Test Report

FCC ID: 2APBP-CS10

Date of issue: Apr. 10, 2018

Report Number:	MTi180416E035
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

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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
Serial Model	CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Standards:	FCC Part 15.247
Test Procedure:	ANSI C63.10-2013 KDB 55074 v01r04

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

Product name	Smart POS Payment Terminal
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	802.11b/g/n20:2412~2462 MHz 802.11n40:2422~2452 MHz
Modulation Type:	11b: DQPSK, DBPSK, DSSS, CCK 11g: BPSK, QPSK, 16QAM, 64QAM, OFDM 11n: BPSK, QPSK, 16QAM, 64QAM with OFDM
Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n:65/52/6.5Mbps
Antenna Type	Integrated antenna
Antenna Gain (dBi)	-0.39dBi
Max. Output Power:	18.51dBm
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 List for 802.11b/g/n(20)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	\	\

Channel List for 802.11n(40)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	07	2442
04	2427	08	2447
05	2432	09	2452
06	2437	\	\

1.3 Test channel list

Channel List for 802.11b/g/n(20)

Channel	Channel	Frequency (MHz)
Low	01	2412
Middle	06	2437
High	11	2462

Channel List for 802.11n(40)

Channel	Channel	Frequency (MHz)
Low	03	2422
Middle	06	2437
High	09	2452

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	15.203	Antenna Requirement	Pass	
2	15.247 (b)	Peak Output Power	Pass	
3	15.247 (d)	Power Spectral Density	Pass	
4	15.207	Conducted Emission	Pass	
5	15.247 (c)	Radiated Spurious Emission	Pass	
6	15.205	Band Edge Emission	Pass	
7	15.247 (a)(2)	6dB Bandwidth	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	2017/04/13	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

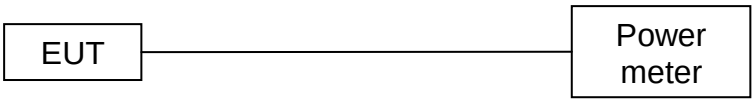
The antenna is an integrated antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is -0.39dBi.

5.2 Peak output power

5.2.1 Limit

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

5.2.2 Test setup



5.2.3 Test procedure

The EUT was directly connected to the Power meter.

5.2.4 Test results

802.11b

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power	LIMIT (dBm)
CH01	2412	16.14	30
CH06	2437	15.59	30
CH11	2462	15.52	30

802.11g

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power	LIMIT (dBm)
CH01	2412	16.97	30
CH06	2437	15.51	30
CH11	2462	18.65	30

802.11n20

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power	LIMIT (dBm)
CH01	2412	16.98	30
CH06	2437	18.51	30
CH11	2462	18.50	30

802.11n40

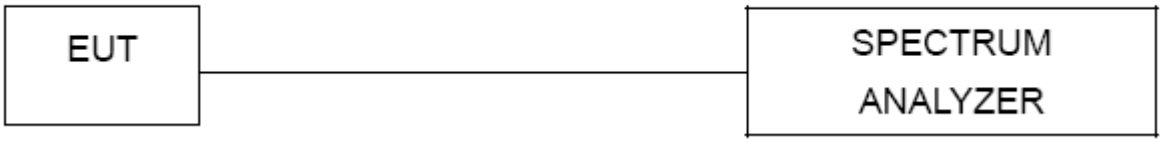
Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power	LIMIT (dBm)
CH03	2422	18.45	30
CH06	2437	18.18	30
CH09	2452	17.87	30

5.3 Power spectral density

5.3.1 Limit

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

5.3.2 Test Setup



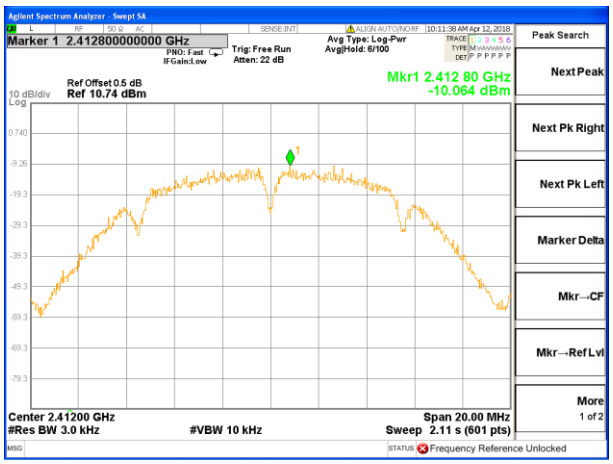
5.3.3 Test Procedure

a. 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.
b. Set analyzer center frequency to DTS channel center frequency.
c. Set the span to 1.5 times the DTS channel bandwidth.
d. Set the RBW ≥ 3 kHz.
e. Set the VBW ≥ 3 x RBW.
f. Detector = peak.
g. Sweep time = auto couple.
h. Trace mode = max hold.
i. Allow trace to fully stabilize.
j. Use the peak marker function to determine the maximum amplitude level.
k. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

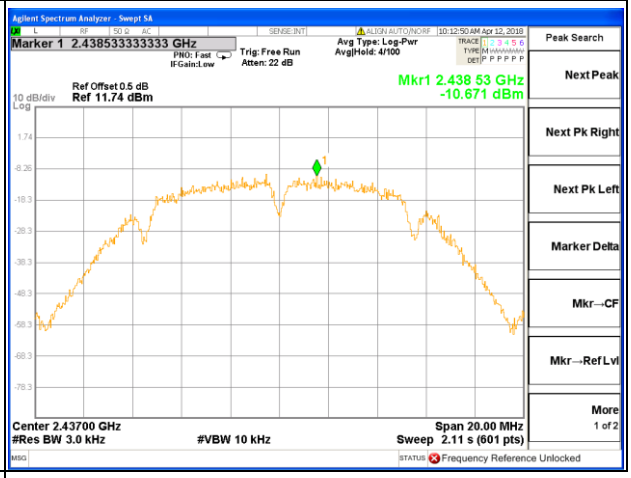
5.3.4 Test Results

802.11b			
Frequency	Power Density (dBm)	Limit 8dBm/3kHz	Result
2412 MHz	-10.064	8	Pass
2437 MHz	-10.671	8	Pass
2462 MHz	-9.799	8	Pass

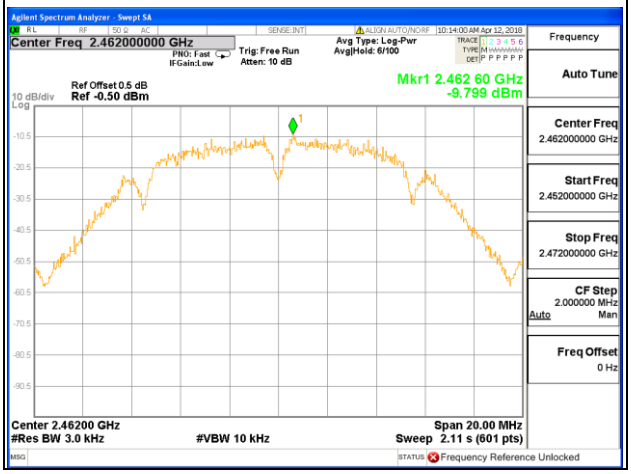
TX CH01



TX CH06

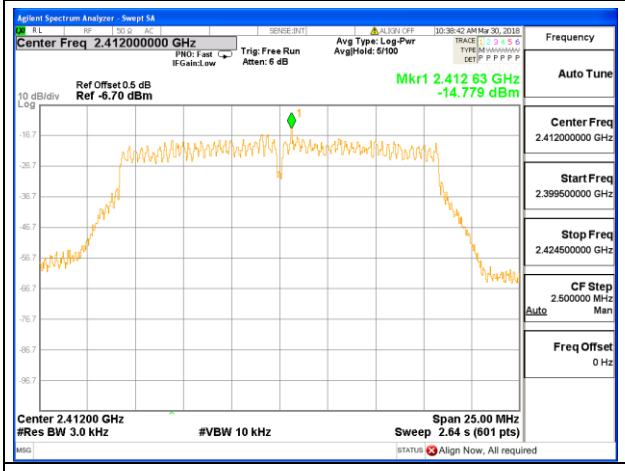


TX CH11

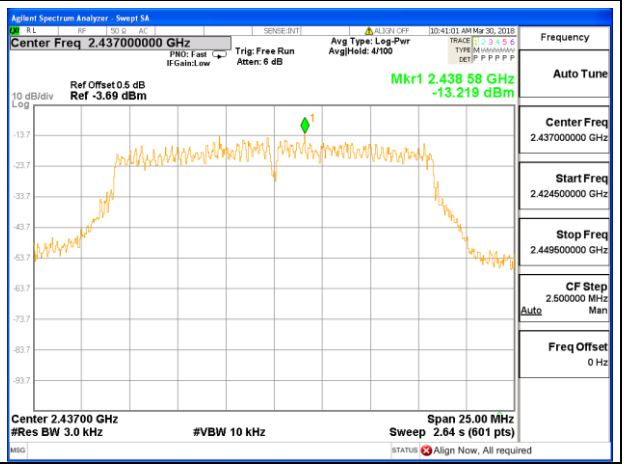


802.11g			
Frequency	Power Density (dBm)	Limit 8dBm/3kHz	Result
2412 MHz	-14.779	8	Pass
2437 MHz	-13.219	8	Pass
2462 MHz	-14.723	8	Pass

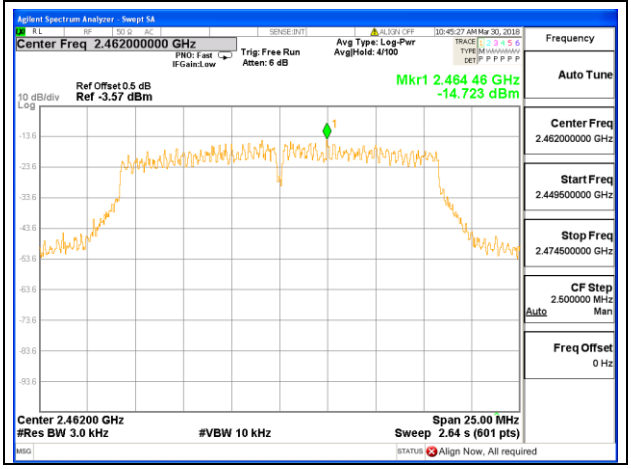
TX CH01



TX CH06

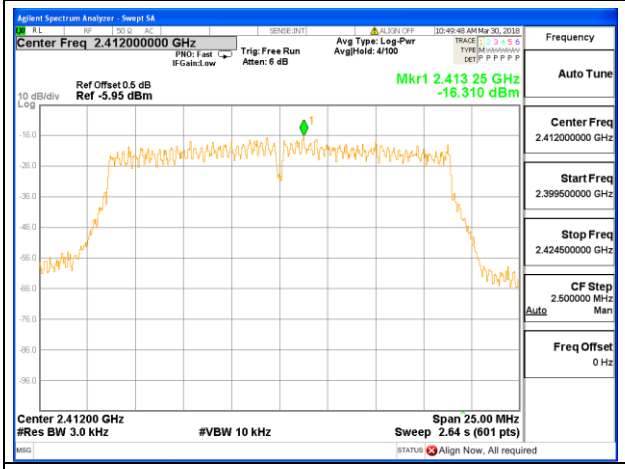


TX CH11

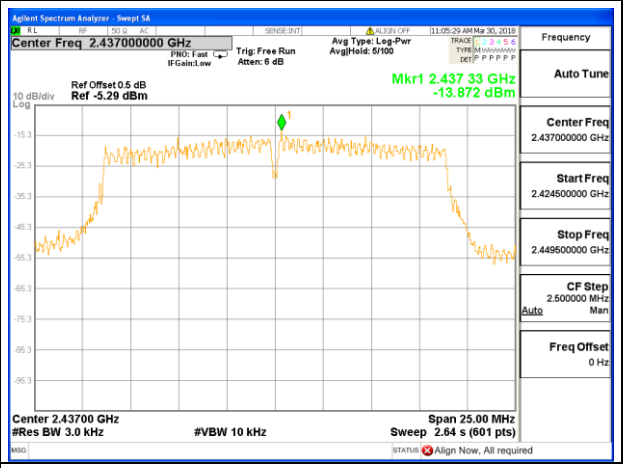


802.11n20			
Frequency	Power Density (dBm)	Limit 8dBm/3kHz	Result
2412 MHz	-16.310	8	Pass
2437 MHz	-13.872	8	Pass
2462 MHz	-14.647	8	Pass

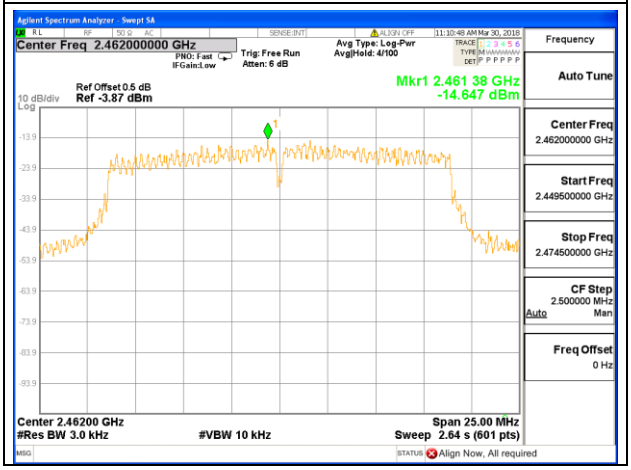
TX CH01



TX CH06

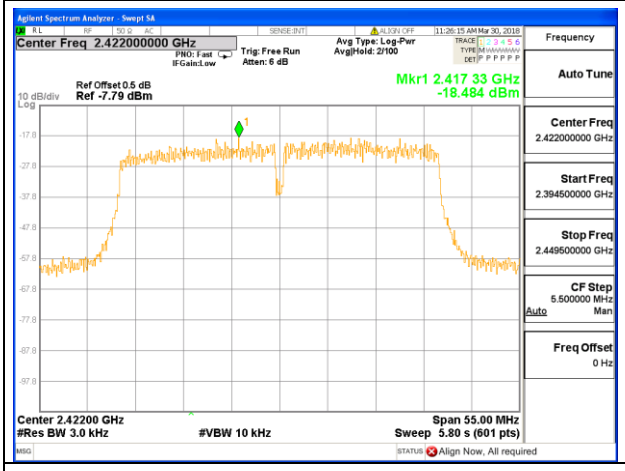


TX CH11

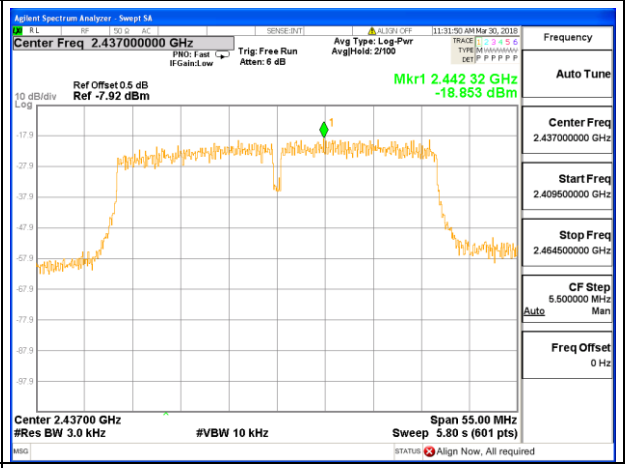


802.11n40			
Frequency	Power Density (dBm)	Limit 8dBm/3kHz	Result
2422 MHz	-18.484	8	Pass
2437 MHz	-18.853	8	Pass
2452 MHz	-16.651	8	Pass

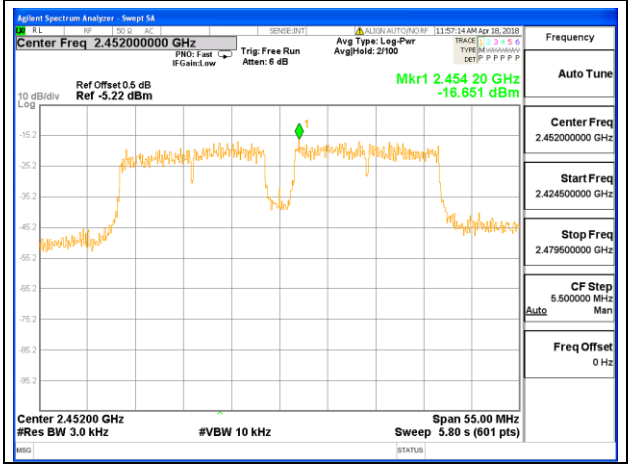
TX CH01



TX CH06



TX CH11



5.4 Conducted emission

5.4.1 Limits

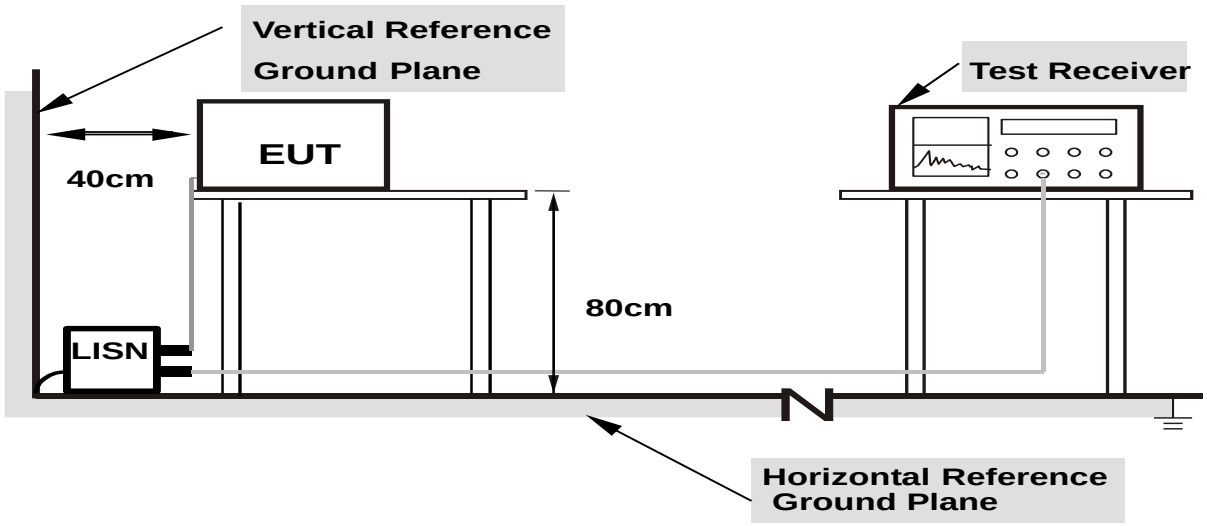
FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

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.

5.4.2 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

5.4.3 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.

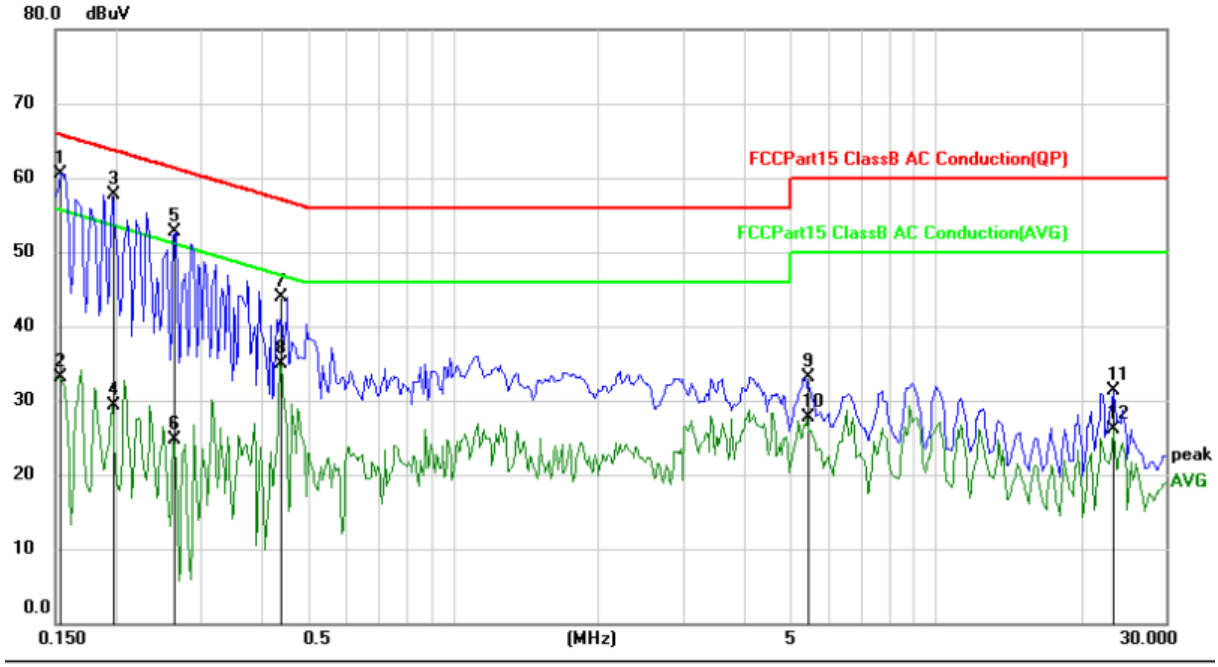
e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

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.

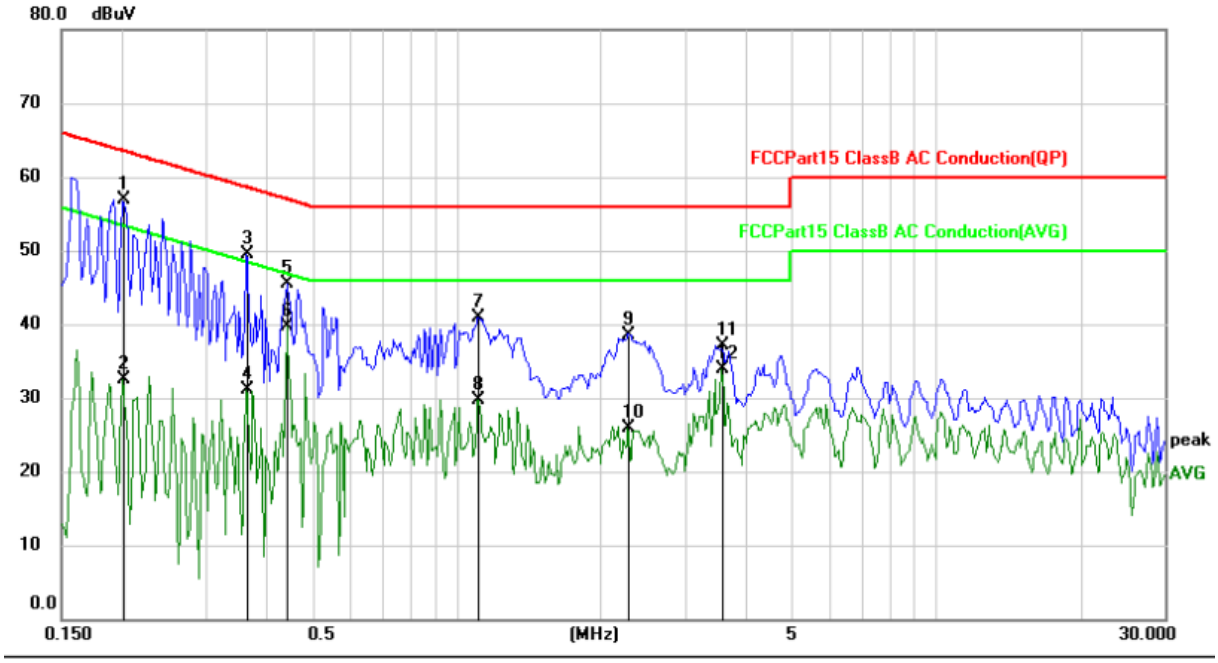
5.4.4 Test results

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：	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1539	60.55	-0.04	60.51	65.79	-5.28	QP	
2		0.1539	33.18	-0.04	33.14	55.79	-22.65	AVG	
3		0.1969	57.82	-0.03	57.79	63.74	-5.95	QP	
4		0.1969	29.34	-0.03	29.31	53.74	-24.43	AVG	
5		0.2633	52.75	-0.03	52.72	61.33	-8.61	QP	
6		0.2633	24.71	-0.03	24.68	51.33	-26.65	AVG	
7		0.4391	43.92	-0.03	43.89	57.08	-13.19	QP	
8		0.4391	34.95	-0.03	34.92	47.08	-12.16	AVG	
9		5.4219	33.07	-0.06	33.01	60.00	-26.99	QP	
10		5.4219	27.68	-0.06	27.62	50.00	-22.38	AVG	
11		23.3438	31.64	-0.30	31.34	60.00	-28.66	QP	
12		23.3438	26.37	-0.30	26.07	50.00	-23.93	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：	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.2008	57.03	-0.03	57.00	63.58	-6.58	QP	
2		0.2008	32.61	-0.03	32.58	53.58	-21.00	AVG	
3		0.3648	49.62	-0.03	49.59	58.62	-9.03	QP	
4		0.3648	31.11	-0.03	31.08	48.62	-17.54	AVG	
5		0.4430	45.45	-0.03	45.42	57.01	-11.59	QP	
6		0.4430	39.81	-0.03	39.78	47.01	-7.23	AVG	
7		1.1109	40.93	-0.04	40.89	56.00	-15.11	QP	
8		1.1109	29.75	-0.04	29.71	46.00	-16.29	AVG	
9		2.2828	38.65	-0.05	38.60	56.00	-17.40	QP	
10		2.2828	25.86	-0.05	25.81	46.00	-20.19	AVG	
11		3.5742	37.08	-0.05	37.03	56.00	-18.97	QP	
12		3.5742	33.93	-0.05	33.88	46.00	-12.12	AVG	

5.5 Radiated spurious

5.5.1 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.

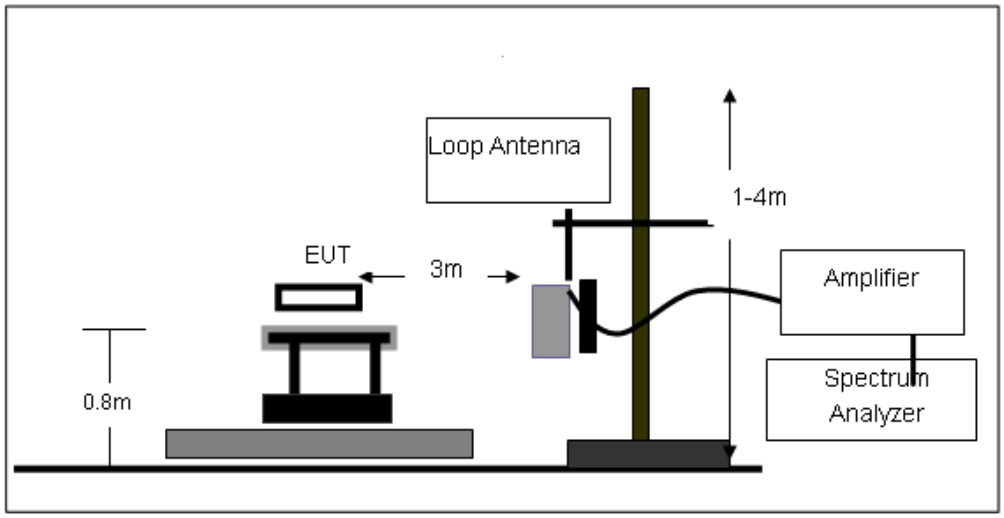
Frequency (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

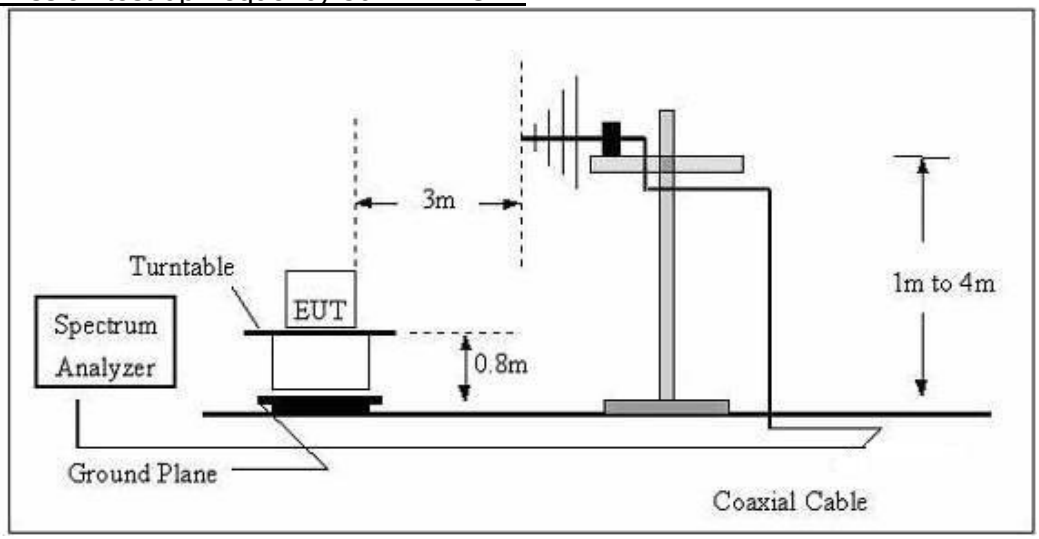
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.5.2 Test setup

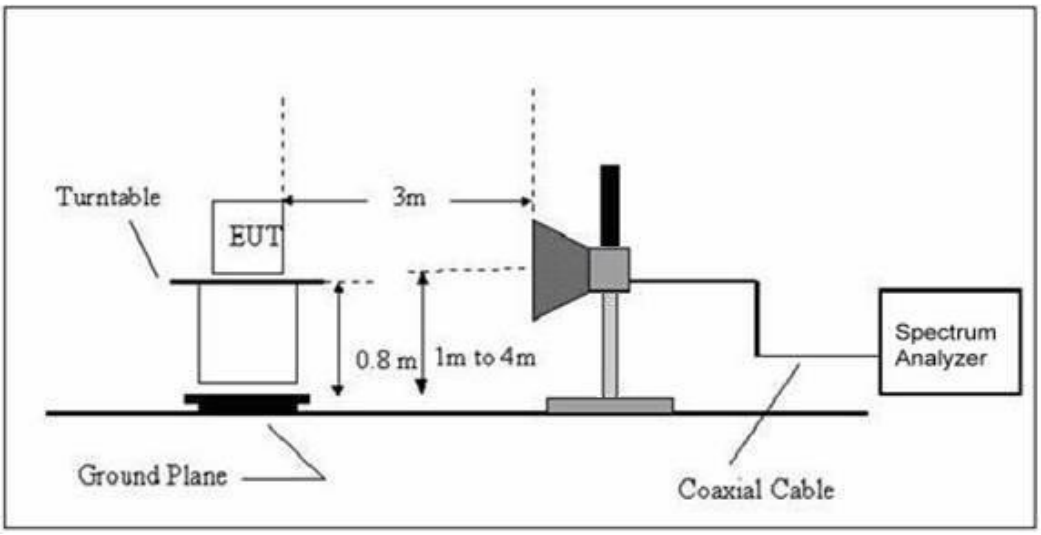
Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.5.3 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

5.5.4 Test results

5.5.4.1 Radiation emission

Below 30MHz

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		

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

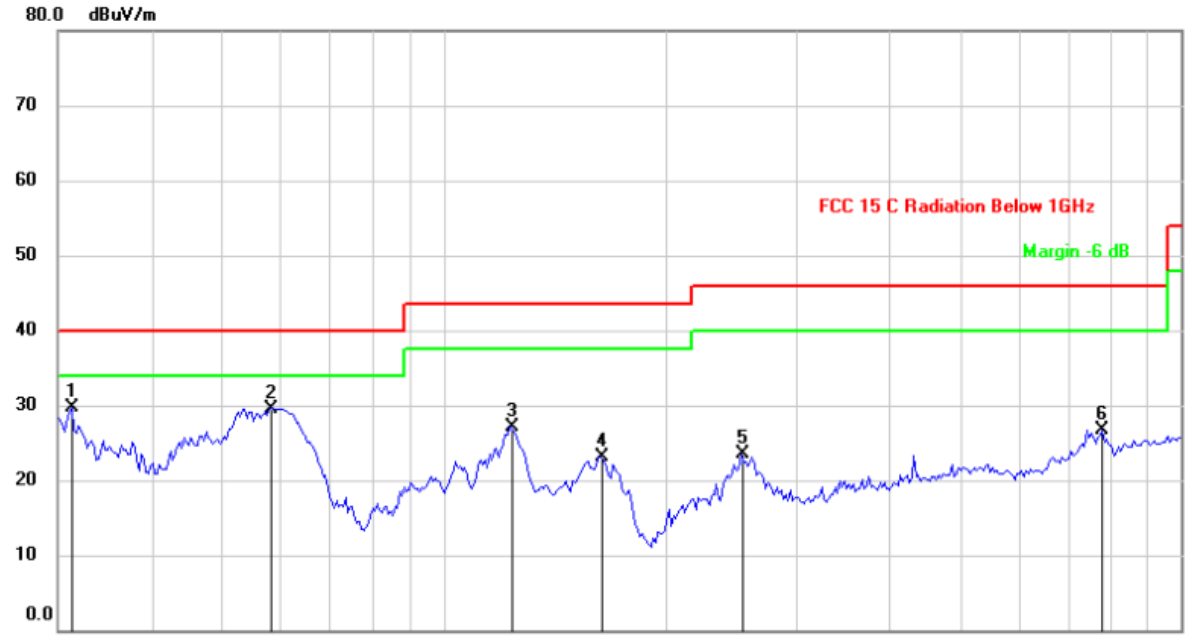
Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.

Between 30MHz – 1GHz

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

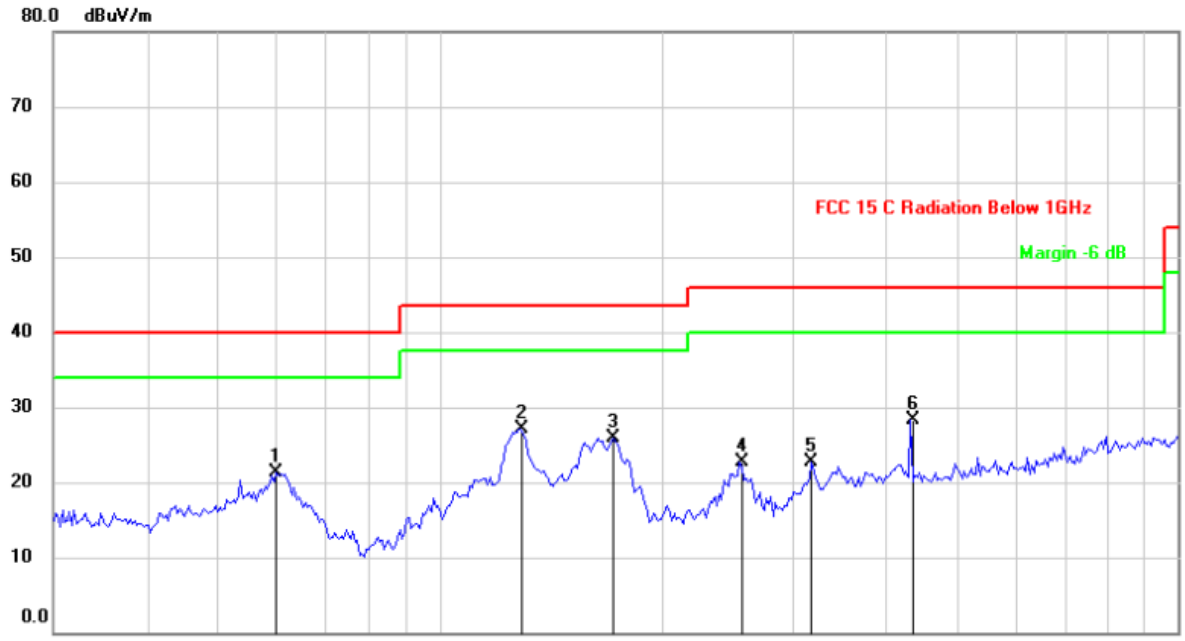
Note2 :The peak value is less than the AV value, AV value is not required Factor added by measurement software automatically.

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	*	31.2893	41.12	-11.47	29.65	40.00	-10.35	peak			
2		58.4074	40.54	-10.94	29.60	40.00	-10.40	peak			
3		122.8340	39.62	-12.48	27.14	43.50	-16.36	peak			
4		162.6106	36.08	-12.88	23.20	43.50	-20.30	peak			
5		252.9482	33.68	-10.24	23.44	46.00	-22.56	peak			
6		782.3453	29.71	-3.05	26.66	46.00	-19.34	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		60.0691	32.46	-11.19	21.27	40.00	-18.73	peak			
2	*	128.1130	41.38	-14.23	27.15	43.50	-16.35	peak			
3		171.9946	40.34	-14.49	25.85	43.50	-17.65	peak			
4		254.7284	32.51	-9.89	22.62	46.00	-23.38	peak			
5		318.8170	30.97	-8.23	22.74	46.00	-23.26	peak			
6		434.0651	34.26	-6.05	28.21	46.00	-17.79	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 802.11b

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4843.847	49.79	-7.39	42.40	74.00	-31.60	Horizontal
2	7235.875	47.61	-2.81	44.80	74.00	-29.20	Horizontal
3	8764.115	44.94	-1.39	43.55	74.00	-30.45	Horizontal
4	11687.704	44.33	2.47	46.80	74.00	-27.20	Horizontal
5	14112.955	46.61	5.98	52.59	74.00	-21.41	Horizontal
6	15508.304	43.50	4.08	47.58	74.00	-26.42	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6305.642	45.20	-6.55	38.65	74.00	-35.35	Vertical
2	7401.988	46.26	-4.37	41.89	74.00	-32.11	Vertical
3	8797.337	45.77	-2.43	43.34	74.00	-30.66	Vertical
4	10823.916	45.30	0.28	45.58	74.00	-28.42	Vertical
5	12451.824	44.96	0.95	45.91	74.00	-28.09	Vertical
6	14245.845	44.37	5.47	49.84	74.00	-24.16	Vertical

Middle channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4815.631	55.08	-7.23	47.85	74.00	-26.15	Horizontal
2	7234.469	53.25	-2.81	50.44	74.00	-23.56	Horizontal
3	9789.579	43.99	1.24	45.23	74.00	-28.77	Horizontal
4	11663.327	44.05	2.48	46.53	74.00	-27.47	Horizontal
5	14218.437	44.54	5.72	50.26	74.00	-23.74	Horizontal
6	4815.631	55.08	-7.23	47.85	74.00	-26.15	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4815.631	50.59	-8.97	41.62	74.00	-32.38	Vertical
2	6825.651	46.81	-5.17	41.64	74.00	-32.36	Vertical
3	9108.216	46.62	-1.90	44.72	74.00	-29.28	Vertical
4	11799.599	47.30	0.31	47.61	74.00	-26.39	Vertical
5	12991.984	46.64	1.38	48.02	74.00	-25.98	Vertical
6	16705.411	43.52	6.01	49.53	74.00	-24.47	Vertical

High channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4112.949	44.66	-3.26	41.40	74.00	-32.60	Horizontal
2	7435.210	45.05	-2.74	42.31	74.00	-31.69	Horizontal
3	8996.673	45.35	-0.87	44.48	74.00	-29.52	Horizontal
4	10691.026	44.16	2.29	46.45	74.00	-27.55	Horizontal
5	11588.037	44.12	2.48	46.60	74.00	-27.40	Horizontal
6	14079.732	44.38	6.06	50.44	74.00	-23.56	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4179.395	46.69	-5.31	41.38	74.00	-32.62	Vertical
2	8066.440	46.98	-3.56	43.42	74.00	-30.58	Vertical
3	9827.238	46.46	-0.58	45.88	74.00	-28.12	Vertical
4	10624.581	47.22	0.24	47.46	74.00	-26.54	Vertical
5	13448.503	47.03	3.27	50.30	74.00	-23.70	Vertical
6	14378.736	45.57	5.26	50.83	74.00	-23.17	Vertical

For 802.11g

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6416.834	50.72	-4.66	46.06	74.00	-27.94	Horizontal
2	9040.080	48.26	-0.77	47.49	74.00	-26.51	Horizontal
3	10300.601	47.86	2.11	49.97	74.00	-24.03	Horizontal
4	12719.439	48.46	3.01	51.47	74.00	-22.53	Horizontal
5	14150.301	45.51	5.89	51.40	74.00	-22.60	Horizontal
6	14865.731	46.23	4.44	50.67	74.00	-23.33	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4168.337	52.04	-5.24	46.80	74.00	-27.20	Vertical
2	6519.038	52.32	-5.86	46.46	74.00	-27.54	Vertical
3	10641.283	49.73	0.25	49.98	74.00	-24.02	Vertical
4	12753.507	50.27	1.21	51.48	74.00	-22.52	Vertical
5	14456.914	46.86	5.14	52.00	74.00	-22.00	Vertical
6	15172.345	45.94	4.28	50.22	74.00	-23.78	Vertical

Middle channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6587.174	51.01	-4.18	46.83	74.00	-27.17	Horizontal
2	8290.581	48.43	-1.93	46.50	74.00	-27.50	Horizontal
3	9959.920	48.10	1.77	49.87	74.00	-24.13	Horizontal
4	12480.962	48.03	2.94	50.97	74.00	-23.03	Horizontal
5	12889.780	48.35	3.05	51.40	74.00	-22.60	Horizontal
6	14388.778	46.04	5.29	51.33	74.00	-22.67	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6553.106	51.85	-5.79	46.06	74.00	-27.94	Vertical
2	9074.148	49.62	-1.96	47.66	74.00	-26.34	Vertical
3	10607.214	49.88	0.24	50.12	74.00	-23.88	Vertical
4	11663.327	49.86	0.34	50.20	74.00	-23.80	Vertical
5	12991.984	50.12	1.38	51.50	74.00	-22.50	Vertical
6	14661.323	46.33	4.96	51.29	74.00	-22.71	Vertical

High channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6587.174	50.71	-4.18	46.53	74.00	-27.47	Horizontal
2	8120.240	49.13	-1.88	47.25	74.00	-26.75	Horizontal
3	11050.100	47.45	2.34	49.79	74.00	-24.21	Horizontal
4	12753.507	48.94	3.03	51.97	74.00	-22.03	Horizontal
5	14082.164	45.98	6.06	52.04	74.00	-21.96	Horizontal
6	14933.868	46.28	4.33	50.61	74.00	-23.39	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6519.038	52.61	-5.86	46.75	74.00	-27.25	Vertical
2	8086.172	50.49	-3.54	46.95	74.00	-27.05	Vertical
3	10402.806	50.42	0.13	50.55	74.00	-23.45	Vertical
4	12549.098	50.13	1.04	51.17	74.00	-22.83	Vertical
5	13945.892	45.59	5.61	51.20	74.00	-22.80	Vertical
6	14627.254	45.84	4.97	50.81	74.00	-23.19	Vertical

For 802.11n20

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6621.243	50.15	-4.07	46.08	74.00	-27.92	Horizontal
2	8869.739	50.12	-1.15	48.97	74.00	-25.03	Horizontal
3	10573.146	47.83	2.28	50.11	74.00	-23.89	Horizontal
4	12617.235	47.48	2.99	50.47	74.00	-23.53	Horizontal
5	12957.916	48.09	3.08	51.17	74.00	-22.83	Horizontal
6	14014.028	45.54	6.23	51.77	74.00	-22.23	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6621.243	52.21	-5.63	46.58	74.00	-27.42	Vertical
2	8971.944	49.42	-2.12	47.30	74.00	-26.70	Vertical
3	9959.920	49.91	-0.30	49.61	74.00	-24.39	Vertical
4	11424.850	49.70	0.38	50.08	74.00	-23.92	Vertical
5	13162.325	49.28	2.06	51.34	74.00	-22.66	Vertical
6	14320.641	47.00	5.35	52.35	74.00	-21.65	Vertical

Middle channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6008.016	49.99	-5.66	44.33	74.00	-29.67	Horizontal
2	7779.559	48.66	-2.24	46.42	74.00	-27.58	Horizontal
3	10334.669	47.92	2.14	50.06	74.00	-23.94	Horizontal
4	11561.122	47.71	2.49	50.20	74.00	-23.80	Horizontal
5	12617.235	48.54	2.99	51.53	74.00	-22.47	Horizontal
6	14014.028	45.46	6.23	51.69	74.00	-22.31	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	4474.950	52.02	-7.09	44.93	74.00	-29.07	Vertical
2	6519.038	52.11	-5.86	46.25	74.00	-27.75	Vertical
3	8869.739	49.69	-2.30	47.39	74.00	-26.61	Vertical
4	11084.168	50.06	0.33	50.39	74.00	-23.61	Vertical
5	12787.575	49.95	1.23	51.18	74.00	-22.82	Vertical
6	14320.641	46.16	5.35	51.51	74.00	-22.49	Vertical

High channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6621.243	50.47	-4.07	46.40	74.00	-27.60	Horizontal
2	8188.377	48.00	-1.90	46.10	74.00	-27.90	Horizontal
3	9653.307	48.15	0.83	48.98	74.00	-25.02	Horizontal
4	11595.190	48.22	2.48	50.70	74.00	-23.30	Horizontal
5	12787.575	48.20	3.03	51.23	74.00	-22.77	Horizontal
6	14286.573	46.39	5.55	51.94	74.00	-22.06	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	5701.403	51.98	-8.49	43.49	74.00	-30.51	Vertical
2	6553.106	52.56	-5.79	46.77	74.00	-27.23	Vertical
3	7609.218	51.68	-4.14	47.54	74.00	-26.46	Vertical
4	10505.010	49.77	0.22	49.99	74.00	-24.01	Vertical
5	12889.780	50.28	1.30	51.58	74.00	-22.42	Vertical
6	14456.914	46.81	5.14	51.95	74.00	-22.05	Vertical

For 802.11n40

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6519.038	50.84	-4.39	46.45	74.00	-27.55	Horizontal
2	8120.240	48.88	-1.88	47.00	74.00	-27.00	Horizontal
3	10334.669	47.78	2.14	49.92	74.00	-24.08	Horizontal
4	12617.235	47.94	2.99	50.93	74.00	-23.07	Horizontal
5	14593.186	46.10	4.87	50.97	74.00	-23.03	Horizontal
6	15002.004	45.55	4.22	49.77	74.00	-24.23	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6212.425	52.29	-6.87	45.42	74.00	-28.58	Vertical
2	6484.970	52.54	-5.95	46.59	74.00	-27.41	Vertical
3	9142.285	49.30	-1.85	47.45	74.00	-26.55	Vertical
4	10743.487	50.45	0.26	50.71	74.00	-23.29	Vertical
5	11867.736	49.88	0.28	50.16	74.00	-23.84	Vertical
6	13128.256	49.39	1.92	51.31	74.00	-22.69	Vertical

Middle channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6587.174	50.42	-4.18	46.24	74.00	-27.76	Horizontal
2	8971.944	48.35	-0.93	47.42	74.00	-26.58	Horizontal
3	10470.942	48.23	2.24	50.47	74.00	-23.53	Horizontal
4	11152.305	47.83	2.37	50.20	74.00	-23.80	Horizontal
5	12957.916	48.42	3.08	51.50	74.00	-22.50	Horizontal
6	14116.233	45.44	5.97	51.41	74.00	-22.59	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6621.243	52.10	-5.63	46.47	74.00	-27.53	Vertical
2	7404.810	51.18	-4.36	46.82	74.00	-27.18	Vertical
3	9687.375	50.13	-0.88	49.25	74.00	-24.75	Vertical
4	12106.212	49.98	0.41	50.39	74.00	-23.61	Vertical
5	13060.120	50.20	1.64	51.84	74.00	-22.16	Vertical
6	13911.824	45.45	5.44	50.89	74.00	-23.11	Vertical

High channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6587.174	50.86	-4.18	46.68	74.00	-27.32	Horizontal
2	8869.739	49.80	-1.15	48.65	74.00	-25.35	Horizontal
3	10505.010	48.54	2.27	50.81	74.00	-23.19	Horizontal
4	12719.439	50.05	3.01	53.06	74.00	-20.94	Horizontal
5	14252.505	45.96	5.63	51.59	74.00	-22.41	Horizontal
6	14559.118	46.31	4.93	51.24	74.00	-22.76	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H/V)
1	6382.766	53.42	-6.29	47.13	74.00	-26.87	Vertical
2	8733.467	49.39	-2.56	46.83	74.00	-27.17	Vertical
3	10164.329	49.61	-0.07	49.54	74.00	-24.46	Vertical
4	10743.487	49.87	0.26	50.13	74.00	-23.87	Vertical
5	13128.256	49.86	1.92	51.78	74.00	-22.22	Vertical
6	14422.846	46.03	5.19	51.22	74.00	-22.78	Vertical

5.5.4.2 Band edge - 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.

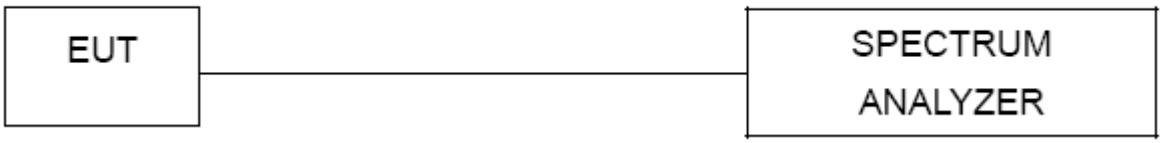
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Polar (H/V)
802.11b							
2390	56.50	-10.41	46.09	74	-27.91	peak	Vertical
2390	62.33	-10.39	51.94	74	-22.06	peak	Horizontal
2400	56.38	-10.16	46.22	74	-27.78	peak	Vertical
2400	53.99	-9.28	44.71	74	-29.29	peak	Horizontal
2483.5	53.36	-9.73	43.63	74	-30.37	peak	Vertical
2483.5	55.00	-8.66	46.34	74	-27.66	peak	Horizontal
802.11g							
2390	53.31	-10.41	42.9	74	-31.1	peak	Vertical
2390	67.33	-10.39	56.94	74	-17.06	peak	Horizontal
2390	49.65	-10.39	39.26	54	-14.74	AV	Horizontal
2400	54.32	-10.16	44.16	74	-29.84	peak	Vertical
2400	52.92	-9.28	43.64	74	-30.36	peak	Horizontal
2483.5	65.92	-9.73	56.19	74	-17.81	peak	Vertical
2483.5	54.16	-8.66	45.5	74	-28.5	peak	Horizontal
802.11n20							
2390	54.16	-10.41	43.75	74	-30.25	peak	Vertical
2390	54.16	-10.39	43.77	74	-30.23	peak	Horizontal
2400	52.14	-10.16	41.98	74	-32.02	peak	Vertical
2400	53.93	-9.28	44.65	74	-29.35	peak	Horizontal
2483.5	54.08	-9.73	44.35	74	-29.65	peak	Vertical
2483.5	54.14	-8.66	45.48	74	-28.52	peak	Horizontal
802.11n40							
2390	54.54	-10.41	44.13	74	-29.87	peak	Vertical
2390	54.99	-10.39	44.6	74	-29.4	peak	Horizontal
2400	52.43	-10.16	42.27	74	-31.73	peak	Vertical
2400	54.26	-9.28	44.98	74	-29.02	peak	Horizontal
2483.5	54.22	-9.73	44.49	74	-29.51	peak	Vertical
2483.5	55.05	-8.66	46.39	74	-27.61	peak	Horizontal

5.6 Conduction spurious emission

5.6.1 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)).

5.6.2 Test setup



5.6.3 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.

EUT OPERATION CONDITIONS

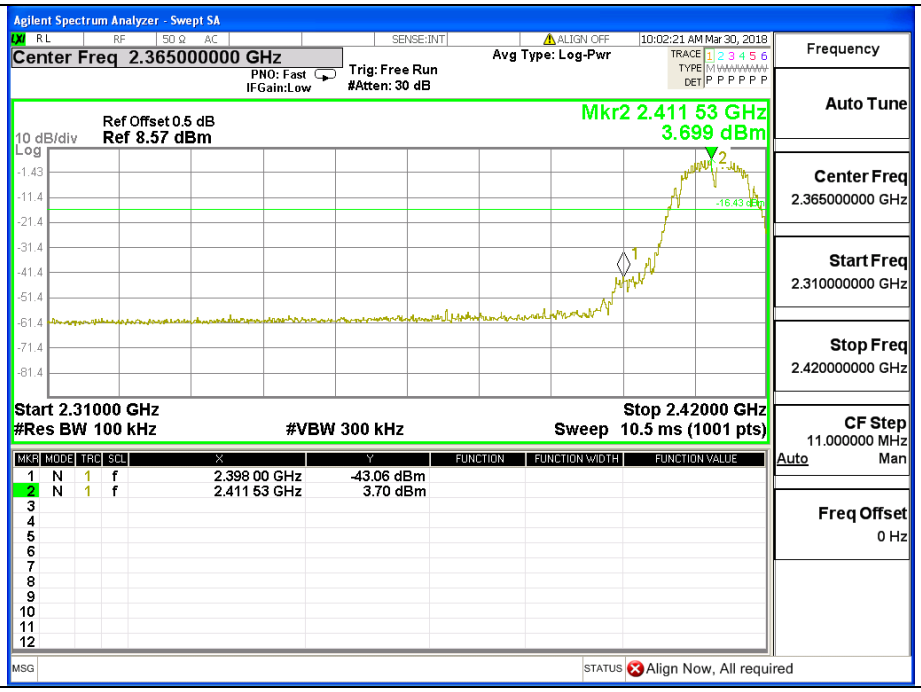
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6.4 Test results

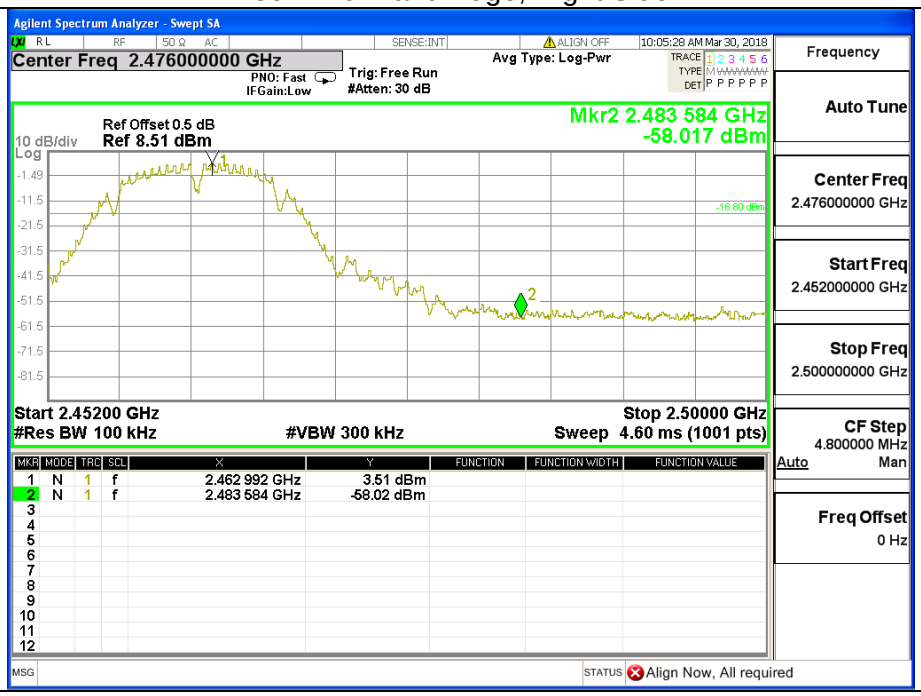
Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
802.11b mode			
Left-band	46.76	20	Pass
Right-band	61.53	20	Pass
802.11g mode			
Left-band	38.58	20	Pass
Right-band	42.16	20	Pass
802.11n20 mode			
Left-band	38.95	20	Pass
Right-band	39.70	20	Pass
802.11n40 mode			
Left-band	30.38	20	Pass
Right-band	30.04	20	Pass

Test plots:

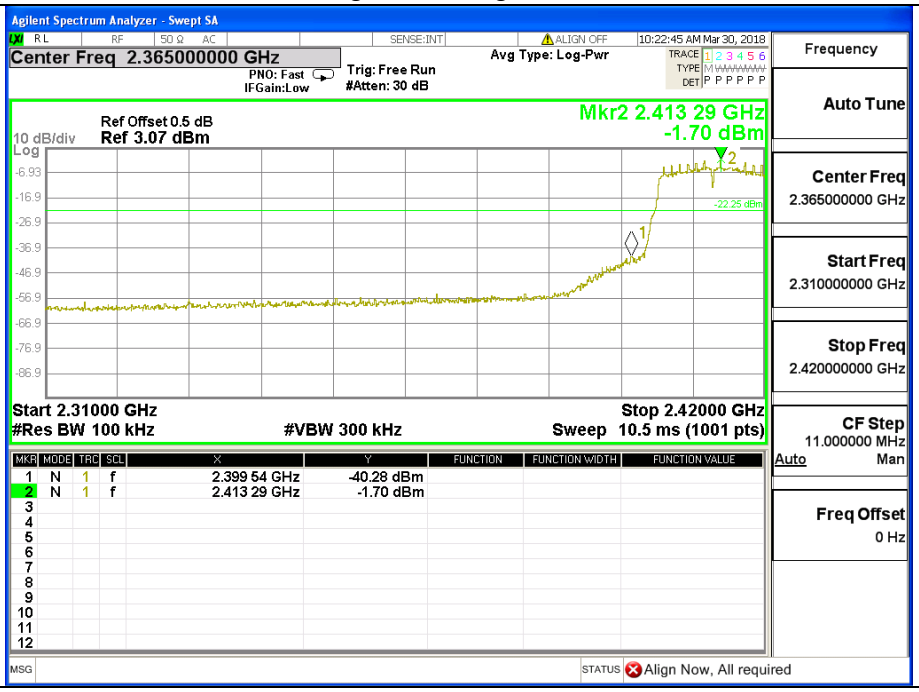
802.11b: Band Edge, Left Side



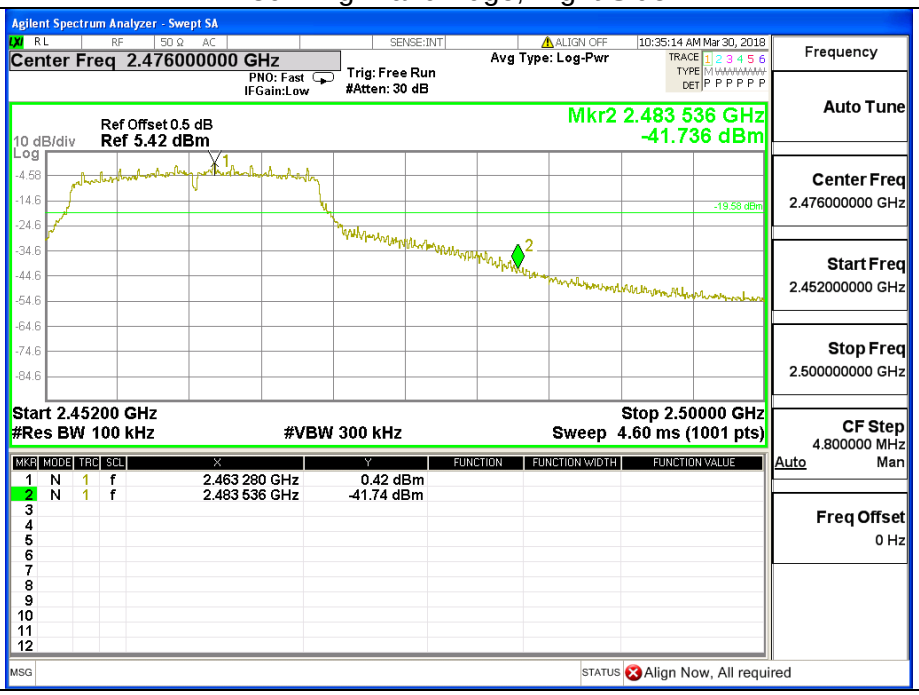
802.11b: Band Edge, Right Side



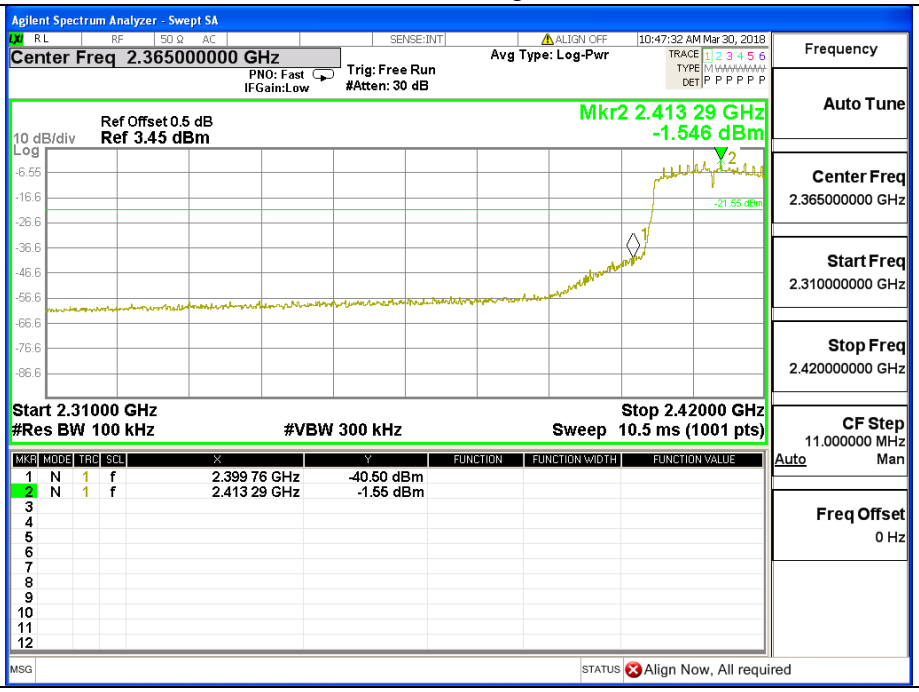
802.11g: Band Edge, Left Side



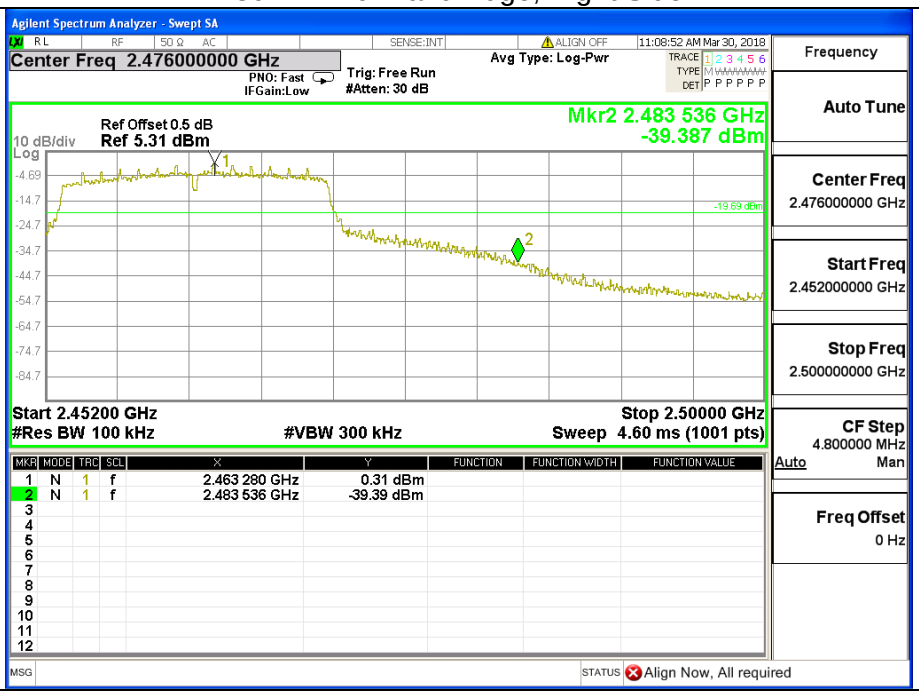
802.11g: Band Edge, Right Side



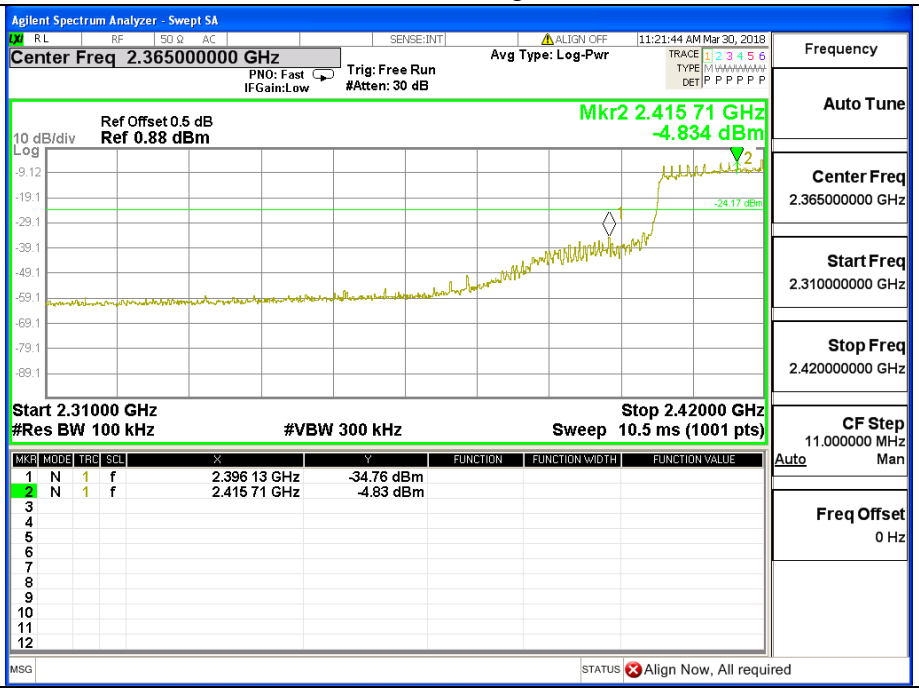
802.11n20: Band Edge, Left Side



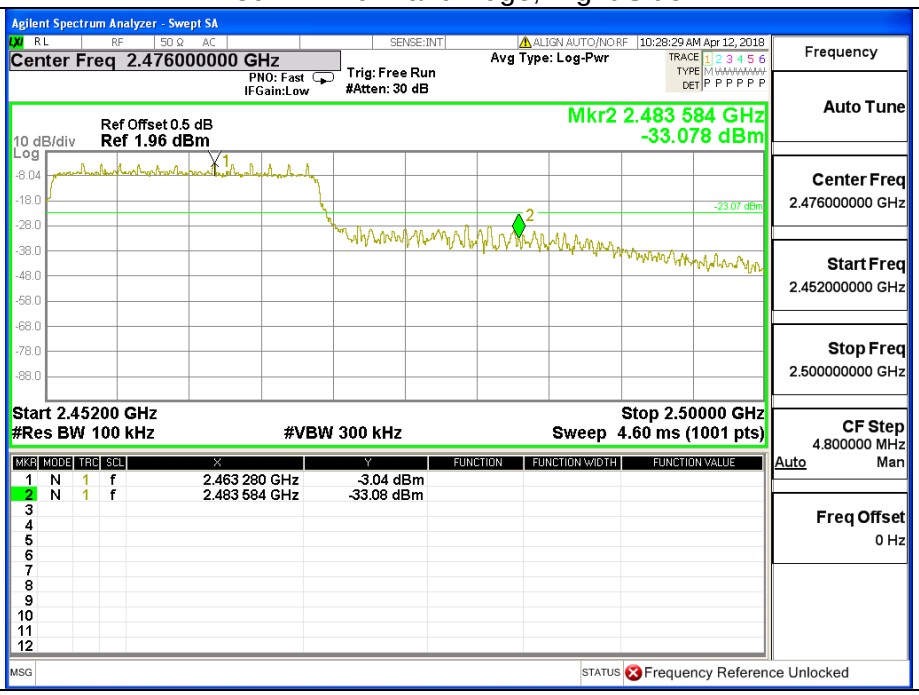
802.11n20: Band Edge, Right Side



802.11n40: Band Edge, Left Side



802.11n40: Band Edge, Right Side

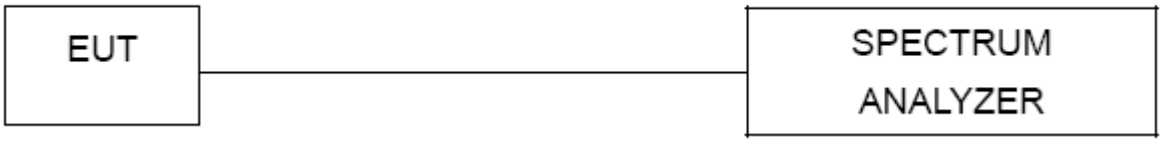


5.7 6dB bandwidth

5.7.1 Limit

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

5.7.2 Test setup



5.7.3 Test procedure

a. Set RBW= 100 kHz.
b. Set the video bandwidth (VBW) ≥ 3 x RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize.
g. 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.

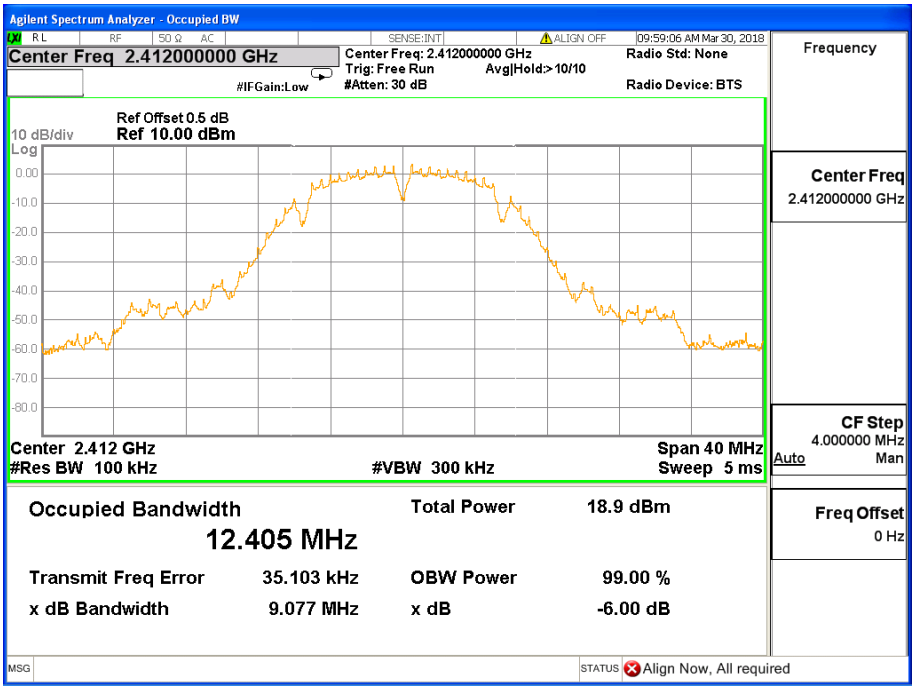
EUT Operation Conditions
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.7.4 Test results

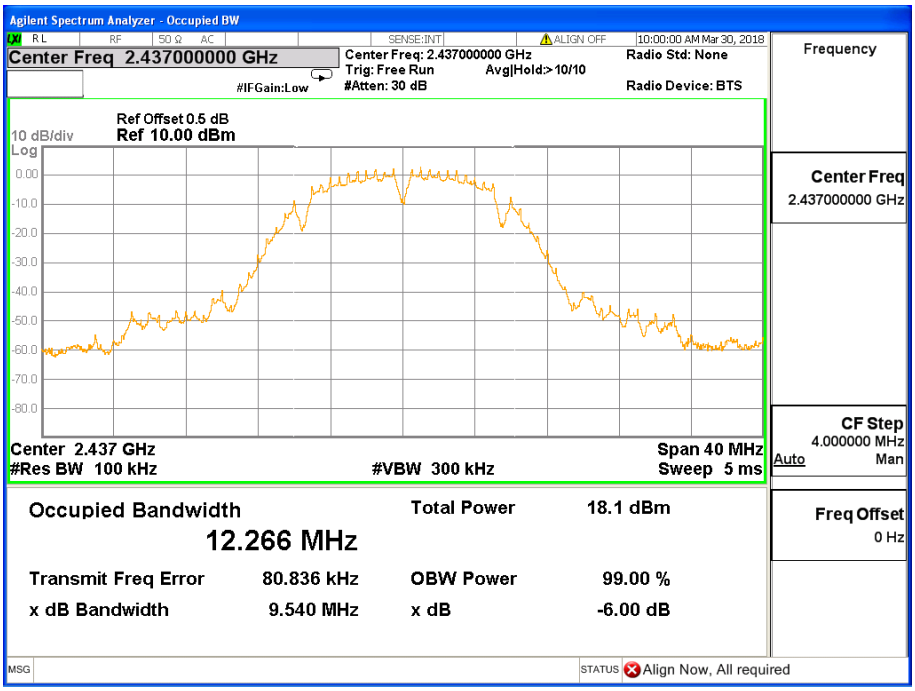
EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 7.4V by battery
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	9.077	500	Pass
Middle	2437	9.540	500	Pass
High	2462	9.566	500	Pass

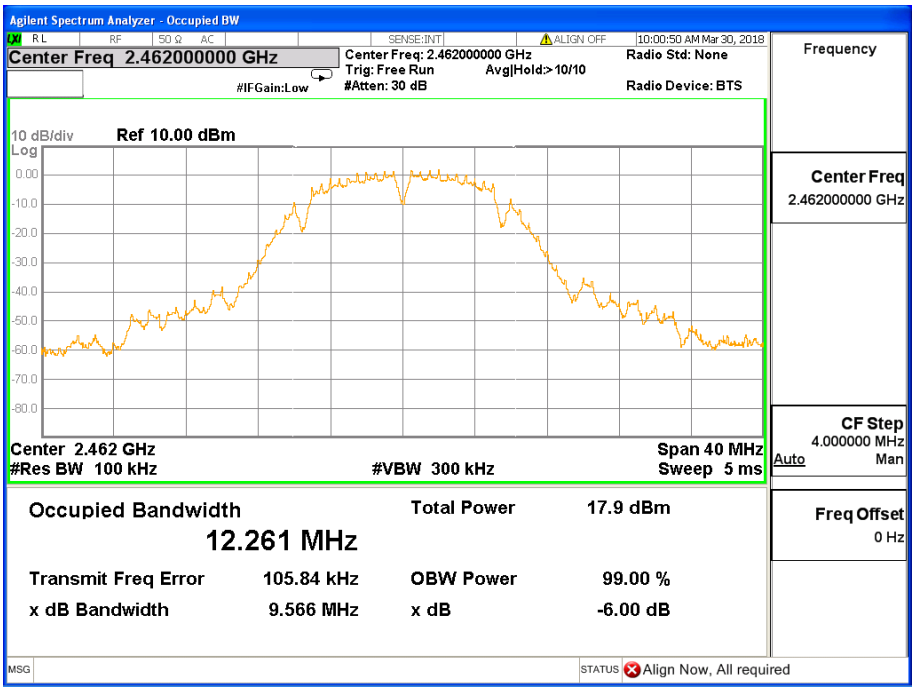
TX CH 01



TX CH 06



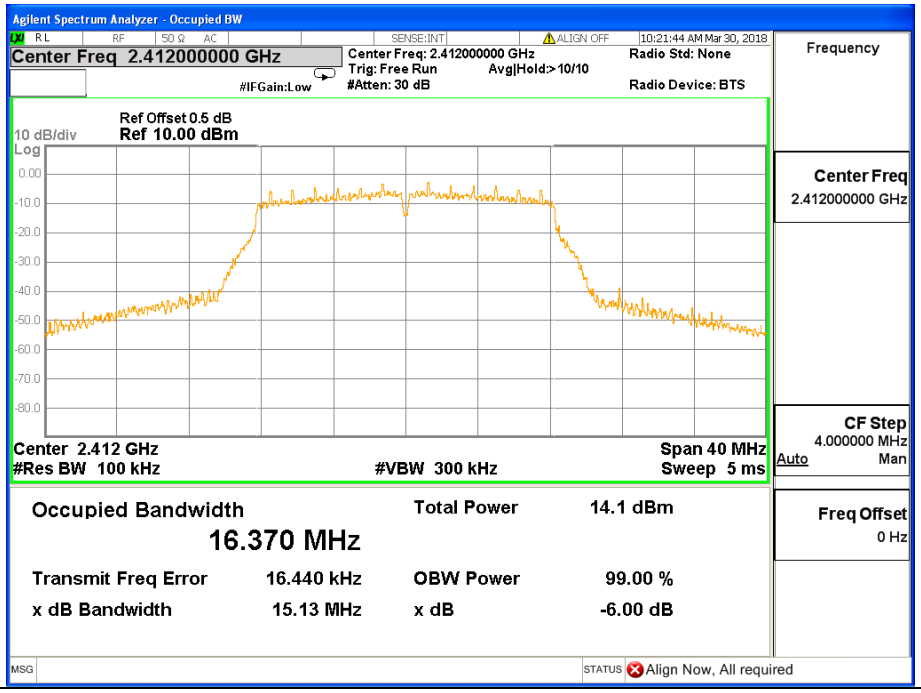
TX CH 11



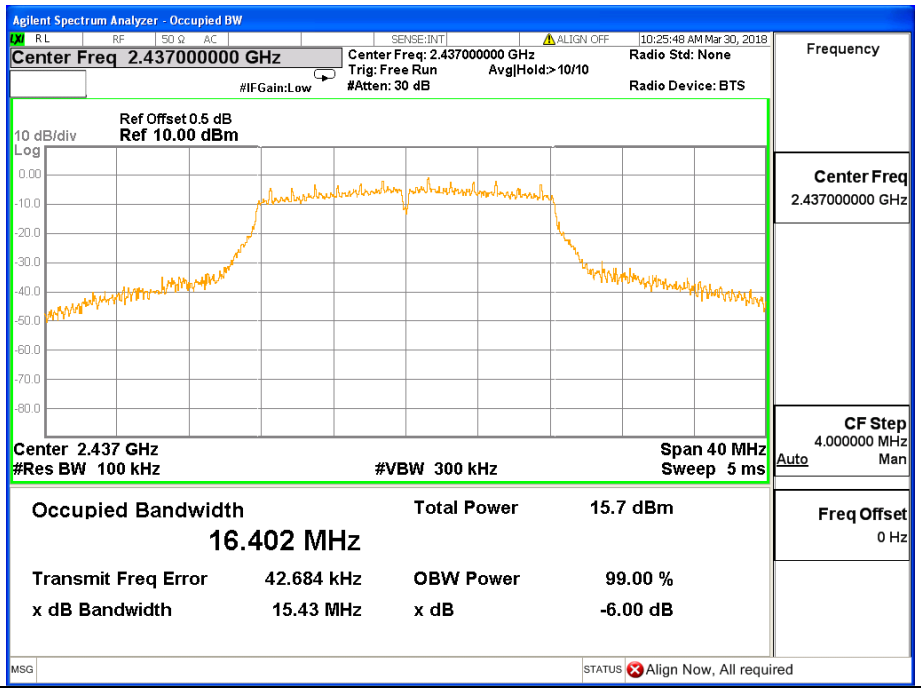
EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 7.4V by battery
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.13	500	Pass
Middle	2437	15.43	500	Pass
High	2462	15.44	500	Pass

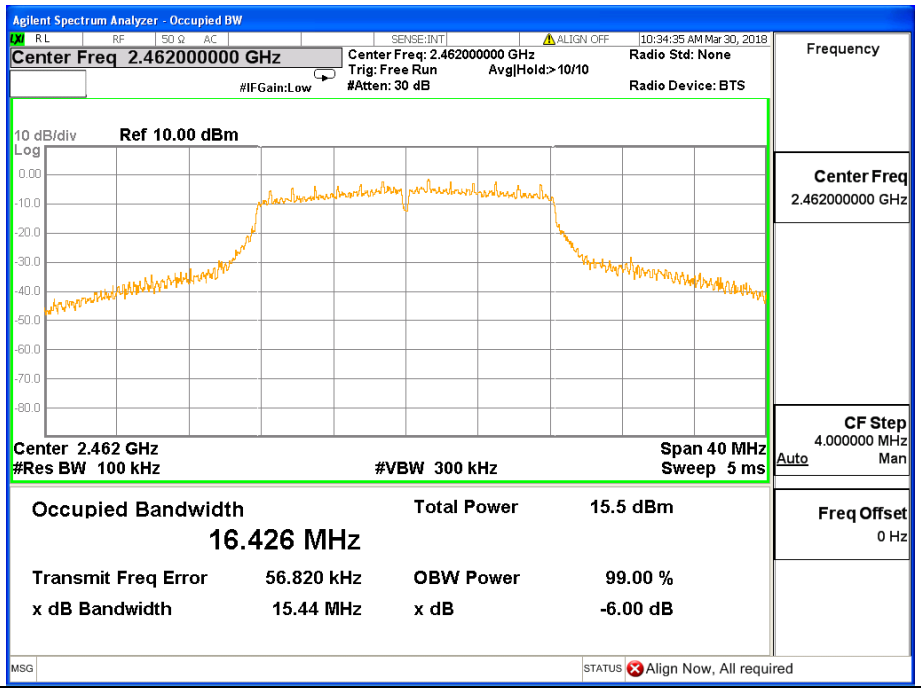
TX CH 01



TX CH 06



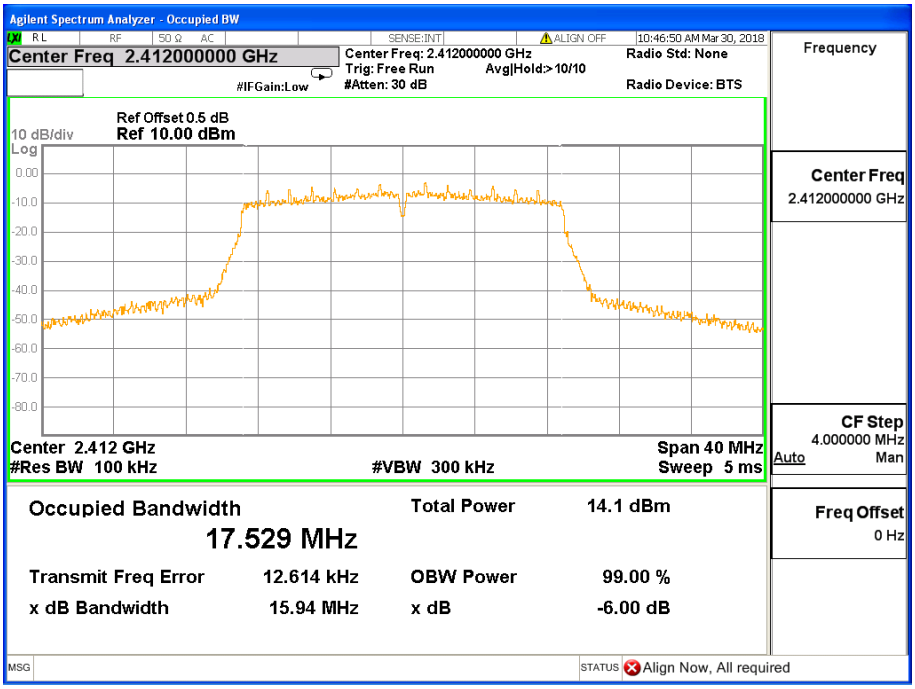
TX CH 11



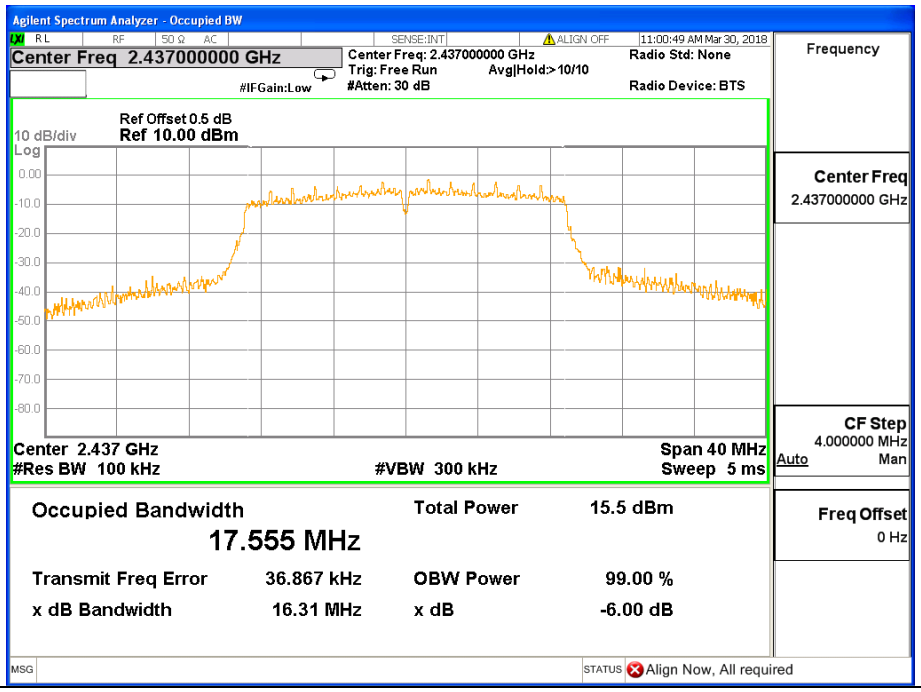
EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 7.4V by battery
Test Mode ：	TX n20 Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.94	500	Pass
Middle	2437	16.31	500	Pass
High	2462	15.93	500	Pass

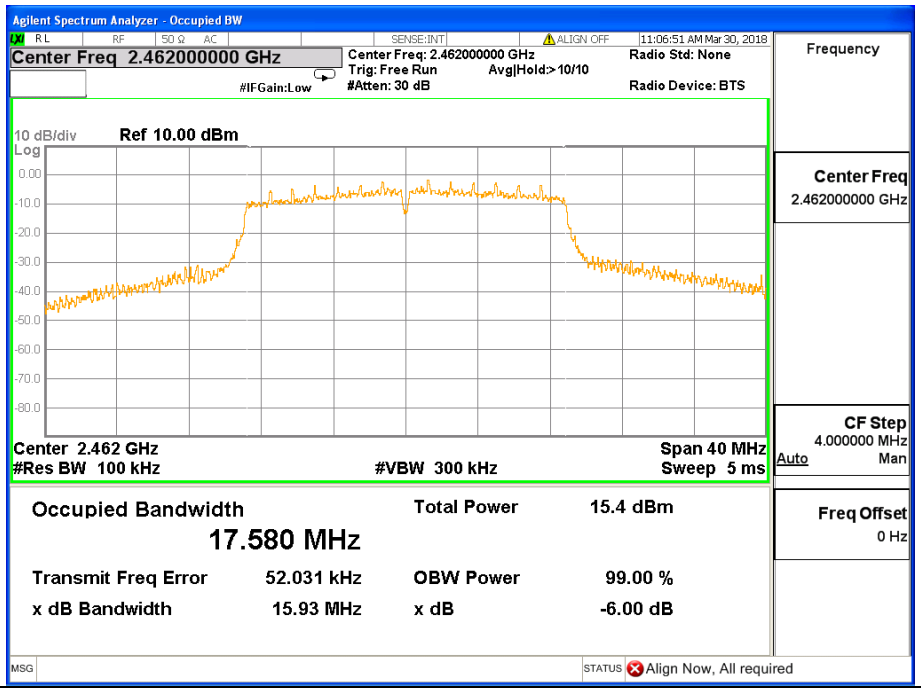
TX CH 01



TX CH 06



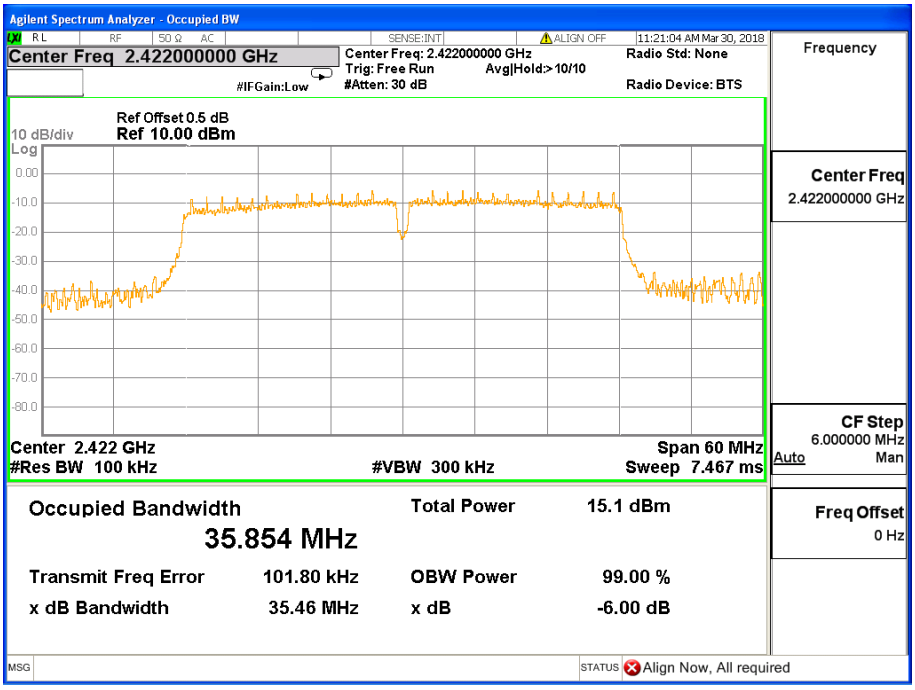
TX CH 11



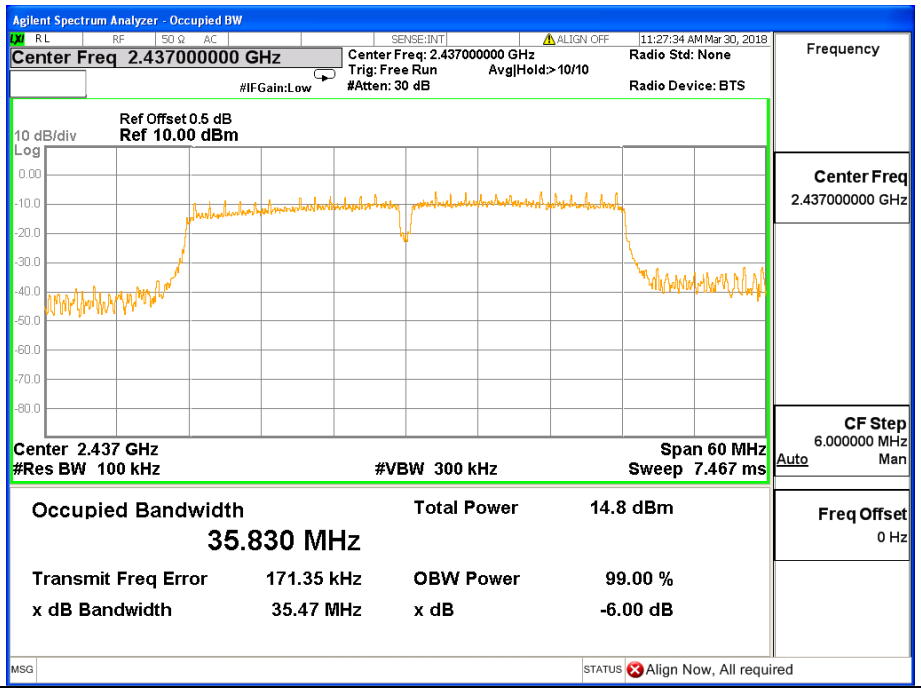
EUT：	Smart POS Payment Terminal	Model Name ：	CS10
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 7.4V by battery
Test Mode ：	TX n40 Mode /CH03, CH06, CH09		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2422	35.46	500	Pass
Middle	2437	35.47	500	Pass
High	2452	35.88	500	Pass

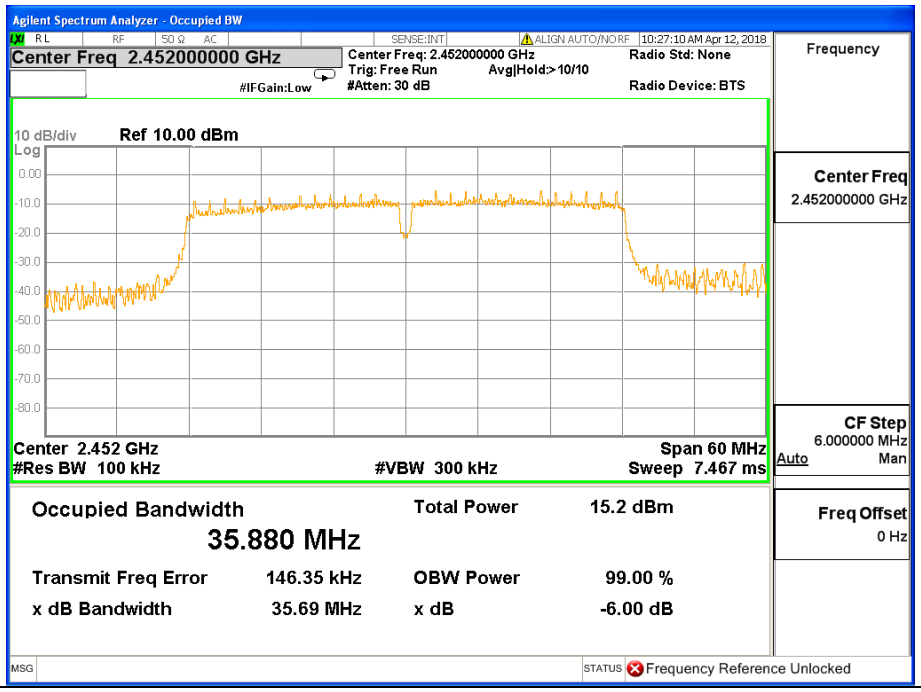
TX CH 01



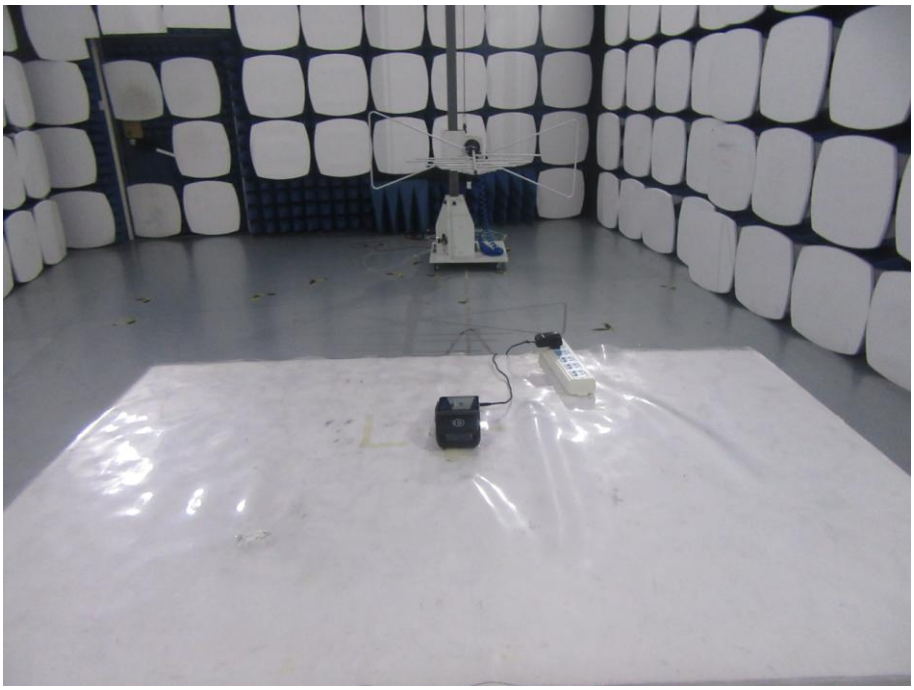
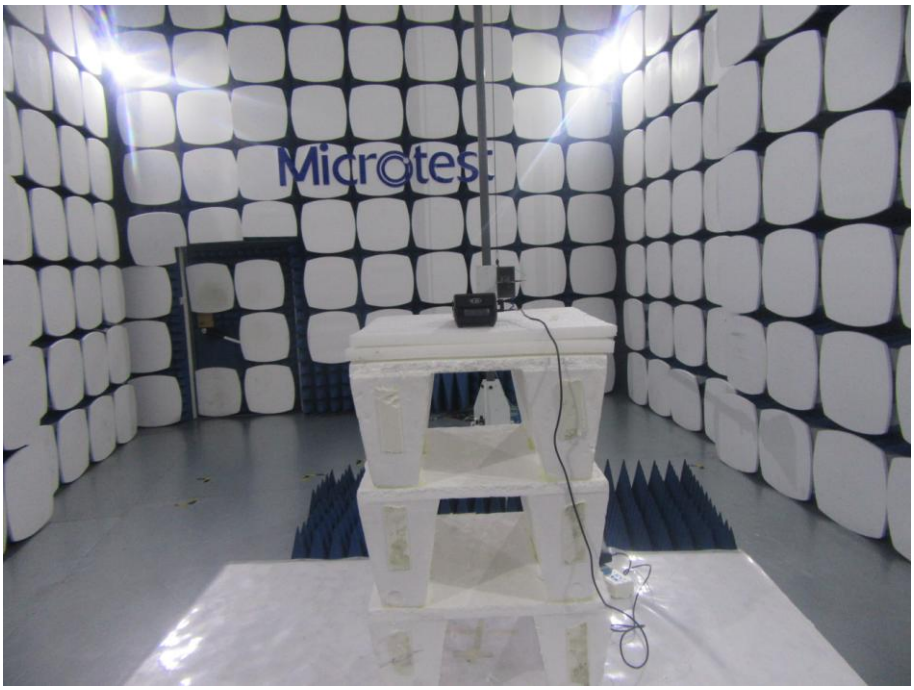
TX CH 06



TX CH 11



Photographs of the Test Setup

Radiated emission



Conducted emission


----END OF REPORT----

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