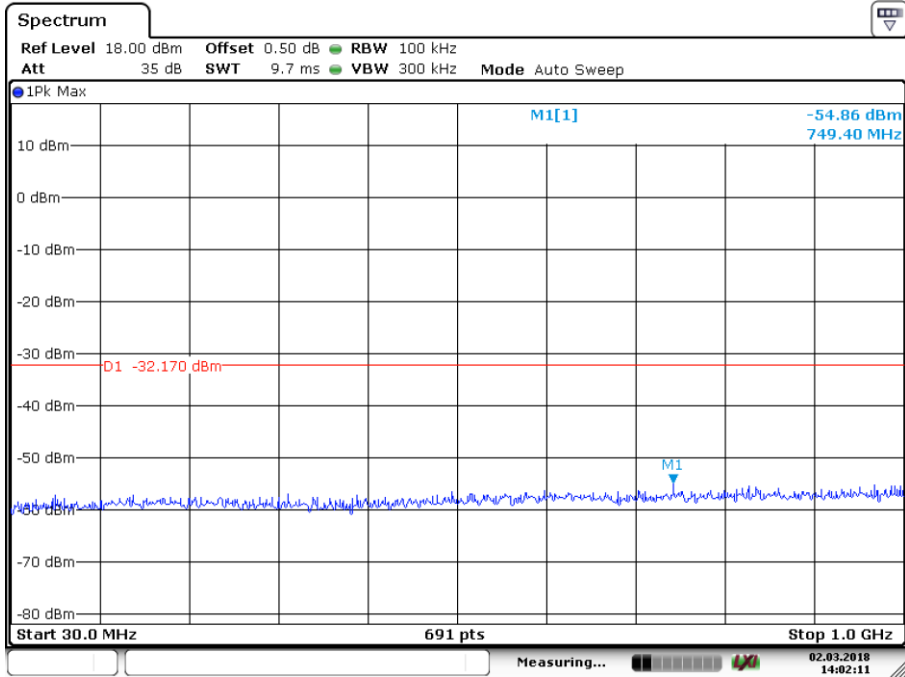


Date: 5.MAR.2018 15:18:37

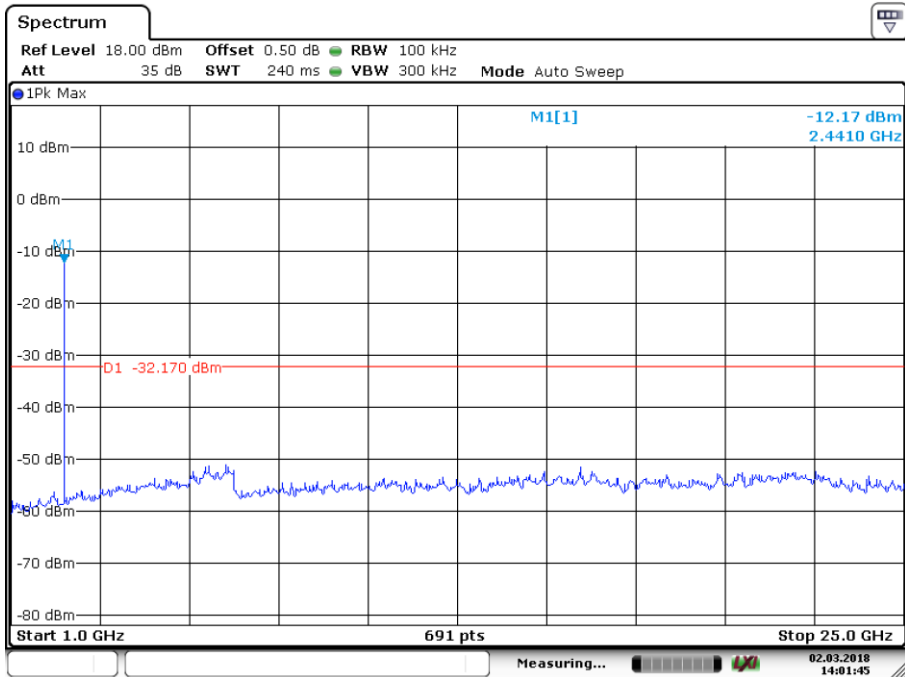


Date: 5.MAR.2018 15:18:13

2440MHz

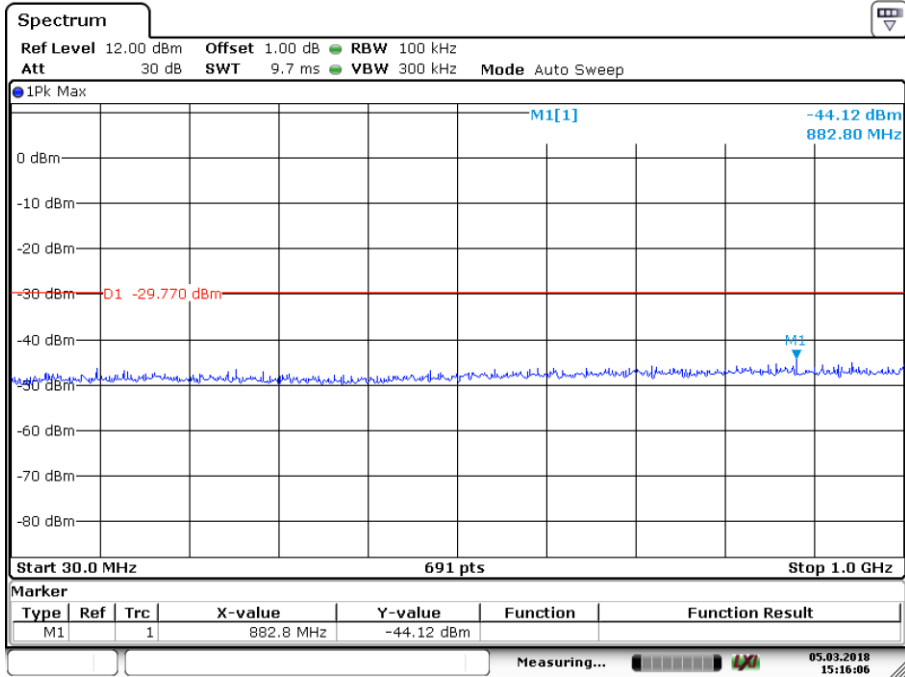


Date: 2.MAR.2018 14:02:11

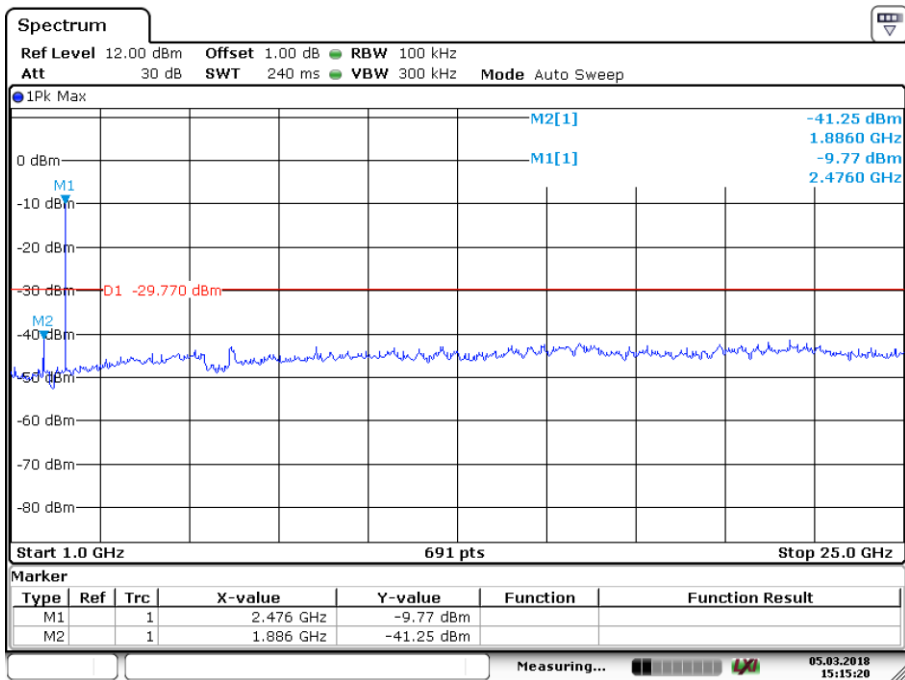


Date: 2.MAR.2018 14:01:45

2480MHz



Date: 5.MAR.2018 15:16:07



Date: 5.MAR.2018 15:15:20

9.5 Band edge

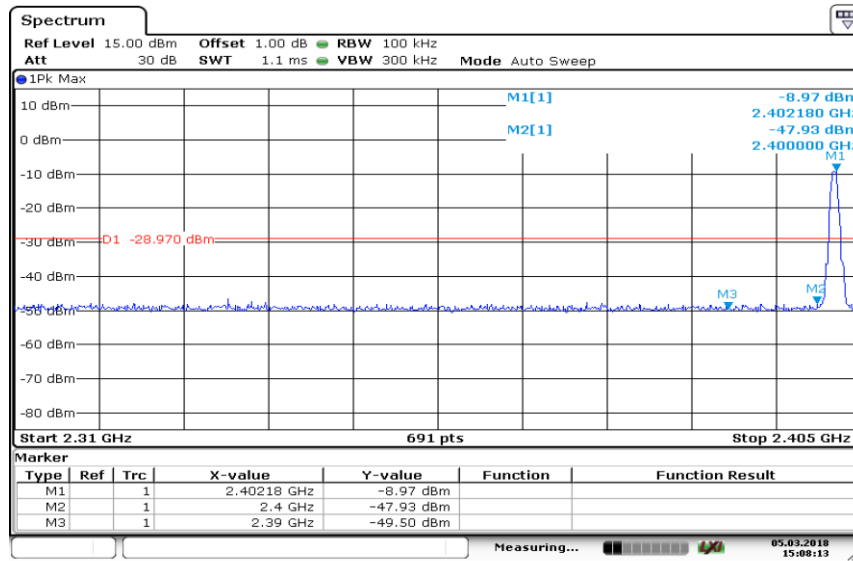
Test Method

- 1 Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz, VBW \geq RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section.

Limit:

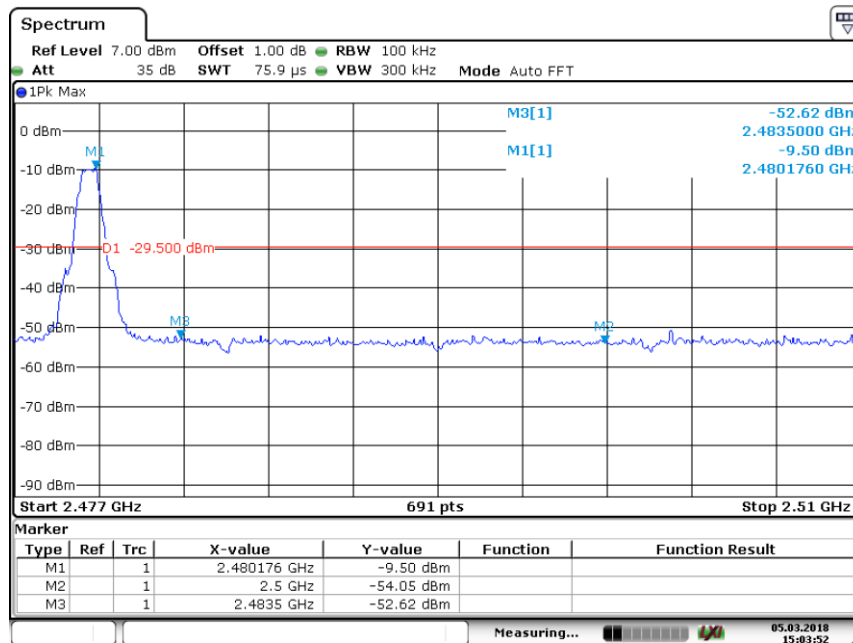
Frequency Range	Limit (dBc)
MHz	
30-25000	-20

2402MHz



Date: 5.MAR.2018 15:08:13

2480MHz



Date: 5.MAR.2018 15:03:52

9.6 Spurious radiated emissions for transmitter

Test Method

- 1: The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
- 3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4: 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5: Use the following spectrum analyzer settings According to C63.10:

For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW \geq RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz, VBW \geq RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Note:

- 1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
- 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

Limit

The radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dB μ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Spurious radiated emissions for transmitter

Remark: According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Transmitting spurious emission test result as below:

Low channel 2402MHz Test Result

Frequency Band	Frequency	Emission Level	Polarization	Limit	Detector	Factor	Margin	Result
	MHz	dBuV/m		dB μ V/m		dB	dBuV/m	
30-1000MHz	877.40	37.70	H	46	QP	-15.8	8.30	Pass
	877.56	33.65	V	46	QP	-15.6	12.35	Pass
1000-25000MHz	8221.88*	40.31	H	74	PK	4.6	33.69	Pass
	--	--	H	54	AV	--	--	--
	6000.00	39.41	V	74	PK	3.8	34.59	Pass
	--	--	V	54	AV	--	--	--

Middle channel 2440MHz Test Result

Frequency Band	Frequency	Emission Level	Polarization	Limit	Detector	Factor	Margin	Result
	MHz	dBuV/m		dB μ V/m		dB	dBuV/m	
30-1000MHz	--	--	H	43.5	QP	--	--	--
	--	--	H	46	QP	--	--	--
1000-25000MHz	8085.94*	40.72	H	74	PK	7.9	33.28	Pass
	--	--	H	54	AV	--	--	--
	10637.81*	42.13	V	74	PK	10	31.87	Pass
	--	--	V	54	AV	--	--	--

High channel 2480MHz Test Result

Frequency Band	Frequency	Emission Level	Polarization	Limit	Detector	Factor	Margin	Result
	MHz	dBuV/m		dB μ V/m		dB	dBuV/m	
30-1000MHz	--	--	H	43.5	QP	--	--	--
	--	--	H	46	QP	--	--	--
1000-25000MHz	4960.31*	41.73	H	74	PK	2.7	32.27	Pass
	--	--	H	54	AV	--	--	--
	7514.53*	41.57	V	74	PK	6.7	32.43	Pass
	--	--	V	54	AV	--	--	--

Remark:

- (1) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.
- (2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.
- (3) QP Emission Level= Antenna Factor +Cable Loss + Reading
 PK Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
 AV Emission Level= PK Emission Level+20log(dutycycle)

10 List of Test Instruments

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2018-7-14
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2018-7-14
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2018-8-2
Horn Antenna	Rohde & Schwarz	HF907	102294	2018-7-14
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2018-7-14
3m Semi-anechoic chamber	TDK	9X6X6	----	2019-5-29
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2018-7-14
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2018-8-2
Horn Antenna	Rohde & Schwarz	HF907	102294	2018-7-14
High Voltage Probe	Rohde & Schwarz	TK9420(VT94 20)	9420-58	2018-7-14
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2018-7-14

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth and 99% Occupied Bandwidth
- Power spectral density*
- Spurious RF conducted emissions
- Band edge



11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.98dB; Vertical: 5.06dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.95dB; Vertical: 4.94dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 5.14dB; Vertical: 5.12dB;
Uncertainty for Conducted RF test with TS 8997	Power level test involved: 2.06dB Frequency test involved: 1.16×10^{-7}