

# FCC TEST REPORT(15B)

for

ZHE JIANG EASTSUN AUTOCAR THINGS CO, LTD.

Flash controller

Model Number: ES-KZ5005

FCC ID: 2ACT9ES-KZ5005

Prepared for : ZHE JIANG EASTSUN AUTOCAR THINGS CO, LTD.  
Address : No. 97 North Chezhan Road, Jiashan County, Zhejiang, China

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Report No. : 14KWE081763F

Date of Test : Aug. 8~14, 2014

Date of Report : Aug. 14, 2014

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## Keyway Testing Technology Co., Ltd.

<b>Applicant:</b>	ZHE JIANG EASTSUN AUTOCAR THINGS CO, LTD.		
<b>Address:</b>	No. 97 North Chezhan Road, Jiashan County, Zhejiang, China		
<b>Manufacturer:</b>	ZHE JIANG EASTSUN AUTOCAR THINGS CO, LTD.		
<b>Address:</b>	No. 97 North Chezhan Road, Jiashan County, Zhejiang, China		
<b>E.U.T:</b>	Flash controller		
<b>Model Number:</b>	ES-KZ5005		
<b>Trade Name:</b>	EASTSUN	<b>Serial No.:</b>	-----
<b>Date of Receipt:</b>	Aug. 8, 2014	<b>Date of Test:</b>	Aug. 8~14, 2014
<b>Test Specification:</b>	FCC Part 15, Subpart B: Oct. 1, 2013 ANSI C63.4:2009		
<b>Test Result:</b>	The equipment under test was found to be compliance with the requirements of the standards applied.		
<b>Issue Date: Aug. 15, 2014</b>			
Tested by:	Reviewed by:	Approved by:	
 <hr style="width: 100%;"/>	 <hr style="width: 100%;"/>	 <hr style="width: 100%;"/>	
Andy Gao / Engineer	Jade Yang/ Supervisor	Chris Du / Manager	
<b>Other Aspects:</b>	None.		
<i>Abbreviations: OK/P=passed    fail/F=failed    n.a/N=not applicable    E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.</i>			

## 1. TEST SUMMARY

Test Items	Test Requirement	Result
Radiated Emissions	15.109	PASS
Conducted Emissions	15.107	N/A

Note: "N/A" means due to this EUT is powered by the battery only, this test item is not applicable.

## 2. GENERAL PRODUCT INFORMATION

### 2.1. Product Function

Refer to Technical Construction Form and User Manual.

### 2.2. Description of Device (EUT)

Product Name:	Flash controller
Model No.:	ES-KZ5005
Operation Frequency:	RX 433.92MHz
Modulation technology:	FSK
Antenna Type:	Internal
Power supply:	DC12~24V

### 2.3. Difference between Model Numbers

None.

### 2.4. Independent Operation Modes

The basic operation modes are:

1	RX 433.92MHz
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## 2.5. Test Supporting System

None.

## 2.6. Test Facilities

Lab Qualifications :

Certificated by Industry Canada  
Registration No.: 9868A  
Date of registration: December 8, 2011

Certificated by FCC, USA  
Registration No.: 370994  
Date of registration: February 21, 2012

Certificated by CNAS China  
Registration No.: CNAS L5783  
Date of registration: August 8, 2012

## 2.7. List of Test and Measurement Instruments

### 2.7.1. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 27,14	Apr. 26,15
System Simulator	Agilent	E5515C	GB43130245	Apr. 30,14	Apr. 29,15
Power Splitter	Weinschel	1506A	NW425	Apr. 30,14	Apr. 29,15
Bilog Antenna	ETS-LINDGREEN	3142D	135452	Apr. 27,14	Apr. 26,15
Loop antenna	teseq	HLA6120	22032	Apr. 30,14	Apr. 29,15
Spectrum Analyzer	Agilent	E4411B	MY4511304	Apr. 27,14	Apr. 26,15
3m Semi-anechoic Chamber	ETS-LINDGREEN	966	KW01	Apr. 27,14	Apr. 26,15
Signal Amplifier	SONOMA	310	187016	Apr. 27,14	Apr. 26,15
Signal Amplifier	Agilent	8449B	3008A00251	Apr. 27,14	Apr. 26,15
RF Cable	IMRO	IMRO-400	966 Cable 1#	N/A	N/A
MULTI-DEVICE Controller	ETS-LINDGREEN	2090	126913	N/A	N/A
Horn Antenna	DAZE	ZN30701	11003	Apr. 27,14	Apr. 26,15
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	Apr. 27,14	Apr. 26,15
Spectrum Analyzer	Agilent	8593E	3911A04271	Apr. 27,14	Apr. 26,15
Spectrum Analyzer	Agilent	E4408B	MY44211125	Apr. 30,14	Apr. 29,15
Signal Amplifier	DAZE	ZN3380C	11001	Apr. 27,14	Apr. 26,15
High Pass filter	Micro	HPM50111	324216	Apr. 30,14	Apr. 29,15
Filter	COM-MW	ZBSF-C836.5-25-X	KW032	Apr. 30,14	Apr. 29,15
Filter	COM-MW	ZBSF-C1747.5-75-X2	KW035	Apr. 30,14	Apr. 29,15
Filter	COM-MW	ZBSF-C1880-60-X2	KW037	Apr. 30,14	Apr. 29,15
DC Power Supply	LongWei	PS-305D	010964729	Apr. 27,14	Apr. 26,15
Constant temperature and humidity box	GF	GTH-800-40-1P	MAA9906-005	Apr. 27,14	Apr. 26,15
Universal radio communication tester	Rohde&Schwarz	CMU200	3215420	Apr. 27,14	Apr. 26,15
Splitter	Agilent	11636B	0025164	Apr. 27,14	Apr. 26,15

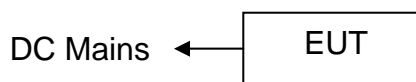
### 3. TEST SET-UP AND OPERATION MODES

#### 3.1. Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

#### 3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



#### 3.3. Test Operation Mode and Test Software

None.

#### 3.4. Special Accessories and Auxiliary Equipment

None.

#### 3.5. Countermeasures to Achieve EMC Compliance

None.

#### 3.6. Test Environment:

Ambient conditions in the test laboratory:

Items	Actual
Temperature (°C)	21~23
Humidity (%RH)	50~65

## 4. EMISSION TEST RESULTS

### 4.1. Radiated Emission Test

#### 4.1.1. Limit 15.109 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	



#### 4.1.2. Test setup

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz.

Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

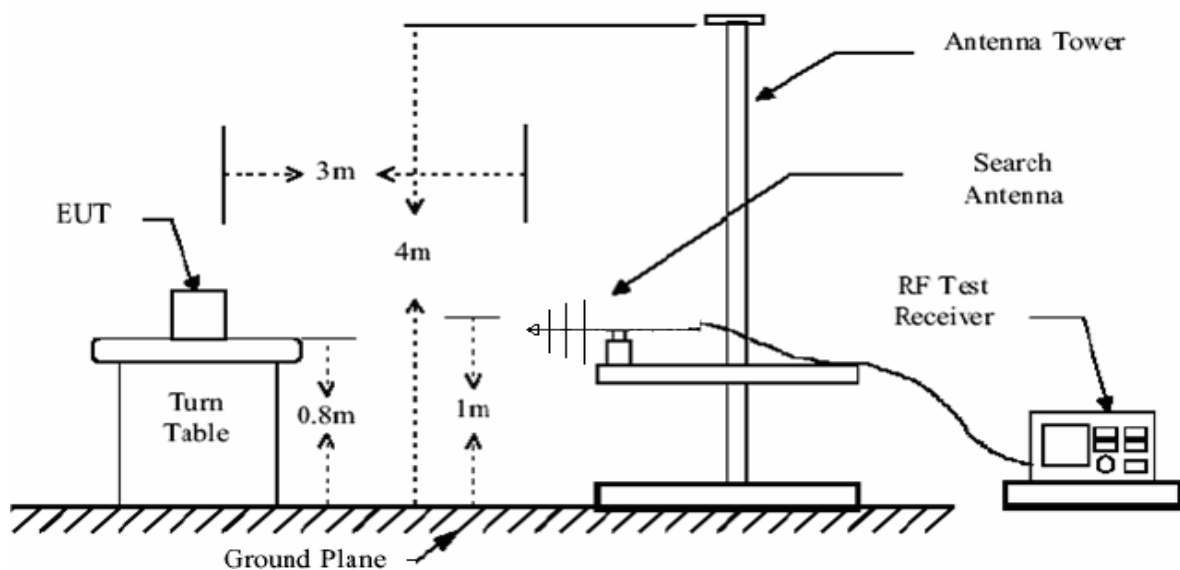
2. Measurement Uncertainty:  $\pm 3.2$  dB at a level of confidence of 95%.

3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.

5: The Max operation frequency of EUT is 433.92MHz, the test frequency is up to 2GHz

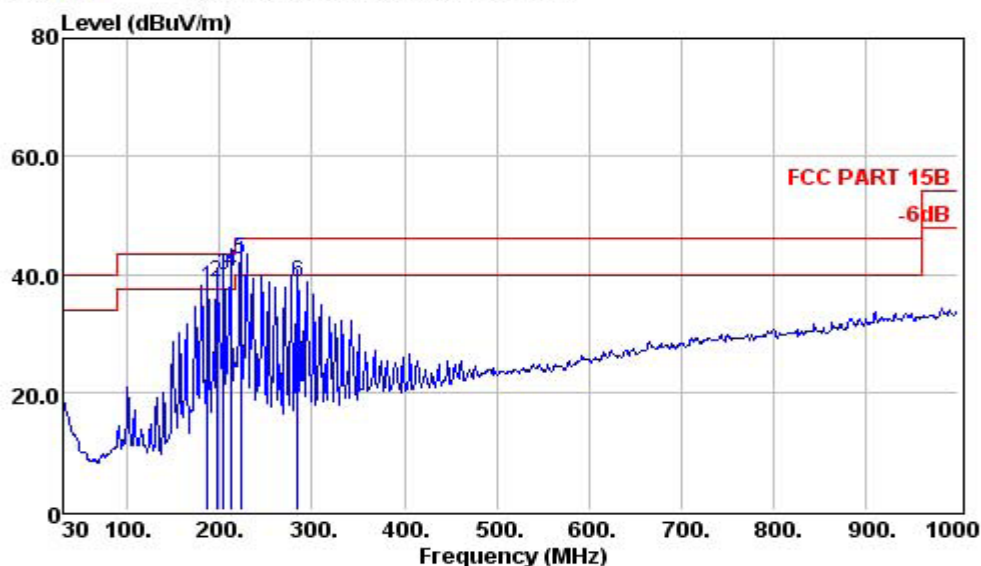
6: The emission of below 30MHz is background, the data no show it.



Below 1GHz

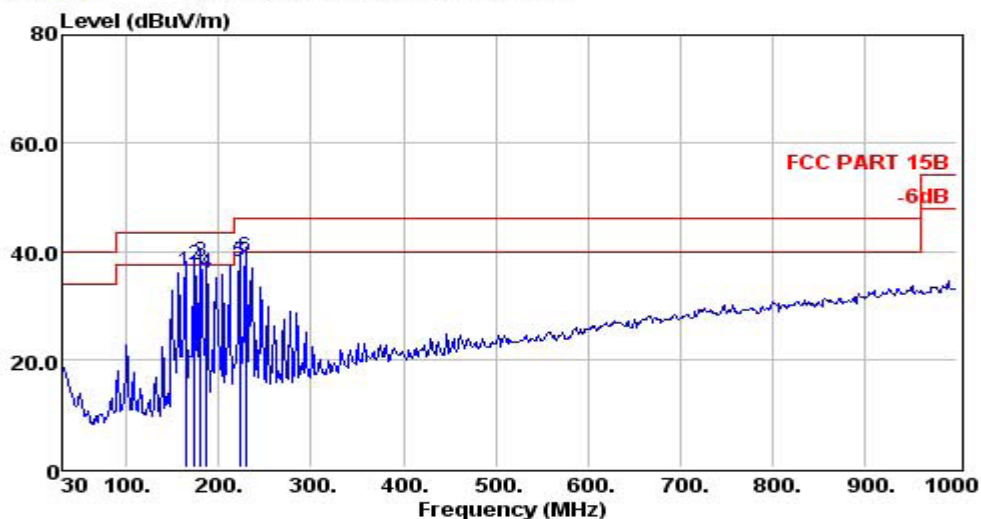
DC 24V

Horizontal polarizations



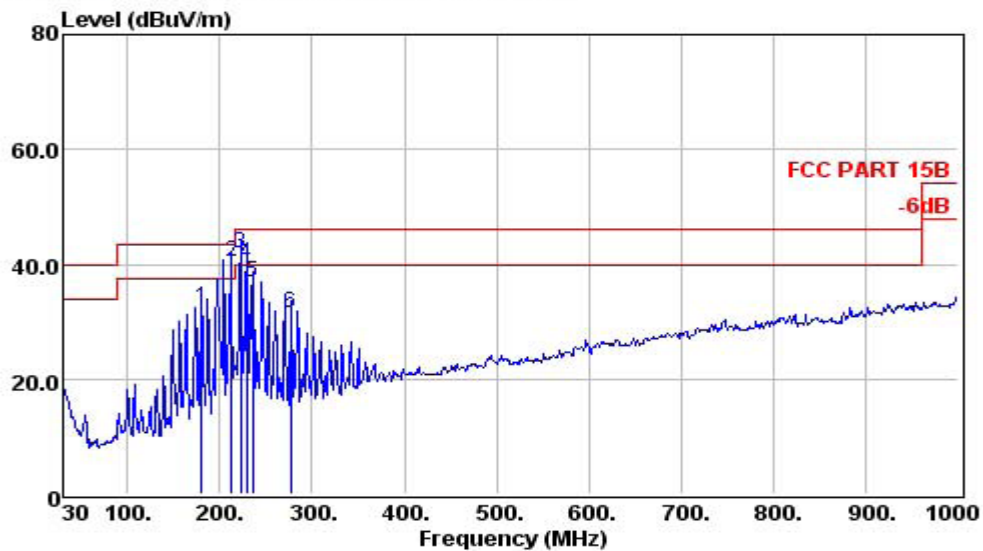
		Preamp	Read	Cable&Antenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	187.14	31.13	57.23	1.39	10.19	37.68	43.50	-5.82
2	196.84	31.11	57.71	1.46	10.72	38.78	43.50	-4.72
3	204.60	31.09	58.40	1.46	11.22	39.99	43.50	-3.51
4	212.36	31.06	58.31	1.53	11.59	40.37	43.50	-3.13
5	222.06	30.96	60.00	1.53	12.06	42.63	46.00	-3.37
6	284.14	30.94	54.51	1.87	13.29	38.73	46.00	-7.27

Vertical polarizations



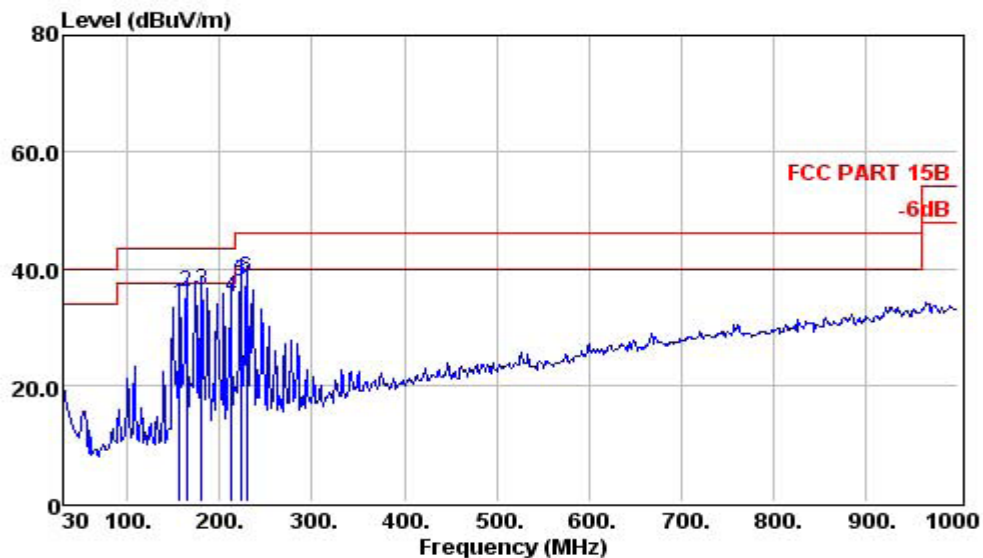
		Preamp	Read	Cable&Antenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	163.86	31.21	56.54	1.30	9.55	36.18	43.50	-7.32
2	173.56	31.18	56.90	1.39	10.21	37.32	43.50	-6.18
3	180.35	31.16	57.46	1.39	10.39	38.08	43.50	-5.42
4	187.14	31.13	55.57	1.39	10.19	36.02	43.50	-7.48
5	222.06	30.96	55.30	1.53	12.06	37.93	46.00	-8.07
6	228.85	30.92	55.83	1.61	12.31	38.83	46.00	-7.17

Below 1GHz  
DC 12V  
Horizontal polarizations



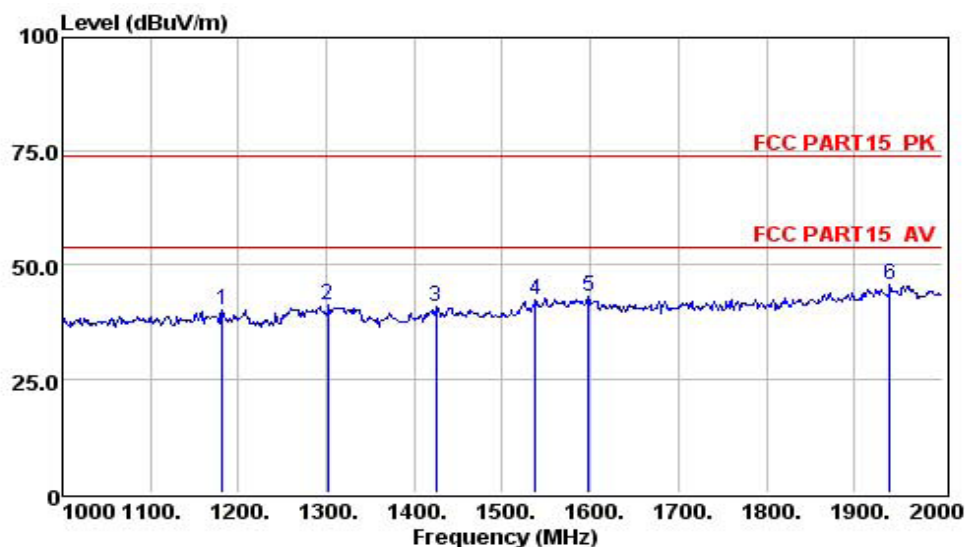
	Preamp Freq	Factor	Read Level	CableAntenna Loss Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB	
1	180.35	31.16	51.65	1.39	10.39	32.27	43.50	-11.23 QP
2	212.36	31.06	58.26	1.53	11.59	40.32	43.50	-3.18 QP
3	222.06	30.96	59.27	1.53	12.06	41.90	46.00	-4.10 QP
4	228.85	30.92	57.28	1.61	12.31	40.28	46.00	-5.72 QP
5	235.64	30.94	53.59	1.61	12.50	36.76	46.00	-9.24 QP
6	277.35	30.94	47.64	1.78	13.08	31.56	46.00	-14.44 QP

Vertical polarizations



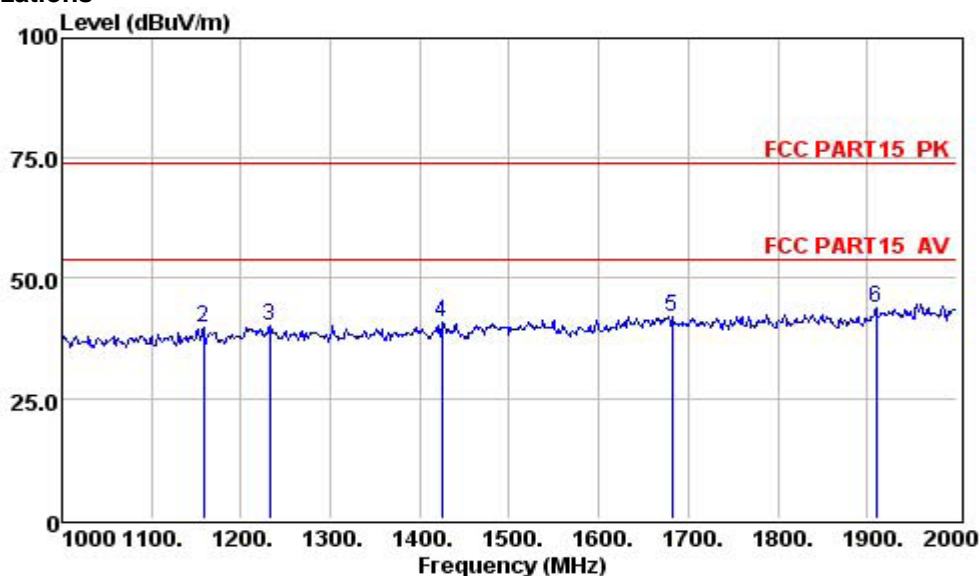
	Preamp Freq	Factor	Read Level	CableAntenna Loss Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB	
1	156.10	31.24	54.58	1.30	9.12	33.76	43.50	-9.74 QP
2	163.86	31.21	56.22	1.30	9.55	35.86	43.50	-7.64 QP
3	180.35	31.16	55.60	1.39	10.39	36.22	43.50	-7.28 QP
4	212.36	31.06	53.11	1.53	11.59	35.17	43.50	-8.33 QP
5	222.06	30.96	55.07	1.53	12.06	37.70	46.00	-8.30 QP
6	228.85	30.92	55.38	1.61	12.31	38.38	46.00	-7.62 QP

Above 1GHz  
DC 24V  
Horizontal polarizations



		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	1182.00	26.04	36.68	5.07	24.56	40.27	74.00	-33.73 Peak
2	1302.00	26.06	37.28	5.15	24.84	41.21	74.00	-32.79 Peak
3	1425.00	26.08	36.49	5.26	25.13	40.80	74.00	-33.20 Peak
4	1538.00	26.11	37.33	5.43	25.61	42.26	74.00	-31.74 Peak
5	1598.00	26.12	37.75	5.57	25.92	43.12	74.00	-30.88 Peak
6	1940.00	26.19	37.45	6.30	27.99	45.55	74.00	-28.45 Peak

Vertical polarizations

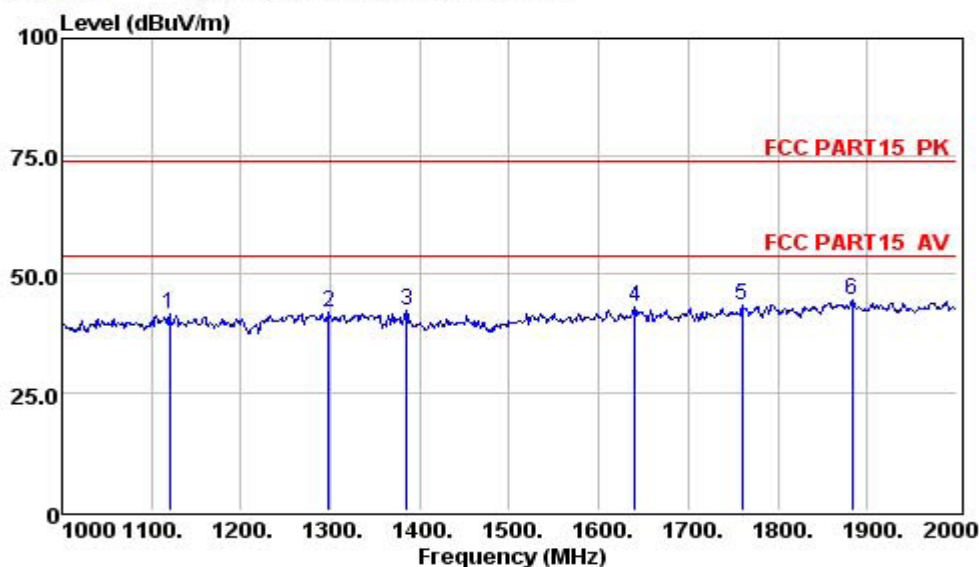


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	1000.00	26.00	36.07	4.95	24.10	39.12	74.00	-34.88 Peak
2	1158.00	26.03	36.35	5.05	24.47	39.84	74.00	-34.16 Peak
3	1232.00	26.05	36.31	5.10	24.68	40.04	74.00	-33.96 Peak
4	1425.00	26.08	36.49	5.26	25.13	40.80	74.00	-33.20 Peak
5	1682.00	26.14	36.01	5.73	26.44	42.04	74.00	-31.96 Peak
6	1910.00	26.18	35.80	6.23	27.88	43.73	74.00	-30.27 Peak

Above 1GHz

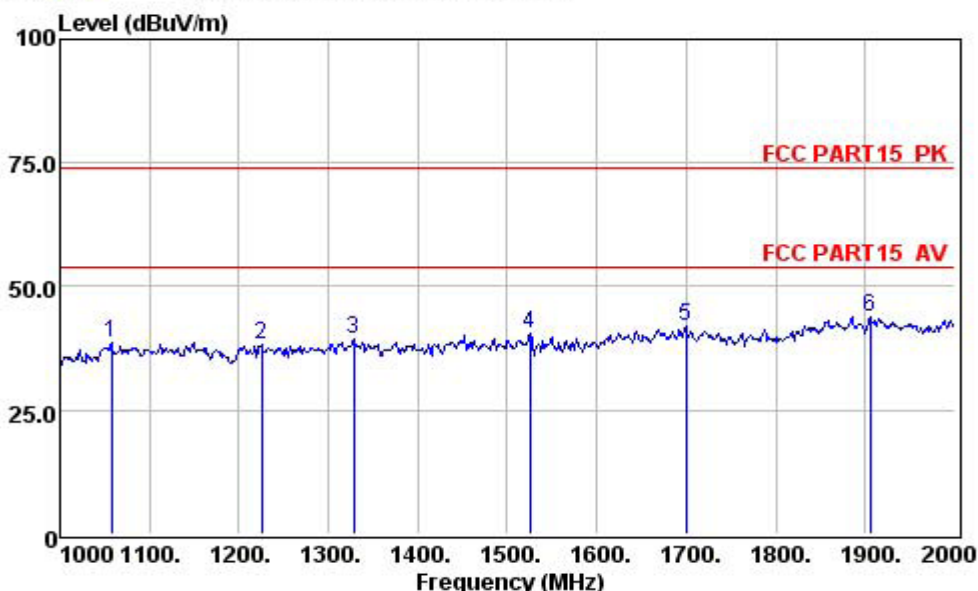
DC 12V

Horizontal polarizations



	Preamp Freq	Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit	Over	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	1120.00	26.02	38.16	5.02	24.39	41.55	74.00	-32.45	Peak
2	1298.00	26.06	37.97	5.15	24.84	41.90	74.00	-32.10	Peak
3	1385.00	26.08	38.35	5.23	25.05	42.55	74.00	-31.45	Peak
4	1640.00	26.13	37.47	5.65	26.23	43.22	74.00	-30.78	Peak
5	1760.00	26.15	36.70	5.93	26.95	43.43	74.00	-30.57	Peak
6	1883.00	26.18	36.74	6.19	27.68	44.43	74.00	-29.57	Peak

Vertical polarizations



	Preamp Freq	Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit	Over	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	1058.00	26.01	35.35	4.98	24.22	38.54	74.00	-35.46	Peak
2	1225.00	26.04	34.53	5.10	24.64	38.23	74.00	-35.77	Peak
3	1328.00	26.06	35.27	5.18	24.89	39.28	74.00	-34.72	Peak
4	1525.00	26.11	35.62	5.43	25.51	40.45	74.00	-33.55	Peak
5	1700.00	26.14	35.66	5.77	26.54	41.83	74.00	-32.17	Peak
6	1905.00	26.18	36.03	6.23	27.78	43.86	74.00	-30.14	Peak



## 5. PHOTOGRAPHS OF TEST SET-UP

### Radiated Emission



## 6. PHOTOGRAPHS OF THE EUT

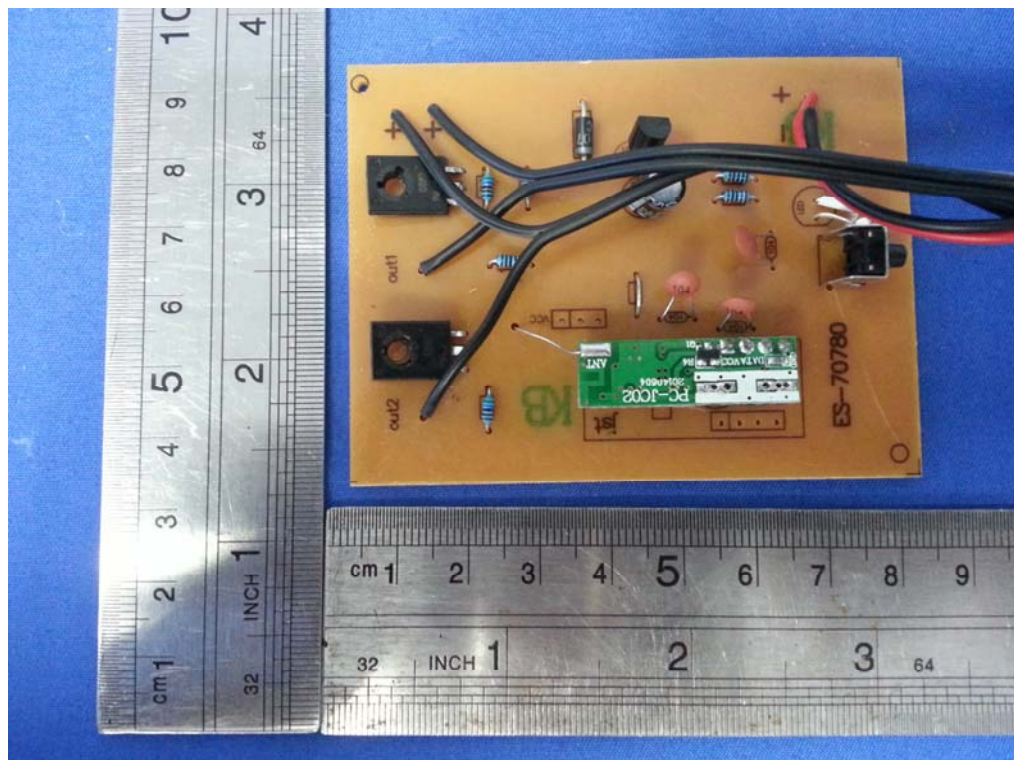




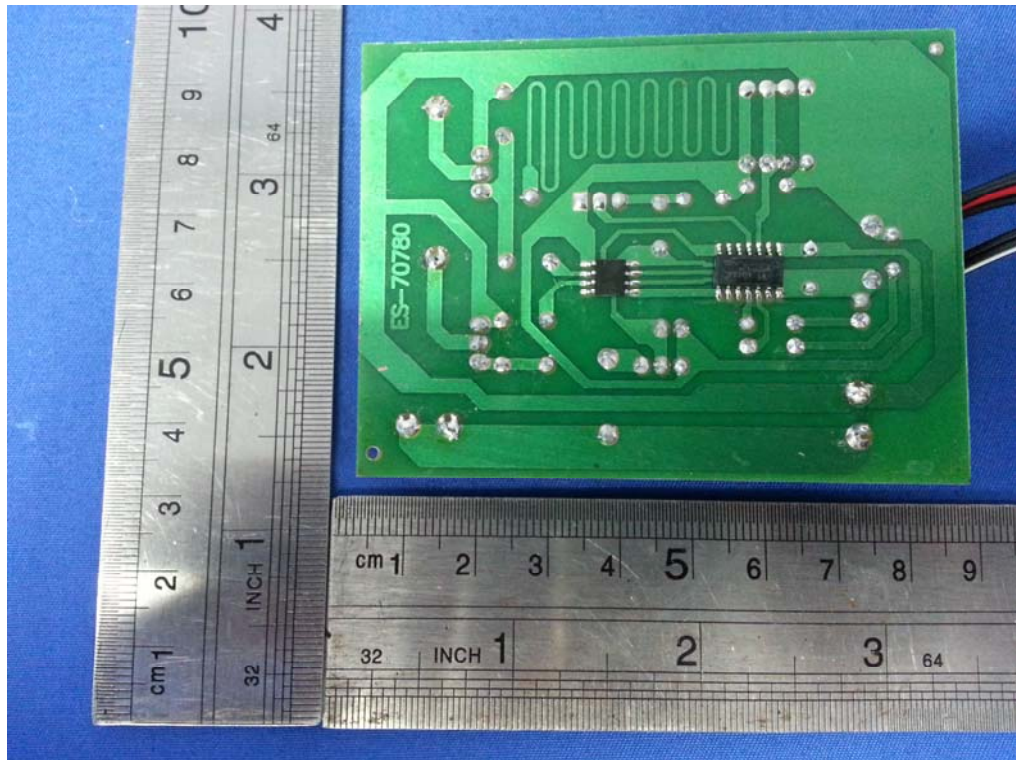












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