



FCC TEST REPORT

FCC ID: 2AAU3JET-M2-400C

Product : TIRE PRESSURE MONITORING SYSTEM

Trade Name : JETSON

Model Number : JET-M2-400C

Serial Model : TMG400C, TM66, TM55-BRASS, TM55-ALUM,
TT400C, TP7001, TP7002, JET-M2-300C,
JET-M-400A, JET-M-400C, JET-1000,
JET-M1-700C, JET-M2-500, JET-M-500

Report No. : NTEK-2013NT0730852F

Prepared for

Shenzhen Jetson Electronic Technologies Co.,Ltd
Rm1108 East Block 4 · Seg sci-tech park · North Huaqiang Road · shenzhen 518031
China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Jetson Electronic Technologies Co.,Ltd
Address : Rm1108 East Block 4 , Seg sci-tech park , North Huaqiang Road , shenzhen 518031 China
Manufacturer's Name : Shenzhen Jetson Electronic Co.,Ltd
Address : 6/F , Block A , Jjingdingsheng Industirial Park Qinghua Road , Bao'an District , Shenzhen 51809 China

Product description

Product name : TIRE PRESSURE MONITORING SYSTEM
Model and/or type reference : TMG400C
Serial Model : TM66, TM55-BRASS, TM55-ALUM, TT400C, TP7001, TP7002, JET-M2-300C, JET-M-400A, JET-M-400C, JET-1000, JET-M1-700C, JET-M2-500, JET-M-500
Standards : FCC Part15B:2012
 ANSI C63.4:2009

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Date of Test :
Date (s) of performance of tests : 30 Jul. 2013 ~14 Aug. 2013
Date of Issue..... : 14 Aug. 2013
Test Result..... : **Pass**

Testing Engineer : Polo Cha
 (Polo Cha)

Technical Manager : Brown Lu
 (Brown Lu)

Authorized Signatory : Bovey Yang
 (Bovey Yang)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2012 ANSI C63.4: 2009	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration Number:238937; IC Registration Number:9270A-1

CNAS Registration Number:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~6GHz	5.0	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	TIRE PRESSURE MONITORING SYSTEM	
Model Name	JET-M2-400C	
Additional Model Number(s)	TM66, TM55-BRASS, TM55-ALUM, TT400C, TP7001, TP7002, JET-M2-300C, JET-M-400A, JET-M-400C, JET-1000, JET-M1-700C, JET-M2-500, JET-M-500	
Model Difference	All models are identical except model names.	
Product Description	The EUT is a TIRE PRESSURE MONITORING SYSTEM.	
	Operating frequency:	434.2MHz (receive)
	Connecting I/O port:	N/A
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Adapter	Model No.: BI05-050100-BdC	
	AC Power Input: 100-240V~, 50/60Hz, 0.3A Output: 5V---, 1A	
Battery	DC 3.7V, 1400mAh	

2.2 DESCRIPTION OF TEST MODES

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

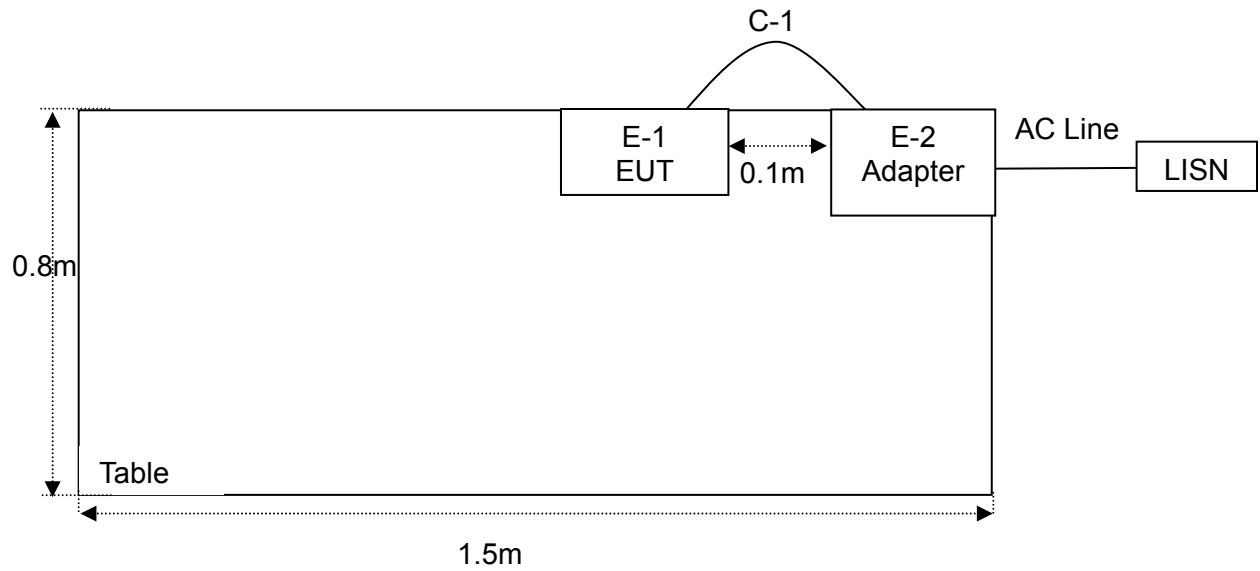
Pretest Mode	Description
Mode 1	Running

For Conducted Test	
Final Test Mode	Description
Mode 1	Running

For Radiated Test	
Final Test Mode	Description
Mode 1	Running

2.3 DESCRIPTION OF TEST SETUP

Mode CE:



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	TIRE PRESSURE MONITORING SYSTEM	JETSON	JET-M2-400C	N/A	EUT
E-2	Adapter	N/A	BI05-050100-BdC	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	120cm	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101313	Jul. 06, 2013	Jul. 05, 2014	1 year
2	LISN	SCHWARZBECK	NNLK 8129	8129245	Dec. 25, 2012	Dec. 24, 2013	1 year
3	Pulse Limiter	SCHWARZBECK	VTSD 9561F	9716	Dec. 25, 2012	Dec. 24, 2013	1 year
4	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jul. 06, 2013	Jul. 05, 2014	1 year
5	Test Cable	N/A	C01	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
6	Test Cable	N/A	C02	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
7	Test Cable	N/A	C03	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
8	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2013	Jul. 05, 2014	1 year
9	Passive Voltage Probe	ESH2-Z3	R&S	100196	Jul. 06, 2013	Jul. 05, 2014	1 year
10	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jul. 06, 2013	Jul. 05, 2014	1 year
11	Absorbing Clamp	R&S	MDS-21	100423	Jul. 08, 2013	Jul. 07, 2014	1 year

2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jul. 06, 2013	Jul. 05, 2014	1 year
2	Test Cable	N/A	R-01	N/A	Dec. 25, 2012	Dec. 24, 2013	1 year
3	Test Cable	N/A	R-02	N/A	Dec. 25, 2012	Dec. 24, 2013	1 year
4	EMI Test Receiver	R&S	ESCI-7	101318	Jul. 06, 2013	Jul. 05, 2014	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jul. 06, 2013	Jul. 05, 2014	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06, 2013	Jul. 05, 2014	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06, 2013	Jul. 05, 2014	1 year
10	Amplifier	EM	EM-30180	060538	Jul. 06, 2013	Jul. 05, 2014	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

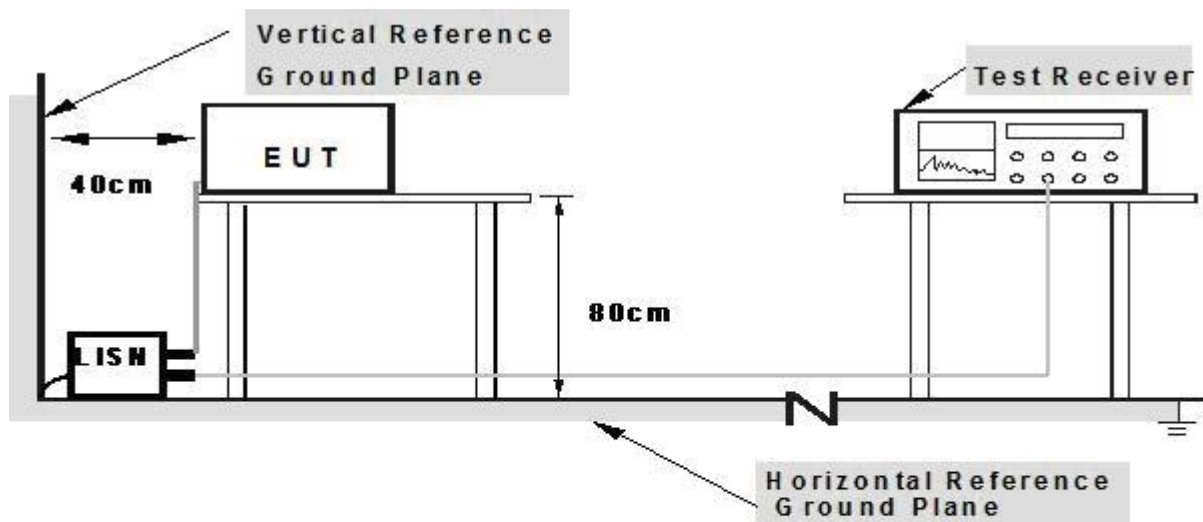
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

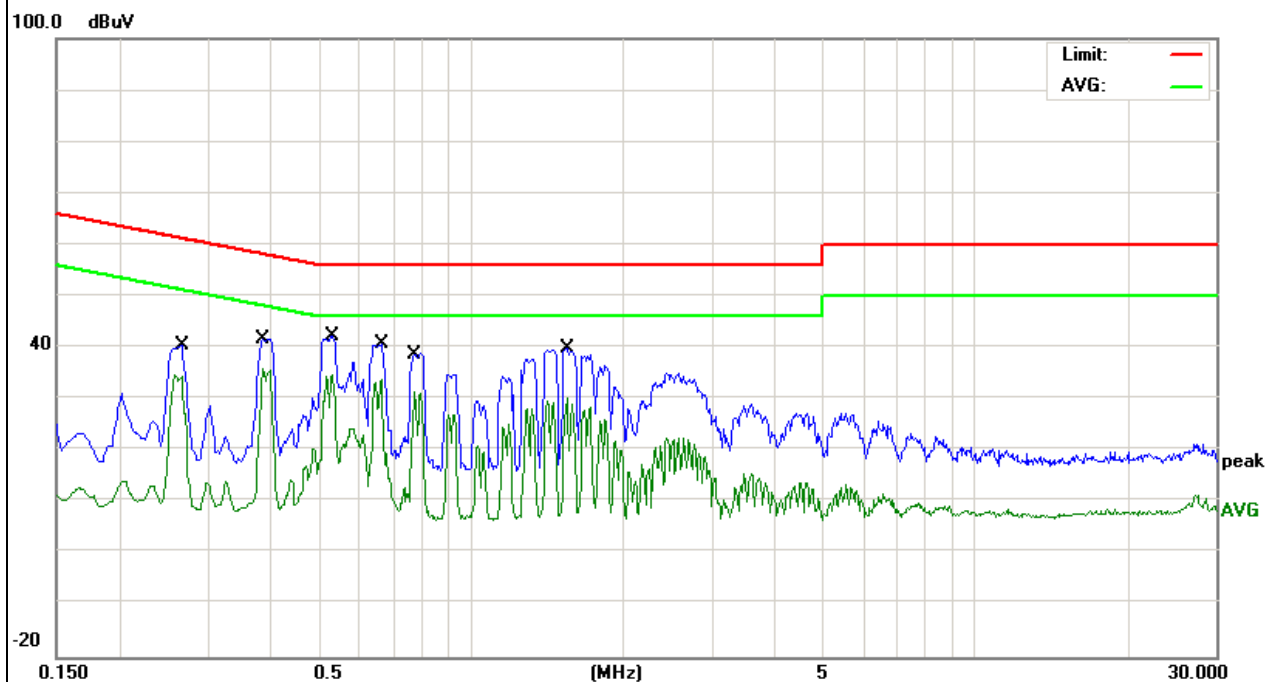
3.1.5 TEST RESULTS

EUT :	TIRE PRESSURE MONITORING SYSTEM	Model Name. :	JET-M2-400C
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2013-08-12
Test Mode :	Running	Phase :	L
Test Voltage :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.2660	30.73	9.82	40.55	61.24	-20.69	QP
0.2660	24.82	9.82	34.64	51.24	-16.60	AVG
0.3860	31.75	9.91	41.66	58.15	-16.49	QP
0.3860	25.89	9.91	35.80	48.15	-12.35	AVG
0.5299	32.38	9.98	42.36	56.00	-13.64	QP
0.5299	24.91	9.98	34.89	46.00	-11.11	AVG
0.6620	30.66	10.02	40.68	56.00	-15.32	QP
0.6620	23.69	10.02	33.71	46.00	-12.29	AVG
0.7740	29.01	10.06	39.07	56.00	-16.93	QP
0.7740	21.51	10.06	31.57	46.00	-14.43	AVG
1.5460	29.73	10.11	39.84	56.00	-16.16	QP
1.5460	20.08	10.11	30.19	46.00	-15.81	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

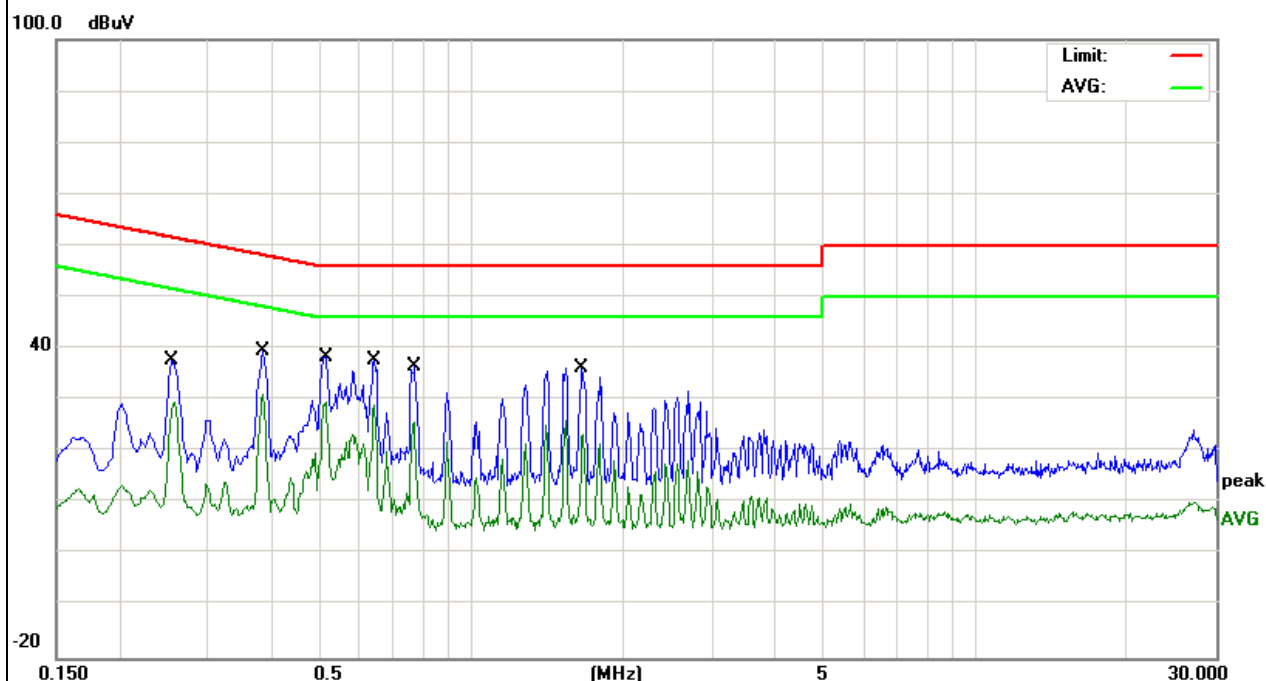


EUT :	TIRE PRESSURE MONITORING SYSTEM	Model Name. :	JET-M2-400C
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2013-08-12
Test Mode :	Running	Phase :	N
Test Voltage :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.2540	27.82	9.78	37.60	61.62	-24.02	QP
0.2540	19.89	9.78	29.67	51.62	-21.95	AVG
0.3860	29.72	9.92	39.64	58.15	-18.51	QP
0.3860	21.13	9.92	31.05	48.15	-17.10	AVG
0.5140	28.38	9.97	38.35	56.00	-17.65	QP
0.5140	19.68	9.97	29.65	46.00	-16.35	AVG
0.6419	27.65	10.01	37.66	56.00	-18.34	QP
0.6419	19.03	10.01	29.04	46.00	-16.96	AVG
0.7700	15.73	10.05	25.78	46.00	-20.22	AVG
0.7740	26.39	10.05	36.44	56.00	-19.56	QP
1.6620	26.15	10.12	36.27	56.00	-19.73	QP
1.6620	13.18	10.12	23.30	46.00	-22.70	AVG

Remark:

Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

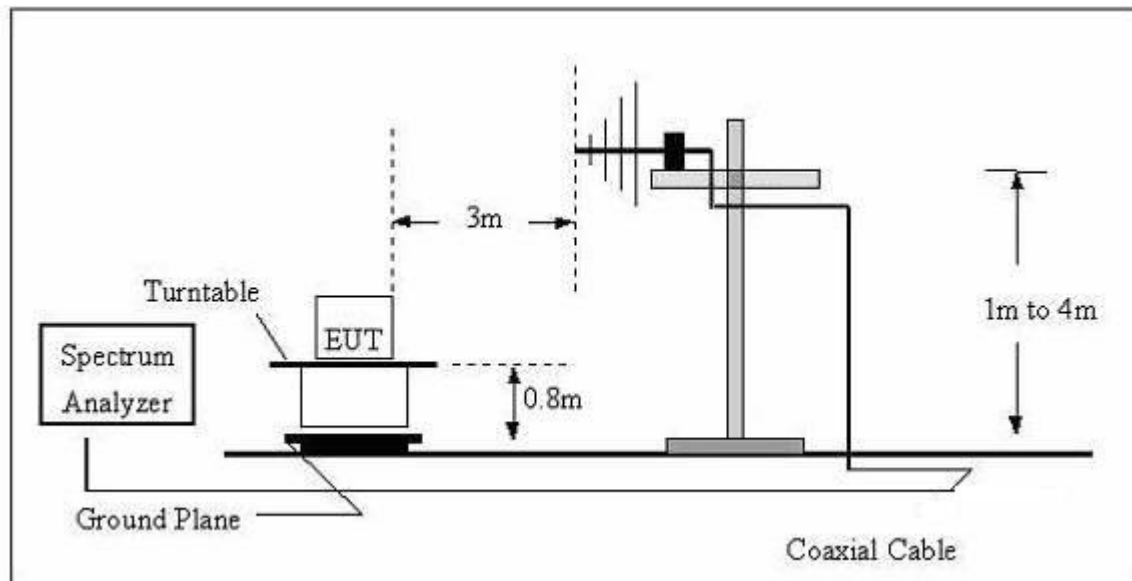
- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

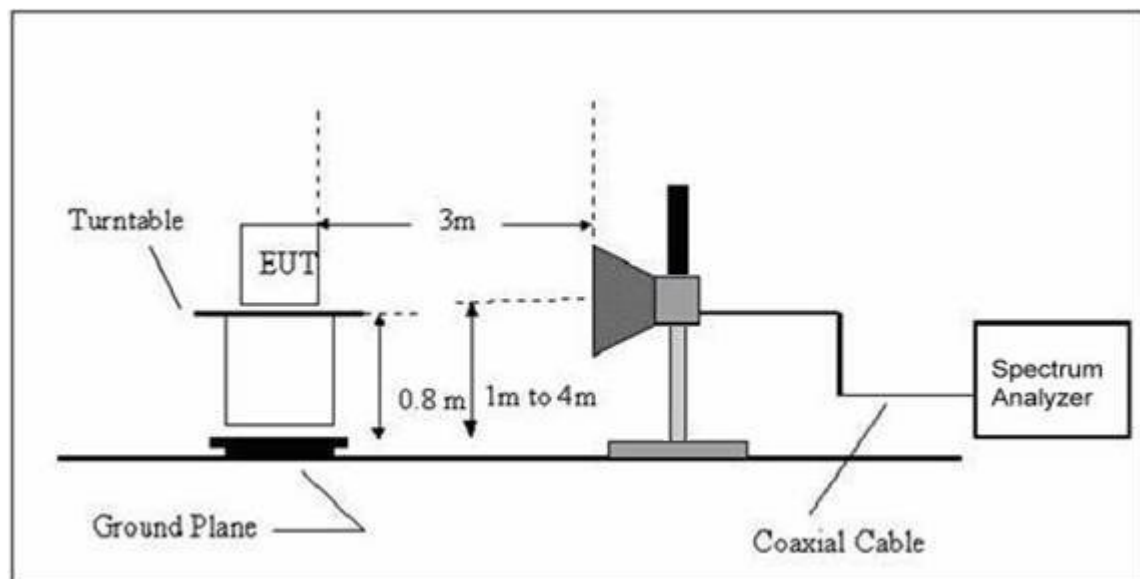
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

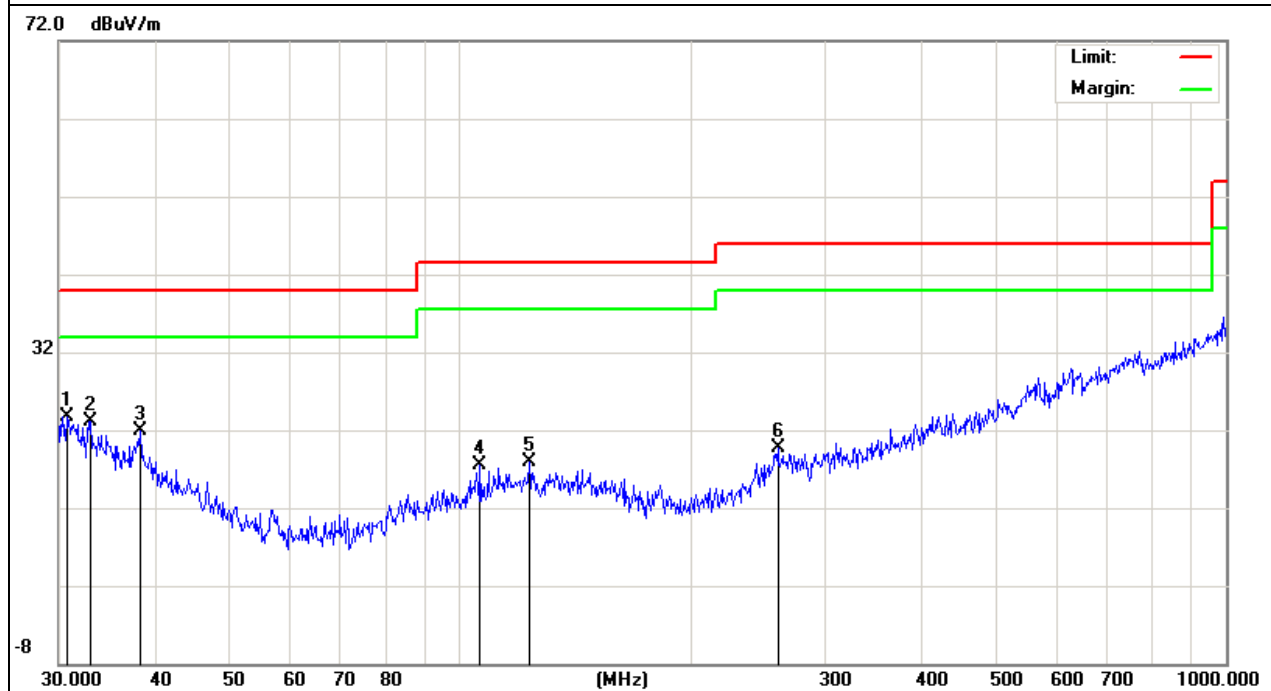
3.2.5 TEST RESULTS

EUT :	TIRE PRESSURE MONITORING SYSTEM	Model Name :	JET-M2-400C
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2013-08-13
Test Mode :	Running	Polarization :	Horizontal
Test Power :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
30.7454	5.61	18.00	23.61	40.00	-16.39	QP
32.9791	6.15	16.91	23.06	40.00	-16.94	QP
38.3462	7.68	14.21	21.89	40.00	-18.11	QP
106.3850	6.22	11.22	17.44	43.50	-26.06	QP
123.2655	5.64	12.17	17.81	43.50	-25.69	QP
260.1444	4.68	14.93	19.61	46.00	-26.39	QP

Remark:

Factor = Antenna Factor + Cable Loss.

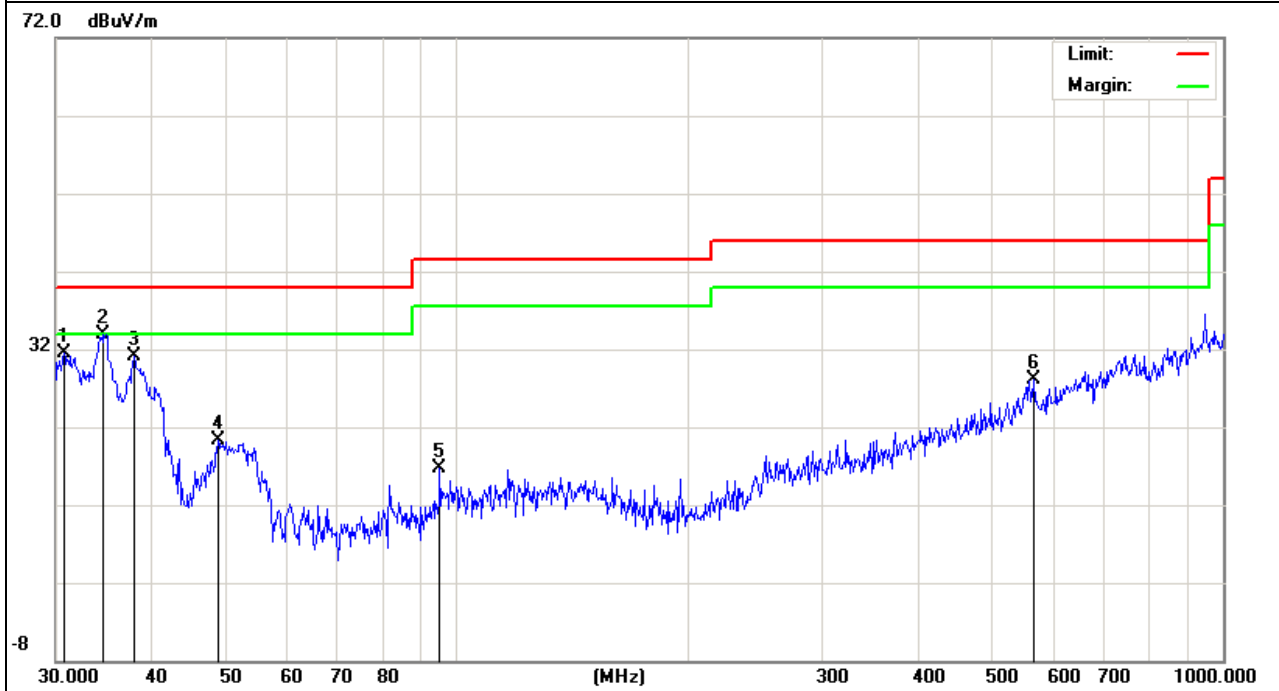


EUT :	TIRE PRESSURE MONITORING SYSTEM	Model Name :	JET-M2-400C
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2013-08-13
Test Mode :	Running	Polarization :	Vertical
Test Power :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
30.7454	13.49	18.00	31.49	40.00	-8.51	QP
34.6385	17.85	16.05	33.90	40.00	-6.10	QP
37.9450	16.60	14.41	31.01	40.00	-8.99	QP
48.8429	11.58	8.78	20.36	40.00	-19.64	QP
95.0930	6.62	10.12	16.74	43.50	-26.76	QP
566.6221	5.29	22.73	28.02	46.00	-17.98	QP

Remark:

Factor = Antenna Factor + Cable Loss.



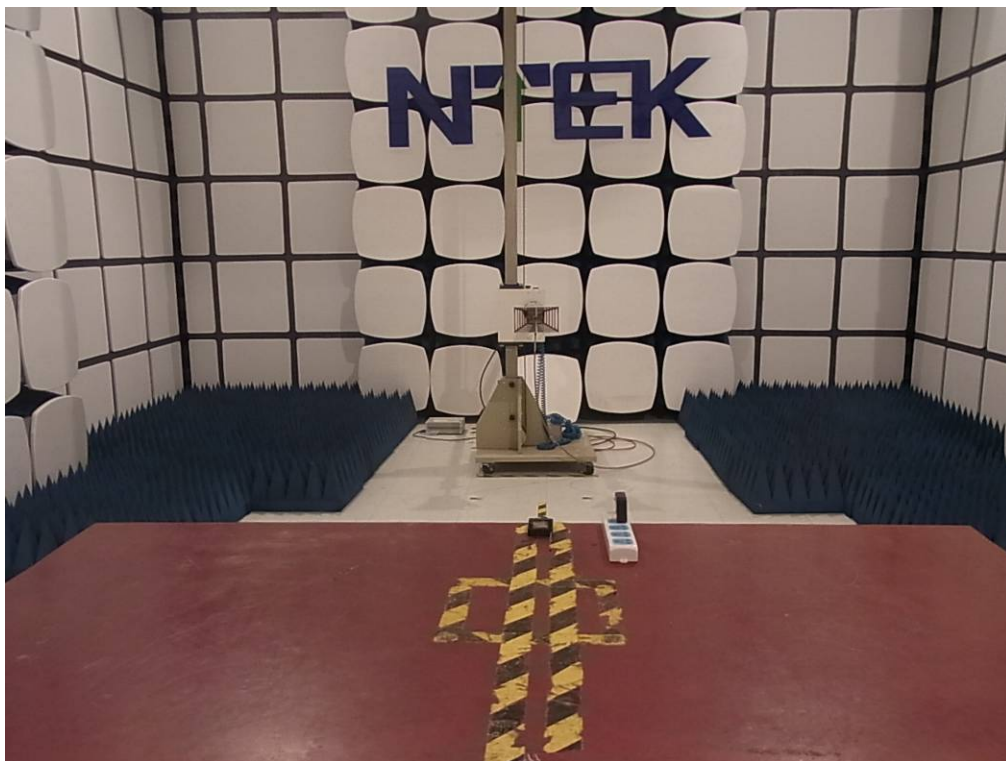
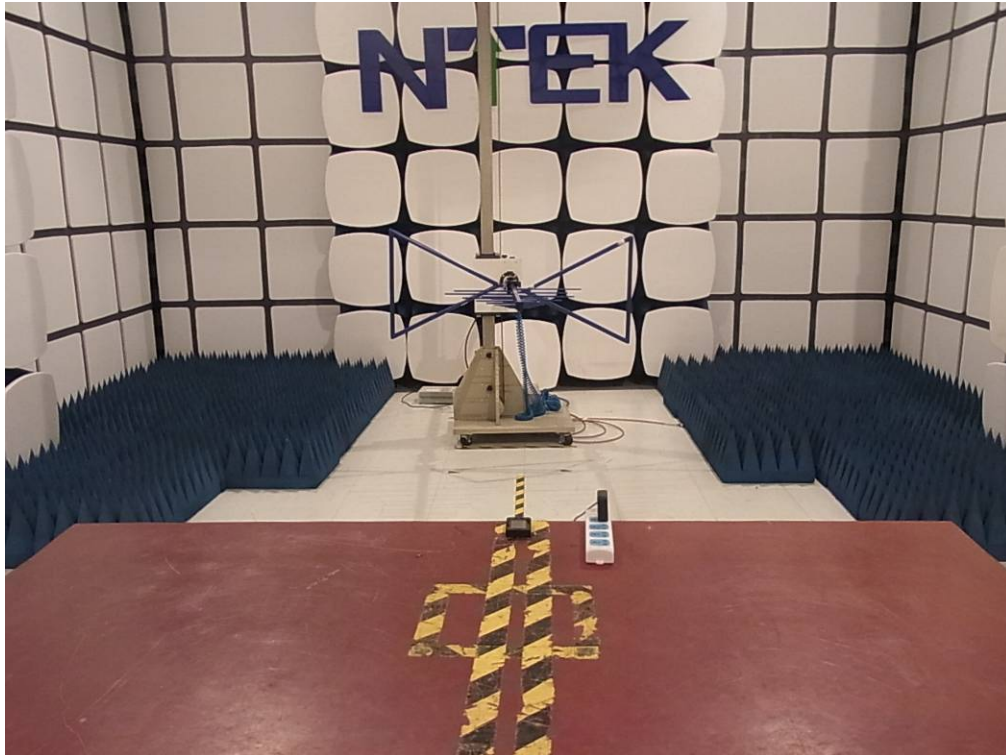
3.2.6 TEST RESULTS(Above 1GHz)

EUT :	TIRE PRESSURE MONITORING SYSTEM	Model Name :	JET-M2-400C
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2013-08-13
Test Mode :	Running	Polarization :	Vertical/ Horizontal
Test results :	Pass		

Note: above 1GHz the emission is below limit 20dB with no record.

4. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos

