APPLICATION CERTIFICATION
On Behalf of
SHENZHEN MARKTRACE CO., LTD

Equipment & Instrument Status Wireless Sensor
Model No.: MR3872C

FCC ID: 2AJQV-MR3872C

Prepared for	:	SHENZHEN MARKTRACE CO., LTD
Address	:	F5, Bldg. 7, Changyuan New Material Port, Keyuan RD, Science & Industry Park, Shenzhen, China.
Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
Address	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396

Report Number	:	ATE20161321
Date of Test	:	July 13-August 29, 2016
Date of Report	:	September 9, 2016

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Description Page

Test Report Certification

Applicant	:	SHENZHEN MARKTRACE CO., LTD
Manufacturer	:	SHENZHEN MARKTRACE CO., LTD
EUT Description	:	Equipment & Instrument Status Wireless Sensor
		(A) Model No.: MR3872C
		(B) Trade Mark: Maktrace RFID
		(C) Power Supply: AC 100-240V; 50/60Hz

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249: 2015
ANSI C63.10: 2013

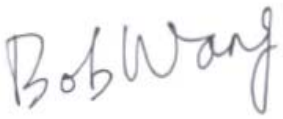
The EUT was tested according to FCC 47CFR 15.249 for compliance to FCC 47CFR 15.249 requirements

The device described above is tested by 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 15.249 limits. The measurement results are contained in this test report and 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 ACCURATE TECHNOLOGY CO. LTD.

Date of Test :	July 13-August 29, 2016
Date of Report:	September 9, 2016

Prepared by :



(Bob Wang, Engineer)

Approved & Authorized Signer :

(Sean Lu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Equipment & Instrument Status Wireless Sensor
Model Number	:	MR3872C
Trade Mark	:	Maktrace RFID
Power Supply	:	AC 100-240V; 50/60Hz
Modulation:	:	GFSK
Frequency Range	:	2425MHz
Number of Channels	:	1
Type of Antenna	:	Integral Antenna
Max antenna gain	:	0dBi
Applicant	:	SHENZHEN MARKTRACE CO., LTD
Address	:	F5, Bldg. 7, Changyuan New Material Port, Keyuan RD, Science & Industry Park, Shenzhen, China.
Manufacturer	:	SHENZHEN MARKTRACE CO., LTD
Address	:	F5, Bldg. 7, Changyuan New Material Port, Keyuan RD, Science & Industry Park, Shenzhen, China.
Date of sample received	:	July 10, 2016
Date of Test	:	July 13-August 29, 2016

1.2.Special Accessory and Auxiliary Equipment

N/A

1.3.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.4.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. 9, 2016	Jan. 8, 2017
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 9, 2016	Jan. 8, 2017
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 9, 2016	Jan. 8, 2017
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 9, 2016	Jan. 8, 2017
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 14, 2016	Jan. 13, 2017
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 14, 2016	Jan. 13, 2017
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 14, 2016	Jan. 13, 2017
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 14, 2016	Jan. 13, 2017
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 9, 2016	Jan. 8, 2017
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 9, 2016	Jan. 8, 2017

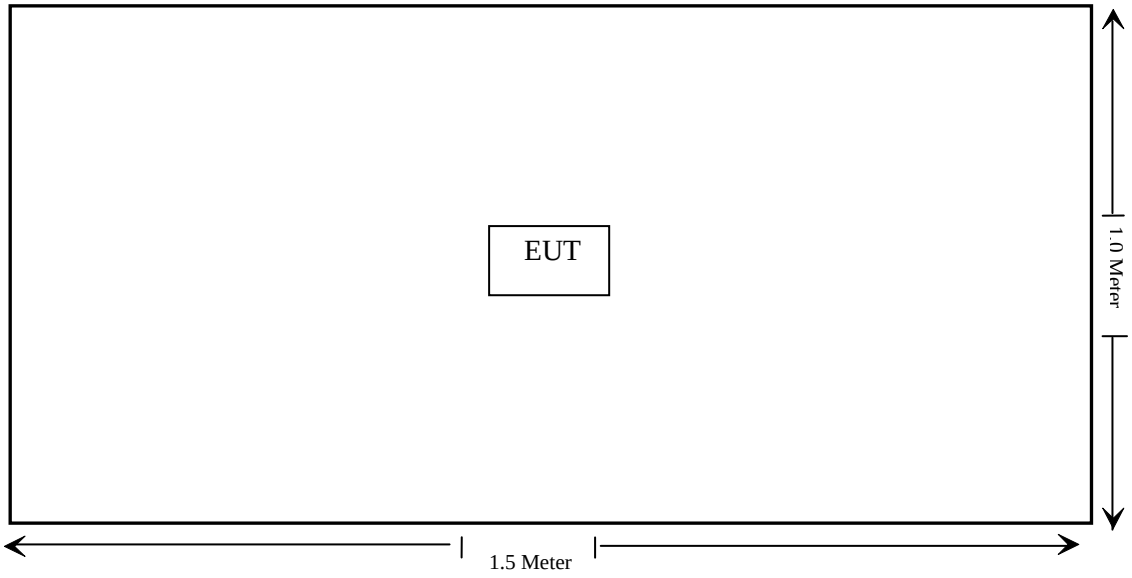
3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **Transmitting mode: 2425MHz**

3.2.Configuration and peripherals

Block Diagram of Test Setup

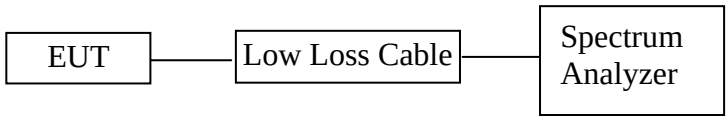


4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.215(c)	20dB Bandwidth	Compliant
Section 15.249(d)	Band Edge Compliance Test	Compliant
Section 15.205(a), Section 15.209(a), Section 15.249, Section 15.35	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH MEASUREMENT

5.1.Block Diagram of Test Setup



5.2.The Requirement For Section 15.215(c)

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

5.3.Operating Condition of EUT

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

5.3.2.Turn on the power of all equipment.

5.3.3.Let the EUT work in TX modes measure it. The transmit frequency is 2425MHz.

5.4.Test Procedure

5.4.1.Place the EUT on the table and set it in transmitting mode.

5.4.2.Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

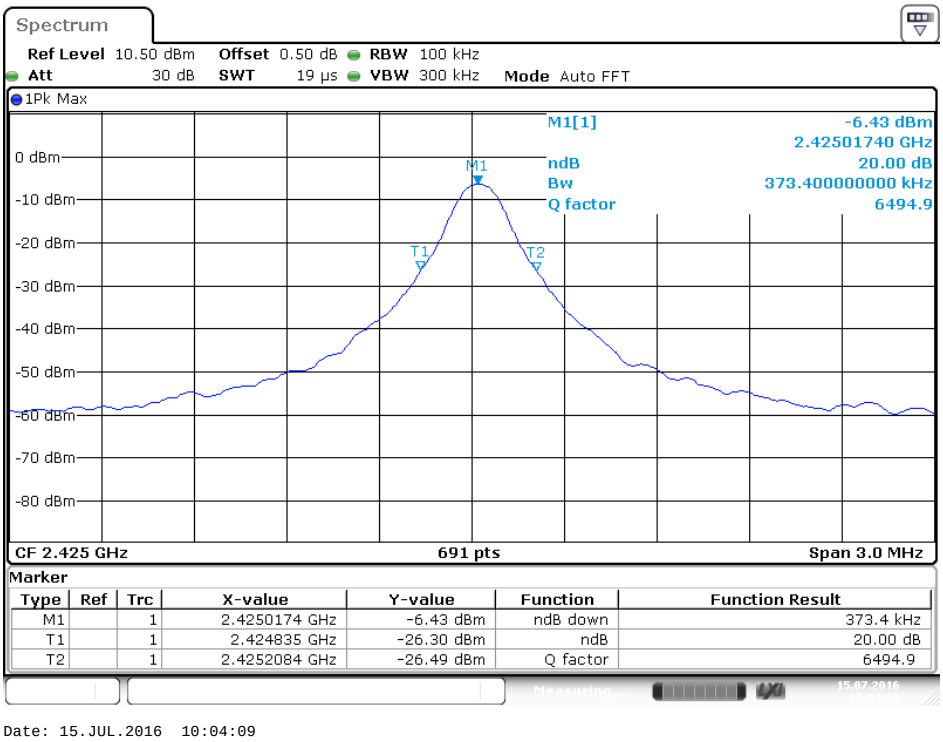
5.4.3.Set RBW of spectrum analyzer to 100 kHz and VBW to300 kHz, Detector function=peak, Trace=max hold, Sweep=auto.

5.4.4.Set the measured low, middle and high frequency and test 20dB bandwidth with spectrum analyzer.

5.5.Test Result

Frequency (MHz)	20 dB Bandwidth (MHz)
2425	0.373

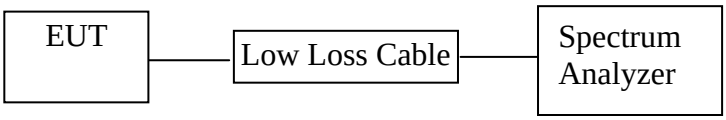
The spectrum analyzer plots are attached as below.



Date: 15.JUL.2016 10:04:09

6. BAND EDGE COMPLIANCE TEST

6.1.Block Diagram of Test Setup



6.2.The Requirement For Section 15.249

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 A8.4(4), the attenuation required 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).

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 is 2425MHz MHz.

6.5.Test Procedure

Conducted Band Edge:

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

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

Radiated Band Edge:
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
3. Display the measurement of peak values.

Test Procedure:

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. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX modes then measure it.

During the radiated emission test, the spectrum analyzer was set with the following configurations:
1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
3.All modes of operation were investigated and the worst-case emissions are reported.

6.6.Test Result

Pass

Radiated Band Edge Result

ACCURATE TECHNOLOGY CO., LTD.
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Site: 1# Chamber
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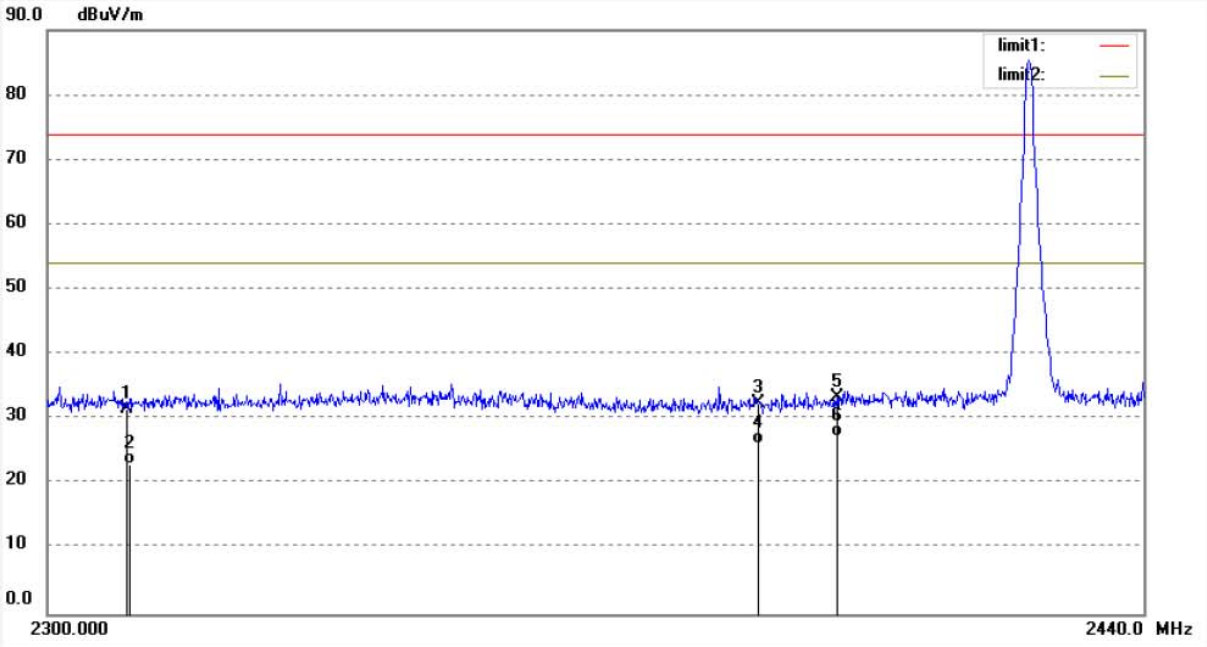
Fax:+86-0755-26503396

Job No.: STAR2016 #1505	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/07/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/24/33
EUT: Ecuipment & Instrument Status Wireless Sensor	Engineer Signature: star
Mode: TX	Distance: 3m
Model: MR3872C	
Manufacturer: MARKTRACE	

Note: Report No.:ATE20161321



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2310.000	39.39	-7.87	31.52	74.00	-42.48	peak			
2	2310.000	31.00	-7.87	23.13	54.00	-30.87	AVG			
3	2390.000	40.12	-7.64	32.48	74.00	-41.52	peak			
4	2390.000	33.76	-7.64	26.12	54.00	-27.88	AVG			
5	2400.000	41.04	-7.61	33.43	74.00	-40.57	peak			
6	2400.000	34.89	-7.61	27.28	54.00	-26.72	AVG			

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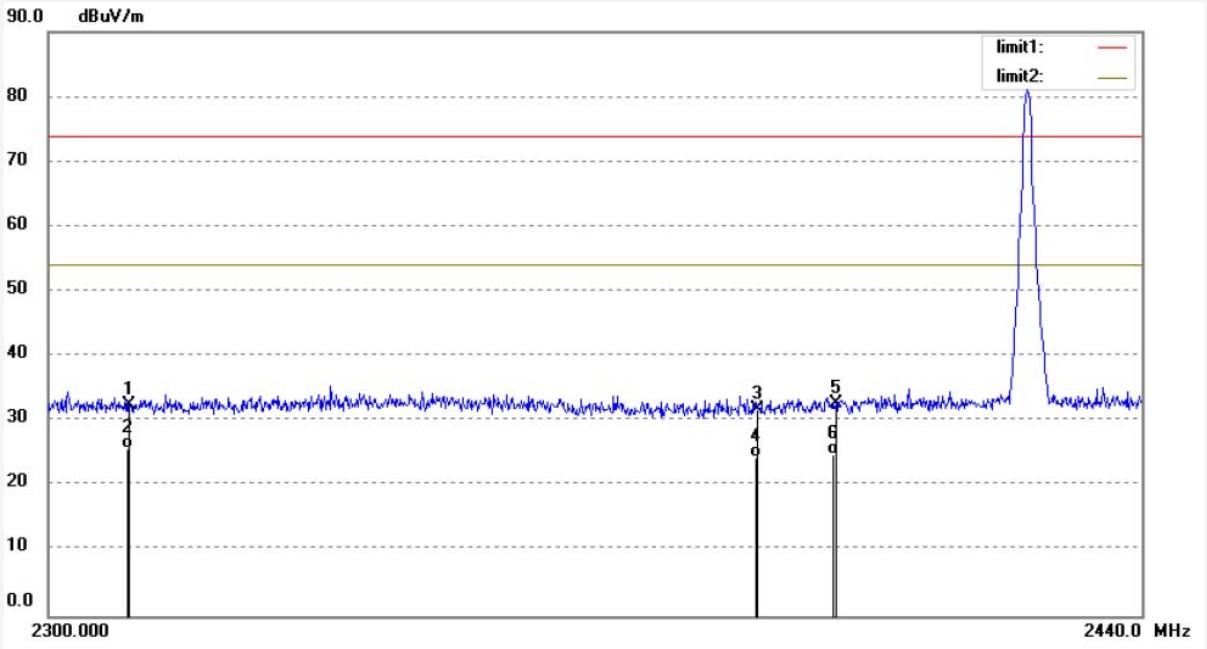
Job No.: STAR2016 #1506	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/07/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/28/58
EUT: Ecuipment & Instrument Status Wireless Sensor	Engineer Signature: star
Mode: TX	Distance: 3m
Model: MR3872C	
Manufacturer: MARKTRACE	

Note: Report No.:ATE20161321



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2310.000	40.37	-7.87	32.50	74.00	-41.50	peak			
2	2310.000	33.64	-7.87	25.77	54.00	-28.23	AVG			
3	2390.000	39.42	-7.64	31.78	74.00	-42.22	peak			
4	2390.000	32.13	-7.64	24.49	54.00	-29.51	AVG			
5	2400.000	40.25	-7.61	32.64	74.00	-41.36	peak			
6	2400.000	32.40	-7.61	24.79	54.00	-29.21	AVG			

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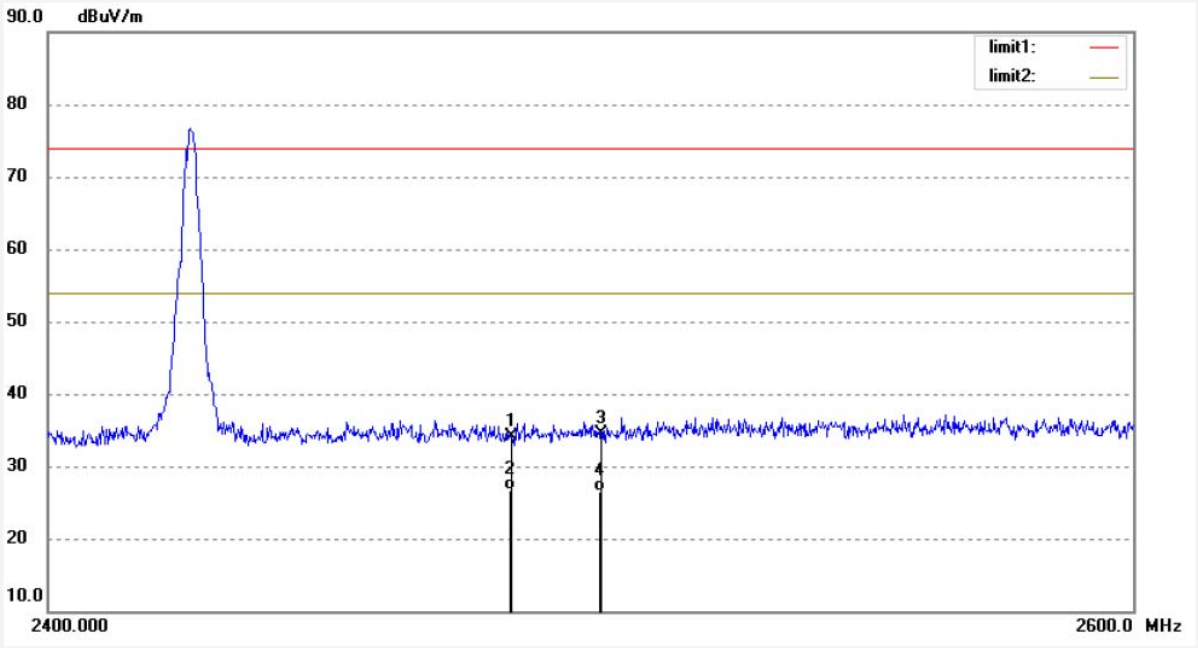
Job No.: STAR2016 #1913	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2016/07/13
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15:35:18
EUT: RFID	Engineer Signature: star
Mode: TX	Distance: 3m
Model: MR3872C	
Manufacturer: MARKTRACE	

Note: Report No.:ATE20161321



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	39.40	-5.37	34.03	74.00	-39.97	peak			
2	2483.500	32.10	-5.37	26.73	54.00	-27.27	AVG			
3	2500.000	39.90	-5.32	34.58	74.00	-39.42	peak			
4	2500.000	31.78	-5.32	26.46	54.00	-27.54	AVG			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
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Site: 1# Chamber
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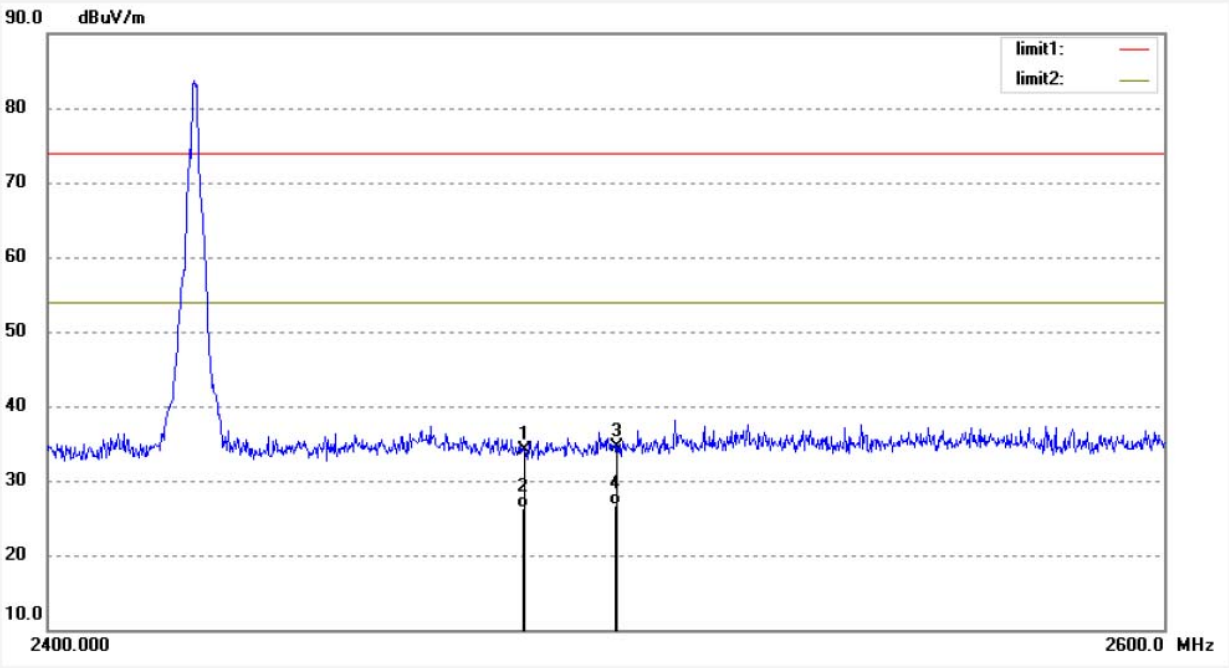
Job No.: STAR2016 #1914
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFID
Mode: TX
Model: MR3872C
Manufacturer: MARKTRACE

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2016/07/13
Time: 15:39:24
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20161321

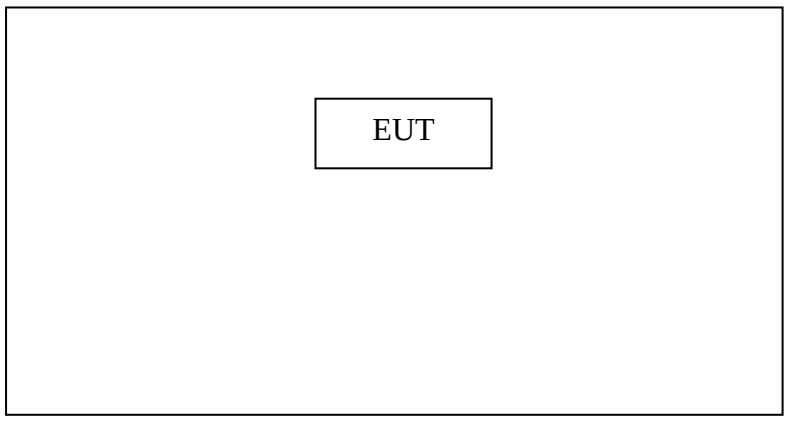


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	39.40	-5.37	34.03	74.00	-39.97	peak			
2	2483.500	31.74	-5.37	26.37	54.00	-27.63	AVG			
3	2500.000	39.90	-5.32	34.58	74.00	-39.42	peak			
4	2500.000	32.08	-5.32	26.76	54.00	-27.24	AVG			

7. RADIATED SPURIOUS EMISSION TEST

7.1.Block Diagram of Test Setup

7.1.1.Block diagram of connection between the EUT and peripherals



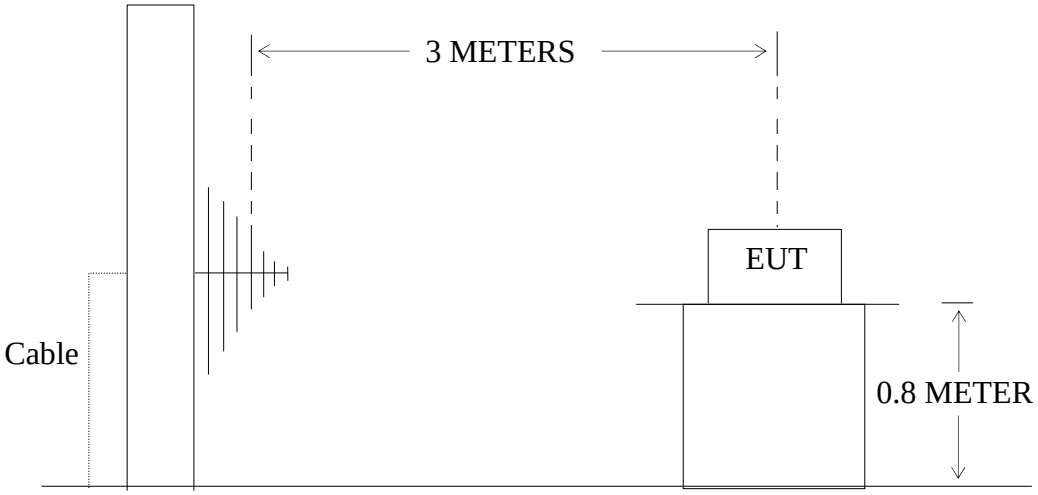
Setup: Transmitting mode

(EUT: Equipment & Instrument Status Wireless Sensor)

7.1.2.Semi-Anechoic Chamber Test Setup Diagram

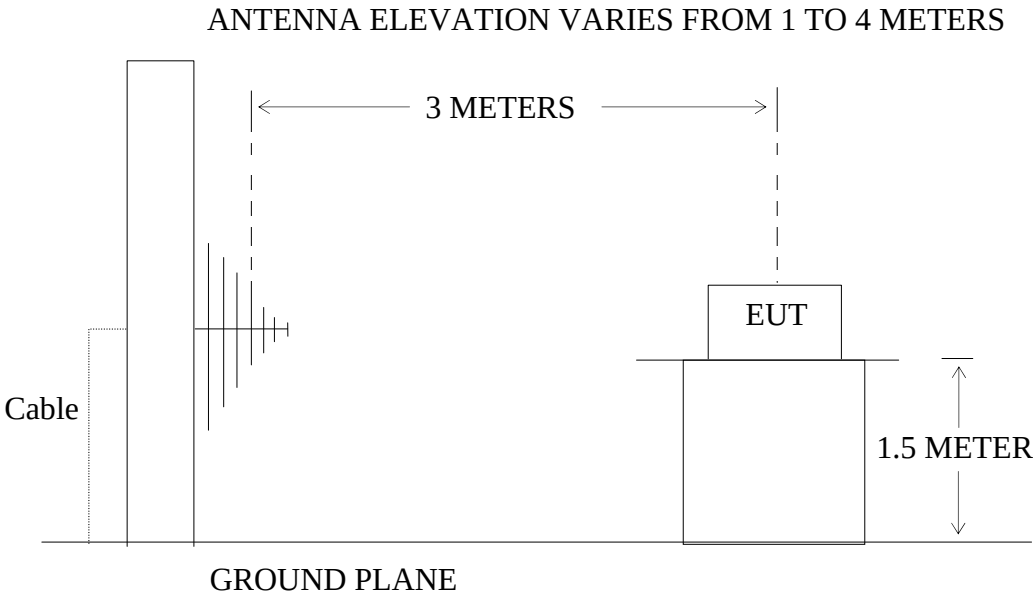
Below 1GHz

ANTENNA ELEVATION VARIES FROM 1 TO 4 METERS



GROUND PLANE

Above 1GHz



7.2.The Limit For Section 15.249

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 A8.4(4), 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).

7.3.Restricted bands of operation

7.3.1.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
[1]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	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]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 Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

7.4.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.

7.5.Operating Condition of EUT

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

7.5.2.Turn on the power of all equipment.

7.5.3.Let the EUT work in TX modes measure it. The transmit frequency is 2425MHz.

7.6. 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. The EUT was tested in 3 orthogonal planes.

The frequency range from 30MHz to 25000MHz is checked.
Result = Reading + Corrected Factor
Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

7.7.The Field Strength of Radiation Emission Measurement Results

PASS.

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
---	---	---	---	---	---	Vertical
---	---	---	---	---	---	Vertical
---	---	---	---	---	---	Vertical
---	---	---	---	---	---	Horizontal
---	---	---	---	---	---	Horizontal
---	---	---	---	---	---	Horizontal

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
-	-	-	-	-	-	-	-	-	-	Vertical
-	-	-	-	-	-	-	-	-	-	Horizontal

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

2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission at Low, Middle, High channel in three axes. The worst emissions are reported in all channels.

4. The radiation emissions from 18-25GHz are not reported, because the test values lower than the limits of 20dB.

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Site: 1# Chamber
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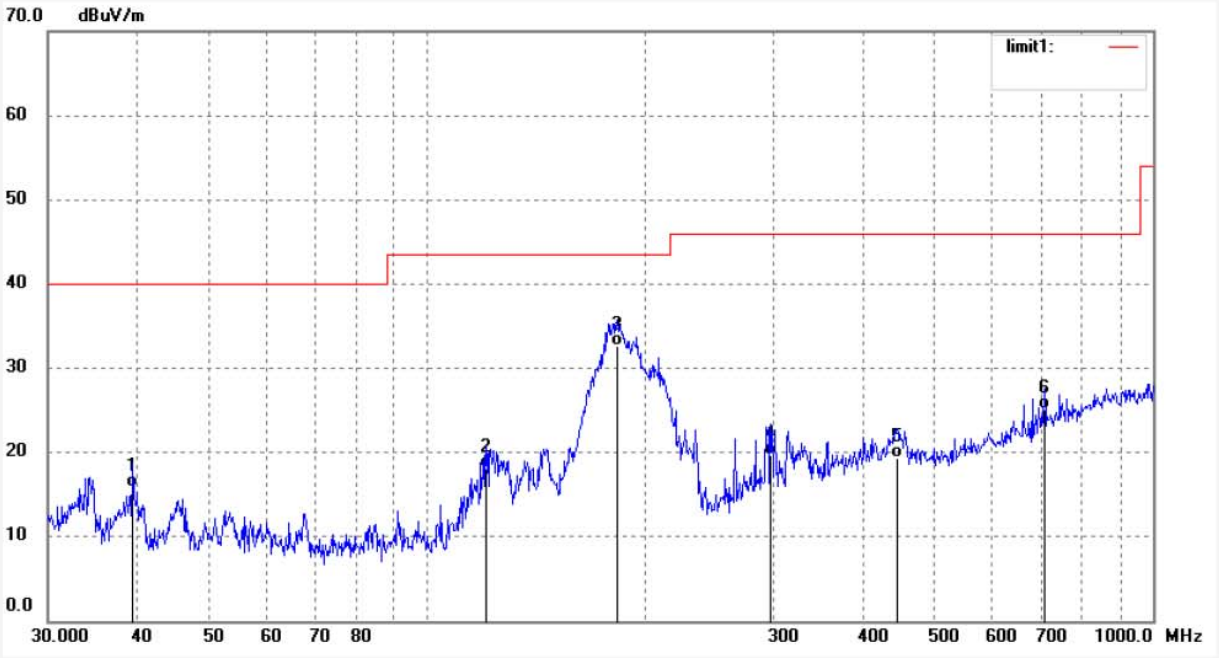
Fax:+86-0755-26503396

Job No.: STAR2016 #1501
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFID
Mode: TX 2425MHz
Model: MR3872C
Manufacturer: MARKTRACE

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2016/07/12
Time: 14:54:15
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20161321



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	39.3203	34.77	-18.88	15.89	40.00	-24.11	QP			
2	120.6118	39.40	-21.36	18.04	43.50	-25.46	QP			
3	182.5785	52.65	-20.09	32.56	43.50	-10.94	QP			
4	297.5459	36.10	-16.33	19.77	46.00	-26.23	QP			
5	444.1299	32.40	-13.13	19.27	46.00	-26.73	QP			
6	708.6941	32.83	-7.77	25.06	46.00	-20.94	QP			

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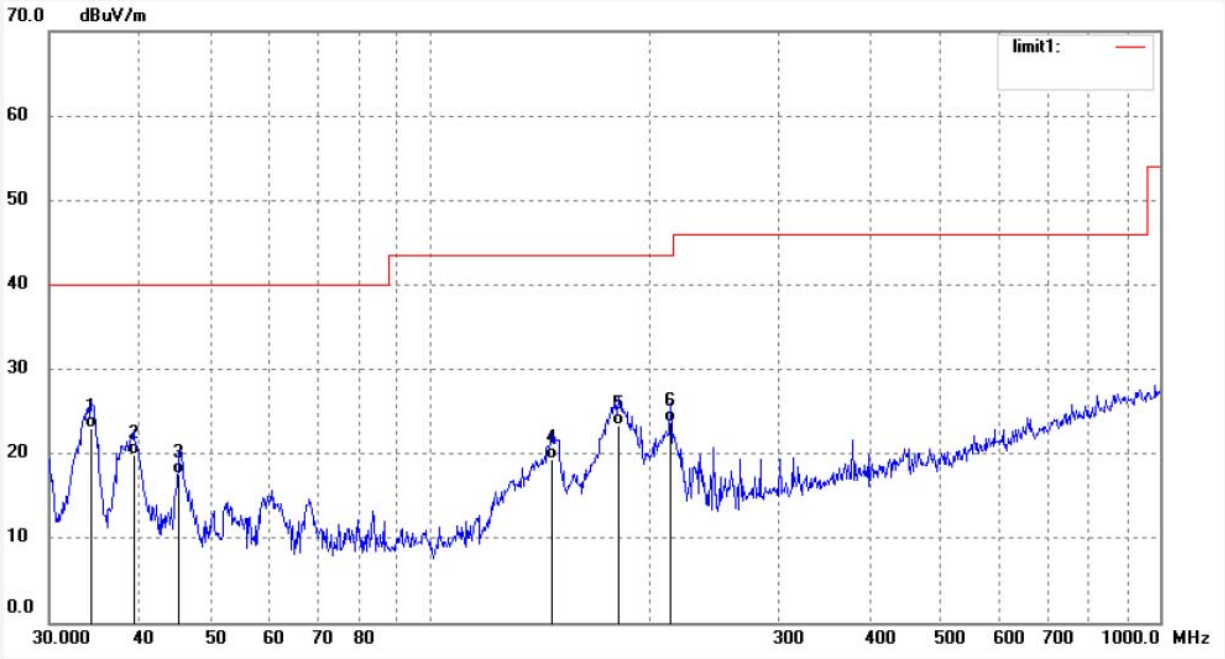
Fax:+86-0755-26503396

Job No.: STAR2016 #1502
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFID
Mode: TX 2425MHz
Model: MR3872C
Manufacturer: MARKTRACE

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2016/07/12
Time: 14:59:12
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20161321



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.2852	40.40	-17.41	22.99	40.00	-17.01	QP			
2	39.1824	38.74	-18.85	19.89	40.00	-20.11	QP			
3	45.2536	37.11	-19.45	17.66	40.00	-22.34	QP			
4	146.8392	41.57	-22.28	19.29	43.50	-24.21	QP			
5	180.6640	43.61	-20.27	23.34	43.50	-20.16	QP			
6	213.1033	42.09	-18.44	23.65	43.50	-19.85	QP			

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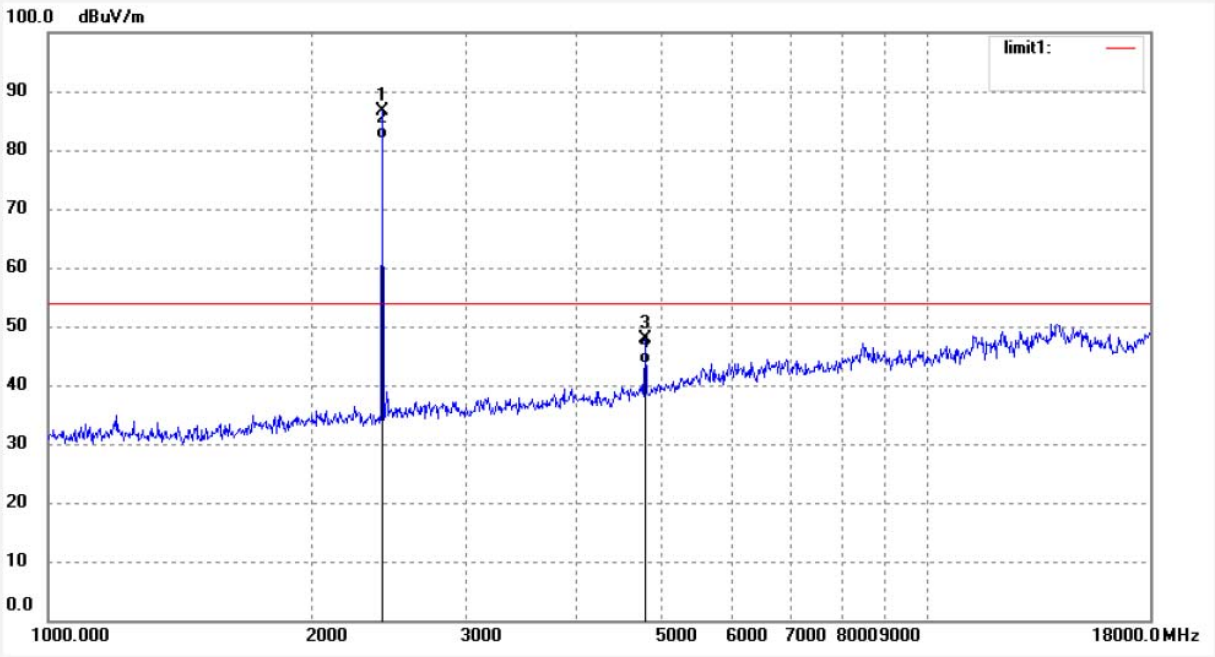
Job No.: STAR2016 #1503	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2016/07/12
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15:02:27
EUT: RFID	Engineer Signature: star
Mode: TX 2425MHz	Distance: 3m
Model: MR3872C	
Manufacturer: MARKTRACE	

Note: Report No.:ATE20161321



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2425.000	94.32	-7.61	86.71	114.00	-27.29	peak			
2	2425.000	89.40	-7.61	81.79	94.00	-12.21	AVG			
3	4850.000	49.54	-1.59	47.95	74.00	-26.05	peak			
4	4850.000	45.21	-1.59	43.62	54.00	-10.38	AVG			

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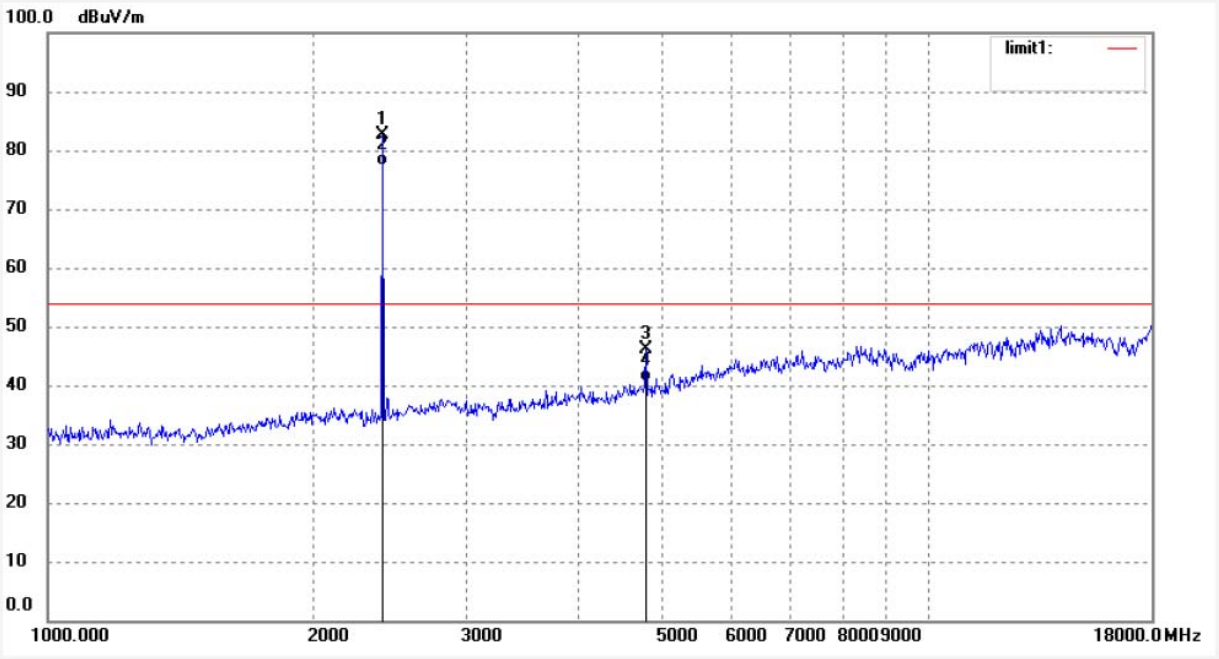
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2016 #1504	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2016/07/12
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15:05:54
EUT: RFID	Engineer Signature: star
Mode: TX 2425MHz	Distance: 3m
Model: MR3872C	
Manufacturer: MARKTRACE	

Note: Report No.:ATE20161321

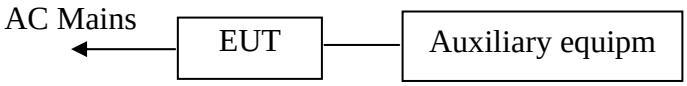


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2425.000	90.15	-7.61	82.54	114.00	-31.46	peak			
2	2425.000	85.10	-7.61	77.49	94.00	-16.51	AVG			
3	4850.000	47.83	-1.59	46.24	74.00	-27.76	peak			
4	4850.000	42.10	-1.59	40.51	54.00	-13.49	AVG			

8. AC POWER LINE CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

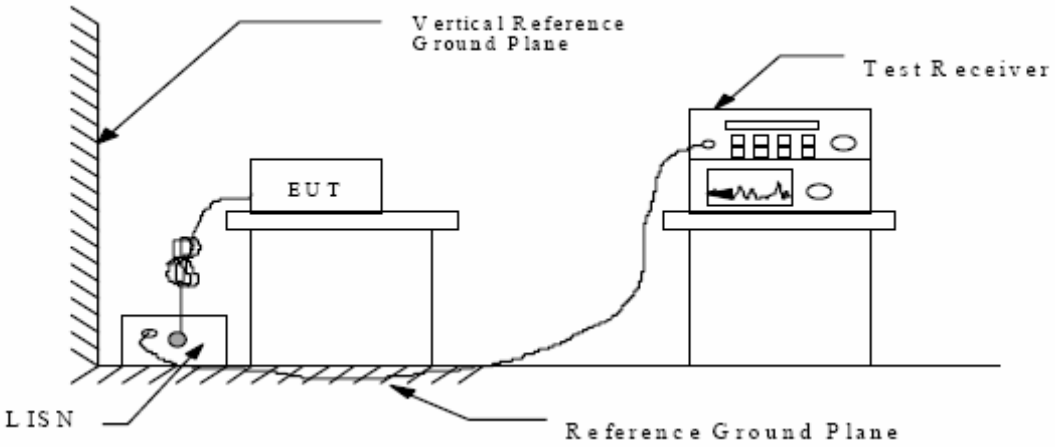
8.1.Block Diagram of Test Setup

8.1.1.Block diagram of connection between the EUT and simulators



(EUT: Equipment & Instrument Status Wireless Sensor)

8.1.2.Shielding Room Test Setup Diagram



(EUT: Equipment & Instrument Status Wireless Sensor)

8.2.The Emission Limit

8.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

8.3. Configuration of EUT on Measurement

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

8.3.1. Equipment & Instrument Status Wireless Sensor (EUT)

Model Number	:	MR3872C
Serial Number	:	N/A
Manufacturer	:	SHENZHEN MARKTRACE CO., LTD

8.4. Operating Condition of EUT

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

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in On mode measure it.

8.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2003 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

8.6. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150kHz to 30MHz is checked.

Date of Test:	August 29, 2016	Temperature:	25°C
EUT:	Equipment & Instrument Status Wireless Sensor	Humidity:	50%
Model No.:	MR3872C	Power Supply:	AC 120V/60Hz
Test Mode:	On	Test Engineer:	Star

MEASUREMENT RESULT: "MX-0829-6_fin"

8/29/2016 11:33AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	38.20	10.5	65	26.3	QP	L1	GND
1.135000	37.80	10.9	56	18.2	QP	L1	GND
1.890000	33.60	11.0	56	22.4	QP	L1	GND
2.660000	33.30	11.0	56	22.7	QP	L1	GND
4.110000	32.10	11.1	56	23.9	QP	L1	GND
6.420000	30.50	11.2	60	29.5	QP	L1	GND

MEASUREMENT RESULT: "MX-0829-6_fin2"

8/29/2016 11:33AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	37.80	10.5	55	17.2	AV	L1	GND
1.135000	36.70	10.9	46	9.3	AV	L1	GND
1.890000	32.40	11.0	46	13.6	AV	L1	GND
2.660000	32.20	11.0	46	13.8	AV	L1	GND
4.120000	30.90	11.1	46	15.1	AV	L1	GND
5.620000	29.90	11.2	50	20.1	AV	L1	GND

MEASUREMENT RESULT: "MX-0829-5_fin"

8/29/2016 11:29AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.190000	38.90	10.5	64	25.1	QP	N	GND
1.135000	33.20	10.9	56	22.8	QP	N	GND
1.850000	28.30	11.0	56	27.7	QP	N	GND
2.610000	29.60	11.0	56	26.4	QP	N	GND
4.130000	28.50	11.1	56	27.5	QP	N	GND
5.510000	26.70	11.2	60	33.3	QP	N	GND

MEASUREMENT RESULT: "MX-0829-5_fin2"

8/29/2016 11:29AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.185000	38.20	10.5	54	16.1	AV	N	GND
1.135000	32.10	10.9	46	13.9	AV	N	GND
1.850000	27.00	11.0	46	19.0	AV	N	GND
2.610000	28.30	11.0	46	17.7	AV	N	GND
4.130000	27.20	11.1	46	18.8	AV	N	GND
5.620000	26.40	11.2	50	23.6	AV	N	GND

Date of Test:	August 29, 2016	Temperature:	25°C
	Equipment & Instrument		
EUT:	Status Wireless Sensor	Humidity:	50%
Model No.:	MR3872C	Power Supply:	AC 240V/60Hz
Test Mode:	On	Test Engineer:	Star

MEASUREMENT RESULT: "MX-0829-3_fin"

8/29/2016 11:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.165000	40.60	10.5	65	24.6	QP	L1	GND
0.845000	37.30	10.8	56	18.7	QP	L1	GND
2.010000	38.80	11.0	56	17.2	QP	L1	GND
3.290000	38.30	11.1	56	17.7	QP	L1	GND
4.710000	37.60	11.1	56	18.4	QP	L1	GND
6.040000	36.50	11.2	60	23.5	QP	L1	GND

MEASUREMENT RESULT: "MX-0829-3_fin2"

8/29/2016 11:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.165000	38.00	10.5	55	17.2	AV	L1	GND
0.850000	35.00	10.8	46	11.0	AV	L1	GND
2.020000	36.50	11.0	46	9.5	AV	L1	GND
3.290000	36.00	11.1	46	10.0	AV	L1	GND
4.710000	35.20	11.1	46	10.8	AV	L1	GND
6.050000	34.20	11.2	50	15.8	AV	L1	GND

MEASUREMENT RESULT: "MX-0829-4_fin"

8/29/2016 11:25AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	40.80	10.5	65	23.7	QP	N	GND
0.845000	32.10	10.8	56	23.9	QP	N	GND
2.010000	34.40	11.0	56	21.6	QP	N	GND
3.370000	34.50	11.1	56	21.5	QP	N	GND
4.760000	33.80	11.1	56	22.2	QP	N	GND
5.990000	33.10	11.2	60	26.9	QP	N	GND

MEASUREMENT RESULT: "MX-0829-4_fin2"

8/29/2016 11:25AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	38.00	10.5	55	16.5	AV	N	GND
0.850000	29.60	10.8	46	16.4	AV	N	GND
2.010000	32.20	11.0	46	13.8	AV	N	GND
3.370000	32.10	11.1	46	13.9	AV	N	GND
4.760000	31.50	11.1	46	14.5	AV	N	GND
6.030000	30.70	11.2	50	19.3	AV	N	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.
The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

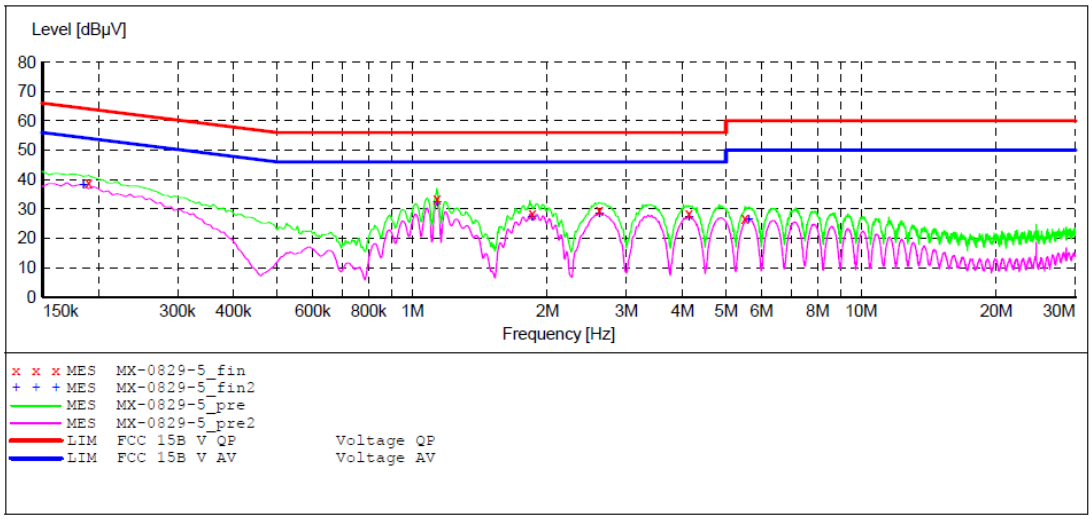
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  Equipment & Instrument Status Wireless Sensor   M/N:MR3872C
Manufacturer:         MARKTRACE
Operating Condition:  ON
Test Site:            1#Shielding Room
Operator:             star
Test Specification:   N 120V/60Hz
Comment:              Report No.:ATE20161321
Start of Test:        8/29/2016 / 11:25:51AM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "MX-0829-5_fin"

8/29/2016 11:29AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.190000	38.90	10.5	64	25.1	QP	N	GND
1.135000	33.20	10.9	56	22.8	QP	N	GND
1.850000	28.30	11.0	56	27.7	QP	N	GND
2.610000	29.60	11.0	56	26.4	QP	N	GND
4.130000	28.50	11.1	56	27.5	QP	N	GND
5.510000	26.70	11.2	60	33.3	QP	N	GND

MEASUREMENT RESULT: "MX-0829-5_fin2"

8/29/2016 11:29AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.185000	38.20	10.5	54	16.1	AV	N	GND
1.135000	32.10	10.9	46	13.9	AV	N	GND
1.850000	27.00	11.0	46	19.0	AV	N	GND
2.610000	28.30	11.0	46	17.7	AV	N	GND
4.130000	27.20	11.1	46	18.8	AV	N	GND
5.620000	26.40	11.2	50	23.6	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

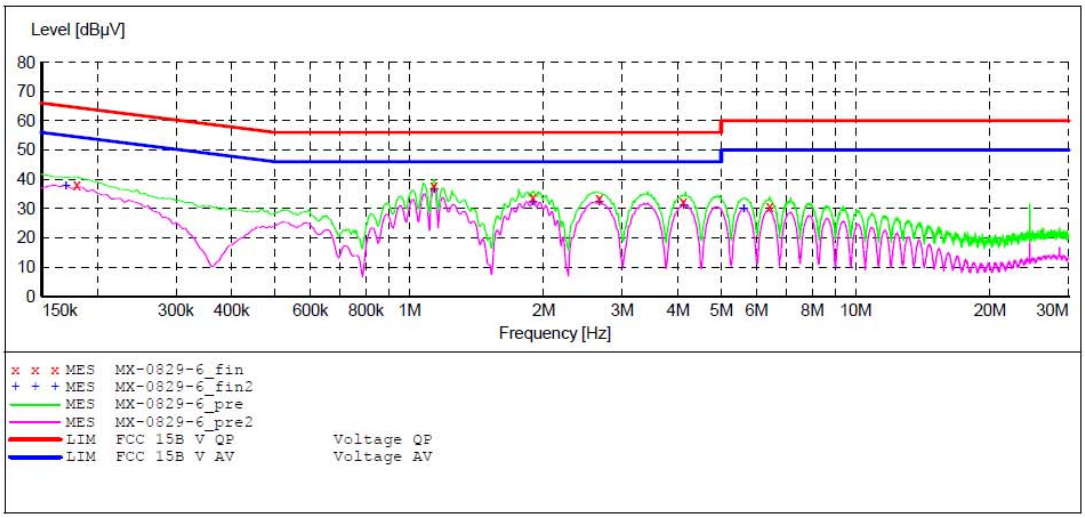
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  Equipment & Instrument Status Wireless Sensor   M/N:MR3872C
Manufacturer:         MARKTRACE
Operating Condition:  ON
Test Site:            1#Shielding Room
Operator:             star
Test Specification:   L 120V/60Hz
Comment:              Report No.:ATE20161321
Start of Test:        8/29/2016 / 11:29:47AM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "MX-0829-6_fin"

8/29/2016 11:33AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	38.20	10.5	65	26.3	QP	L1	GND
1.135000	37.80	10.9	56	18.2	QP	L1	GND
1.890000	33.60	11.0	56	22.4	QP	L1	GND
2.660000	33.30	11.0	56	22.7	QP	L1	GND
4.110000	32.10	11.1	56	23.9	QP	L1	GND
6.420000	30.50	11.2	60	29.5	QP	L1	GND

MEASUREMENT RESULT: "MX-0829-6_fin2"

8/29/2016 11:33AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	37.80	10.5	55	17.2	AV	L1	GND
1.135000	36.70	10.9	46	9.3	AV	L1	GND
1.890000	32.40	11.0	46	13.6	AV	L1	GND
2.660000	32.20	11.0	46	13.8	AV	L1	GND
4.120000	30.90	11.1	46	15.1	AV	L1	GND
5.620000	29.90	11.2	50	20.1	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

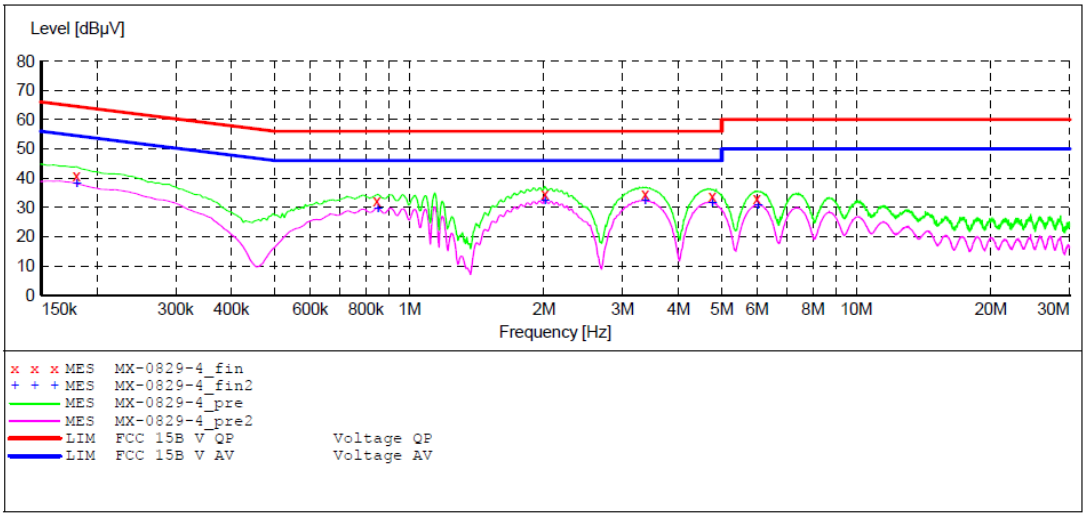
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Equipment & Instrument Status Wireless Sensor M/N:MR3872C
Manufacturer: MARKTRACE
Operating Condition: ON
Test Site: 1#Shielding Room
Operator: star
Test Specification: N 240V/60Hz
Comment: Report No.:ATE20161321
Start of Test: 8/29/2016 / 11:22:15AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "MX-0829-4_fin"

8/29/2016 11:25AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	40.80	10.5	65	23.7	QP	N	GND
0.845000	32.10	10.8	56	23.9	QP	N	GND
2.010000	34.40	11.0	56	21.6	QP	N	GND
3.370000	34.50	11.1	56	21.5	QP	N	GND
4.760000	33.80	11.1	56	22.2	QP	N	GND
5.990000	33.10	11.2	60	26.9	QP	N	GND

MEASUREMENT RESULT: "MX-0829-4_fin2"

8/29/2016 11:25AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	38.00	10.5	55	16.5	AV	N	GND
0.850000	29.60	10.8	46	16.4	AV	N	GND
2.010000	32.20	11.0	46	13.8	AV	N	GND
3.370000	32.10	11.1	46	13.9	AV	N	GND
4.760000	31.50	11.1	46	14.5	AV	N	GND
6.030000	30.70	11.2	50	19.3	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

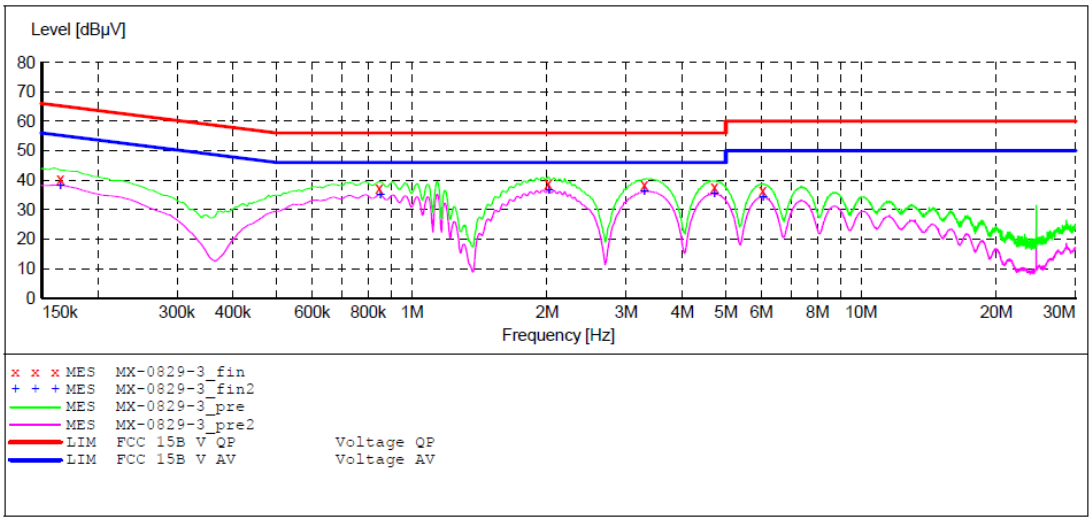
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Equipment & Instrument Status Wireless Sensor M/N:MR3872C
Manufacturer: MARKTRACE
Operating Condition: ON
Test Site: 1#Shielding Room
Operator: star
Test Specification: L 240V/60Hz
Comment: Report No.:ATE20161321
Start of Test: 8/29/2016 / 11:18:23AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "MX-0829-3_fin"

8/29/2016 11:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.165000	40.60	10.5	65	24.6	QP	L1	GND
0.845000	37.30	10.8	56	18.7	QP	L1	GND
2.010000	38.80	11.0	56	17.2	QP	L1	GND
3.290000	38.30	11.1	56	17.7	QP	L1	GND
4.710000	37.60	11.1	56	18.4	QP	L1	GND
6.040000	36.50	11.2	60	23.5	QP	L1	GND

MEASUREMENT RESULT: "MX-0829-3_fin2"

8/29/2016 11:21AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.165000	38.00	10.5	55	17.2	AV	L1	GND
0.850000	35.00	10.8	46	11.0	AV	L1	GND
2.020000	36.50	11.0	46	9.5	AV	L1	GND
3.290000	36.00	11.1	46	10.0	AV	L1	GND
4.710000	35.20	11.1	46	10.8	AV	L1	GND
6.050000	34.20	11.2	50	15.8	AV	L1	GND

9. ANTENNA REQUIREMENT

9.1.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.

9.2.Antenna Construction

Device is equipped with Integral antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.