FCC CERTIFICATION TEST REPORT
FOR
TMS 9250
Manufactured by M/s. Honeywell International, Columbus, US

Report Reference Number:	EMC_tst_0527-1 Rev A
Equipment Under Test (EUT):	TMS 9250
Sample Identification:	Production sample Model Number of EUT : TMS 92516 Serial Number of EUT : 1182664 Power Supply Model : EA1020B1-12-6E-Rev A Serial Number of Power Supply : 13121020131C3 Software Version : 1.40 Hardware Version : Revision A
Number of Samples:	1
Manufacturer name:	M/s. Honeywell International, Columbus, USA
Address:	Honeywell International, 2080 Arlingate Lane, Columbus, OH 43228, USA
Testing Laboratory:	M/s. Honeywell Technology Solutions Lab, Bangalore
Address:	#19/2, Deverabisanahalli Village, K R Puram Hobli, Bangalore – 560 103, INDIA
Test Dates:	25-27, April, 2011
Applicable Tests:	1. Radiated Emission of Carrier Frequency, FCC § 15.225(a) 2. Radiated Spurious Emission, FCC § 15.225(d) 3. Frequency Stability, FCC § 15.225(e) 4. Conducted Emission on AC power lines, FCC § 15.207(a)
Test Results:	One sample was tested as per above applicable standard and the sample meets the test specifications.

Prepared By:
Name: Bhanuprakash M Venkatesh
Signature : Prakash
Date : 28-APRIL-2011

Approved By:
Name: L Narasimha Charyulu
Signature:
Date: 28-APRIL-2011

Test Summary

1. **Radiated Emission of Carrier Frequency**

   Result: PASS

2. **Spurious Radiated Emission**

   Result: PASS

3. **Frequency Stability**

   Result: PASS

4. **Conducted Emission Test on AC power line**

   Result: PASS

Acronyms and Abbreviations

Table 1 : Acronyms and Abbreviations

Acronyms	Abbreviations
µV	Micro Volt
AC	Alternating Current
AVG	Average
CCM	Caliper style Coupling Module
CPU	Central Processing Unit
dB	Decibel
EUT	Equipment Under Test
FCC	Federal Communications Commission
I/O	Input / Output
kHz	Kilo Hertz
m	meter
MHz	Mega Hertz
Mod and De-Mod	Modulation and De-Modulation
PS	Power Supply
QP	Quasi Peak
RF	Radio Frequency
RTE	Rotor Electronics
SPM	Signal Processing Module
TMS	Torque Measurement System

Honeywell

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1. Product Information

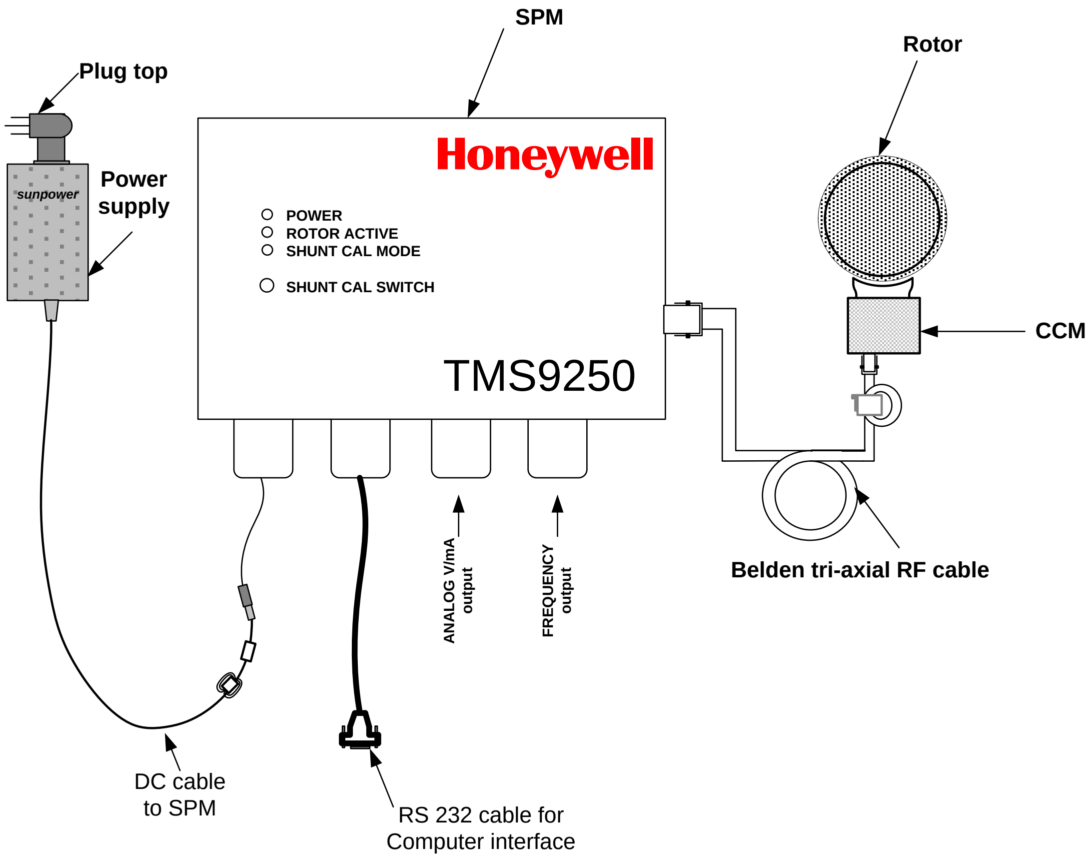


Figure 1 : Block Diagram of the EUT (TMS 9250)

Honeywell Torque Sensors are designed structures that perform in a predictable and repeatable manner when a torque is applied. This torque is translated into a signal voltage by the resistance change of strain gages, which are attached to the torque sensor structure. The change in resistance indicates the degree of deformation, and in turn, the torque on the structure.

The strain gages are connected in a 4 arm Wheatstone bridge configuration which acts as an adding and subtracting electrical network and allows compensation for temperature effects as well as cancellation of signals caused by extraneous loading.

When the torque sensor is rotating, a means must be provided to transfer an excitation voltage to the rotational element from a stationary surface, and also to transfer the torque signal from the rotational element back to the stationary surface. This is accomplished through the use of digital telemetry.

The digital telemetry system consists of a receiver-transmitter module, a caliper-style coupling module and a signal processing module.

The receiver-transmitter module is an integral part of the torque sensor and is connected to the strain gauges and to the annular printed circuit board that contains the rotating antenna system. Within the receiver-transmitter module, the sensor signals are amplified, digitized, and are then used to modulate the radio frequency carrier wave that is detected by the antenna after being transmitted across the air gap by the caliper coupling module. That same carrier wave is rectified to provide power to drive the

strain gauges and the electronic components in the module, which is managed by a miniature microprocessor.
The caliper coupling module connects to the signal processing module via a simple tri-axial cable. The detector circuitry in the signal processing module recovers the digital measurement data from the torque sensor and passes it to the second microprocessor for scaling and linear zing.

The third microprocessor provides the drive to the two analog outputs, as well as the standard digital interfaces and the optional digital interface modules. Extensive facilities are provided in software for setup and configuration of the complete system.

There are 3 coupling styles offered by Honeywell for the TMS 9250 product line

1. Flange to Flange
2. Internal Coupling
3. Shaft to Shaft

Each coupling style can have up to 6 rotor sizes (65, 90, 120, 150, 180 & 225). Size 65 is the smallest rotor size and size 225 is the largest rotor size. The electronics (SPM, RTE & power supply) used in all the coupling styles/rotor sizes is the same.

Note: Engineering team provided a justification document, which proves the EUT with largest rotor size (225) produces more radiations compared to other models; hence the FCC testing was done using the worst case model i.e. the EUT with largest rotor size.

2. Radiated Emission of Carrier Frequency Test

Applicable Standard:

FCC § 15.225(a)

Requirement:

The radiated emission of a carrier frequency should be within the limit specified in Table 3.

Test Instruments

Table 2 : Equipments Used

Description	Make	Model Number	Serial Number	Cal. Due Date
3m Semi Anechoic Chamber	ETS Lindgren	DRS 2016X7DBLLH	J001063	26-06-2011
EMI Test Receiver	Rohde & Schwarz	ESU26	100229	25-01-2012
Loop Antenna	ETS Lindgren	6507	000103694	26-01-2012

Test Specifications

Table 3 : Radiated Emission Limit for carrier frequency

Frequency (MHz)	Measurement Distance (meters)	Field Strength (µV/m)	Field Strength (dBµV/m)	Field Strength @ 3m (dBµV/m)
13.56	30	15848	84	124

Distance Correction Factor	
Frequency < 30 MHz	*40*LOG(D_L / D_m)*
Frequency ≥ 30 MHz	*20*LOG(D_L / D_m)*
Where *D_m= Measured Distance* *D_L= Limit Distance*	

Test Method : ANSI C63.4-2003
Measurement Location : 3m Semi Anechoic Chamber
Supply Voltage : 110 VAC, 60 Hz
Detector : Peak
Measurement Bandwidth : 100 kHz
Measurement Distance : 3 meter
Mode of Operation : Transmitting

Lab Environment Conditions

Temperature : 23.4 ± 1°C
Relative Humidity : 53.9 ± 3.5%

EUT Configurations

The EUT is Torque Measurement System (TMS9250), which is intended to be used in industrial applications. The EUT is a torque measurement system used to measure torque in Dynamo Meters and other applications. The measurement is based on strain gauge sensor and data transmission is wireless. The EUT was powered using 110 VAC / 60Hz source and made operational. During the test, the communication lines were not monitored. The frequency output line, Voltage output line and RS232 lines were terminated with 330 Ω, 4.7 KΩ and 4.7 KΩ loads respectively.

Test Procedure

The radiated emission measurement was performed according to the procedures in ANSI C63.4-2003. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT was 3 meters from the measuring antenna (loop antenna). The turntable was rotated 360° and height of the receiving antenna was varied from 1m to 4m for obtaining the maximum emission of the EUT. The above procedure was repeated for both Horizontal and vertical antenna polarization.

Test Result

Table 4 : Results Summary - Radiated Emission of carrier frequency

Antenna Polarization	Frequency (MHz)	Measured Field Strength (dBμV/m)	Antenna Height (cm)	Azimuth (Degree)	Limit (dBμV/m)	Margin (dB)	Result
Vertical	13.56	82.32	108	270	124	41.68	PASS
Horizontal	13.56	75.97	100	180	124	48.03	PASS

Note: Measured field strength = Measured reading on Receiver + Antenna factor + Cable loss

Measurement Uncertainty

From 150 kHz to 30 MHz test frequency range, the estimated measurement uncertainty for the Radiated Emission Test setup is 3.40 dB.

Enclosed Documents

1. Radiated Emissions plot of the EUT – Appendix 1, Figure 3 and Figure 4
2. Radiated Emissions Test Setup photos – Appendix 2, Figure 14 and Figure 15

Test Date: 25 – APRIL – 2011

EUT Performance Verified By:

Prakash

(Bhanuprakash M Venkatesh)

Test Conducted by:

Gulshan

(Gulshan Kumar)

3. Radiated Spurious Emission Test

Applicable Standard:

FCC § 15.225(d)

Requirement:

The measured radiated spurious emissions of EUT should be within the limit specified in Table 6. Emissions radiated outside of the specified frequency bands, except for the harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in section 15.209, whichever is the lesser attenuation. Attenuation below the general limits specified in Sections 15.209(a) is not required.

Test Instruments

Table 5 : Equipments Used

Description	Make	Model Number	Serial Number	Cal. Due Date
3m Semi Anechoic Chamber	ETS Lindgren	DRS 2016X7DBLLH	J001063	26-06-2011
EMI Test Receiver	Rohde & Schwarz	ESU26	100229	25-01-2012
Bi-log Antenna	TDK	HLP3003C	130524	01-02-2012
Loop Antenna	ETS Lindgren	6507	000103694	26-01-2012

Test Specifications

Table 6 : Limit for Radiated Emission

Frequency (MHz)	Measurement Distance (meters)	Field Strength (µV/m)	Field Strength (dBµV/m)	Field Strength @ 3m (dBµV/m)
0.009-0.490	300	2400	67.60	147.60
0.490-1.705	30	24000	87.60	127.60
1.705-30.0	30	30	29.54	69.54
30-88	3	100	40.00	40.00
88-216	3	150	43.52	43.52
216-960	3	200	46.02	46.02
Above 960	3	300	53.98	53.98

Note: Tighter limits shall apply at the band edges

Distance Correction Factor	
Frequency < 30 MHz	*40*LOG(D_L / D_m)*
Frequency ≥ 30 MHz	*20*LOG(D_L / D_m)*
Where *D_m= Measured Distance* *D_L= Limit Distance*	

Test Method	: ANSI C63.4-2003
Measurement Location	: 3m Semi Anechoic Chamber
Supply Voltage	: 110 VAC, 60 Hz
Detector	: Quasi Peak for frequency less than 1 GHz
Fundamental Frequency	: 13.56 MHz
Measuring Frequency Range	: 150 KHz – 1.0 GHz
Measurement Distance	: 3 meters
Mode of Operation	: Transmitting

Lab Environment Conditions

Temperature	: 23.4 ± 1°C
Relative Humidity	: 53.9 ± 3 .5%

EUT Configurations

The EUT is Torque Measurement System (TMS9250), which is intended to be used in industrial applications. The EUT is a torque measurement system used to measure torque in Dynamo Meters and other applications. The measurement is based on strain gauge sensor and data transmission is wireless. The EUT was powered using 110 VAC / 60Hz source and made operational. During the test, the communication lines were not monitored. The frequency output line, Voltage output line and RS232 lines were terminated with 330 Ω, 4.7 KΩ and 4.7 KΩ loads respectively.

Test Procedure

The radiated emission measurement in the frequency range 150 kHz to 30 MHz was performed according to the procedures in ANSI C63.4-2003 using a loop antenna. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT was 3 meters from the receiving antenna. The turntable was rotated 360° and height of the receiving antenna was varied from 1m to 4m for obtaining the maximum emission of the EUT. The above procedure was repeated for both Horizontal and vertical antenna polarization.

The radiated emission measurement in the frequency range 30 MHz to 1 GHz was performed according to the procedures in ANSI C63.4-2003 using bi-log antenna. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT was 3 meters from the receiving antenna. The turntable was rotated 360° and height of the receiving antenna was varied from 1m to 4m for obtaining the maximum emission of the EUT. The above procedure was repeated for both Horizontal and vertical antenna polarization.

Test Result

Table 7 : Results Summary - Radiated Spurious Emission

Antenna Polarization	Spurious Emission (MHz)	Measured Field Strength (dBµV/m)	Antenna Height (cm)	Azimuth (Degree)	Limit (dBµV/m)	Margin (dB)	Result
Vertical	27.12	50.70	100	0	69.54	18.84	PASS
	38.16	23.90	100	273	40.00	16.10	PASS
	54.24	32.55	100	357	40.00	7.45	PASS
	67.78	24.28	300	357	40.00	15.72	PASS
	956.86	36.89	300	63	46.02	9.13	PASS
Horizontal	27.12	58.26	100	0	69.54	11.28	PASS
	85.48	18.02	400	0	40.00	21.98	PASS
	135.58	31.64	200	0	43.52	11.88	PASS
	176.27	30.15	200	189	43.52	13.37	PASS
	298.33	34.50	100	294	46.02	11.53	PASS
	447.50	38.56	200	147	46.02	7.46	PASS
	474.62	39.98	200	147	46.02	6.04	PASS
	501.75	38.32	200	168	46.02	7.70	PASS
	518.57	29.22	300	84	46.02	16.80	PASS
	528.86	38.37	200	168	46.02	7.66	PASS
	555.96	37.24	200	168	46.02	8.78	PASS
	699.21	33.96	400	189	46.02	12.06	PASS
	734.52	34.70	100	189	46.02	11.32	PASS

Note: Measured field strength = Measured reading on Receiver + Antenna factor + Cable loss

Measurement Uncertainty

From 150 kHz to 30 MHz test frequency range, the estimated measurement uncertainty for the Radiated Emission Test setup is 3.40 dB.
From 30 MHz to 1 GHz test frequency range, the estimated measurement uncertainty for the Radiated Emission Test setup is 4.90 dB.

Enclosed Documents

1. Radiated Emissions plot of the EUT – Appendix 1,Figure 5, Figure 6, Figure 7 and Figure 8
2. Radiated Emissions Test Setup photos – Appendix 2, Figure 14, Figure 15, Figure 16 and Figure 17

Test Date: 25 – APRIL – 2011

EUT Performance Verified By:

Prakash

(Bhanuprakash M Venkatesh)

Test Conducted by:

Gulshan

(Gulshan Kumar)

4. Frequency Stability Test

Applicable Standard:

FCC § 15.225(e)

Requirement:

The frequency shall be maintained within +/-0.01% of the operating frequency over a temperature variation of -20 degrees C to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

Test Instruments

Table 8 : Equipments Used

Description	Make	Model Number	Serial Number	Cal. Due Date
Thermal Chamber	WEISS	WK-180	58226089190010	01-04-2012
Frequency Counter	Agilent	53181A	MY40005408	09-03-2012

Test Specifications

Supply Voltage : 110 VAC, 60 Hz
Fundamental Frequency : 13.56 MHz

Lab Environment Conditions

Temperature : Not Applicable
Relative Humidity : Not Applicable

EUT Configurations

The EUT is Torque Measurement System (TMS9250), which is intended to be used in industrial applications. The EUT is a torque measurement system used to measure torque in Dynamo Meters and other applications. The measurement is based on strain gauge sensor and data transmission is wireless. The EUT was powered using 110 VAC / 60Hz source and made operational. During the test, the communication lines were not monitored. The frequency output line, Voltage output line and RS232 lines were terminated with 330 Ω, 4.7 KΩ and 4.7 KΩ loads respectively. The setup shown in Figure 2 was used to measure the carrier frequency during temperature and voltage variation test. Rotor was not coupled to CCM during this test to avoid modulation of carrier frequency.

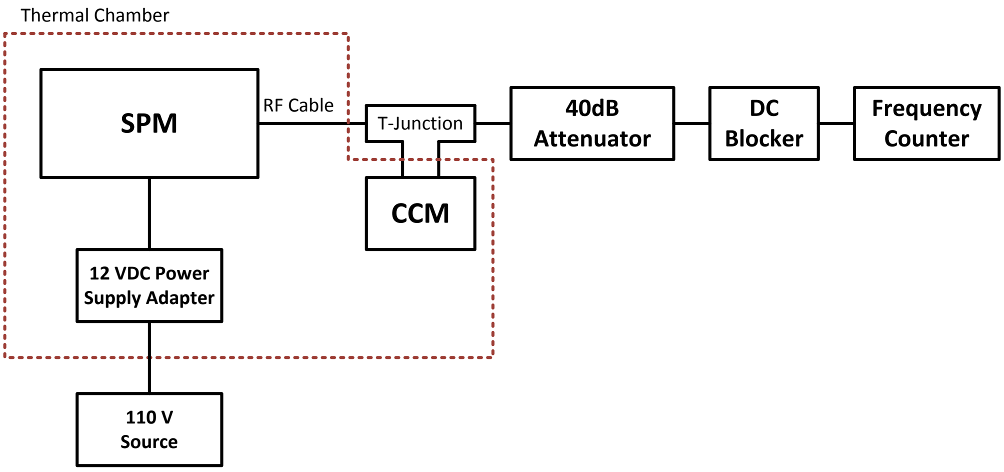


Figure 2 : Block Diagram of Frequency Stability Test Setup

Test Procedure

1. Keep the supply voltage constant at 110 VAC and measure and note down the carrier frequency by stabilizing(Soaked for 1 hour duration) the EUT temperature at -20°C, -10°C, 0°C, 10°C, 20°C, 30°C, 40°C and 50°C
2. Maintain the EUT temperature at 20°C and then measure and note down the carrier frequency by varying the supply voltage from 85% to 115% of the rated supply voltage.

Test Result

Table 9 : Test Result – Temperature Variation

Temperature (DEG C)	Supply Voltage (VAC)	Fundamental Frequency (MHz)	Measured Frequency (MHz)	Deviation Observed (kHz)	Limit, (kHz)	Result
-20	110	13.560	13.56052131	0.521310	± 1.356	PASS
-10	110	13.560	13.56049758	0.497580	± 1.356	PASS
0	110	13.560	13.56046394	0.463940	± 1.356	PASS
10	110	13.560	13.56042587	0.425870	± 1.356	PASS
20	110	13.560	13.56039514	0.395140	± 1.356	PASS
30	110	13.560	13.56037828	0.378280	± 1.356	PASS
40	110	13.560	13.56037989	0.379890	± 1.356	PASS
50	110	13.560	13.56040768	0.407680	± 1.356	PASS

Table 10 : Test Result – Source Voltage Variation

Temperature (DEG C)	Supply Voltage (VAC)	Fundamental Frequency (MHz)	Measured Frequency (MHz)	Deviation Observed (kHz)	Limit (kHz)	Result
20	93.5	13.560	13.56039526	0.395260	± 1.356	PASS
20	110.0	13.560	13.56039564	0.395640	± 1.356	PASS
20	126.5	13.560	13.56039541	0.395410	± 1.356	PASS

Enclosed Documents

1. Frequency Measurements – Appendix 1,Table 14
2. Frequency Stability Test Setup – Appendix 2, Figure 18 and Figure 19

Test Date: 27 – APRIL – 2011

EUT Performance Verified By:

(Bhanuprakash M Venkatesh)

Test Conducted by:

(Bhanuprakash M Venkatesh)

5. Conducted Emission Test

Applicable Standard:

FCC § 15.207(a)

Requirement:

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits shown in Table 12

Note: Per the publication number 174176, dated 07/02/2008 (http://fjallfoss.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=34866&switch=P), For a device with a permanent antenna operating at or below 30 MHz, the FCC will accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Test Instruments

Table 11 : Equipments Used

Description	Make	Model Number	Serial Number	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESU26	100229	25-01-2012
2 Line LISN	Rohde & Schwarz	ENV216	100019	25-01-2012

Test Specifications

Table 12 : Limit for Conducted Emission

Frequency (MHz)	Quasi peak limit (dBµV)	Average limit (dBµV)
0.15-0.50	66.00-56.00	56-46
0.50 -5.00	56.00	46.00
5.00-30.00	60.00	50.00

Test Method : ANSI C63.4-2003
Measurement Location : Screen Room
Supply Voltage : 110 VAC, 60 Hz
Detector : Quasi Peak and Average
Measurement Bandwidth : 9 kHz
Measuring Frequency Range : 150 kHz – 30 MHz

Lab Environment Conditions

Temperature : 21.6 ± 1°C
Relative Humidity : 57 ± 3.5%

EUT Configurations

The EUT is Torque Measurement System (TMS9250), which is intended to be used in industrial applications. The EUT is a torque measurement system used to measure torque in Dynamo Meters and other applications. The measurement is based on strain gauge sensor and data transmission is wireless. The EUT was powered by 110 VAC / 60Hz and made operational. During the test, the communication lines were not monitored. The frequency output line, Voltage output line and RS232 lines are terminated with 330 Ω, 4.7 KΩ and 4.7 KΩ loads respectively.

Test Procedure

The RF Conducted Emissions from the EUT sent back to the mains input were coupled using a Line Impedance Stabilization Network and measured using an Electromagnetic Interference (EMI) receiver. The measurement was done initially in Peak & Average Detection Modes and wherever the emission was closer to the limit line in peak detection mode, Quasi Peak Detection Mode was employed. The measurement was carried out in the frequency range of 150 kHz to 30 MHz.

Test Result

Table 13 : Test Result – Conducted Emission on AC power line

Conductor	Frequency of Emission (MHz)	Emission Level (Quasi Peak) (dBµV)	Quasi Peak limit (dBµV)	Margin (dB)	Result
Line	0.182	51.215	64.32	13.11	PASS
	3.738	22.858	56.00	33.14	PASS
	13.562	42.811	60.00	17.19	PASS
Neutral	0.182	49.002	64.32	15.32	PASS
	1.642	34.335	56.00	21.66	PASS
	3.530	34.599	56.00	21.40	PASS
	3.834	32.978	56.00	23.02	PASS
	13.562	37.942	60.00	22.06	PASS
	19.418	31.249	60.00	28.75	PASS

Conductor	Frequency of Emission (MHz)	Emission Level (Average) (dBµV)	Average limit (dBµV)	Margin (dB)	Result
Line	0.182	37.572	54.32	16.75	PASS
	3.738	18.051	46.00	27.95	PASS
	13.562	40.292	50.00	09.71	PASS
Neutral	0.182	35.594	54.32	18.73	PASS
	1.642	32.747	46.00	13.25	PASS
	3.530	30.150	46.00	15.85	PASS
	3.834	28.691	46.00	17.31	PASS
	13.562	36.976	50.00	13.02	PASS
	19.418	23.894	50.00	22.11	PASS

Note: Measured emission = Measured reading on Receiver + LISN insertion loss + Cable loss

Measurement Uncertainty

From 150 kHz to 30 MHz test frequency range, the estimated measurement uncertainty for the Conducted Emission Test setup is 3.40 dB.

Enclosed Documents

1. Conducted Emission Plots – Appendix 1,Figure 9, Figure 10, Figure 11 and Figure 12
2. Conducted Emission Test Setup – Appendix 2, Figure 20 and Figure 21

Test Date: 27 – APRIL – 2011

EUT Performance Verified By:

Prakash

(Bhanuprakash M Venkatesh)

Test Conducted by:

Gulshan

(Gulshan Kumar)

6. Appendix-1: Emission Plots and Frequency Measurements

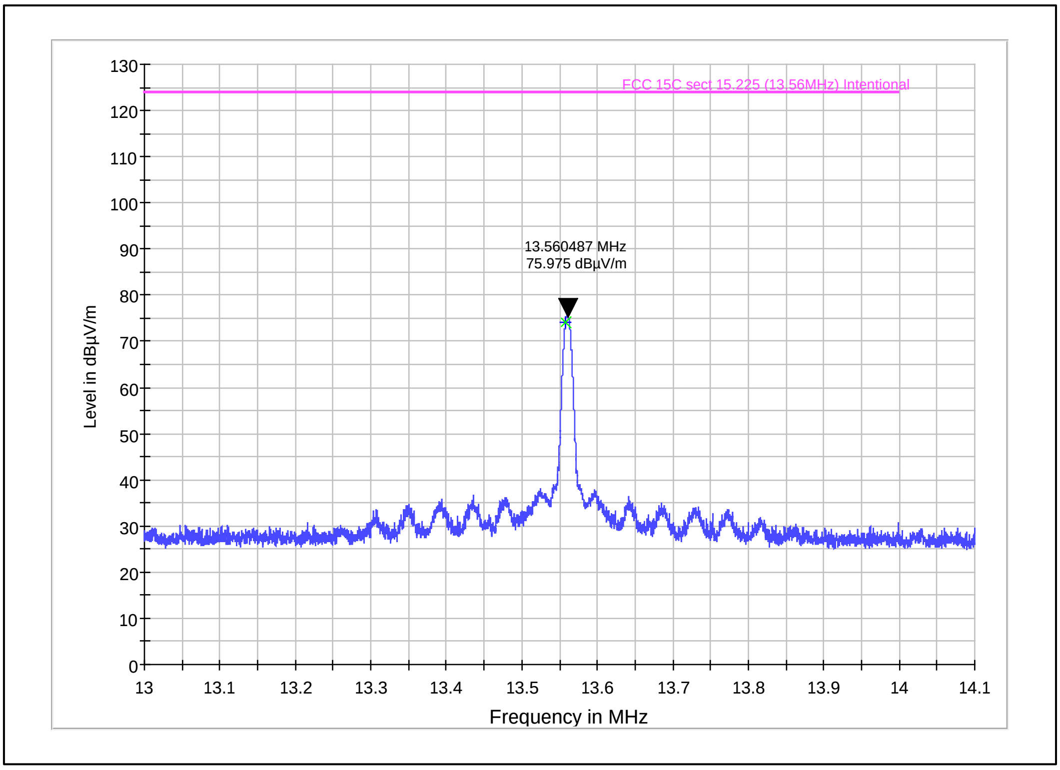


Figure 3 : Radiated Emission of carrier frequency, Horizontal Polarization

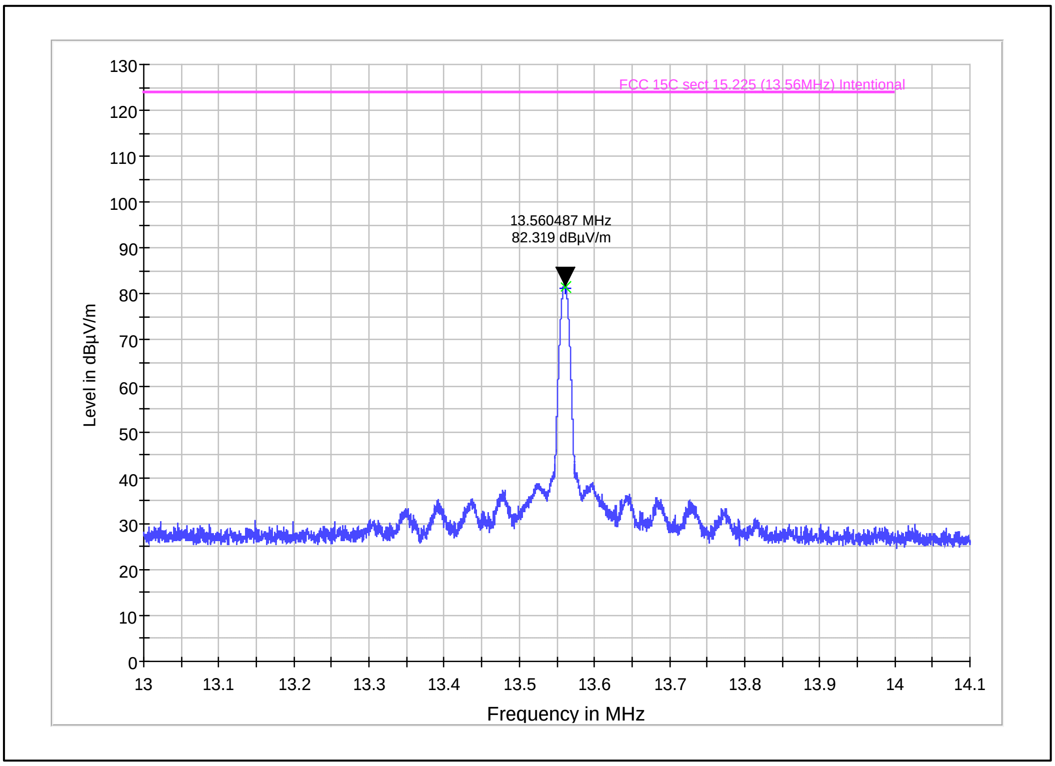


Figure 4 : Radiated Emission of carrier frequency, Vertical Polarization

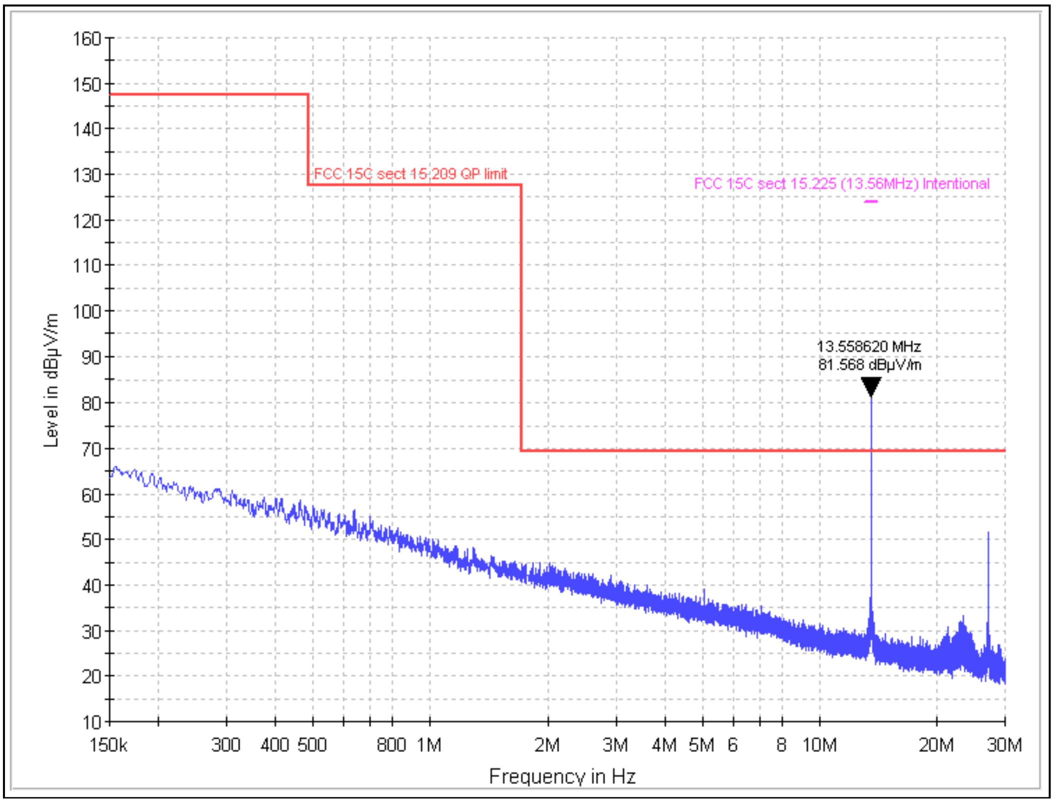


Figure 5 : Radiated Spurious Emission: 150 kHz - 30 MHz: Vertical Polarization

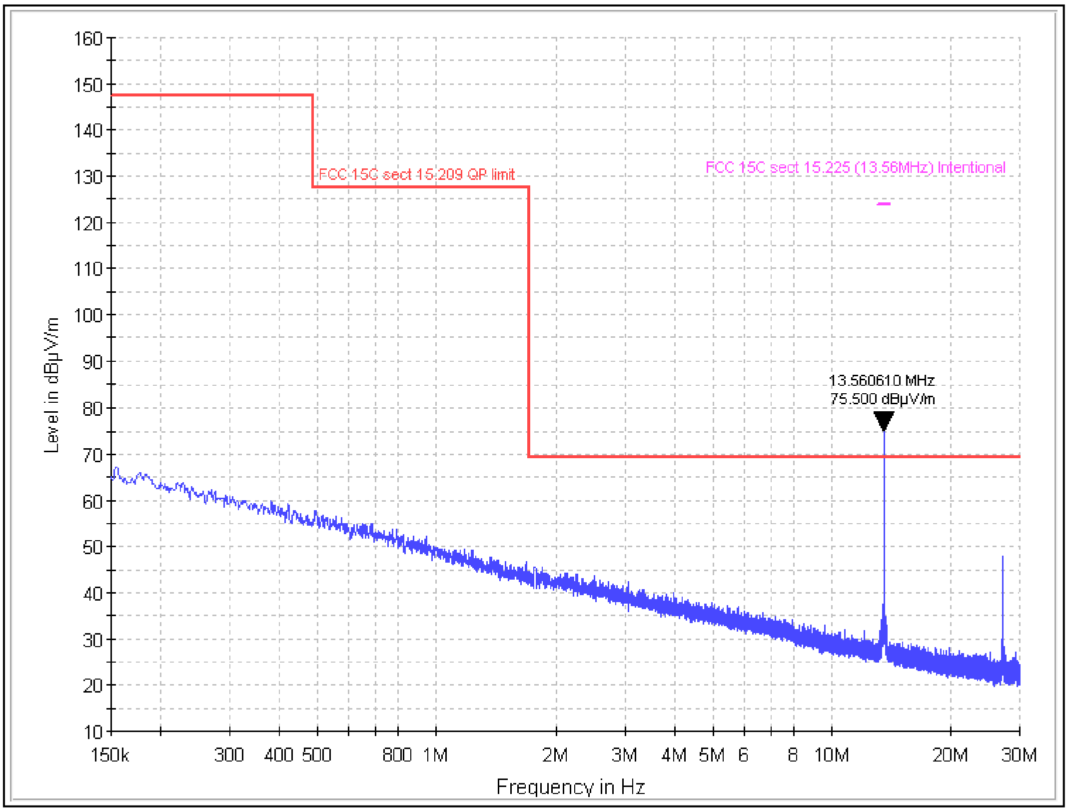


Figure 6 : Radiated Spurious Emission: 150 KHz - 30 MHz: Horizontal Polarization

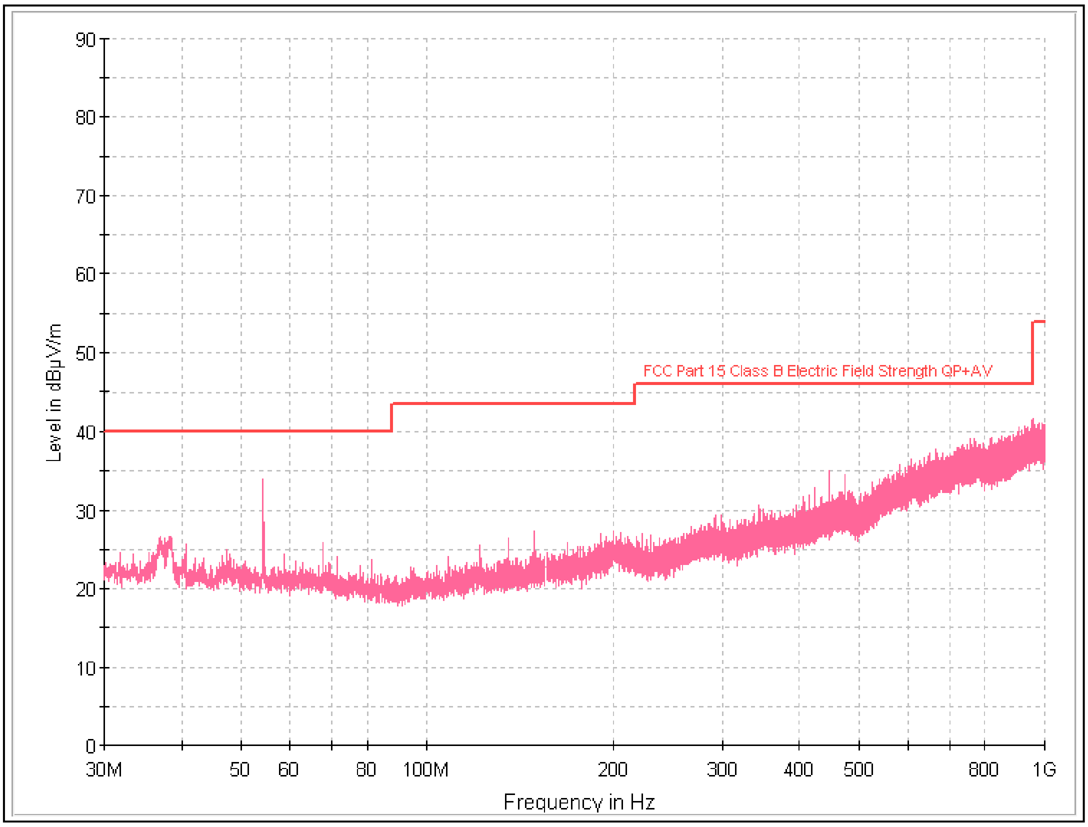


Figure 7 : Radiated Spurious Emission: 30 MHz - 1 GHz: Vertical Polarization

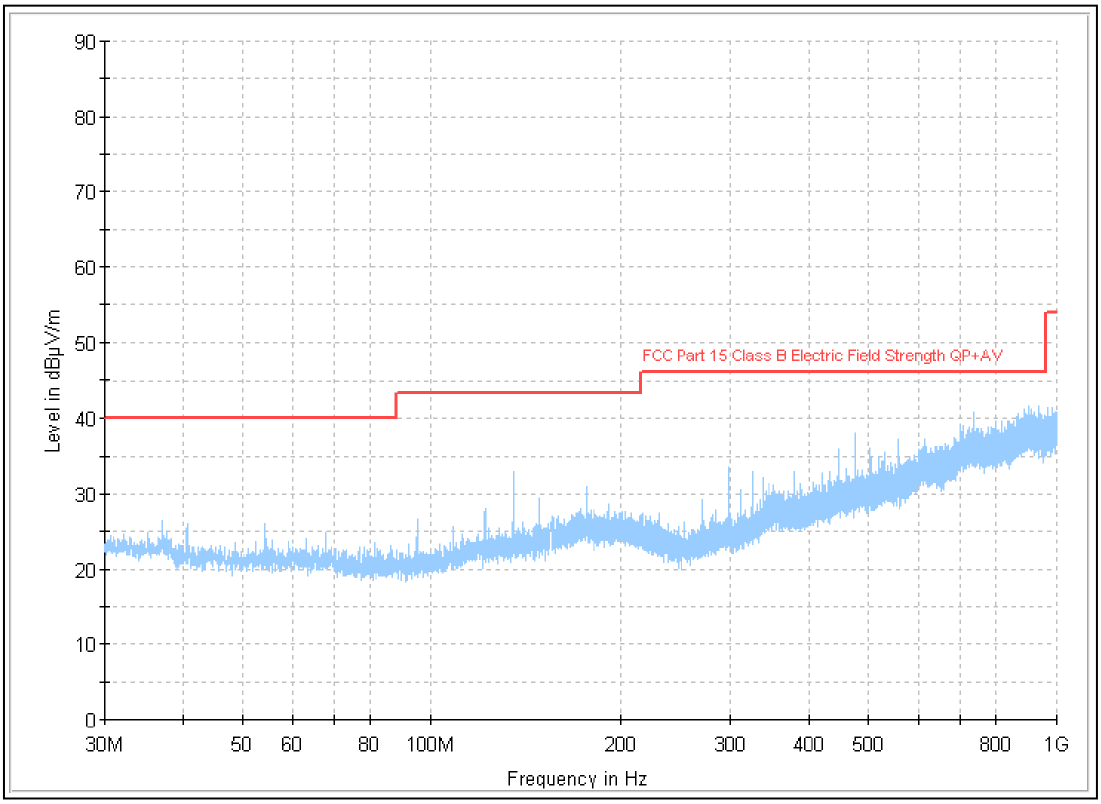
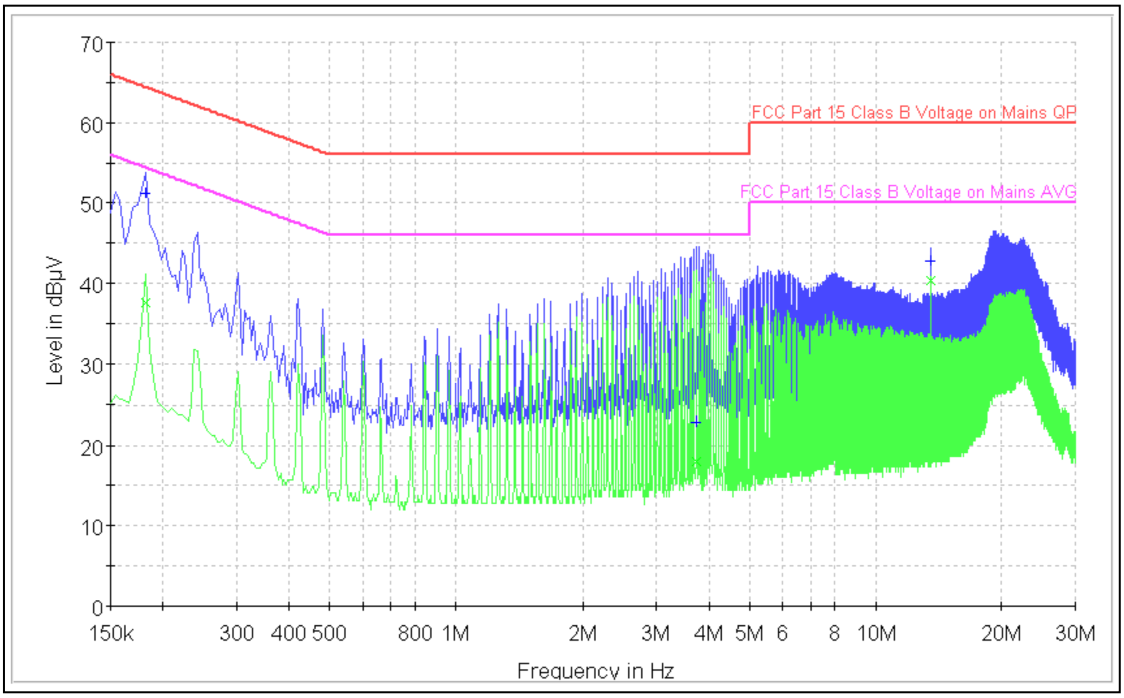


Figure 8 : Radiated Spurious Emission: 30 MHz - 1 GHz: Horizontal Polarization

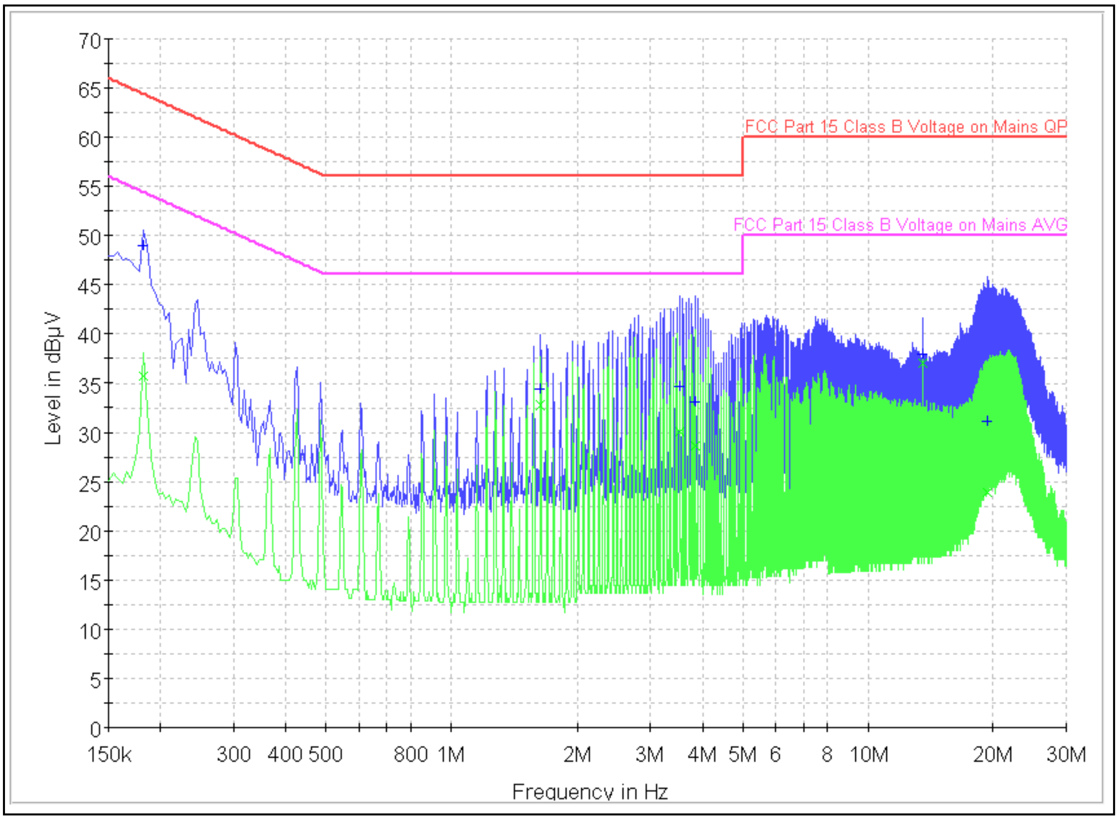
Table 14 : Carrier Frequency Measurements – Frequency Stability Test

Temperature Variation		
Temperature (Deg C)	**Supply Voltage (V AC)**	**Measured Carrier Frequency (MHz)**
-20	110.0	
-10	110.0	
0	110.0	
10	110.0	
20	110.0	
30	110.0	
40	110.0	
50	110.0	
Power Supply Variation		
20	110.0	
20	93.5	
20	126.5	



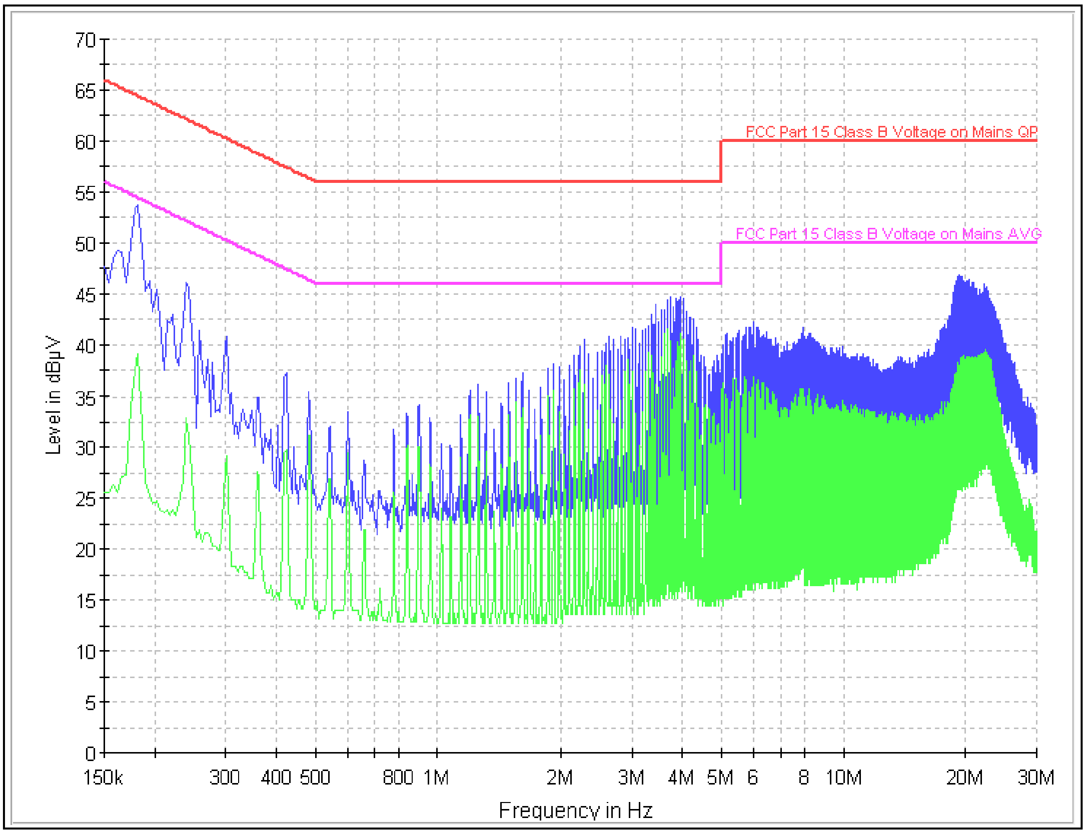
Note: Green Color Graph refers to Average Detector readings and Blue Color Graph refers to Quasi Peak Detector readings.

Figure 9 : Conducted Emission on Line (With Permanent Antenna)



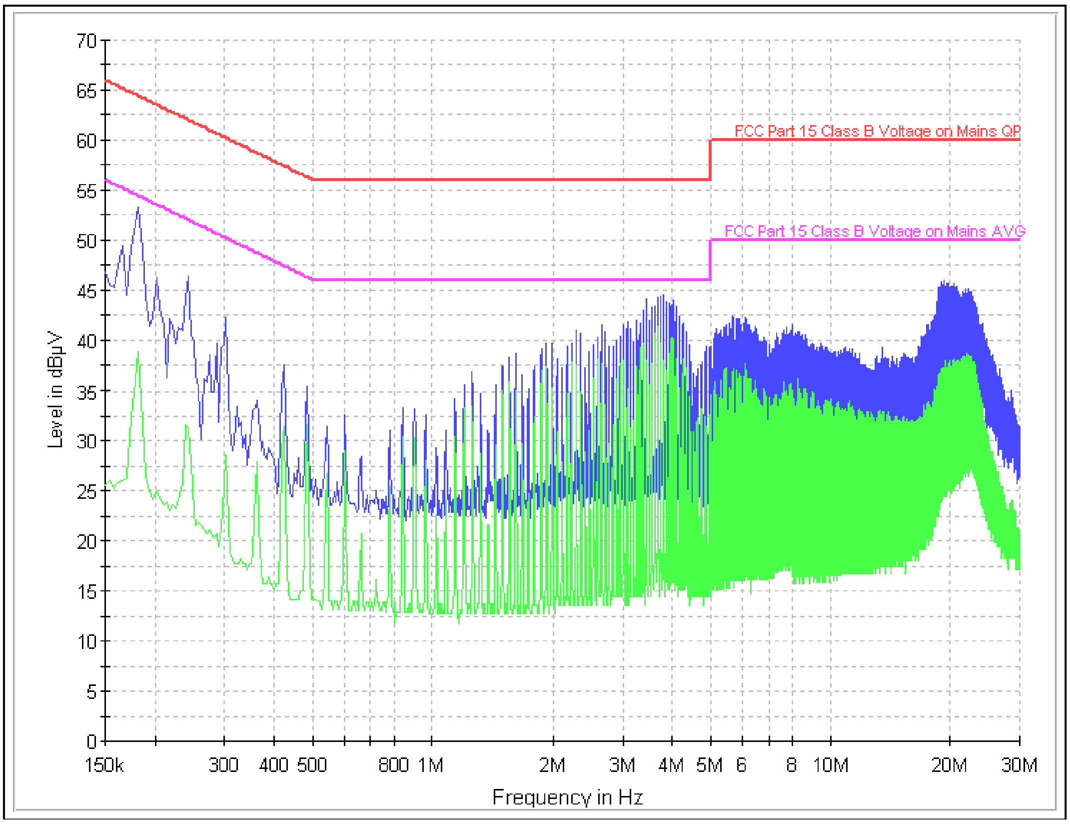
Note: Green Color Graph refers to Average Detector readings and Blue Color Graph refers to Quasi Peak Detector readings.

Figure 10 : Conducted Emission on Neutral (With Permanent Antenna)



Note: Green Color Graph refers to Average Detector readings and Blue Color Graph refers to Quasi Peak Detector readings.

Figure 11 : Conducted Emission on Line (Dummy Load)



Note: Green Color Graph refers to Average Detector readings and Blue Color Graph refers to Quasi Peak Detector readings.

Figure 12 : Conducted Emission on Neutral (Dummy Load)

7. Appendix-2: Test Setup Photos

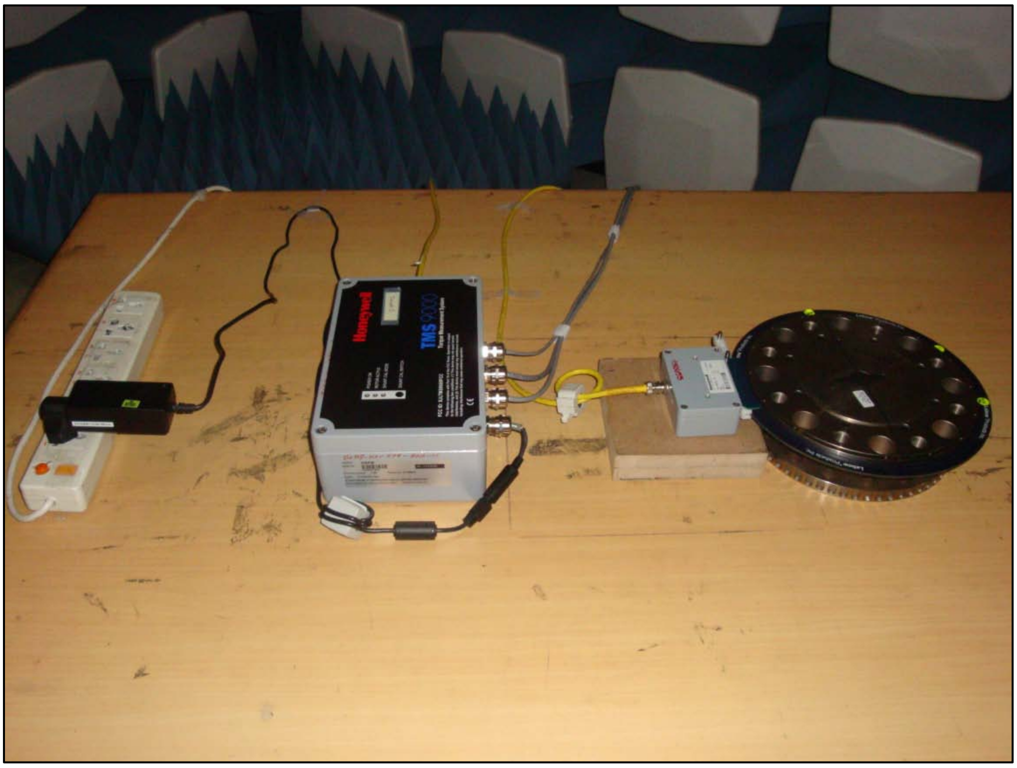


Figure 13 : General EUT Test Setup Diagram

Figure 14 : Loop Antenna, Horizontal Polarization (150 kHz - 30 MHz)

Figure 15 : Loop Antenna, Vertical Polarization (150 kHz - 30 MHz)

Figure 16 : Bi-log Antenna, Horizontal Polarization (30 MHz - 1 GHz)

Figure 17 : Bi-log Antenna, Vertical Polarization (30 MHz - 1 GHz)

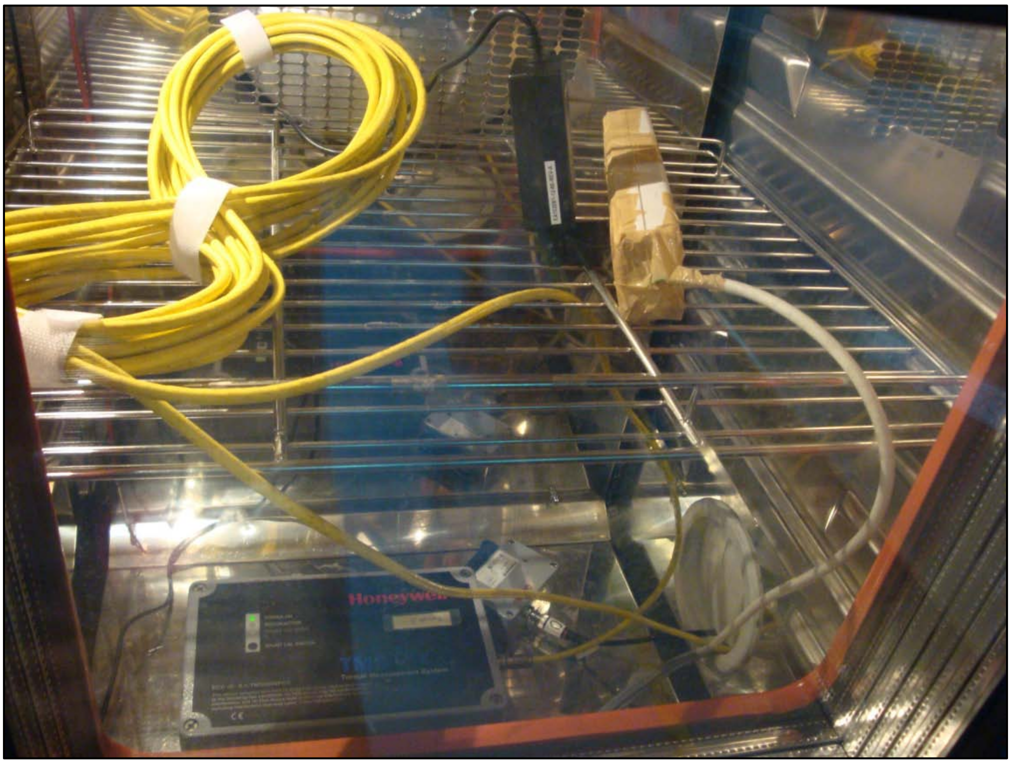


Figure 18 : Frequency Stability Test Setup (Inside Thermal Chamber)

Figure 19 : Frequency Stability Test Setup

Figure 20 : Conducted Emission Test Setup with permanent Antenna

Figure 21 : Conducted Emission Test Setup with dummy load

Figure 22 : Dummy Load - Internal View