

EMC TEST REPORT

Report No.: TS13060087-EME(R1)

Model No.: TTD-VM2501T, TTD-VM2500T, TTD-VM2502T

Issued Date: Feb. 11, 2014

Applicant: Tranwo Technology Corp.
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Test Method/ Standard: FCC Part 15 Subpart C Section §15.205, §15.207, §15.209,
§15.247, DA 00-705 and ANSI C63.4/2003

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1. General information

1.1 Identification of the EUT

Product: Wireless Video Baby Monitor
Model No.: TTD-VM2502T
FCC ID.: O6LTTD-VM2501T
Frequency Range: 2408MHz~2468MHz
Available Hopping Channels: 31 channels
Frequency of Each Channel: 2408+2k, k=0~30
Type of Modulation: GFSK, FHSS
Rated Power: DC 6 V from adapter
Power Cord: N/A
Sample Received: Jan. 23, 2014
Test Date(s): Jan. 27, 2014~ Feb. 06, 2014

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Note 2: When determining the test conclusion, the Measurement Uncertainty of test has been considered.



1.2 Additional information about the EUT

The EUT is Wireless Video Baby Monitor, and was defined as information technology equipment.

The customer confirmed the models listed as below were series model to model TTD-VM2501T (EUT), the difference between main model and series model are listed as below.

Model Number	Difference
TTD-VM2501T	With PTZ
TTD-VM2500T	Without PTZ
TTD-VM2502T	With PTZ

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

Modification (R1) to test report No.: TS13060087-EME (Verification No.: TS13060087-EME)

The original Test Report Ref. No.: TS13060087-EME, dated Aug. 07, 2013 was modified on Feb. 11, 2014 to include the following changes and/or additions, which were considered technical modifications:

Add serial model "TTD-VM2502T". The different is change layout and auto-tacking of IC.

After engineer judgment, Maximum Output Power test and Radiated Spurious Emission test were considered necessary.

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 1.5dBi
Antenna Type : Dipole Antenna
Connector Type : Fixed Type Antenna

1.4 Adapter information

The EUT will be supplied with a power supply from below list:

No.	Brand	Model no.	Specification
Adapter	SALOM ELECTRIC (XIAMEN) CO., LTD.	SSW-2256US	I/P: 100-240V~, 50-60Hz, 0.2A O/P: 6.0V, 800mA



1.5 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Description of Data Cable
Wireless Video Baby Monitor	Tranwo	TTD-VM2501R	N/A	N/A



2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §15.205, §15.207, §15.209, §15.247, DA 00-705 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT is supplied with DC 6 V from adapter (Test voltage: 120Vac, 60Hz).

The EUT is the type of transmitter and receiver equipment and transmits RF signal.

The EUT configuration refers to the “Spurious set-up photo.pdf”.

2.3 Measurement Uncertainty

Measurement uncertainty was calculated in accordance with TR 100 028-1

Parameter	Uncertainty		
Radiated Emission	Below 1 GHz	Vertical	3.90 dB
		Horizontal	3.86 dB
	Above 1 GHz	Vertical	5.74 dB
		Horizontal	5.55 dB
Conducted Emission	2.08 dB		

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of $k=2$.

2.4 Test equipment

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2013/12/3	2014/12/2
Spectrum Analyzer	Rohde&schwarz	FSP30	100137	2013/06/21	2014/06/21
Spectrum Analyzer	Rohde&schwarz	FSEK30	100186	2014/1/20	2015/1/19
Horn Antenna (1-18G)	Schwarzbeck	BBHA 9120 D	9120D-456	2012/09/03	2014/09/03
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2012/09/05	2014/09/05
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-172	2013/8/8	2015/8/7
Loop Antenna	RolfHeine	LA-285	02/10033	2012/03/20	2014/03/20
Pre-Amplifier	MITEQ	AFS44-0010265 0--42-10P-44	1495287	2013/10/27	2015/10/26
Pre-Amplifier	MITEQ	JS4-26004000-- 27-8A	828825	2012/09/18	2014/09/18
Power Meter	Anritsu	ML2495A	0844001	2013/10/10	2014/10/9
Power Sensor	Anritsu	MA2411B	0738452	2013/10/10	2014/10/9
Temperature&Humidity Test Chamber	TERCHY	MHU-225LRU (SA)	950838	2013/06/14	2014/06/14
Two-Line V-Network	Rohde&schwarz	ESH3-Z5	838979/014	2013/10/12	2014/10/11

Note: The above equipments are within the valid calibration period.



3. Maximum Output Power test

3.1 Operating environment

Temperature: 20 °C
Relative Humidity: 50 %
Atmospheric Pressure: 1008 hPa
Test Date: Feb. 05, 2014

3.2 Test setup & procedure

The test procedure was according to FCC measurement guidelines DA 00-705.

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (2 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

3.3 Measured data of Maximum Output Power test results

Channel	Frequency (MHz)	Output Power (dBm)	Total Power (mW)	Limit (dBm)	Margin (dB)
		(PK)	(PK)		
1	2408	16.25	42.17	20.97	-4.72
17	2440	17.53	56.62	20.97	-3.44
31	2468	17.85	60.95	20.97	-3.12

4. Radiated Emission test

4.1 Operating environment

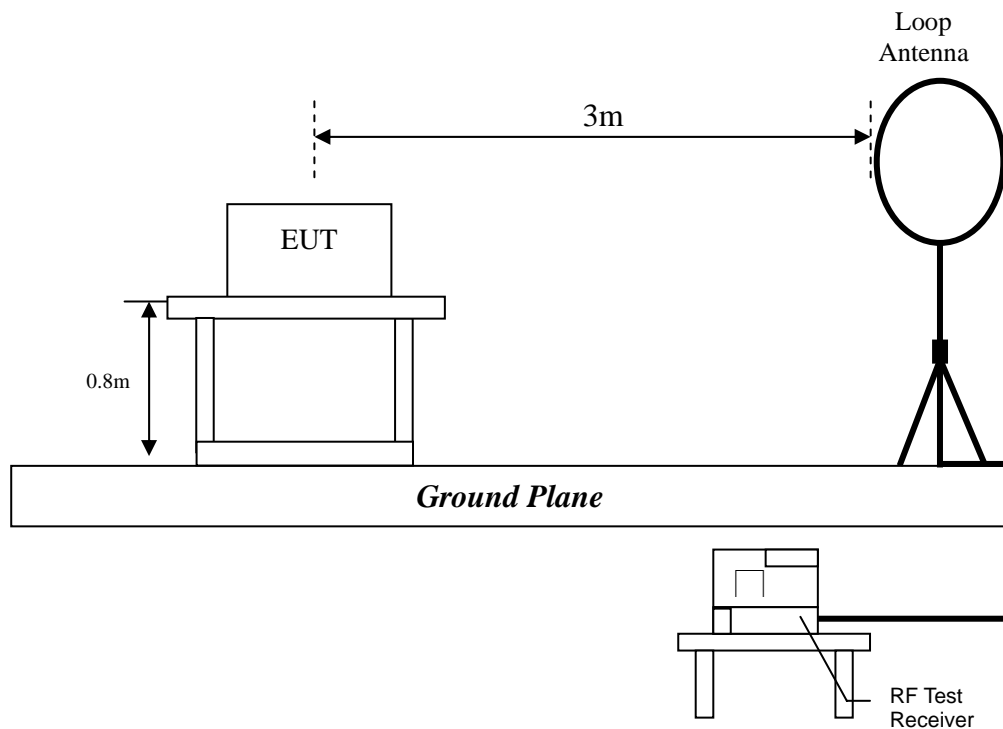
Temperature: 20 °C
Relative Humidity: 50 %
Atmospheric Pressure: 1008 hPa
Test Date: Jan. 27, 2014

4.2 Test setup & procedure

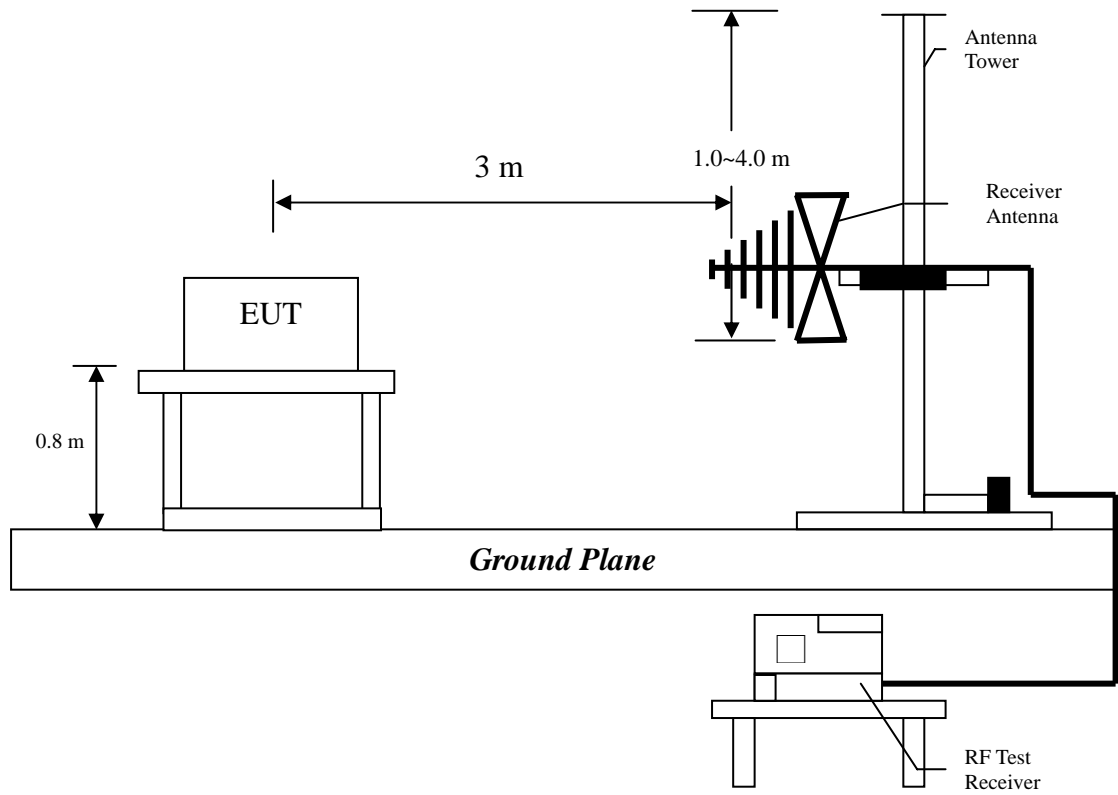
The test procedure was according to FCC measurement guidelines DA 00-705 and ANSI C63.4/2003.

The Diagram below shows the test setup, which is utilized to make these measurements.

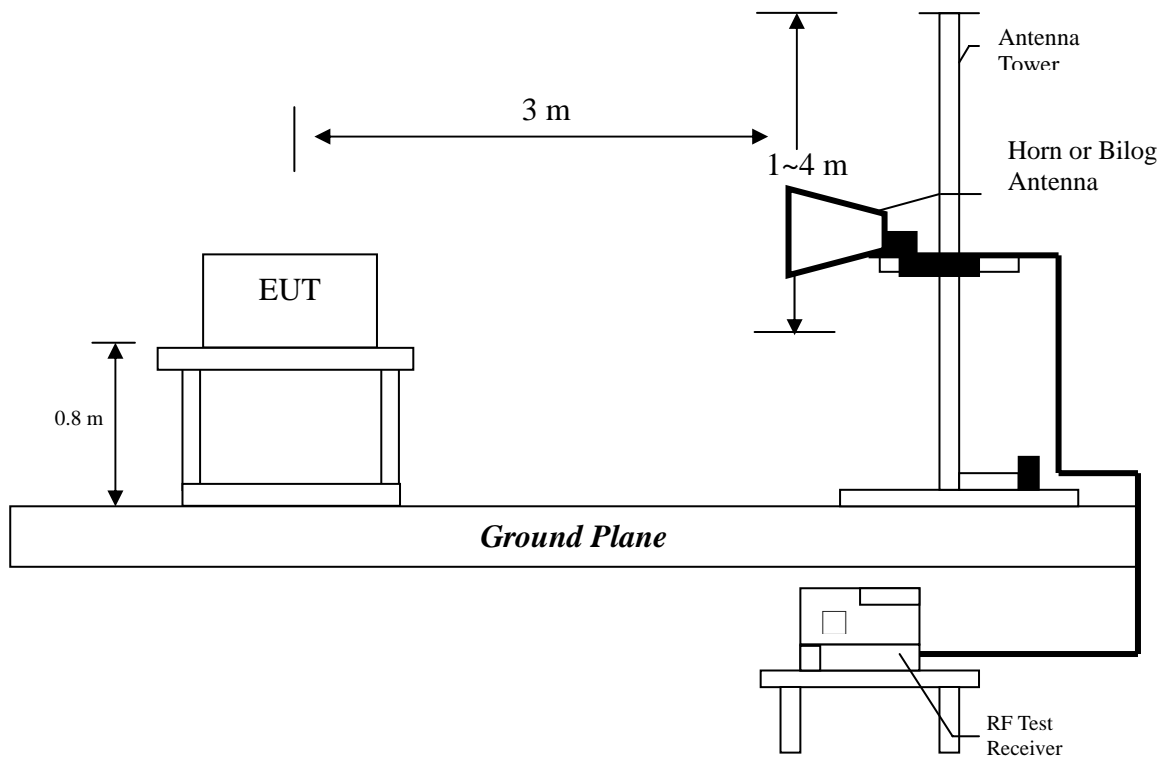
Radiated emission from 9kHz to 30MHz uses Loop Antenna:



Radiated emission from 30MHz to 1GHz uses Bilog Antenna:



Radiated emission above 1GHz uses Horn Antenna:



The signal is maximized through rotation and placement in the three orthogonal axes. According to §15.33(a), the spectrum shall be investigated from the lowest radio frequency signal generated in the device, to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz – for frequencies above 1GHz.

The EUT for testing is arranged on a fiberglass turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meter reading using inverse scaling with distance.

The EUT configuration refers to the “Spurious set-up photo.pdf”.

4.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Field Strength (microvolts/meter)
0.009~0.490	2400/F(kHz)
0.490~1.705	2400/F(kHz)
1.705~30	30
30-88	100
88-216	150
216-960	200
Above 960	500

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system



4.4 Radiated spurious emission test data

4.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under Channel 1, Channel 17 and Channel 31. The worst case occurred at Channel 31.

EUT : TTD-VM2502T
Worst Case : TX mode at Channel 31

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	191.02	QP	12.00	4.55	16.55	43.50	-26.95
V	288.02	QP	13.70	6.42	20.11	46.00	-25.89
V	383.08	QP	16.40	6.70	23.10	46.00	-22.90
V	480.08	QP	18.43	7.31	25.73	46.00	-20.27
V	503.36	QP	18.56	5.96	24.51	46.00	-21.49
V	864.20	QP	23.70	7.37	31.07	46.00	-14.93
H	191.02	QP	11.27	4.27	15.53	43.50	-27.97
H	288.02	QP	13.85	5.85	19.69	46.00	-26.31
H	383.08	QP	16.74	5.38	22.12	46.00	-23.88
H	480.08	QP	18.64	7.40	26.04	46.00	-19.96
H	503.36	QP	18.77	5.89	24.66	46.00	-21.34
H	864.20	QP	24.12	6.72	30.83	46.00	-15.17

Remark: 1. Corr. Factor = Antenna Factor + Cable Loss

2. Corrected Level = Reading + Corr. Factor

Note: The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.



4.4.2 Measurement results: frequency above 1GHz

EUT : TTD-VM2502T
Test Condition : TX mode at Channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4816.00	PK	V	35.1	38.54	55.66	59.10	74	-14.90
4816.00	AV	V	35.1	38.54	39.91	43.35	54	-10.65
7224.00	PK	V	33	44.6	40.43	52.03	74	-21.97
9632.00	PK	V	32.7	49.3	46.62	63.22	74	-10.78
9632.00	AV	V	32.7	49.3	32.1	48.70	54	-5.30
12040.00	PK	V	31.6	50.87	37.27	56.54	74	-17.46
12040.00	AV	V	31.6	50.87	24.58	43.85	54	-10.15
4816.00	PK	H	35.1	38.54	57.5	60.94	74	-13.06
4816.00	AV	H	35.1	38.54	40.94	44.38	54	-9.62
7224.00	PK	H	33	44.6	43.5	55.10	74	-18.90
7224.00	AV	H	33	44.6	27.3	38.90	54	-15.10
9632.00	PK	H	32.7	49.3	42.04	58.64	74	-15.36
9632.00	AV	H	32.7	49.3	27.09	43.69	54	-10.31
12040.00	PK	H	31.6	50.87	36.11	55.38	74	-18.62
12040.00	AV	H	31.6	50.87	21.93	41.20	54	-12.80

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.



EUT : TTD-VM2502T
Test Condition : TX mode at Channel 17

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4880.00	PK	V	35.1	38.54	55.09	58.53	74	-15.47
4880.00	AV	V	35.1	38.54	41.17	44.61	54	-9.39
7320.00	PK	V	33	44.6	39.65	51.25	74	-22.75
9760.00	PK	V	32.7	49.3	44.02	60.62	74	-13.38
9760.00	AV	V	32.7	49.3	29.09	45.69	54	-8.31
12200.00	PK	V	31.6	50.87	35.28	54.55	74	-19.45
12200.00	AV	V	31.6	50.87	25.11	44.38	54	-9.62
4880.00	PK	H	35.1	38.54	55.74	59.18	74	-14.82
4880.00	AV	H	35.1	38.54	44.3	47.74	54	-6.26
7320.00	PK	H	33	44.6	41.93	53.53	74	-20.47
9760.00	PK	H	32.7	49.3	43.56	60.16	74	-13.84
9760.00	AV	H	32.7	49.3	30.56	47.16	54	-6.84
12200.00	PK	H	31.6	50.87	34.78	54.05	74	-19.95
12200.00	AV	H	31.6	50.87	22.67	41.94	54	-12.06

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.



EUT : TTD-VM2502T
Test Condition : TX mode at Channel 31

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4936.00	PK	V	35.1	38.54	53.76	57.20	74	-16.80
4936.00	AV	V	35.1	38.54	43.41	46.85	54	-7.15
7404.00	PK	V	33	44.6	37.94	49.54	74	-24.46
9872.00	PK	V	33	49.3	46.14	62.44	74	-11.56
9872.00	AV	V	33	49.3	32.47	48.77	54	-5.23
12340.00	PK	V	33	50.87	35.6	53.47	74	-20.53
4936.00	PK	H	35.1	38.54	56.71	60.15	74	-13.85
4936.00	AV	H	35.1	38.54	42.94	46.38	54	-7.62
7404.00	PK	H	33	44.6	42.06	53.66	74	-20.34
7404.00	AV	H	33	44.6	29.79	41.39	54	-12.61
9872.00	PK	H	33	49.3	43.11	59.41	74	-14.59
9872.00	AV	H	33	49.3	30.84	47.14	54	-6.86
12340.00	PK	H	33	50.87	38.32	56.19	74	-17.81
12340.00	AV	H	33	50.87	24.97	42.84	54	-11.16

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Appendix A1: External photo of series model TTD-VM2502T





Appendix A2: Internal photo of series model TTD-VM2502T

