Test Report

FCC ID: 2APBP-CS10

Date of issue: Apr. 10, 2018

Report Number:	MTi180416E036
Sample Description:	Smart POS Payment Terminal
Model(s):	CS10, CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Applicant:	Ciontek Technology Corp.
Address:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Nanshan District, Shenzhen
Date of Test:	Mar. 23, 2018 to Apr. 10, 2018

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

Tel:(86-755)88850135 Fax: (86-755) 88850136 Web: http://www.mtitest.com E-mail: mti@51mti.com
Address: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China

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Test Result Certification

Applicant's name:	**Ciontek Technology Corp.**
Address:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Nanshan District, Shenzhen
Manufacture's Name:	**Ciontek Technology Corp.**
Address:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Nanshan District, Shenzhen
Product name:	Smart POS Payment Terminal
Trademark:	Ciontek
Model name:	CS10, CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Standards:	FCC Part 15.247
Test Procedure:	ANSI C63.10-2013 DA 00-705

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

Tested by:	Demi Mu	Apr. 10, 2018
Reviewed by:	Blue Zheng	Apr. 10, 2018
Approved by:	Smith Chen	Apr. 10, 2018

1. General Information

1.1. Description of EUT

Equipment:	Smart POS Payment Terminal
Trade Name:	Ciontek
Model Name:	CS10
Serial Model:	CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Model Difference:	All the models above are identical in interior structure, electrical circuits and components; just the color. fingerprint module and scanner module is different. The model CS10 has been tested for the worst case.
Operation Frequency:	BLE: 2402-2480MHz
Modulation Type:	GFSK
Bit Rate of Transmitter:	1Mbps
Antenna Tpye:	Integrated antenna
Antenna Gain:	-0.39dBi
Max. Output Power:	3.550dBm
Hardware Version:	CS10_V3.0
Software Version:	A26_V3.17_171103US
Power Supply:	DC 5V From adapter
Battery:	DC 7.4V/2600mA
Adapter information:	Model:GKYPG0200050 US2 Input: 100-240V 50/60Hz 0.5A Output: 5V 2A

1.2. Operation channel list

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

1.3. Test channel list

Channel	Channel	Frequency (MHz)
Low	00	2402
Middle	19	2440
High	39	2480

1.4. Ancillary equipment list

Equipment	Model	S/N	Manufacturer	Certificate type
/	/	/	/	/

1.5. Description of Support Units

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
/	/	/	/	/	
/	/	/	/	/	

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. Summary of Test Results

Test procedures according to the technical standards:

No.	Standard Section	Test Item	Result	Remark
1	15.207	Conducted Emission	Pass	
2	15.247 (a)(2)	6dB Bandwidth	Pass	
3	15.247 (b)	Peak Output Power	Pass	
4	15.247 (c)	Radiated Spurious Emission	Pass	
5	15.247 (d)	Power Spectral Density	Pass	
6	15.205	Band Edge Emission	Pass	
7	15.203	Antenna Requirement	Pass	

3. Test Facilities and Accreditations

3.1. Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.:	FCC Registration No.: 448573

3.2. Environmental conditions

Temperature:	20ºC~30ºC
Humidity	30%~70%
Atmospheric pressure	98kPa~101kPa

3.3. Measurement uncertainty

The reported uncertainty of measurement y ± 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	±1.38dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1G)	±4.68dB
5	All emissions, radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

3.4. Test software

Software Name	Manufacturer	Model	Version
RF Test System	Farad	LZ-RF	Lz_Rf 3A3

4. Equipment List

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E001	Spectrum Analyzer	Agilent	E4407B	MY41441082	2017/09/18	2018/09/17
MTI-E002	CMU 200 universal radio communication tester	Rohde&schwarz	CMU 200	114587	2017/09/18	2018/09/17
MTI-E004	EMI Test Receiver	Rohde&schwarz	ESPI	1000314	2017/09/18	2018/09/17
MTI-E006	Broadband antenna	schwarabeck	VULB9163	872	2017/09/18	2018/09/17
MTI-E007	Horn antenna	schwarabeck	BBHA9120D	1201	2017/09/18	2018/09/17
MTI-E014	amplifier	America	8447D	3113A06150	2017/09/18	2018/09/17
MTI-E015	Conduction Immunity Signal Generator	Schloder	CDG6000	126A1343/2015	2017/09/18	2018/09/17
MTI-E016	Coupled decoupling network	Schloder	CDA M2/M3	A2210332/2015	2017/09/18	2018/09/17
MTI-E032	Comprehensive test instrument	Rohde&schwarz	CMW500	124192	2017/09/13	2018/09/12
MTI-E034	amplifier	Agilent	8449B	3008A02400	2017/08/22	2018/08/21
MTI-E040	Spectrum analyzer	Agilent	N9020A	MY49100060	2017/09/05	2018/09/04
MTI-E041	Signal generator	Agilent	N5182A	MY49060455	2017/09/23	2018/09/22
MTI-E042	Analog signal generator	Agilent	E4421B	GB40051240	2017/09/23	2018/09/22
MTI-E043	Power probe	Dare Instruments	RPR3006W	16I00054SNO16	2017/09/29	2018/09/28
MTI-E047	10dB attenuator	Mini-Circuits	UNAT-10+	15542	2017/09/24	2018/09/23
MTI-E049	spectrum analyzer	Rohde&schwarz	FSP-38	100019	2017/09/18	2018/09/17
MTI-E050	PSG Signal generator	Agilent	E8257D	MY46520873	2017/09/24	2018/09/23
MTI-E051	Active Loop Antenna 9kHz - 30MHz	Schwarzbeek	FMZB 1519 B	00044	2017/09/26	2018/09/25
MTI-E052	18-40GHz amplifier	Chengdu step Micro Technology	ZLNA-18-40G-21	1608001	2017/09/18	2018/09/17
MTI-E053	15-40G Antenna	Schwarzbeek	BBHA9170	BBHA9170582	2017/09/18	2018/09/17
Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).						

5. Test Result

5.1. Antenna requirement

5.1.1 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

5.1.2 EUT Antenna

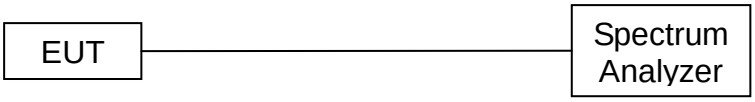
The antenna is an integrated antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is -0.39dBi.

5.2. Peak output power test

5.2.1 Limit

FCC Part15 Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(b)(3)	Peak output power	1 watt or 30dBm	2400-2483.5

5.2.2 Test setup



5.2.3 Test procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz)
RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz)
(3) The EUT was set to continuously transmitting in the max power during the test.

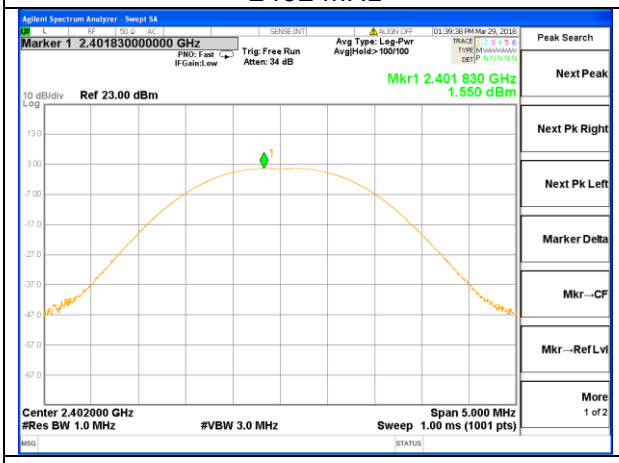
5.2.4 Test results

TX BLE mode

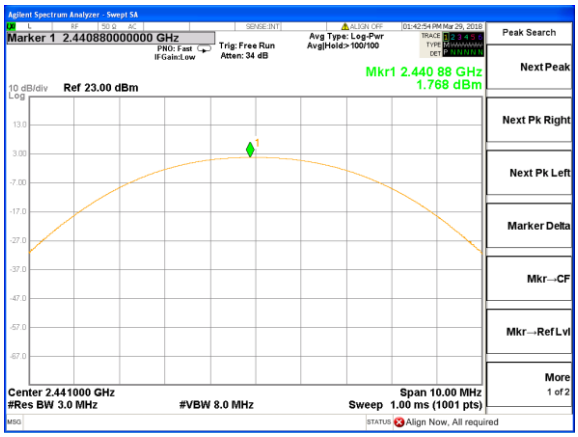
Test Channel	Frequency	Maximum Peak Conducted Output Power	Limit
	(MHz)	(dBm)	dBm
CH01	2402	1.475	30
CH20	2440	1.705	30
CH40	2480	3.552	30

BLE

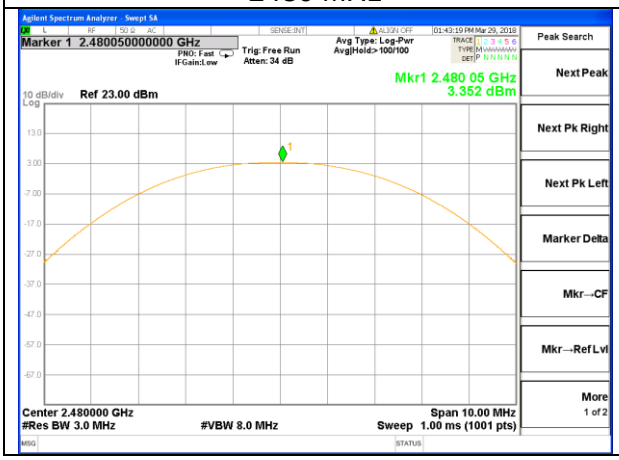
2402 MHz



2441 MHz



2480 MHz

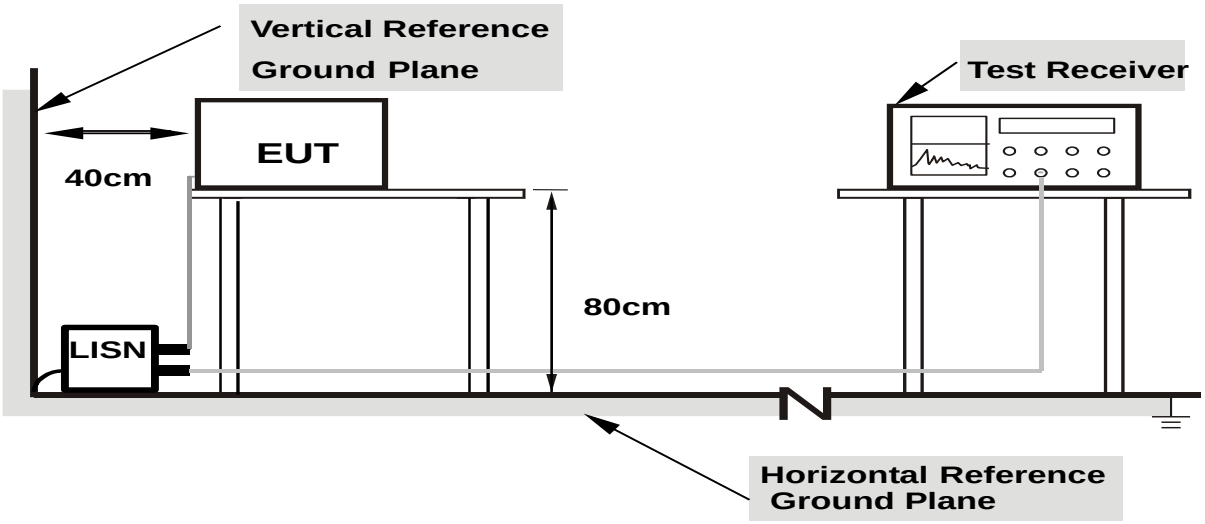


5.3. Conducted emission

5.3.1 Limits

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 note2	56 - 46 note2
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Note1: The tighter limit applies at the band edges. *Note2: The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.*		

5.3.2 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 from other units and other metal planes

5.3.3 Test procedure

a. 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.

b. 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

c. 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.

d. 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.

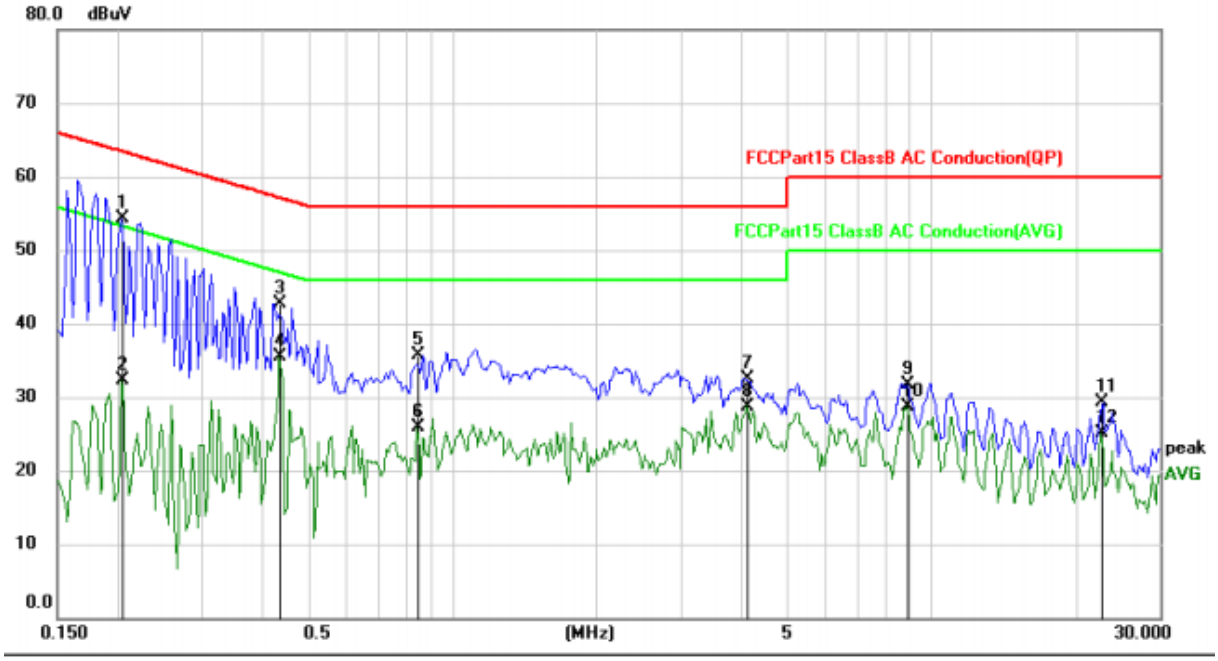
e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f. LISN at least 80 cm from nearest part of EUT chassis.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

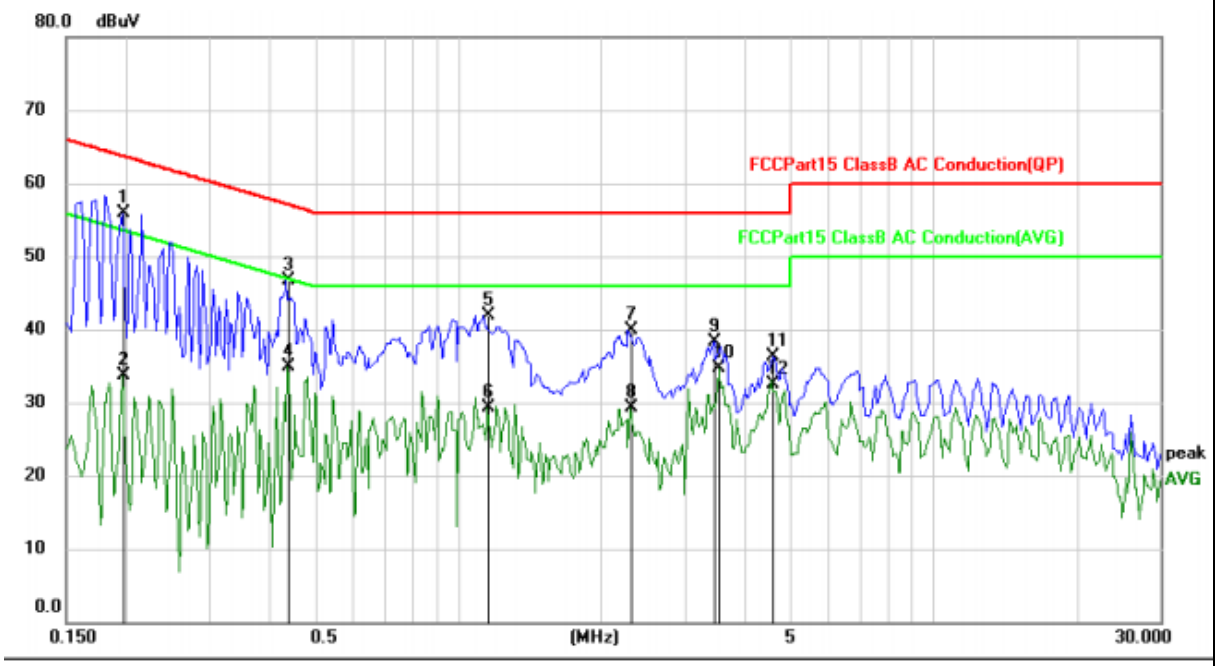
5.3.4 Test results

EUT：	Smart POS Payment Terminal	Model Name. ：	CS10
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from AC Adapter 120V/60Hz	Test Mode：	Normal working



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.2047	54.40	-0.03	54.37	63.42	-9.05	QP	
2		0.2047	32.27	-0.03	32.24	53.42	-21.18	AVG	
3		0.4352	42.81	-0.03	42.78	57.15	-14.37	QP	
4		0.4352	35.50	-0.03	35.47	47.15	-11.68	AVG	
5		0.8453	35.77	-0.03	35.74	56.00	-20.26	QP	
6		0.8453	25.98	-0.03	25.95	46.00	-20.05	AVG	
7		4.1288	32.52	-0.05	32.47	56.00	-23.53	QP	
8		4.1288	28.85	-0.05	28.80	46.00	-17.20	AVG	
9		8.8945	31.87	-0.07	31.80	60.00	-28.20	QP	
10		8.8945	28.68	-0.07	28.61	50.00	-21.39	AVG	
11		22.5820	29.58	-0.29	29.29	60.00	-30.71	QP	
12		22.5820	25.36	-0.29	25.07	50.00	-24.93	AVG	

EUT：	Smart POS Payment Terminal	Model Name. ：	CS10
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from AC Adapter 120V/60Hz	Test Mode：	Normal working



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1969	55.86	-0.03	55.83	63.74	-7.91	QP	
2		0.1969	33.64	-0.03	33.61	53.74	-20.13	AVG	
3		0.4391	46.81	-0.03	46.78	57.08	-10.30	QP	
4		0.4391	35.00	-0.03	34.97	47.08	-12.11	AVG	
5		1.1539	42.01	-0.04	41.97	56.00	-14.03	QP	
6		1.1539	29.29	-0.04	29.25	46.00	-16.75	AVG	
7		2.2984	39.87	-0.05	39.82	56.00	-16.18	QP	
8		2.2984	29.30	-0.05	29.25	46.00	-16.75	AVG	
9		3.4531	38.36	-0.04	38.32	56.00	-17.68	QP	
10		3.5391	34.67	-0.05	34.62	46.00	-11.38	AVG	
11		4.5736	36.42	-0.06	36.36	56.00	-19.64	QP	
12		4.5736	32.61	-0.06	32.55	46.00	-13.45	AVG	

5.4 Radiated spurious emission

5.4.1 Limits

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), then the 15.209(a) limit in the table below has to be followed.

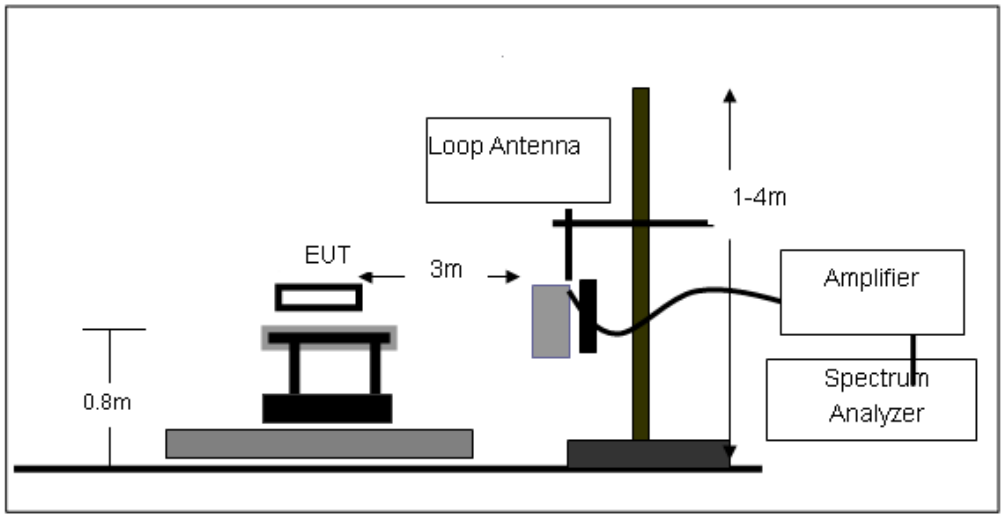
Frequency (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

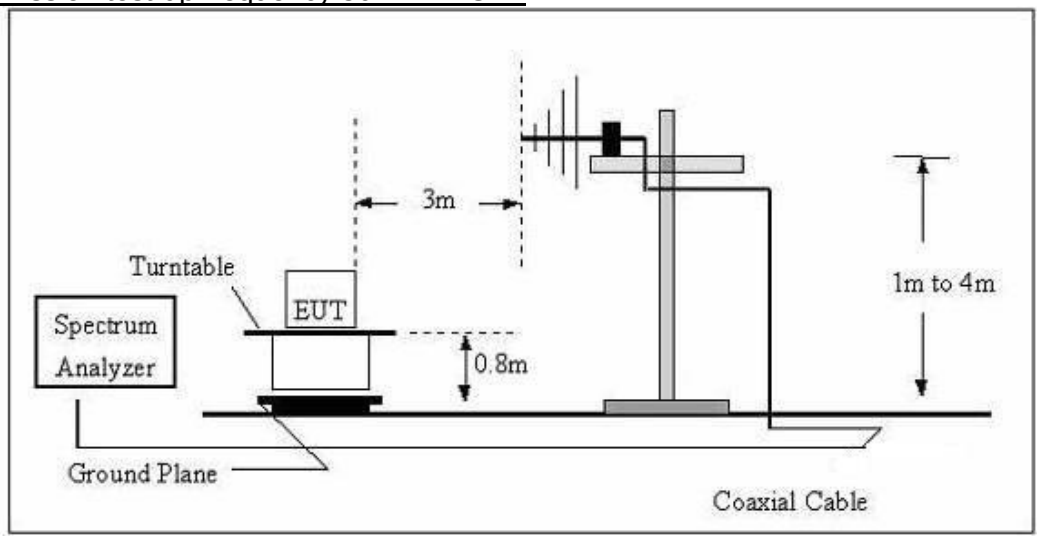
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.4.2 Test setup

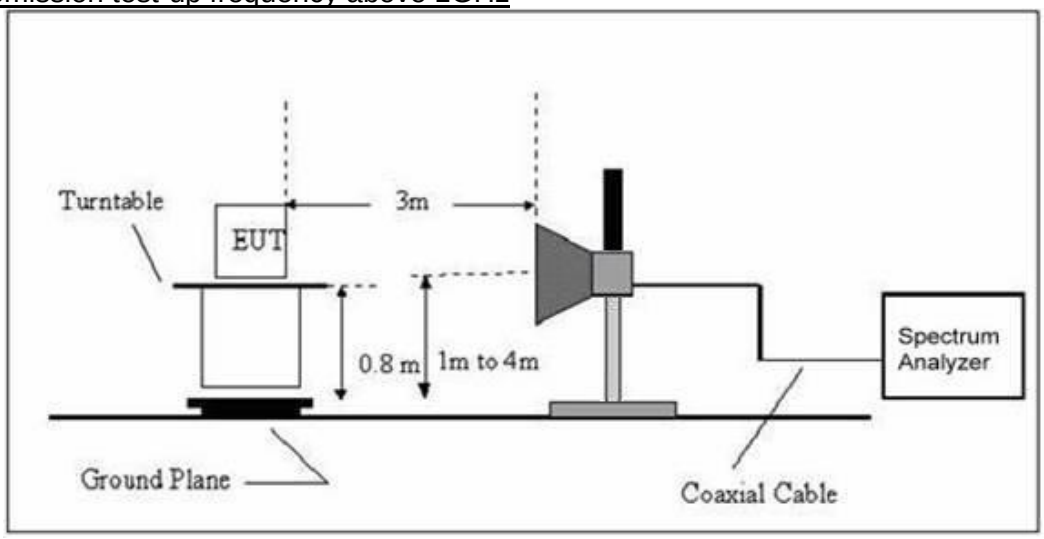
Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.4.3 Test procedure

a. 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.

b. 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.

c. 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.

d. 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.

e. 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.

f. 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.

g. For the actual test configuration, please refer to the related Item –EUT Test photos.

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

5.4.4 Test results

5.4.4.1 Radiation emission

Below 30MHz

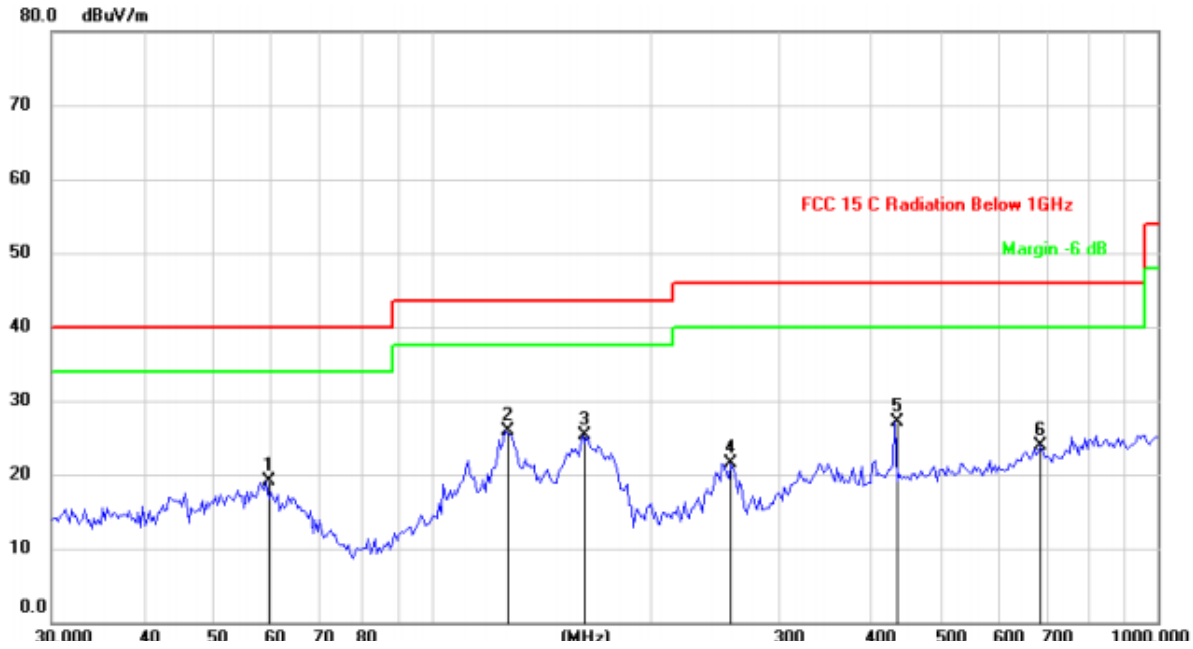
EUT：	Smart POS Payment Terminal	Model Name：	CS10
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage：	DC 5V from adapter AC 120V/60Hz
Test Mode：	Normal working		

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

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 (specific distance/test distance)(dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.

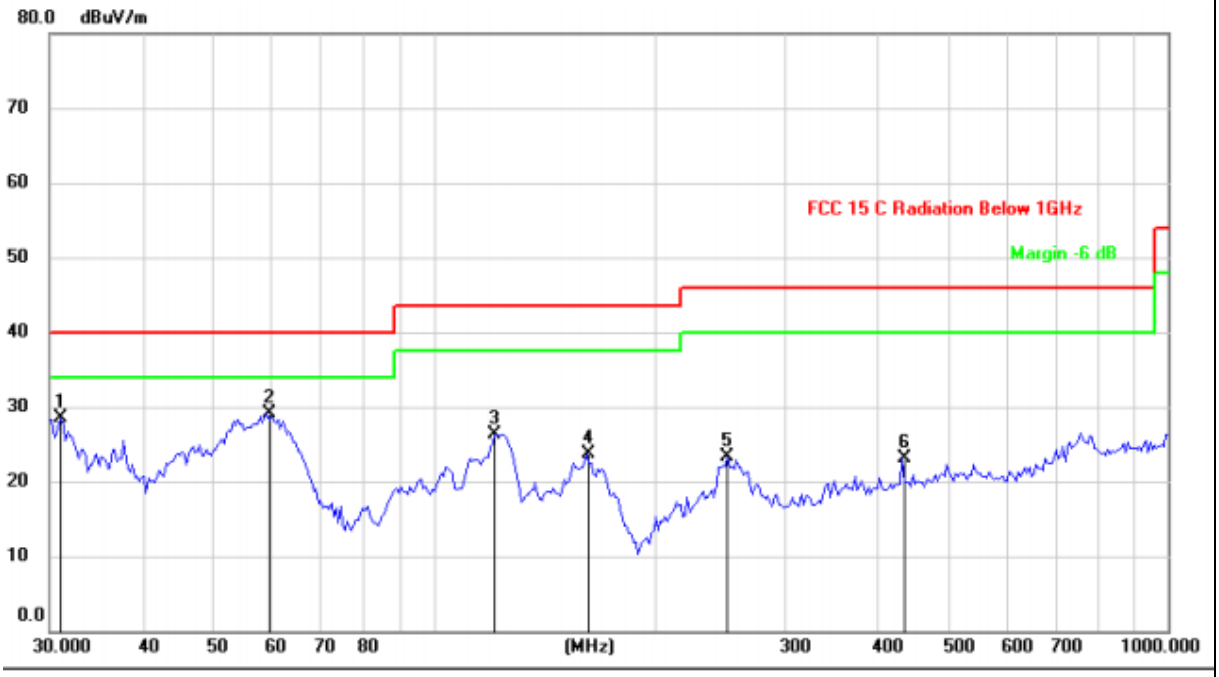
Between 30MHz – 1GHz

EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Relative Humidity:	52%	Phase:	H
Pressure：	1010 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz
Test Mode ：	Normal working		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		59.2325	30.09	-11.06	19.03	40.00	-20.97	peak			
2	*	126.3286	39.90	-13.96	25.94	43.50	-17.56	peak			
3		161.4742	39.34	-14.10	25.24	43.50	-18.26	peak			
4		258.3264	31.35	-9.79	21.56	46.00	-24.44	peak			
5		434.0651	33.21	-6.05	27.16	46.00	-18.84	peak			
6		689.5644	28.22	-4.34	23.88	46.00	-22.12	peak			

EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Relative Humidity:	52%	Phase:	V
Pressure：	1010 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz
Test Mode ：	Normal working		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		31.0706	39.94	-11.48	28.46	40.00	-11.54	peak			
2	*	59.2325	40.08	-11.06	29.02	40.00	-10.98	peak			
3		121.1231	38.59	-12.23	26.36	43.50	-17.14	peak			
4		161.4742	36.73	-12.95	23.78	43.50	-19.72	peak			
5		251.1804	33.47	-10.11	23.36	46.00	-22.64	peak			
6		434.0651	29.24	-6.05	23.19	46.00	-22.81	peak			

1G-25GHz

Note1 : Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Note2 :The peak value is less than the AV value, AV value is not required Factor added by measurement software automatically.

For BLE

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	3997.996	47.64	-2.63	45.01	74.00	-28.99	Horizontal
2	6519.038	50.93	-4.39	46.54	74.00	-27.46	Horizontal
3	7200.401	47.63	-2.82	44.81	74.00	-29.19	Horizontal
4	9176.353	45.35	-0.43	44.92	74.00	-29.08	Horizontal
5	9925.852	45.62	1.67	47.29	74.00	-26.71	Horizontal
6	11254.509	45.10	2.41	47.51	74.00	-26.49	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4100.200	49.59	-4.82	44.77	74.00	-29.23	Vertical
2	4577.154	52.11	-7.67	44.44	74.00	-29.56	Vertical
3	6450.902	49.19	-6.06	43.13	74.00	-30.87	Vertical
4	7847.695	47.44	-3.84	43.60	74.00	-30.40	Vertical
5	9074.148	47.04	-1.96	45.08	74.00	-28.92	Vertical
6	10777.555	46.64	0.27	46.91	74.00	-27.09	Vertical

Middle channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4032.064	47.79	-2.80	44.99	74.00	-29.01	Horizontal
2	4543.086	51.59	-7.47	44.12	74.00	-29.88	Horizontal
3	6655.311	47.70	-3.96	43.74	74.00	-30.26	Horizontal
4	8188.377	47.00	-1.90	45.10	74.00	-28.90	Horizontal
5	9993.988	45.76	1.87	47.63	74.00	-26.37	Horizontal
6	12787.575	44.70	3.03	47.73	74.00	-26.27	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	3997.996	48.79	-4.22	44.57	74.00	-29.43	Vertical
2	5973.948	50.11	-5.77	44.34	74.00	-29.66	Vertical
3	6178.357	48.59	-6.97	41.62	74.00	-32.38	Vertical
4	8052.104	48.32	-3.59	44.73	74.00	-29.27	Vertical
5	9857.715	46.94	-0.52	46.42	74.00	-27.58	Vertical
6	11527.054	47.49	0.38	47.87	74.00	-26.13	Vertical

High channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4270.541	49.02	-4.14	44.88	74.00	-29.12	Horizontal
2	6655.311	50.14	-3.96	46.18	74.00	-27.82	Horizontal
3	6519.038	46.68	-4.39	42.29	74.00	-31.71	Horizontal
4	8052.104	46.49	-1.87	44.62	74.00	-29.38	Horizontal
5	9959.920	45.36	1.77	47.13	74.00	-26.87	Horizontal
6	11356.713	44.87	2.44	47.31	74.00	-26.69	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	3963.928	49.39	-4.35	45.04	74.00	-28.96	Vertical
2	6519.038	52.17	-5.86	46.31	74.00	-27.69	Vertical
3	6484.970	48.26	-5.95	42.31	74.00	-31.69	Vertical
4	8699.399	46.92	-2.61	44.31	74.00	-29.69	Vertical
5	10573.146	46.38	0.23	46.61	74.00	-27.39	Vertical
6	12651.303	45.92	1.13	47.05	74.00	-26.95	Vertical

5.4.4.2 Bandedge-radiated

Note1 : Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Note2 :The peak value is less than the AV value, AV value is not required Factor added by measurement software automatically.

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
BLE							
2390	61.6	-10.41	51.19	74	-22.81	PK	Vertical
2390	58.49	-10.39	48.1	74	-25.9	PK	Horizontal
2400	57.97	-10.16	47.81	74	-26.19	PK	Vertical
2400	59.36	-9.28	50.08	74	-23.92	PK	Horizontal
2483.5	58.79	-9.73	49.06	74	-24.94	PK	Vertical
2483.5	60.37	-8.66	51.71	74	-22.29	PK	Horizontal

5.5 Power spectral density

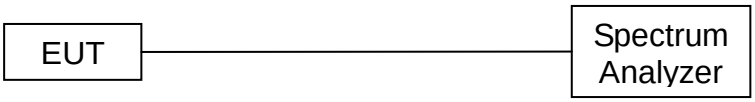
5.5.1 Limit

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

5.5.2 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 ≥ 3 kHz.
4. Set the VBW ≥ 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.

5.5.3 Test setup

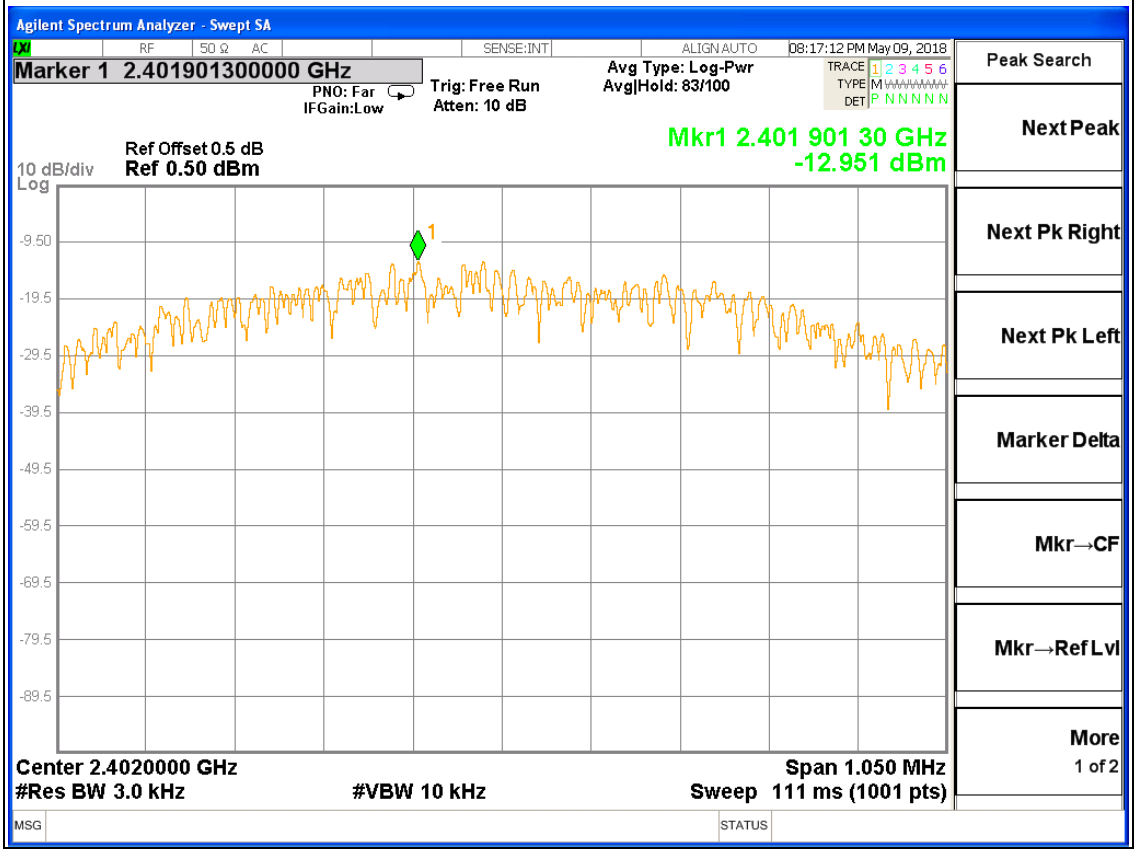


5.5.4 Test results

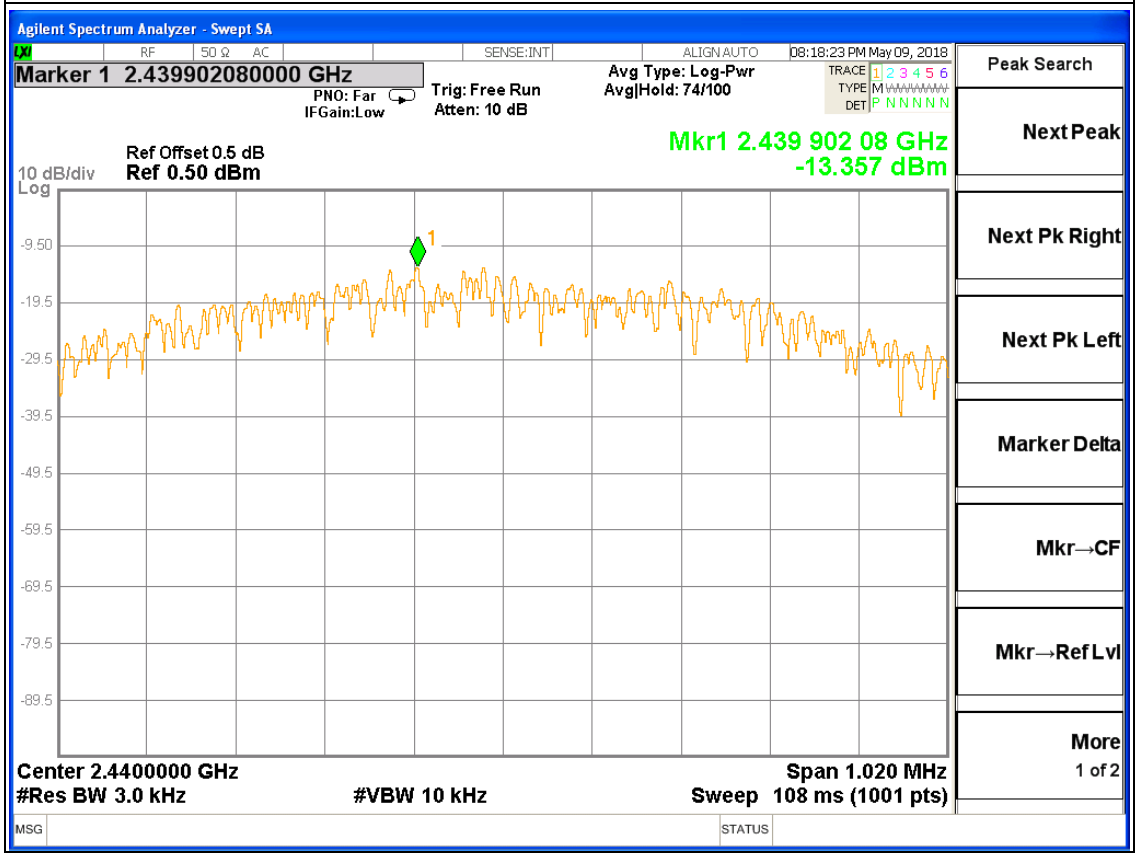
EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC 7.4V by battery

Frequency	Power Density (dBm)	Limit 8dBm/3kHz	Result
2402 MHz	-12.951	8	Pass
2440 MHz	-13.357	8	Pass
2480 MHz	-11.345	8	Pass

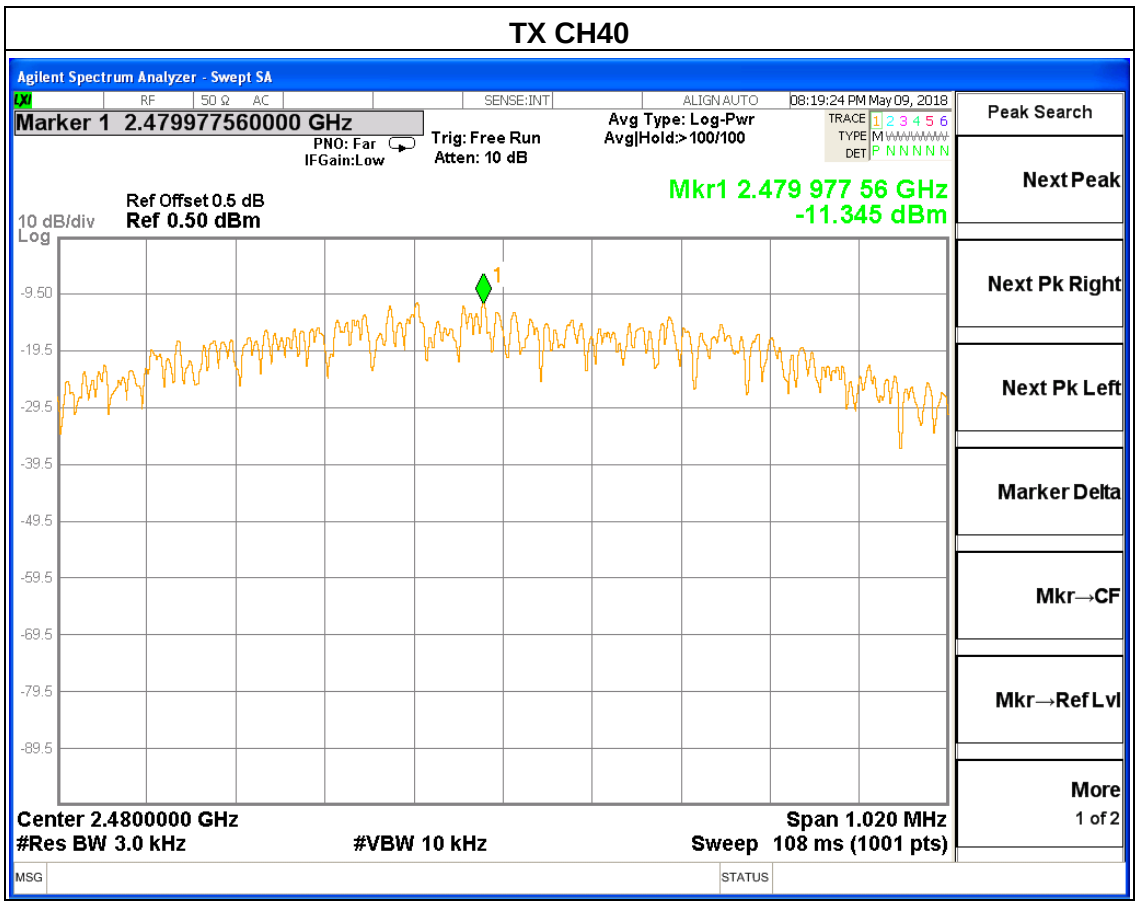
TX CH00



TX CH20



TX CH40



5.6 6dB bandwidth

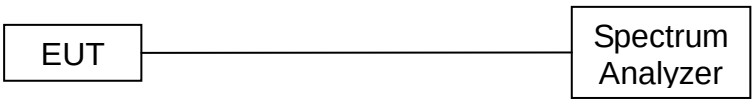
5.6.1 Limit

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

5.6.2 Test procedure

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.6.3 Test setup

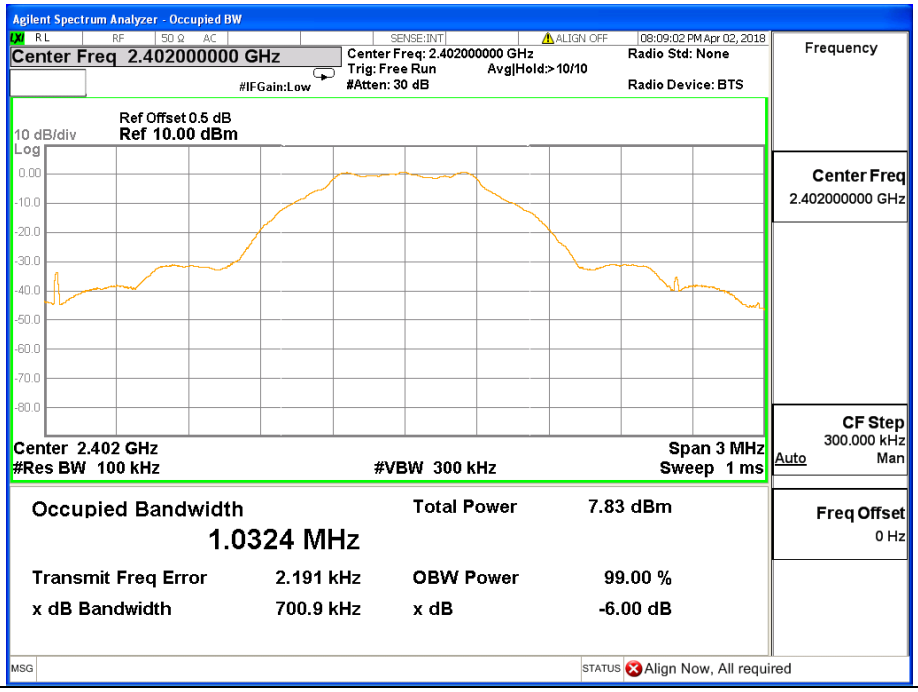


5.6.4 Test Result

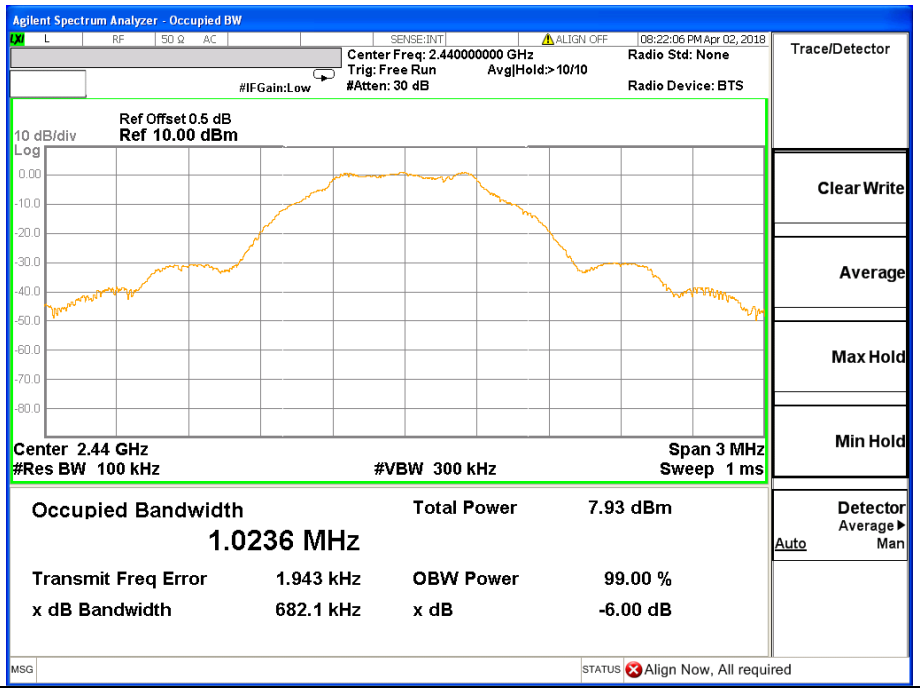
EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 7.4V by battery

Channel	Frequency (MHz)	6dB bandwidth (KHz)	Limit (kHz)	Result
Low	2402	700.9	500	Pass
Middle	2440	682.1	500	Pass
High	2480	681.0	500	Pass

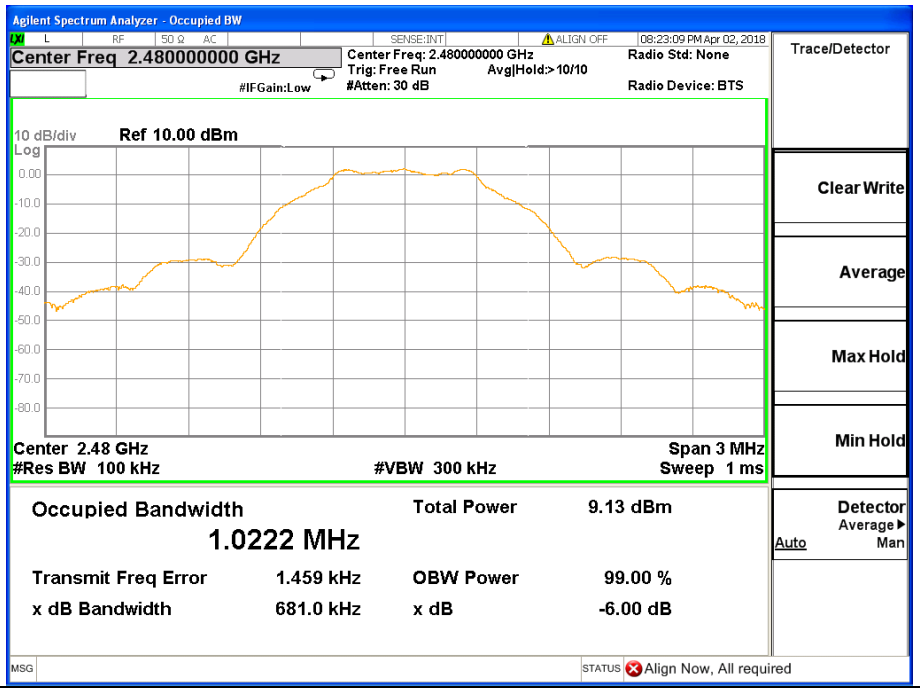
TX CH 00



TX CH 19



TX CH 39



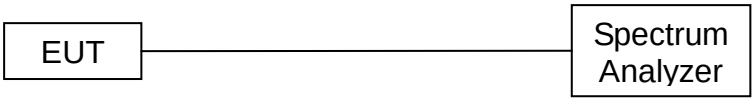
5.7 Conducted spurious emission

5.7.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.7.2 Test setup



5.7.3 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.

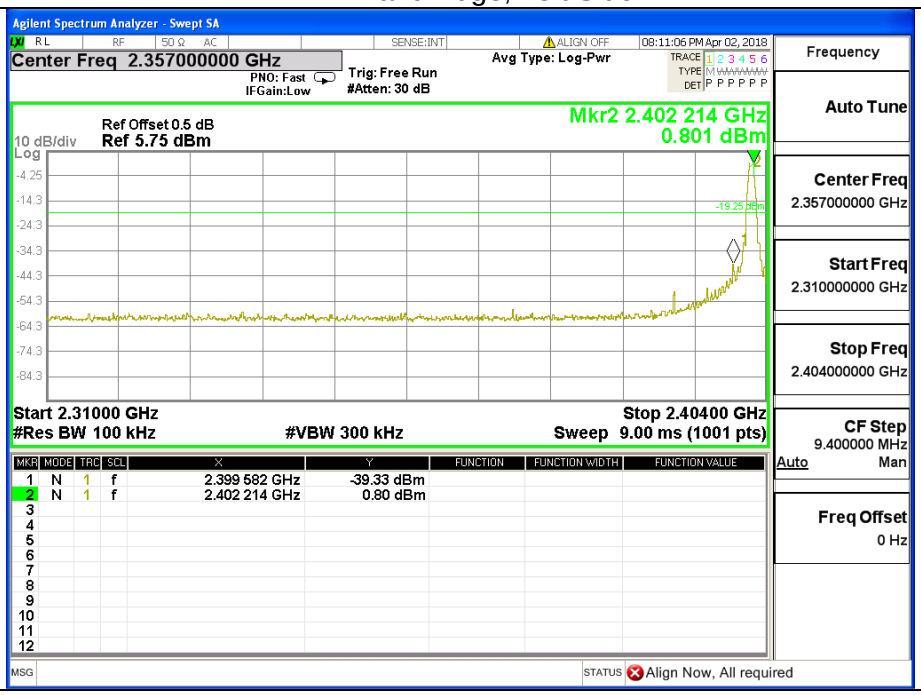
5.7.4 Test Result

EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 7.4V by battery

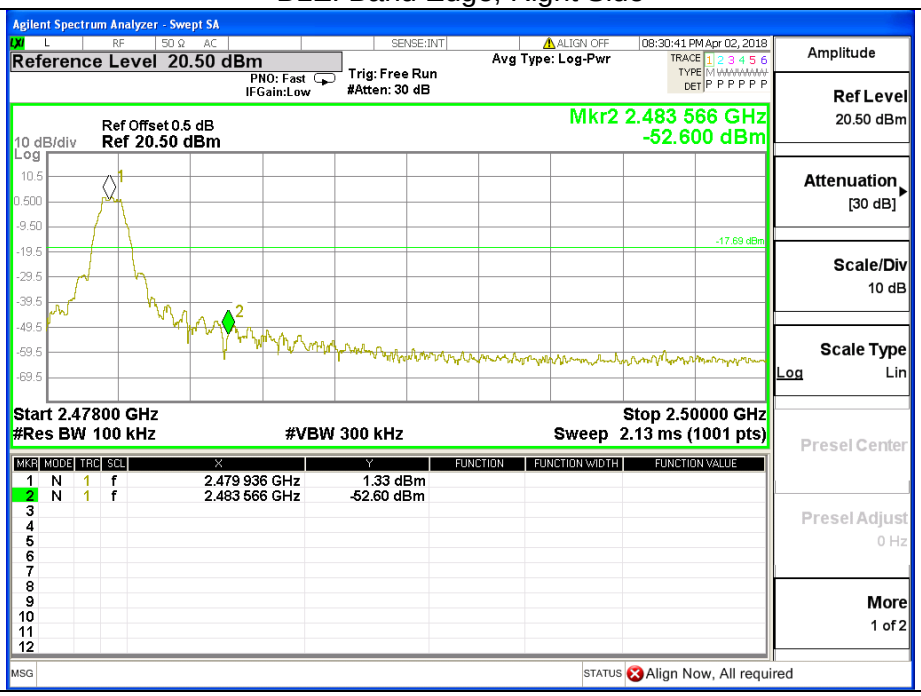
Frequency band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
BLE mode			
Left-band	40.13	20	Pass
Right-band	53.93	20	Pass

Test plots:

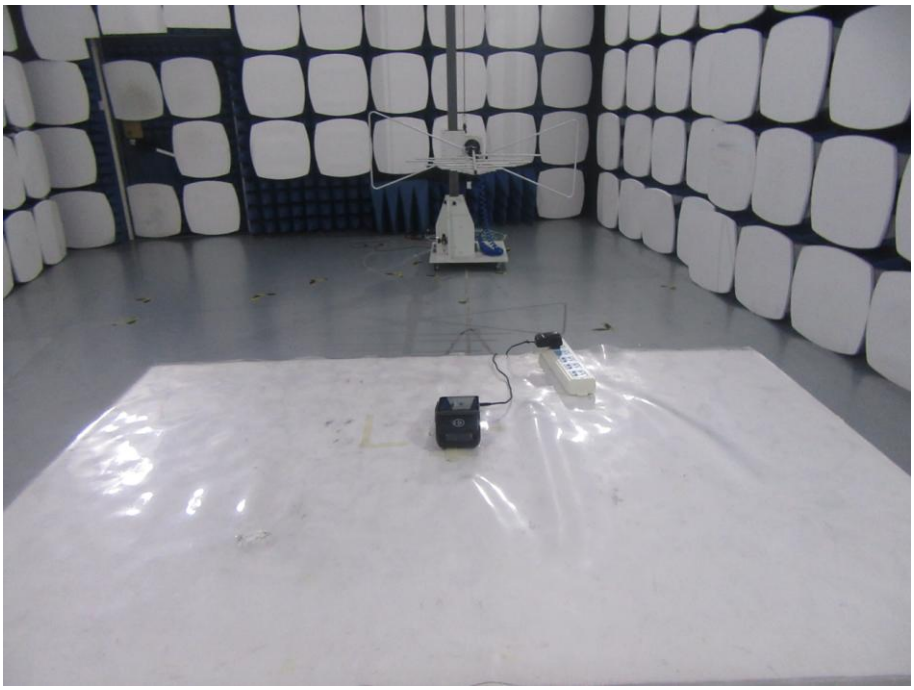
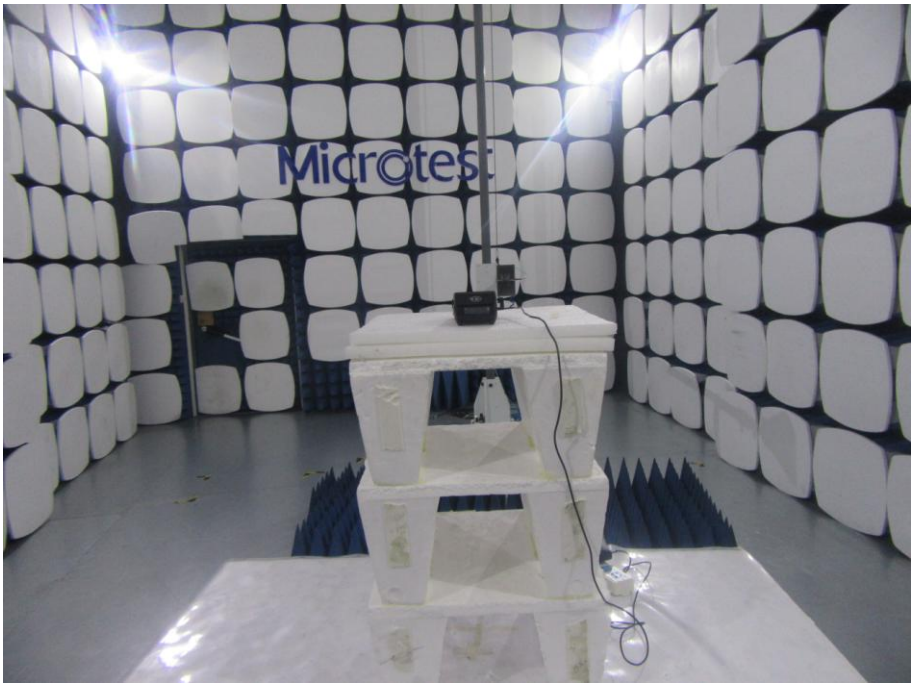
BLE: Band Edge, Left Side



BLE: Band Edge, Right Side



Photographs of the Test Setup

Radiated emission



Conducted emission


----END OF REPORT----