

Test Report



Applicant :	LawMate International Co., Ltd.	
Address of Applicant :	3F, No.34, Lane 60, Wenhu St., Nei-Hu District, Taipei 114, Taiwan	
Equipment Under Test :	640x480 CMOS Necklace Camera	
Model Number :	CM-NL10	
Series :	Q-CM-NL10, CM-NLxx, Q-CM-NLxx	

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Verification

Applicant :	LawMate International Co., Ltd.	
Manufacturer :	LawMate International Co., Ltd.	
Equipment Under Test :	640x480 CMOS Necklace Camera	
Model Number :	CM-NL10	
Series :	Q-CM-NL10, CM-NLxx, Q-CM-NLxx	
Sample Received Date :	2014-07-21	
Test Standards :	FCC Part 15 B and CISPR 22 Class B	

Remark

This report details the results of the test carried out on one sample. The test results are contained in this test report and Matrix Test Laboratory assumes full responsibility for the accuracy and completeness of these tests. This report shows the EUT is technically compliant with FCC Part 15 B and CISPR 22 Class B official requirements. The test procedure is in compliance with ANSI C63.4 as indicated in FCC Part15 B Sec. 15.31. This report applies to the above sample only and shall not be reproduced in part without written approval of Matrix Test Laboratory.

Jody Peng

Documented by:

Jody Peng/ ADM. Dept Staff

George Hsu

Tested by:

Date: 2014-08-22

2014-08-25

Date:

George Hsu/ ENG. Dept. Staff

Approved by:

Date: 2014-08-25

Peter Chin/ Head of Laboratory

Testing Report

Summary of Test Result

Emission					
Test Standard	Test Item	Test Result	Remark		
FCC Part15B CISPR22 Class B	Radiated Disturbance Test (Below 1GHz)	Pass	Highest Emission H: 342.340MHz, 50.38dBuV, Margin-1.52 dB Antenna Height 3.73 m, Turntable Angle 98° V: 31.940MHz, 29.86dBuV, Margin-4.57 dB Antenna Height 1.85 m, Turntable Angle 294°		
FCC Part15B CISPR22 Class B	Radiated Disturbance Test (Above 1GHz)	N/A	The highest frequency of the internal sources of the EUT is less than 108MHz. Hence, up to 1GHz Radiated Measurement shall not be made.		

Measurement Uncertainty – Emission

The following measurement uncertainty has been calculated for Emission Tests performed on the EUT as specified in CISPR 16-4-2:

Test Item		Uncertainty	
Conducted Emission		± 3.61dB	
Radiated Emission	Below 1GHz	± 5.04dB	
	Above 1GHz	± 4.97dB	

This reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k = 2, providing a level of confidence of approximately 95%.

1 General Description

1.1 Description of Equipment Under Test (EUT)

Equipment Under Test	:	640x480 CMOS Necklace Camera		
Model Number	:	CM-NL10		
Series	:	Q-CM-NL10, CM-NLxx, Q-CM-NLxx		
Applicant Address of Applicant		LawMate International Co., Ltd. 3F, No.34, Lane 60, Wenhu St., Nei-Hu District, Taipei 114, Taiwan		
Manufacturer Address of Manufacturer	:	awMate International Co., Ltd. F, No.34, Lane 60, Wenhu St., Nei-Hu District, Taipei 114, Taiwan		
Power Supply	:	DC 4.5V~5.5V		
Data Cable	:	⊠N/A		
Description of EUT	:	 Dimensions : 125 cm (W) Weight : 35 g Highest Frequency of the Internal Source : below 108 MHz Position : ⊠Table-top / □Floor-standing Intended Function : The EUT is a 640x480 CMOS Necklace Camera. Product Variance : The manufacturer declares that the series products are identical to the main test sample. For marketing reason, there are different series numbers. Matrix only takes the responsibility to the test result of the main test sample. 		

1.2 Test Facility

Conducted Emission Test is performed at 2F, No.146, Jian Yi Rd., Chung-Ho District, New Taipei City, Taiwan, R.O.C.

Radiated Emission Test is performed at No. 15-1, Cweishuh Keng, Cweipin Village, Linkou, New Taipei City, Taiwan, R.O.C.

1.3 Test Instruments

Instruments Used for Emission Measurement

Instrument	Manufacturer	Model	Serial No.	Calibration Date	Application
L.I.S.N.	Mess Tec	NNB-2/16Z	03/1006	2014-01-24	
L.I.S.N.	EMCIS	LN2-16	LN04023	2014-08-01	Conducted Disturbance
Pulse Limiter	Mess Tec	PL10	N/A	2013-11-30	
RF Cable	N/A	N/A	N/A	2013-10-05	
Coupling AND Decoupling Network	SCHAFFNER	ISN T400	16832	2013-10-08	Conducted Disturbance at Telecommunication
RF Current Probe	FCC	F-33-4	53	2014-05-16	Port
EMI Receiver	R&S	ESCI	100615	2014-06-18	Conducted Disturbance Radiated Disturbance (Below 1GHz)
Bilog Antenna	Teseq GmbH	CBL6111D	25769	2014-02-06	
Pre-Amplifier	WIRELESS	FPA-6592G	60009	2014-07-08	Radiated Disturbance
Spectrum Analyzer	R & S	FSL6	100564	2014-06-15	(Below 1GHz)
RF Cable	MIYAZAKI	8D-F8	N/A	2014-02-08	
Double-Ridged Waveguide Horn	EMCO	3115	9912-5992	2014-05-14	
Preamplifier	HD	HD17187	004	2014-02-14	Radiated Disturbance
Spectrum Analyzer	ADVANTEST	R3172	101202158	2013-08-27	(Above 1GHz)
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104	197541/4	2013-08-29	

Note: The instruments listed above are within their calibration period of 1 year.

1.4 Test Methodology

All Emission Tests were performed according to the procedures specified in ANSI C63.4 as indicated in FCC Part15 B Sec. 15.31.

1.5 Auxiliary Equipments

Provided by Matrix Test Lab.

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Remark
01	DVR	PV-500EVO2	N/A	N/A	N/A	N/A
02	Adapter	UN310-0520	N/A	N/A	N/A	Input: AC100-240; 50/60Hz, 0.3A Output: DC5V, 2A
03	Battery Box	BA-2200	N/A	N/A	N/A	N/A

1.6 Block Diagram



1.7 Identifying the Final Test Mode (Worst Case)

- 1. Standby Mode
- 2. Operation Mode

Note: After pre-test, we identified that the Operation Mode (the worst case) was most likely to cause maximum disturbance. Therefore, the Final Test was performed for the worst case.

1.8 Final Test Mode

Operation Mode

1.9 Condition of Power Supply

DC 5V

1.10 EUT Configuration

- 1. Setup the EUT and peripheral as shown in Section 1.6.
- 2. Turn on the power of all equipments.
- 3. Activate the selected Final Test Mode.

2 Radiated Disturbance Test – Below 1 GHz

2.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

2.2 Test Configuration and Procedure



Table-top Equipment

- The EUT was place on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 10m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 3.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.

2.3 Radiated Limit

FCC Part 15 B

		s A (10m)	Clas	s B (3m)
Frequency	Field Strength	Quasi-Peak	Field Strength	Quasi-Peak
(MHz)	(μV/m)	(dBµV/m)	(μV/m)	(dBµV/m)
30 ~ 88	90	39.08	100	40.00
88 ~ 216	150	43.52	150	43.52
216 ~ 960	210	46.44	200	46.02

Emission Level ($dB\mu V/m$)=20 Log Emission Level ($\mu V/m$)

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CISPR 22

	🗌 Class A (10m)	🛛 Class B (10m)
Frequency (MHz)	Quasi-Peak (dBµV/m)	Quasi-Peak (dBµV/m)
30 ~ 230	40.0	30.0
230 ~ 1000	47.0	37.0

2.4 Test Result

PASS

The final tests data are shown on the following page(s).

Radiated Emission Test Data



0 :Maximum Data x :Over Limit

Remark : All readings are Quasi-Peak values.

Radiated Emission Test Data



0 :Maximum Data x :Over Limit

Remark : All readings are Quasi-Peak values.

3.1 Radiated Disturbance Test – Below 1 GHz



Front View



Rear View

Report No.:R14071802F4Photographs of EUT



Front View of the EUT



Rear View of the EUT



Inside View-1 of the EUT



Inside View-2 of the EUT



Front View of the PCB



Rear View of the PCB