EMC TEST SHEET / TEST PLAN

☒ PASS ☐ FAIL

Tested By: Satishkumar Patel Date Tested: September 24 & 25, 2016

RADIATED IMMUNITY – IEC 61000-4-3: 2010 (Ed. 3.2)

Project No.: 70094524
Company: Key Sight Technology Inc.
Product: Chassis Fan Control
Model No.: M9010A
Serial No.: -
Rated Input Voltage: 120VAC, 60Hz

☒ **Safety Functions Incorporating electronics Technology C22.2 No. 0.8-12 Clause 6.4.3.4 Immunity to radiated electromagnetic fields**

Results: Refer to standard

☒ 10 V/m, 80-1000MHz, 80% AM modulated (1 kHz) (Level 3, table 9)
☒ 10 V/m, 1400 – 6000 MHz, 80% AM modulated (1 kHz) (Level 3, table 9)

Note: *The levels in the ISM- and GSM bands are chosen to be* 6 dB *higher. (ISM: Industrial, Scientific, and Medical radio frequency equipment* 433.92 ± 0.87 MHz *GSM: Group Special Mobile* 900 MHz ± 5.0 MHz *modulated by* 200 Hz ± 1% *pulses of equal mark/space ratio)* 2.5 rms *ON and* 2.5 rms *OFF).*

Test Configuration

The EUT was set up and configured as per the manufacturer's instructions. The test setup was in accordance with IEC 61000-4-3 requirements. The EUT was setup on top of a table 80cm from the floor, 3m from the antenna in a way that represented a normal installation. The AC power cable was plugged into the AC source. The EUT was set up and operated normally. Tests were made using the immunity system described in the section Test Equipment Used. The EUT was then subjected to the RF test signals on Front and back sides and monitored for correct operation. The test frequency range was80-1000MHz & 1400-6000MHz, with 80% amplitude modulation with a 1 kHz sine wave for the swept tests. Dwell time was set to 3second based on the consideration of the time required for the EUT to be exercised and to respond to the test signal.

When testing at frequencies above 1 GHz, an independent window method was used. The test field was divided into a suitable array of 0.5m × 0.5m windows such that the whole area to be occupied by the face of the EUT was covered. Window 4 was used for 0, ~~90,~~ 180 and ~~270~~ degrees, (and windows was used for degrees). The test distance was 1 m. A horn antenna was used as field generating antenna

Sample Size: 35.0cm wide x 58.0 cm deep x 19.3 cm high (Size of the Chassis).

Instrument	Manufacturer	Model	Serial Number	CSA Group ID Number	Cal Date	Calibration Due Date
Signal Generator	Rohde & Schwarz	SMT 03	1039.2000.03	7500 6920	2016-08-05	2017-08-10
Signal Generator	Agilent	N5181A	MY47070335	3900 9170	2016-02-29	2017-03-01
Signal Generator	Marconi	2024	112252/031	3900 7089	2015-11-10	2016-12-16
Amplifier	Amplifier Research	100W1000 M1	19601	3900 7053	-	-
Amplifier	Amplifier Research	50S1G4A	307249	3900 8368	-	-
Amplifier	Milmega	AS0206-30	1032510	3900 9579	-	-
Directional Coupler	Werlatone	C3910	5228	3900 7049	2015-09-25	2016-10-07
Directional Coupler	Amplifier Research	DC7144A	306011	3900 8369	2016-05-12	2017-06-07
BiLog Antenna	Chase	CBL6140	1010	3900 7033	-	-
Horn Antenna	ETS Lindgren	3115	00094882	3900 9580	2016-03-03	2017-03-30
Power Meter	HP	437B	3125U21579	3900 7045	2016-02-10	2017-02-22

Power Sensor	HP	8482A	3318A28498	3900 7055	2016-02-10	2017-02-22
EM Radiation Probe	ETS Lindgren	H1-6105	00121787	3900 0005	2016-02-12	2017-03-30
Thermo-Hygrometer	Fluke	1620A	B21632	0000 0036	-	-
Thermo-Hygrometer	Fluke	2626-S	B21833	0004 0013	2015-11-04	2017-05-02
Compact Chamber	Panashield	-	-	3900 7059	2015-04	2016-05 *
Software	ETS Lindgren	TILE!™	7.0.7.560	-	-	-

* Constant field strength calibration as per IEC 61000-4-3 Cl. 6.2.1

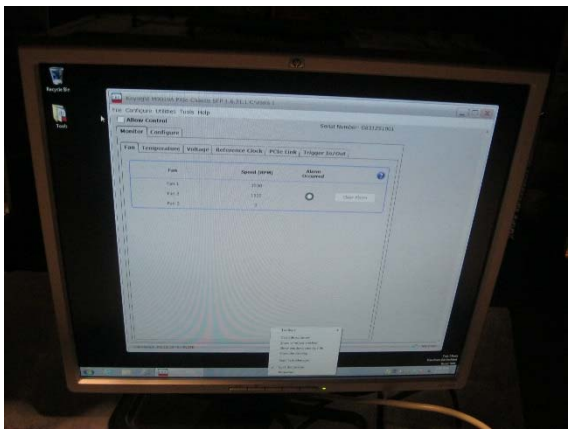
Operation of EUT During Testing

The tests were made exercising all primary functions as determined by the manufacturer in the most representative mode consistent with typical / normal applications and installation practice. (Add if apply: Because it was not possible to test every function of the EuT, the most critical mode of operation was selected.)

The determined operational mode was: Fan Running mode and Fan Stopped

Fan Running Mode: The Fan Controller installed in the PC Chassis (Make: Key sight, Model: M9037A PXIe Embedded Controller), with window operating system. The "Chassis Family SFP" software installed on the PC.

During Normal operation mode (Fan Running), the fans will be running and the software indicate the Fan Speed in r.p.m.



Fan Stopped / Locked Mode: To run the Chassis in Fan Locked mode, the fan need to be manually blocked for rotation for couple minute when chassis powered up initially. The chassis will run in Fan locked mode. The Temp, Fan and Power LED in the Front will Blink Five times and Only Fan LED will Blink Sixth time. Cycle will keep repeating while Fan are stopped. During Fan Locked mode the fans will not run and the Chassis will stay off.

Rational for this condition: As per Standard

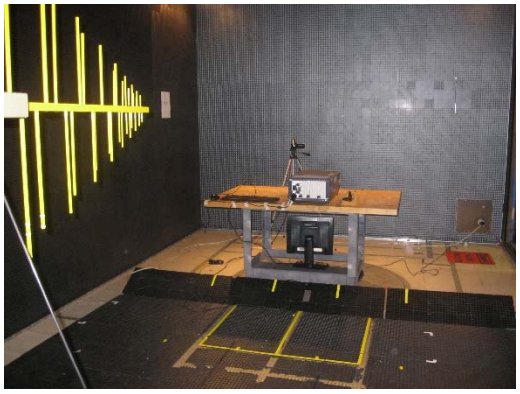
The operation of the EUT was monitored by observation of the system display panel, along with the lack of any observable problems or error codes. Proper operation of the EUT was determined from the operator's point of view, which was based on externally available controls and indications.

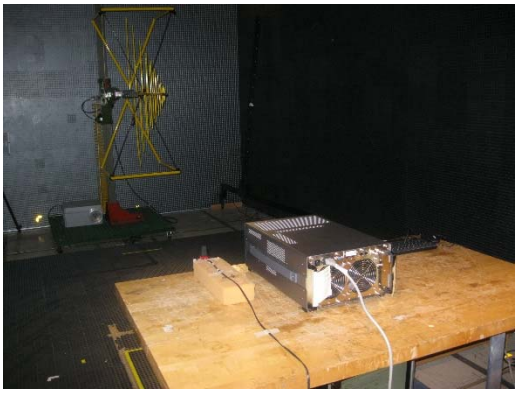
Tested at 120 VAC, 60 Hz input voltage

Modifications Required/Comments

No modifications to the EUT were required for compliance with IEC 61000-4-3 requirements. No deviations from the requirements of the standard were made. No degradation of the performance of the system was noted during the tests. Exposure to the severity levels noted in this test did not cause the EUT to reset, indicate a warning condition, cause any change to the EUT's settings or mode of operation, or require operator intervention to continue normal operation. The EUT satisfies the requirements for criteria as per clause 6.4.3.2 (b) of C22.2 No. 0.8-12.

Radiated Immunity Test Photo



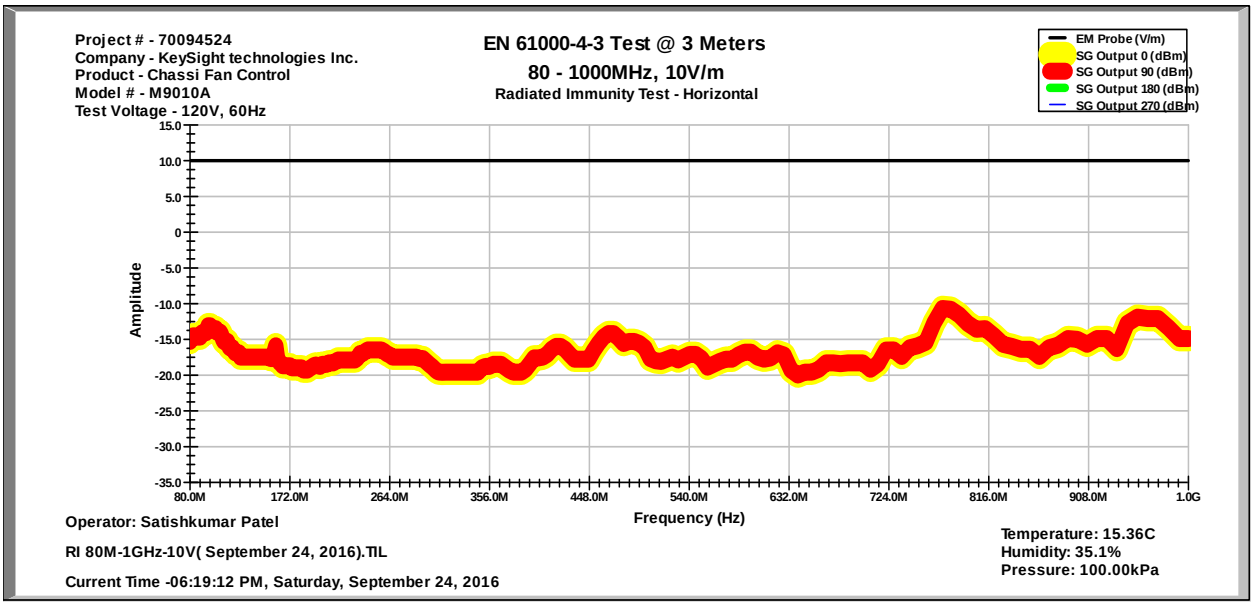


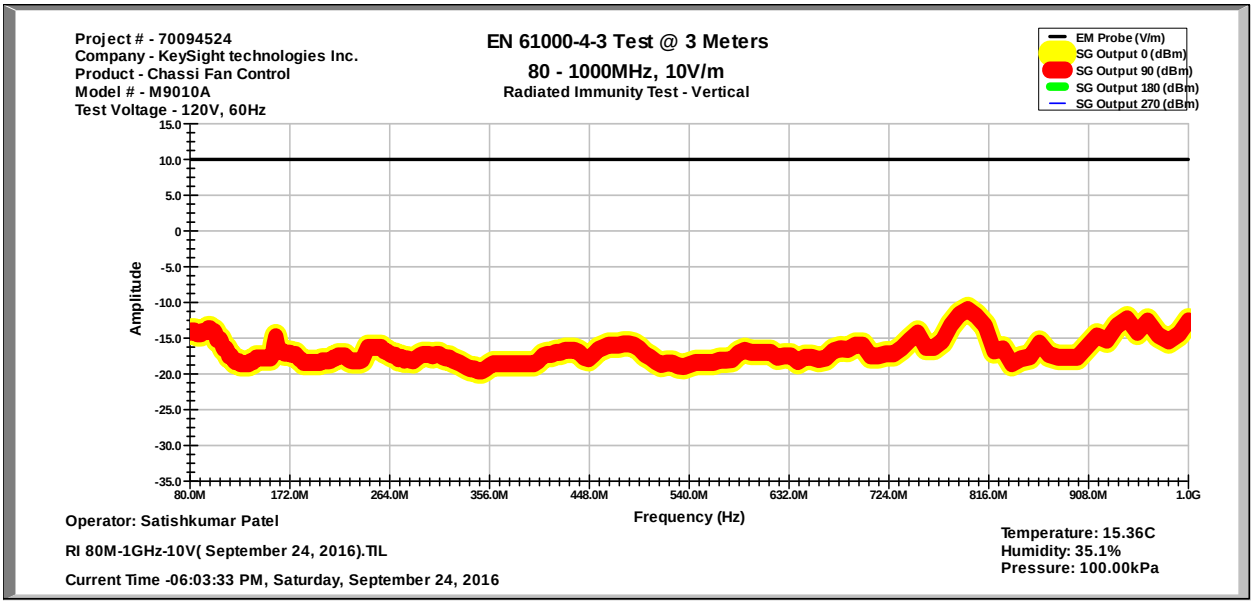
80-1000MHz

1400 -6000MHz

Radiated Immunity Test Data

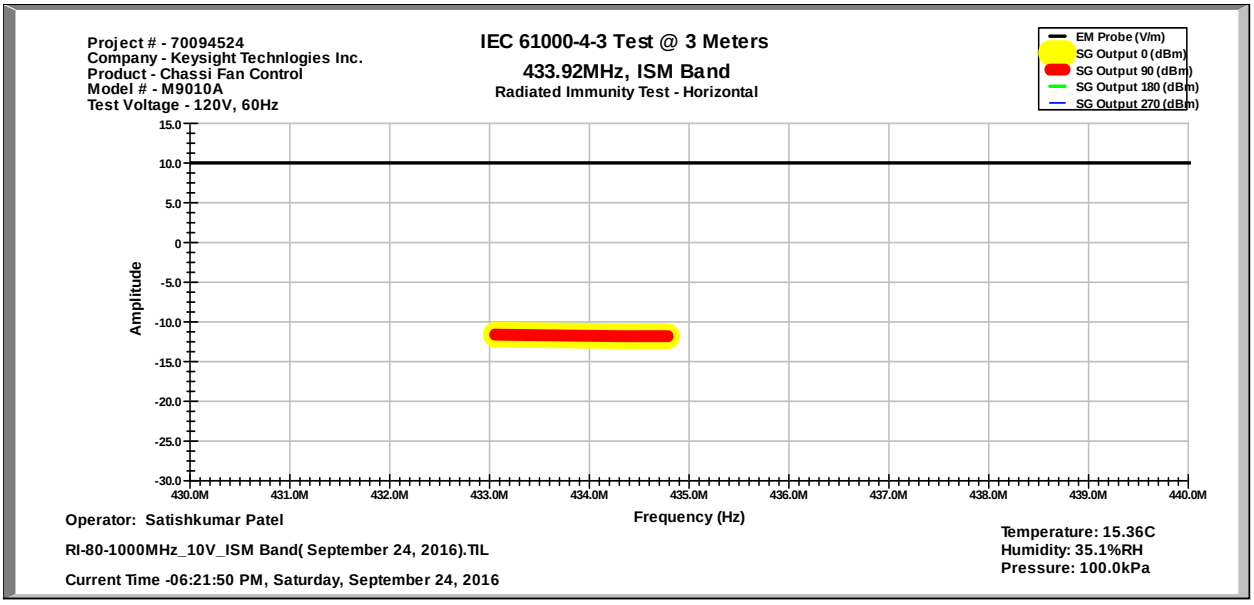
Normal Operation Mode: Fan Running

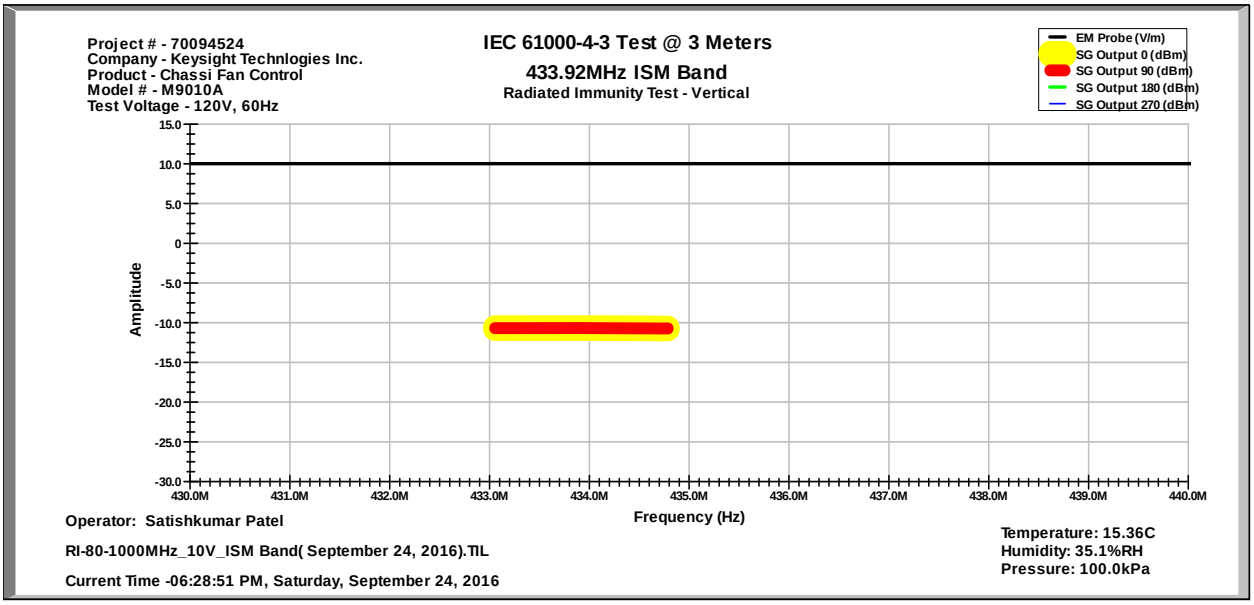




80-1000MHz

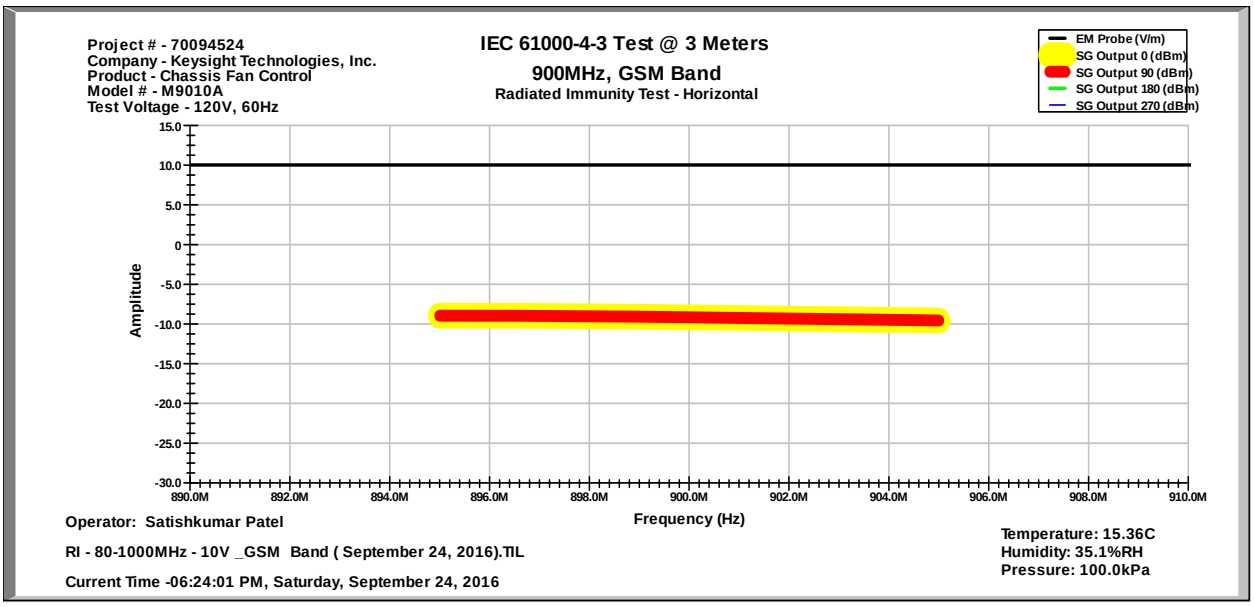
Radiated Immunity Test Data (continued)

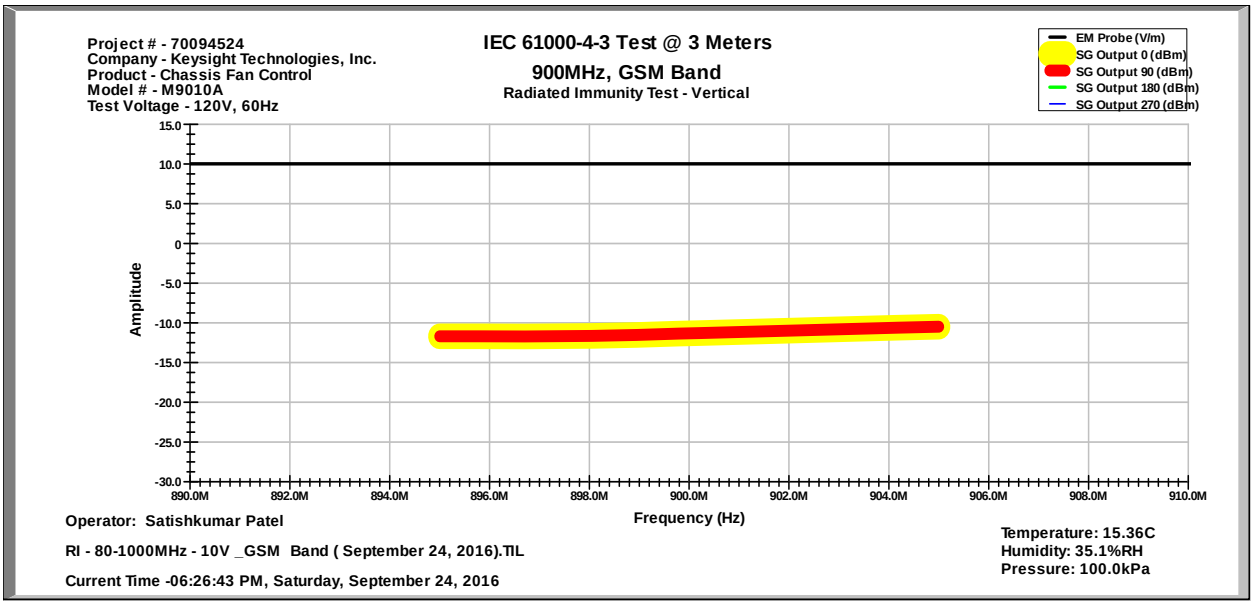




ISM Band

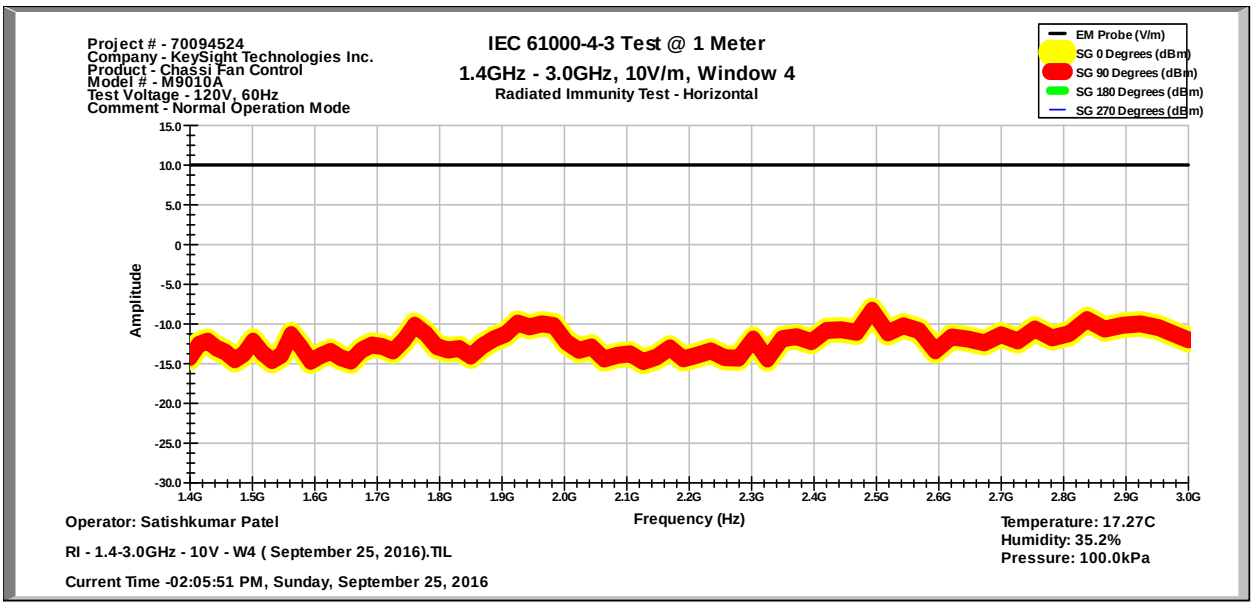
Radiated Immunity Test Data (continued)

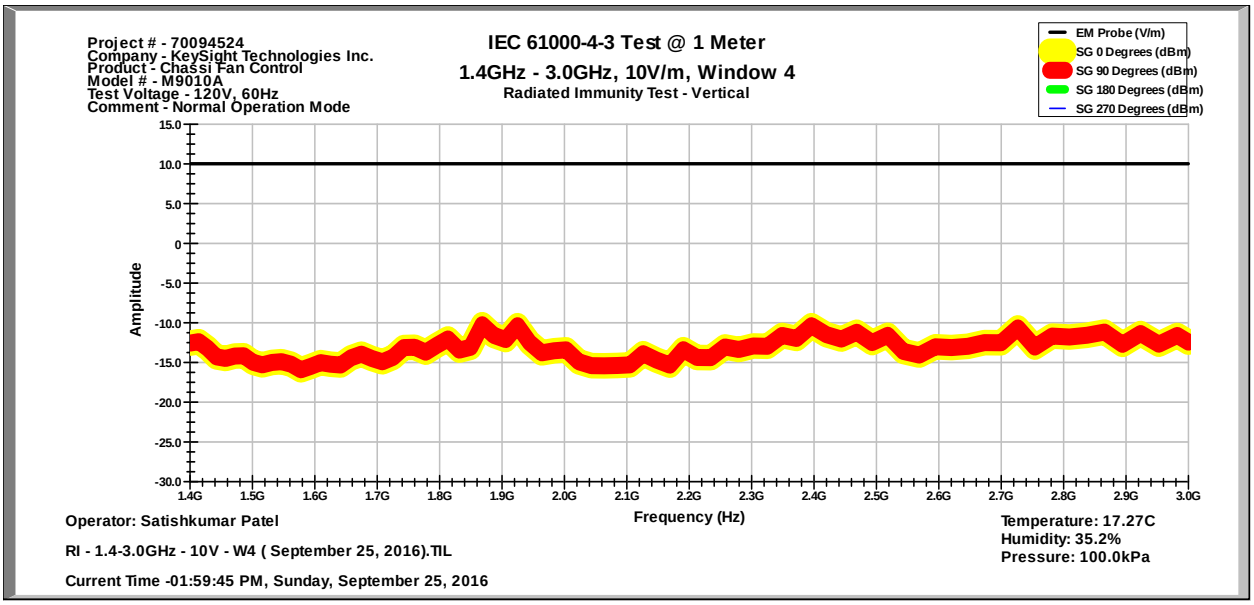




GSM Band

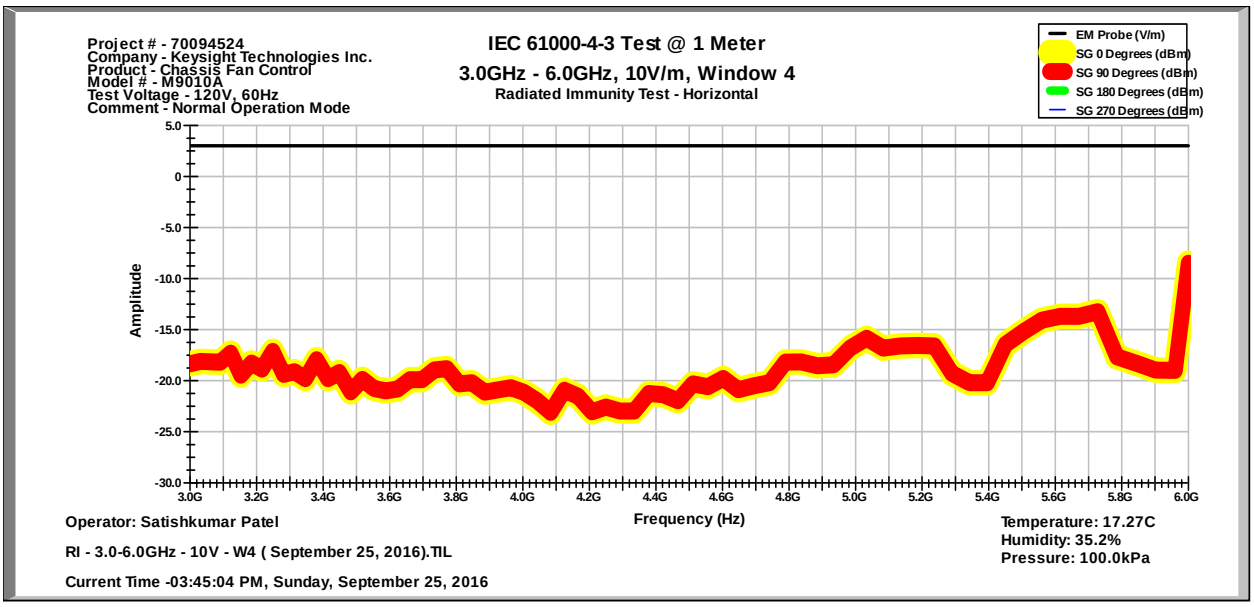
Radiated Immunity Test Data (continued)

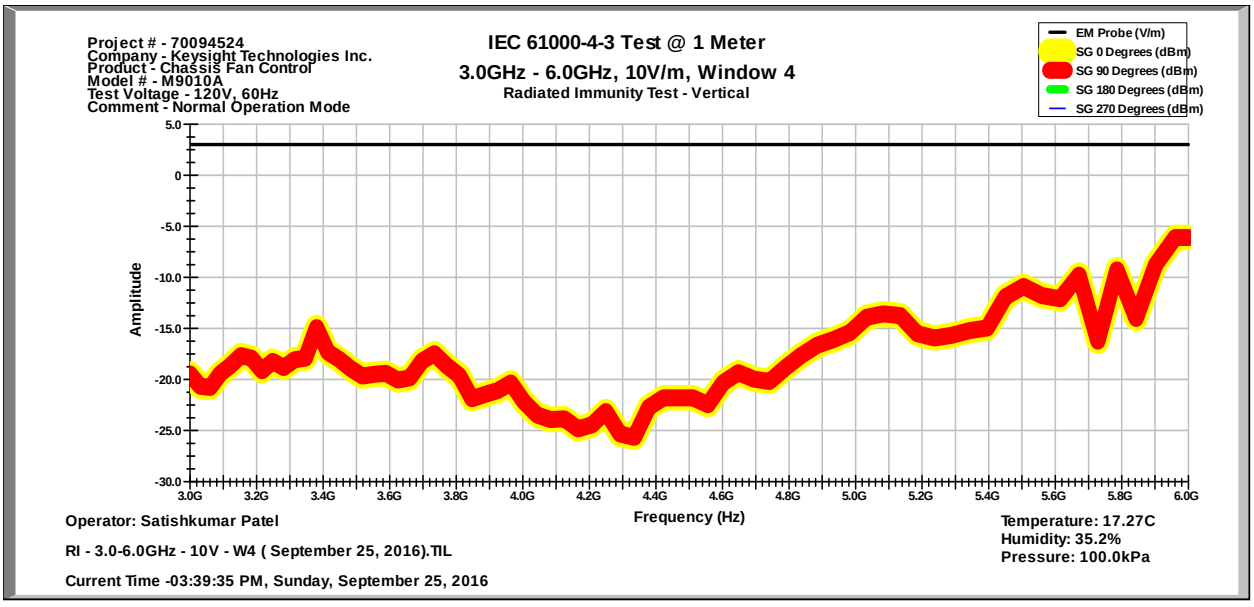




1.4-3.0GHz

Radiated Immunity Test Data (continued)

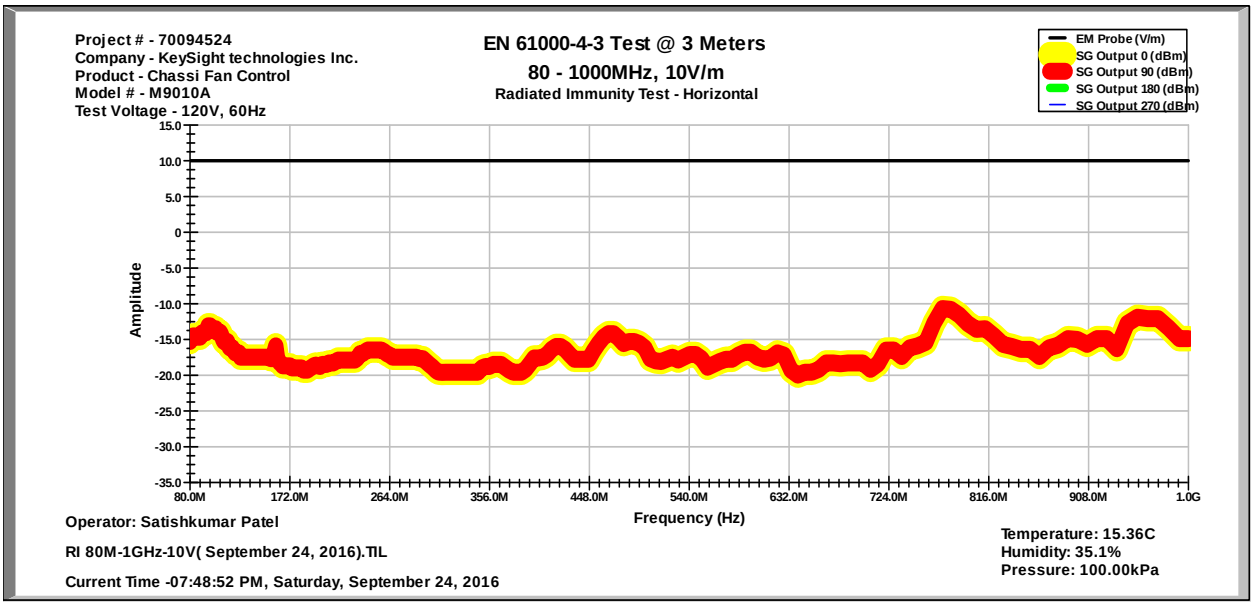


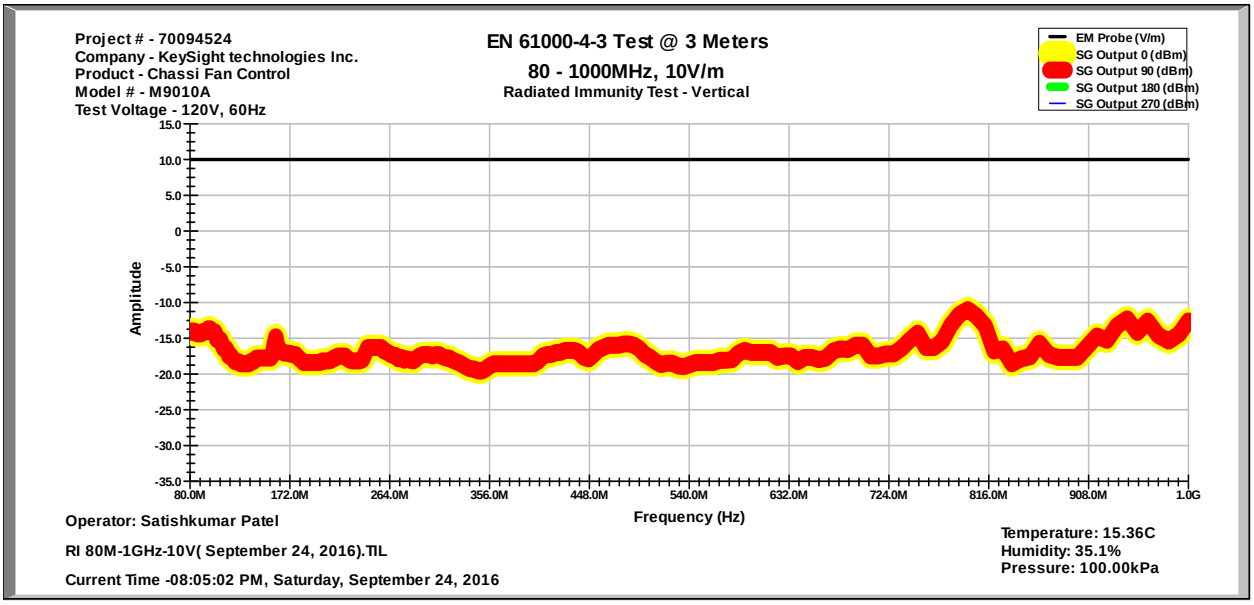


3.0-6.0GHz

Radiated Immunity Test Data (continued)

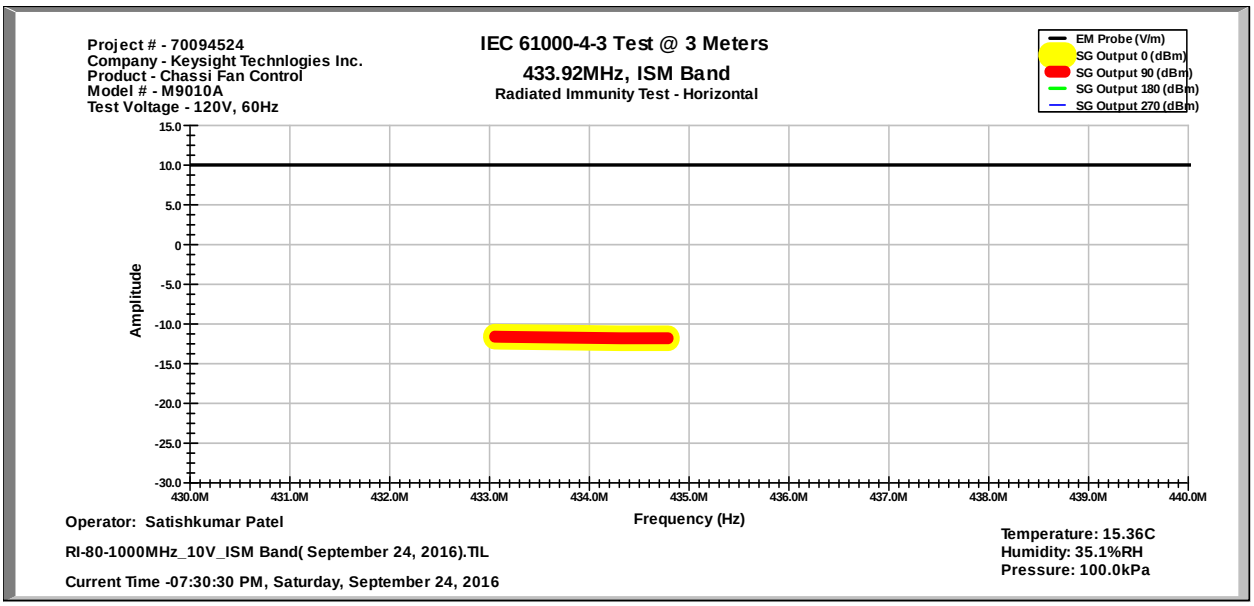
Fan Stopped / Locked Mode:

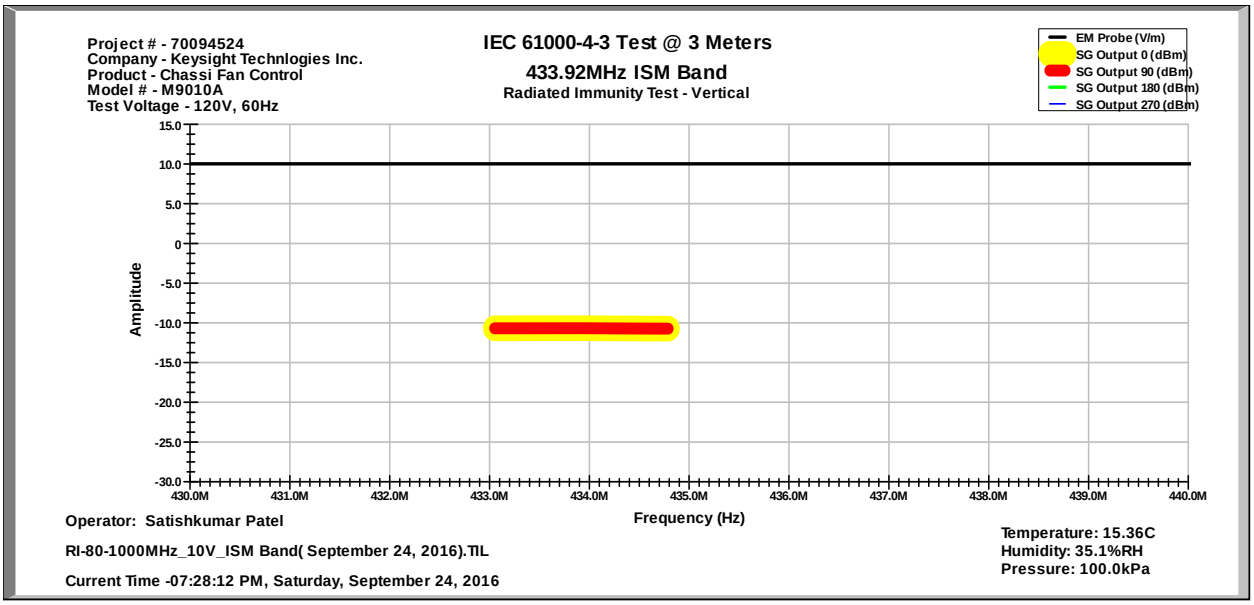




80-1000MHz

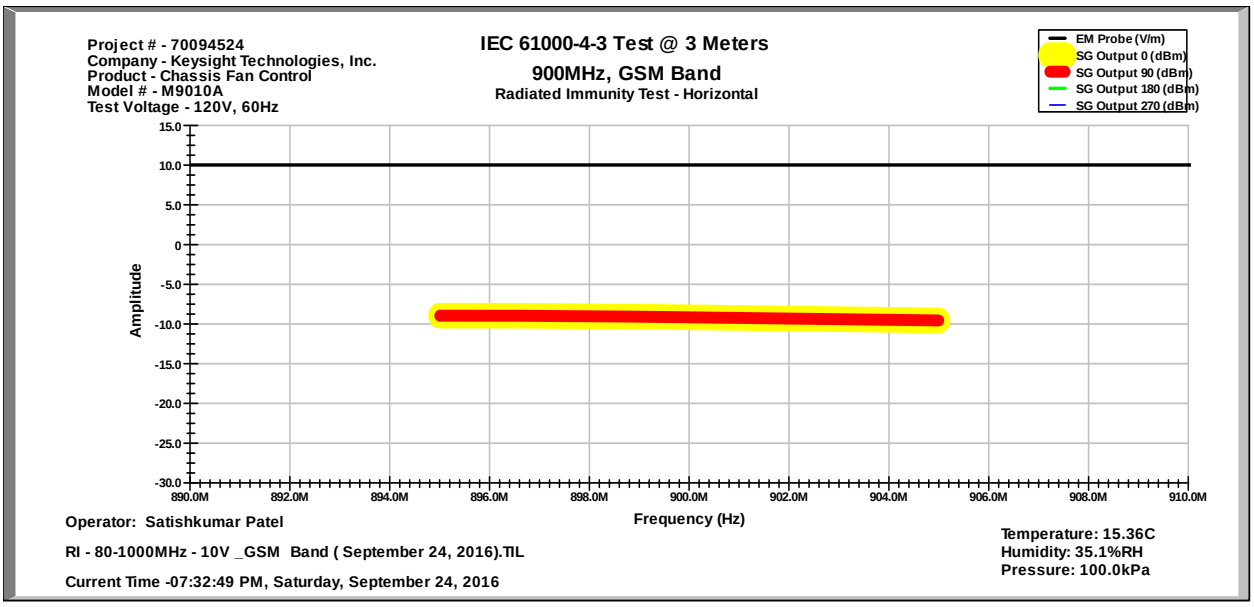
Radiated Immunity Test Data (continued)

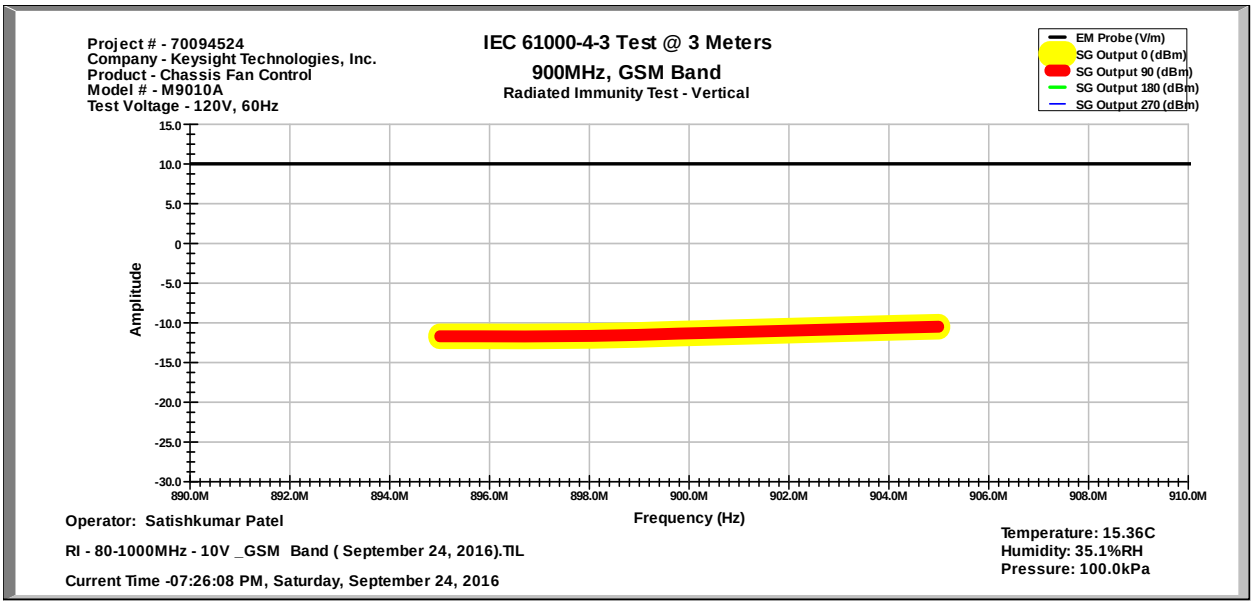




ISM Band

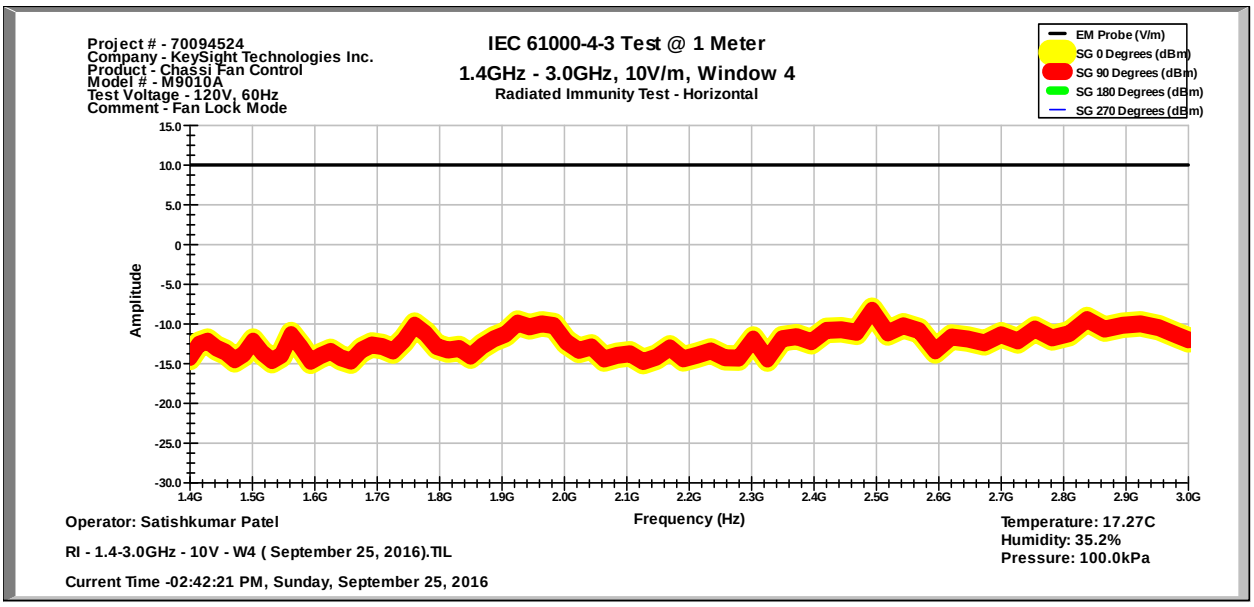
Radiated Immunity Test Data (continued)

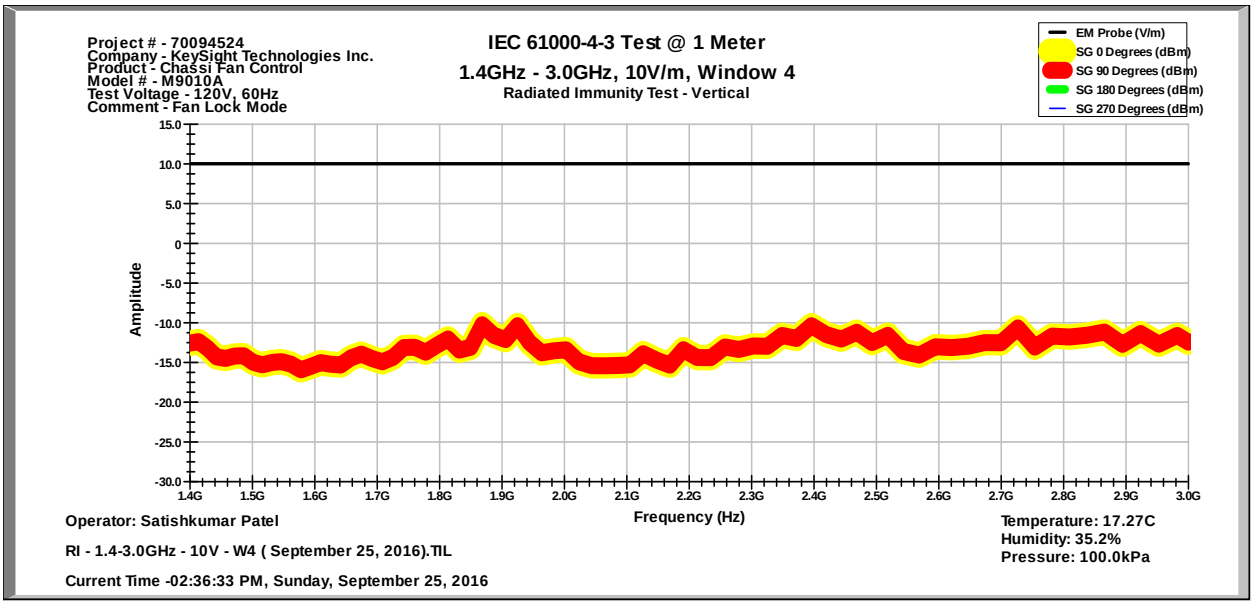




GSM Band

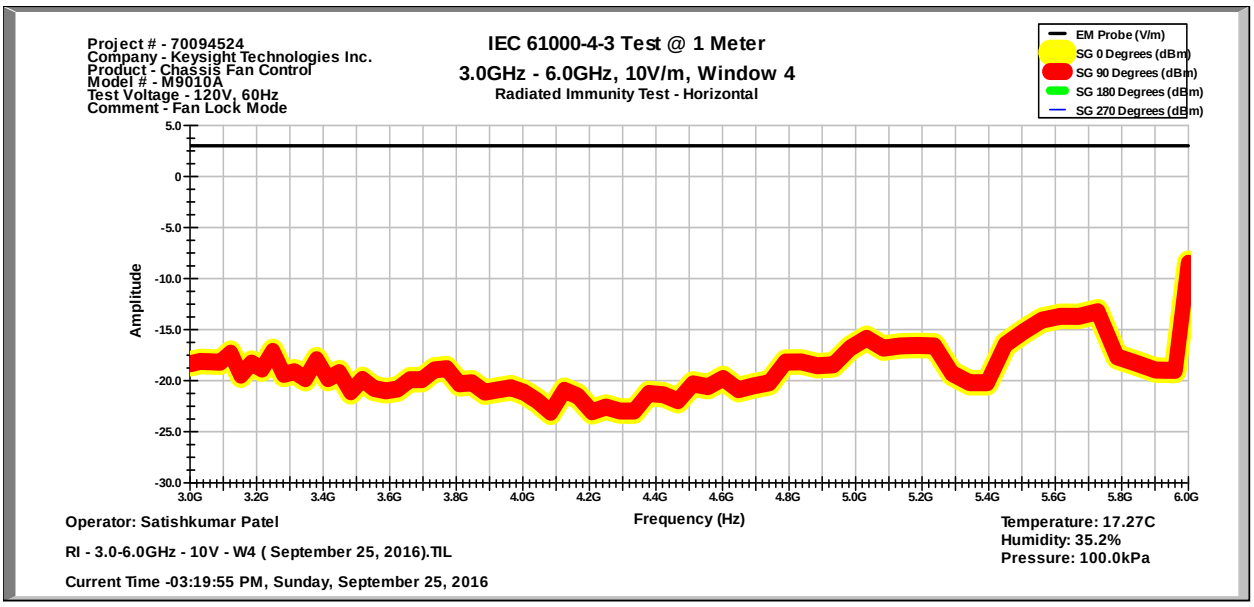
Radiated Immunity Test Data (continued)

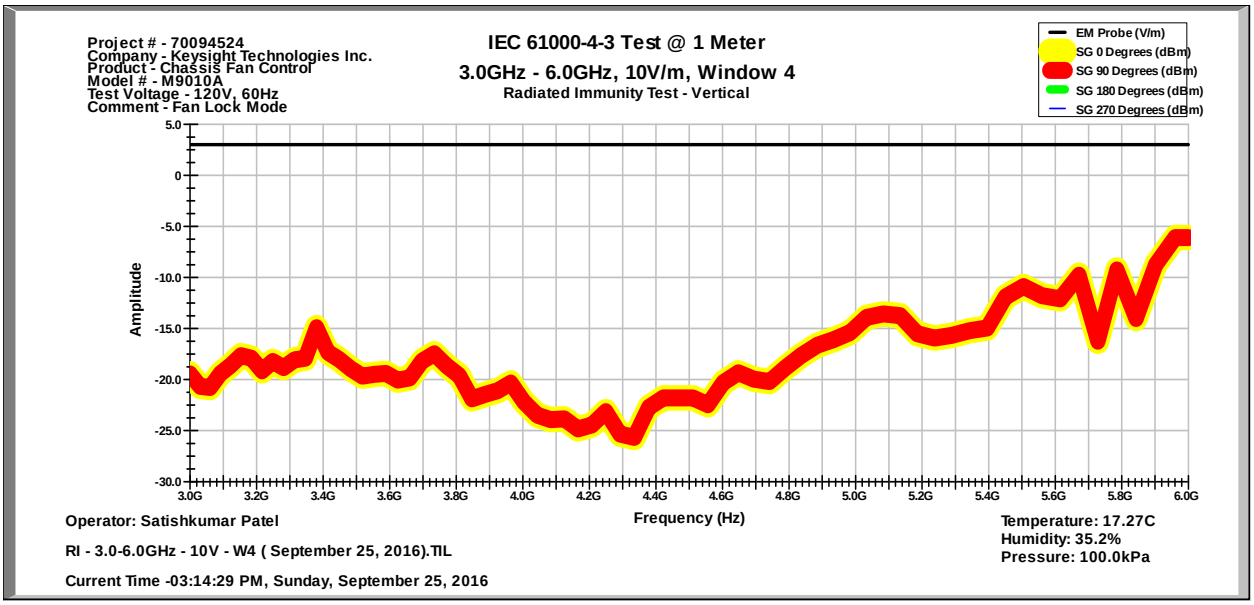




1.4-3GHz

Radiated Immunity Test Data (continued)





3.0-6.0GHz

Cables Used on EUT

Type	Length	Manufacturer	Shielded (Yes/No)	Type of Shield (wire braid or aluminum)	How Shield is Terminated to Connector	Type of Connector at Each End of Cable	Connected To	Connected From	Conductors
AC Mains	2.28m	Volex	No	N/A	N/A	Std. NEMA 5 plug at one end, Std. IEC C13 female plug at other end	Fan Control Chassis	AC Mains	3X1.25mm²