Test Report

Date : 2020-09-08
No. : HM20080027

Applicant:	Heng Yu Electronic Manufacturing Co., Ltd. Room 1503-05, Nan Fung Commercial Centre, 19 Lam Lok Street, Kowloon Bay, Kowloon, Hong Kong
Manufacturer:	Zhuhai Heng Yu New Technology Company Limited Heng Ke Campus, Jin Hai Avenue, San Zao, Zhuhai, Guang Dong, P.R.C.: 519040
Description of Sample(s):	Product: RF Dongle Brand Name: Heng Yu Model Number: DON2 FCC ID: XEN-D2
Date Sample(s) Received:	2020-08-14
Date Tested:	2020-08-24 to 2020-09-02
Investigation Requested:	Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2018 and ANSI C63.10:2013 for FCC Certification.
Conclusion(s):	The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.
Remark(s):	---

LEUNG Kwun Hang, Joey
Authorized Signatory

Test Report

CONTENT:

1.0 General Details

1.1 Equipment Under Test [EUT]
Description of Sample(s)

Product:	RF Dongle
Manufacturer:	Zhuhai Heng Yu New Technology Company Limited Heng Ke Campus, Jin Hai Avenue, San Zao, Zhuhai, Guang Dong, P.R.C.: 519040
Brand Name:	Heng Yu
Model Number:	DON2
Rating:	5Vd.c powered by USB

1.2 Description of EUT Operation

The Equipment Under Test (EUT) is 2.4GHz RF USB Dongle for Human-Interface-Device of Heng Yu Electronic Manufacturing Co., Ltd., which is 2.4GHz transmitter.
The DON2 transmissions mode which are modulated at GFSK. There is PCB printed antenna supported by the EUT The EUT was tested under test mode which was set in maximum output power and transmit continuously by software.TestLib.exe, which provided by manufacturer.

1.3 Date of Order

2020-08-14

1.4 Submitted Sample(s):

2 Samples

1.5 Test Duration

2020-08-24 to 2020-09-02

1.6 Country of Origin

China

2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2018 Regulations and ANSI C63.10:2013 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary					
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result	
				Pass	Fail
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.10:2013	N/A	☒	☐
AC power-line conducted emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A	☒	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10:2013	N/A	☒	☐
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	☒	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Field Strength of Fundamental & Harmonics Emissions

Test Requirement:	FCC 47CFR 15.249
Test Method:	ANSI C63.10:2013
Test Date:	2020-08-27
Mode of Operation:	Tx mode

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

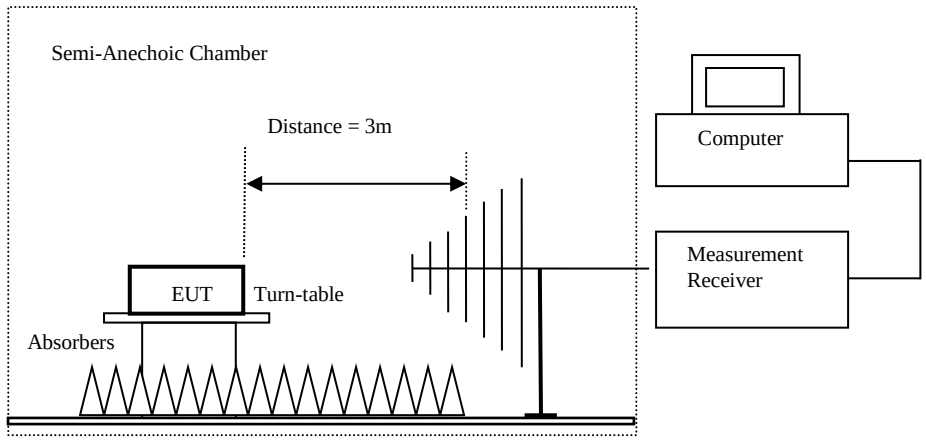
Remark: 3 orthogonal axis apply to hand-held device only.

*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd.
FCC Test Firm Registration Number 723883
Designation Number HK0001

Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW:	10kHz
	VBW:	30kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
30MHz – 1GHz (QP)	RBW:	120kHz
	VBW:	120kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Pk & Av)	RBW:	3MHz
	VBW:	3MHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold

Test Setup:



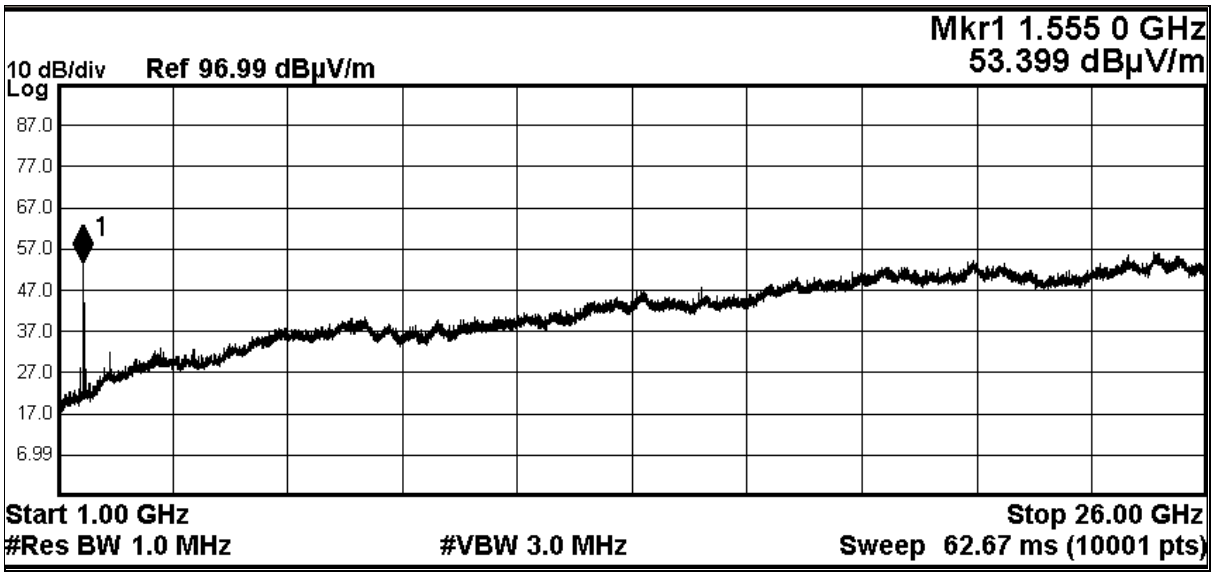
Ground Plane

- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used,
9kHz to 30MHz loop antennas are used.
-For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground

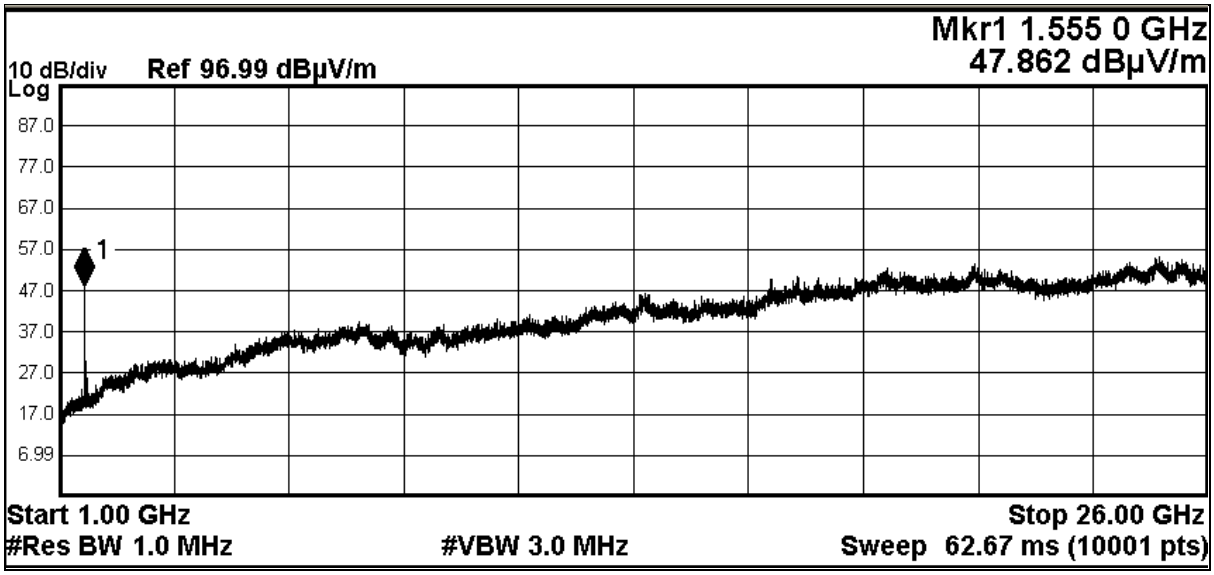
Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Fundamental frequency [MHz]	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

Result of Tx Mode, (Above 1GHz): Pass
Horizontal



Vertical



Remarks: The fundamental frequency was not included in the pre-scan plot, a 2.4G notch filter was added prior to the Receiver, please refer the band-edge plot for the level of fundamental frequency.

Result of Tx mode (Lowest Channel):Pass

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
2401.0	49.7	27.9	77.6	7,585.8	500,000	Vertical
1555.0	28.1	19.8	47.9	248.3	5,000	Vertical
* 4802.0	13.1	32.1	45.2	182.0	5,000	Vertical
7203.0	2.3	38.6	40.9	110.9	5,000	Vertical
9604.0	Emissions detected are more than 20 dB below the FCC Limits				5,000	Vertical
* 12005.0					5,000	Vertical
14406.0					5,000	Vertical
16807.0					5,000	Vertical
* 19208.0					5,000	Vertical
21609.0					5,000	Vertical
24010.0					5,000	Vertical

Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
2401.0	41.5	27.9	69.4	2,951.2	50,000	Vertical
1555.0	19.8	19.8	39.6	95.5	500	Vertical
* 4802.0	4.6	32.1	36.7	68.4	500	Vertical
7203.0	-1.3	38.6	37.3	73.3	500	Vertical
9604.0	Emissions detected are more than 20 dB below the FCC Limits				500	Vertical
* 12005.0					500	Vertical
14406.0					500	Vertical
16807.0					500	Vertical
* 19208.0					500	Vertical
21609.0					500	Vertical
24010.0					500	Vertical

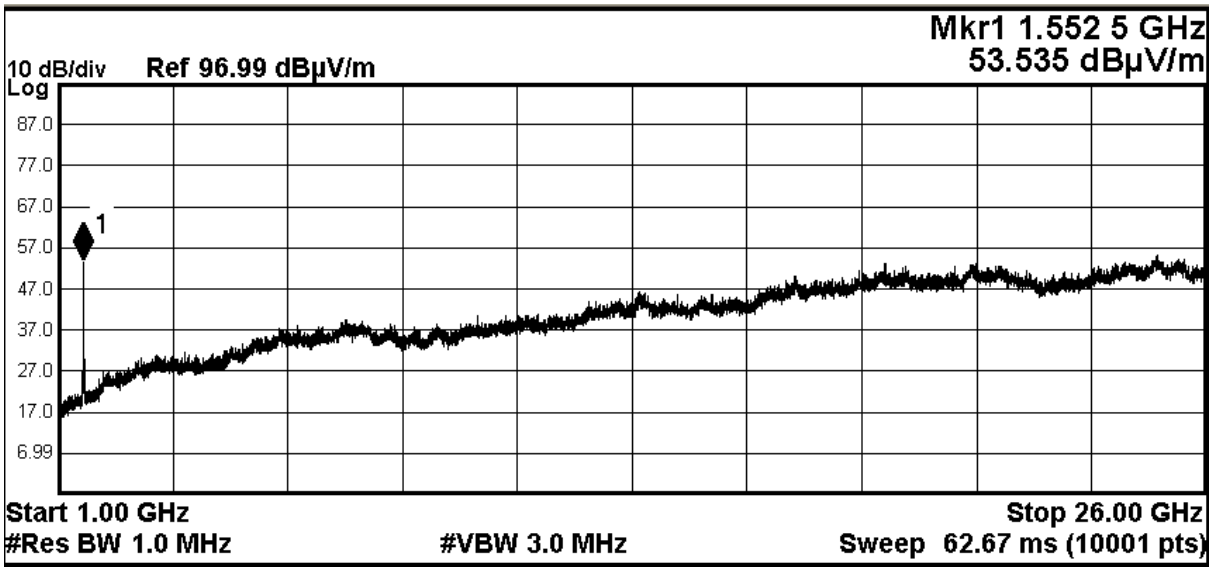
Result of Tx mode (Lowest Channel):Pass

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
2401.0	57.0	27.9	84.9	17,579.2	500,000	Horizontal
1555.0	34.2	19.8	54.0	501.2	5,000	Horizontal
* 4802.0	12.3	32.1	44.4	166.0	5,000	Horizontal
7203.0	2.1	38.6	40.7	108.4	5,000	Horizontal
9604.0	Emissions detected are more than 20 dB below the FCC Limits				5,000	Horizontal
* 12005.0					5,000	Horizontal
14406.0					5,000	Horizontal
16807.0					5,000	Horizontal
* 19208.0					5,000	Horizontal
21609.0					5,000	Horizontal
24010.0					5,000	Horizontal

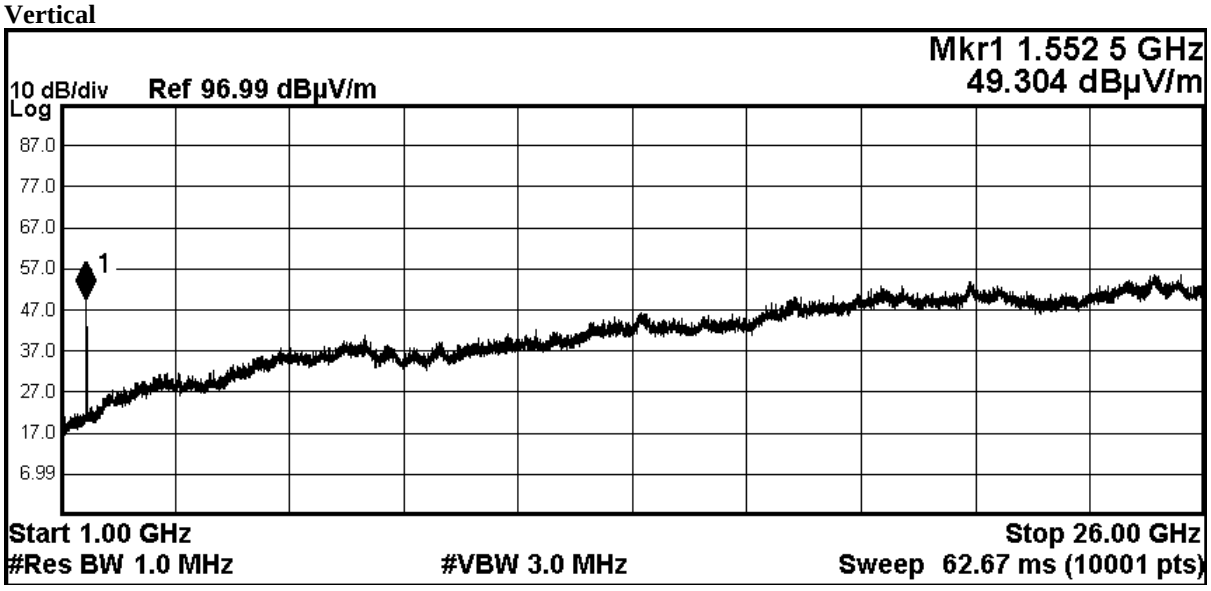
Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
2401.0	48.7	27.9	76.6	6,760.8	50,000	Horizontal
1555.0	25.7	19.8	45.5	188.4	500	Horizontal
* 4802.0	3.9	32.1	36.0	63.1	500	Horizontal
7203.0	0.5	38.6	39.1	90.2	500	Horizontal
9604.0	Emissions detected are more than 20 dB below the FCC Limits				500	Horizontal
* 12005.0					500	Horizontal
14406.0					500	Horizontal
16807.0					500	Horizontal
* 19208.0					500	Horizontal
21609.0					500	Horizontal
24010.0					500	Horizontal

Result of Tx mode (Middle Channel), (Above 1GHz): Pass

Horizontal



Vertical



Remarks: The fundamental frequency was not included in the pre-scan plot, a 2.4G notch filter was added prior to the Receiver, please refer the band-edge plot for the level of fundamental frequency.

Result of Tx mode (Middle Channel), (Above 1GHz): Pass

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2441.0	49.7	27.9	77.6	7,585.8	500,000	Vertical
1552.5	29.2	19.8	49.0	281.8	5,000	Vertical
* 4882.0	12.6	32.1	44.7	171.8	5,000	Vertical
* 7323.0	1.5	38.6	40.1	101.2	5,000	Vertical
9764.0	Emissions detected are more than 20 dB below the FCC Limits				5,000	Vertical
* 12205.0					5,000	Vertical
14646.0					5,000	Vertical
17087.0					5,000	Vertical
* 19528.0					5,000	Vertical
21969.0					5,000	Vertical
24410.0					5,000	Vertical

Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2441.0	42.8	27.9	70.7	3,427.7	50,000	Vertical
1552.5	20.6	19.8	40.4	104.7	500	Vertical
* 4882.0	3.8	32.1	35.9	62.4	500	Vertical
* 7323.0	-1.3	38.6	37.3	73.3	500	Vertical
9764.0	Emissions detected are more than 20 dB below the FCC Limits				500	Vertical
* 12205.0					500	Vertical
14646.0					500	Vertical
17087.0					500	Vertical
* 19528.0					500	Vertical
21969.0					500	Vertical
24410.0					500	Vertical

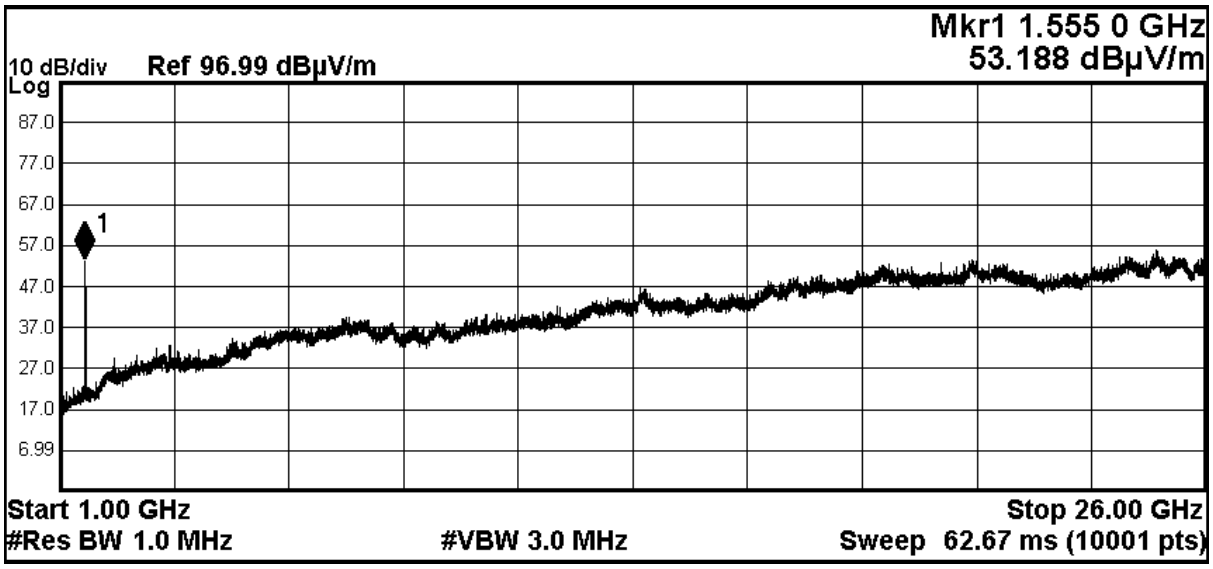
Result of Tx mode (Middle Channel), (Above 1GHz): Pass

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2441.0	56.3	27.9	84.2	16,218.1	500,000	Horizontal
1552.5	33.7	19.8	53.5	473.2	5,000	Horizontal
* 4882.0	11.2	32.1	43.3	146.2	5,000	Horizontal
* 7323.0	2.3	38.6	40.9	110.9	5,000	Horizontal
9764.0	Emissions detected are more than 20 dB below the FCC Limits				5,000	Horizontal
* 12205.0					5,000	Horizontal
14646.0					5,000	Horizontal
17087.0					5,000	Horizontal
* 19528.0					5,000	Horizontal
21969.0					5,000	Horizontal
24410.0					5,000	Horizontal

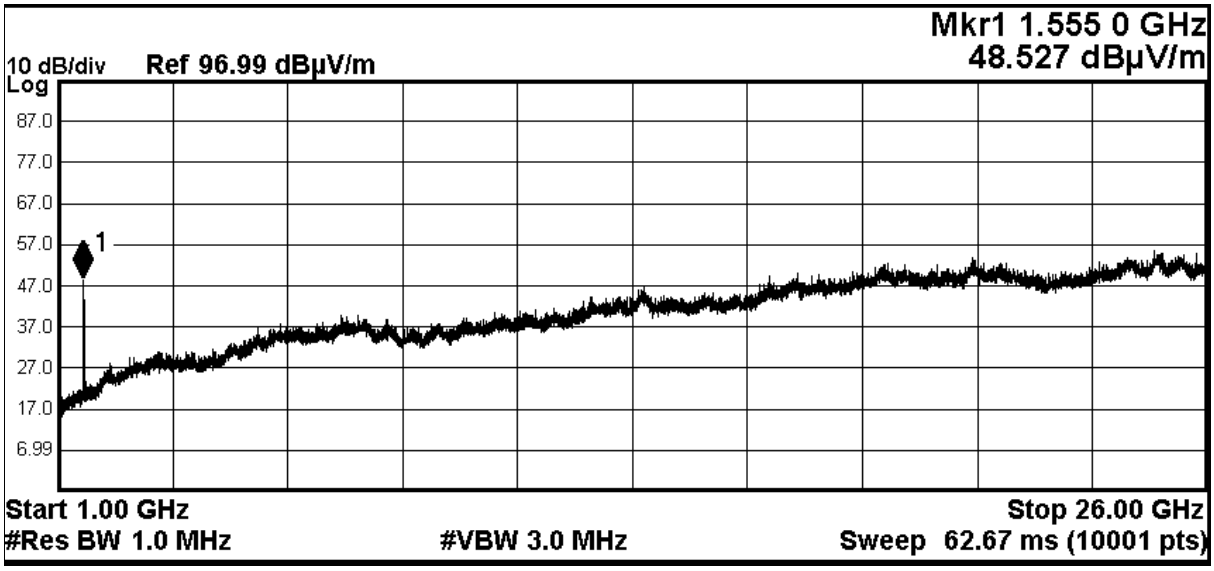
Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2441.0	46.7	27.9	74.6	5,370.3	50,000	Horizontal
1552.5	24.9	19.8	44.7	171.8	500	Horizontal
* 4882.0	3.9	32.1	36.0	63.1	500	Horizontal
* 7323.0	-1.6	38.6	37.0	70.8	500	Horizontal
9764.0	Emissions detected are more than 20 dB below the FCC Limits				500	Horizontal
* 12205.0					500	Horizontal
14646.0					500	Horizontal
17087.0					500	Horizontal
* 19528.0					500	Horizontal
21969.0					500	Horizontal
24410.0					500	Horizontal

Result of Tx Mode, (Above 1GHz): Pass

Horizontal



Vertical



Remarks: The fundamental frequency was not included in the pre-scan plot, a 2.4G notch filter was added prior to the Receiver, please refer the band-edge plot for the level of fundamental frequency.

Result of Tx mode (Highest Channel), (Above 1GHz): Pass

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2482.0	60.2	27.9	88.1	25,409.7	500,000	Vertical
1555.0	28.7	19.8	48.5	266.1	5,000	Vertical
* 4964.0	13.6	32.1	45.7	192.8	5,000	Vertical
* 7446.0	2.3	38.6	40.9	110.9	5,000	Vertical
9928.0	Emissions detected are more than 20 dB below the FCC Limits				5,000	Vertical
* 12410.0					5,000	Vertical
14892.0					5,000	Vertical
17374.0					5,000	Vertical
* 19856.0					5,000	Vertical
22338.0					5,000	Vertical
24820.0					5,000	Vertical

Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2482.0	51.2	27.9	79.1	9,015.7	50,000	Vertical
1555.0	20.3	19.8	40.1	101.2	500	Vertical
* 4964.0	4.9	32.1	37.0	70.8	500	Vertical
* 7446.0	-1.6	38.6	37.0	70.8	500	Vertical
9928.0	Emissions detected are more than 20 dB below the FCC Limits				500	Vertical
* 12410.0					500	Vertical
14892.0					500	Vertical
17374.0					500	Vertical
* 19856.0					500	Vertical
22338.0					500	Vertical
24820.0					500	Vertical

Result of Tx mode (Highest Channel), (Above 1GHz): Pass

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2482.0	58.9	27.9	86.8	21,877.6	500,000	Horizontal
1555.0	33.4	19.8	53.2	457.1	5,000	Horizontal
* 4964.0	16.3	32.1	48.4	263.0	5,000	Horizontal
* 7446.0	1.9	38.6	40.5	105.9	5,000	Horizontal
9928.0	Emissions detected are more than 20 dB below the FCC Limits				5,000	Horizontal
* 12410.0					5,000	Horizontal
14892.0					5,000	Horizontal
17374.0					5,000	Horizontal
* 19856.0					5,000	Horizontal
22338.0					5,000	Horizontal
24820.0					5,000	Horizontal

Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2482.0	50.8	27.9	78.7	8,609.9	50,000	Horizontal
1555.0	23.4	19.8	43.2	144.5	500	Horizontal
* 4964.0	5.9	32.1	38.0	79.4	500	Horizontal
* 7446.0	1.3	38.6	39.9	98.9	500	Horizontal
9928.0	Emissions detected are more than 20 dB below the FCC Limits				500	Horizontal
* 12410.0					500	Horizontal
14892.0					500	Horizontal
17374.0					500	Horizontal
* 19856.0					500	Horizontal
22338.0					500	Horizontal
24820.0					500	Horizontal

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

***: Denotes restricted band of operation.**
Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 9kHz to 30MHz: 2.4dB
30MHz to 18GHz: 5.0dB
18GHz – 26.5Hz: 5.24dB

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

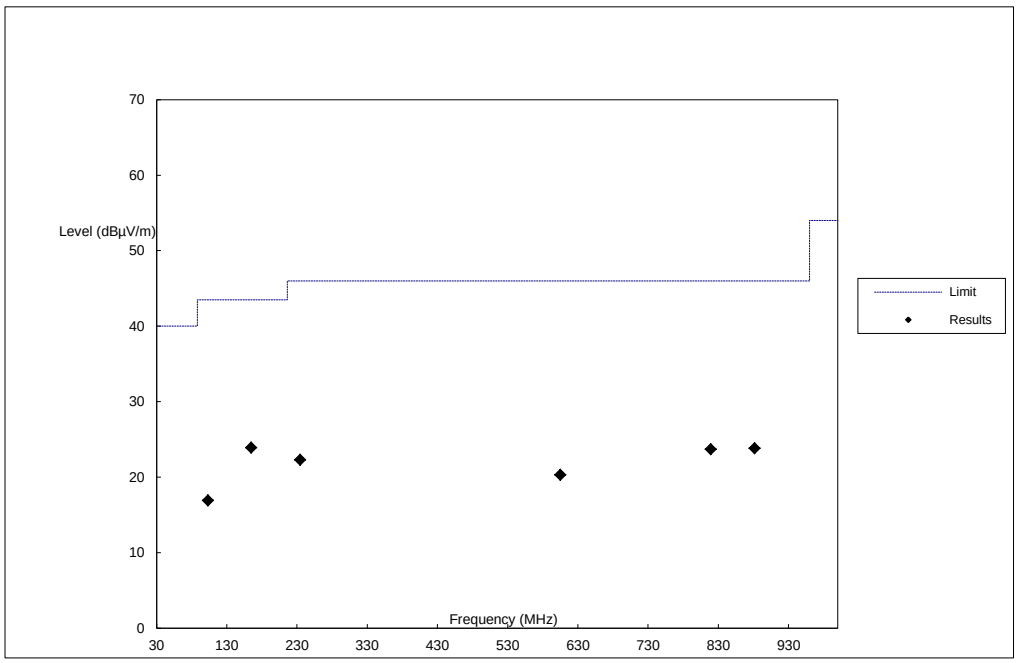
Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Remarks: Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate in the table below is the worst case rate with respect to the specific test item.
Investigation has been done on all the possible configurations for searching the worst cases.

Result of TX mode, (9kHz – 30MHz): PASS
Emissions detected are more than 20 dB below the FCC Limits

Results of On mode: PASS
Please refer to the following table for result details



The quasi-peak measurements were recorded as follows:-

Radiated Emissions Quasi-Peak							
Emission Frequency MHz	Measured Level @3m dBµV	Correcction Factor dB/m	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m	E-Field Polarity
103.2	8.5	8.4	16.9	43.5	7.0	150	Horizontal
165.0	13.7	10.2	23.9	43.5	15.7	150	Horizontal
234.6	10.1	12.2	22.3	46.0	13.0	200	Horizontal
605.3	-0.8	21.1	20.3	46.0	10.4	200	Horizontal
819.3	-0.2	23.9	23.7	46.0	15.3	200	Horizontal
881.6	0.0	23.8	23.8	46.0	15.5	200	Vertical

Result of Receiver mode, (9kHz – 30MHz): N/A

Result of Receiver mode, (30MHz – 1GHz): N/A

Result of Receiver mode, (1GHz – 18GHz): N/A

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz
Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty	:	(9kHz – 30MHz):	2.4dB
		(30MHz – 18GHz):	5.0dB
		(18GHz - 26GHz):	5.24dB

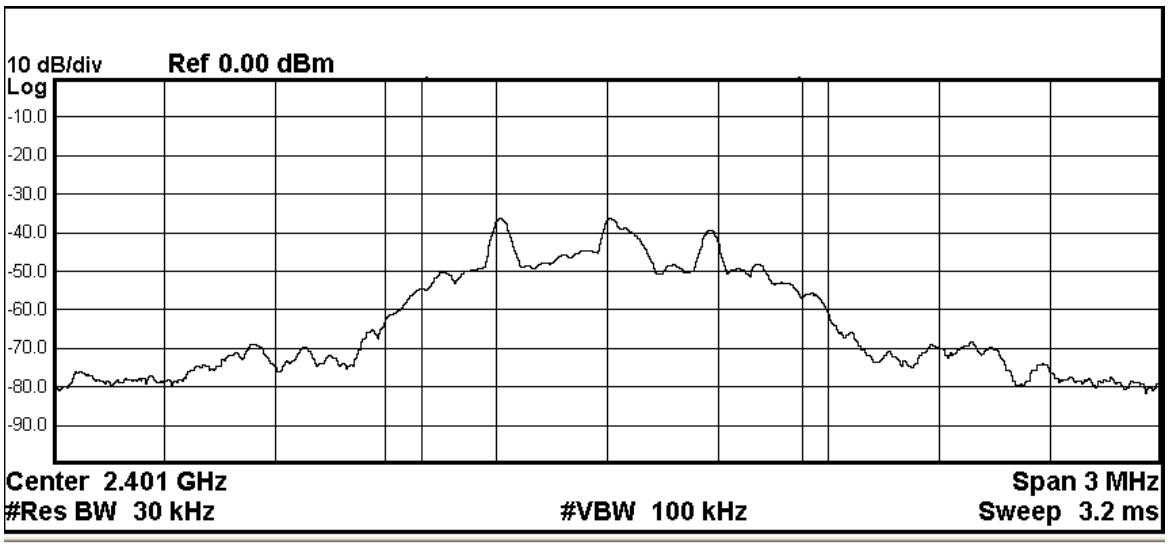
3.1.1.1 20dB Bandwidth

Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [MHz]
2401	0.549

Tx mode (Lowest Channel)

20dB Bandwidth of Fundamental Emission

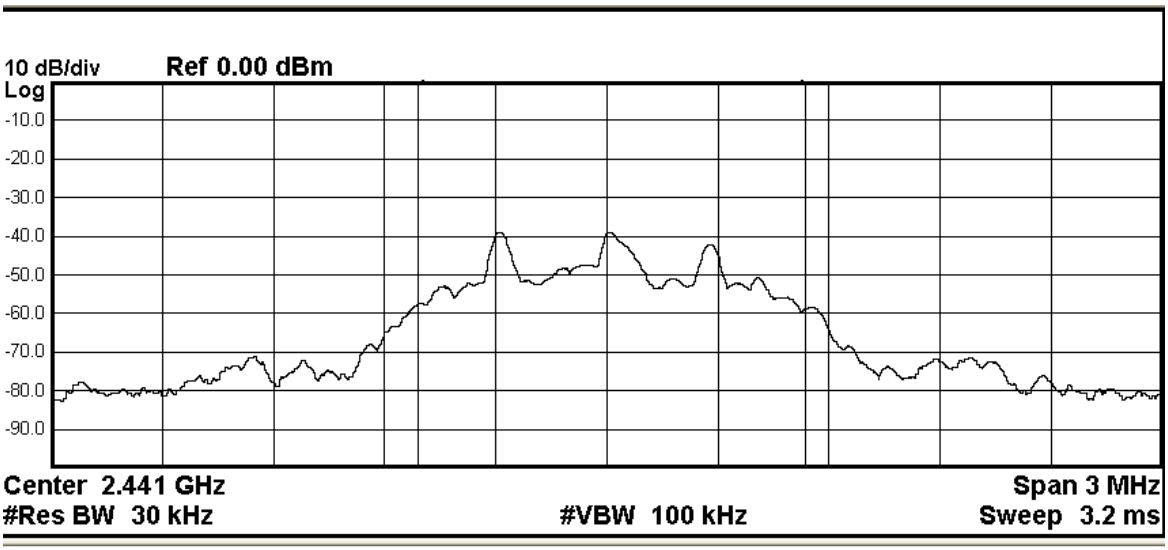


Occupied Bandwidth 1.0325 MHz		Total Power	-28.9 dBm
Transmit Freq Error	13.003 kHz	OBW Power	99.00 %
x dB Bandwidth	1.095 MHz	x dB	-20.00 dB

Frequency Range [MHz]	20dB Bandwidth [MHz]
2441	1.10

Tx mode (Middle Channel)

20dB Bandwidth of Fundamental Emission

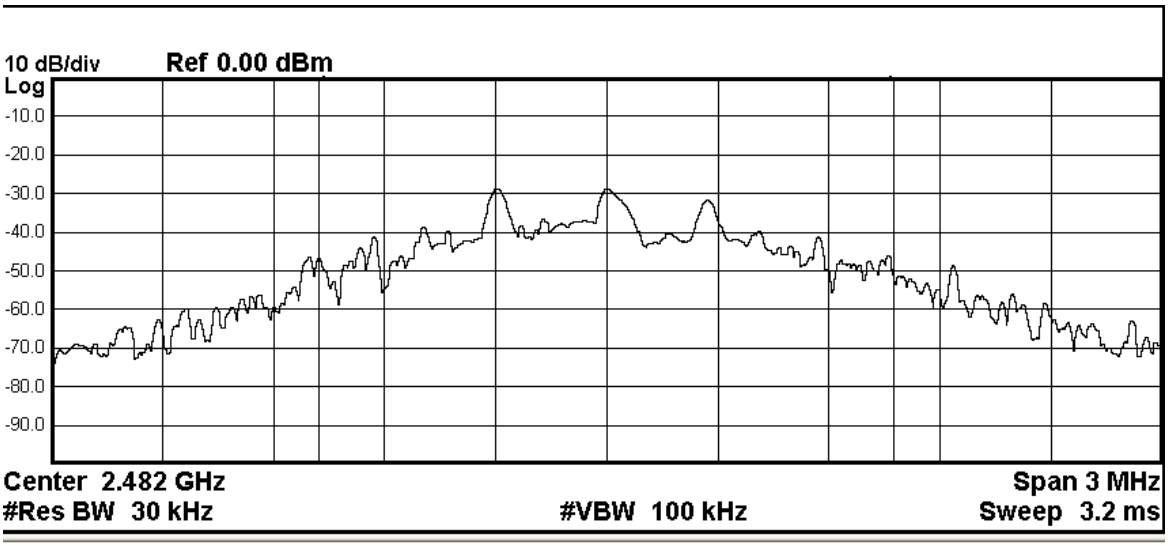


Occupied Bandwidth		Total Power	-31.8 dBm
1.0410 MHz			
Transmit Freq Error	14.887 kHz	OBW Power	99.00 %
x dB Bandwidth	1.095 MHz	x dB	-20.00 dB

Frequency Range [MHz]	20dB Bandwidth [MHz]
2482	1.76

Tx Mode, Highest Channel

20dB Bandwidth of Fundamental Emission



Occupied Bandwidth		Total Power	-21.1 dBm
1.5507 MHz			
Transmit Freq Error	-1.622 kHz	OBW Power	99.00 %
x dB Bandwidth	1.756 MHz	x dB	-20.00 dB

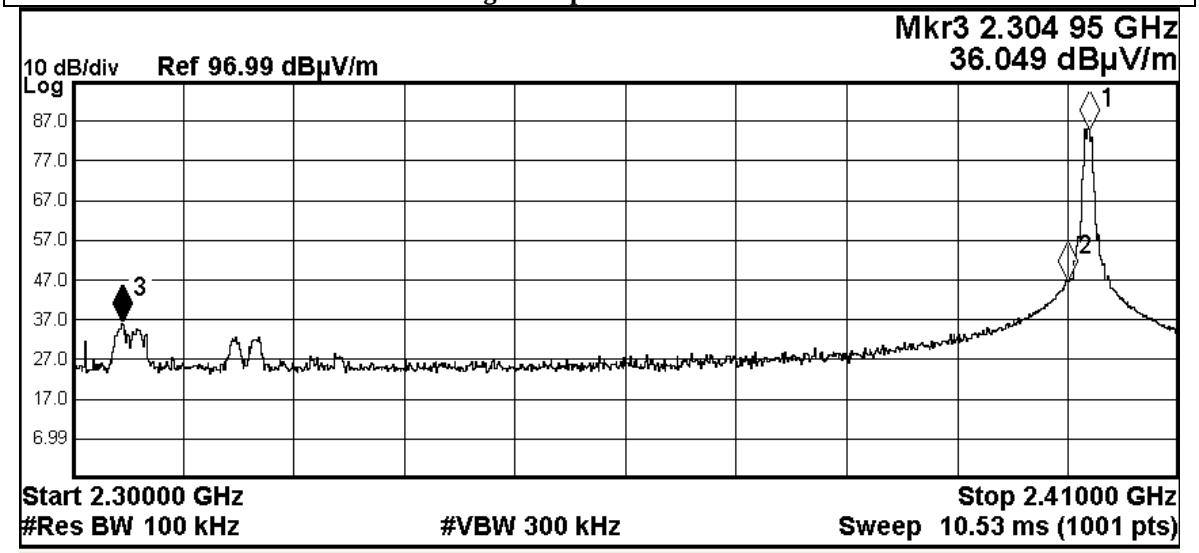
3.1.1.2 Band Edge Measurement

Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400MHz – Lowest Fundamental	38.1

Tx mode

Band Edge Compliance Measurement



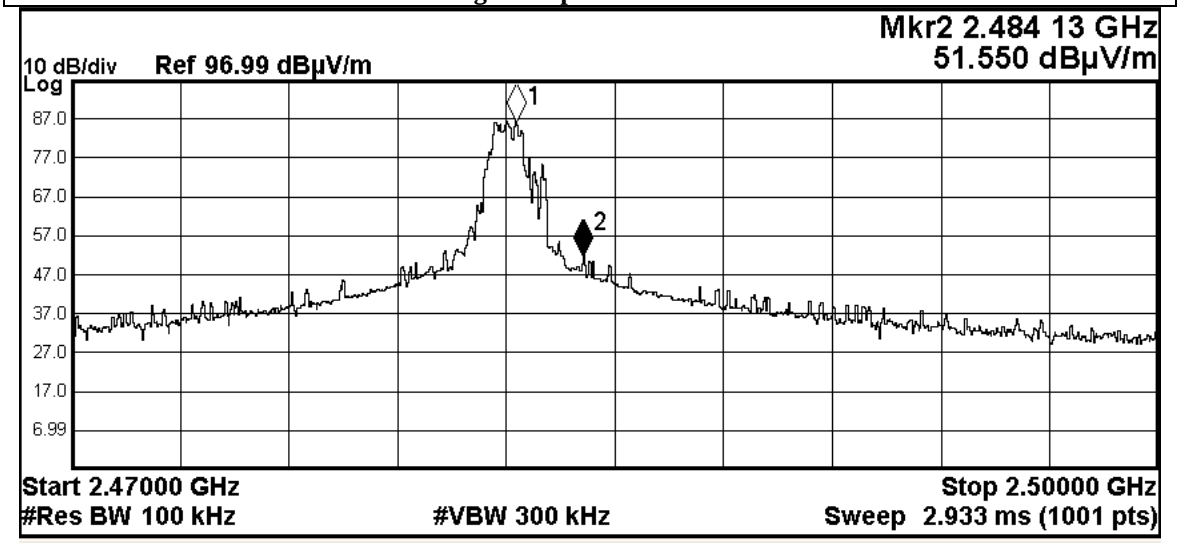
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.401 09 GHz	84.910 dBµV/m			
2	N	1	f	2.399 01 GHz	46.720 dBµV/m			
3	N	1	f	2.304 95 GHz	36.049 dBµV/m			
4								

Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
Highest Fundamental – 2483.5MHz	34.8

Tx mode

Band Edge Compliance Measurement



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.482 27 GHz	86.372 dBµV/m			
2	N	1	f	2.484 13 GHz	51.550 dBµV/m			
3								
4								

Result of Tx mode, Band-edge measurement: PASS

Field Strength of Fundamental and Harmonics Emissions Peak Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
2399.0	18.8	27.9	46.7	216.3	5,000	Horizontal
2484.0	23.7	27.9	51.6	380.2	5,000	Horizontal

Field Strength of Fundamental and Harmonics Emissions Average Value						
Frequency MHz	Measured Level @3m dBµV/m	Correction Factor dBµV/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
2399.0	11.3	27.9	39.2	91.2	500	Horizontal
2484.0	17.4	27.9	45.3	184.1	500	Horizontal

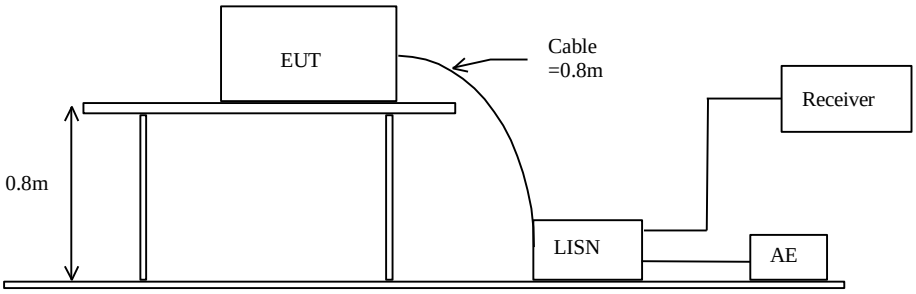
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207 Class B
Test Method:	ANSI C63.10: 2013
Test Date:	2020-08-27
Mode of Operation:	TX mode connected to PC

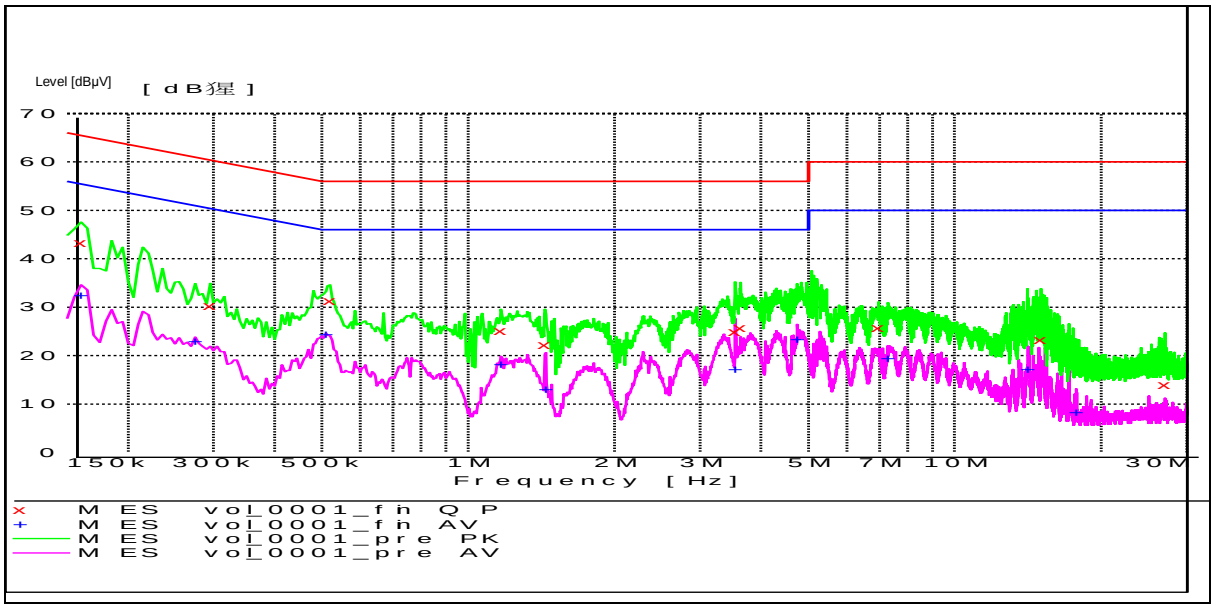
Test Method:

The test was performed in accordance with ANSI C63.10: 2013, with the following: initial measurements were performed in peak and average detection modes on the live line, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



Results of On mode – Live and Neutral : PASS
Please refer to the following diagram for individual results.



MEASUREMENT RESULT: "vol_0001_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.160000	43.40	9.9	66	22.1	N	GND
0.295000	30.20	9.9	60	30.2	L1	GND
0.520000	31.40	10.0	56	24.6	L1	GND
1.170000	25.10	10.0	56	30.9	L1	GND
1.440000	22.10	10.0	56	33.9	N	GND
3.545000	24.90	10.2	56	31.1	L1	GND
3.630000	25.70	10.2	56	30.3	L1	GND
6.975000	25.80	10.5	60	34.2	N	GND
15.070000	23.20	10.7	60	36.8	L1	GND
27.075000	14.10	10.7	60	45.9	N	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.160000	32.30	9.9	56	23.2	L1	GND
0.275000	22.80	9.9	51	28.1	N	GND
0.510000	24.20	10.0	46	21.8	N	GND
1.170000	18.20	10.0	46	27.8	L1	GND
1.445000	13.00	10.0	46	33.0	N	GND
3.545000	17.00	10.2	46	29.0	N	GND
4.745000	23.30	10.3	46	22.7	N	GND
7.285000	19.30	10.4	50	30.7	L1	GND
14.145000	17.00	10.8	50	33.0	N	GND

3.1.3 Antenna Requirement

Ambient temperature 21°C Relative humidity 50%

Test Requirements: § 15.203

Test Specification:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

There is no external antenna port. User is unable to remove or changed the Antenna. The antenna of the EUT was PCB printed antenna, the antenna gain = 0.0dBi

Appendix A

LIST OF MEASUREMENT EQUIPMENT

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2020/01/12	2021/01/12
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00201783	2019/03/11	2021/03/11
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2020/05/14	2021/05/14
EM299	DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	ETS-LINDGREN	3115	00114120	2018/04/27	2021/04/27
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2018/05/13	2021/05/13
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2010/06/10	2022/06/10

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	2020/06/30	2021/06/30
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2020/05/13	2021/05/13
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357-8810.52/54	2020/01/13	2021/01/11

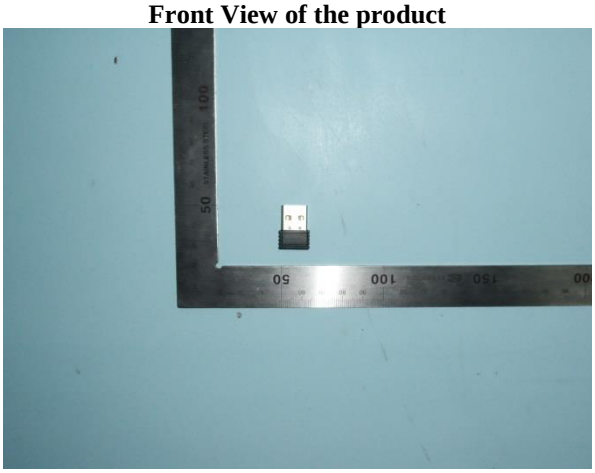
Remarks:-

CM Corrective Maintenance
N/A Not Applicable
TBD To Be Determined

Appendix B

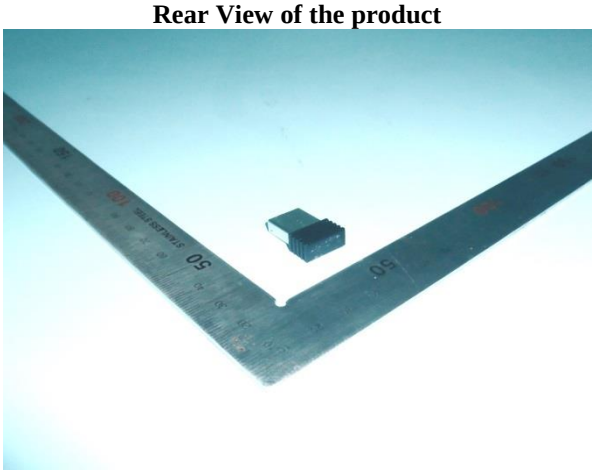
Photographs of EUT

Front View of the product

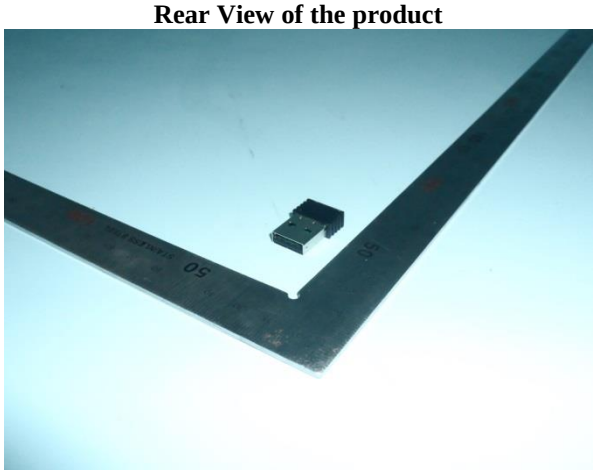


Rear View of the product

Rear View of the product

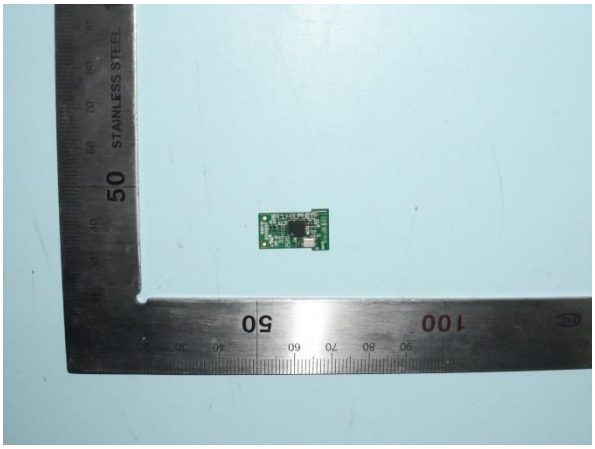


Rear View of the product

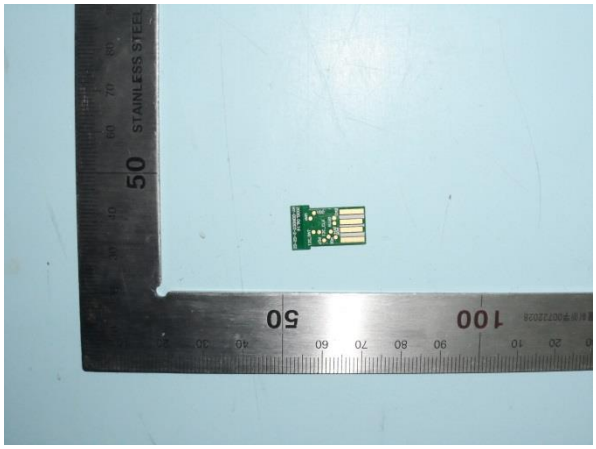


Photographs of EUT

PCB Front View of the Product

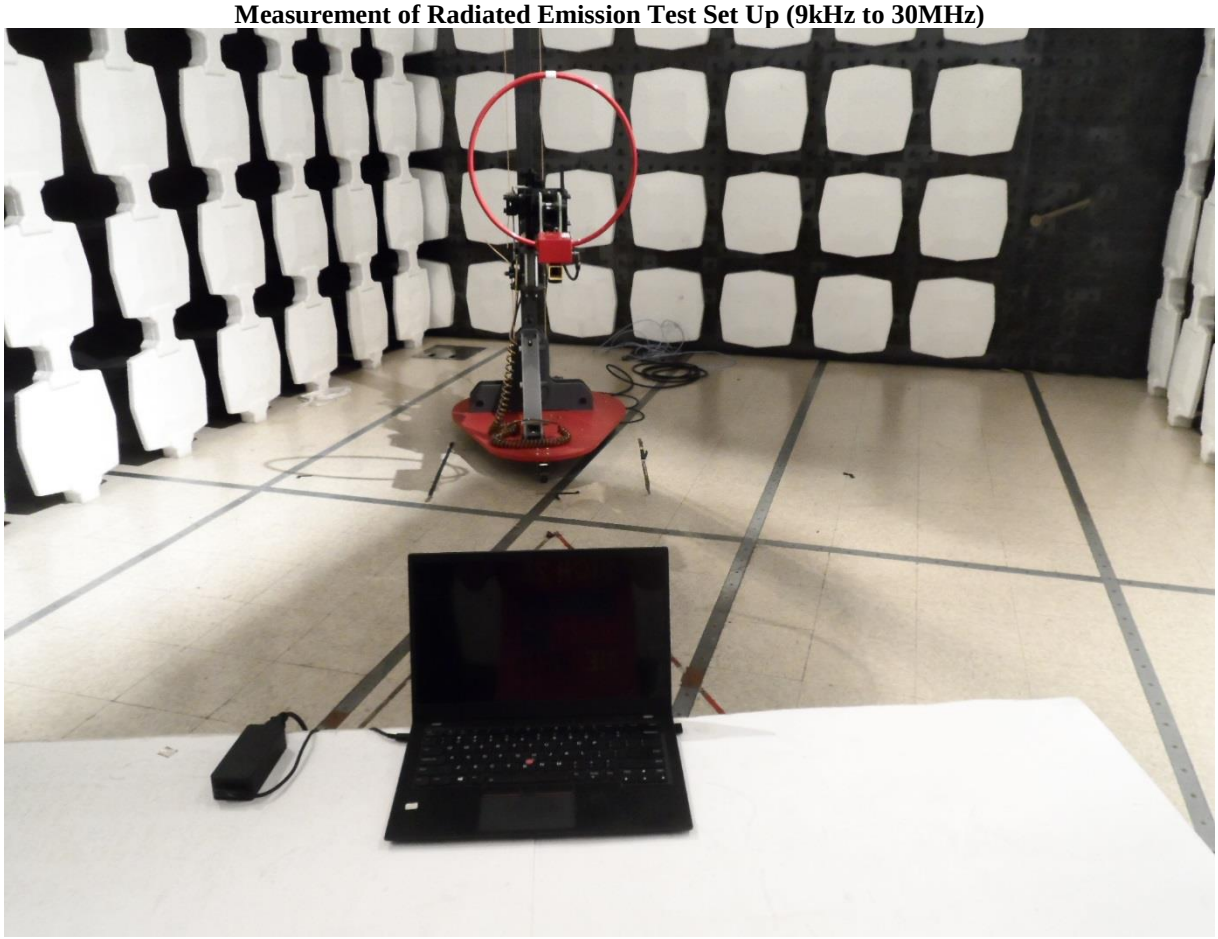


PCB Bottom View of the Product



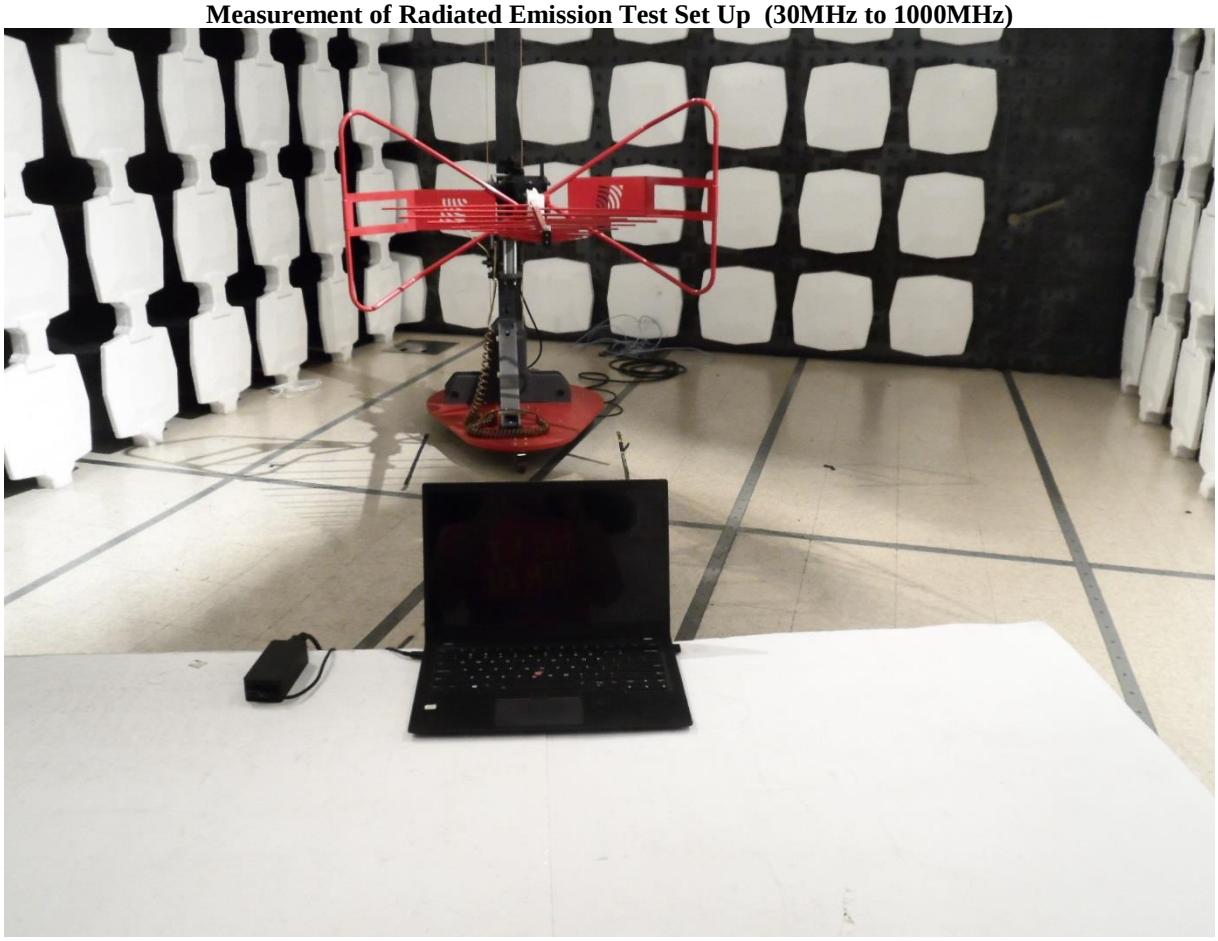
Photographs of EUT

Measurement of Radiated Emission Test Set Up (9kHz to 30MHz)



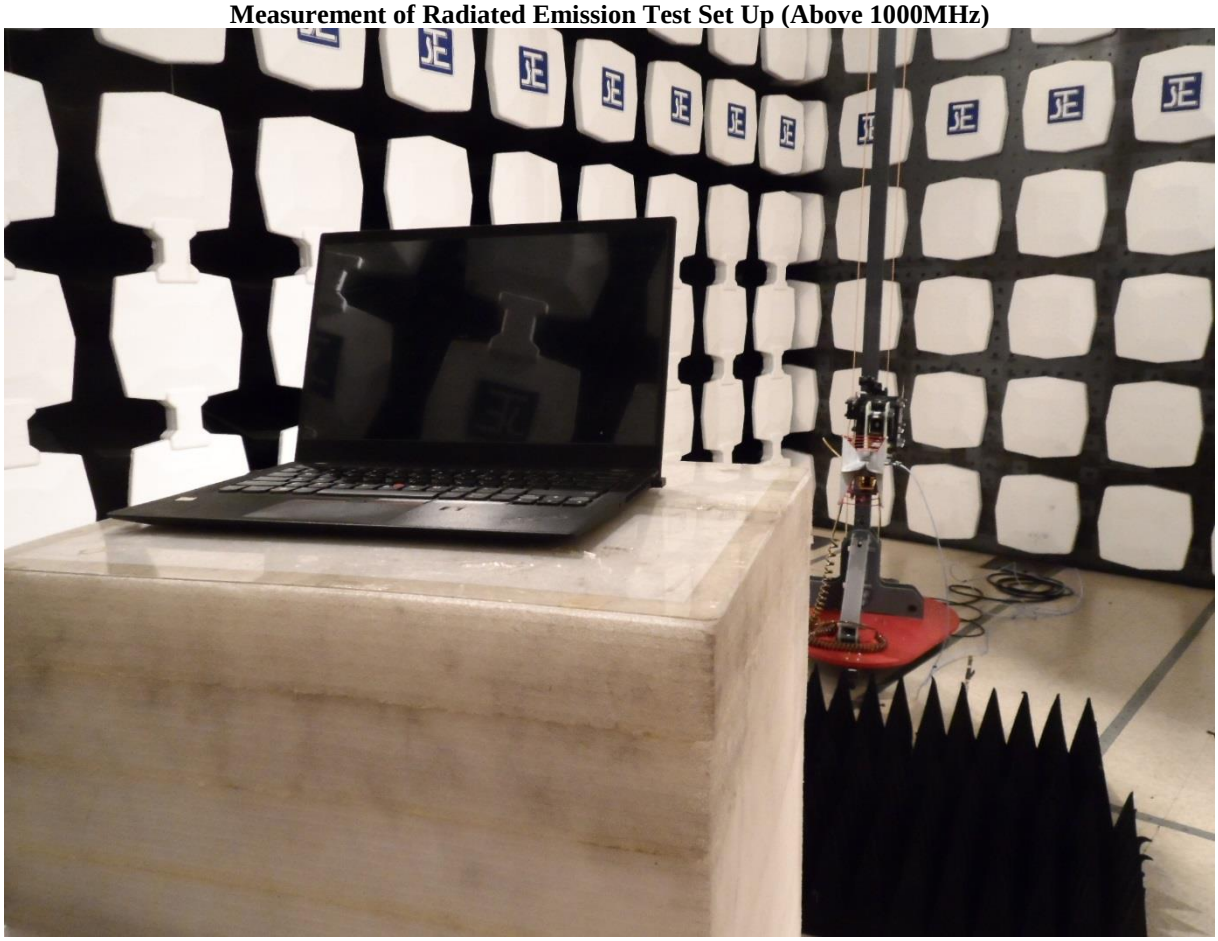
Photographs of EUT

Measurement of Radiated Emission Test Set Up (30MHz to 1000MHz)



Photographs of EUT

Measurement of Radiated Emission Test Set Up (Above 1000MHz)



Photographs of EUT

Measurement of Conducted Emission Test Set Up

******* End of Test Report *******

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by The Hong Kong Standards & Testing Centre Limited (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The Company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. Subject to clause 3, the Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall be at liberty to disclose the testing-related documents and/or files anytime to any third-party accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall attach to the Company's act of disclosure.

4. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.

6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.

7. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

8. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

9. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

12. Issuance records of the Report are available on the internet at www.stc.group. Further enquiry of validity or verification of the Reports should be addressed to the Company.