

FCC Test Report

Report No.: RF170118D03

FCC ID: IKQMPQ

Test Model: MPQ

Received Date: Jan. 18, 2017

Test Date: Jan. 20 ~ Oct. 11, 2017

Issued Date: Oct. 12, 2017

Applicant: Scosche Industries, Inc.

Address: 1550 Pacific Ave. Oxnard, CA 93033, USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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(R.O.C.)



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Release Control Record

Issue No.	Description	Date Issued
RF170118D03	Original release.	Oct. 12, 2017

1 Certificate of Conformity

Product: WIRELESS CHARGING PAD

Brand: SCOSCHE

Test Model: MPQ

Sample Status: Engineering Sample

Applicant: Scosche Industries, Inc.

Test Date: Jan. 20 ~ Oct. 11, 2017

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.209)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Annie Chang , **Date:** Oct. 12, 2017
Annie Chang / Senior Specialist

Approved by : Rex Lai , **Date:** Oct. 12, 2017
Rex Lai / Assistant Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -6.63dB at 0.86484MHz.
15.209	Radiated Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is -9.77dB at 168.807MHz.
-	Occupied Bandwidth Measurement	PASS	Meet the requirement of limit.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.77 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.54 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WIRELESS CHARGING PAD
Brand	SCOSCHE
Test Model	MPQ
Status of EUT	Engineering Sample
Power Supply Rating	12Vdc
Modulation Type	Load Modulation
Operating Frequency	122-138kHz
Tested Frequency	122kHz, 134kHz, 138kHz
Antenna Type	Coil antenna
Antenna Connector	N/A
Accessory Device	Refer to table as below
Data Cable Supplied	N/A

Note:

1. The EUT is a WIRELESS CHARGING PAD (Qi).

2. The EUT uses following adapter or car charger.

Adapter	
Brand	SCOSCHE
Model	DYS624-120250-16B26
Input Power	100-240Vac, 50/60Hz, 0.8A Max
Output Power	12Vdc 2.5A
Power Line	AC 2-Pin, Non-shielded DC (1.2m)
Car charger	
Brand	SCOSCHE
Model	CLA
Input Power	10.8Vdc-14Vdc
Output Power	10.8Vdc-14Vdc
Power Line	Non-shielded DC (1.5m)

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

3 channels are provided to this EUT:

Channel	Frequency (kHz)	Load
1	122	10% Load
2	134	50% Load
3	138	90% Load

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE<1G	PLC	APCM	
A	√	√	√	Charging Mode (EUT + Adapter)
B	√	-	√	Charging Mode (EUT + Car Charger)

Where **RE<1G**: Radiated Emission below 1GHz **PLC**: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL
A & B	1 to 3	1, 2, 3

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL
A	1 to 3	3

Antenna Port Conducted Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL
A & B	1 to 3	1, 2, 3

Test Condition:

APPLICABLE TO	EUT CONFIGURE MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	A	25deg. C, 75% RH	120Vac, 60Hz (Adapter)	Ian Chang
RE<1G	A	18deg. C, 75% RH	120Vac, 60Hz (Adapter)	Ian Chang
	B	18deg. C, 75% RH	12Vdc (Battery)	Ian Chang
APCM	A	18deg. C, 75% RH	120Vac, 60Hz (Adapter)	Saxon Lee
	B	18deg. C, 75% RH	12Vdc (Battery)	Saxon Lee

3.3 Description of Support Units

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Cell Phone	Samsung	SM-G935FZBUBRI	N/A	N/A	Supplied by client

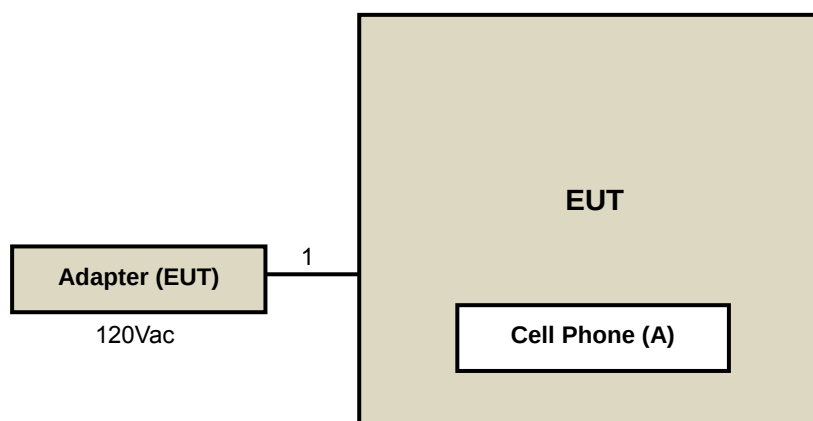
Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.2	Y	0	Supplied by client <For Mode A>
	DC cable	1	1.5	Y	0	Supplied by client <For Mode B>
2.	DC cable	1	1.0	Y	0	Provided by Lab

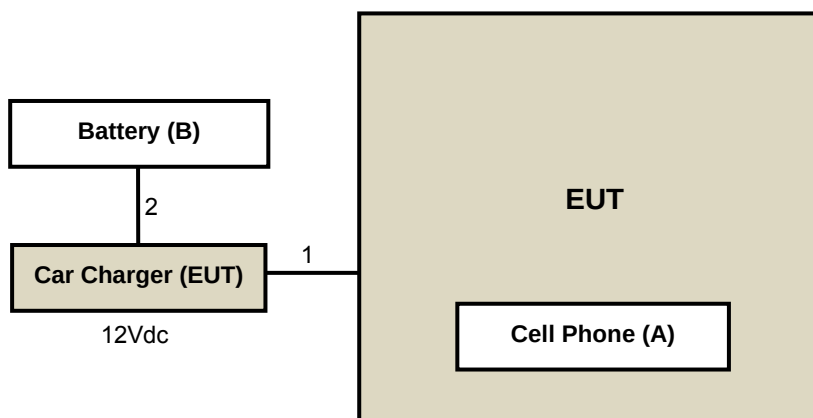
Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration of System under Test

Mode A:



Mode B:



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.209)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

FOR FREQUENCY BELOW 30MHz

FREQUENCY (MHz)	FIELD STRENGTH (dBuV/m)		MEASUREMENT DISTANCE (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

FOR FREQUENCY BETWEEN 30-1000MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30-88	90	39.1	100	40.0
88-216	150	43.5	150	43.5
216-960	210	46.4	200	46.0
Above 960	300	49.5	500	54.0

4.1.2 Test Instruments

For Channel 1 & 2:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 21, 2017	Feb. 20, 2018
HP Preamplifier	8449B	3008A01201	Feb. 22, 2017	Feb. 21, 2018
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2017	Feb. 20, 2018
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 8, 2017	Feb. 7, 2018
Schwarzbeck Antenna	VULB 9168	139	Dec. 13, 2016	Dec. 12, 2017
Schwarzbeck Antenna	VHBA 9123	480	May 19, 2017	May 18, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Dec. 30, 2016	Dec. 29, 2017
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Dec. 27, 2016	Dec. 26, 2017
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 14, 2017	Aug. 13, 2018
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 14, 2017	Aug. 13, 2018
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	May 31, 2017	May 30, 2018
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 26, 2017	Jul. 25, 2018
Loop Antenna EMCI	LPA600	270	Aug. 11, 2017	Aug. 10, 2019
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 29, 2017	Sep. 28, 2018

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.
 4. The Industry Canada Reference No. IC 7450E-6.
 5. The FCC Designation Number is TW2021.
 6. Tested Date: Oct. 11, 2017

For Channel 3:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 26, 2016	Feb. 25, 2017
HP Preamplifier	8449B	3008A01201	Feb. 26, 2016	Feb. 25, 2017
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Mar. 01, 2016	Feb. 28, 2017
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 02, 2016	Feb. 01, 2017
Schwarzbeck Antenna	VULB 9168	139	Dec. 13, 2016	Dec. 12, 2017
Schwarzbeck Antenna	VHBA 9123	480	May 29, 2015	May 28, 2017
Schwarzbeck Horn Antenna	BBHA-9170	212	Dec. 30, 2016	Dec. 29, 2017
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Dec. 27, 2016	Dec. 26, 2017
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 15, 2016	Aug. 14, 2017
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 15, 2016	Aug. 14, 2017
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	May 25, 2016	May 24, 2017
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 26, 2016	Jul. 25, 2017
Loop Antenna EMCI	LPA600	270	Aug. 20, 2015	Aug. 19, 2017
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 30, 2016	Sep. 29, 2017

- NOTE:** 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is TW2021.
6. Tested Date: Jan. 20, 2017

4.1.3 Test Procedures

For Frequency range 9kHz~30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Frequency range 30 ~ 1000MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

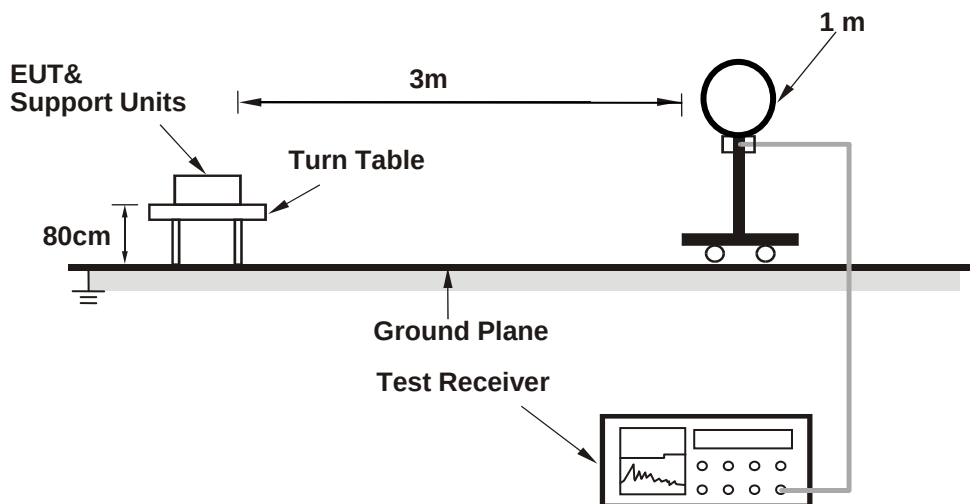
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

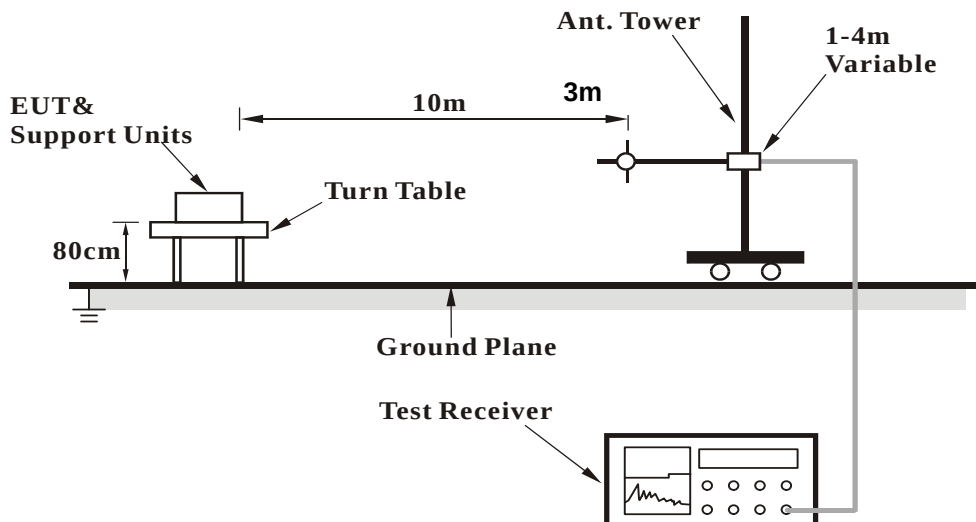
No deviation.

4.1.5 Test Set Up

For Frequency range 9kHz~30MHz



For Frequency range 30 ~ 1000MHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

- Connected the Adapter or Car Charger to EUT.
- Turned on the power of all equipment.
- The cell phone which supplied by the client is meant to simulate the charging condition.
- EUT charged to cell phone continuously.

4.1.7 Test Results

Below 30MHz Data:

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	9kHz ~ 30MHz	TEST MODE	Mode A

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	82.29 AV	106.78	-24.49	1.00 H	168	66.28	16.01
2	*0.122	90.82 AV	105.88	-15.06	1.00 H	206	75.51	15.31
3	0.495	48.36 AV	73.71	-25.35	1.00 H	274	44.05	4.31
4	0.610	54.16 AV	71.90	-17.74	1.00 H	169	51.20	2.96
5	0.976	56.26 AV	67.82	-11.56	1.00 H	236	56.03	0.23
6	28.463	36.96 AV	69.54	-32.58	1.00 H	241	40.78	-3.82
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	79.44 AV	106.78	-27.34	1.00 V	129	63.43	16.01
2	*0.122	88.26 AV	105.88	-17.62	1.00 V	199	72.95	15.31
3	0.495	45.26 AV	73.71	-28.45	1.00 V	300	40.95	4.31
4	0.610	51.08 AV	71.90	-20.82	1.00 V	128	48.12	2.96
5	0.976	51.33 AV	67.82	-16.49	1.00 V	183	51.10	0.23
6	28.220	32.03 AV	69.54	-37.51	1.00 V	208	36.62	-4.59

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	9kHz ~ 30MHz	TEST MODE	Mode A

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	82.30 AV	106.78	-24.48	1.00 H	134	66.29	16.01
2	*0.134	90.97 AV	105.06	-14.09	1.00 H	221	76.35	14.62
3	0.495	48.34 AV	73.71	-25.37	1.00 H	269	44.03	4.31
4	0.670	58.25 AV	71.08	-12.83	1.00 H	198	55.83	2.42
5	0.938	56.33 AV	68.16	-11.83	1.00 H	225	55.99	0.34
6	28.662	37.18 AV	69.54	-32.36	1.00 H	341	40.39	-3.21
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	79.86 AV	106.78	-26.92	1.00 V	158	63.85	16.01
2	*0.134	88.26 AV	105.06	-16.80	1.00 V	195	73.64	14.62
3	0.495	46.36 AV	73.71	-27.35	1.00 V	250	42.05	4.31
4	0.670	57.11 AV	71.08	-13.97	1.00 V	154	54.69	2.42
5	0.938	54.16 AV	68.16	-14.00	1.00 V	201	53.82	0.34
6	27.555	35.03 AV	69.54	-34.51	1.00 V	295	41.11	-6.08

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	9kHz ~ 30MHz	TEST MODE	Mode A

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	73.84 AV	106.78	-32.94	1.00 H	154	52.77	21.07
2	*0.138	91.22 AV	104.81	-13.59	1.00 H	186	71.77	19.45
3	0.414	68.75 AV	95.26	-26.51	1.00 H	169	58.43	10.32
4	0.495	36.94 AV	73.71	-36.77	1.00 H	211	27.66	9.28
5	0.690	59.36 AV	70.83	-11.47	1.00 H	206	52.22	7.14
6	0.966	55.84 AV	67.90	-12.06	1.00 H	239	50.25	5.59
7	1.242	51.85 AV	65.72	-13.87	1.00 H	295	46.97	4.88
8	28.960	37.18 AV	69.54	-32.36	1.00 H	341	34.11	3.07
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	70.16 AV	106.78	-36.62	1.00 V	164	49.09	21.07
2	*0.138	77.16 AV	104.81	-27.65	1.00 V	134	57.71	19.45
3	0.414	51.96 AV	95.26	-43.30	1.00 V	218	41.64	10.32
4	0.495	34.16 AV	73.71	-39.55	1.00 V	118	24.88	9.28
5	0.690	43.52 AV	70.83	-27.31	1.00 V	184	36.38	7.14
6	0.966	38.11 AV	67.90	-29.79	1.00 V	178	32.52	5.59
7	1.242	38.96 AV	65.72	-26.76	1.00 V	258	34.08	4.88
8	28.460	34.11 AV	69.54	-35.43	1.00 V	345	31.83	2.28

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	9kHz ~ 30MHz	TEST MODE	Mode B

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	79.25 AV	106.78	-27.53	1.00 H	159	63.24	16.01
2	*0.122	90.21 AV	105.88	-15.67	1.00 H	188	74.90	15.31
3	0.495	51.51 AV	73.71	-22.20	1.00 H	178	47.20	4.31
4	0.610	56.89 AV	71.90	-15.01	1.00 H	154	53.93	2.96
5	0.976	57.15 AV	67.82	-10.67	1.00 H	215	56.92	0.23
6	28.467	36.99 AV	69.54	-32.55	1.00 H	196	40.80	-3.81
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	72.23 AV	106.78	-34.55	1.00 V	134	56.22	16.01
2	*0.122	87.16 AV	105.88	-18.72	1.00 V	162	71.85	15.31
3	0.495	48.46 AV	73.71	-25.25	1.00 V	124	44.15	4.31
4	0.610	52.06 AV	71.90	-19.84	1.00 V	112	49.10	2.96
5	0.976	53.26 AV	67.82	-14.56	1.00 V	141	53.03	0.23
6	27.285	31.03 AV	69.54	-38.51	1.00 V	236	37.61	-6.58

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	9kHz ~ 30MHz	TEST MODE	Mode B

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	79.89 AV	106.78	-26.89	1.00 H	168	63.88	16.01
2	*0.134	90.32 AV	105.06	-14.74	1.00 H	178	75.70	14.62
3	0.495	47.82 AV	73.71	-25.89	1.00 H	228	43.51	4.31
4	0.670	58.22 AV	71.08	-12.86	1.00 H	168	55.80	2.42
5	0.938	56.89 AV	68.16	-11.27	1.00 H	238	56.55	0.34
6	28.790	37.88 AV	69.54	-31.66	1.00 H	301	40.69	-2.81
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	76.23 AV	106.78	-30.55	1.00 V	154	60.22	16.01
2	*0.134	83.34 AV	105.06	-21.72	1.00 V	164	68.72	14.62
3	0.495	41.16 AV	73.71	-32.55	1.00 V	214	36.85	4.31
4	0.670	52.03 AV	71.08	-19.05	1.00 V	133	49.61	2.42
5	0.938	53.04 AV	68.16	-15.12	1.00 V	210	52.70	0.34
6	27.883	31.45 AV	69.54	-38.09	1.00 V	306	36.94	-5.49

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	9kHz ~ 30MHz	TEST MODE	Mode B

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	84.47 AV	106.78	-22.31	1.00 H	122	63.40	21.07
2	*0.138	90.48 AV	104.81	-14.33	1.00 H	181	71.03	19.45
3	0.414	67.45 AV	95.26	-27.81	1.00 H	177	57.13	10.32
4	0.495	49.99 AV	73.71	-23.72	1.00 H	134	40.71	9.28
5	0.690	58.71 AV	70.83	-12.12	1.00 H	227	51.57	7.14
6	0.966	54.47 AV	67.90	-13.43	1.00 H	275	48.88	5.59
7	1.242	50.39 AV	65.72	-15.33	1.00 H	314	45.51	4.88
8	29.731	36.52 AV	69.54	-33.02	1.00 H	360	32.24	4.28

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	0.110	80.46 AV	106.78	-26.32	1.00 V	87	59.39	21.07
2	*0.138	76.60 AV	104.81	-28.21	1.00 V	126	57.15	19.45
3	0.414	51.64 AV	95.26	-43.62	1.00 V	228	41.32	10.32
4	0.495	45.02 AV	73.71	-28.69	1.00 V	134	35.74	9.28
5	0.690	42.60 AV	70.83	-28.23	1.00 V	198	35.46	7.14
6	0.966	37.70 AV	67.90	-30.20	1.00 V	166	32.11	5.59
7	1.242	37.58 AV	65.72	-28.14	1.00 V	263	32.70	4.88
8	29.611	33.18 AV	69.54	-36.36	1.00 V	360	29.09	4.09

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- Loop antenna was used for all radiated emission below 30MHz.
- Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
- Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

Below 1GHz Data:

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	Mode A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.550	20.22 QP	40.00	-19.78	2.09 H	166	29.83	-9.61
2	151.110	25.20 QP	43.50	-18.30	2.28 H	181	34.23	-9.03
3	243.290	24.58 QP	46.00	-21.42	1.19 H	281	34.28	-9.70
4	309.000	24.13 QP	46.00	-21.87	1.88 H	108	31.22	-7.09
5	411.830	26.75 QP	46.00	-19.25	1.08 H	29	31.88	-5.13
6	662.830	31.99 QP	46.00	-14.01	1.09 H	25	31.76	0.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.230	22.04 QP	40.00	-17.96	1.98 V	208	31.22	-9.18
2	79.240	19.59 QP	40.00	-20.41	3.37 V	281	33.37	-13.78
3	151.830	25.19 QP	43.50	-18.31	2.08 V	195	34.21	-9.02
4	230.810	24.58 QP	46.00	-21.42	1.11 V	285	35.82	-11.24
5	390.890	30.79 QP	46.00	-15.21	1.62 V	331	36.39	-5.60
6	561.870	29.85 QP	46.00	-16.15	1.66 V	32	31.53	-1.68

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	Mode A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	66.590	19.33 QP	40.00	-20.67	2.11 H	105	30.27	-10.94
2	155.000	24.88 QP	43.50	-18.62	2.10 H	183	33.75	-8.87
3	244.280	23.95 QP	46.00	-22.05	1.81 H	77	33.59	-9.64
4	312.830	26.85 QP	46.00	-19.15	1.93 H	82	33.82	-6.97
5	415.290	27.58 QP	46.00	-18.42	1.09 H	33	32.65	-5.07
6	693.540	33.59 QP	46.00	-12.41	1.91 H	56	32.63	0.96
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	44.930	20.03 QP	40.00	-19.97	1.07 V	221	29.29	-9.26
2	81.230	17.75 QP	40.00	-22.25	3.31 V	204	31.95	-14.20
3	166.560	25.01 QP	43.50	-18.49	1.87 V	89	34.23	-9.22
4	332.820	28.53 QP	46.00	-17.47	1.05 V	83	34.96	-6.43
5	429.530	30.87 QP	46.00	-15.13	1.66 V	331	35.27	-4.40
6	618.780	32.35 QP	46.00	-13.65	1.77 V	32	32.55	-0.20

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	Mode A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	74.620	21.87 QP	40.00	-18.13	2.63 H	160	34.54	-12.67
2	138.446	25.79 QP	40.00	-14.21	2.18 H	160	35.82	-10.03
3	295.829	28.59 QP	47.00	-18.41	1.42 H	166	36.26	-7.67
4	321.728	28.86 QP	47.00	-18.14	1.94 H	174	35.98	-7.12
5	369.403	27.33 QP	47.00	-19.67	1.77 H	206	33.45	-6.12
6	593.085	27.67 QP	47.00	-19.33	2.08 H	261	29.19	-1.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.372	29.15 QP	40.00	-10.85	1.32 V	159	39.97	-10.82
2	137.040	30.11 QP	40.00	-9.89	2.05 V	132	40.31	-10.20
3	168.807	30.23 QP	40.00	-9.77	1.88 V	162	39.84	-9.61
4	186.510	28.47 QP	40.00	-11.53	1.67 V	87	39.68	-11.21
5	306.256	24.72 QP	47.00	-22.28	2.18 V	138	32.23	-7.51
6	569.805	28.69 QP	47.00	-18.31	2.69 V	159	30.80	-2.11

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	Mode B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.500	19.82 QP	40.00	-20.18	1.55 H	227	29.99	-10.17
2	148.000	27.05 QP	43.50	-16.45	1.18 H	183	36.23	-9.18
3	205.230	21.71 QP	43.50	-21.79	1.66 H	118	33.25	-11.54
4	243.820	21.57 QP	46.00	-24.43	1.18 H	312	31.23	-9.66
5	360.000	26.56 QP	46.00	-19.44	2.81 H	6	32.82	-6.26
6	533.000	27.84 QP	46.00	-18.16	1.88 H	178	30.23	-2.39
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.230	23.41 QP	40.00	-16.59	1.66 V	208	32.59	-9.18
2	69.000	22.03 QP	40.00	-17.97	2.21 V	147	33.14	-11.11
3	122.890	25.87 QP	43.50	-17.63	2.92 V	161	37.23	-11.36
4	253.830	23.93 QP	46.00	-22.07	1.61 V	225	33.23	-9.30
5	285.910	23.47 QP	46.00	-22.53	1.18 V	308	31.23	-7.76
6	669.230	31.66 QP	46.00	-14.34	3.31 V	181	31.29	0.37

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 2	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	Mode B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.290	21.16 QP	40.00	-18.84	1.66 H	208	31.28	-10.12
2	144.850	26.68 QP	43.50	-16.82	1.81 H	221	35.89	-9.21
3	208.000	22.48 QP	43.50	-21.02	1.66 H	211	33.95	-11.47
4	293.560	26.68 QP	46.00	-19.32	1.81 H	209	34.29	-7.61
5	366.870	27.94 QP	46.00	-18.06	2.27 H	88	33.99	-6.05
6	553.240	29.95 QP	46.00	-16.05	1.91 H	82	31.90	-1.95
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	48.220	22.05 QP	40.00	-17.95	1.67 V	288	31.23	-9.18
2	69.110	24.15 QP	40.00	-15.85	2.21 V	147	35.28	-11.13
3	124.220	25.05 QP	43.50	-18.45	2.81 V	159	36.23	-11.18
4	253.230	25.50 QP	46.00	-20.50	1.60 V	225	34.83	-9.33
5	288.250	24.59 QP	46.00	-21.41	1.28 V	301	32.31	-7.72
6	678.810	33.01 QP	46.00	-12.99	3.30 V	181	32.29	0.72

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	TEST MODE	Mode B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.928	19.59 QP	40.00	-20.41	1.18 H	67	30.94	-11.35
2	150.425	23.51 QP	40.00	-16.49	2.36 H	130	32.78	-9.27
3	261.636	22.19 QP	47.00	-24.81	1.87 H	155	31.18	-8.99
4	280.697	23.18 QP	47.00	-23.82	2.18 H	289	31.03	-7.85
5	302.085	23.71 QP	47.00	-23.29	1.94 H	125	31.26	-7.55
6	517.716	26.48 QP	47.00	-20.52	2.52 H	294	29.24	-2.76
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.450	23.30 QP	40.00	-16.70	1.68 V	64	34.19	-10.89
2	114.584	18.58 QP	40.00	-21.42	1.48 V	102	30.96	-12.38
3	153.335	27.07 QP	40.00	-12.93	1.52 V	107	36.27	-9.20
4	226.813	19.88 QP	40.00	-20.12	1.00 V	295	31.50	-11.62
5	332.543	21.22 QP	47.00	-25.78	1.55 V	360	28.11	-6.89
6	522.712	26.59 QP	47.00	-20.41	2.39 V	325	29.34	-2.75

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100276	Apr. 12, 2016	Apr. 11, 2017
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ENV216	101197	May 04, 2016	May 03, 2017
LISN With Adapter (for EUT)	AD10	C10Ada-002	May 04, 2016	May 03, 2017
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 23, 2016	Nov. 22, 2017
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 04, 2016	May 03, 2017
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C10.01	Feb. 15, 2016	Feb. 14, 2017
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-011484	May 12, 2016	May 11, 2017
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 08, 2016	Nov. 07, 2017
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 08, 2016	Nov. 07, 2017

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Shielded Room No. 10.

3. The VCCI Site Registration No. C-1852.

4. Tested Date: Jan. 24, 2017

4.2.3 Test Procedures

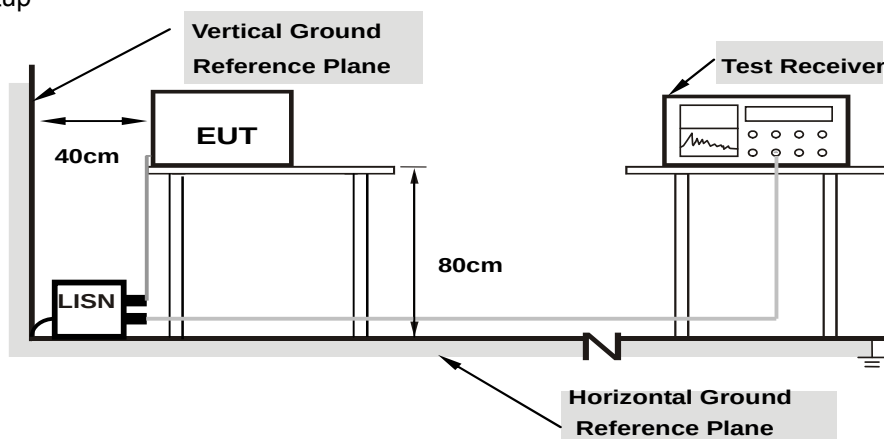
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as item 4.1.6.

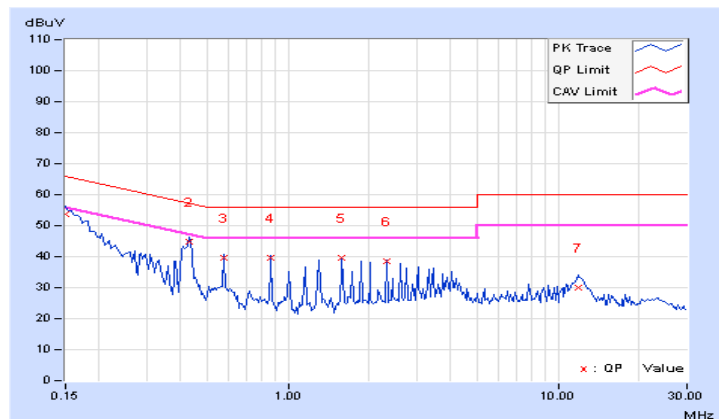
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Test Mode	Mode A		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.70	44.06	31.52	53.76	41.22	66.00	56.00	-12.24	-14.78
2	0.43125	9.73	35.17	30.46	44.90	40.19	57.23	47.23	-12.33	-7.04
3	0.57578	9.76	30.05	28.88	39.81	38.64	56.00	46.00	-16.19	-7.36
4	0.86484	9.80	29.90	29.57	39.70	39.37	56.00	46.00	-16.30	-6.63
5	1.58594	9.88	29.77	29.10	39.65	38.98	56.00	46.00	-16.35	-7.02
6	2.30859	9.94	28.63	27.50	38.57	37.44	56.00	46.00	-17.43	-8.56
7	11.85156	10.17	19.81	14.10	29.98	24.27	60.00	50.00	-30.02	-25.73

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

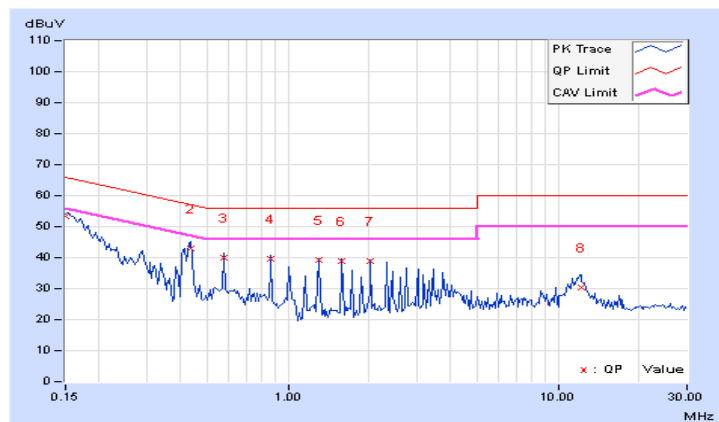


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Test Mode	Mode A		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.70	43.71	30.54	53.41	40.24	66.00	56.00	-12.59	-15.76
2	0.43516	9.73	33.09	27.88	42.82	37.61	57.15	47.15	-14.33	-9.54
3	0.57578	9.75	30.11	29.14	39.86	38.89	56.00	46.00	-16.14	-7.11
4	0.86484	9.79	29.86	29.31	39.65	39.10	56.00	46.00	-16.35	-6.90
5	1.29688	9.84	29.57	29.18	39.41	39.02	56.00	46.00	-16.59	-6.98
6	1.58594	9.86	28.96	28.52	38.82	38.38	56.00	46.00	-17.18	-7.62
7	2.01953	9.90	28.87	28.24	38.77	38.14	56.00	46.00	-17.23	-7.86
8	12.13281	10.21	19.98	12.75	30.19	22.96	60.00	50.00	-29.81	-27.04

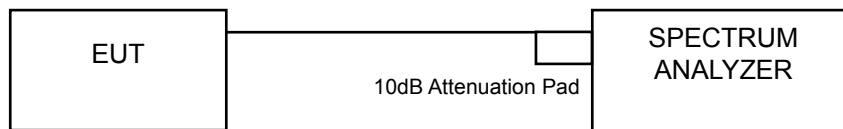
Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Occupied Bandwidth Measurement

4.3.1 Test SetUp



4.3.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.3.4 Deviation from Test Standard

No deviation.

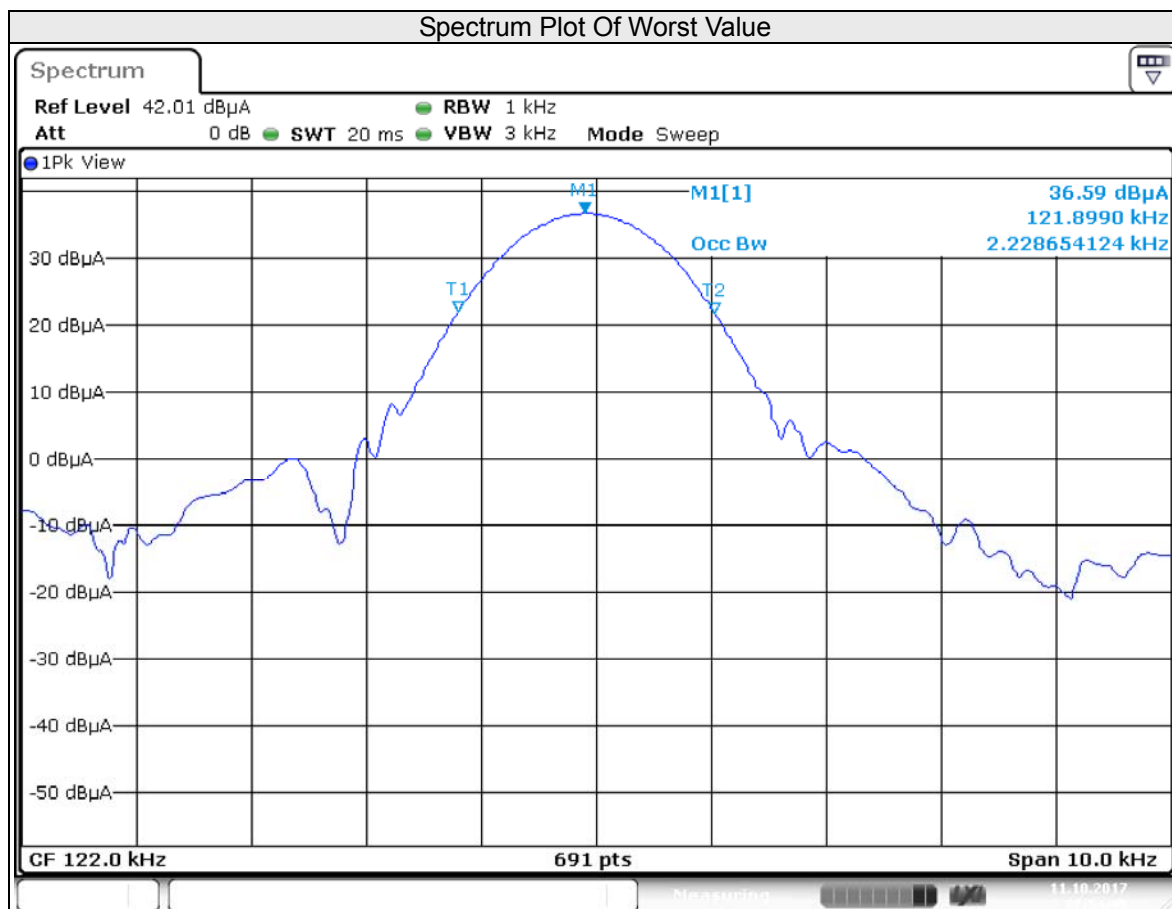
4.3.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously.

4.3.6 Test Results

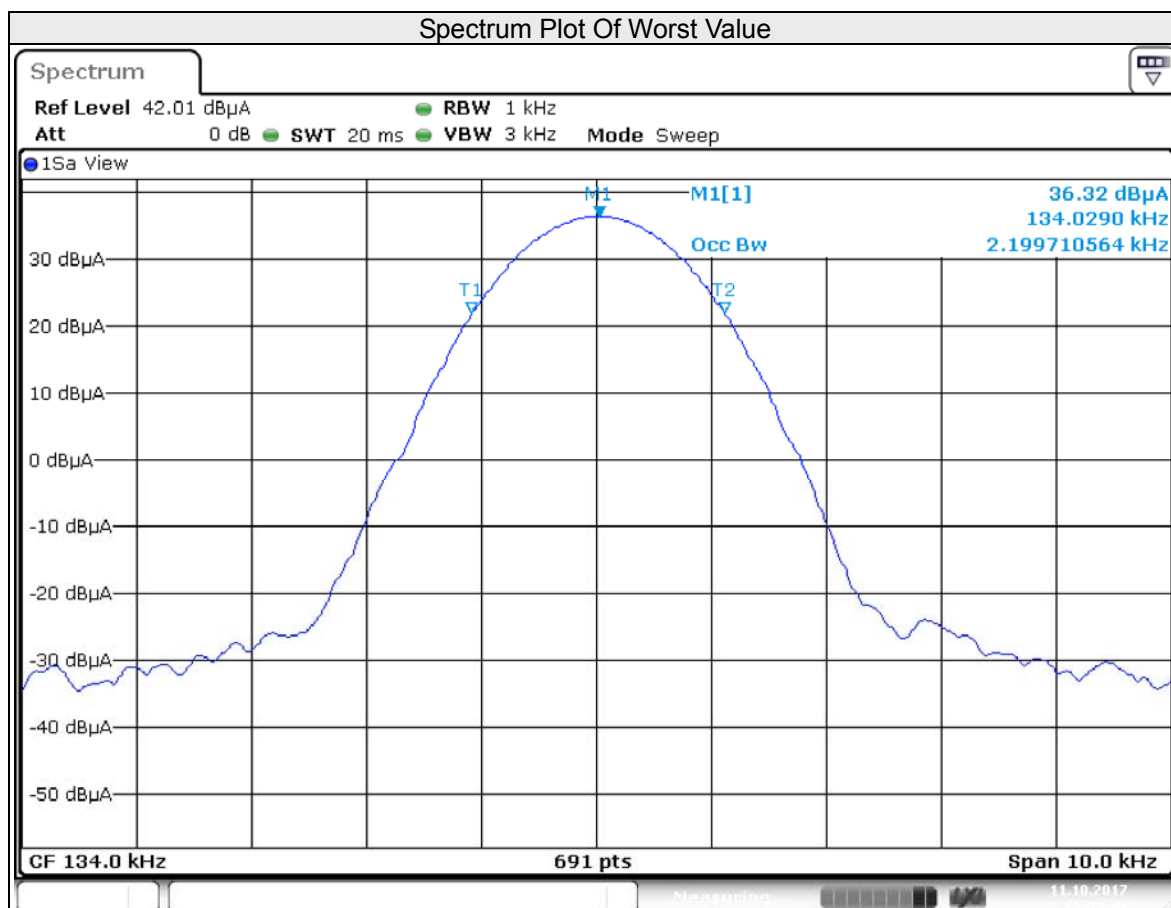
Mode A

Channel	Frequency (kHz)	Occupied Bandwidth (kHz)
1	122	2.22
2	134	2.18
3	138	2.18



Mode B

Channel	Frequency (kHz)	Occupied Bandwidth (kHz)
1	122	2.18
2	134	2.19
3	138	2.12



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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