

APPLICATION CERTIFICATION FCC Part 15C  
On Behalf of  
Elec-Tech International Co., Ltd.

telecontroller  
Model No.: 90600366

FCC ID: XZH-90600366

Prepared for : Elec-Tech International Co., Ltd.  
Address : No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai  
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Report No. : ATE20180953  
Date of Test : May 22-June 7, 2018  
Date of Report : June 8, 2018

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## Test Report Certification

Applicant : Elec-Tech International Co., Ltd.  
Manufacturer : ETI Solid State Lighting (Zhuhai) Ltd  
EUT Description : telecontroller  
Model No. : 90600366  
Trade Name : ETI, Commercial Electric, Hampton Bay

Measurement Procedure Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.247  
ANSI C63.10: 2013**

The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB558074 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : May 22-June 7, 2018  
Date of Report : June 8, 2018  
(Star Yang, Engineer)

Prepared by : Star Yang  
(Star Yang, Engineer)

Approved & Authorized Signer : Sean Liu  
(Sean Liu, Manager)



## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

EUT	:	telecontroller
Model Number	:	90600366
Modulation Type	:	ZigBee
Frequency Range	:	2405-2480MHz
Number of Channels	:	16
Channel Spacing	:	5 MHz
Antenna Gain	:	1dBi
Antenna Type	:	Ceramic Antenna
Power Supply	:	DC 3V
Applicant	:	Elec-Tech International Co., Ltd.
Address	:	No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R.China 519085
Manufacturer	:	ETI Solid State Lighting (Zhuhai) Ltd
Address	:	No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China

### 1.2. Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	17	2435	23	2465
12	2410	18	2440	24	2470
13	2415	19	2445	25	2475
14	2420	20	2450	26	2480
15	2425	21	2455		
16	2430	22	2460		

### 1.3.Special Accessory and Auxiliary Equipment

N/A

### 1.4.Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358
		Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2
		Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193
		Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

### 1.5.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

## 2. MEASURING DEVICE AND TEST EQUIPMENT

**Table 1: List of Test and Measurement Equipment**

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 06, 2018	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 06, 2018	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10S	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.3	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.4	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.5	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.6	Jan. 06, 2018	1 Year
Temporary antenna connector	NTGS	14AE	N/A	May 22, 2018	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

### 3. OPERATION OF EUT DURING TESTING

#### 3.1. Operating Mode

The mode is used: **Transmitting mode**

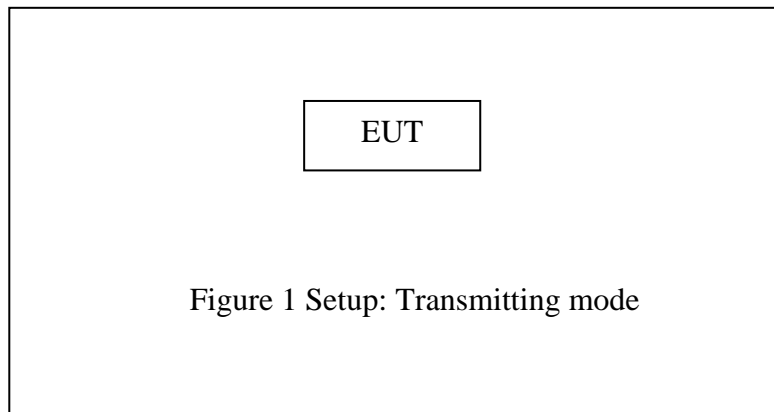
Low Channel: 2402MHz

Middle Channel: 2445MHz

High Channel: 2480MHz

Note: The equipment under test (EUT) was tested under fully battery.  
Its duty cycle setting is greater than 98%.

#### 3.2. Configuration and peripherals





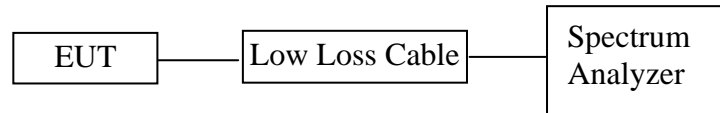
#### 4. TEST PROCEDURES AND RESULTS

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	N/A
Section 15.203	Antenna Requirement	Compliant

Note: The power supply mode of the EUT is DC 3V, According to the FCC standard requirements, conducted emission is not applicable

## 5. 6DB BANDWIDTH MEASUREMENT

### 5.1. Block Diagram of Test Setup



(EUT: telecontroller)

### 5.2. The Requirement For Section 15.247(a)(2)

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 5.3. EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2405-2480MHz. We select 2405MHz, 2445MHz, and 2480MHz TX frequency to transmit.

### 5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

5.5.3. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

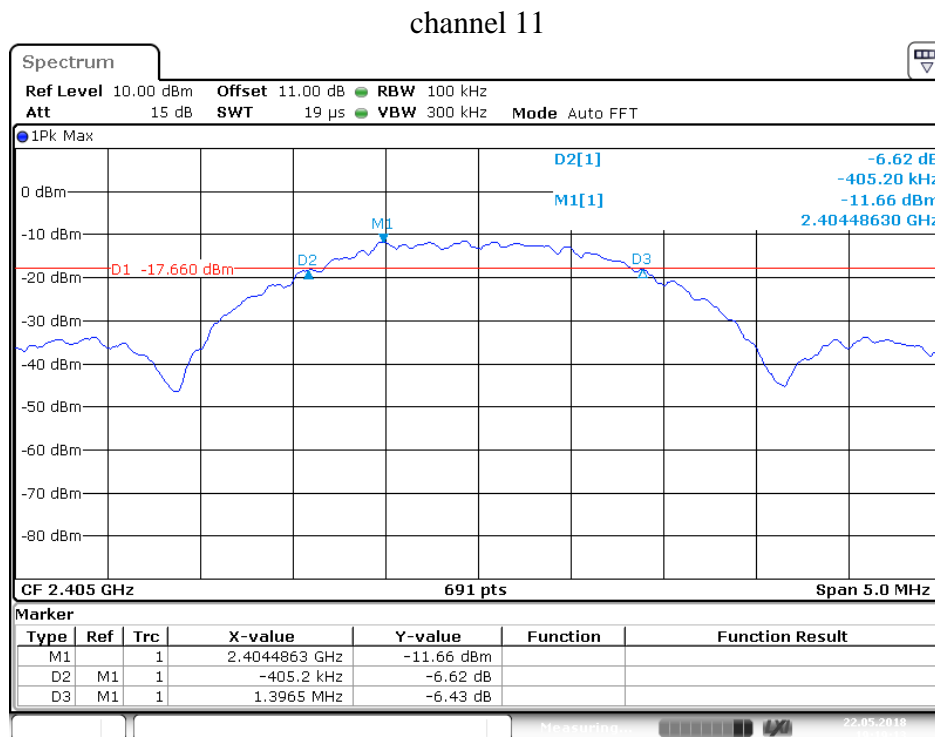
### 5.6. Test Result

Test Lab: Shielding room

Test Engineer: Star

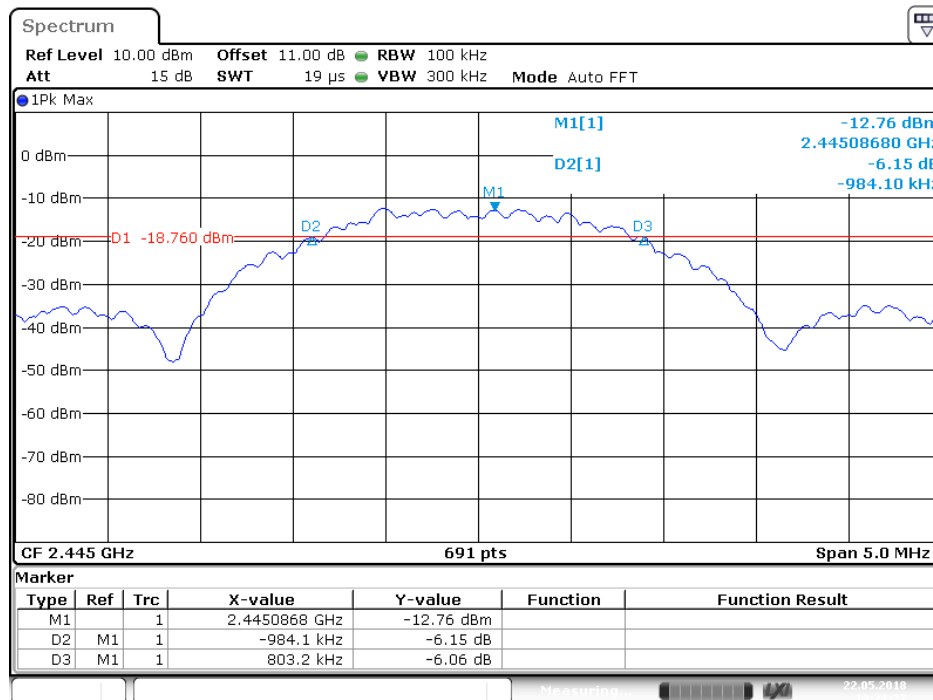
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit(MHz)	Result
11	2405	1.802	0.5	PASS
19	2445	1.787	0.5	PASS
26	2480	1.795	0.5	PASS

The spectrum analyzer plots are attached as below.



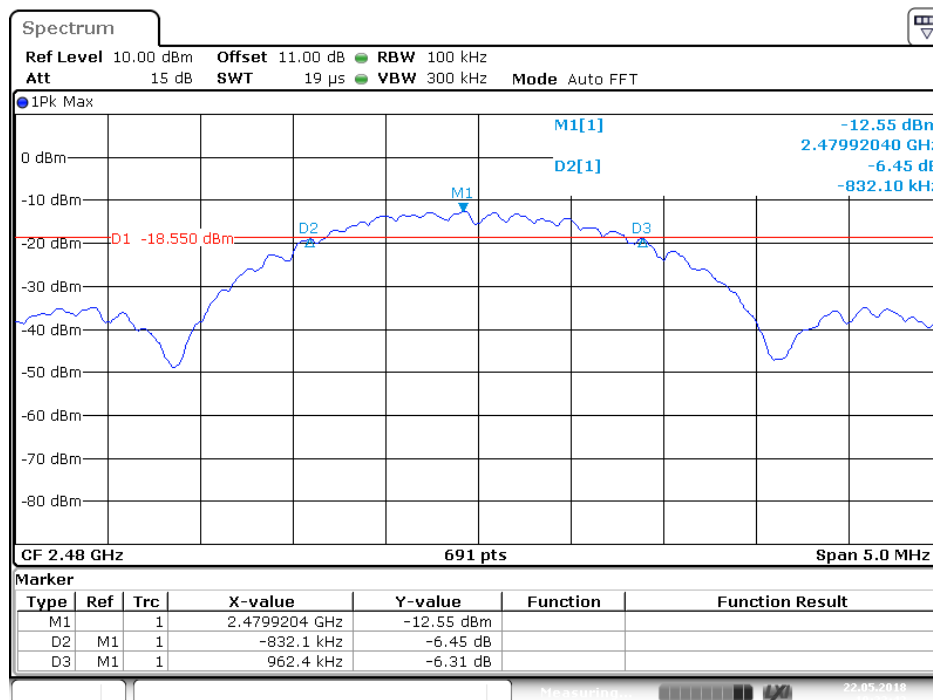
Date: 22.MAY.2018 19:19:14

## channel 19



Date: 22.MAY.2018 19:21:27

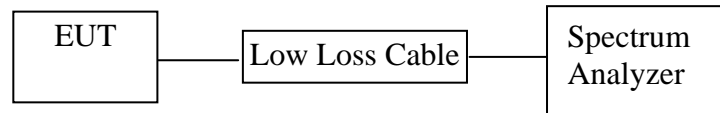
## channel 26



Date: 22.MAY.2018 19:22:43

## 6. MAXIMUM PEAK OUTPUT POWER

### 6.1. Block Diagram of Test Setup



(EUT: telecontroller)

### 6.2. The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

### 6.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2405-2480MHz. We select 2405MHz, 2445MHz, and 2480MHz TX frequency to transmit.

### 6.5. Test Procedure

6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2. Set RBW of spectrum analyzer to 1 MHz and VBW to 3MHz.

6.5.3. Measurement the maximum peak output power.

### 6.6. Test Result

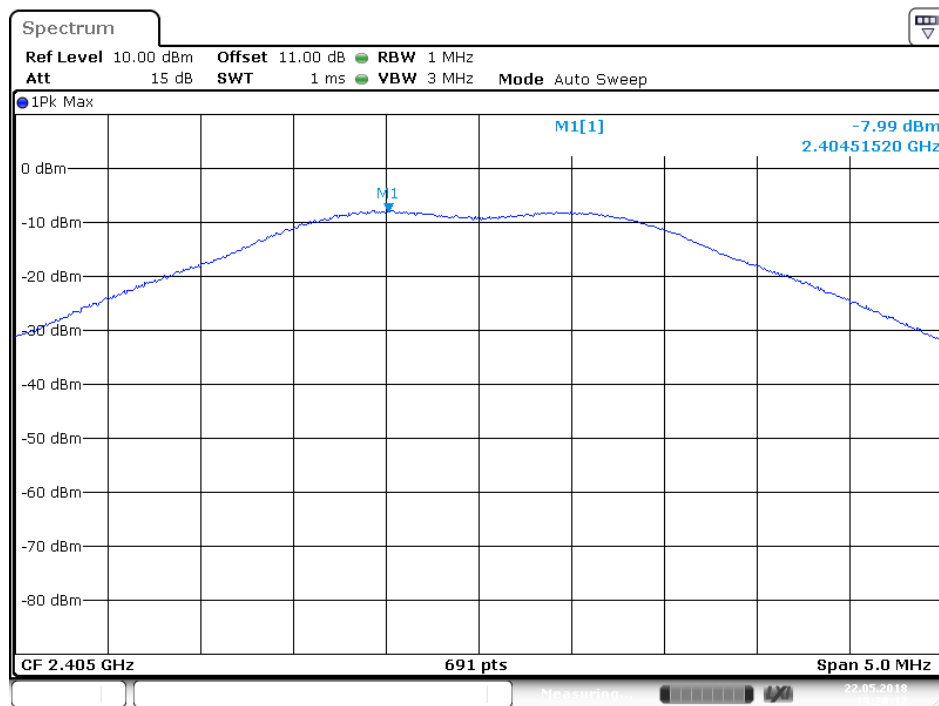
Test Lab: Shielding room

Test Engineer: Star

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Result
11	2405	-7.99	30	PASS
19	2445	-8.62	30	PASS
26	2480	-8.77	30	PASS

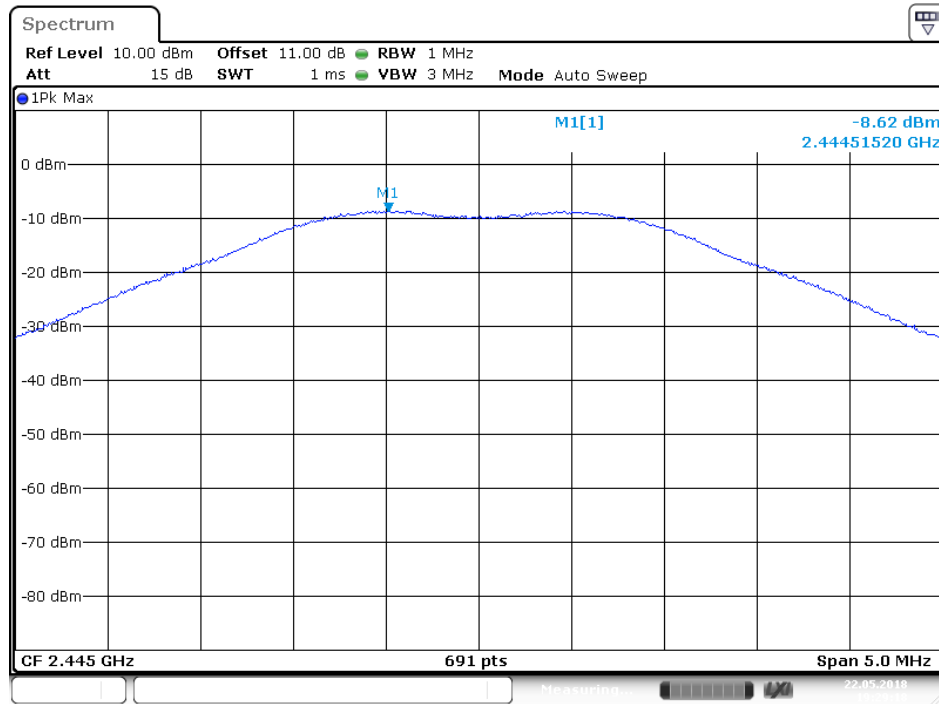
The spectrum analyzer plots are attached as below.

channel 11

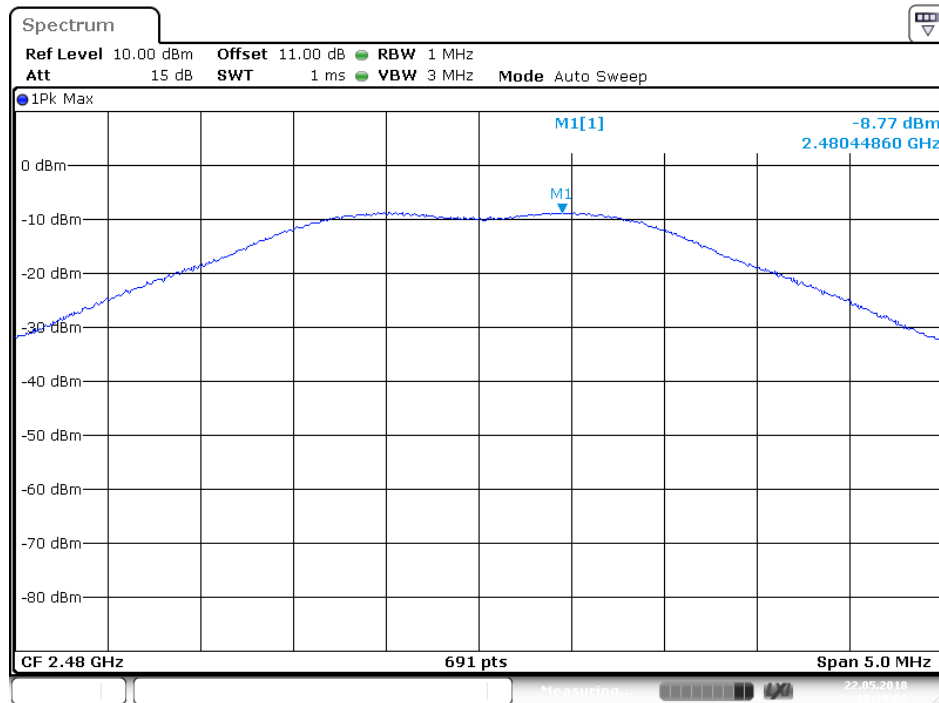


Date: 22.MAY.2018 19:28:12

### channel 19

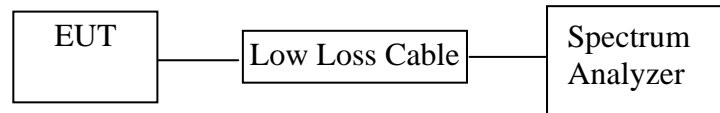


### channel 26



## 7. POWER SPECTRAL DENSITY MEASUREMENT

### 7.1. Block Diagram of Test Setup



(EUT: telecontroller)

### 7.2. The Requirement For Section 15.247(e)

Section 15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 7.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2405-2480MHz. We select 2405MHz, 2445MHz, and 2480MHz TX frequency to transmit.

### 7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2. Measurement Procedure PKPSD:

7.5.3. This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.



1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
4. Set the VBW  $\geq 3 \times \text{RBW}$ .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

7.5.4.Measurement the maximum power spectral density.

7.6.Test Result

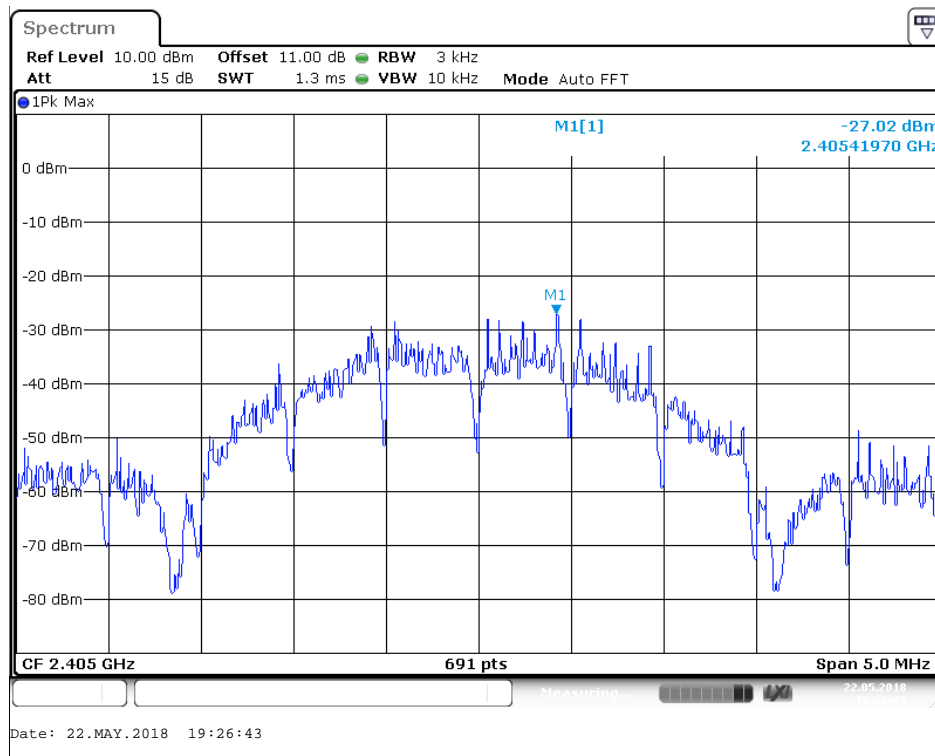
Test Lab: Shielding room

Test Engineer: Star

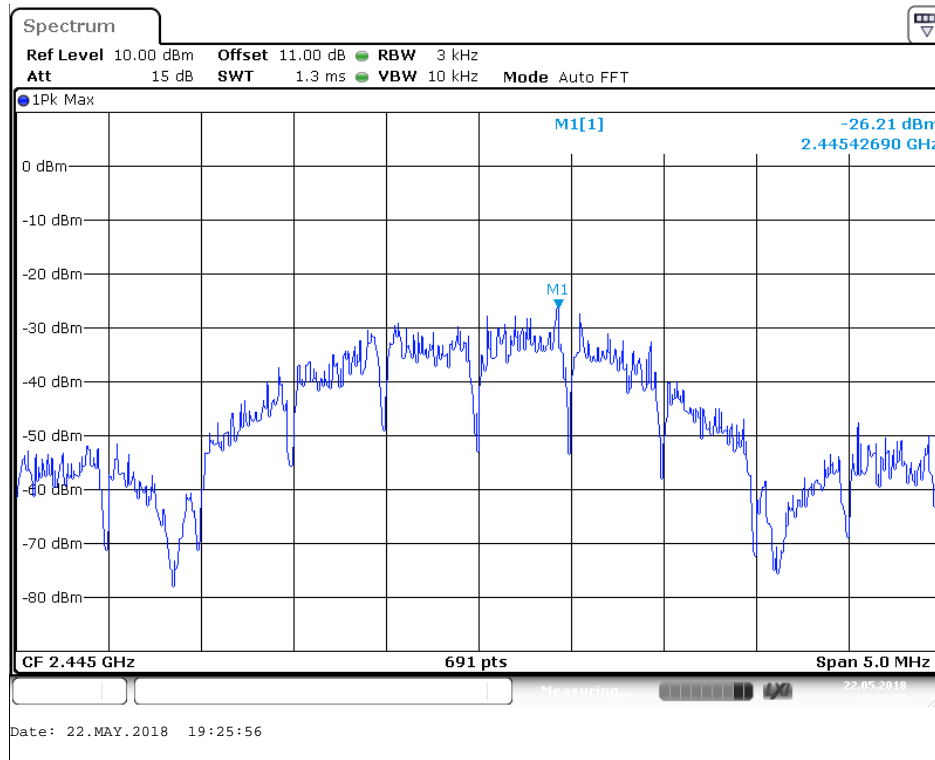
Channel	Frequency (MHz )	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
11	2405	-27.02	8	PASS
19	2445	-26.21	8	PASS
26	2480	-25.10	8	PASS

The spectrum analyzer plots are attached as below.

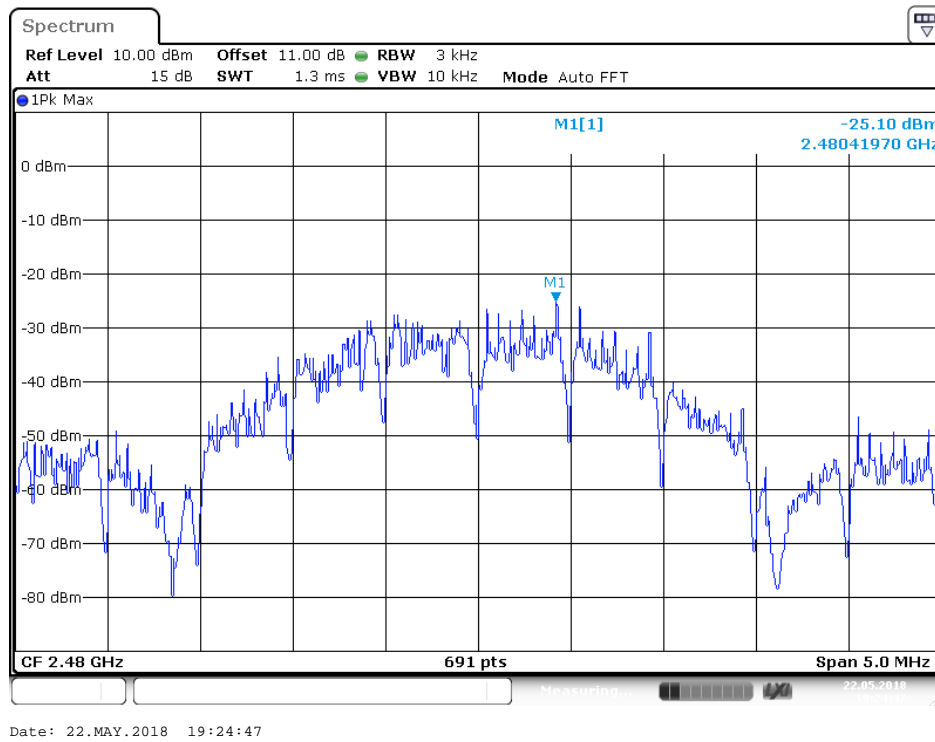
channel 11



## channel 19

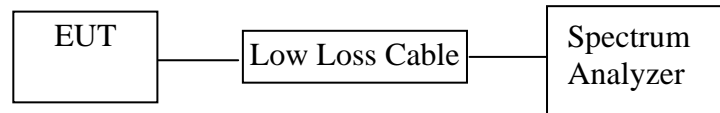


## channel 26



## 8. BAND EDGE COMPLIANCE TEST

### 8.1. Block Diagram of Test Setup



(EUT: telecontroller)

### 8.2. The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 8.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2405-2480MHz. We select 2405MHz, 2480MHz TX frequency to transmit.

## 8.5. Test Procedure

### Conducted Band Edge:

8.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

8.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

### 8.5.3. Radiate Band Edge:

8.5.4. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

8.5.5. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

8.5.6. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

8.5.7. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

8.5.8. RBW=1MHz, VBW=1MHz

8.5.9. The band edges was measured and recorded.

## 8.6. Test Result

**Pass.**

Test Lab: Shielding room

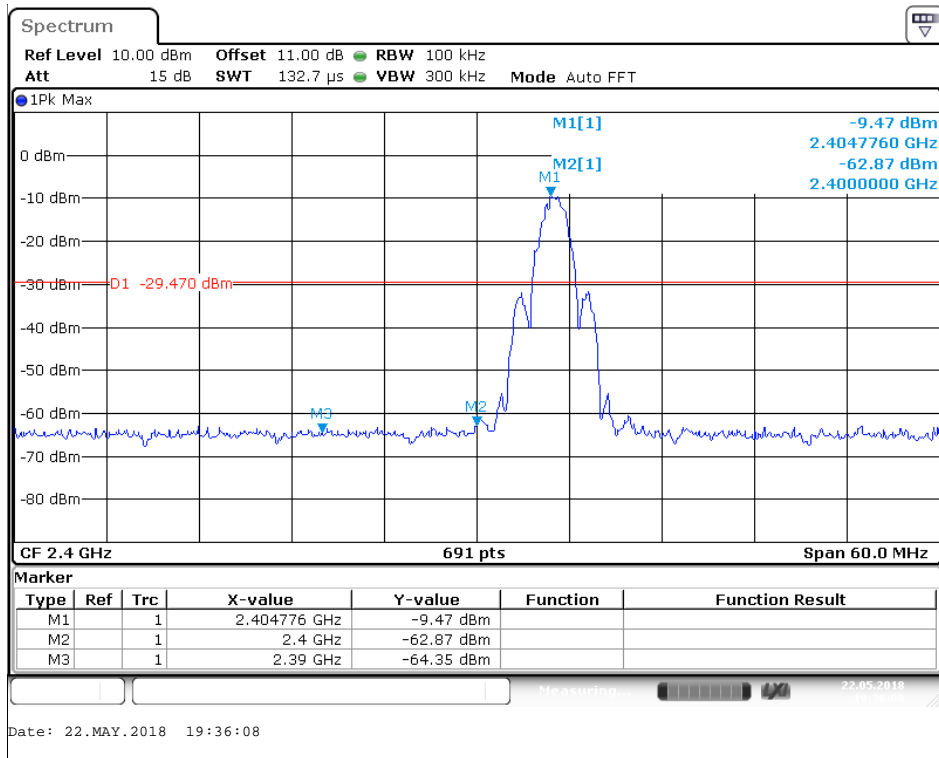
Test Engineer: Star

### Conducted Band Edge Result

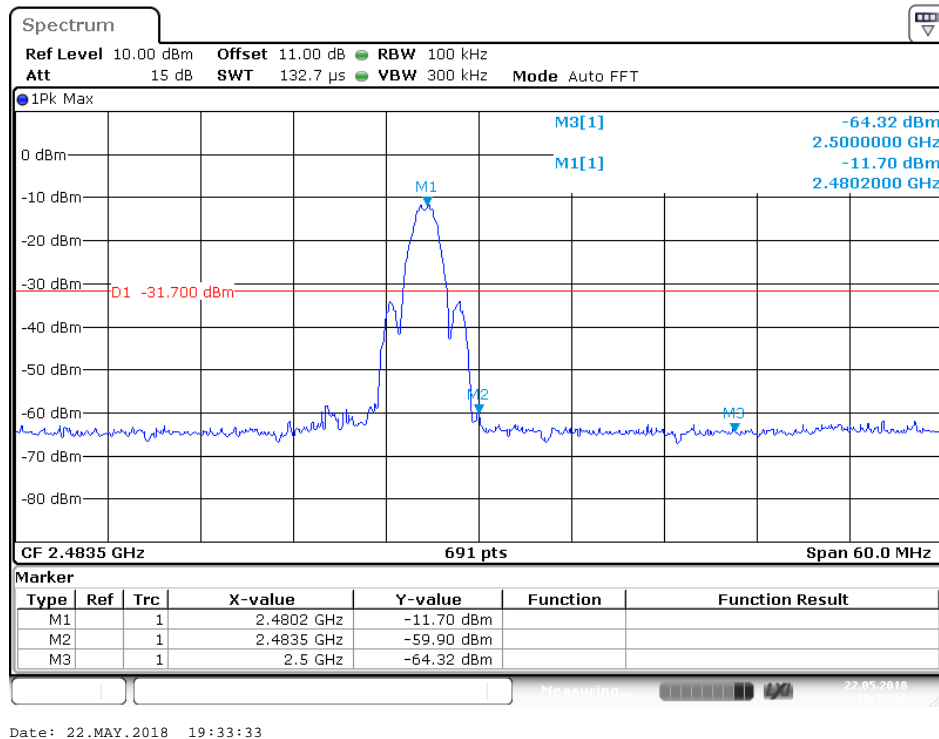
Channel	Frequency	Delta peak to band emission	Limit(dBc)
11	2.405GHz	53.4	> 20
26	2.480GHz	48.2	> 20

The spectrum analyzer plots are attached as below.

channel 11



channel 26



**Radiated Band Edge Result**

**ACCURATE TECHNOLOGY CO., LTD.**

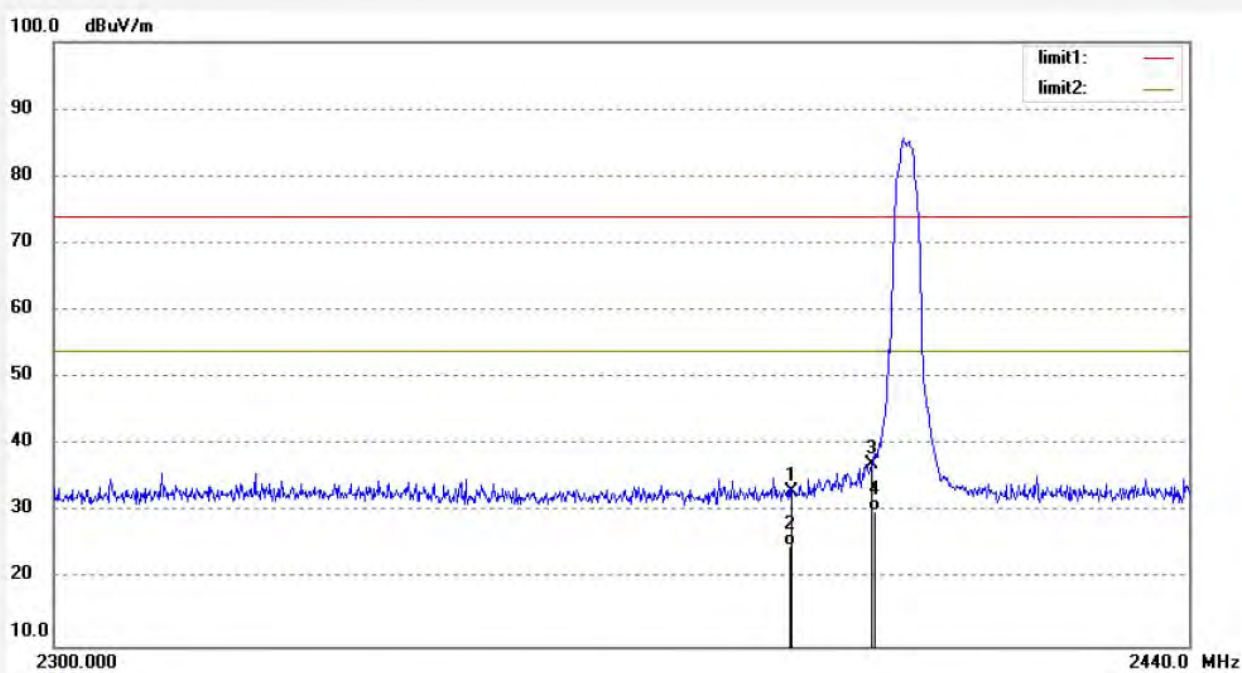
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

 Site: 2# Chamber  
 Tel:+86-0755-26503290  
 Fax:+86-0755-26503396

 Job No.: STAR2016 #243  
 Standard: FCC Part 15C  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2405MHz  
 Model: 90600366  
 Manufacturer: ETI

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 11/16/07  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953



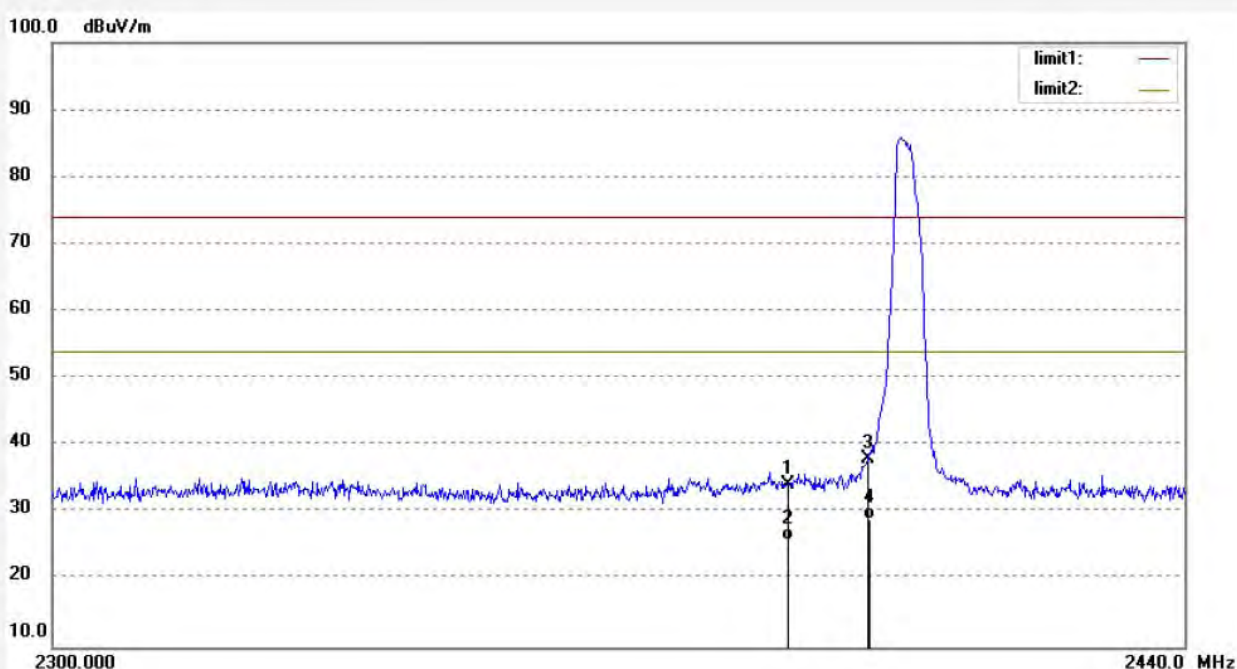
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.16	-8.00	33.16	74.00	-40.84	peak	200	182	
2	2390.000	33.00	-8.00	25.00	54.00	-29.00	AVG	200	201	
3	2400.000	44.99	-7.97	37.02	74.00	-36.98	peak	200	177	
4	2400.000	38.13	-7.97	30.16	54.00	-23.84	AVG	200	103	



Job No.: STAR2016 #242  
 Standard: FCC Part 15C  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2405MHz  
 Model: 90600366  
 Manufacturer: ETI

Polarization: Vertical  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 11/14/55  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953

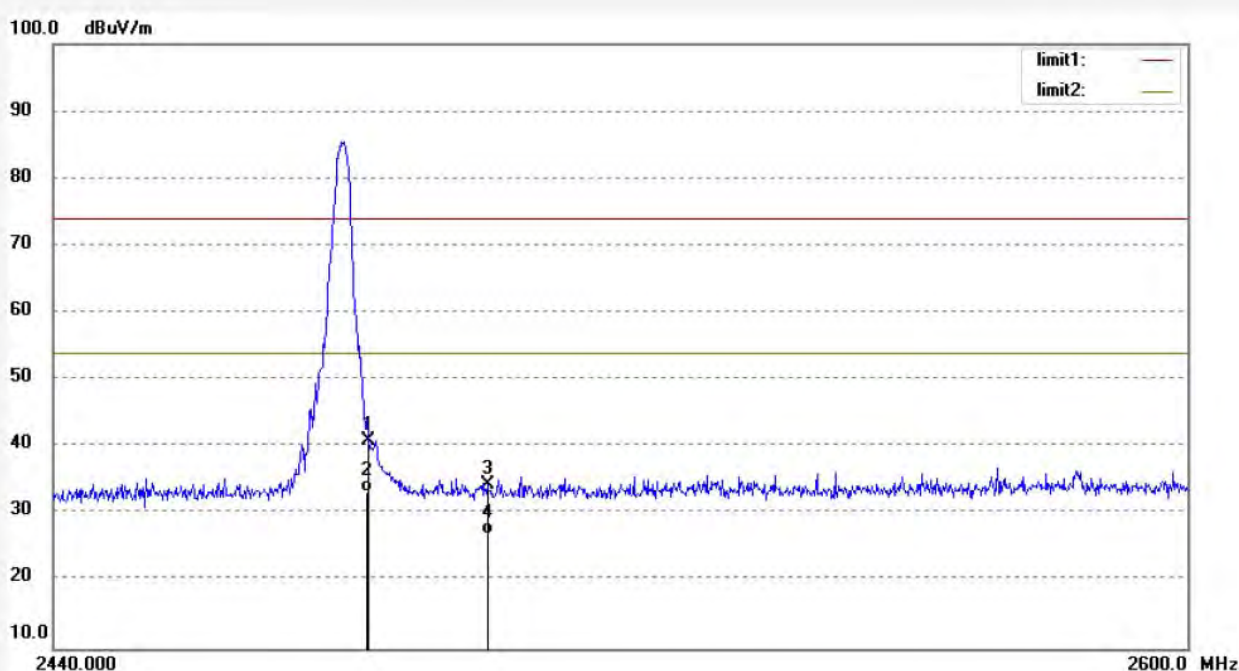


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.30	-8.00	34.30	74.00	-39.70	peak	150	142	
2	2390.000	33.90	-8.00	25.90	54.00	-28.10	AVG	150	333	
3	2400.000	45.89	-7.97	37.92	74.00	-36.08	peak	150	215	
4	2400.000	37.00	-7.97	29.03	54.00	-24.97	AVG	150	159	

Job No.: STAR2016 #244  
 Standard: FCC Part 15C  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2480MHz  
 Model: 90600366  
 Manufacturer: ETI

Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 11/18/27  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953



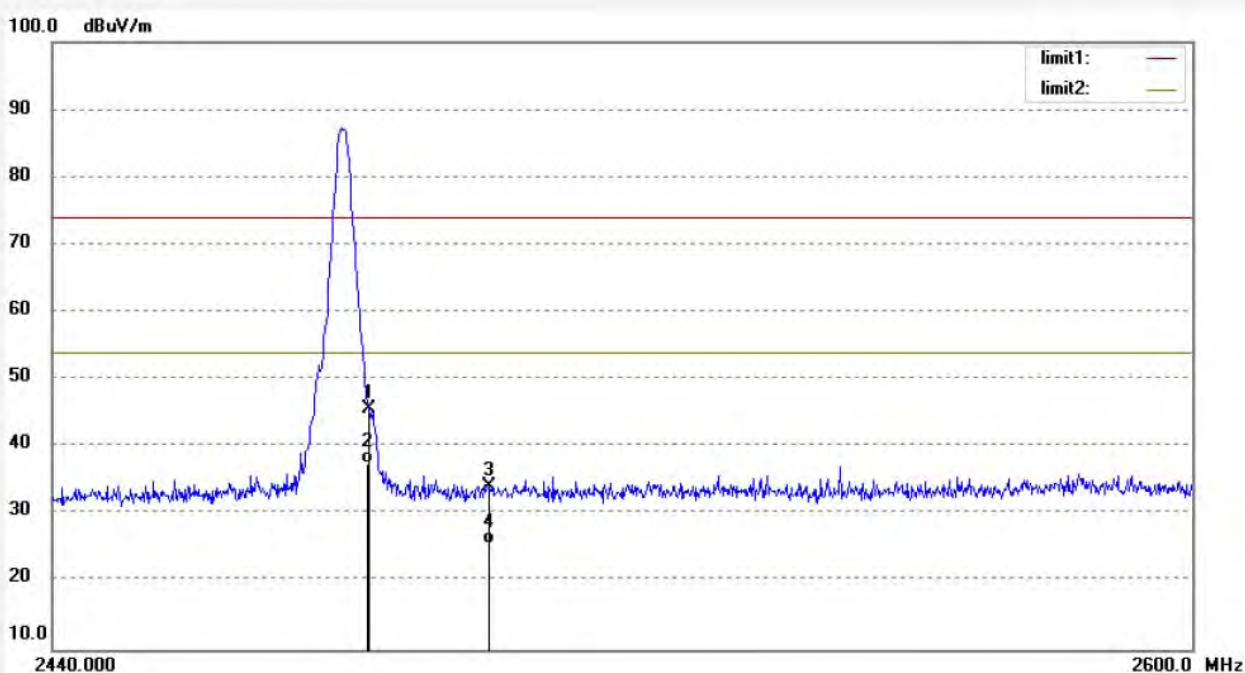
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.60	-7.76	40.84	74.00	-33.16	peak	200	177	
2	2483.500	41.13	-7.76	33.37	54.00	-20.63	AVG	200	120	
3	2500.000	42.19	-7.71	34.48	74.00	-39.52	peak	200	139	
4	2500.000	34.63	-7.71	26.92	54.00	-27.08	AVG	200	225	



Job No.: STAR2016 #245  
 Standard: FCC Part 15C  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 25 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2480MHz  
 Model: 90600366  
 Manufacturer: ETI

Polarization: Vertical  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 11/20/04  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	53.46	-7.76	45.70	74.00	-28.30	peak	150	299	
2	2483.500	45.36	-7.76	37.60	54.00	-16.40	AVG	150	154	
3	2500.000	41.98	-7.71	34.27	74.00	-39.73	peak	150	223	
4	2500.000	33.27	-7.71	25.56	54.00	-28.44	AVG	150	147	

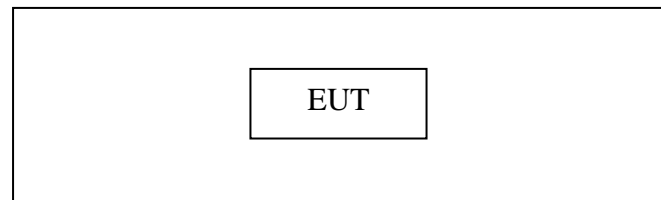
Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:  
 Result = Reading + Corrected Factor

## 9. RADIATED SPURIOUS EMISSION TEST

### 9.1. Block Diagram of Test Setup

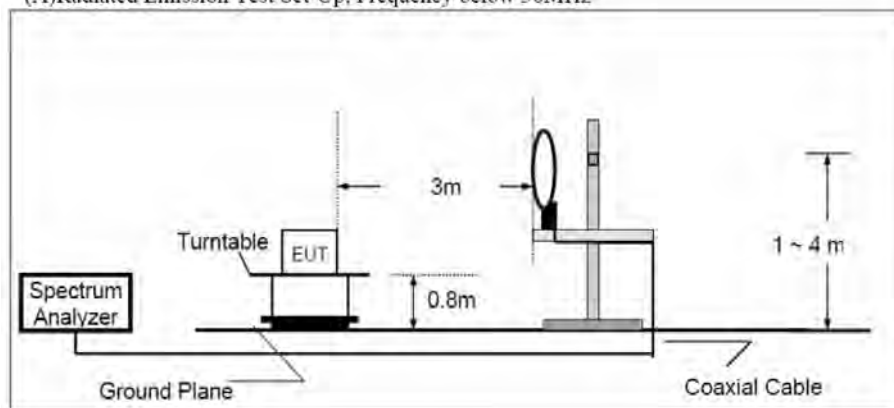
#### 9.1.1. Block diagram of connection between the EUT and peripherals



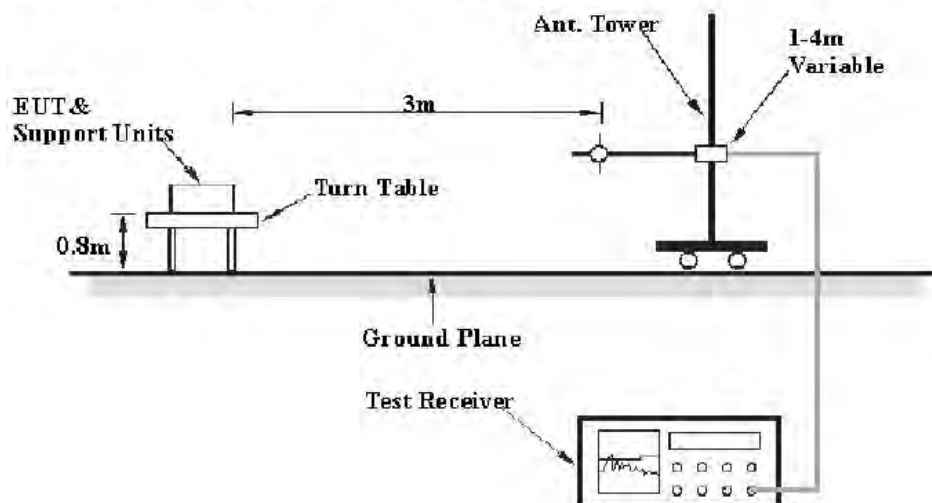
Setup: Transmitting mode

#### 9.1.2. Semi-Anechoic Chamber Test Setup Diagram

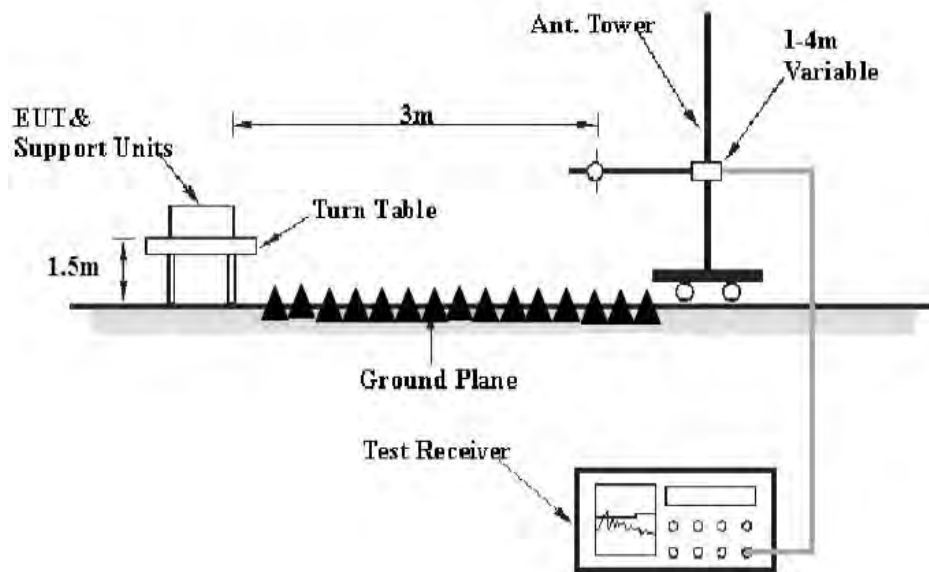
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



## 9.2. The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 9.3. Restricted bands of operation

#### 9.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510

<sup>2</sup>Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

### 9.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

## 9.5. Operating Condition of EUT

9.5.1. Setup the EUT and simulator as shown as Section 9.1.

9.5.2. Turn on the power of all equipment.

9.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2405-2480MHz. We select 2405MHz, 2445MHz, and 2480MHz TX frequency to transmit.

## 9.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground (Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground (Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector. The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading.

### 9.7.Data Sample

Frequency (MHz)	Reading (dB $\mu$ v)	Factor (dB/m)	Result (dB $\mu$ v/m)	Limit (dB $\mu$ v/m)	Margin (dB)	Remark
X.XX	43.85	-22.22	21.63	43.5	-21.87	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB $\mu$ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB $\mu$ v/m) = Reading(dB $\mu$ v) + Factor(dB/m)

Limit (dB $\mu$ v/m) = Limit stated in standard

Margin (dB) = Result(dB $\mu$ v/m) - Limit (dB $\mu$ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB $\mu$ V/m)–Limit(dB $\mu$ V/m)

Result(dB $\mu$ V/m)= Reading(dB $\mu$ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

### 9.8.The Field Strength of Radiation Emission Measurement Results

**Pass.**

Test Lab: 3m Anechoic chamber

Test Engineer: Star

The frequency range from 9kHz to 26.5GHz is checked.

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. \*: Denotes restricted band of operation.

3. The radiation emissions from 9kHz-30MHz and 18-26.5GHz are not reported, because the test values lower than the limits of 20dB.

The spectrum analyzer plots are attached as below.



## Below 1GHz


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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

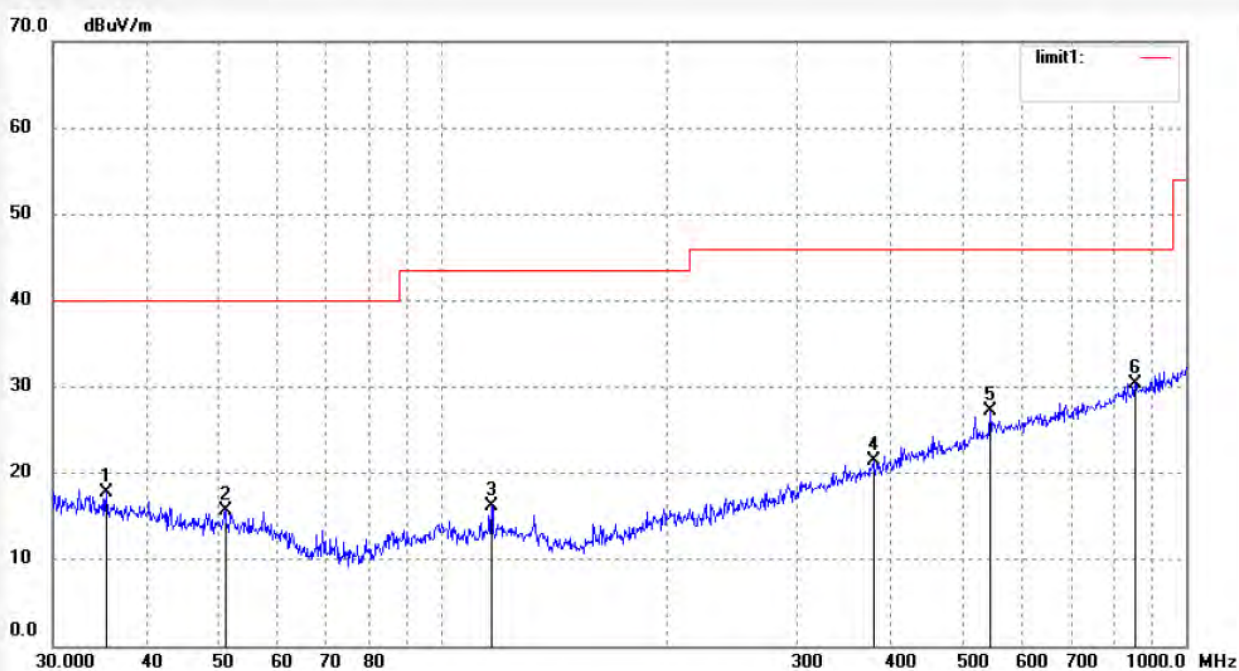
Tel:+86-0755-26503290

Fax:+86-0755-26503396

 Job No.: STAR2016 #2571  
 Standard: FCC Part 15C 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2405MHz  
 Model: 90600366  
 Manufacturer: ETI

 Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 17/29/55  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	35.3750	28.31	-10.49	17.82	40.00	-22.18	peak	200	122	
2	51.1208	28.26	-12.67	15.59	40.00	-24.41	peak	200	114	
3	116.5400	29.22	-13.06	16.16	43.50	-27.34	peak	200	256	
4	379.9141	28.39	-6.98	21.41	46.00	-24.59	peak	200	12	
5	545.1825	30.43	-3.23	27.20	46.00	-18.80	peak	200	36	
6	854.0247	28.82	1.59	30.41	46.00	-15.59	peak	200	90	



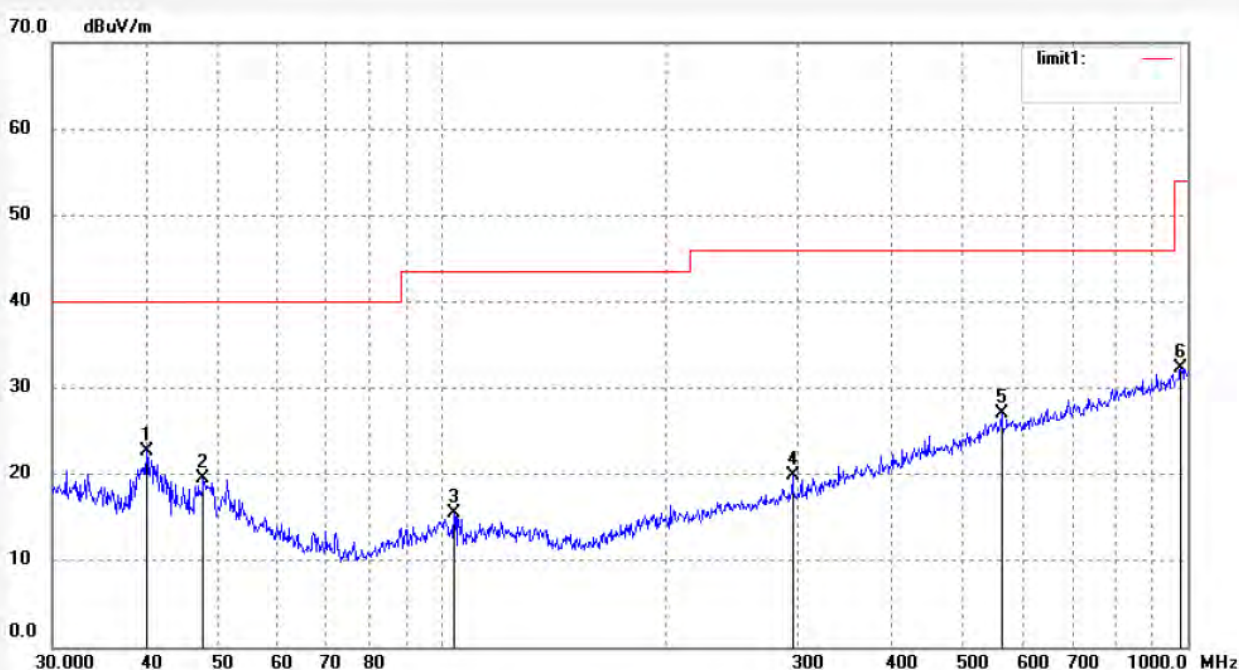
**ACCURATE TECHNOLOGY CO., LTD.**

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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: STAR2016 #2572	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 18/06/07/
Temp.( C)/Hum.(%) 23 C / 48 %	Time: 17/31/24
EUT: telecontroller	Engineer Signature: star
Mode: TX 2405MHz	Distance: 3m
Model: 90600366	
Manufacturer: ETI	

Note: Report No.: ATE20180953



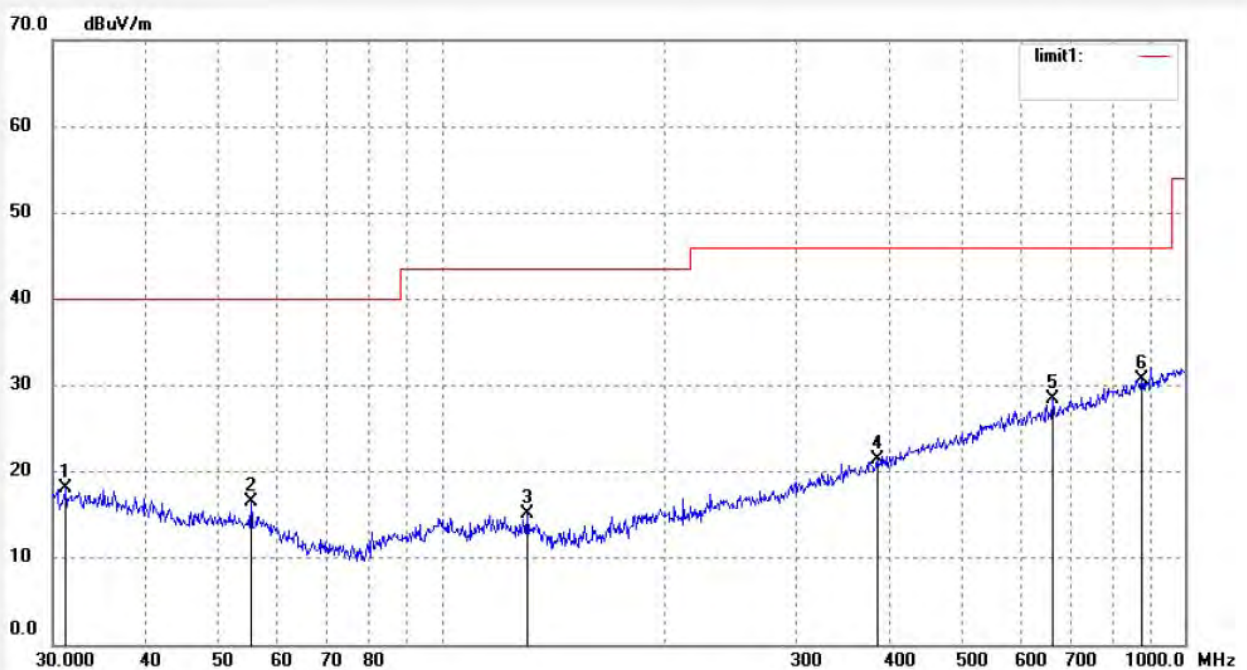
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	40.1347	34.19	-11.56	22.63	40.00	-17.37	peak	100	139	
2	47.8260	32.16	-12.60	19.56	40.00	-20.44	peak	100	45	
3	103.8055	29.08	-13.66	15.42	43.50	-28.08	peak	100	360	
4	295.1469	28.90	-9.10	19.80	46.00	-26.20	peak	100	125	
5	562.6624	29.91	-2.87	27.04	46.00	-18.96	peak	100	222	
6	979.1804	28.78	3.57	32.35	54.00	-21.65	peak	100	184	



Job No.: STAR2016 #2574  
 Standard: FCC Part 15C 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2445MHz  
 Model: 90600366  
 Manufacturer: ETI

Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 17/34/47  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953

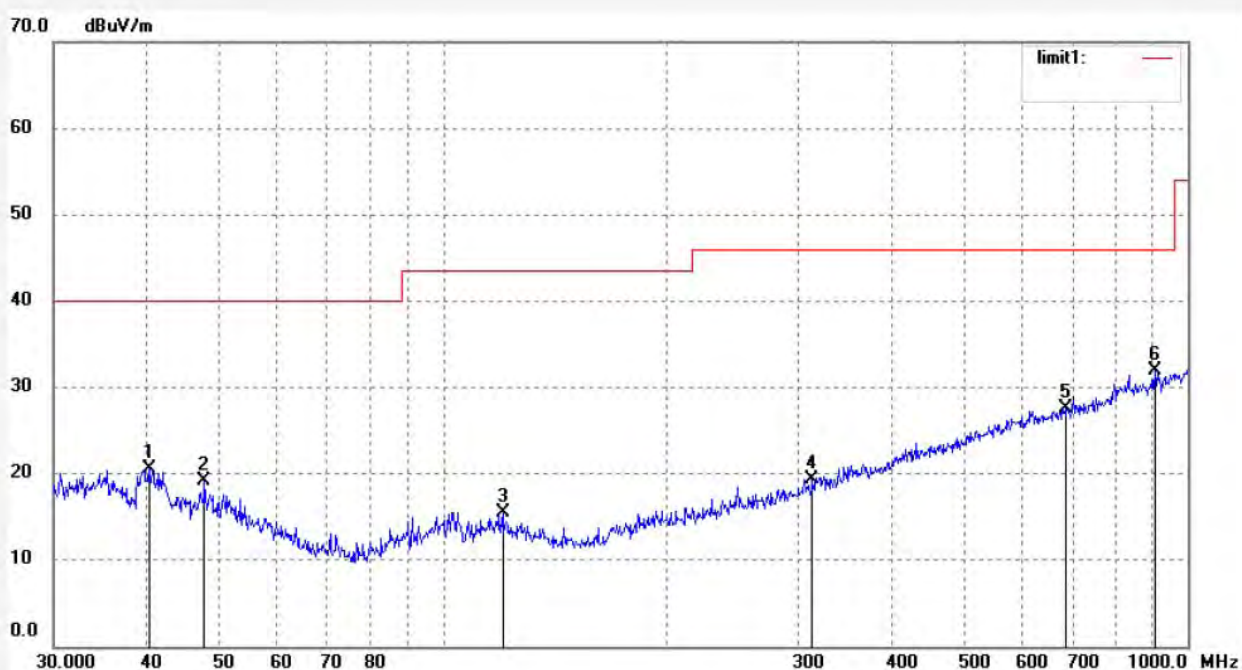


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.1798	28.15	-10.04	18.11	40.00	-21.89	peak	200	112	
2	55.4147	29.63	-13.03	16.60	40.00	-23.40	peak	200	125	
3	130.3789	28.95	-13.78	15.17	43.50	-28.33	peak	200	166	
4	385.2805	28.41	-6.91	21.50	46.00	-24.50	peak	200	189	
5	663.4729	29.99	-1.57	28.42	46.00	-17.58	peak	200	246	
6	875.2470	28.77	1.98	30.75	46.00	-15.25	peak	200	301	

Job No.: STAR2016 #2573  
 Standard: FCC Part 15C 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2445MHz  
 Model: 90600366  
 Manufacturer: ETI

Polarization: Vertical  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 17/32/52  
 Engineer Signature: star  
 Distance: 3m

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	40.2757	32.19	-11.60	20.59	40.00	-19.41	peak	100	99	
2	47.8260	31.70	-12.60	19.10	40.00	-20.90	peak	100	102	
3	120.2766	28.66	-13.09	15.57	43.50	-27.93	peak	100	154	
4	313.2760	28.04	-8.64	19.40	46.00	-26.60	peak	100	214	
5	687.1507	28.82	-1.28	27.54	46.00	-18.46	peak	100	236	
6	903.3093	29.78	2.20	31.98	46.00	-14.02	peak	100	224	





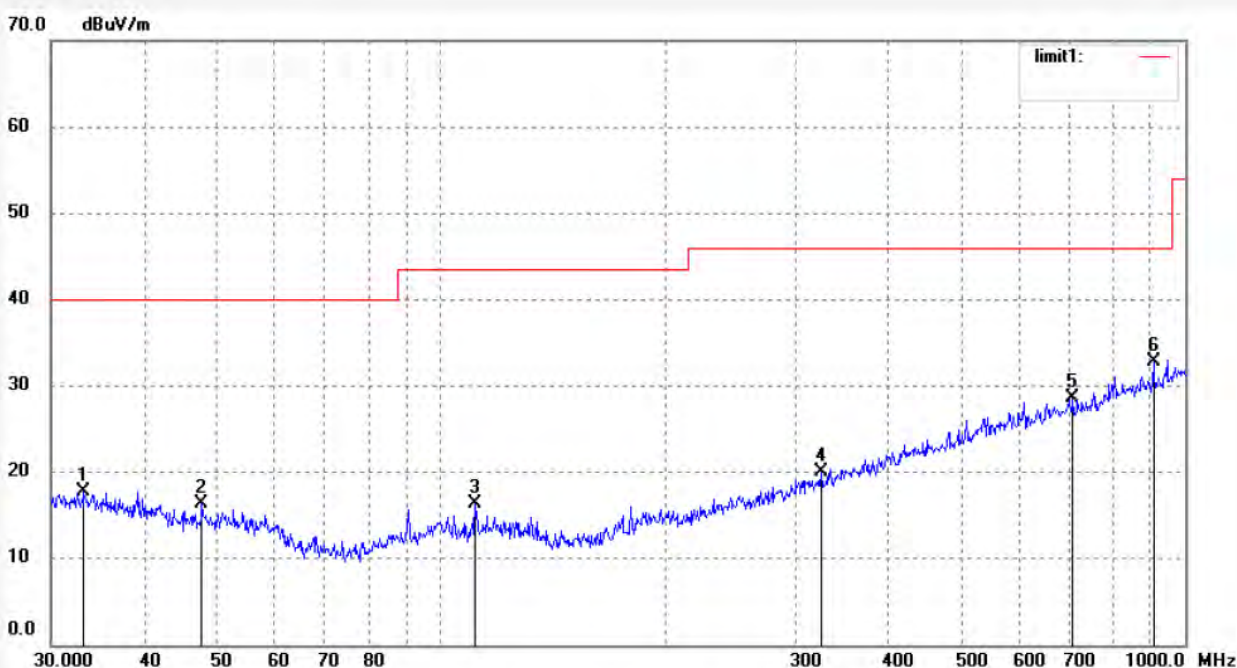
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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: STAR2016 #2575	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 18/06/07/
Temp.( C)/Hum.(%) 23 C / 48 %	Time: 17/36/09
EUT: telecontroller	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: 90600366	
Manufacturer: ETI	

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.2111	28.09	-10.25	17.84	40.00	-22.16	peak	200	311	
2	47.8260	29.01	-12.60	16.41	40.00	-23.59	peak	200	215	
3	111.3468	30.04	-13.62	16.42	43.50	-27.08	peak	200	92	
4	324.4560	28.22	-8.26	19.96	46.00	-26.04	peak	200	41	
5	706.6998	29.47	-0.92	28.55	46.00	-17.45	peak	200	33	
6	906.4823	30.53	2.22	32.75	46.00	-13.25	peak	200	29	

Job No.: STAR2016 #2576

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 3V

Test item: Radiation Test

Date: 18/06/07/

Temp.( C)/Hum.(%) 23 C / 48 %

Time: 17/37/20

EUT: telecontroller

Engineer Signature: star

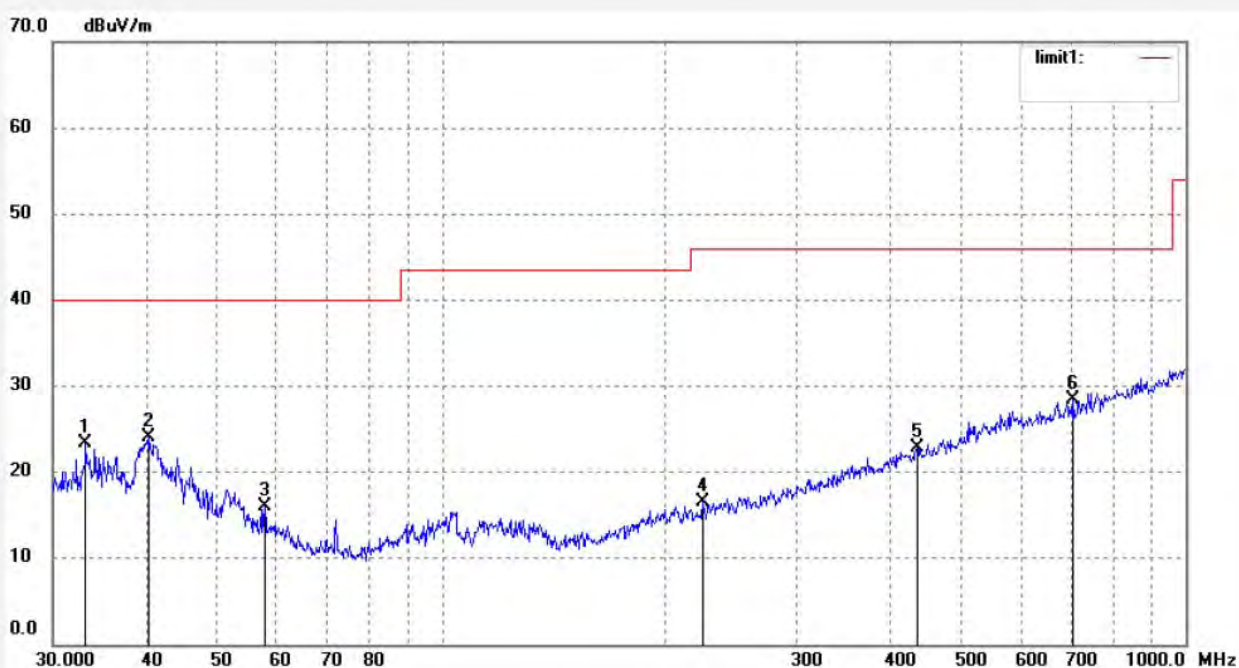
Mode: TX 2480MHz

Distance: 3m

Model: 90600366

Manufacturer: ETI

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.2112	33.21	-9.89	23.32	40.00	-16.68	peak	100	145	
2	40.4172	35.60	-11.62	23.98	40.00	-16.02	peak	100	240	
3	57.7962	29.49	-13.49	16.00	40.00	-24.00	peak	100	224	
4	224.5193	27.75	-11.26	16.49	46.00	-29.51	peak	100	211	
5	435.5898	28.32	-5.51	22.81	46.00	-23.19	peak	100	26	
6	706.6999	29.36	-0.92	28.44	46.00	-17.56	peak	100	116	



## Above 1GHz


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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: NTC #817

Standard: FCC Part 15C

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: telecontroller

Mode: TX 2405MHz

Model: 90600366

Manufacturer: ETI

Polarization: Horizontal

Power Source: DC 3V

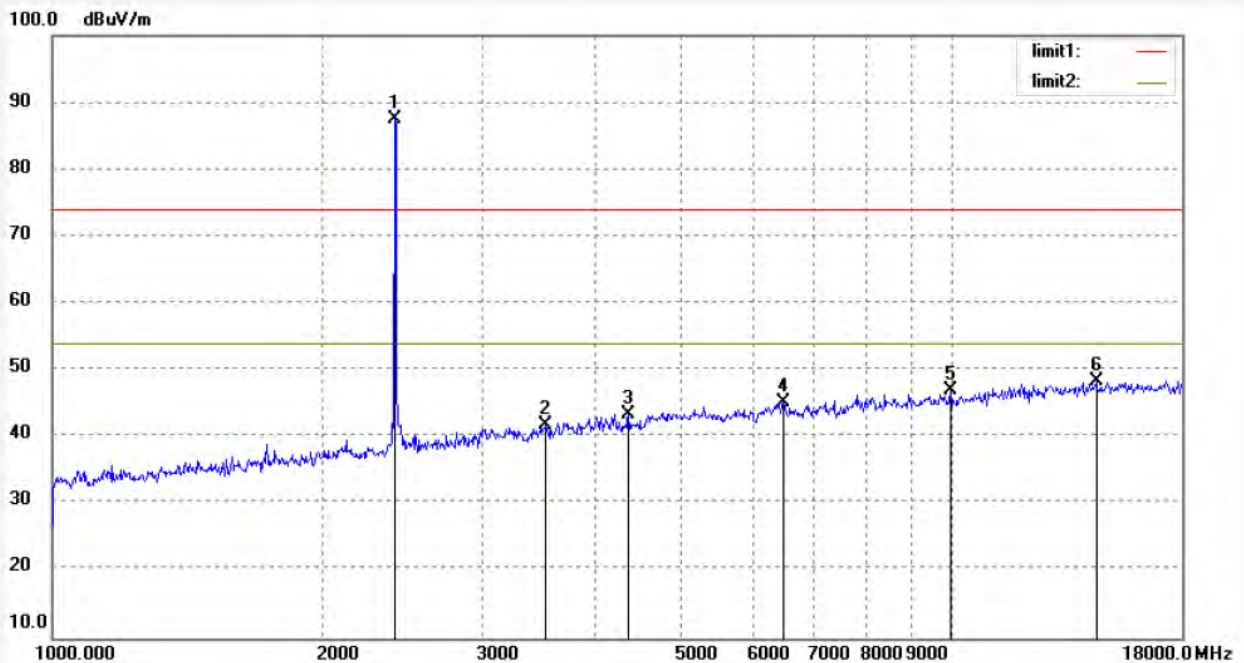
Date: 18/06/07/

Time: 20:23:46

Engineer Signature: star

Distance: 3m

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2405.053	86.67	0.88	87.55			peak	200	174	
2	3536.340	38.72	3.13	41.85	74.00	-32.15	peak	200	281	
3	4367.058	38.27	5.24	43.51	74.00	-30.49	peak	200	302	
4	6488.754	33.60	11.57	45.17	74.00	-28.83	peak	200	314	
5	9952.717	28.96	18.16	47.12	74.00	-26.88	peak	200	230	
6	14450.131	-11.96	60.27	48.31	74.00	-25.69	peak	200	199	

Job No.: NTC #818

Standard: FCC Part 15C

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: telecontroller

Mode: TX 2405MHz

Model: 90600366

Manufacturer: ETI

Polarization: Vertical

Power Source: DC 3V

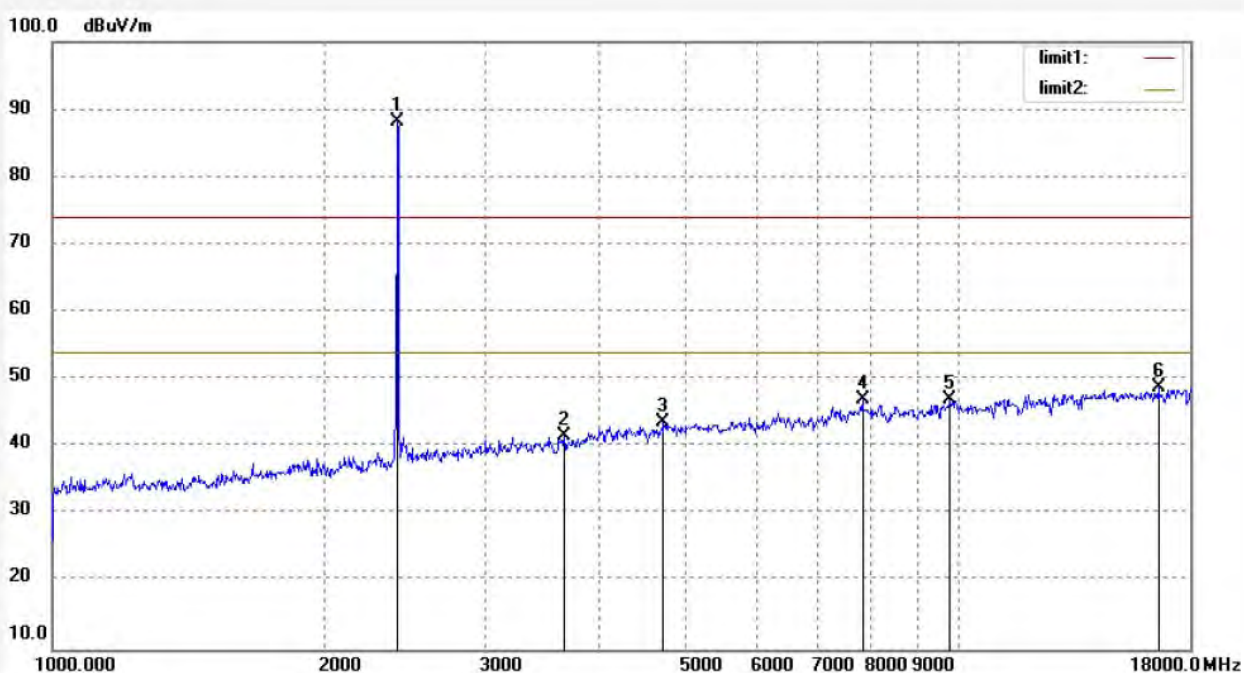
Date: 18/06/07/

Time: 20:26:21

Engineer Signature: star

Distance: 3m

Note: Report No.: ATE20180953



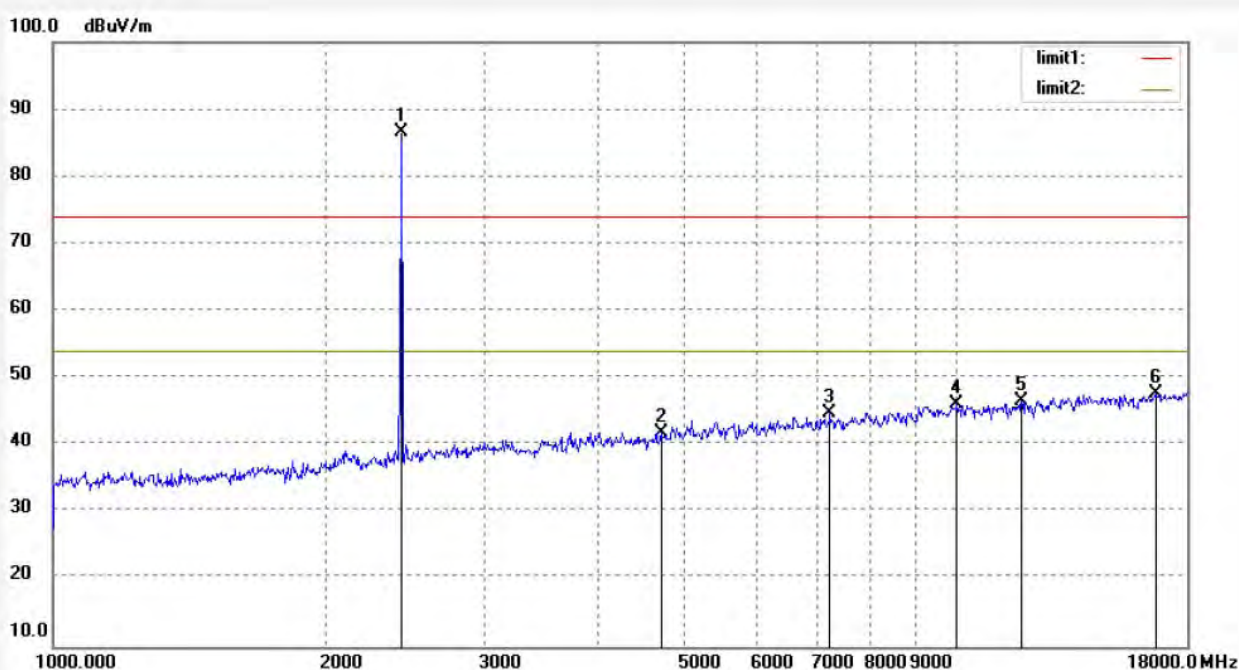
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2405.053	87.23	0.88	88.11			peak	150	300	
2	3671.746	37.98	3.61	41.59	74.00	-32.41	peak	150	71	
3	4721.515	36.61	6.95	43.56	74.00	-30.44	peak	200	110	
4	7829.860	32.92	14.07	46.99	74.00	-27.01	peak	200	273	
5	9781.602	29.17	17.84	47.01	74.00	-26.99	peak	150	145	
6	16600.642	-10.84	59.62	48.78	74.00	-25.22	peak	150	128	



Job No.: NTC #820  
 Standard: FCC Part 15C  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: telecontroller  
 Mode: TX 2445MHz  
 Model: 90600366  
 Manufacturer: ETI

Polarization: Horizontal  
 Power Source: DC 3V  
 Date: 18/06/07/  
 Time: 20:29:39  
 Engineer Signature: star  
 Distance: 3m

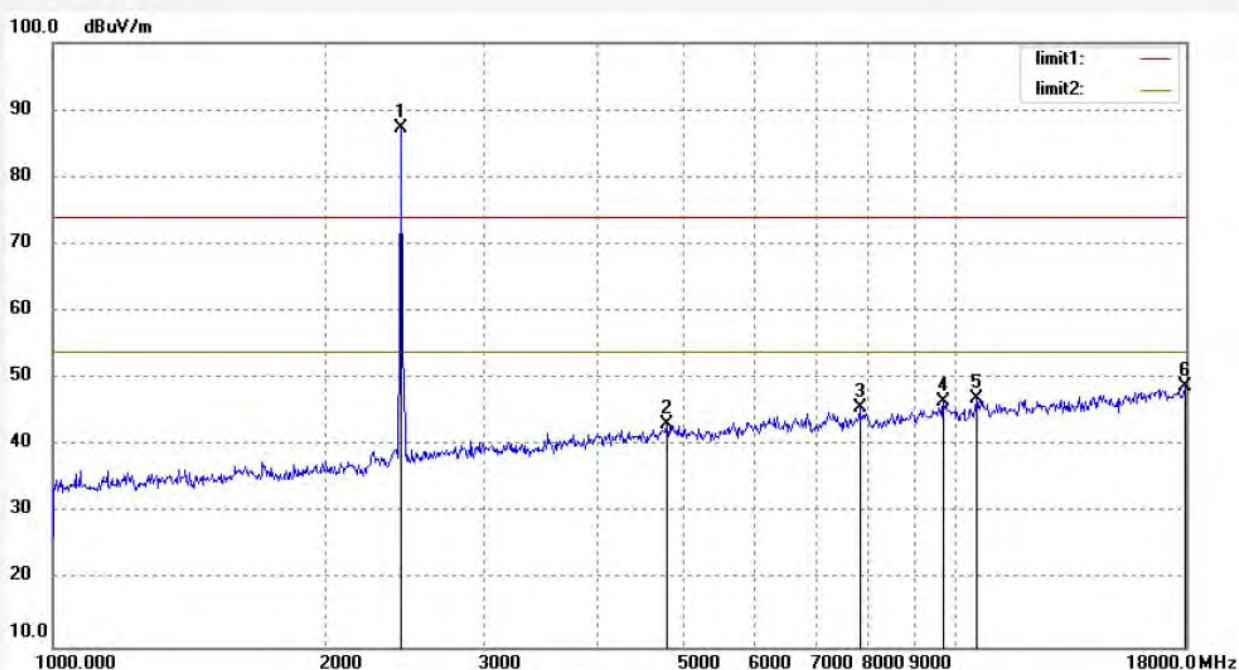
Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2445.071	85.72	1.00	86.72			peak	200	14	
2	4707.887	35.02	6.88	41.90	74.00	-32.10	peak	200	151	
3	7242.052	33.74	11.05	44.79	74.00	-29.21	peak	200	93	
4	10010.417	28.88	17.21	46.09	74.00	-27.91	peak	200	128	
5	11803.280	24.41	22.21	46.62	74.00	-27.38	peak	200	300	
6	16600.642	-11.86	59.62	47.76	74.00	-26.24	peak	200	219	

Job No.: NTC #819	Polarization: Vertical
Standard: FCC Part 15C	Power Source: DC 3V
Test item: Radiation Test	Date: 18/06/07/
Temp.( C)/Hum.(%) 23 C / 48 %	Time: 20:28:21
EUT: telecontroller	Engineer Signature: star
Mode: TX 2445MHz	Distance: 3m
Model: 90600366	
Manufacturer: ETI	

Note: Report No.: ATE20180953

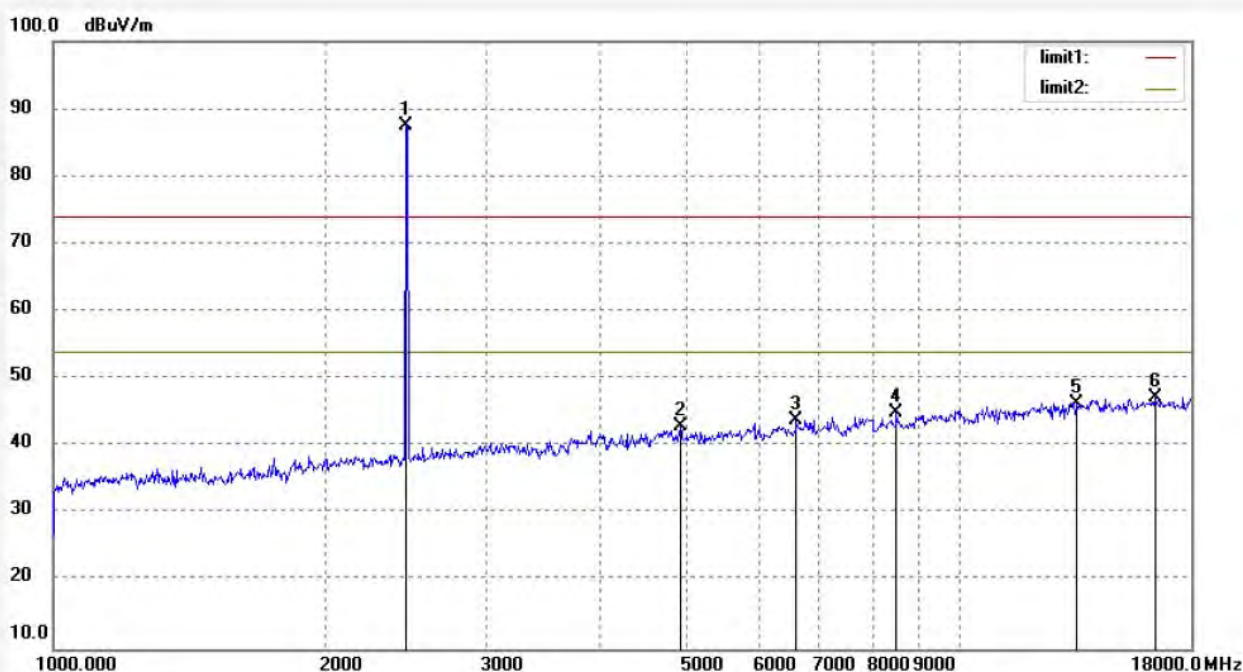


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2445.071	86.36	1.00	87.36			peak	150	112	
2	4790.245	35.79	7.30	43.09	74.00	-30.91	peak	150	288	
3	7829.860	31.63	14.07	45.70	74.00	-28.30	peak	150	103	
4	9697.152	28.94	17.65	46.59	74.00	-27.41	peak	150	128	
5	10545.012	30.63	16.32	46.95	74.00	-27.05	peak	150	112	
6	17948.048	-17.09	65.80	48.71	74.00	-25.29	peak	150	42	



Job No.: NTC #821	Polarization: Horizontal
Standard: FCC Part 15C	Power Source: DC 3V
Test item: Radiation Test	Date: 18/06/07/
Temp.( C)/Hum.(%) 23 C / 48 %	Time: 20:31:49
EUT: telecontroller	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: 90600366	
Manufacturer: ETI	

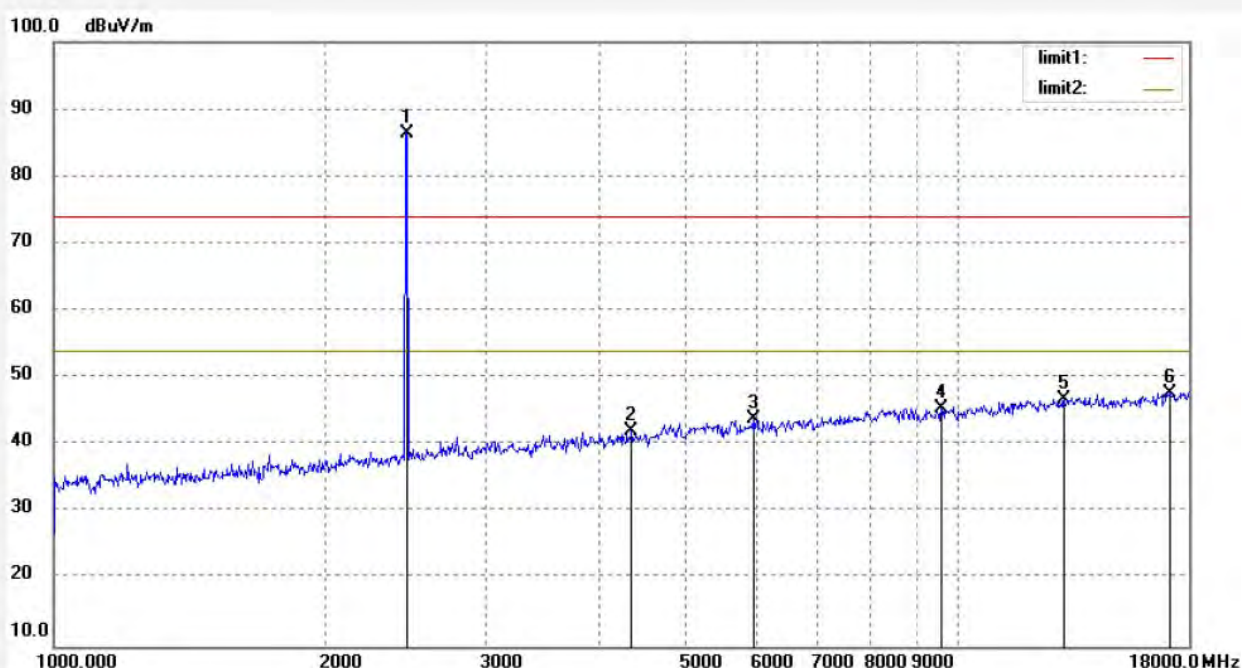
Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.022	86.50	1.09	87.59			peak	200	189	
2	4916.490	34.52	8.37	42.89	74.00	-31.11	peak	200	222	
3	6602.265	32.47	11.39	43.86	74.00	-30.14	peak	200	171	
4	8514.456	29.85	15.06	44.91	74.00	-29.09	peak	200	325	
5	13442.808	-10.44	56.88	46.44	74.00	-27.56	peak	200	87	
6	16409.819	-11.84	59.18	47.34	74.00	-26.66	peak	200	116	

Job No.: NTC #822	Polarization: Vertical
Standard: FCC Part 15C	Power Source: DC 3V
Test item: Radiation Test	Date: 18/06/07/
Temp.( C)/Hum.(%) 23 C / 48 %	Time: 20:32:42
EUT: telecontroller	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: 90600366	
Manufacturer: ETI	

Note: Report No.: ATE20180953



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.013	85.28	1.09	86.37			peak	150	99	
2	4354.454	36.94	5.17	42.11	74.00	-31.89	peak	150	100	
3	5932.638	32.74	11.03	43.77	74.00	-30.23	peak	150	211	
4	9585.684	28.10	17.43	45.53	74.00	-28.47	peak	150	108	
5	13097.624	-9.36	56.20	46.84	74.00	-27.16	peak	150	132	
6	17136.924	-13.76	61.53	47.77	74.00	-26.23	peak	150	188	

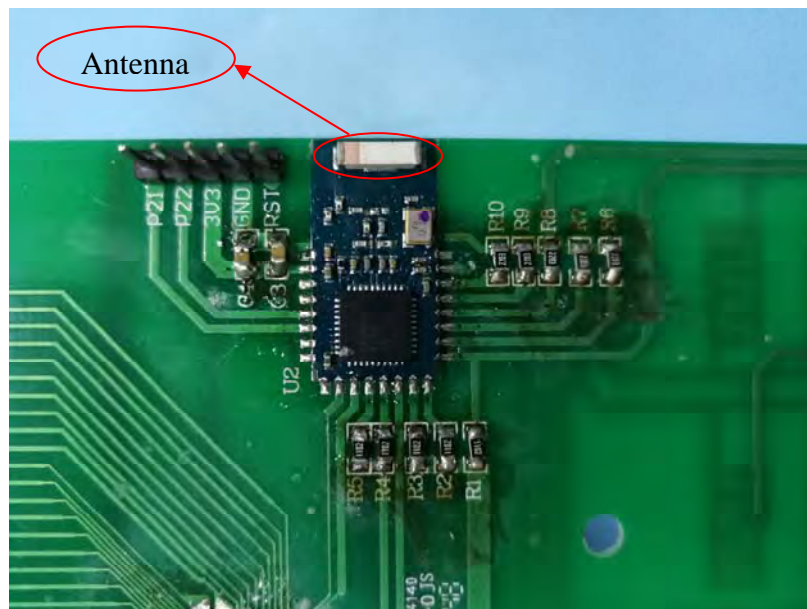
## 10. ANTENNA REQUIREMENT

### 10.1. The Requirement

According to Section 15.203, 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.

### 10.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 1dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



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