

FCC Radio Test Report

FCC ID: QISY560-L03

This report concerns (check one): ☒ Original Grant ☐ Class II Change

Project No. : 1505C241A
Equipment : Smart Phone
Model Name : HUAWEI Y560-L03, Y560-L03
Applicant : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt : May 25, 2015
Date of Test : May 25, 2015 ~ Jun. 23, 2015
Issued Date : Jun. 24, 2015
Tested by : BTL Inc.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-3-1505C241	Original report.	Jun. 19, 2015
BTL-FCCP-3-1505C241A	Compared with the previous report (BTL-FCCP-3-1505C241), model HUAWEI Y560-L23, Y560-L23 support dual cards, and now, model HUAWEI Y560-L03, Y560-L03 only support single card, so the radiated emission by worst case has been retested and record in this report, the original models' test results please refer to original report.	Jun. 24, 2015

1. CERTIFICATION

Equipment : Smart Phone
Brand Name : HUAWEI
Model Name : HUAWEI Y560-L03, Y560-L03
Applicant : Huawei Technologies Co., Ltd.
Manufacturer : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, P.R.C
Date of Test : May 25, 2015 ~ Jun. 23, 2015
Test Sample : ENGINEERING SAMPLE
Standard(s) : FCC Part15, Subpart C :2014 (15.247) / ANSI C63.4-2009

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-3-1505C241A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247) , Subpart C				
Standard(s)	Section	Test Item	Judgment	Remark
15.207		Conducted Emission	N/A	NOTE (1)
15.247(d)		Antenna conducted Spurious Emission	N/A	NOTE (1)
15.247(a)(2)		6dB Bandwidth	N/A	NOTE (1)
15.247(b)(3)		Peak Output Power	N/A	NOTE (1)
15.247(e)		Power Spectral Density	N/A	NOTE (1)
15.203		Antenna Requirement	N/A	NOTE (1)
15.209/15.205		Transmitter Radiated Emissions	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this test report.

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r03 (Measurement Guidelines of DTS)

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's test firm number for FCC: 319330

2.2 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. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)	Note
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone	
Brand Name	HUAWEI	
Model Name	HUAWEI Y560-L03, Y560-L03	
Model Difference	Only differ in model name.	
Product Description	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps)
	Bit Rate of Transmitter	
	Output Power (Max.)	-0.41 dBm (1Mbps)
Power Source	#1 DC voltage supplied from AC/DC adapter. Brand / Model: HUAWEI / HW-050100U01 #2 Supplied from battery. Brand / Model: HUAWEI / HB474284RBC	
Power Rating	#1 I/P: 100-240V~ 50/60H 0.2A O/P: DC 5V 1A #2 DC 3.8V 2000mAh	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	-1.5

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode NOTE (1)

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode Note (1)

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) Both adapter and battery are evaluated, operated the adapter is the worst and recorded as below test data
- (3) The EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test

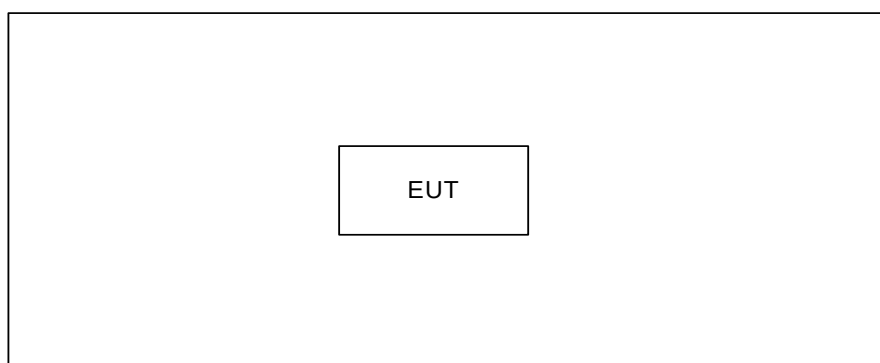
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN

Test Software Version	0		
Frequency (MHz)	2402	2440	2480
BT LE	NA	NA	NA

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated TX Mode:



3.5 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	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
-	-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	

Note:

- (1) For detachable type I/O cable should be specified the length in m in 『Length』 column.

4. EMC EMISSION TEST

4.1 RADIATED EMISSION LIMITS

20dB 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.

LIMITS OF RADIATED EMISSION MEASUREMENT (9KHz-1000MHz)

Frequency (MHz)	Field Strength (microvolts/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
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
 Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	RBW 1MHz VBW 3MHz peak detector for Pk value RMS detector for AV value

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz~110KHz for QP detector
Start ~ Stop Frequency	110KHz~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2 TEST PROCEDURE

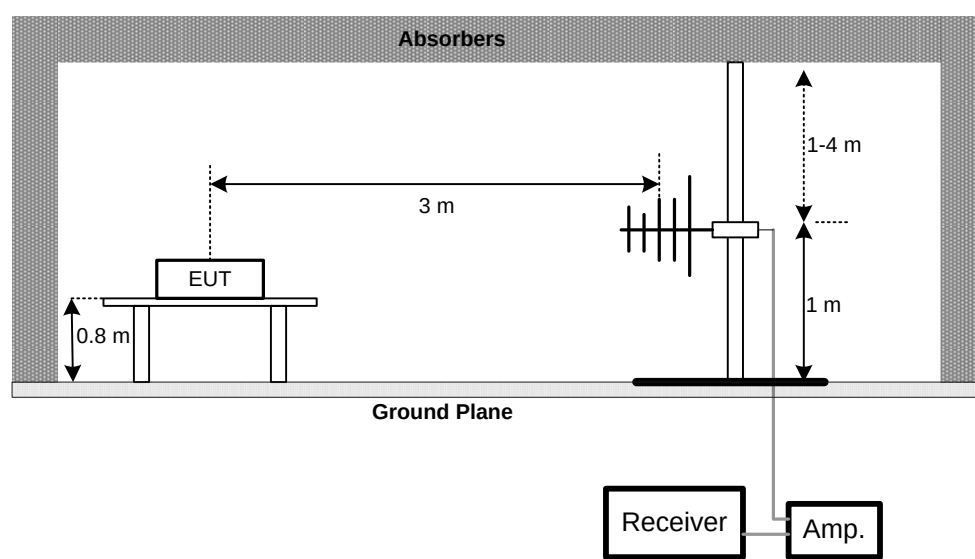
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- 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.
- 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.
- 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.3 DEVIATION FROM TEST STANDARD

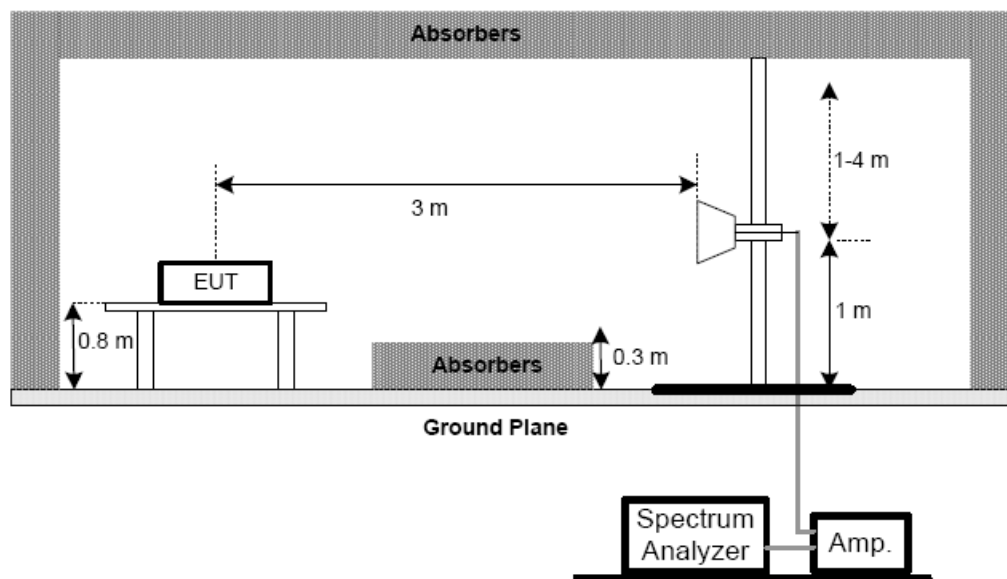
No deviation

4.4 TEST SETUP

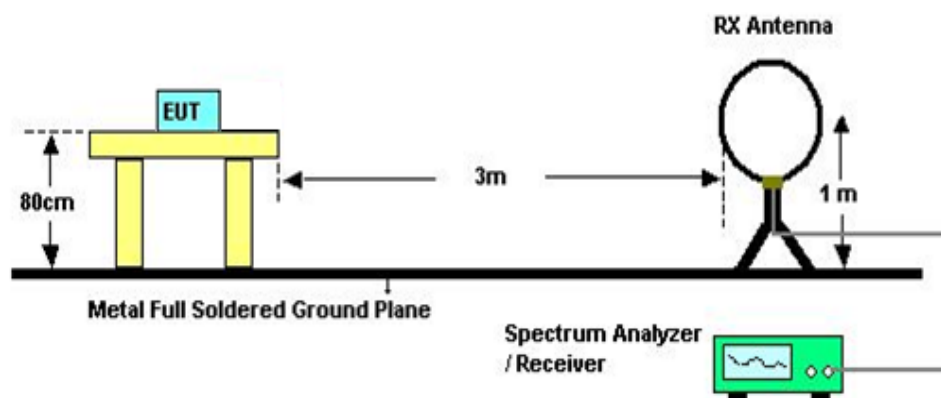
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



4.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.6 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

4.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment A

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.8 TEST RESULTS (30MHZ TO 1000 MHZ)

Please refer to the Attachment B.

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

4.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment C.

Remark:

- (1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

5. MEASUREMENT INSTRUMENTS LIST

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 17, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 01, 2015
5	Controller	CT	SC100	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Antenna	ETS	3115	00075789	Mar. 28, 2016
8	Amplifier	Agilent	8449B	3008A02274	Nov. 02, 2015
9	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
10	Test Cable	N/A	C-68	N/A	Jul. 01, 2015
11	Controller	CT	SC100	N/A	N/A
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
13	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 16, 2015

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

ATTACHMENT A - RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode: TX Mode

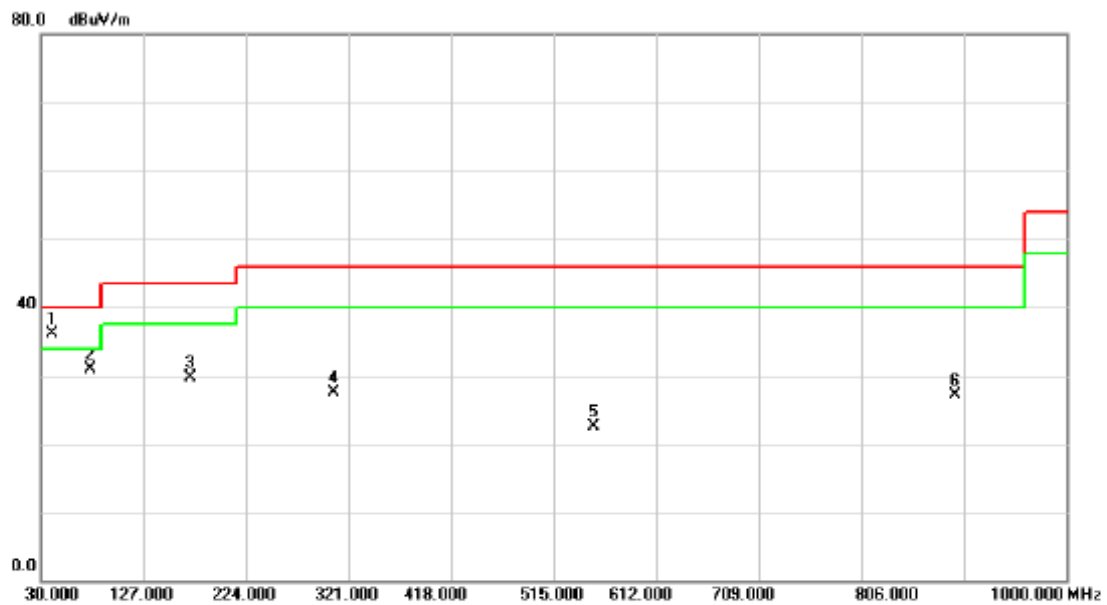
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0169	0°	13.62	24.50	38.12	123.05	-84.93	AVG
0.0169	0°	14.73	24.50	39.23	143.05	-103.82	PK
0.0372	0°	6.79	23.21	30.00	116.19	-86.19	AVG
0.0372	0°	7.73	23.21	30.94	136.19	-105.25	PK
0.0384	0°	3.75	23.13	26.88	115.92	-89.03	AVG
0.0384	0°	5.68	23.13	28.81	135.92	-107.10	PK
0.0483	0°	0.79	22.51	23.30	113.93	-90.63	AVG
0.0483	0°	3.23	22.51	25.74	133.93	-108.19	PK
2.0672	0°	30.72	19.46	50.18	69.54	-19.36	QP
3.3691	0°	21.85	18.94	40.79	69.54	-28.75	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0167	90°	13.75	24.30	38.05	123.15	-85.10	AVG
0.0167	90°	14.59	24.30	38.89	143.15	-104.26	PK
0.0375	90°	6.53	23.19	29.72	116.12	-86.40	AVG
0.0375	90°	8.94	23.19	32.13	136.12	-103.99	PK
0.0392	90°	3.73	23.08	26.81	115.74	-88.92	AVG
0.0392	90°	5.62	23.08	28.70	135.74	-107.03	PK
0.0676	90°	0.78	22.05	22.83	111.01	-88.18	AVG
0.0676	90°	2.93	22.05	24.98	131.01	-106.03	PK
2.0583	90°	30.64	19.47	50.11	69.54	-19.43	QP
3.2478	90°	21.63	18.92	40.55	69.54	-28.99	QP

ATTACHMENT B - RADIATED EMISSION (30MHZ TO 1000MHZ)

Test Mode: TX 2402MHz -CH00

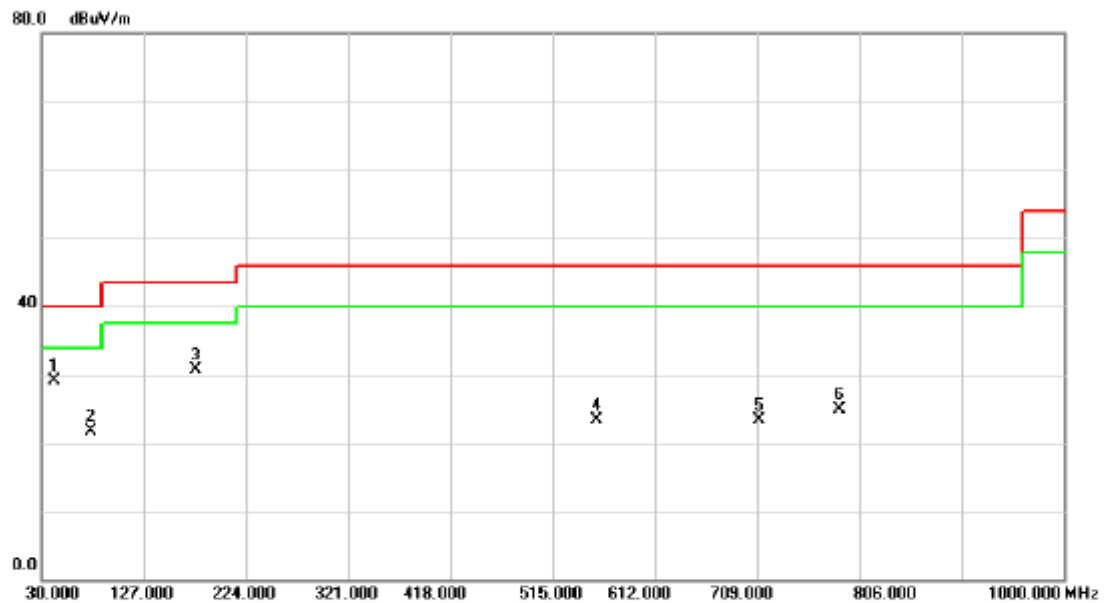
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	40.9400	49.87	-13.83	36.04	40.00	-3.96	peak	
2		77.5300	47.28	-16.47	30.81	40.00	-9.19	peak	
3		171.6200	42.55	-12.89	29.66	43.50	-13.84	peak	
4		307.4200	38.07	-10.63	27.44	46.00	-18.56	peak	
5		553.8000	27.89	-5.35	22.54	46.00	-23.46	peak	
6		894.2700	27.16	-0.06	27.10	46.00	-18.90	peak	

Test Mode: TX 2402MHz -CH00

Horizontal

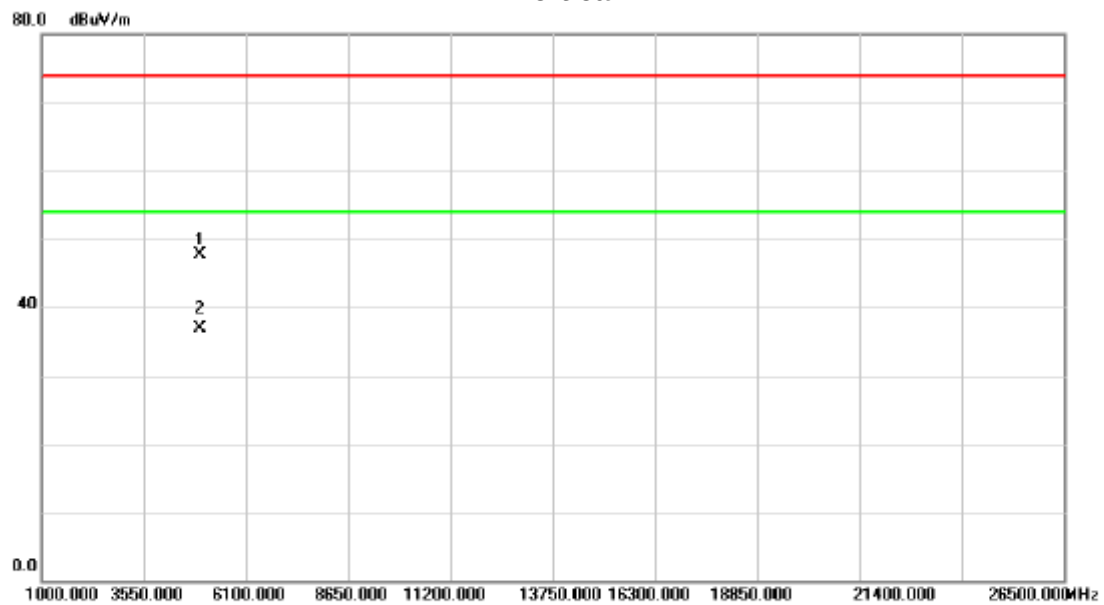


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	41.6400	42.79	-13.72	29.07	40.00	-10.93	peak	
2		76.5600	38.18	-16.40	21.78	40.00	-18.22	peak	
3		176.4700	43.66	-12.92	30.74	43.50	-12.76	peak	
4		557.6800	28.89	-5.56	23.33	46.00	-22.67	peak	
5		710.9400	27.62	-4.29	23.33	46.00	-22.67	peak	
6		786.6000	27.75	-2.75	25.00	46.00	-21.00	peak	

ATTACHMENT C - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode:	TX 2480MHz –CH39

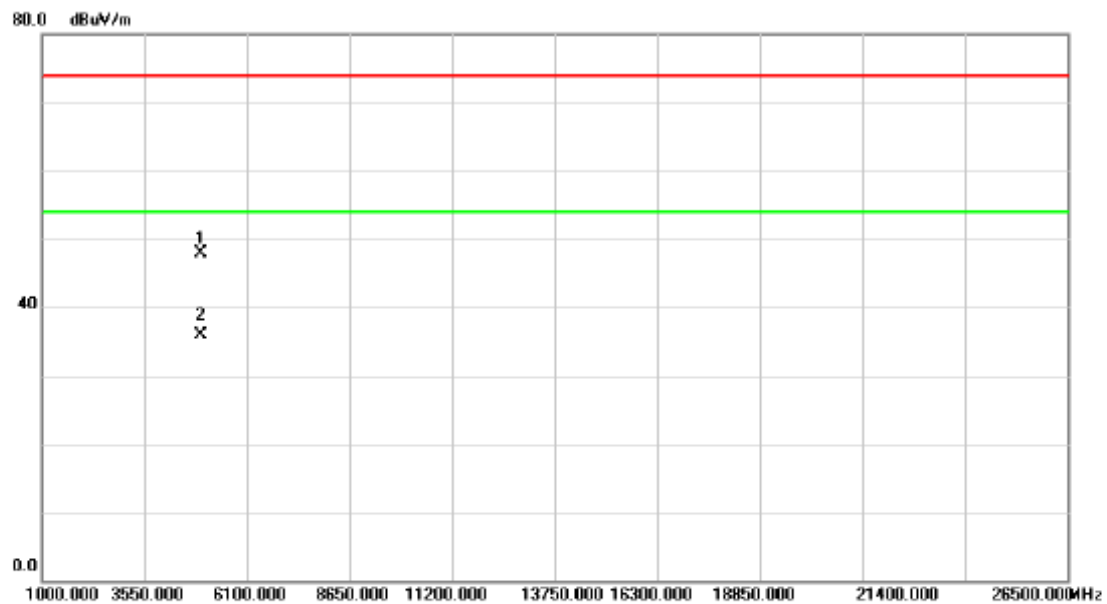
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4961.360	41.48	6.24	47.72	74.00	-26.28	peak	
2	*	4961.680	30.57	6.24	36.81	54.00	-17.19	AVG	

Orthogonal Axis :	X
Test Mode:	TX 2480MHz –CH39

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4956.150	41.73	6.22	47.95	74.00	-26.05	peak	
2	*	4961.240	29.61	6.24	35.85	54.00	-18.15	AVG	