

FCC CERTIFICATION
On Behalf of
REALTRACE

USB Pocket Reader
Model No.: RT10

FCC ID: BSO-RT10

Prepared for : REALTRACE
Address : 2, rue Georges Pompidou, 91140 VILLEBON SUR
YVETTE, FRANCE

Prepared by : ACCURATE TECHNOLOGY CO. LTD
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Report Number : ATE20120224
Date of Test : Feb. 22-Mar. 5, 2012
Date of Report : Mar. 6, 2012

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Test Report Certification

Applicant : REALTRACE
 Manufacturer : SHENZHEN MARKTRACE CO., LTD
 EUT Description : USB Pocket Reader
 (A) MODEL NO.: RT10
 (B) SERIAL NO.: N/A
 (C) POWER SUPPLY: DC 3.7V (Li-ion battery 1×)

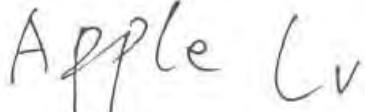
Measurement Procedure Used:

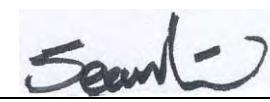
**FCC Rules and Regulations Part 15 Subpart C Section 15.209
ANSI C63.4: 2003**

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 15.209 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 : _____ Feb. 22-Mar. 5, 2012

Prepared by : _____

 _____ (Engineer)

Approved & Authorized Signer : _____

 _____ (Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : USB Pocket Reader

Model Number : RT10

Power Supply : DC 3.7V (Li-ion battery 1×)

Operation Frequency : 134.2KHz

Applicant : REALTRACE

Address : 2, rue Georges Pompidou, 91140 VILLEBON SUR YVETTE, FRANCE

Manufacturer : SHENZHEN MARKTRACE CO., LTD

Address : F3, Bldg. D, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen, China

Date of sample received : Feb. 22, 2012

Date of Test : Feb. 22-Mar. 5, 2012

1.2. Special Accessory and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Notebook PC : Manufacturer: LENOVO
M/N: 4290-RT8
S/N: R9-FW93G 11/08

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 = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated date	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 7, 2012	Jan. 7, 2013
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 7, 2012	Jan. 7, 2013
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 7, 2012	Jan. 7, 2013
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 7, 2012	Jan. 7, 2013
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 7, 2012	Jan. 7, 2013
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 7, 2012	Jan. 7, 2013
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 7, 2012	Jan. 7, 2013
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 7, 2012	Jan. 7, 2013
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 7, 2012	Jan. 7, 2013
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 7, 2012	Jan. 7, 2013

3. SUMMARY OF TEST RESULTS

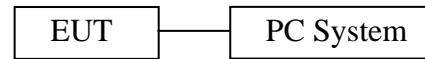
FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission	Compliant
Section 15.209	Radiated Emission	Compliant
Section 15.203	Antenna Requirement	Compliant

Remark: "N/A" means "Not applicable".

4. RADIATED EMISSION FOR FCC PART 15 SECTION 15.209

4.1. Block Diagram of Test Setup

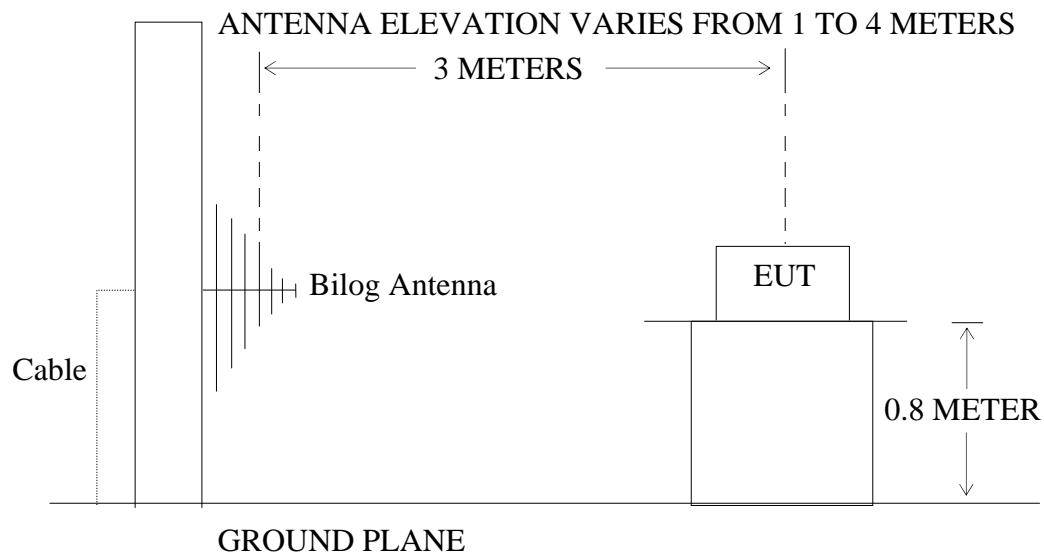
4.1.1. Block diagram of connection between the EUT and simulators



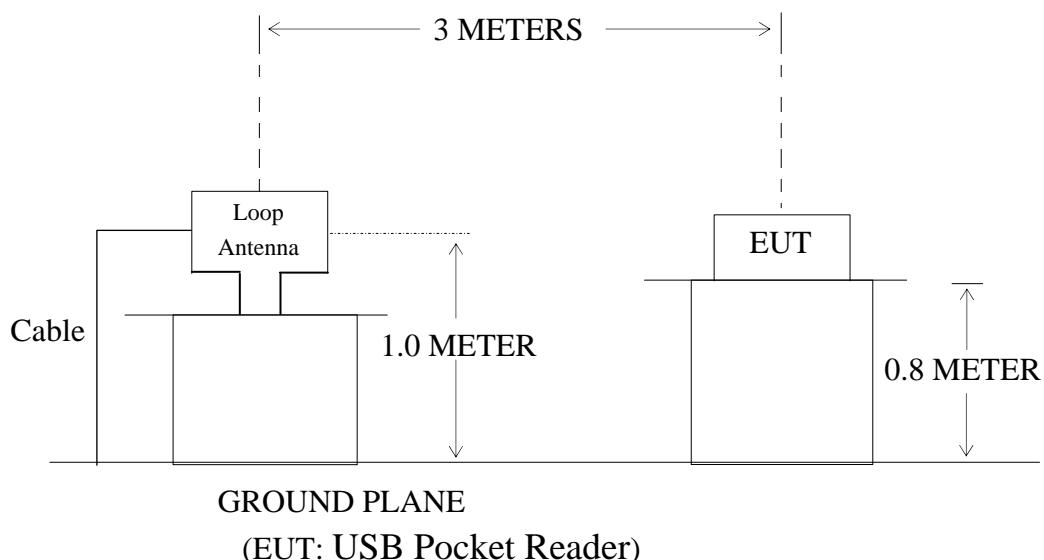
(EUT: USB Pocket Reader)

4.1.2. Semi-Anechoic Chamber Test Setup Diagram

4.1.2.1. Above 30MHz



4.1.2.2. Below 30MHz



4.2.The Field Strength of Radiation Emission Measurement Limits

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

4.3.Configuration of EUT on Measurement

The following 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.

4.3.1. USB Pocket Reader (EUT)

Model Number : RT10
 Serial Number : N/A
 Manufacturer : SHENZHEN MARKTRACE CO., LTD

4.4.Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in TX modes and measure it.

4.5. Test Procedure

4.5.1. Above 30MHz: The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. 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 bilog 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 interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz.

The frequency range from 30MHz to 1000MHz is checked.

4.5.2. Below 30MHz: The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. 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. calibrated Loop antenna is used as receiving antenna. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C 63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 9kHz in 9kHz-30MHz.

The frequency range from 9kHz to 30MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz 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.

4.6. The Field Strength of Radiation Emission Measurement Results

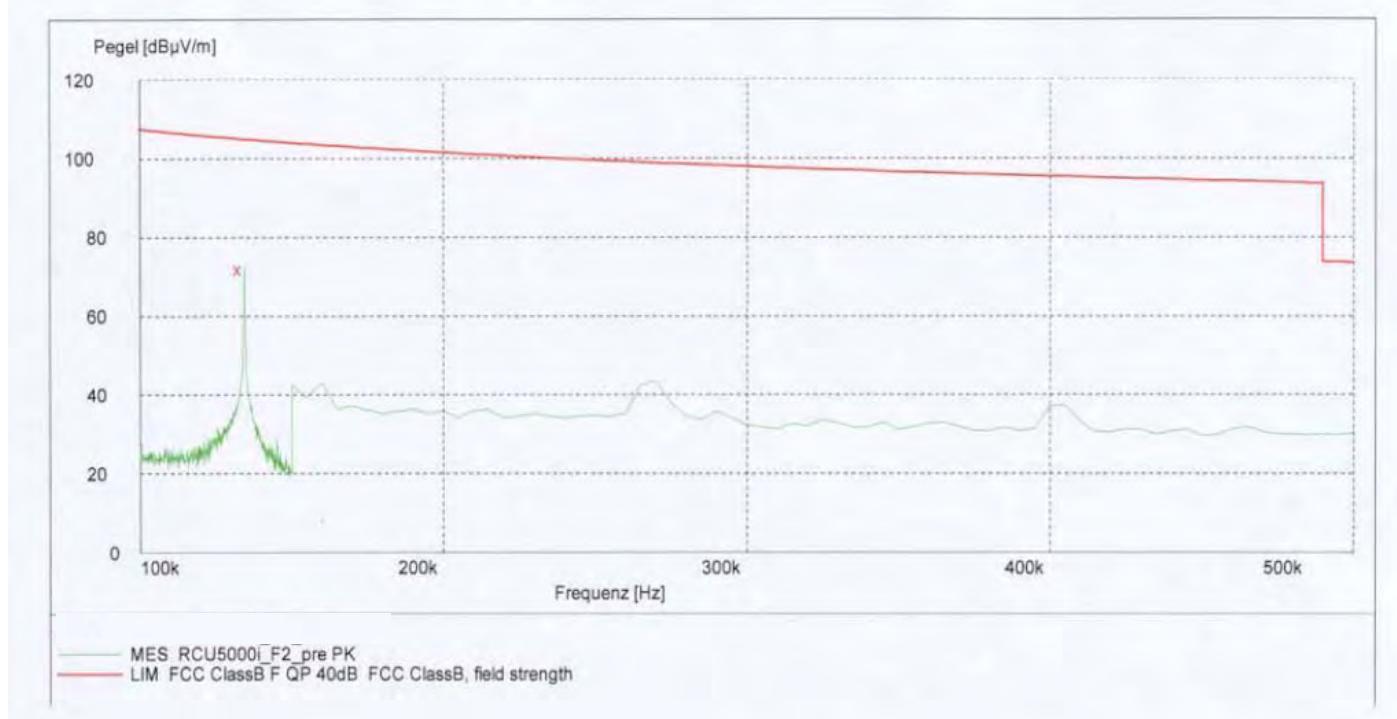
PASS.

Date of Test:	February 27, 2012	Temperature:	25°C
EUT:	USB Pocket Reader	Humidity:	50%
Model No.:	RT10	Power Supply:	DC 3.7V
Test Mode:	TX	Test Engineer:	Pei

Fundamental Radiated Emissions

Fundamental Frequency	134.2KHz
Final Result	72.9dB μ V/m
Limit	105.0dB μ V/m

Note: Measurement was performed with modulated signal with peak detector.



Radiated Emissions

Date of Test:	February 27, 2012	Temperature:	25°C
EUT:	USB Pocket Reader	Humidity:	50%
Model No.:	RT10	Power Supply:	DC 3.7V
Test Mode:	TX	Test Engineer:	Pei

Below 30MHz:

Polarization	Frequency (MHz)	Reading(dB μ V/m) PK/AV	Factor Corr.(dB)	Result(dB μ V/m) PK/AV	Limits(dB μ V/m) PK/AV	Margin(dB μ V/m) PK/AV
Horizontal	-	-	-	-	-	-
Vertical	-	-	-	-	-	-

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency	Reading (dB μ V/m)	Factor Corr. (dB)	Result	Limit	Margin	Polarization
			QP	QP	QP	
73.0116	12.40	13.09	25.49	40.00	-14.51	Vertical
240.5221	13.78	16.79	30.57	46.00	-15.43	Vertical
585.1611	8.06	25.42	33.48	46.00	-12.52	Vertical
206.1632	18.22	16.20	34.42	43.50	-9.08	Horizontal
240.5225	20.61	16.79	37.40	46.00	-8.60	Horizontal
343.6029	15.48	20.18	35.66	46.00	-10.34	Horizontal

Note:

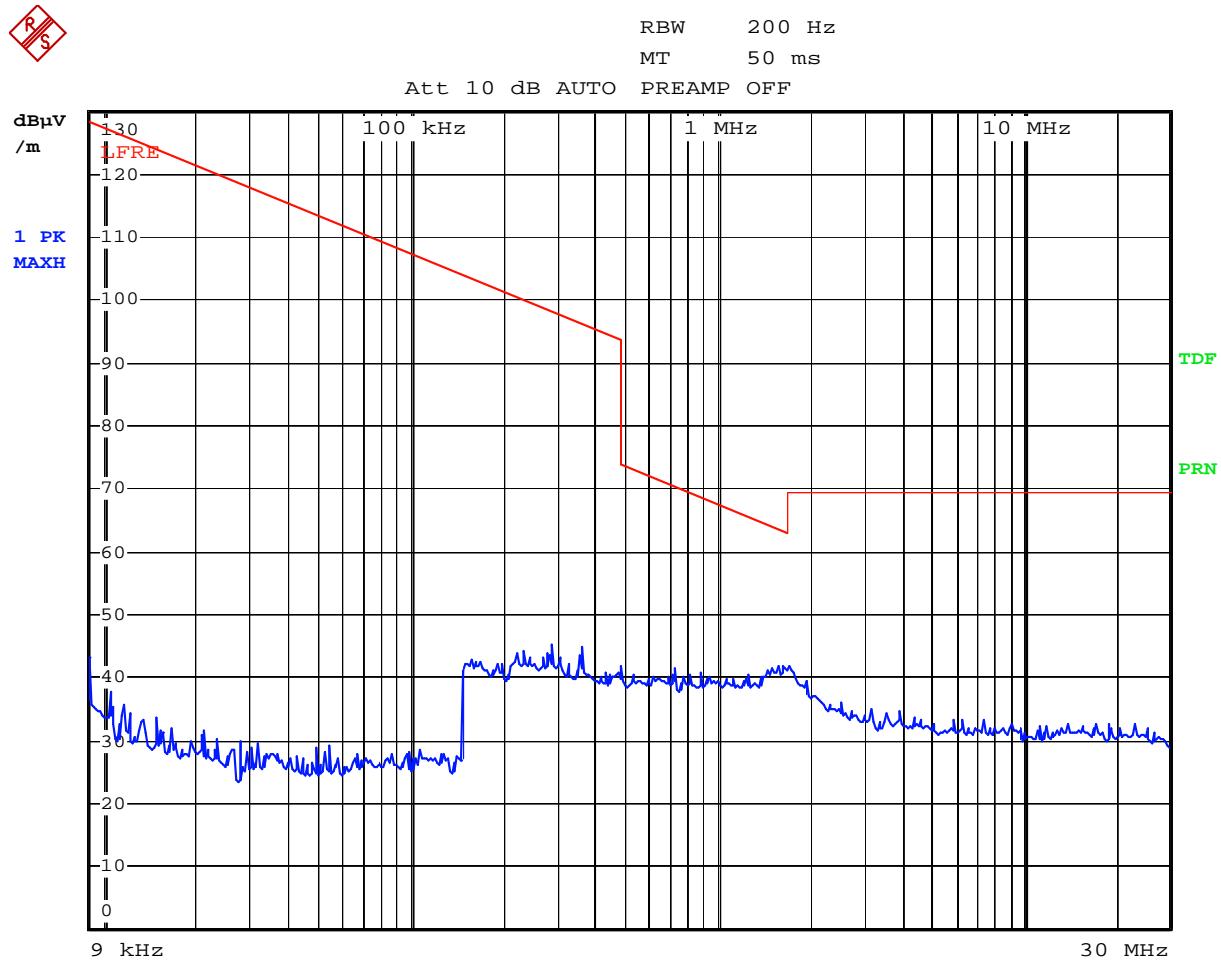
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is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

Result = Reading + Corrected Factor

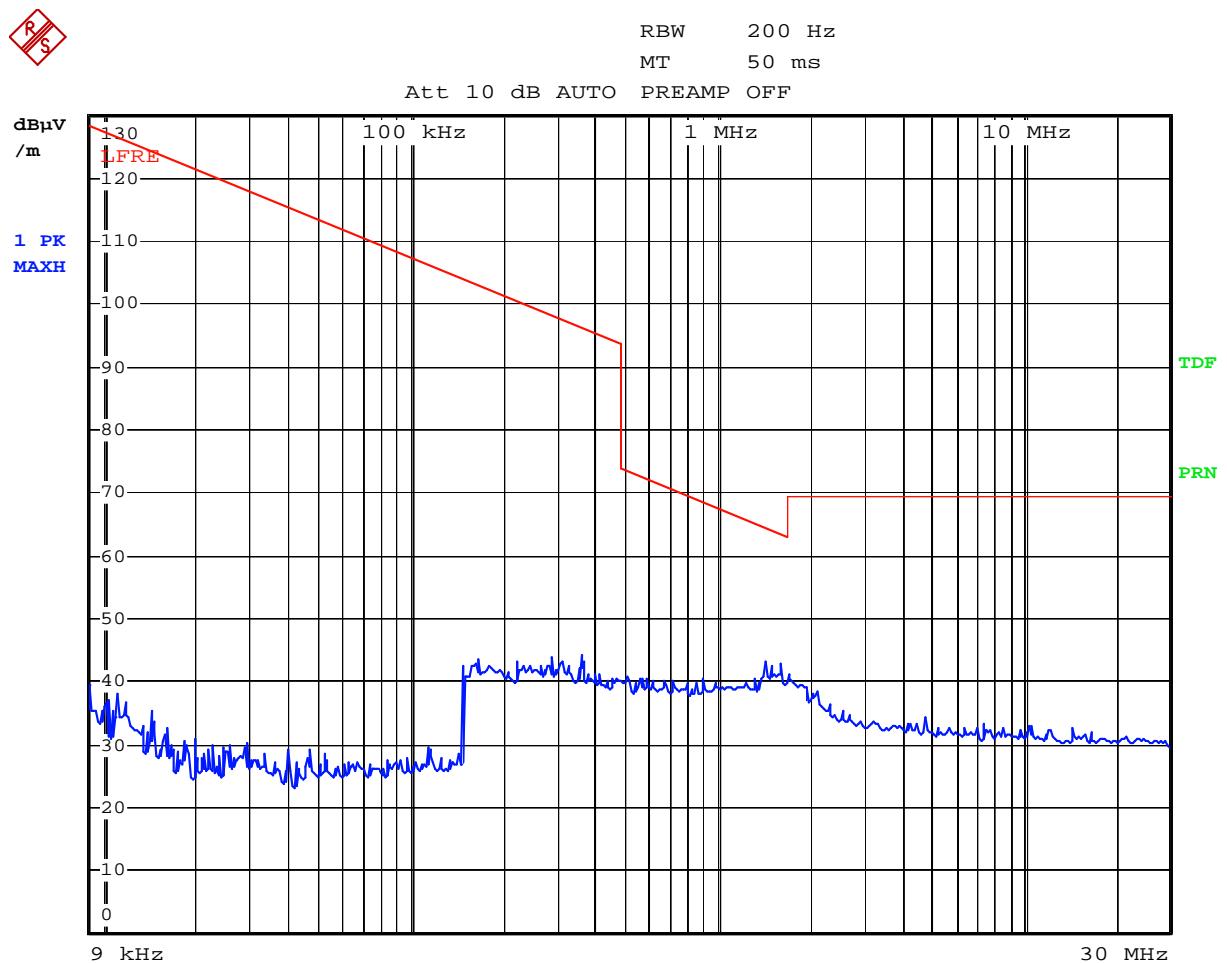
Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

3. The spectral diagrams in appendix I display the measurement of peak values.
4. Between the antenna and Amplifier have a Highpass Filter (Restricted bands of operation is 134.0-135.0 KHz)

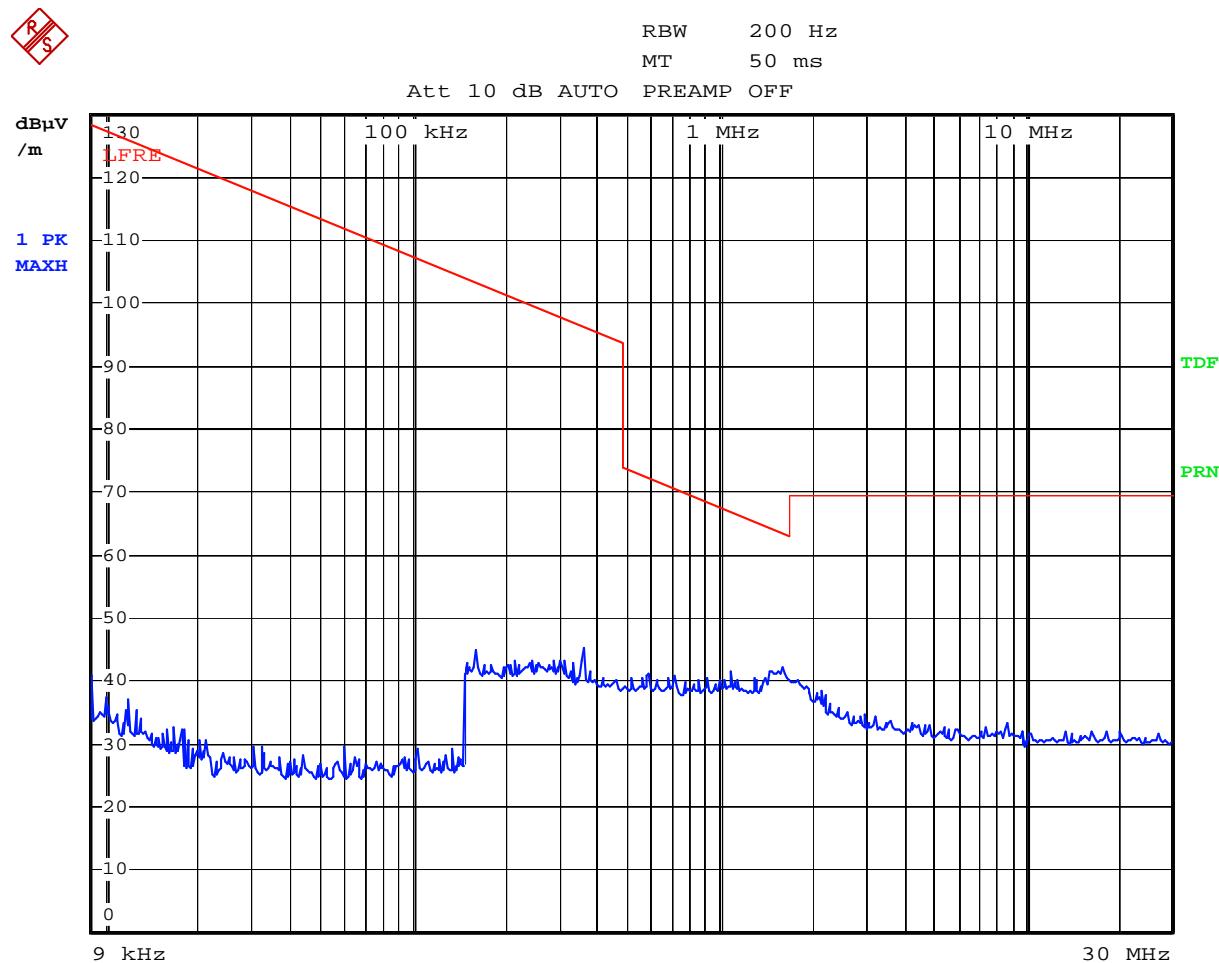
X Axis



Y Axis



Z Axis





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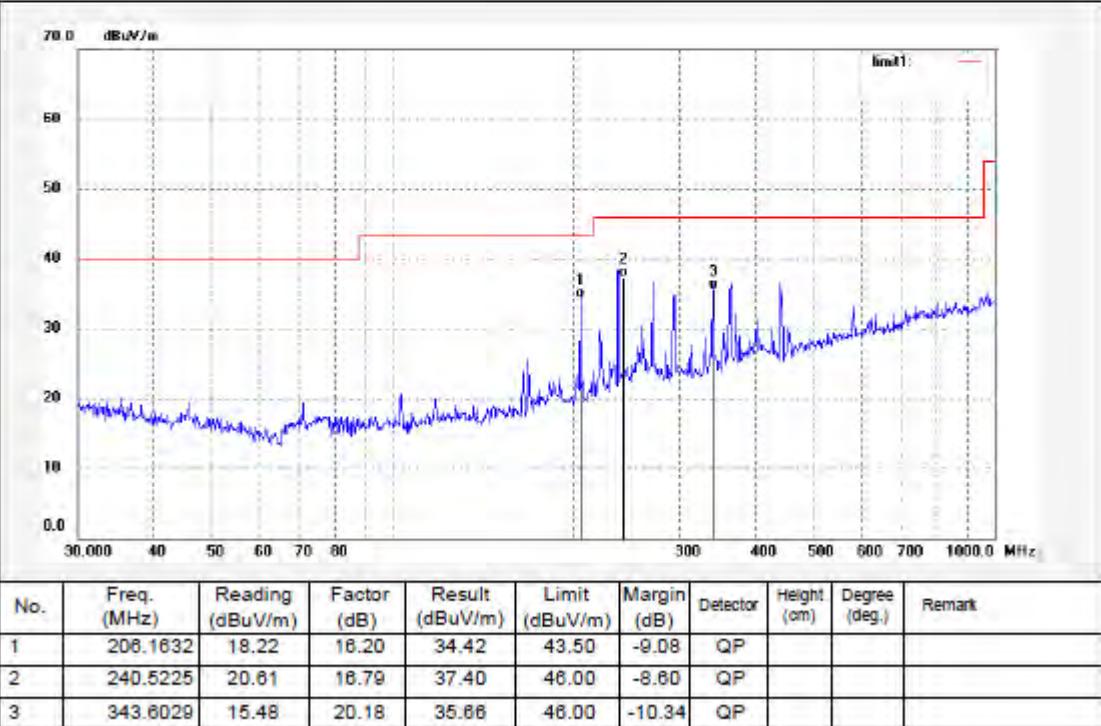
F1,Bldg.A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.:	Bob #1114	Polarization:	Horizontal
Standard:	FCC Class B 3M Radiated	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	12/02/27/
Temp.(C)/Hum.(%)	24 C / 48 %	Time:	9/23/22
EUT:	USB Pocket reader	Engineer Signature:	
Mode:	TX	Distance:	3m
Model:	RT10		
Manufacturer:	MARKTRACE		
Note:	Report NO.:ATE20120224		





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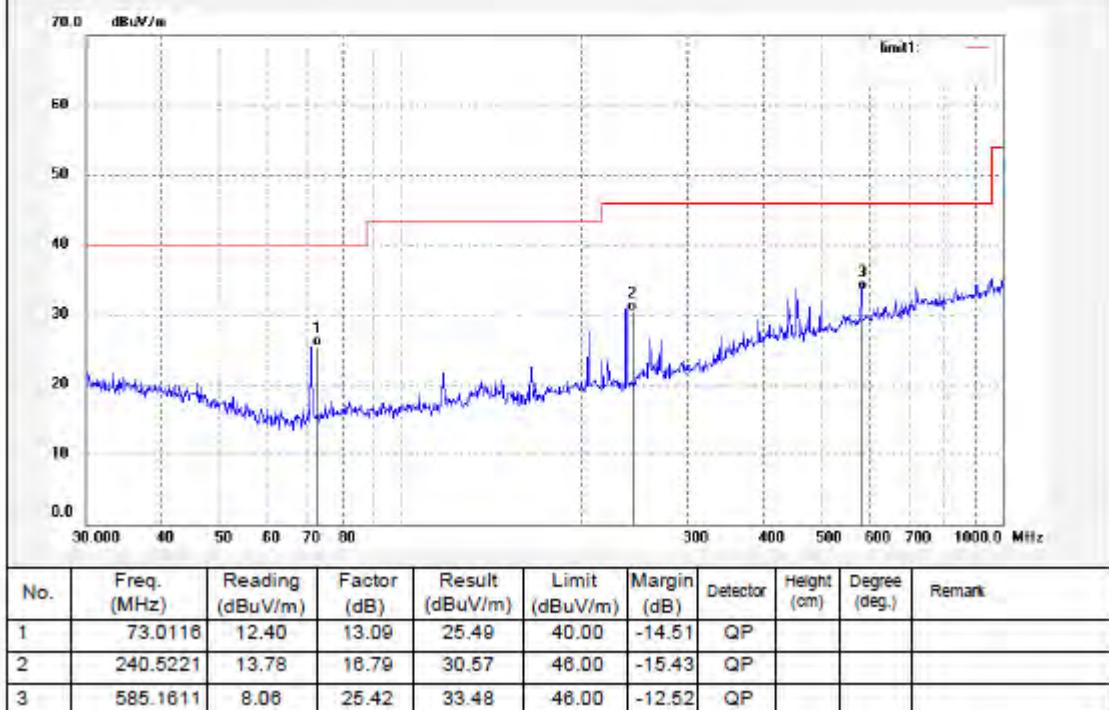
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

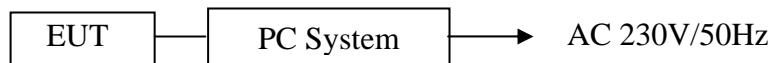
Job No.:	Bob #1115	Polarization:	Vertical
Standard:	FCC Class B 3M Radiated	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	12/02/27
Temp. (C)/Hum.(%)	24 C / 48 %	Time:	9/26/18
EUT:	USB Pocket reader	Engineer Signature:	
Mode:	TX	Distance:	3m
Model:	RT10		
Manufacturer:	MARKTRACE		
Note:	Report NO.:ATE20120224		



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

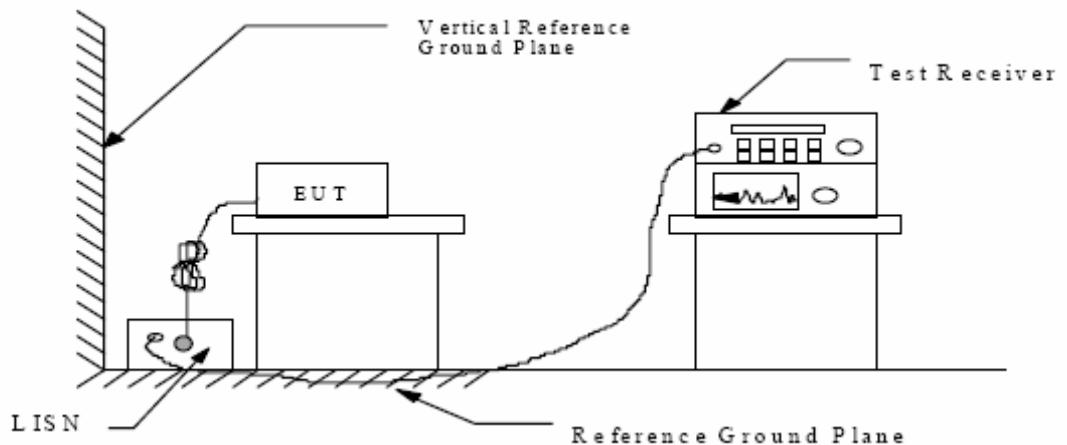
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: USB Pocket Reader)

5.1.2. Shielding Room Test Setup Diagram



(EUT: USB Pocket Reader)

5.2. The Emission Limit

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

Frequency (MHz)	Limit dB(μ V)	
	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.

5.3. 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.

5.3.1. USB Pocket Reader (EUT)

Model Number	:	RT10
Serial Number	:	N/A
Manufacturer	:	SHENZHEN MARKTRACE CO., LTD

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 mode measure it.

5.5. 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.

5.6. Power Line Conducted Emission Measurement Results

PASS.

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

Date of Test:	February 27, 2012	Temperature:	25°C
EUT:	USB Pocket Reader	Humidity:	50%
Model No.:	RT10	Power Supply:	AC 120V/ 60Hz
Test Mode:	Tx	Test Engineer:	Kai

Frequency (MHz)	Result (dB μ V)	Limit (dB μ V)	Margin (dB)	Detector	Line
0.197568	55.30	63.7	-8.4	QP	Neutral
0.298051	47.30	60.3	-13.0	QP	
0.397299	44.00	57.9	-13.9	QP	
0.496827	46.70	56.1	-9.4	QP	
0.694763	38.30	56	-17.7	QP	
1.892339	41.00	56	-15.0	QP	
0.197568	42.80	53.7	-10.9	AV	
0.298051	35.90	50.3	-14.4	AV	
0.397299	33.00	47.9	-14.9	AV	
0.496827	37.80	46.1	-8.3	AV	
0.694763	32.50	46	-13.5	AV	Live
1.892339	37.00	46	-9.0	AV	
0.197568	57.90	63.7	-5.8	QP	
0.294502	47.40	60.7	-13.0	QP	
0.496827	42.80	56.1	-13.3	QP	
0.694763	37.40	56	-18.6	QP	
0.792592	35.20	56	-20.8	QP	
1.985196	38.20	56	-17.8	QP	
0.197568	46.20	63.7	-7.5	AV	
0.296863	38.10	60.7	-12.2	AV	
0.496827	36.10	56.1	-10.0	AV	
0.694763	32.60	53.7	-13.4	AV	
0.795762	32.00	50.3	-14.0	AV	
1.985196	33.60	46.0	-12.4	AV	

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

The spectral diagrams are attached as below.

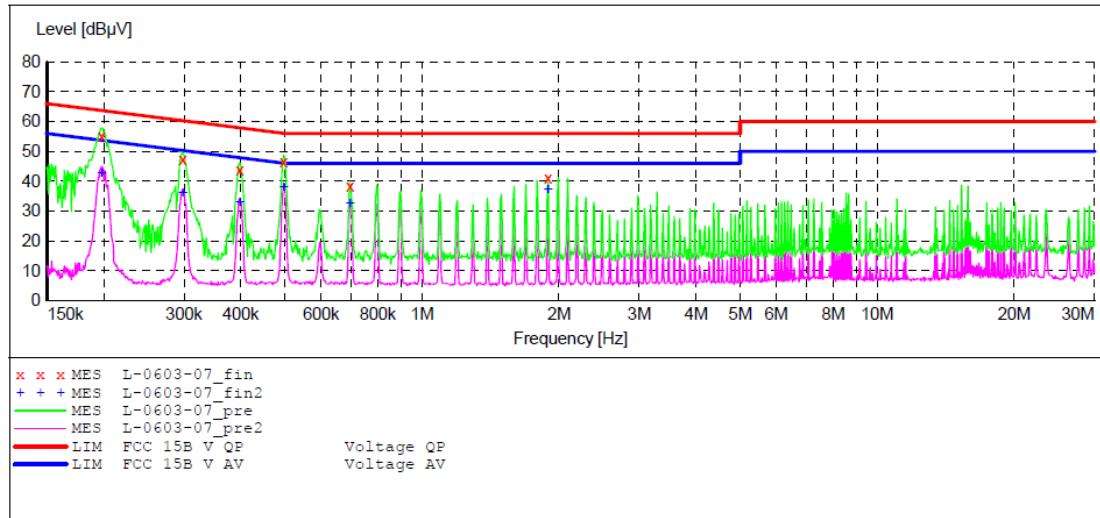
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: USB Pocket reader M/N:RT10
 Manufacturer: MARKTRACE
 Operating Condition: TX
 Test Site: 1#Shielding Room
 Operator: Bob
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20120224
 Start of Test: 2/27/2012 / 4:16:11PM

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 0.8 % QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "L-0603-07_fin"

2/27/2012 4:19PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.197568	55.30	11.2	63.7	8.4	QP	N	GND
0.298051	47.30	11.6	60.3	13.0	QP	N	GND
0.397299	44.00	11.8	57.9	13.9	QP	N	GND
0.496827	46.70	12.0	56.1	9.4	QP	N	GND
0.694763	38.30	11.9	56	17.7	QP	N	GND
1.892339	41.00	11.7	56	15.0	QP	N	GND

MEASUREMENT RESULT: "L-0603-07_fin2"

2/27/2012 4:19PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.197568	42.80	11.2	53.7	10.9	AV	N	GND
0.298051	35.90	11.6	50.3	14.4	AV	N	GND
0.397299	33.00	11.8	47.9	14.9	AV	N	GND
0.496827	37.80	12.0	46	8.3	AV	N	GND
0.694763	32.50	11.9	46	13.5	AV	N	GND
1.892339	37.00	11.7	46	9.0	AV	N	GND

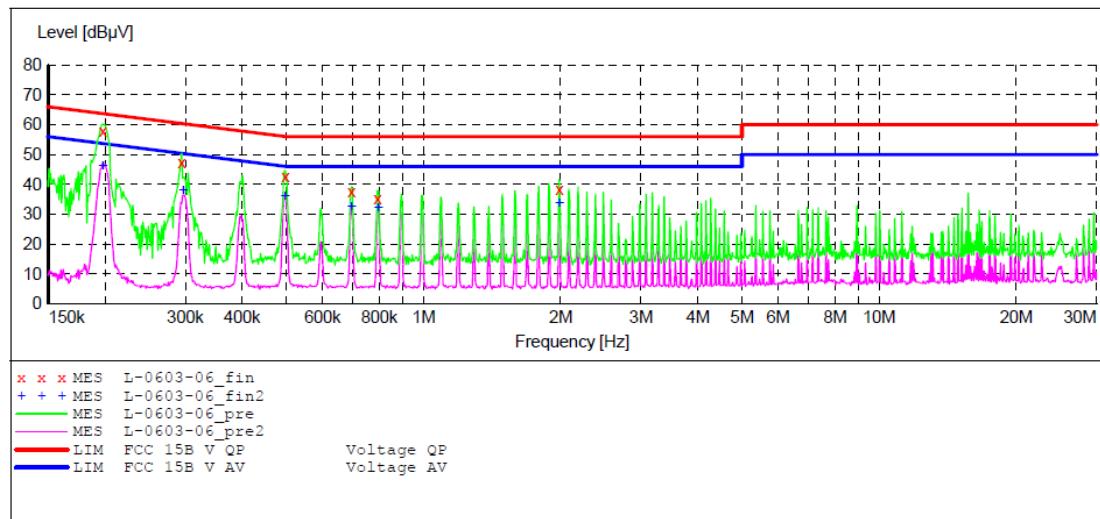
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: USB Pocket reader M/N:RT10
 Manufacturer: MARKTRACE
 Operating Condition: TX
 Test Site: 1#Shielding Room
 Operator: Bob
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20120224
 Start of Test: 2/27/2012 / 4:11:46PM

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw. NSLK8126 2008
 150.0 kHz 30.0 MHz 0.8 % QuasiPeak 1.0 s 9 kHz Average



MEASUREMENT RESULT: "L-0603-06_fin"

2/27/2012 4:15PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.197568	57.90	11.2	63.7	5.8	QP	L1	GND
0.294502	47.40	11.6	60.7	13.0	QP	L1	GND
0.496827	42.80	12.0	56.1	13.3	QP	L1	GND
0.694763	37.40	11.9	56	18.6	QP	L1	GND
0.792592	35.20	11.9	56	20.8	QP	L1	GND
1.985196	38.20	11.7	56	17.8	QP	L1	GND

MEASUREMENT RESULT: "L-0603-06_fin2"

2/27/2012 4:15PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.197568	46.20	11.2	53.7	7.5	AV	L1	GND
0.294502	38.10	11.6	50.3	12.2	AV	L1	GND
0.496827	36.10	12.0	46.1	10.0	AV	L1	GND
0.694763	32.60	11.9	46	13.4	AV	L1	GND
0.792592	32.00	11.9	46	14.0	AV	L1	GND
1.985196	33.60	11.7	46	12.4	AV	L1	GND

6. ANTENNA REQUIREMENT

6.1. 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.

6.2. Antenna Construction

Device is equipped with unique antenna, which isn't displaced by other antenna. Therefore, the equipment complies with the antenna requirement of Section 15.203.

