TEST REPORT

Product	:	Card Case
Trade mark	:	Loop Card Case
Model/Type reference	:	LOOPMST0004
Serial number	:	N/A
Ratings	:	3.7V, 350mAH
FCC ID	:	2AB3L-LOOPMST0004
Report number	:	EESZG10230002-2
Date	:	Jan. 05, 2014
Regulations	:	See below

Test Standards	Results
☒ 47 CFR FCC Part 15 Subpart C: 2014	PASS

Prepared for:

LoopPay, Inc.
8 New England Executive Park, Suite 220, Burlington, MA 01803, United States

Prepared by:

Centre Testing International
Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen, China
TEL: +86-755-3368 3919
FAX: +86-755-3368 3385

Tested by: _____ Reviewed by: _____

Approved by: _____ Date: Jan. 05, 2014

Jimmy Li
Lab manager

Check No.: 1702098331

TABLE OF CONTENTS

N/A means not applicable.

1. GENERAL INFORMATION

Applicant: LoopPay, Inc.
8 New England Executive Park, Suite 220, Burlington, MA 01803, United States

Manufacturer: BBPOS Limited
Suite 1602, 16/F, Tower 2, Nina Tower, No.8 Yeung UK Rd, Tsuen Wan, Hong Kong

FCC ID: 2AB3L-LOOPMST0004

Product: Card Case

Model/Type reference: LOOPMST0004

Trade Name: Loop Card Case

Serial Number: N/A

Report Number: EESZG10230002-2

Sample Received Date: Oct. 25, 2014

Sample tested Date: Oct. 25, 2014 to Dec. 01, 2014

The above equipment was tested by Centre Testing International (Shenzhen) Corporation for compliance with the requirements set forth in the FCC Rules and the measurement procedure according to ANSI C63.4:2009.

2. TEST SUMMARY

No.	Test Item	Rule	Test Result
1	Conducted Emission	FCC 15.207	**PASS**
2	Radiated Emission	FCC 15.209	**PASS**
3.	20dB Bandwidth	Part 2.1049	**PASS**
4.	Antenna Requirement	FCC Part 15.203	**PASS***

*: The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

3. PRODUCT INFORMATION

Items	Description
Rating	3.7V, 350mAH
Type of Modulation	ASK
Antenna Type	Integral antenna
Frequency Range	125KHz
Gain	0dBi

4. MEASUREMENT UNCERTAINTY

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement items	Uncertainty
Conducted Emission Test	3.2 dB
Radiated Emissions / Bandedge Emission	4.5 dB

5. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06/01/2016
Spectrum Analyzer	Agilent	E4443A	MY45300910	01/15/2015
Receiver	R&S	ESCI	100435	07/19/2015
Loop Antenna	ETS-LINDGREN	6502	00071730	07/22/2015
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	617	06/25/2015
Multi device Controller	maturo	NCD/070/10711112	---	N/A
Spectrum Analyzer	R&S	FSP40	100416	07/06/2015
Receiver	R&S	ESCI	100009	07/19/2015
LISN	R&S	ENV216	100098	07/19/2015

6. SUPPORT EQUIPMENT LIST

Device Type	Brand	Model	Series No.	Data Cable	Remark
Notebook	Lenovo	E42L	R36037B10223	N/A	FCC DOC
Mouse	L.Selectron	M004	02284699	Un-shielded 1.2M	FCC DOC

7. AC CONDUCTED EMISSION TEST

7.1. LIMITS

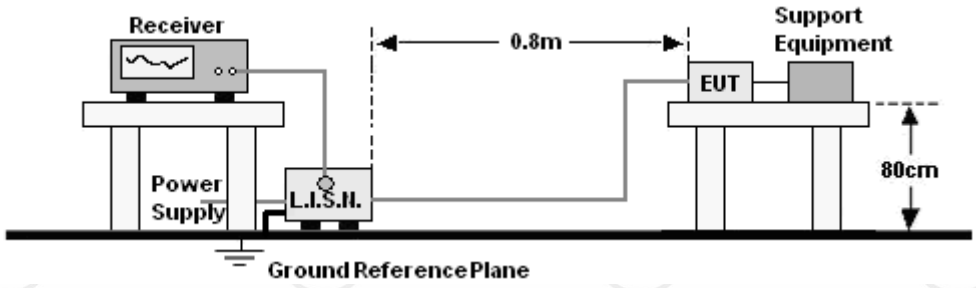
Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP



7.3. PROCEDURE OF CONDUCTED EMISSION TEST

a. The Product was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

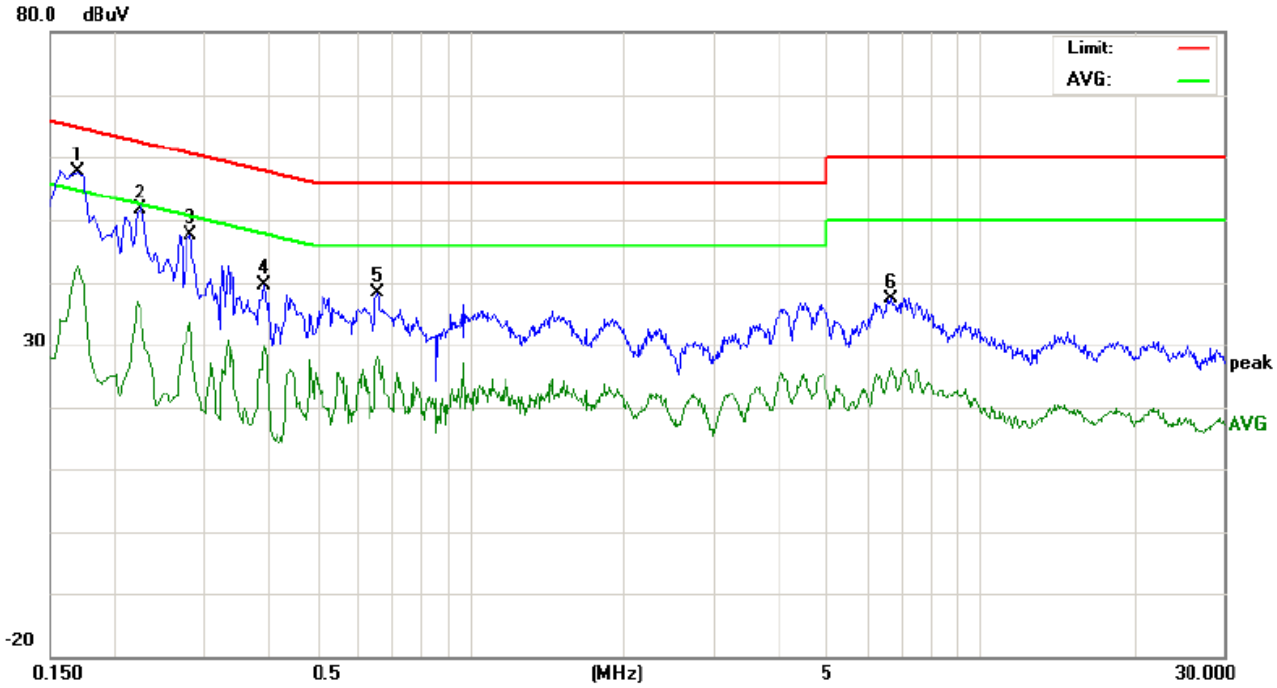
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

7.4. GRAPHS AND DATA

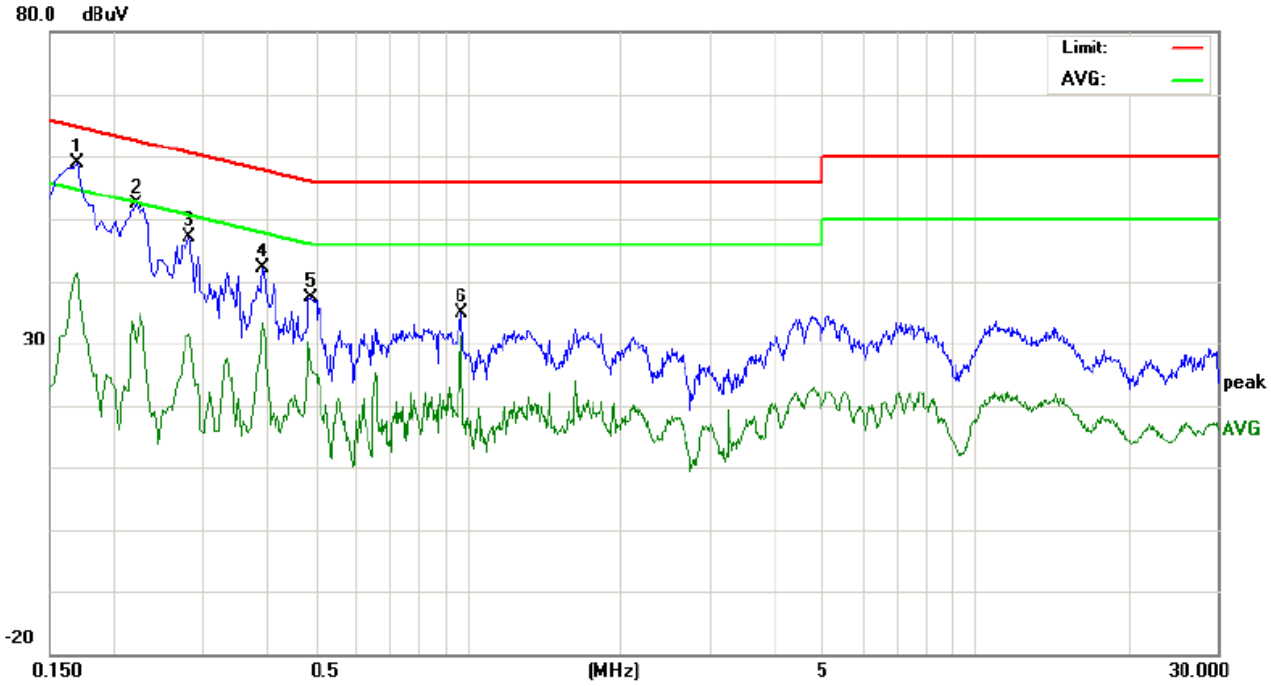
Product	:	Card Case	**Model/Type reference**	:	LOOPMST0004
Power	:	AC 120V/60Hz	**Temperature**	:	18℃
Mode	:	Keeping TX	**Humidity**	:	51%

L:



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1700	47.61		32.66	9.90	57.51		42.56	64.96	54.96	-7.45	-12.40	P	
2	0.2220	40.94		26.97	9.90	50.84		36.87	62.74	52.74	-11.90	-15.87	P	
3	0.2819	37.77		23.69	9.90	47.67		33.59	60.76	50.76	-13.09	-17.17	P	
4	0.3940	29.61		20.05	9.90	39.51		29.95	57.98	47.98	-18.47	-18.03	P	
5	0.6580	28.47		18.32	9.90	38.37		28.22	56.00	46.00	-17.63	-17.78	P	
6	6.7299	27.52		16.38	9.90	37.42		26.28	60.00	50.00	-22.58	-23.72	P	

N:



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1700	48.90		31.55	9.90	58.80		41.45	64.96	54.96	-6.16	-13.51	P	
2	0.2220	42.45		20.44	9.90	52.35		30.34	62.74	52.74	-10.39	-22.40	P	
3	0.2819	37.33		21.64	9.90	47.23		31.54	60.76	50.76	-13.53	-19.22	P	
4	0.3940	32.24		23.39	9.90	42.14		33.29	57.98	47.98	-15.84	-14.69	P	
5	0.4900	27.35		16.30	9.90	37.25		26.20	56.17	46.17	-18.92	-19.97	P	
6	0.9740	24.88		18.90	9.90	34.78		28.80	56.00	46.00	-21.22	-17.20	P	

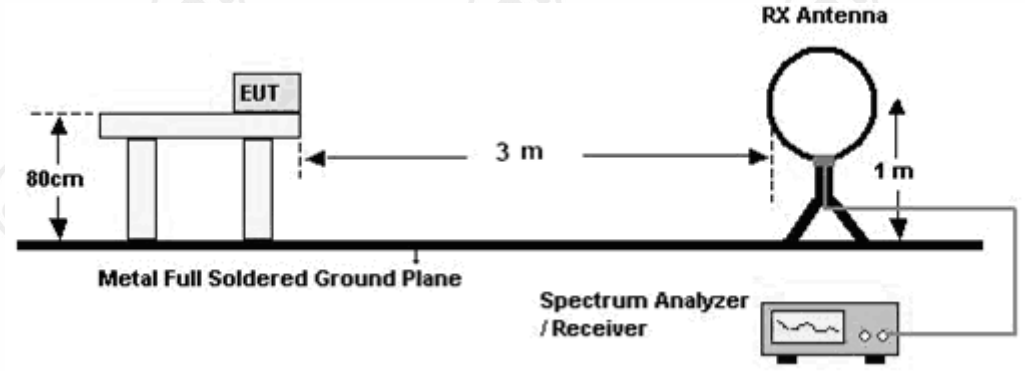
8. RADIATED EMISSION MEASUREMENT

8.1. LIMITS

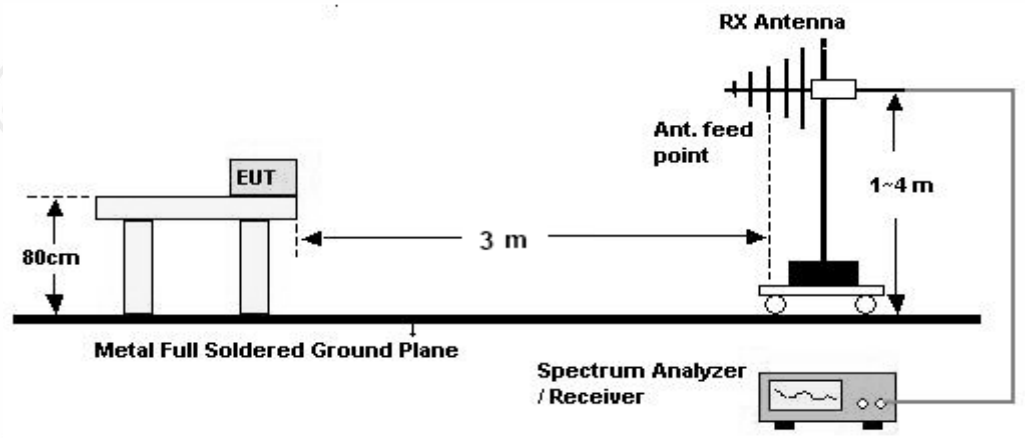
Frequency (MHz)	Field strength (μV/m)	Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

8.2. BLOCK DIAGRAM OF TEST SETUP

For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz - 1000MHz



8.3. TEST PROCEDURE

Below 30MHz

a. The Product is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.

b. For each suspected emission, the Product was arranged to its worst case and then turn table was turned from 0 degrees to 360 degrees to find the maximum reading.

c. The test frequency analyzer system was set to Peak Detect (300Hz RBW in 9kHz to 150kHz and 10kHz RBW in 150kHz to 30MHz) Function and Specified Bandwidth with Maximum Hold Mode.

30MHz ~ 1GHz:

a. The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value (120 kHz RBW): vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

8.4. TEST RESULT

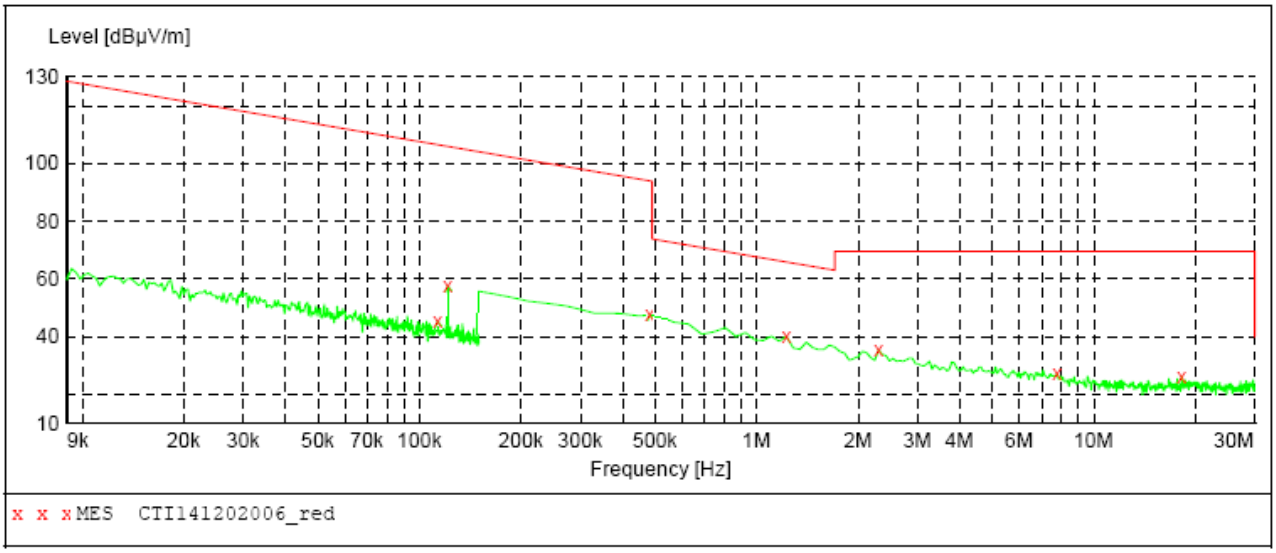
The TX operated frequency is 125kHz.

A. Below 30MHz:

The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

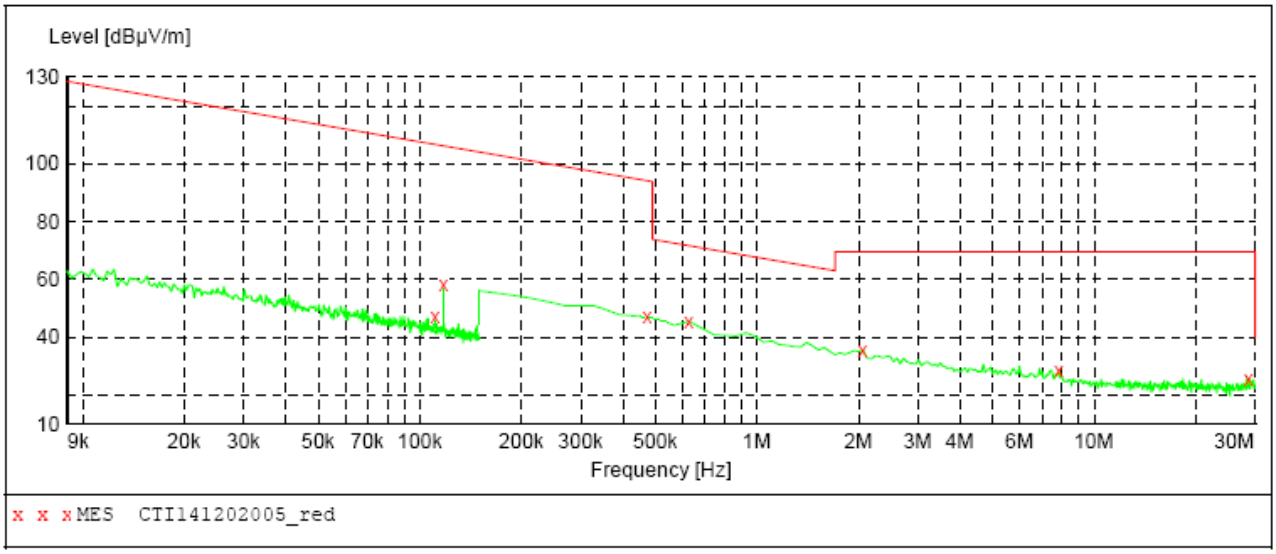
Product	:	Card Case	**Model/Type reference**	:	LOOPMST0004
Power	:	DC 3.7V	**Temperature**	:	18℃
Mode	:	Keeping TX	**Humidity**	:	51%

X:



Frequency (MHz)	Level (dBuV/m)	Limit@3M (dBuV/m)	Margin (dB)	Detector Type
0.11	41.4	106.8	65.4	PK
0.125	59.2	105.7	46.5	PK
0.490	44.9	73.8	28.9	PK
1.225	40	65.8	25.8	QP
2.299	38.6	69.5	30.9	QP
7.792	21.6	69.5	47.9	QP
18.239	20.4	69.5	49.1	QP

Y:

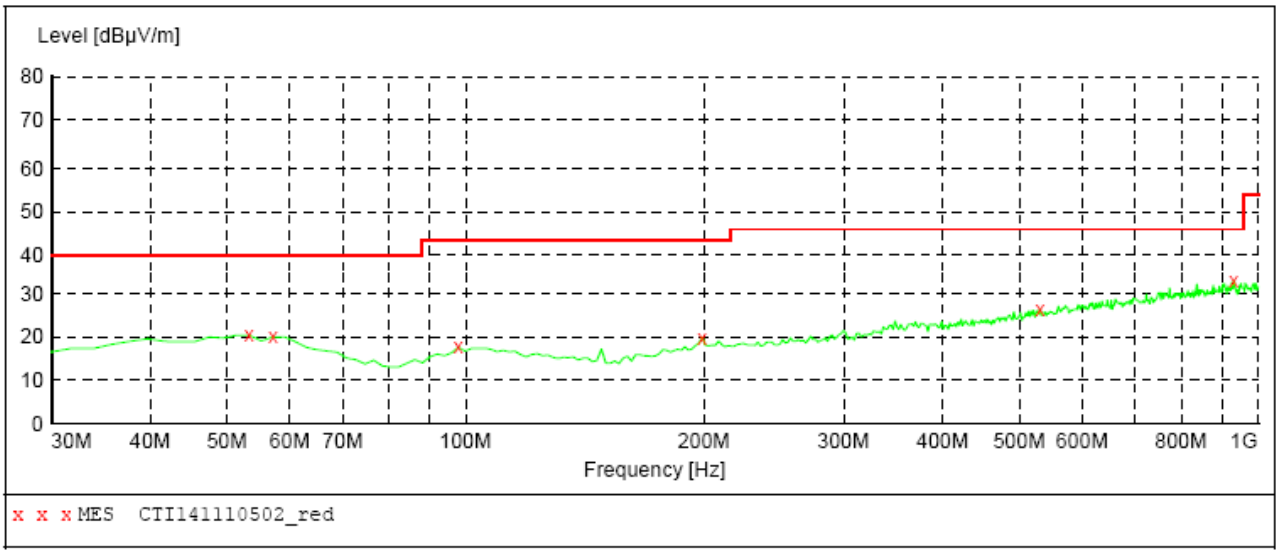


Frequency (MHz)	Level (dBuV/m)	Limit@3M (dBuV/m)	Margin (dB)	Detector Type
0.11	41.2	106.8	65.6	PK
0.125	58.6	105.7	47.1	PK
0.490	43.2	73.8	30.6	PK
0.628	41.6	71.6	30.0	QP
2.06	28.3	69.5	41.2	QP
7.851	24.6	69.5	44.9	QP
28.746	20.9	69.5	48.6	QP

B. 30MHz ～ 1GHz:

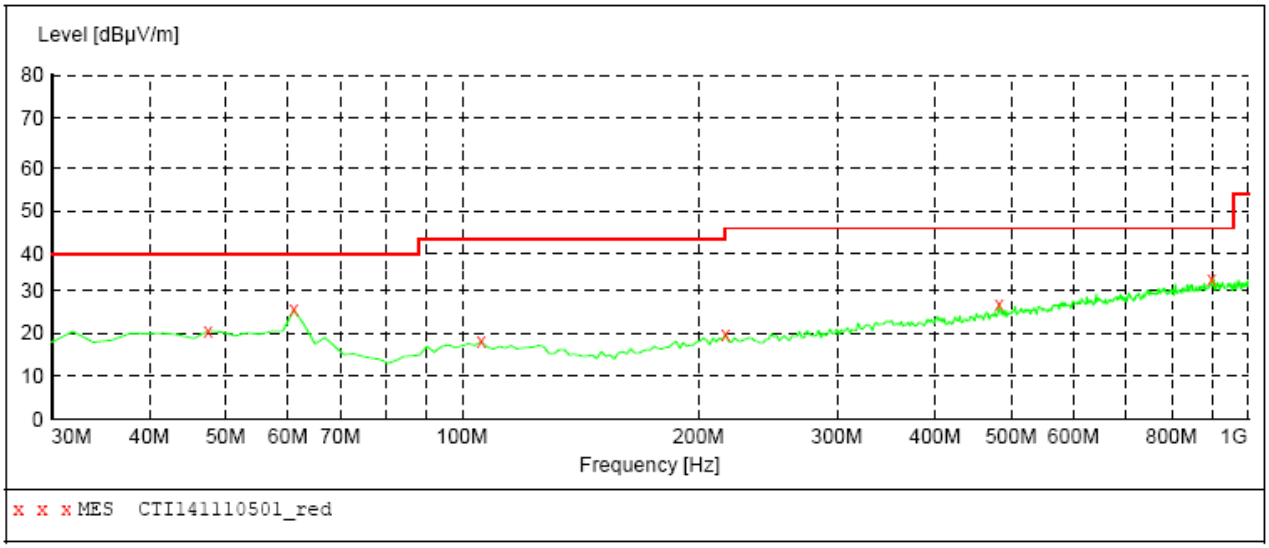
Product	:	Card Case	**Model/Type reference**	:	LOOPMST0004
Power	:	DC 3.7V	**Temperature**	:	18℃
Mode	:	Keeping TX	**Humidity**	:	51%

H:



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	20.40	14.6	40.0	19.6	QP	200.0	172.00	HORIZONTAL
57.160000	20.00	14.1	40.0	20.0	QP	200.0	33.00	HORIZONTAL
97.900000	17.60	12.3	43.5	25.9	QP	100.0	221.00	HORIZONTAL
198.780000	19.90	13.4	43.5	23.6	QP	200.0	283.00	HORIZONTAL
530.520000	26.40	20.7	46.0	19.6	QP	200.0	352.00	HORIZONTAL
932.100000	33.00	26.4	46.0	13.0	QP	100.0	112.00	HORIZONTAL

V:



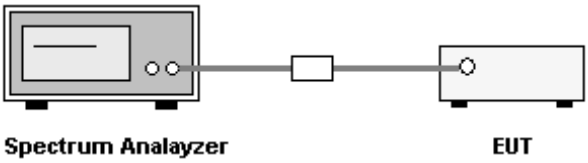
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	20.50	14.7	40.0	19.5	QP	100.0	229.00	VERTICAL
61.040000	25.40	13.4	40.0	14.6	QP	100.0	182.00	VERTICAL
105.660000	18.00	12.3	43.5	25.5	QP	100.0	52.00	VERTICAL
216.240000	19.90	13.8	46.0	26.1	QP	200.0	170.00	VERTICAL
482.020000	26.80	19.8	46.0	19.2	QP	200.0	301.00	VERTICAL
899.120000	32.60	26.3	46.0	13.4	QP	100.0	211.00	VERTICAL

9. 20DB BANDWIDTH OCCUPIED BANDWIDTH MEASUREMENT

9.1. LIMITS

None

9.2. BLOCK DIAGRAM OF TEST SETUP



9.3. TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.

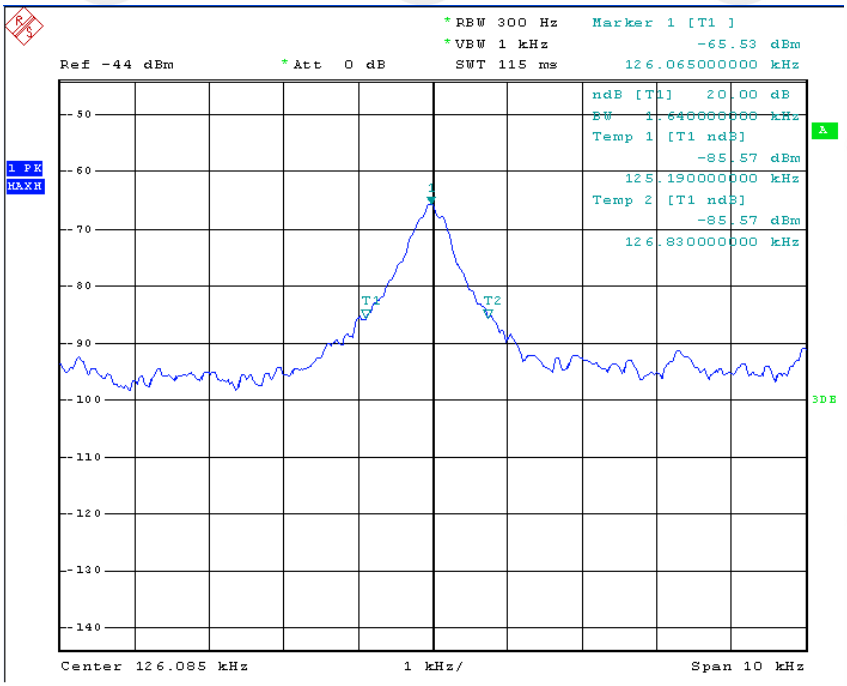
2. Set to the maximum power setting and enable the EUT transmit continuously.

3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a TX channel; RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.

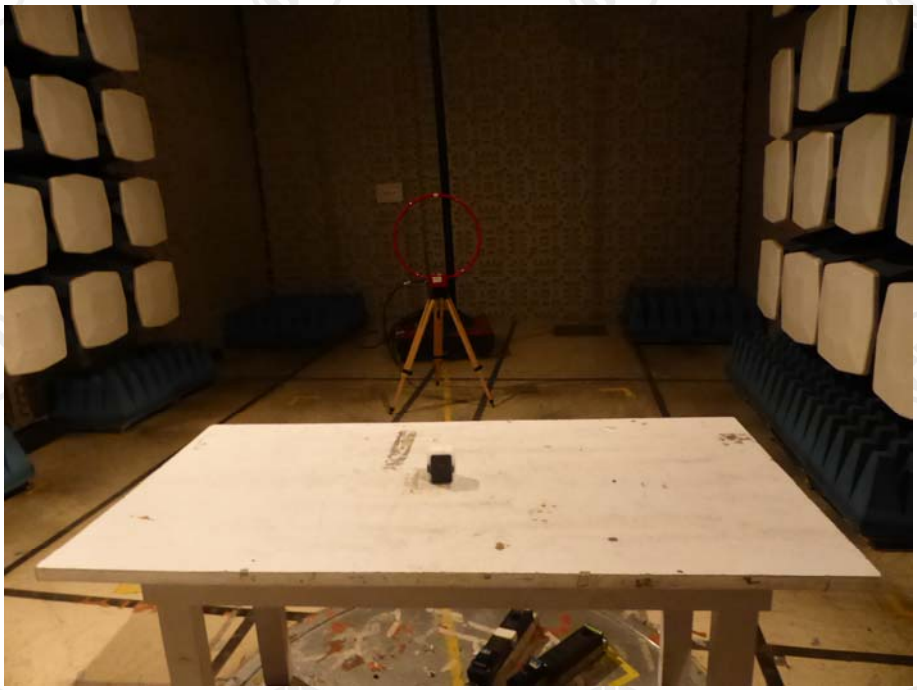
4. Measure and record the results in the test report.

9.4. TEST RESULT

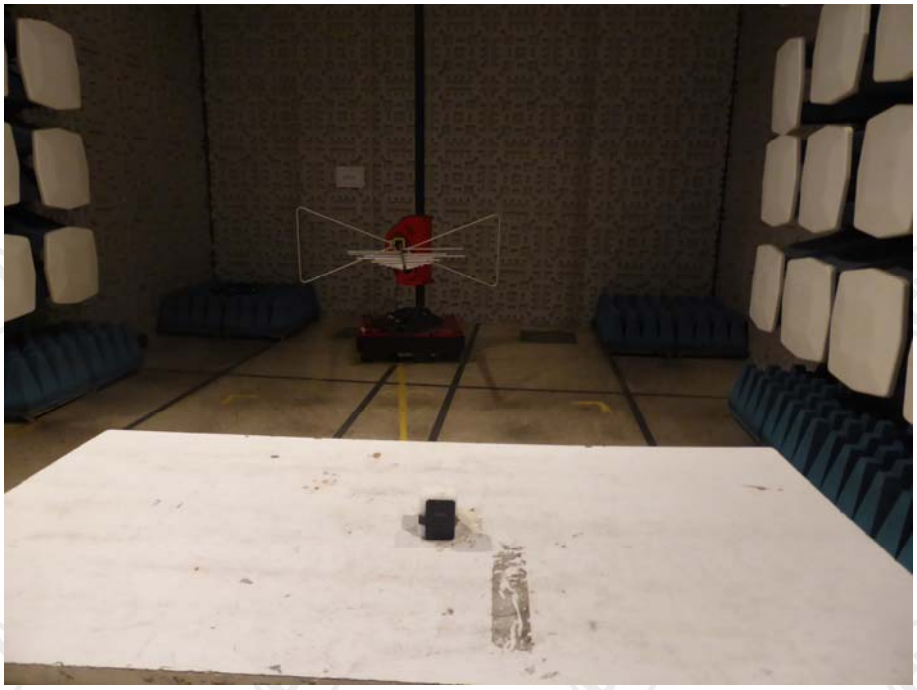
Frequency (kHz)	20 dB BW (kHz)
125	1.64



APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



TEST SETUP OF RADIATED EMISSION (9kHz-30MHz)



TEST SETUP OF RADIATED EMISSION (30MHz-1GHz)

TEST SETUP OF CONDUCTED EMISSION

APPENDIX 2 EXTERNAL PHOTOGRAPHS OF PRODUCT

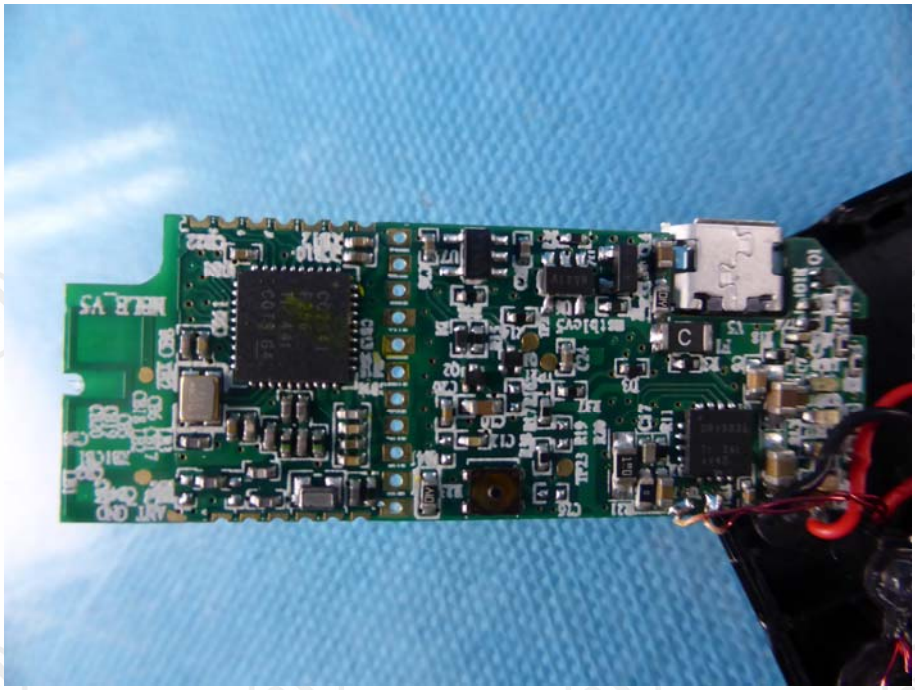
External View of product-1

External View of product-2

External View of product-3

APPENDIX 3 INTERNAL PHOTOGRAPHS OF PRODUCT

Internal View of product-1



Internal View of product-2

Internal View of product-3

Internal View of product-4

Internal View of product-5

*** End of Report ***