



**World Standardization Certification & Testing CO., LTD**  
**World Standardization Safety and EMC Testing Centre**

## **FCC ID TEST REPORT**

**for**

**TRAILER MONITORING SYSTEM**

**Trade Mark: N/A**

**Model: TRMS-ANT-10000**

**Test Report Number: WSCT10040112E-2**

**Issued Date: May 11, 2010**

Issued for

**Kenwo Industries Limited**

**Unit 1-2, 7/F, Block A, Hi-Tech Ind Ctr 5 Park Tin Par Street Tsuen Wan, Hong Kong**

Issued by:

**WORLD STANDARDIZATION CERTIFICATION & TESTING CO., LTD.**

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**Revision History of report**

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	WSCT10040112E-2	Initial Issue	ALL	Kallen Wang



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## 1 TEST RESULT CERTIFICATION

**Product:** TRAILER MONITORING SYSTEM

**Model:** TRMS-ANT-10000

**Trade Mark:** N/A

**Applicant:** Kenwo Industries Limited

Unit 1-2, 7/F, Block A, Hi-Tech Ind Ctr 5 Park Tin Par Street Tsuen Wan, Hong Kong

**Factory** Kenwo Manufacturing Factory

Linwu Industrial Area, Junzibu, Guanlan, Baoan, Shenzhen, China

**Tested Date:** April 18~ May 11,2010

**Test Voltage:** DC 12V(Adapter input AC 120V/60Hz)

### APPLICABLE STANDARDS

STANDARD	TEST RESULT
FCC PART 15B	No non-compliance noted
ANSI C63.4: 2003	No non-compliance noted

Note: 1. The test result judgment is decided by the limit of measurement standard  
2. The information of measurement uncertainty is available upon the customer's request.

### Deviation from Applicable Standard

None

The above equipment has been tested by World Standardization Certification & Testing Co., Ltd and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

**Tested By:** Davis Zhou

(Davis Zhou)

**Date:** 2010-05-11

**Check By:** Kelly Wu

(Kelly Wu)

**Date:** 2010-05-11

**Approved By:** Kallen Wang

(Kallen Wang)

**Date:** 2010-05-11



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## 2 TEST RESULT SUMMARY

Test Item	Test Result
Conduct Emission	PASS
Radiation Emission	Pass

- Note:** 1. The test result judgment is decided by the limit of test standard  
2. The information of measurement uncertainty is available upon the customer's request.  
3. N/A means to no applicable.



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### 3 EUT DESCRIPTION

<b>Product</b>	TRAILER MONITORING SYSTEM
<b>Brand Name</b>	N/A
<b>Model</b>	TRMS-ANT-10000
<b>Applicant</b>	Kenwo Industries Limited
<b>EUT Type</b>	Prototype production.
<b>Serial Number</b>	N/A
<b>Antenna Type</b>	Intergral antenna
<b>EUT Power Rating</b>	N/A
<b>Temperature Range(Operating)</b>	15-35℃
<b>Operating Frequency</b>	N/A

N/A mean to no applicable

#### I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH
N/A	N/A	N/A

#### Models difference

N/A

## 4 TEST METHODOLOGY

### 4.1 DECISION OF FINAL TEST MODE

The EUT was tested together with the below additional components, and configuration, which produced the worst emission levels, was selected and recorded in this report.

the following test mode was recorder in this report.

Test Item	Test mode
Conduct Emission	Normal operation
Radiation Emission	Normal operation

### 4.2 EUT SYSTEM OPERATION

1. Set up EUT with the relative support equipments.
- 2.Make sure the EUT normal operation during the test.

## 5 SETUP OF EQUIPMENT UNDER TEST

### 5.1 DESCRIPTION OF SUPPORT UNITS

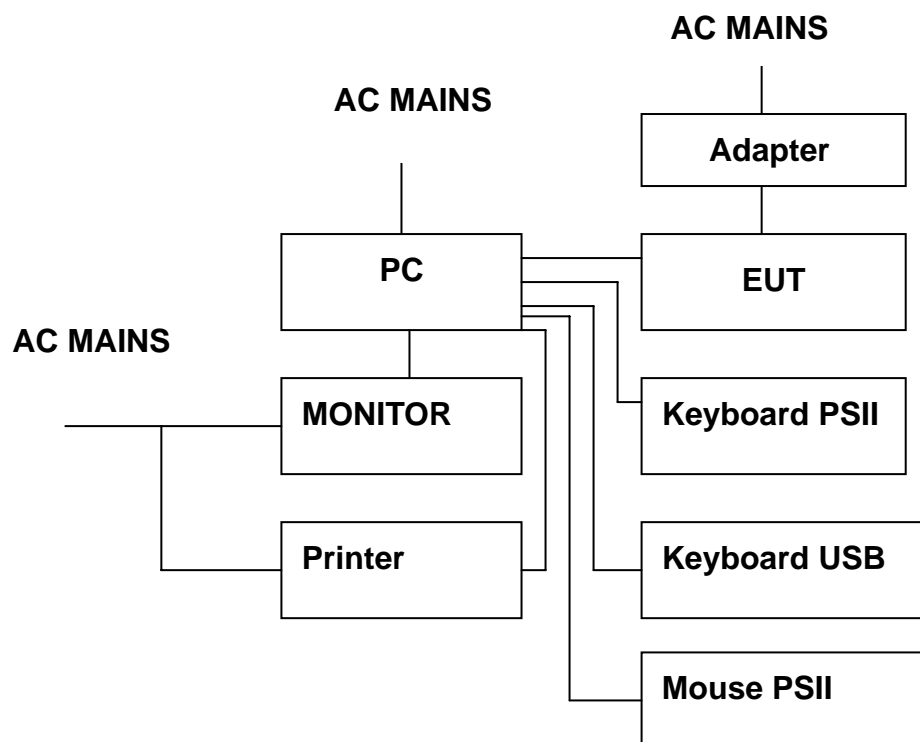
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	PC	dx2700	CNG7140T7P	/	HP	/	/
2.	Monitor	HPL1706V	CND74535YZ	/	HP	/	/
3.	Printer	LBP2900	/	/	Canon	/	/
4.	Keyboard PSII	SK-2880	435302-AA1	/	HP	/	/
5.	Keyboard USB	SK-3500	/	/	HP	/	/
6.	Mouse PSII	MP-1200	/	/	/	/	/

**Note:**

- 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

### 5.2 CONFIGURATION OF SYSTEM UNDER TEST



(EUT:TRAILER MONITORING SYSTEM)



## 6 FACILITIES AND ACCREDITATIONS

### 6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at  
**1-2/F, DaChong Science&Technology Building, No.28 of Tonggu Road,Nanshan District, ShenZhen.PRC**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 15. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 6.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

<b>USA</b>	<b>FCC</b> (The certificate registration number is 276008)
	<b>TIMCO</b> (The certificate registration number is Q2001)
<b>Japan</b>	<b>VCCI</b> (The certificate registration number is C-2912, R-2662)
<b>Canada</b>	<b>INDUSTRY CANADA</b> (The certificated registration number is 46405-7700)
<b>Germany</b>	<b>TUV</b> (The certificate registration number is UA50138086-0001,UA50138086-0002)
	<b>EMCC</b> (The certificated registration number is 080380)
<b>China</b>	<b>CNAS</b> (The certificated registration number is L3732)

Copies of granted accreditation certificates are available for downloading from our web site,  
<http://www.wsct.org.cn>

### 6.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency		Uncertainty
Conducted emissions	450kHz~30MHz		+/- 3.59dB
Radiated emissions	Horizontal	30MHz ~ 200MHz	+/- 4.77dB
		200MHz ~1000MHz	+/- 4.93dB
	Vertical	30MHz ~ 200MHz	+/- 5.04dB
		200MHz ~1000MHz	+/- 4.93dB

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

## 7 CONDUCTED EMISSION MEASUREMENT

### 7.1 LIMITS

FREQUENCY (MHz)	LIMIT(dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

**NOTE:**

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) All emanations from EUT or system, shall not exceed the level of field strengths specified above.

### 7.2 TEST INSTRUMENTS

Conducted Emission Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	100005	06/24/2010
LISN	AFJ	LS16	16010222119	09/29/2010
LISN(EUT)	Mestec	AN3016	04/10040	09/28/2010

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).  
2. N.C.R = No Calibration Request.

### 7.3 TEST PROCEDURES

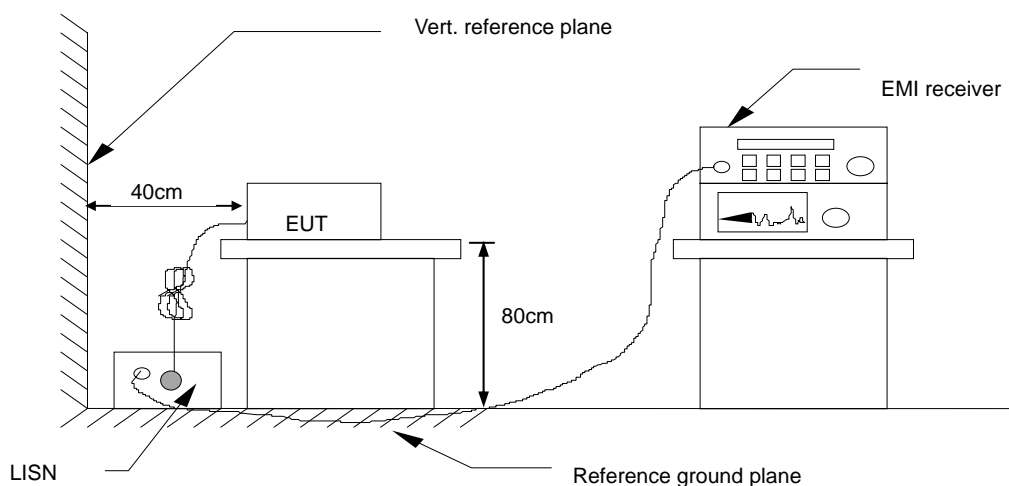
The EUT was put on a wooden table which was 0.8metre high above the ground and connected to the AC mains through a Artificial Mains Network (A.M.N). The mains lead in excess of 1 m separating the EUT from the AMN was folded back and forth parallel to the lead so as to form a bundle with a length of 0.3m to 0.4m. The EUT was kept 0.4m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during conducted emission test.

The bandwidth of the test receiver (ESCI) was set at 9KHz.

The frequency range from 150 KHz to 30 MHz was investigated.

The test data of the worst-case condition(s) was recorded.

## 7.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 7.5. TEST RESULTS

<b>Model No.</b>	TRMS-ANT-10000	<b>6dB Bandwidth</b>	10 KHz
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Mode</b>	Normal operation
<b>Detector Function</b>	Peak / Quasi-peak/AV	<b>Test Result</b>	Pass
<b>Test By</b>	Davis Zhou		

NOTE: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

2. "---" denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

Freq. = Emission frequency in MHz

Reading level(dBuV) = Receiver reading

Corr. Factor (dB) = Attenuator Factor+ Cable loss

Level (dBuV) = Reading level(dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Level (dBuV) – Limits (dBuV)

Q.P.=Quasi-Peak

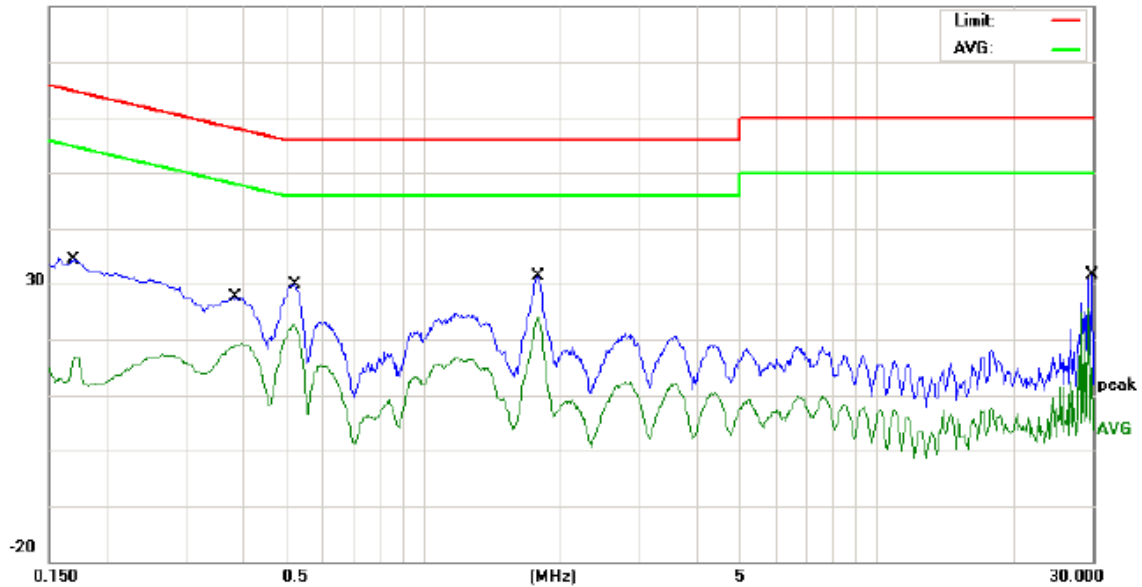
## Conducted Emission Measurement

File :Kenwo  
 80.0 dBuV

Data :#2

Date: 2010/05/06

Time: 14:52:13



Site 843 Shielded Room

Phase: **L1**

Temperature: 26

Limit: FCC Part 15 B Conduction(QP)

Power: AC 120V/60Hz

Humidity: 60 %

EUT: TRAILER MONITORING SYSTEM

M/N: TRMS-ANT-10000

Mode: Normal operation

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1700	16.37	10.47	26.84	64.96	-38.12	QP	
2		0.1700	6.39	10.47	16.86	54.96	-38.10	AVG	
3		0.3860	11.44	10.72	22.16	58.15	-35.99	QP	
4		0.3860	8.22	10.72	18.94	48.15	-29.21	AVG	
5		0.5220	15.06	10.54	25.60	56.00	-30.40	QP	
6		0.5220	15.05	10.54	25.59	56.00	-30.41	QP	
7		0.5220	11.93	10.54	22.47	46.00	-23.53	AVG	
8		0.5220	11.94	10.54	22.48	46.00	-23.52	AVG	
9		1.8020	16.83	10.27	27.10	56.00	-28.90	QP	
10	*	1.8020	13.83	10.27	24.10	46.00	-21.90	AVG	
11		29.9580	16.97	10.65	27.62	60.00	-32.38	QP	
12		29.9580	6.21	10.65	16.86	50.00	-33.14	AVG	

\*:Maximum data x:Over limit !:over margin

(Reference Only)



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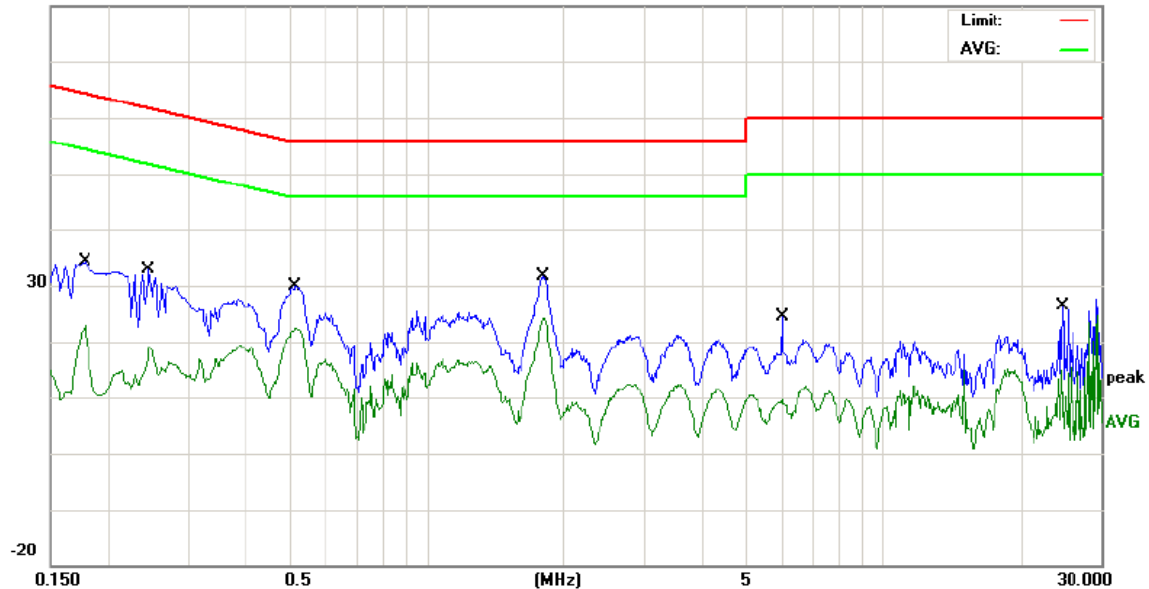
### Conducted Emission Measurement

File :Kenwo  
80.0 dBuV

Data :#1

Date: 2010/05/06

Time: 14:43:21



Site 843 Shielded Room

Limit: FCC Part 15 B Conduction(QP)

EUT: TRAILER MONITORING SYSTEM

M/N: TRMS-ANT-10000

Mode: Normal operation

Note:

Phase: **N**

Power: AC 120V/60Hz

Temperature: 26

Humidity: 60 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1780	17.62	10.54	28.16	64.57	-36.41	QP	
2		0.1780	-0.88	10.54	9.66	54.57	-44.91	AVG	
3		0.2460	13.27	10.79	24.06	61.89	-37.83	QP	
4		0.2460	2.53	10.79	13.32	51.89	-38.57	AVG	
5		0.5180	15.05	10.54	25.59	56.00	-30.41	QP	
6		0.5180	11.72	10.54	22.26	46.00	-23.74	AVG	
7		1.7980	17.30	10.27	27.57	56.00	-28.43	QP	
8	*	1.7980	14.17	10.27	24.44	46.00	-21.56	AVG	
9		5.9940	2.56	10.22	12.78	60.00	-47.22	QP	
10		5.9940	-1.54	10.22	8.68	50.00	-41.32	AVG	
11		24.7780	-2.09	10.26	8.17	60.00	-51.83	QP	
12		24.7780	-7.52	10.26	2.74	50.00	-47.26	AVG	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## 8 RADIATED EMISSION MEASUREMENT

### 8.1. LIMITS OF RADIATED EMISSION MEASUREMENT

#### Maximum permissible level of Radiated Emission measured at 3 meter

FREQUENCY (MHz)	dBuV/m (At 3m)
	Class B
30~88	40.00
88~216	43.50
216~960	46.00
960~1000	54.00
>1000	PK:74;AV:54

**NOTE:** (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) The limit below 1GHz use QP detector

### 8.2. TEST INSTRUMENTS

966 Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100005	06/24/2010
Spectrum Analyzer	R&S	FSU	100114	04/14/2011
Pre Amplifier	H.P.	HP8447E	2945A02715	06/24/2010
Pre-Amplifier	Compliance	PAM0118	1360976	06/04/2010
Bilog Antenna	SUNOL Sciences	JB3	A021907	06/10/2010
Horn Antenna	Compliance	CE18000	001	06/10/2010
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/09/2010
Cable	TIME MICROWAVE	--	--	06/09/2010
System-Controller	CCS	N/A	N/A	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

2. N.C.R = No Calibration Request.

### 8.3.TEST PROCEDURES

The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz,The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna (calibrated by dipole antenna) was used as a receiving antenna. At the frequency band of 1GHz to 2GHz,The measuring antenna moved from 1 to 4 m for horizontal and vertical polarization. The horn antenna was used as a receiving antenna.

The resolution bandwidth and video bandwidth of the test receiver was 120 KHz and 300KHz for Quasi-peak detection at frequency below 1GHz.

The resolution bandwidth and video bandwidth of the test receiver was 1MHz and 3MHz for Peak emission measurement above 1GHz .

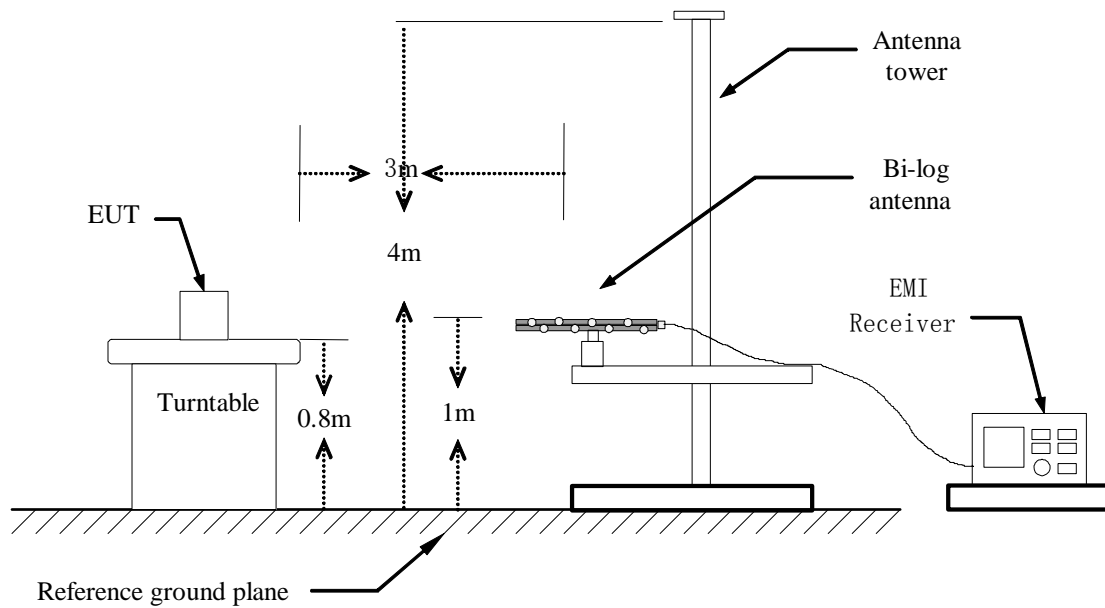
The resolution bandwidth of the test receiver was 1MHz and the video bandwidth are 10Hz for Average emission measurement above 1GHz .

The EUT was tested in Chamber Site.

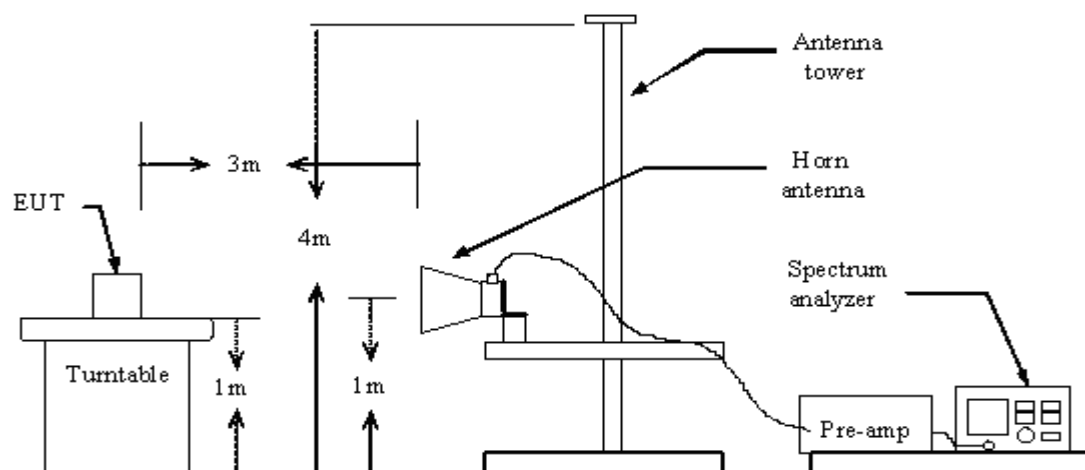
The test data of the worst case condition(s) was reported on the following pages.

## 8.4. TEST SETUP

### Below 1GHz



### Above 1GHz







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## 8.5.TEST RESULTS

<b>Model No.</b>	TRMS-ANT-10000	<b>Test Mode</b>	Normal operation
<b>Environmental Conditions</b>	25°C, 55% RH	<b>Test Result</b>	Pass

Frequency (MHz)	Ant. Pol.	Corr.Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin	Note	Result
45.00	H	-5.85	35.60	40.00	-4.40	QP	Pass
123.12	H	-4.64	37.00	43.50	-6.50	QP	Pass
229.82	H	-5.44	31.60	46.00	-14.40	QP	Pass
650.53	H	5.60	33.54	46.00	-12.46	QP	Pass
819.58	H	4.93	35.60	46.00	-10.40	QP	Pass
1238.00	H	26.51	48.50	74.00	-25.50	Peak	Pass
1238.00	H	26.51	--	54.00	--	AV	Pass
30.00	V	4.96	34.50	40.00	-5.50	QP	Pass
123.12	V	-4.64	30.10	43.50	-13.40	QP	Pass
315.12	V	-2.57	33.50	46.00	-12.50	QP	Pass
546.04	V	2.46	30.10	46.00	-15.90	QP	Pass
951.50	V	3.31	38.45	46.00	-7.55	QP	Pass
1200.00	V	26.50	50.13	74.00	-23.87	Peak	Pass
1200.00	V	26.50	--	54.00	--	AV	Pass

Note: 1. Level = Antenna Factor + Cable Loss + Meter Reading-Preamp factor

2. -- means to the measure is no necessary, due to the PK value comply with AV limits.