Test Report

FCC ID: 2ANVD-RVM740SM

Date of issue: Jul. 02, 2017

Report Number:	MTi170907E020
Sample Description:	Smart Mirror
Model(s):	RVM740SM
Applicant:	Coagent Global Limited
Address:	1/F, 94 Wellington Street, Central, Hong Kong
Date of Test:	Jun. 20, 2017 – Jul. 02, 2017

Shenzhen Microtest Co., Ltd.
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TEST RESULT CERTIFICATION

Applicant's name ..... :	**Coagent Global Limited**
Address ..... :	1/F, 94 Wellington Street, Central, Hong Kong
Manufacture's Name ..... :	**Guangdong Coagent Global S&T Co., Ltd.**
Address ..... :	Room 501, 5/F(F1), NO.25-8, Section C, Xi'nan Industrial Park, Sanshui Technology Industrail Zone, Foshan City, Guangdong Province, China
Product name ..... :	Smart Mirror
Model and/or type reference :	RVM740SM
Serial Model ..... :	N/A
Standards ..... :	FCC Part15 Section 15.203
Test procedure..... :	**ANSI C63.10-2013**

This device described above has been tested by Shenzhen Toby Technology Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by: Demi Mu Jul. 02, 2017

Reviewed by: Smith Chen Jul. 02, 2017

Approved by: Tom Xue Jul. 02, 2017

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1. DESCRIPTION OF TEST MODE

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

Test Mode	Description
Transmitting mode	Keep the EUT in Transmitting mode with worst case data rate
Audio Input Signal	A typical audio with maximum audio input

In section 15.31(m), regards to the operating frequency range over 10MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel as below:

Lowest Channel	CH01:88.1MHz
Middle Channel	CH101:98.1MHz
Highest Channel	CH199:107.9MHz

Remark: The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

NOTE: FULL CAR BATTERY IS USED DURING ALL TEST

2. GENERAL INFORMATION

Equipment	Smart Mirror
Trade Name	**N/A**
Model Name	RVM740SM
Serial Model	N/A
Model Difference	N/A
Product Description	The EUT is a Smart Mirror Operation Frequency: 88.1-107.9MHz Modulation Type: FSK Antenna Gain (dBi) 0dBi
Adapter	N/A
Battery	N/A
Connecting I/O Port(s)	Please refer to the User's Manual

3. TEST SUMMARY

Standard Section	Test Item	Judgment
15.203	Antenna Requirement	PASSED
15.207	Conducted Emission	N/A
15.239(a)	20dB Occupied Bandwidth	PASSED
15.239(b)	Radiated Emission of the Fundamental Signal	PASSED
15.239(c)/15.209	Spurious Emission	PASSED
Remark: "N/A" is an abbreviation for Not Applicable.		

4. ANTENNA REQUIREMENT

4.1 STANDARD REQUIREMENT

4.1.1 Test standard

FCC Part15 Section 15.203

4.1.2 Requirement

1) 15.203 requirement:
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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

4.2 ANTENNA CONNECTED CONSTRUCTION

The FM antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.

5.CONDUCTED EMISSION TEST

5.1 TEST STANDARD AND LIMIT

5.1.1 Test Standard

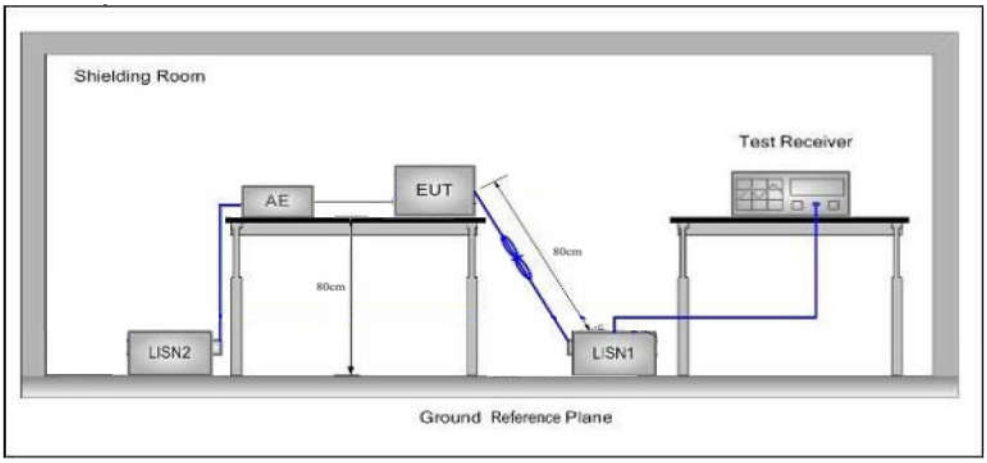
FCC Part15 Section 15.207

5.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequencies.		

5.2 TEST SETUP



5.3 TEST PROCEDURE

1) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ωlinear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

The Test Receiver setup: RBW=9kHz, VBW=30kHz, Sweep time= auto

5.4 TEST DATA

N/A.

Remark: The EUT's power supply is DC 12V, from a car battery.

6. 20DB OCCUPY BANDWIDTH TEST

6.1 TEST STANDARD AND LIMIT

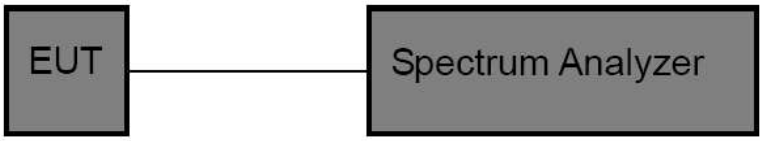
6.1.1 Test Standard

FCC Part15 C Section 15.239 (a)

6.1.2 Test Limit

FCC Part 15 Subpart C(15.239)		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	200KHz	88~108

6.2 TEST SETUP

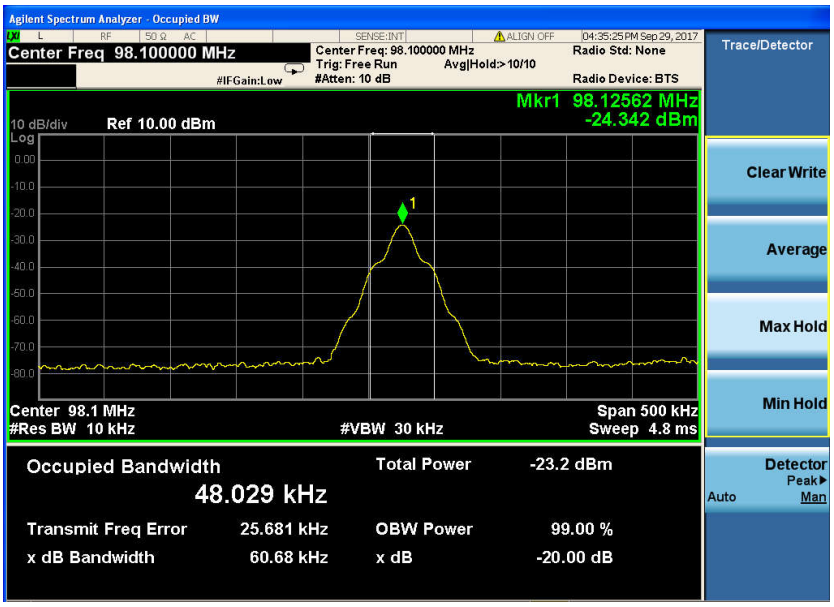


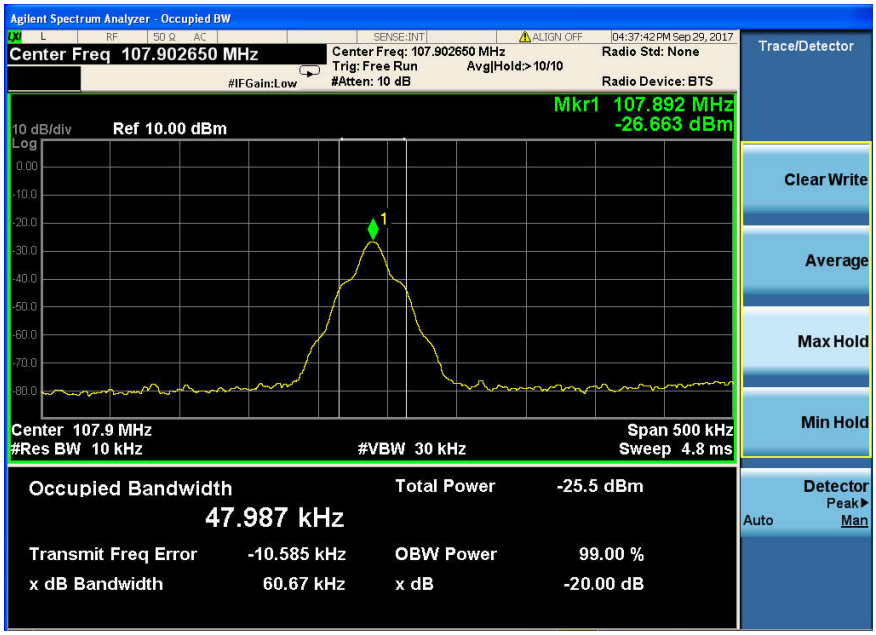
6.3 TEST PROCEDURE

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Spectrum Setting:
Bandwidth: RBW=10 kHz, VBW=30 kHz, detector= Peak

6.4 TEST DATA

Channel Number	Channel Frequency	20dB Bandwidth (kHz)	Limit(kHz)	Result
CH L	88.0(MHz)	58.72	200	PASSED
CH M	98.1(MHz)	60.68	200	PASSED
CH H	107.9(MHz)	60.67	200	PASSED
Remark: Test plot as follows				




Agilent Spectrum Analyzer - Occupied BW
Center Freq 107.902650 MHz
Center Freq: 107.902650 MHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
04:37:42 PM Sep 29, 2017
Trace/Detector
Mkr1 107.892 MHz
-26.663 dBm
10 dB/div
Log
Ref 10.00 dBm
Center 107.9 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 500 kHz
Sweep 4.8 ms
Occupied Bandwidth
47.987 kHz
Total Power
-25.5 dBm
Transmit Freq Error
-10.585 kHz
OBW Power
99.00 %
x dB Bandwidth
60.67 kHz
x dB
-20.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man

7. SPURIOUS EMISSION

7.1 TEST STANDARD AND LIMIT

7.1.1 Test Standard

FCC Part15 C Section 15.239(b), 15.239(c), 15.209

7.1.2 Test Limit

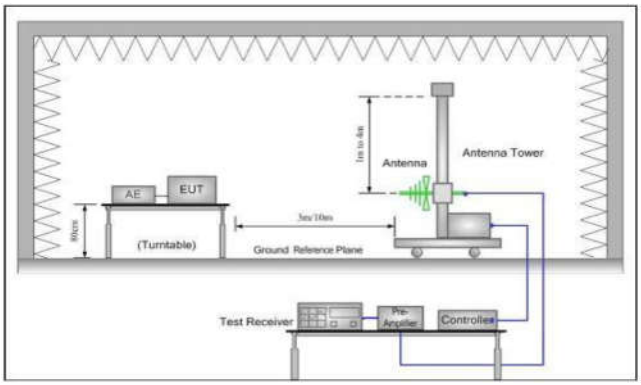
Frequency (MHz)	***Limit (dBμV/m) At 3m Distance***	
30MHz~88MHz	*40*	*Quasi-peak*
88MHz~216MHz	*43.5*	*Quasi-peak*
216MHz~960MHz	*46*	*Quasi-peak*
960MHz~1000MHz	*54*	*Quasi-peak*
Above 1000MHz	*54*	*Average*
	74	*Peak*
***Remark:** 1. The lower limit shall apply at the transition frequency.*		

Radiated Emission of the Fundamental Signal Limit

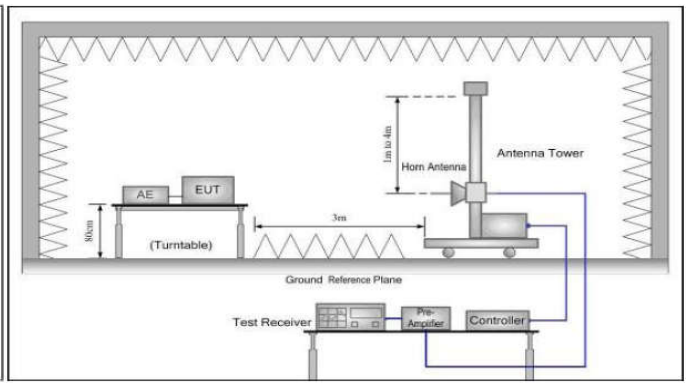
Frequency (MHz)	***Limit (dBμV/m) At 3m Distance***	
88MHz~108MHz	*48.0*	*Average*
	68.0	*Peak*

7.2 TEST SETUP

Below 1GHz



Above 1GHz



7.3 TEST PROCEDURE

1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
   Peak value: RBW=1MHz, VBW=3MHz;
   Average value: RBW=1MHz, VBW=10Hz ， Peak detector ;
   QP Value: RBW=120kHz, VBW=300kHz
6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

7.4 TEST DATA

Remark:
1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.
2. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.

Radiated Emission Test Data of Fundamental Signal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
88.1	71.62	11.46	1.03	30.34	56.58	68.00	-11.42	V	PEAK
88.1	71.37	11.46	1.03	30.34	56.33	68.00	-11.67	H	PEAK
98.10	73.87	16.31	1.65	30.45	60.45	68.00	-7.60	V	PEAK
98.10	71.01	16.31	1.65	30.45	60.45	68.00	-10.46	H	PEAK
107.9	74.21	14.45	1.14	30.26	59.62	68.00	-8.38	V	PEAK
107.9	73.56	14.45	1.14	30.26	58.97	68.00	-9.03	H	PEAK
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
88.1	55.14	11.46	1.03	30.34	40.10	48.00	-7.90	V	AVG
88.1	56.21	11.46	1.03	30.34	41.17	48.00	-6.83	H	AVG
98.10	57.11	16.31	1.65	30.45	43.64	48.00	-4.36	V	AVG
98.10	52.78	16.31	1.65	30.45	39.31	48.00	-8.69	H	AVG
107.9	53.34	14.45	1.14	30.26	38.75	48.00	-9.25	V	AVG
107.9	52.61	14.45	1.14	30.26	38.02	48.00	-9.98	H	AVG

Remark:

1. Final Level = Read Level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Radiated Emission Test Data (30MHz to 1080MHz)

Test mode: 88.1MHz					Test channel: LOW				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
88.0	46.62	12.04	0.99	30.82	28.83	40	-11.17	V	PEAK
176.31	49.41	12.55	1.72	31.07	32.61	43.5	-10.89	V	PEAK
264.52	43.77	15.26	2.19	31.17	30.05	46	-15.95	V	PEAK
393.14	39.84	16.97	2.82	30.91	28.72	46	-17.28	V	PEAK
750.51	38.06	22.43	4.28	30.26	34.51	46	-11.49	V	PEAK
88.0	39.19	15.61	0.87	30.93	24.74	40	-15.26	H	PEAK
176.21	41.83	12.55	1.72	31.07	25.03	43.5	-18.47	H	PEAK
282.91	40.14	15.75	2.28	31.17	27.00	46	-19.00	H	PEAK
582.76	38.64	20.14	3.66	30.12	32.32	46	-13.68	H	PEAK
776.82	38.68	22.77	4.37	30.29	35.53	46	-10.47	H	PEAK

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Test mode: 98.1MHz					Test channel: MIDDLE				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
176.75	50.50	12.55	1.72	31.07	33.70	43.5	-9.80	V	PEAK
265.92	44.32	15.26	2.19	31.17	30.60	46	-15.40	V	PEAK
394.68	40.33	16.97	2.82	30.91	29.21	46	-16.79	V	PEAK
752.09	39.22	22.43	4.28	30.26	35.67	46	-10.33	V	PEAK
178.14	41.33	12.55	1.72	31.07	24.53	43.5	-18.97	H	PEAK
284.41	39.96	15.75	2.28	31.17	26.82	46	-19.18	H	PEAK
584.19	39.69	20.14	3.66	30.12	33.37	46	-12.63	H	PEAK
777.78	37.81	22.77	4.37	30.29	34.66	46	-11.34	H	PEAK

Test mode: 107.9MHz					Test channel:HIGH				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
108.0	44.81	12.04	0.99	30.82	27.02	40	-12.96	V	PEAK
177.81	50.36	12.55	1.72	31.07	33.56	43.5	-9.94	V	PEAK
266.10	45.05	15.26	2.19	31.17	31.33	46	-14.67	V	PEAK
393.52	40.77	16.97	2.82	30.91	29.65	46	-16.35	V	PEAK
751.39	39.00	22.43	4.28	30.26	35.45	46	-10.55	V	PEAK
108.0	39.95	15.61	0.87	30.93	25.50	40	-14.48	H	PEAK
177.81	42.13	12.55	1.72	31.07	25.33	43.5	-18.17	H	PEAK
283.91	40.05	15.75	2.28	31.17	26.91	46	-19.09	H	PEAK
583.51	38.80	20.14	3.66	30.12	32.48	46	-13.52	H	PEAK
777.45	38.61	22.77	4.37	30.29	35.46	46	-10.54	H	PEAK

Remark:

1. Final Level = Read Level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

----END OF REPORT----