

# FCC Radio Test Report FCC ID: PUWJSHT-2K14-RC2

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

**Issued Date**: Nov. 11, 2013 **Project No.**: 1310C010

**Equipment**: RF Control Transmitter

Model Name: YKF352-001; YKF351 series; YKF352 series

Applicant : Jiangsu Huitong Group Co., Ltd.Address : No.24,Block 2,Taohuawu New District,

Zhenjiang, Jiangsu, P.R.C

**Tested by:** Neutron Engineering Inc. EMC Laboratory

Date of Receipt: Oct. 24, 2013

Date of Test: Oct. 24, 2013~ Nov. 08, 2013

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# REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
NEI-FCCP-1-1310C010	Original Issue.	Nov. 11, 2013
-	-	-

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#### 1. CERTIFICATION

Equipment : RF Control Transmitter

Brand Name : Philips

Model Name : YKF352-001; YKF351 series; YKF352 series

Applicant : Jiangsu Huitong Group Co., Ltd. Manufacturer : Jiangsu Huitong Group Co., Ltd.

Address : No.24, Block 2, Taohuawu New District, Zhenjiang, Jiangsu, P.R.C

Factory : Jiangsu Huitong Group Co., Ltd.

Address : No.24, Block 2, Taohuawu New District, Zhenjiang, Jiangsu, P.R.C

Date of Test : Oct. 24, 2013~ Nov. 08, 2013

Test Sample : Engineering Sample

Standard(s) : FCC Part15(2012), Subpart C(15.247) / ANSI C63.4-2009

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1310C010) 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).

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# 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC P	art15 (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	PASS	
15.247(a)(2)	6dB Bandwidth	PASS	
15.247(b)(3)	Peak Output Power	PASS	
15.247(e)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
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 v03r01 (Measurement Guidelines of DTS)

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#### 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-CB03** at the location of No.3, Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792 Neutron's test firm number is 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 reported uncertainty of measurement y  $\pm$  U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %  $\circ$ 

#### A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

#### B. Radiated Measurement:

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

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# 3. GENERAL INFORMATION

# 3.1 GENERAL DESCRIPTION OF EUT

Equipment	RF Control Transmitter		
Brand Name	Philips		
Model Name	YKF352-001; YKF351 se	ries; YKF352 series	
Model Difference	Only differ in appearance	).	
Product Description	Operation Frequency Modulation Technology Bit Rate of Transmitter Number Of Channel Antenna Designation Antenna Gain(Peak) Output Power (Max.)  More details of EUT tech User's Manual.	2425~2475 MHz RF4CE 250Kbps 3 CH, Please see note 2.(Page 10) Please see note 3.(Page 10) -3.75 dBm  nical specification, please refer to the	
Power Source	DC voltage supplied from 2*AAA battery.		
Power Rating	DC 3V		
Connecting I/O Port(s)	Please refer to the User's Manual		

#### Note:

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

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2.

Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2425	02	2450	03	2475

# 3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	<b>P</b> partron	SDBTPTR3 015	Printed Antenna	N/A	1.99

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#### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible 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	Low – 2425MHz
Mode 2	Middle – 2450MHz
Mode 3	High -2475MHz

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

For Conducted Test			
Final Test Mode Description			
-	"N/A" denotes test is not applicable in this test report.		

For Radiated Test		
Final Test Mode	Description	
Mode 1	Low – 2425MHz	
Mode 2	Middle – 2450MHz	
Mode 3	High -2475MHz	

Note:

(1) The measurements are performed at the high, middle, low available channels.

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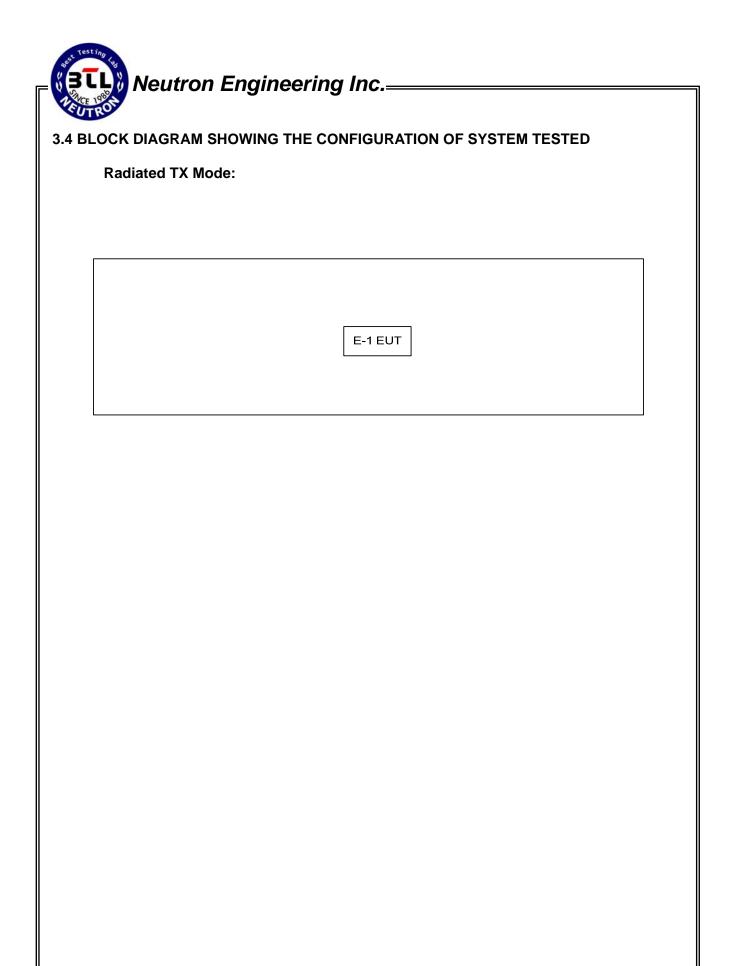


#### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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	N/A		
Frequency	2425 MHz	2450 MHz	2475 MHz
Parameters	N/A	N/A	N/A

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#### 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
E-1	RF Control Transmitter	Philips	YKF352-001	PUWJSHT-2K14- RC2	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
-	-	ı	1	

# Note:

(1) For detachable type I/O cable should be specified the length in m in <code>"Length"</code> column.

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# 4. EMC EMISSION TEST

# **4.1 CONDUCTED EMISSION MEASUREMENT**

# 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

EDEOLIENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
FREQUENCY (MHz)	Quasi-peak	Average	Quasi-peak	Average	Statiuatu
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

#### 4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Apr. 25, 2014
2	LISN	R&S	ENV216	100087	Nov.16, 2013
3	Test Cable	N/A	C_17	N/A	Mar.15, 2014
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	Apr. 25, 2014
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Apr. 25, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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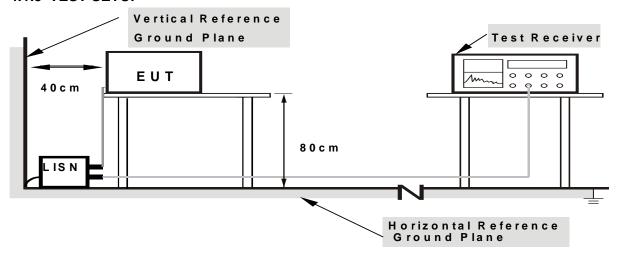
#### 4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



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

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

#### 4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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#### 4.1.7 TEST RESULTS

EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	-	Relative Humidity:	-
Test Power:	-	Phase:	-
Test Mode :	N/A		

#### Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note ... If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform on this case, a " \* " marked in AVG Mode column of Interference Voltage Measured on the North AVG Mode column of Interference Voltage Measured on
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) "N/A" denotes test is not applicable in this test report.

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#### 4.2 RADIATED EMISSION MEASUREMENT

## 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(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)

EDECLIENCY (MHz)	(dBuV/m) (at 3m)		
FREQUENCY (MHz)	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).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB	ANALIS / ANALIS for Dools A MUSS / AOUS for Average
(Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

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

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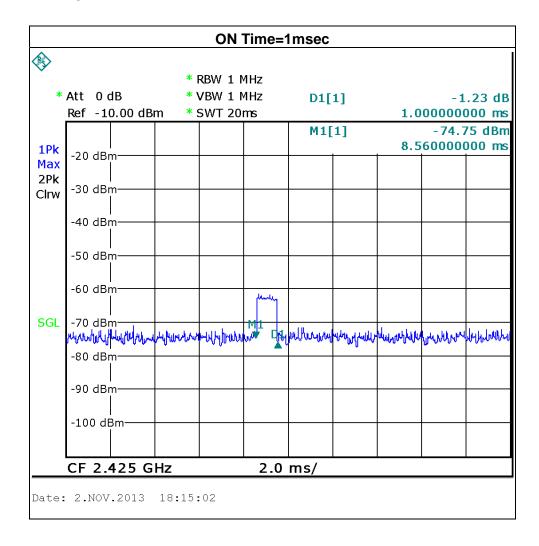
Channel: TX 2425MHz

Duty Cycle= $T_{ON}/(T_{ON}+T_{OFF})$ 

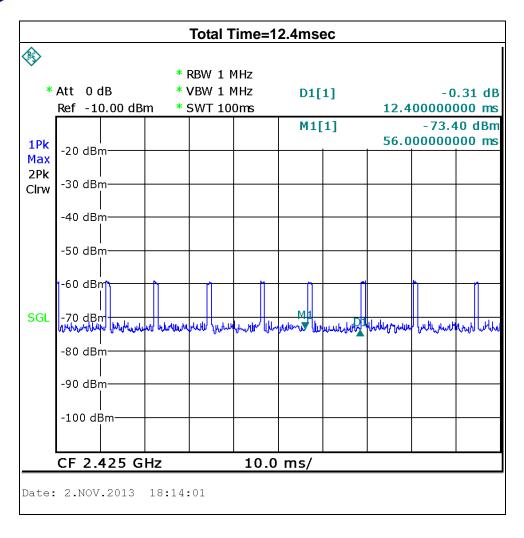
Duty Cycle=1/12.4

Average = Peak value +20log (Duty cycle)

Final AV=PK-21.87



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#### 4.2.2 MEASUREMENT INSTRUMENTS LIST ANS SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Apr. 25, 2014
2	Amplifier	HP	8447D	2944A09673	Apr. 25, 2014
3	Test Receiver	R&S	ESCI	100382	Apr. 25, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 02, 2014
5	Antenna	ETS	3115	00075789	Apr. 25, 2014
6	Amplifier	Agilent	8449B	3008A02274	Apr. 25, 2014
7	Spectrum	Agilent	E4408B	US39240143	Nov.16, 2013
8	Test Cable	HUBER+SUHNER	C-45	N/A	Apr. 30, 2014
9	Controller	СТ	SC100	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	Apr. 25, 2014
11	Active Loop Antenna R&S		HFH2-Z2	830749/020	Apr. 25, 2014
12	Broad-Band Horn Antenna Schwarzbeck		BBHA 9170	9170319	Oct.11, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

#### **4.2.3 TEST PROCEDURE**

- a. 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)
- b. 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)
- c. 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.
- d. 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.
- e. 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.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.2.4 DEVIATION FROM TEST STANDARD

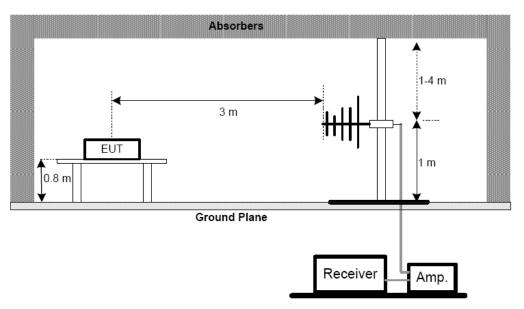
No deviation

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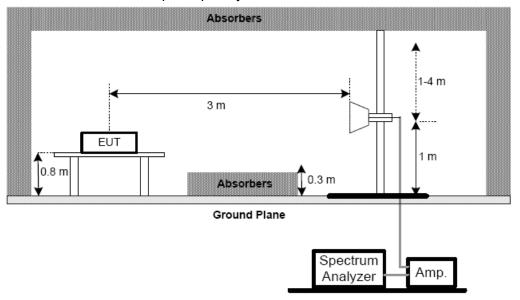


# 4.2.5 TEST SETUP

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



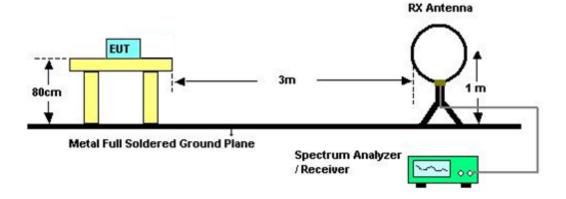
(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



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(C) For radiated emissions below 30MHz



# **4.2.6 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

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# 4.2.7 TEST RESULTS (BELOW 30MHZ)

EUT:	RF Control Transmitter	Model Name:	YKF352-001			
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %			
Test Voltage:	DC 3V					
Test Mode:	TX MODE					

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	(MHz) 0°/90° (dBuV)		(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
0.0213	0°	16.52	24.22	40.74	121.04	-80.30	AVG
0.0213	0°	18.19	24.22	42.41	141.04	-98.63	PK
0.0279	0°	17.15	23.80	40.95	118.69	-77.74	AVG
0.0279	0°	19.03	23.80	42.83	138.69	-95.86	PK
0.0331	0°	17.16	23.47	40.63	117.21	-76.58	AVG
0.0331	0°	20.08	23.47	43.55	137.21	-93.66	PK
0.0528	0°	18.47	22.34	40.81	113.15	-72.34	AVG
0.0528	0°	21.55	22.34	43.89	133.15	-89.26	PK
0.3170	0°	18.36	20.24	38.60	97.58	-58.98	AVG
0.3170	0°	21.05	20.24	41.29	117.58	-76.29	PK
1.5250	0°	18.73	19.55	38.28	63.94	-25.66	QP

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Note
0.0175	90°	17.64	24.30	41.94	122.74	-80.80	AVG
0.0175	90°	19.24	24.30	43.54	142.74	-99.20	PK
0.0267	90°	16.91	23.88	40.79	119.07	-78.29	AVG
0.0267	90°	18.35	23.88	42.23	139.07	-96.85	PK
0.0372	90°	20.13	23.21	43.34	116.19	-72.85	AVG
0.0372	90°	21.78	23.21	44.99	136.19	-91.20	PK
0.0515	90°	20.25	22.37	42.62	113.37	-70.75	AVG
0.0515	90°	23.41	22.37	45.78	133.37	-87.59	PK
0.3270	90°	18.48	20.22	38.70	97.31	-58.62	AVG
0.3270	90°	20.72	20.22	40.94	117.31	-76.38	PK
1.6750	90°	18.63	19.53	38.16	63.12	-24.96	QP

#### 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 (specific distance / test distance) (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

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# **4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHZ)**

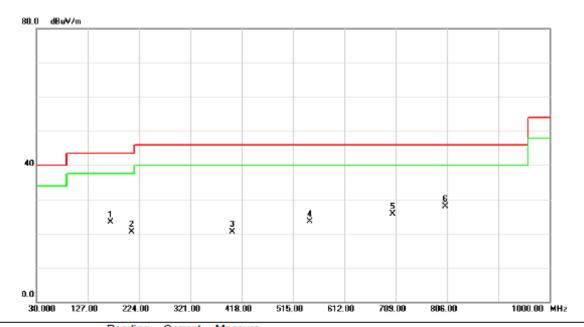
#### Remark:

- (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 =  $0.3 \text{ sec./MHz} \circ$
- (2) All readings are Peak unless otherwise stated QP in column of  $\lceil$ Note $_{
  m J}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{
  m O}$
- (3) Measuring frequency range from 30MHz to 1000MHz o
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table  $\circ$

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EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %
Test Voltage:	DC 3V	Polarization:	Vertical
Test Mode:			

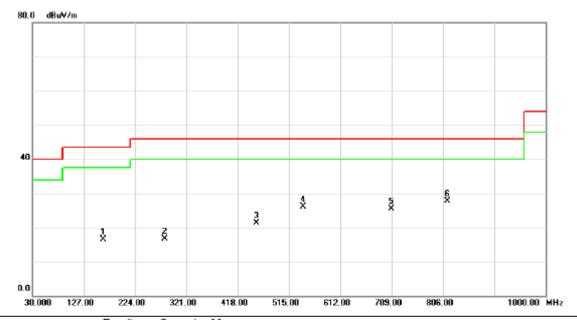


		MHz					Over		
			dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	1	70.6500	36.20	-12.86	23.34	43.50	-20.16	peak	
2	2	10.4200	35.53	-15.05	20.48	43.50	-23.02	peak	
3	4	00.5400	30.29	-9.77	20.52	46.00	-25.48	peak	
4	5	46.0400	29.69	-6.22	23.47	46.00	-22.53	peak	
5	7	03.1800	30.12	-4.46	25.66	46.00	-20.34	peak	
6 '	* 8	02.1200	29.57	-1.72	27.85	46.00	-18.15	peak	

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EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %
Test Voltage:	DC 3V	Polarization:	Horizontal
Test Mode:	TX MODE 2425MHz		

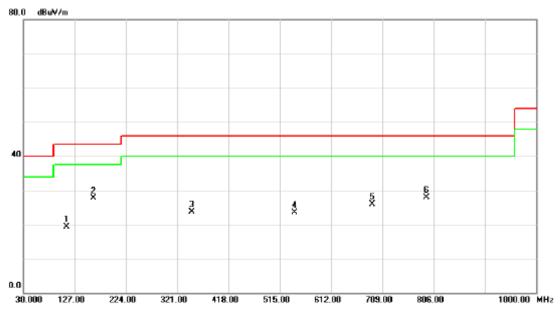


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		163.8600	29.30	-12.78	16.52	43.50	-26.98	peak	
2		280.2600	29.13	-12.52	16.61	46.00	-29.39	peak	
3	-	452.9200	30.14	-8.81	21.33	46.00	-24.67	peak	
4		541.1900	32.76	-6.68	26.08	46.00	-19.92	peak	
5		708.0300	30.06	-4.56	25.50	46.00	-20.50	peak	
6	*	814.7300	29.97	-2.36	27.61	46.00	-18.39	peak	

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EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %
Test Voltage:	DC 3V	Polarization:	Vertical
Test Mode:	TX MODE 2450MHz		

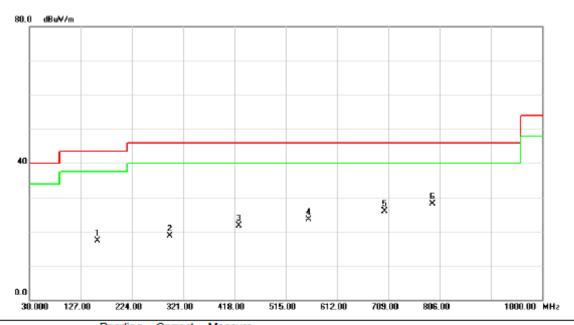


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		111.4800	34.19	-14.95	19.24	43.50	-24.26	peak	
2	*	162.8900	40.50	-12.78	27.72	43.50	-15.78	peak	
3		349.1300	35.03	-11.35	23.68	46.00	-22.32	peak	
4		543.1300	30.06	-6.50	23.56	46.00	-22.44	peak	
5		689.6000	30.59	-4.72	25.87	46.00	-20.13	peak	
6		792.4200	30.08	-2.17	27.91	46.00	-18.09	peak	

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EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %
Test Voltage:	DC 3V	Polarization:	Horizontal
Test Mode:	TX MODE 2450MHz		

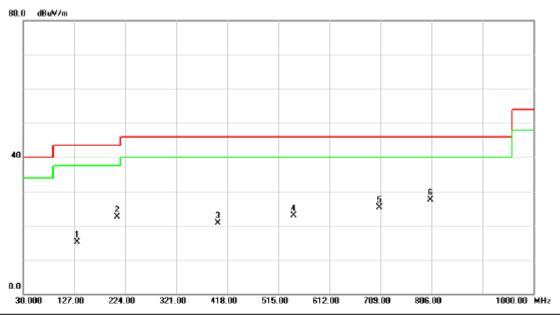


	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
_			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
_	1		158.0400	30.18	-12.90	17.28	43.50	-26.22	peak	
_	2		295.7800	29.96	-11.28	18.68	46.00	-27.32	peak	
_	3		426.7300	30.82	-9.21	21.61	46.00	-24.39	peak	
_	4		557.6800	29.70	-6.21	23.49	46.00	-22.51	peak	
_	5		702.2100	30.37	-4.45	25.92	46.00	-20.08	peak	
	6	*	792.4200	30.29	-2.17	28.12	46.00	-17.88	peak	

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EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %
Test Voltage:	DC 3V	Polarization:	Vertical
Test Mode:	TX MODE 2475MHz		

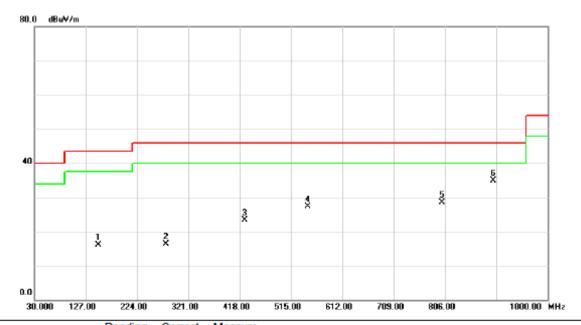


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		132.8200	29.07	-14.05	15.02	43.50	-28.48	peak	
2		209.4500	37.61	-15.09	22.52	43.50	-20.98	peak	
3		400.5400	30.55	-9.77	20.78	46.00	-25.22	peak	
4		544.1000	29.38	-6.41	22.97	46.00	-23.03	peak	
5		707.0600	29.91	-4.54	25.37	46.00	-20.63	peak	
6	*	804.0600	29.26	-1.82	27.44	46.00	-18.56	peak	

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EUT:	RF Control Transmitter	Model Name:	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	54 %
Test Voltage:	DC 3V	Polarization:	Horizontal
Test Mode:	TX MODE 2475MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		151.2500	29.60	-13.43	16.17	43.50	-27.33	peak	
2		278.3200	29.02	-12.80	16.22	46.00	-29.78	peak	
3		427.7000	32.58	-9.19	23.39	46.00	-22.61	peak	
4		546.0400	33.54	-6.22	27.32	46.00	-18.68	peak	
5		800.1800	30.07	-1.62	28.45	46.00	-17.55	peak	
6	*	897.1800	34.62	0.37	34.99	46.00	-11.01	peak	

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## 4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	24 ℃	Relative Humidity:	51 %
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE 2425MHz		

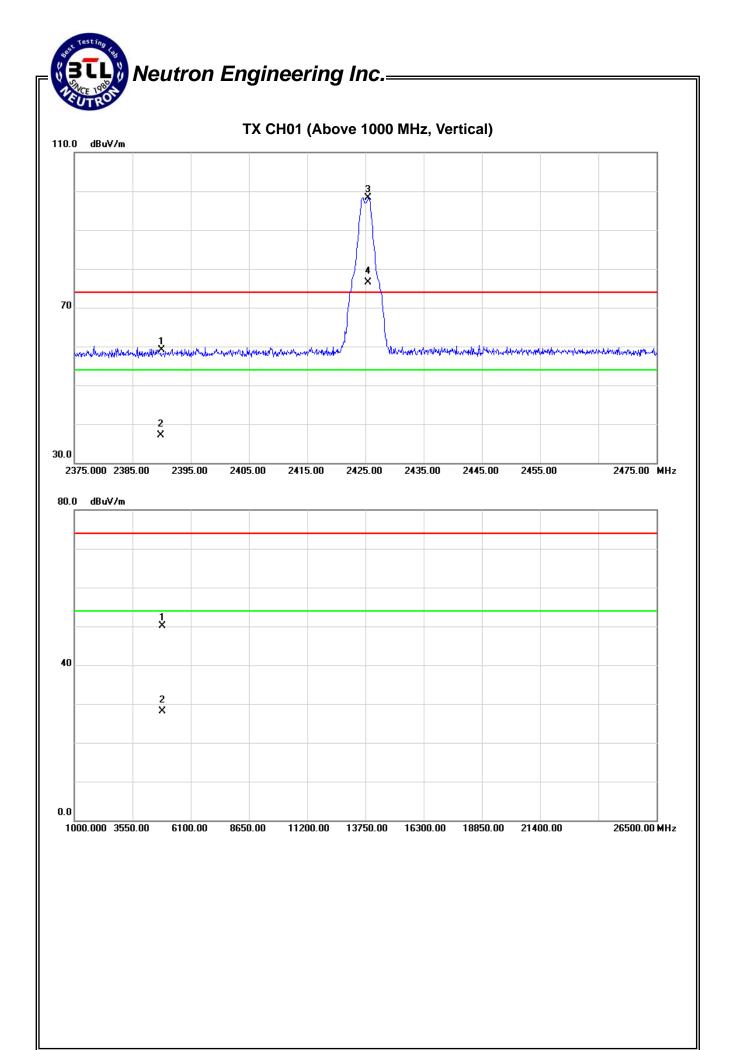
Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	nit	
	Ant.i oi.	Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	24.92	3.06	34.09	59.01	37.15	74.00	54.00	X/E
2425.50	V	64.07	42.21	34.20	98.27	76.41			X/F
4850.04	V	43.52	21.66	6.54	50.06	28.20	74.00	54.00	X/H

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of  $\lceil$ Note $_{
  m J}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{
  m O}$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

  Average = Peak value + 20log(Duty cycle) , Final AV=PK-21.87

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EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	51 %
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE 2425MHz		

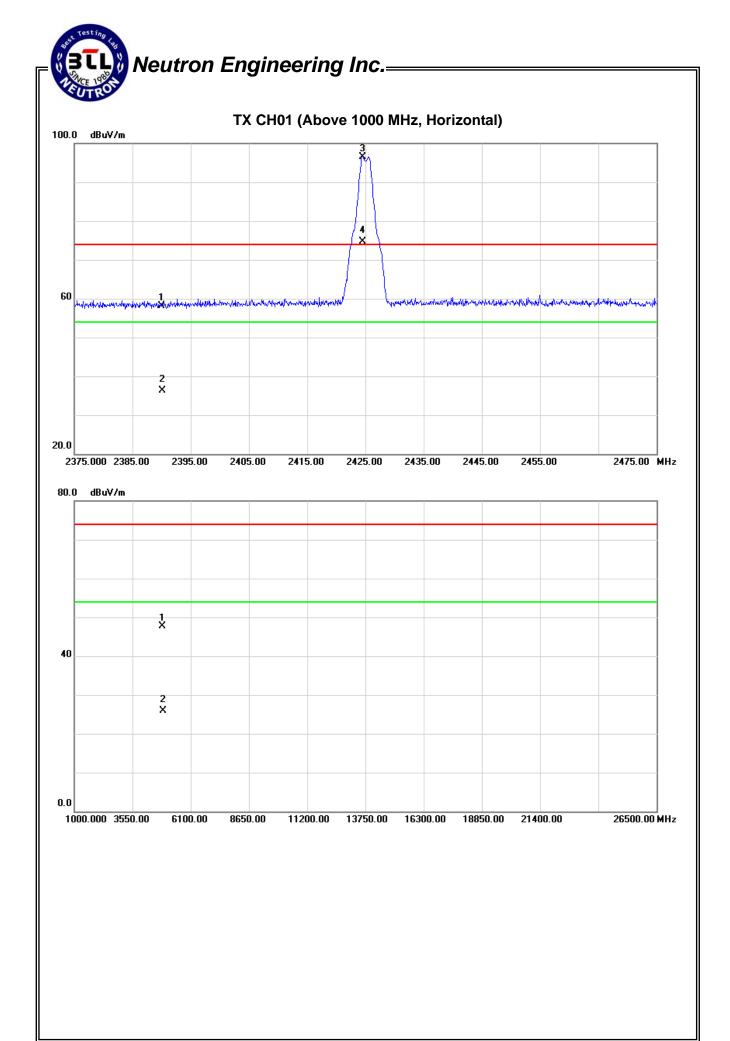
Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	nit	
	Ant.i oi.	Peak	AV	Ant./Of	Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	Н	24.00	2.14	34.09	58.09	36.23	74.00	54.00	X/E
2424.50	Н	62.41	40.55	34.19	96.60	74.74			X/F
4851.78	Н	41.19	19.33	6.54	47.73	25.87	74.00	54.00	X/H

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of  $\lceil$ Note $_{
  m J}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{
  m O}$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

  Average = Peak value + 20log(Duty cycle) , Final AV=PK-21.87

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EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	51 %
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE 2450MHz		

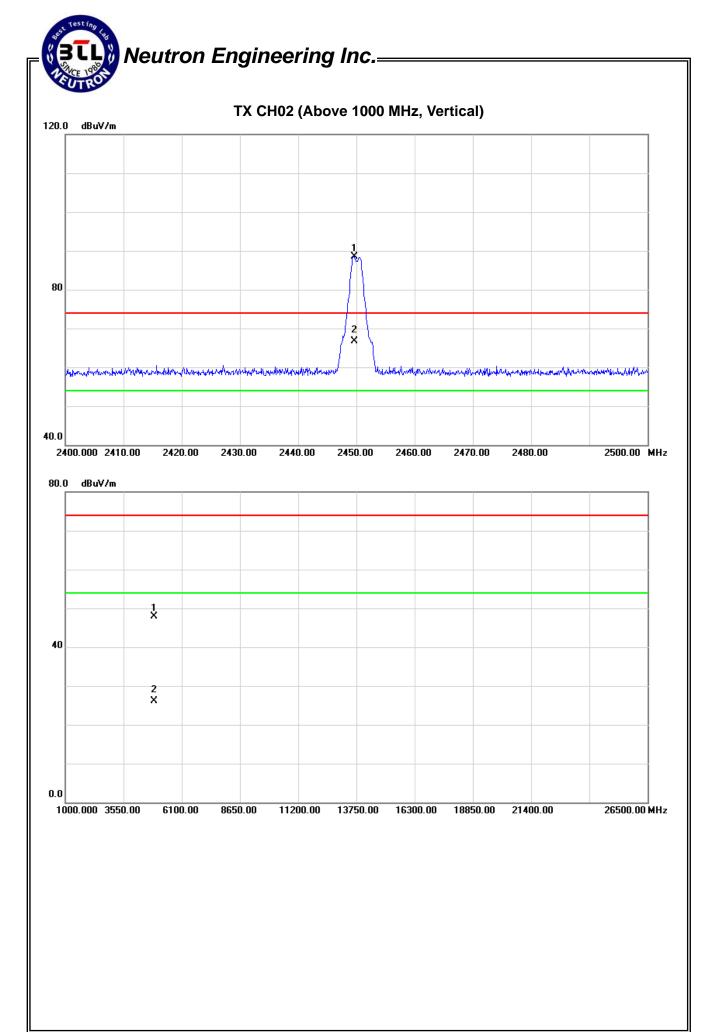
Freq.	Ant.Pol.	Rea	ding	Ant./CF	Ad	ct.	Lir	nit	
	Ant.i oi.	Peak	AV	Ant./Ci	Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2449.60	V	54.27	32.41	34.27	88.54	66.68			X/F
4901.20	V	41.33	19.47	6.67	48.00	26.14	74.00	54.00	X/H

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of  ${}^{\mathbb{F}}$ Note $_{\mathbb{J}}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{\circ}$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

  Average = Peak value + 20log(Duty cycle) , Final AV=PK-21.87

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EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	51 %
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE 2450MHz		

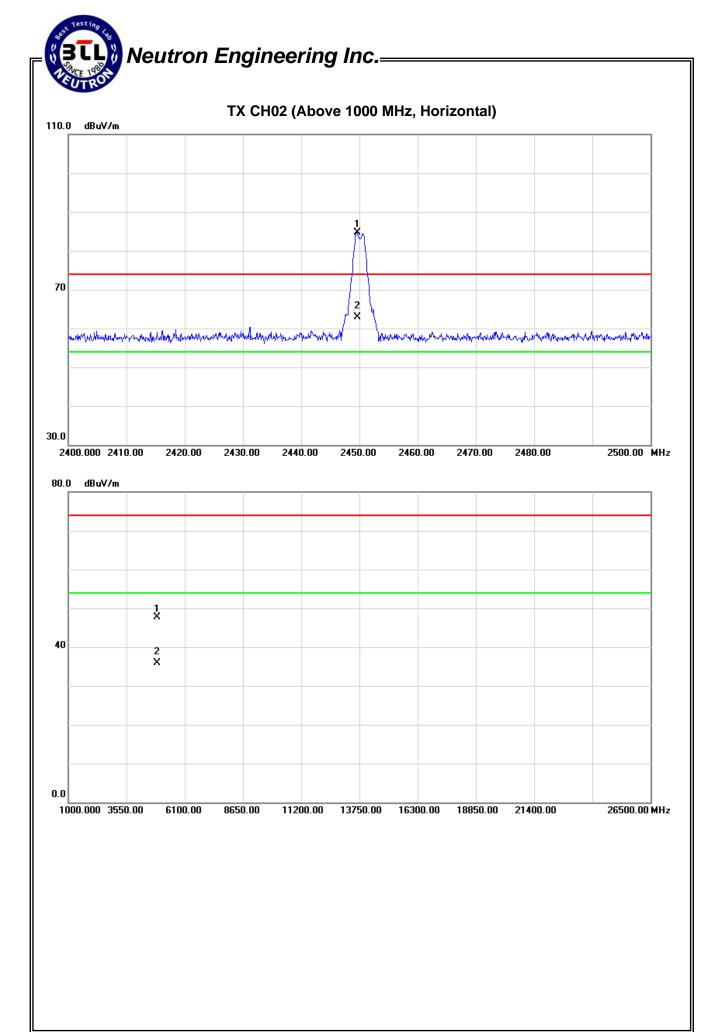
Freq.	Ant.Pol.	Rea	ding	Ant /CE	Ant./CF Act.		Limit		
	AIILFUI.	Peak	AV	Ant./Ci	Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2449.60	Н	50.40	28.54	34.27	84.67	62.81			X/F
4900.15	Н	40.99	29.19	6.67	47.66	35.86	74.00	54.00	X/H

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of  ${}^{\mathbb{F}}$ Note $_{\mathbb{J}}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{\circ}$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ∘
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

  Average = Peak value + 20log(Duty cycle) , Final AV=PK-21.87

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EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	51 %
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE 2475MHz		

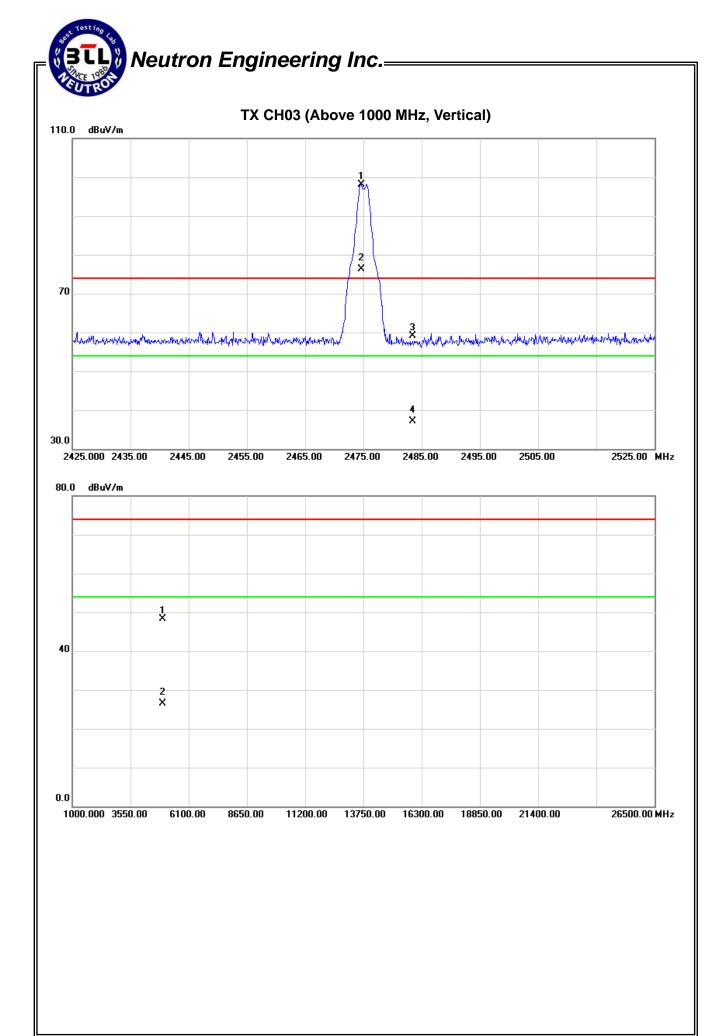
Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	mit	
		Peak	AV	Ant./Ci	Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2474.60	V	63.86	42.00	34.34	98.20	76.34			X/F
2483.50	V	24.69	2.83	34.37	59.06	37.20	74.00	54.00	X/E
4950.04	V	41.48	19.62	6.82	48.30	26.44	74.00	54.00	X/H

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of  $\lceil$ Note $_{
  m J}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{
  m O}$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

  Average = Peak value + 20log(Duty cycle) , Final AV=PK-21.87

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EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	51 %
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE 2475MHz		

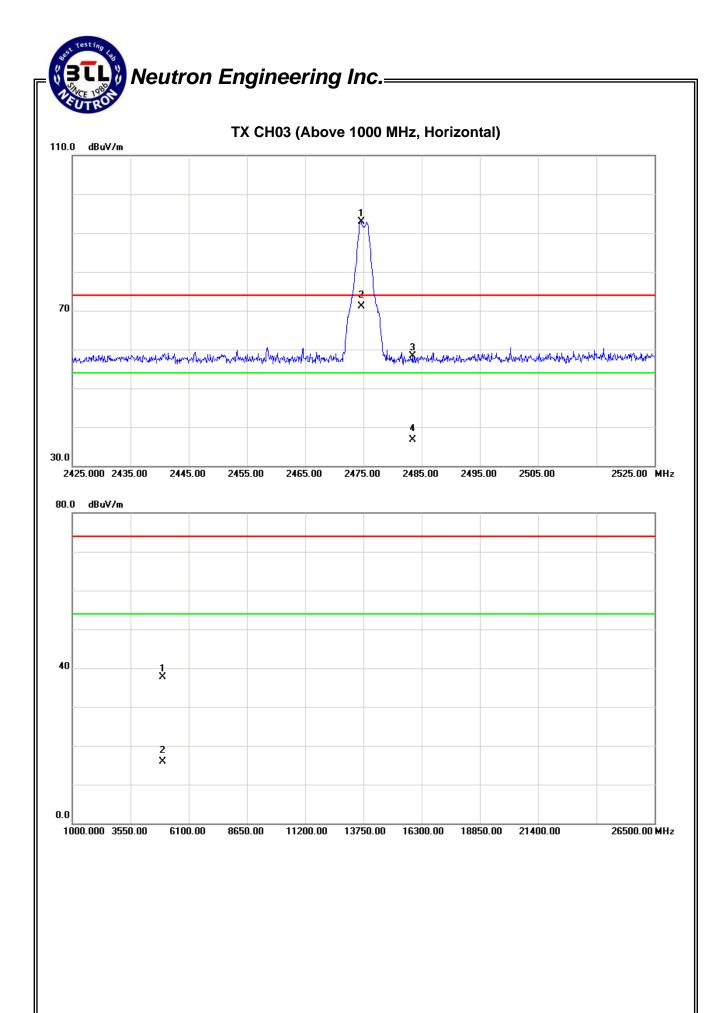
Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	mit		
		Peak	AV	Ant./Ci	Peak	AV	Peak	AV	Note	
(MHz	<u>z)</u>	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2474.0	60	Н	58.56	36.70	34.34	92.90	71.04			X/F
2483.5	50	Н	24.01	2.24	34.37	58.38	36.61	74.00	54.00	X/E
4950.3	38	Н	30.91	9.05	6.82	37.73	15.87	74.00	54.00	X/H

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of  $\lceil$ Note $_{
  m J}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{
  m O}$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

  Average = Peak value + 20log(Duty cycle) , Final AV=PK-21.87

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## 5. BANDWIDTH TEST

## 5.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Frequency Range (MHz)	Result			
15.247(a)(2)	Bandwidth	2400-2483.5	PASS			

#### **5.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.16, 2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

#### **5.1.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

#### **5.1.3 DEVIATION FROM STANDARD**

No deviation.

#### 5.1.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

## **5.1.5 EUT OPERATION CONDITIONS**

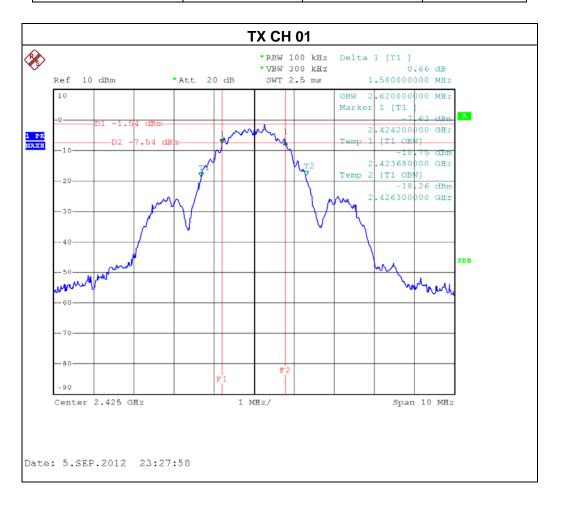
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

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## **5.1.6 TEST RESULTS**

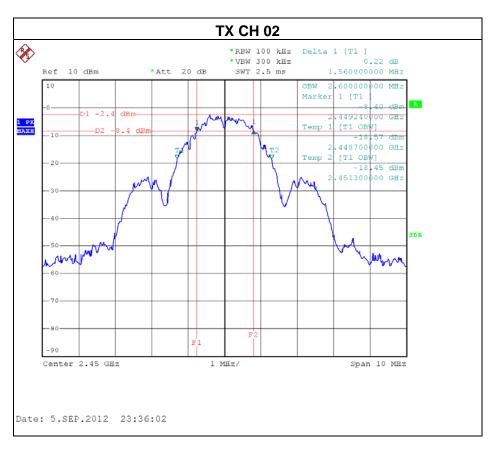
EUT:	RF Control Transmitter	Model Name. :	YKF352-001		
Temperature:	<b>24</b> ℃	Relative Humidity:	60 %		
Pressure:	1016 hPa	Test Voltage :	DC 3V		
Test Mode :	TX MODE /CH01, CH02, CH03				

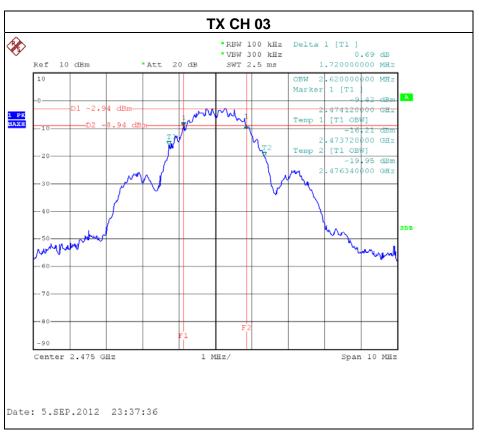
Test Channel	Frequency (MHz)	Bandwidth (MHz)	Result
CH01	2425	1.58	PASS
CH02	2450	1.56	PASS
CH03	2475	1.72	PASS



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## 6. MAXIMUM OUTPUT POWER TEST

## 6.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C								
Section	Test Item	Limit	Frequency Range (MHz)	Result				
15.247(b)(3)	Maximum Output Power	1 watt or 30dBm	2400-2483.5	PASS				

## **6.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Apr.25.2014
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Apr.25.2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

#### **6.1.2 TEST PROCEDURE**

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- b. The maximum peak conducted output power was performed in accordance with method 9.1.3 of FCC KDB 558074

#### 6.1.3 DEVIATION FROM STANDARD

No deviation.

#### 6.1.4 TEST SETUP

EUT	Power Meter
	1 ower weter

## **6.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

Transmit output power was measured while the host equipment supply voltage was varied from 85 % to 115 % of the nominal rated supply voltage. No change in transmit output power was observed.

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## 6.1.6 TEST RESULTS

EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE /CH01, CH02, CH03		

Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
2425	-4.31	30	1
2450	-6.96	30	1
2475	-3.75	30	1

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#### 7. ANTENNA CONDUCTED SPURIOUS EMISSION

## 7.1 Applied procedures / limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

#### 7.1.1 MEASUREMENT INSTRUMENTS LIST

Ite	m Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
,	Spectrum Analyzer	R&S	FSP_40	100185	Nov.16, 2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

## 7.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = Auto.

#### 7.1.3 DEVIATION FROM STANDARD

No deviation.

#### 7.1.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

#### 7.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

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## 7.1.6 TEST RESULTS

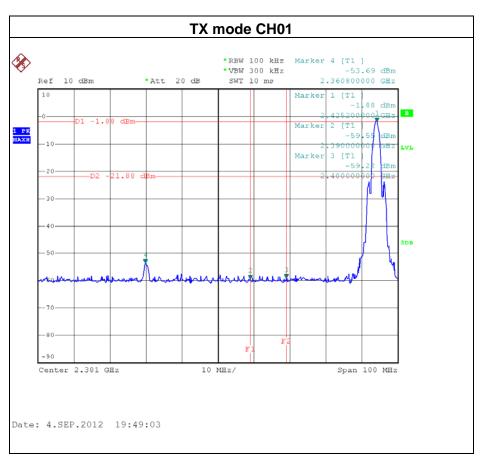
EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	DC 3V
Test Mode :	TX MODE /CH01, CH02, CH03		

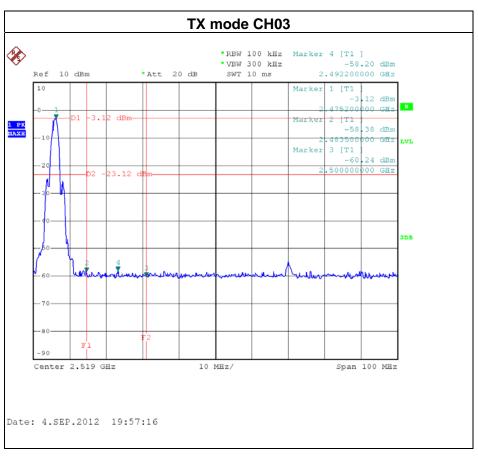
Channel of Worst Data: CH01				
The max. radio frequency power in any 100kHz bandwidth outside the frequency band  The max. radio frequency power in any 100 kHz bandwidth within the frequency band.				
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)	
2360.80	-53.69	2492.20	-58.20	
Result				

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.

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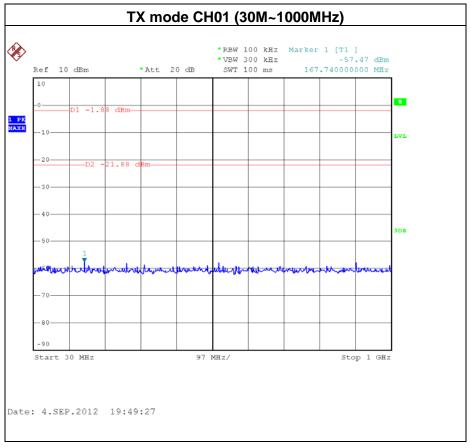


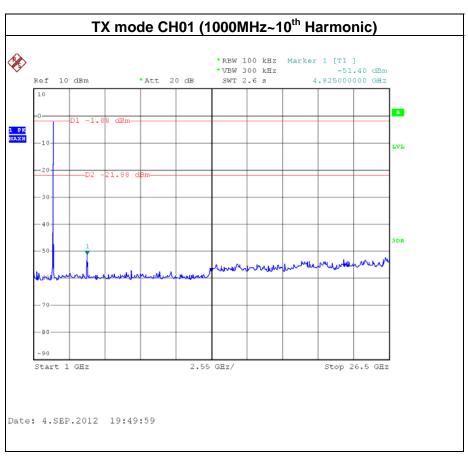


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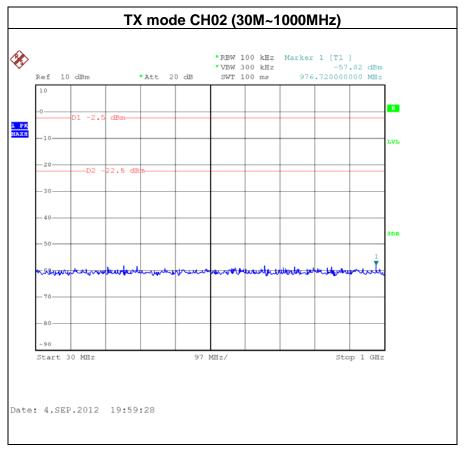


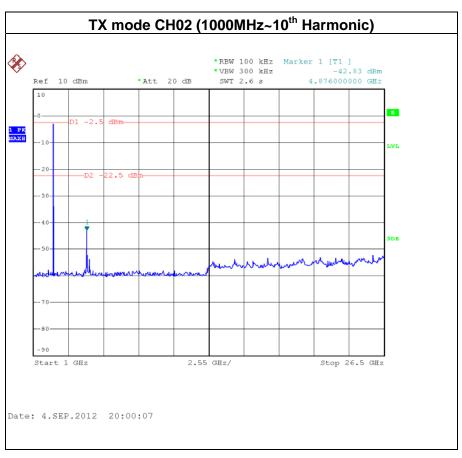




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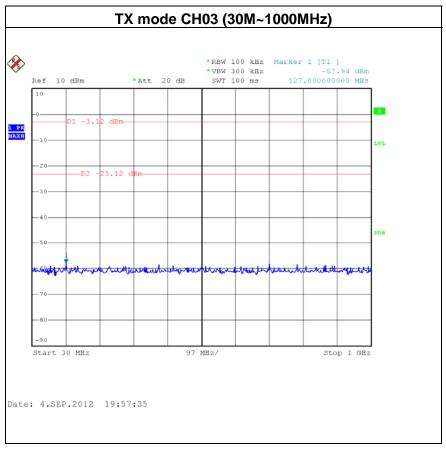


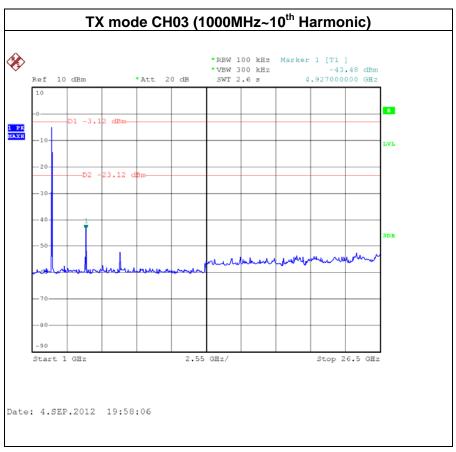




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## 8. POWER SPECTRAL DENSITY TEST

## 8.1 Applied procedures / limit

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

## **8.1.1 MEASUREMENT INSTRUMENTS LIST**

I	tem	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
	1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.16, 2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

## **8.1.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW=3KHz, VBW=10 KHz, Sweep time = Auto.

## 8.1.3 DEVIATION FROM STANDARD

No deviation.

## 8.1.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

#### **8.1.5 EUT OPERATION CONDITIONS**

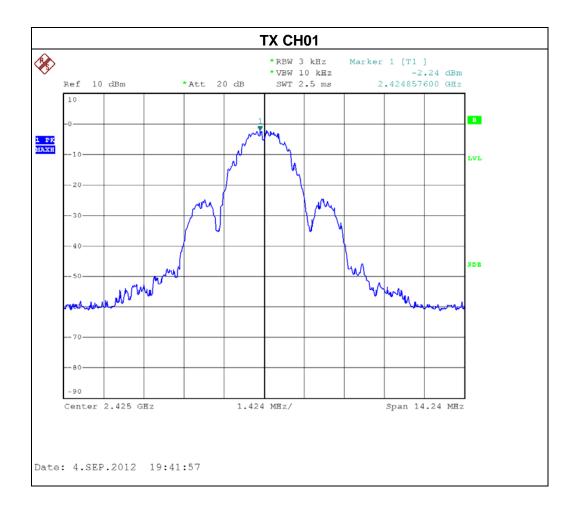
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

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## 8.1.6 TEST RESULTS

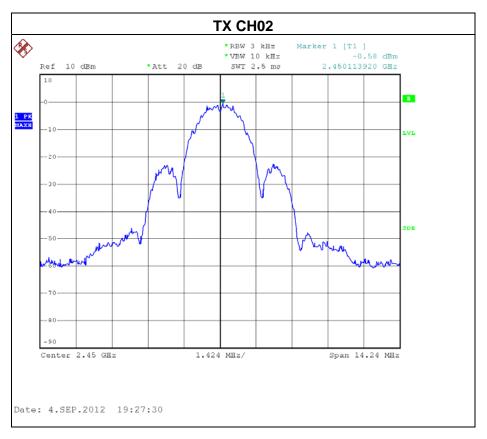
EUT:	RF Control Transmitter	Model Name :	YKF352-001
Temperature:	<b>24</b> ℃	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	DC 3V
Test Mode :	TX B MODE /CH01, CH02, CH03		

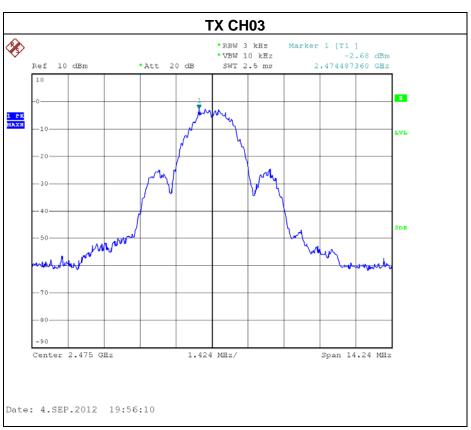
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2425	-2.24	8
CH02	2450	-0.58	8
CH03	2475	-2.68	8



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## 9. EUT TEST PHOTO

# Radiated Measurement Photos 9KHz~30MHz

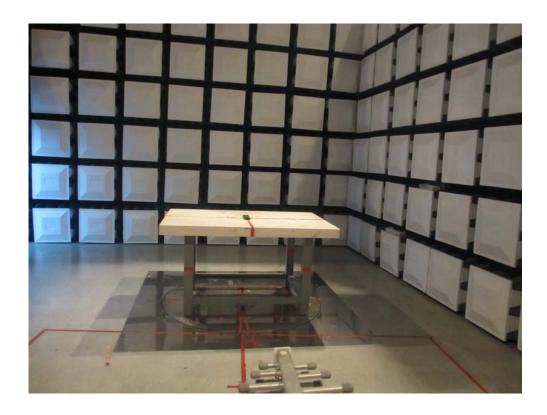


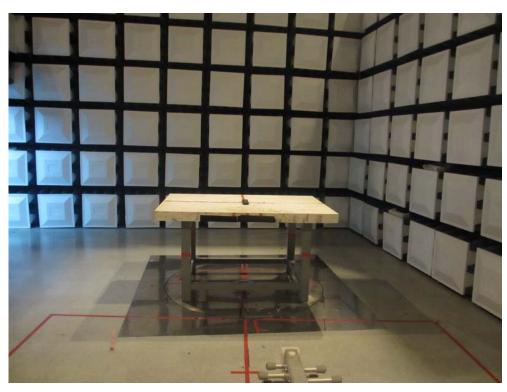


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# Radiated Measurement Photos 300MHz~1000MHz





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# Radiated Measurement Photos Above 1000MHz





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