TEST REPORT

Report Number: 100825363ATL-001

March 29, 2013

Product Designation: IQPanel-VRZ

Standard: RSS-210, Issue 8, 2010
CFR, Title 47, Chapter I, Part 15 Subpart B

Tested by:
Intertek Testing Services NA Inc.
1950 Evergreen Blvd., Suite 100
Duluth, GA 30096

Client:
Qolsys Inc
20111 Stevens Creek Blvd
Suite 280
Cupertino, CA 95114
Contact: Ken McMaster
Phone: (408) 832-4362
Fax: (408) 927-5832

Tests performed by:

Yuneush Khan
EMC Project Engineer

Report reviewed by:

Troy Ihle
EMC Project Engineer

1.0 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatum text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2.0 Test Summary

Section	Test Full Name	Test Date	Result
4.0	System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)		
5.0	Conducted emissions on AC power lines (Conducted Emissions)	03/07/2013	PASS
6.0	Radiated emissions (E-field) (Radiated Emissions)	03/07/2013	PASS

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Security Control Panel	Qolsys	IQPanel -VRZ	QSMA130500076
AC/DC Power Supply	Sure-Power	SW-102000A	N/A

EUT receive date:	03-01-2013
EUT receive condition:	Good

Description of EUT provided by Client:

The IQ Panel is a combination wireless home security, life safety, and home automation system.

Description of EUT exercising:

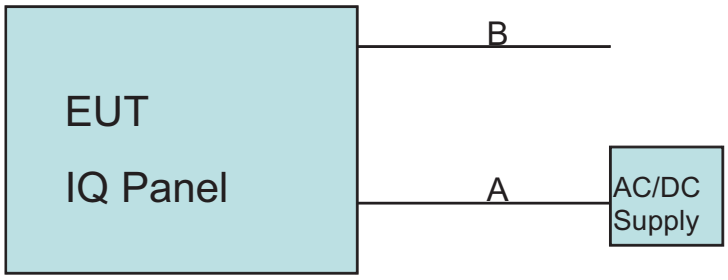
The IQ Panel was powered via a 12VDC AC/DC power supply which was connected to 120Vac/60Hz mains.

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

Record the details of EUTcabling, document the support equipment, and show the interconnections in a block diagram.

Drawing:



Block diagram

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

EUT Cabling						
					Connection	
ID	Description	Length	Shielding	Ferrites	From	To
A	DC Line	1.5m	No	No	EUT	AC/DC Power supply
B	Relay Outputs	1.5m	No	No	EUT	Unterminated

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None Required			

5.0 Conducted emissions on AC power lines (Conducted Emissions)

Method:

Equipment setup for conducted disturbance tests shall follow the guidelines of ANSI C63.4:2009.

Measurements in the frequency range of 150kHz to 30 MHz shall be performed with a quasi-peak or average detector instrument that meets the requirements of Section One of CISPR 16. An AMN shall be used to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN defined in CISPR 16 shall be used.

In the frequency range of 150 kHz to 30 MHz, a resolution/video bandwidth of 9kHz/30kHz or greater shall be used.

The EUT shall be located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

If a flexible mains cord is provided by the manufacturer that is in excess of 1m, the excess cable shall be folded back and forth as far as possible to form a bundle not exceeding 0.4m in length.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance shall be measured between each current carrying conductor and the reference ground. Each measured values shall be reported.

If EUT is intended for tabletop use, the EUT shall be placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is be placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the floor standing EUT shall be placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material. The metal ground plane shall extend at least 0.5m beyond the boundaries of the EUT and had minimum dimensions of 2m by 2m.

TEST SITE
The test site for conducted emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. The VCCI Registration Number for this site is C-3319.

MEASUREMENT UNCERTAINTY
Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.
150 kHz to 30 MHz: +/- 2.8 dB

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Cable E11, <18GHz	Huber-Suhner	Sucoflex 104PEA	E11 211266	09/10/2012	09/10/2013
Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/07/2012	05/07/2013
Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	E204	05/07/2012	05/07/2013
EMI Receiver	Hewlett Packard	8546A	213109	01/03/2013	01/03/2014
EMI Receiver, Preselector section	Hewlett Packard	85460A	213108	01/03/2013	01/03/2014
Excel spreadsheet for conducted emissions tests	Software	Excel - CE Worksh	SW002	01/14/2013	01/14/2014
LISN	Solar Electronics	8028-50-TS-24-BN	213153	12/03/2012	12/03/2013
LISN	Solar Electronics	8028-50-TS-24-BN	213042	12/03/2012	12/03/2013
Tile - software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	01/14/2013	01/14/2014

Results: The sample tested was found to Comply.

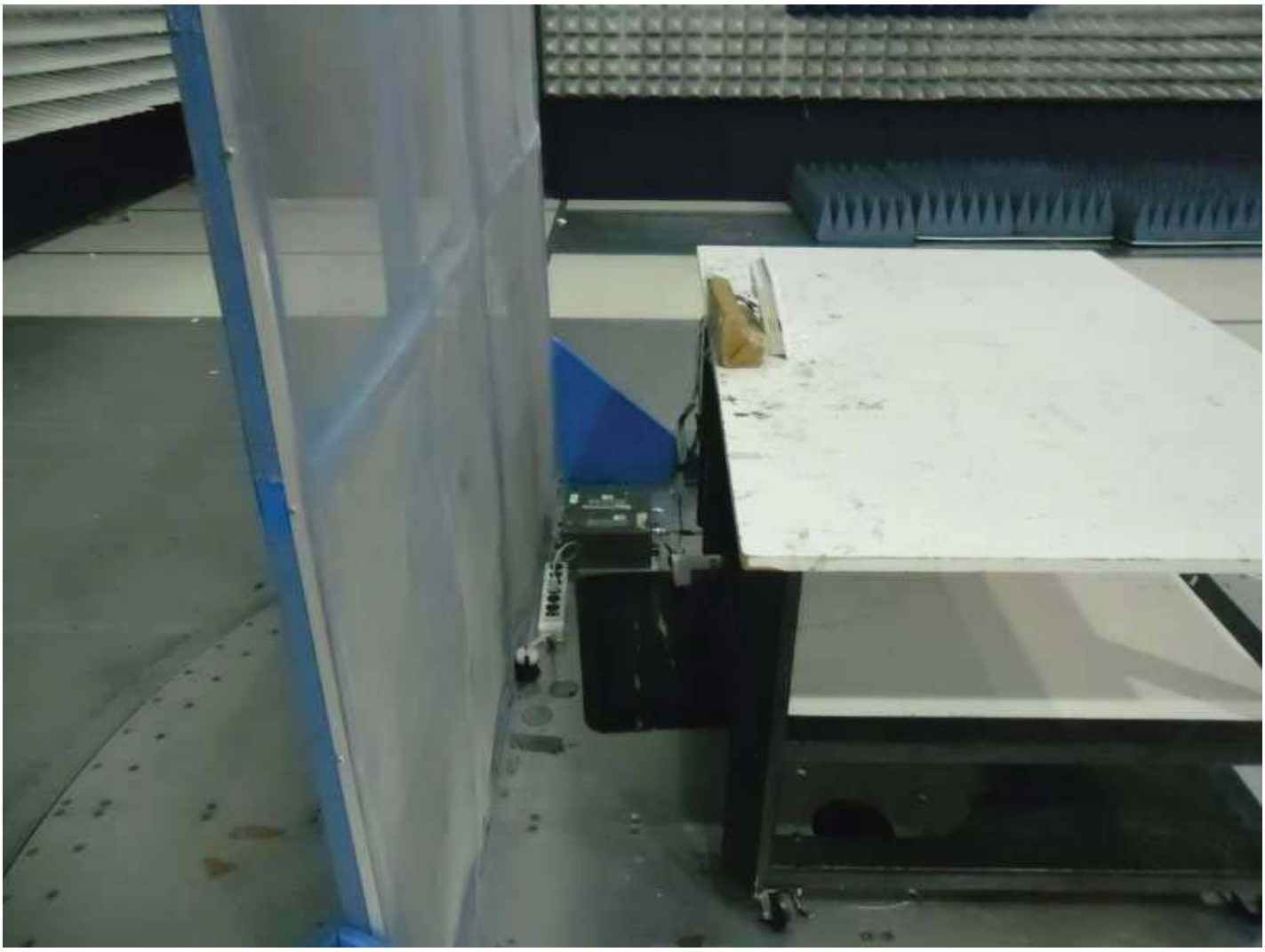
5.0 Conducted emissions on AC power lines (Conducted Emissions)

Photo:

Test Setup

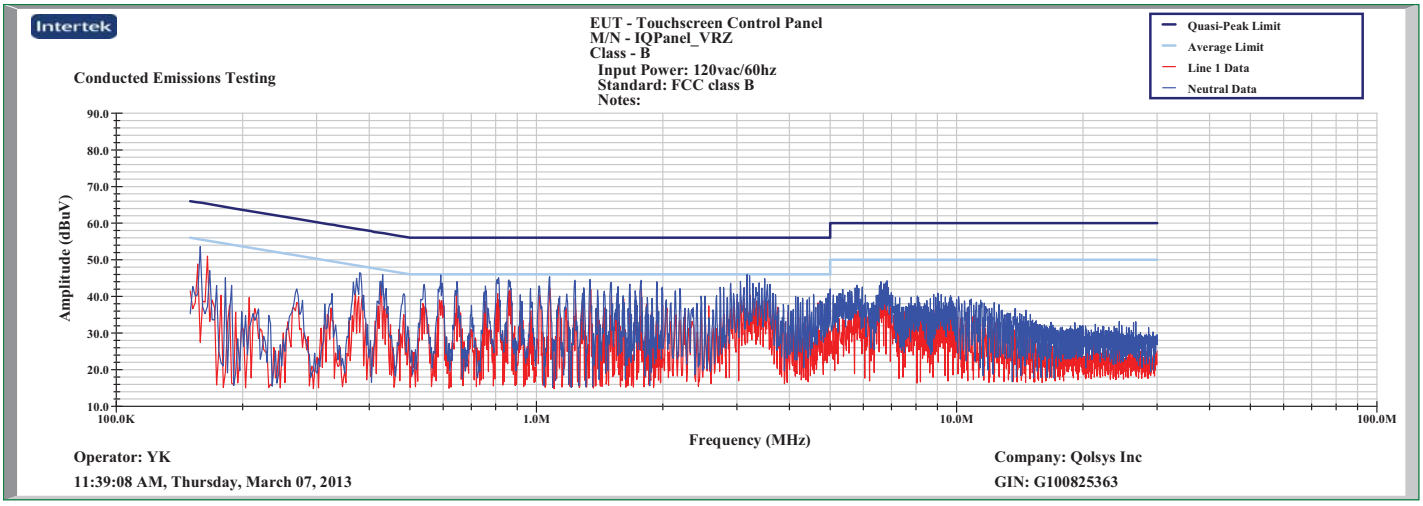
5.0 Conducted emissions on AC power lines (Conducted Emissions)

Photo:



Test Setup

5.0 Conducted emissions on AC power lines (Conducted Emissions)



Peak Plot

5.0 Conducted emissions on AC power lines (Conducted Emissions)

Data:

Frequency Range (MHz): .15 ~ 30

Input power: 120vac/60hz **Limit:** CISPR Class B

Modifications for compliance (y/n):

A	B	C	D	E	F	G	H	I
LISN Number 1,2	**Detector (P,QP, A)**	**Frequency MHz**	**Reading dBuV**	**Cable Loss dB**	**LISN Ins. Loss dB**	**Net dBuV**	**Limit dBuV**	**Margin dB**
1	QP	0.156	35.8	0.2	0.3	36.3	65.7	-29.4
1	AVG	0.156	16.7	0.2	0.3	17.2	55.7	-38.5
1	QP	0.164	39.1	0.2	0.3	39.6	65.5	-25.9
1	AVG	0.164	22.5	0.2	0.3	23.0	55.5	-32.5
1	QP	0.426	33.2	0.2	0.1	33.5	57.3	-23.8
1	AVG	0.426	28.7	0.2	0.1	29.0	47.3	-18.3
1	QP	0.808	26.3	0.2	0.1	26.6	56.0	-29.4
1	AVG	0.808	26.1	0.2	0.1	26.4	46.0	-19.6
1	QP	0.864	24.9	0.2	0.1	25.2	56.0	-30.8
1	AVG	0.864	19.4	0.2	0.1	19.7	46.0	-26.3
1	QP	1.020	23.7	0.2	0.1	24.0	56.0	-32.0
1	AVG	1.020	17.2	0.2	0.1	17.5	46.0	-28.5
2	QP	0.159	36.4	0.2	0.3	36.9	65.7	-28.8
2	AVG	0.159	33.4	0.2	0.3	33.9	55.7	-21.8
2	QP	0.430	36.8	0.2	0.1	37.1	57.3	-20.2
2	AVG	0.430	34.5	0.2	0.1	34.8	47.3	-12.5
2	QP	0.592	39.4	0.2	0.1	39.6	56.0	-16.4
2	AVG	0.592	28.5	0.2	0.1	28.7	46.0	-17.3
2	QP	0.810	35.5	0.2	0.1	35.7	56.0	-20.3
2	AVG	0.810	28.7	0.2	0.1	28.9	46.0	-17.1
2	QP	1.075	35.4	0.2	0.1	35.6	56.0	-20.4
2	AVG	1.075	29.5	0.2	0.1	29.7	46.0	-16.3
2	QP	3.156	32.1	0.2	0.1	32.3	56.0	-23.7
2	AVG	3.156	23.4	0.2	0.1	23.6	46.0	-22.4
Calculations		G=D+E+F		I=G-H				

6.0 Radiated emissions (E-field) (Radiated Emissions)

Method:

Measurements in the frequency range of 30 MHz to 1000 MHz shall be performed with a quasi-peak detector instrument that meets the requirements of Section One of CISPR 16. Above 1000 MHz, a peak detector shall be used. Peak values converted to average by appying the duty cycle correction factor, when applicable. When an average detector is used, it shall meet the requirements of Section One of CISPR 16. The measuring antenna shall correlate to a balanced dipole.

Bandwidths:
30 MHz to 1000 MHz: 120 kHz RBW and 1 MHz VBW
Above 1000 MHz: 1 MHz RBW and 3 MHz VBW

Measurements of the radiated field are made with the antenna located at a distance of 3 or 10 meters from the EUT. The limit applied to the measurement shall be appropriate for the test distance. The test distance shall be indicated in the results section.
The EUT shall be arranged and connected with cables terminated in accordance with the product specification.
Exploratory tests should be carried out while varying the cable positions to determine the maximum or near-maximum emission level. During manipulation, cables shall not be placed under or on top of the system test components unless such placement is required by the inherent equipment design.
The antenna shall be adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.
The antenna-to-EUT azimuth shall be varied during the measurement to find the maximum field-strength readings.
The antenna-to-EUT polarization (horizontal and vertical) shall be varied during the measurements to find the maximum field-strength readings.
If the EUT is intended for tabletop use, it shall be placed on a table whose top is 0.8m above the ground plane. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.
If EUT is floor standing, the EUT was placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material.
Equipment setup for radiated disturbance tests shall follow the guidelines of ANSI C63.4:2009.

TEST SITE
The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10 meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3 meter diameter turntable.

A2LA: 1455.01
IC: 2077-1
VCCI Registration Number: A-0117

MEASUREMENT UNCERTAINTY
Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.
30 MHz to 1000 MHz at 3 meters: +/- 3.9 dB
30 MHz to 1000 MHz at 10 meters: +/- 3.6 dB
1 GHz to 18 GHz at 3 meters: +/- 4.2 dB

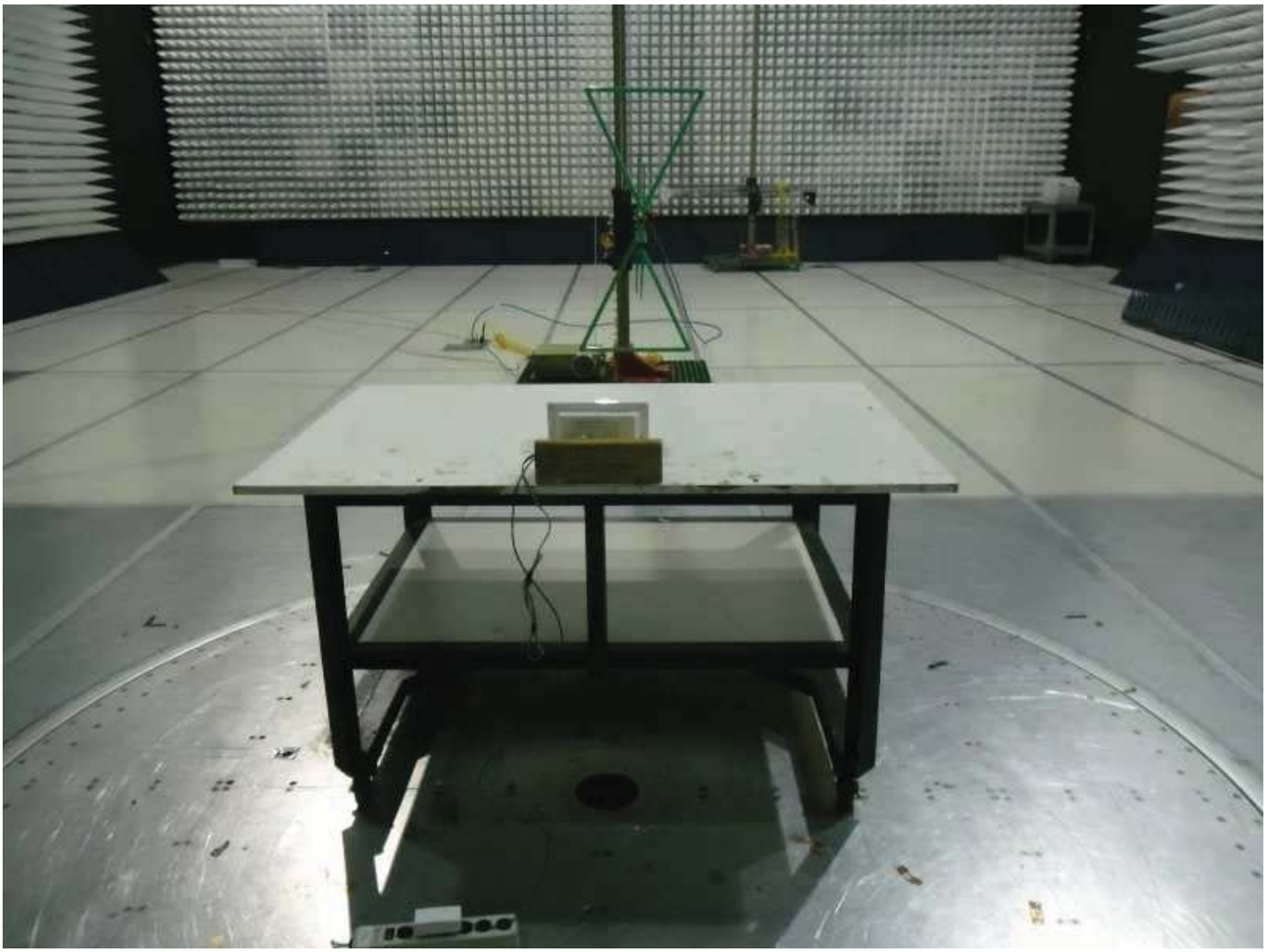
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
7m Cable, 0.01-18GHz	Storm Products Co.	A81-0303-275.6	ST-5	07/25/2012	07/25/2013
7m Cable, 0.01-18GHz	Storm Products Co.	A81-0303-275.6	ST-4	07/25/2012	07/25/2013
Antenna, BiLog, 20-2000MHz	Chase	CBL6112B	211386	11/12/2012	11/12/2013
Antenna, Horn, <18 GHz	EMCO	3115	213061	07/19/2012	07/19/2013
Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/07/2012	05/07/2013
Cable, 3-meters, 1-18GHz	Megaphase	EM18-N1N1-119	MP-HF-2	06/28/2012	06/28/2013
Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	E206	05/07/2012	05/07/2013
Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	E204	05/07/2012	05/07/2013
EMI Receiver	Hewlett Packard	8546A	213109	01/03/2013	01/03/2014
EMI Receiver, Preselector section	Hewlett Packard	85460A	213108	01/03/2013	01/03/2014
Excel spreadsheet for radiated emissions	Software	Excel - RE Worksh	SW004	01/14/2013	01/14/2014
Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	200074	03/20/2012	03/20/2013
Preamplifier, 20 MHz to 18 GHz, 40 dB	A.H. Systems	PAM-0118	200108	05/22/2012	05/22/2013
Tile - software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	01/14/2013	01/14/2014

Results: The sample tested was found to Comply.

6.0 Radiated emissions (E-field) (Radiated Emissions)

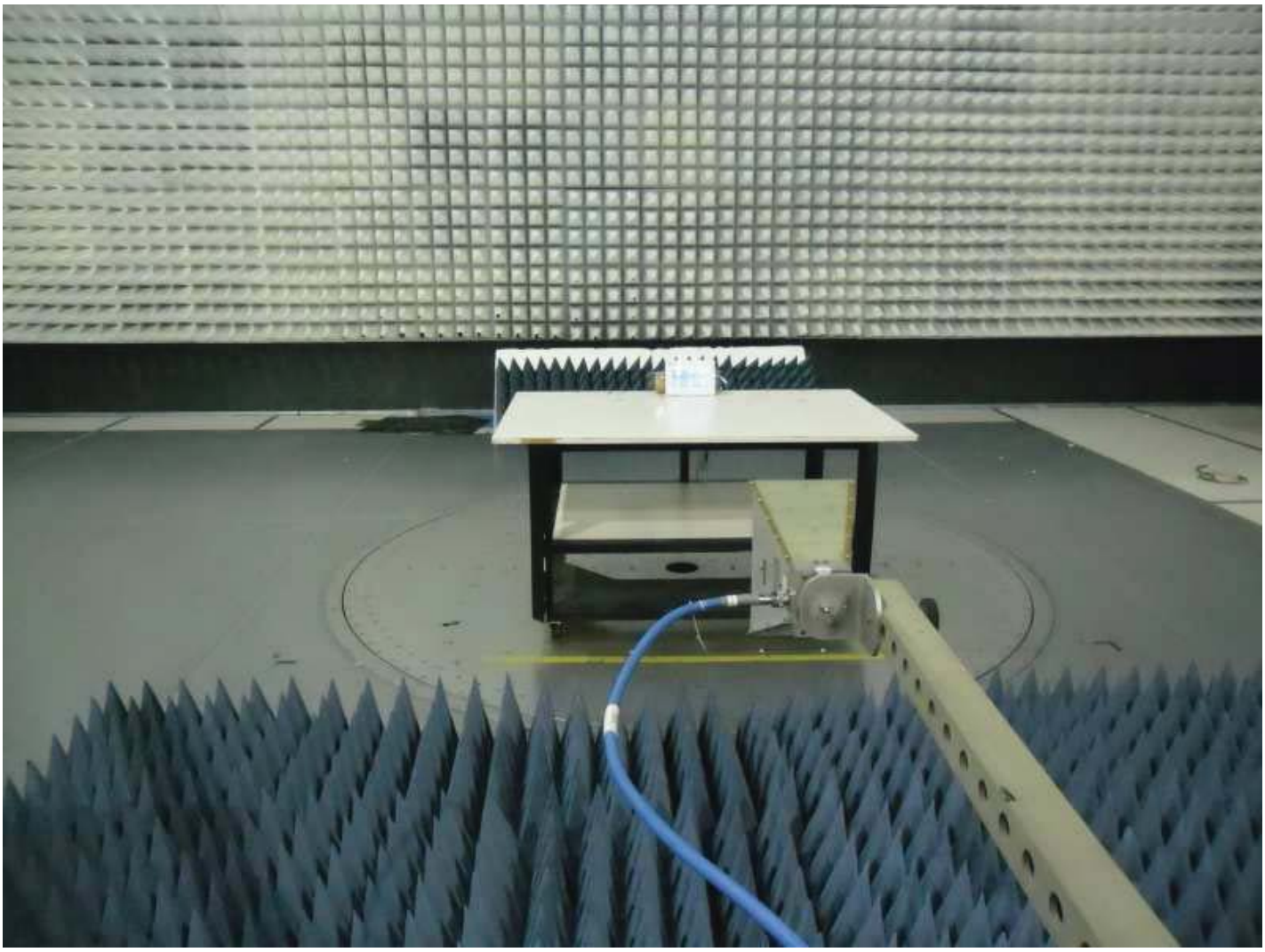
Photo:



Test Setup

6.0 Radiated emissions (E-field) (Radiated Emissions)

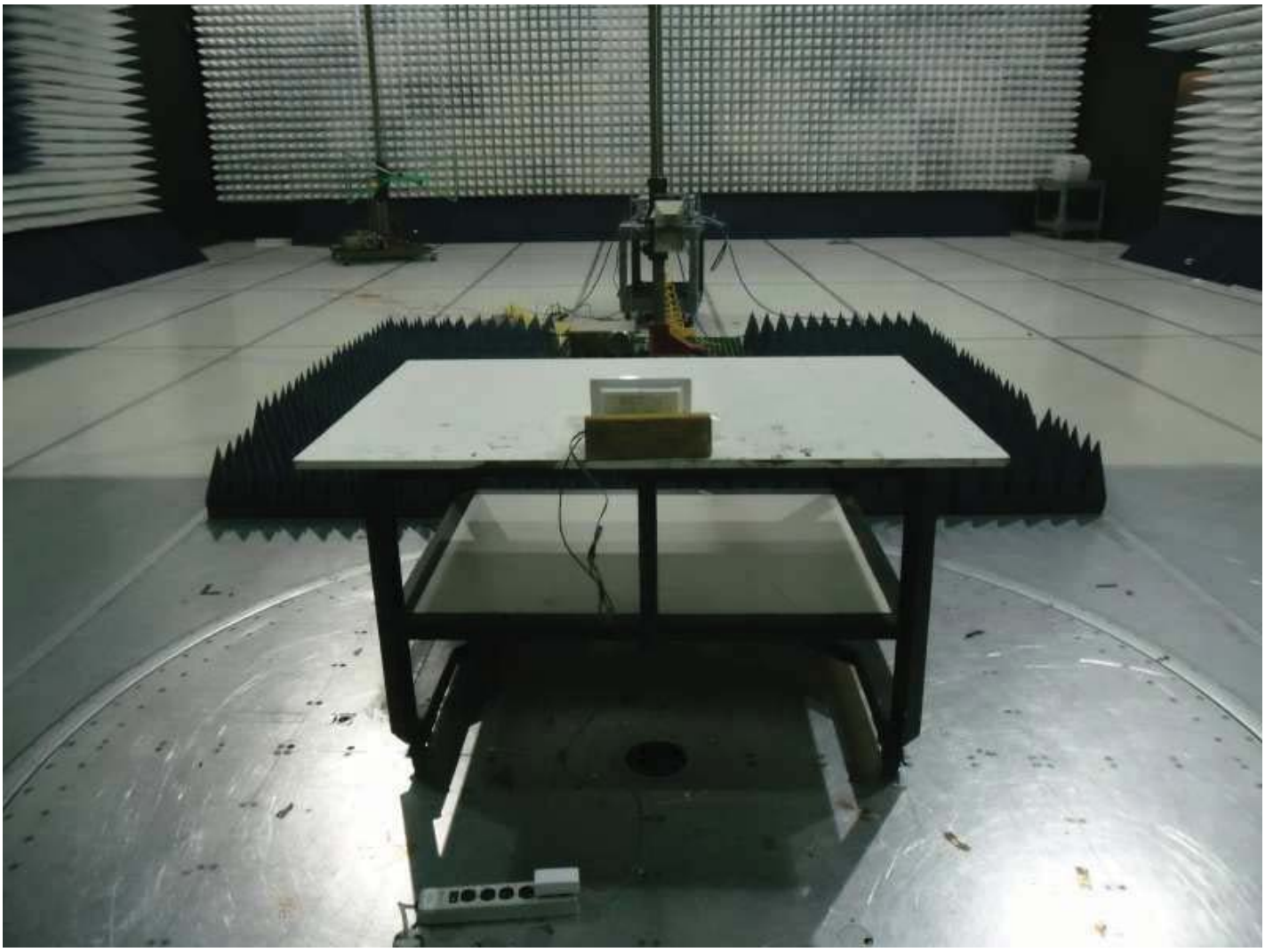
Photo:



Test Setup

6.0 Radiated emissions (E-field) (Radiated Emissions)

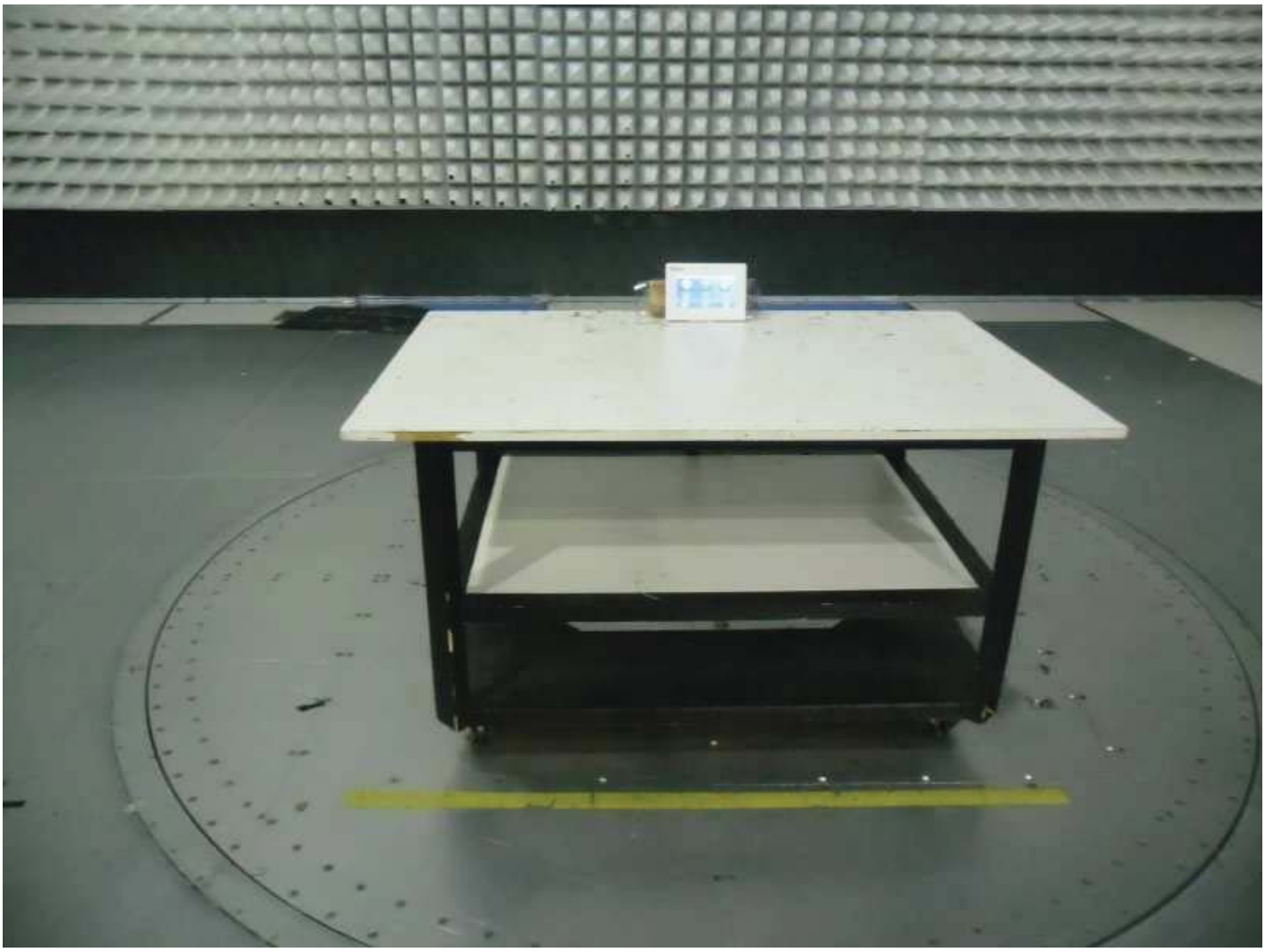
Photo:



Test Setup

6.0 Radiated emissions (E-field) (Radiated Emissions)

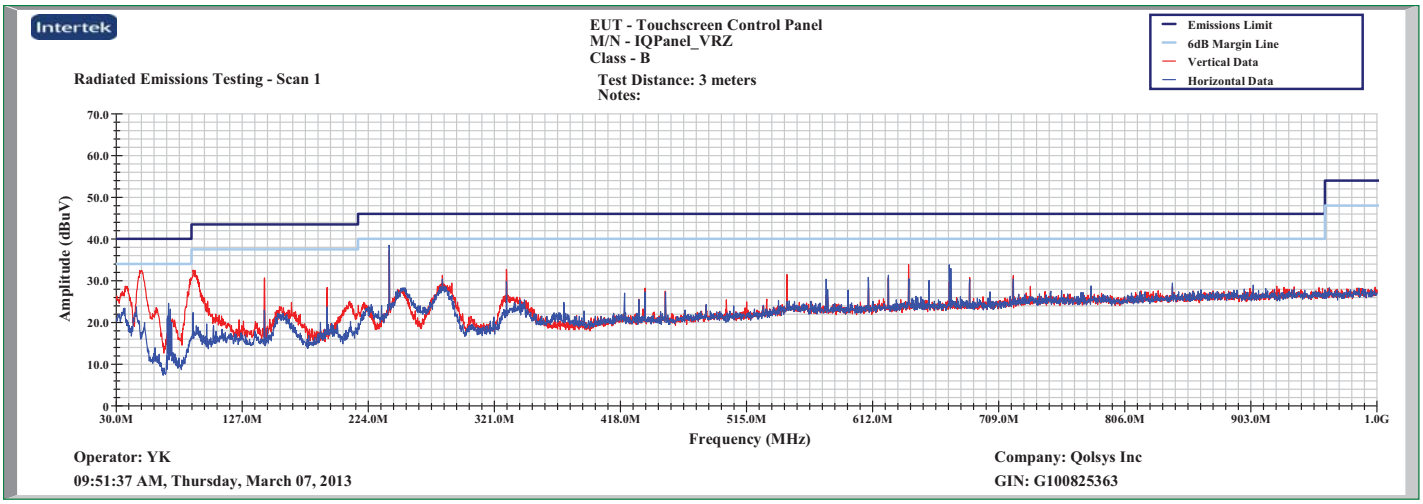
Photo:



Test Setup

6.0 Radiated emissions (E-field) (Radiated Emissions)

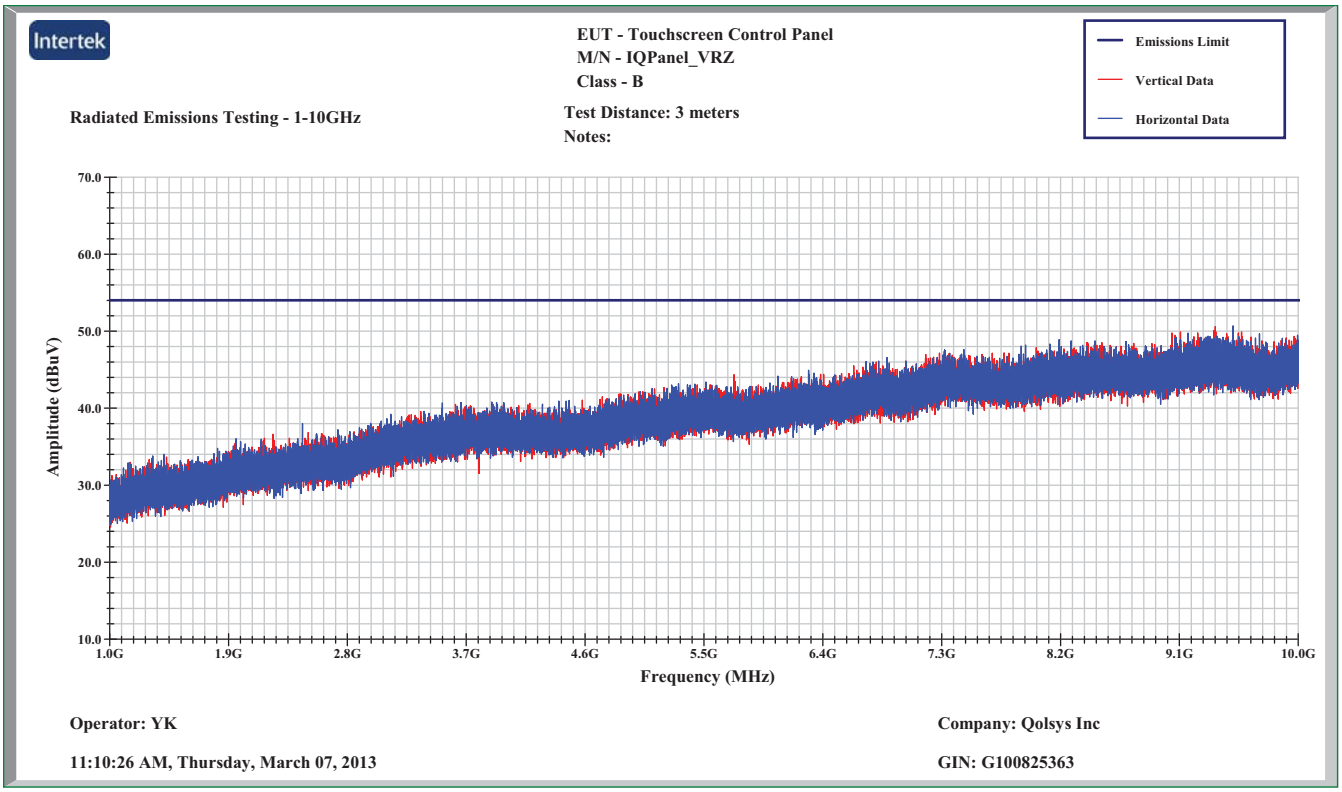
Plot:



Peak Plot, 30MHz - 1GHz

6.0 Radiated emissions (E-field) (Radiated Emissions)

Plot:



Peak Plot, 1GHz - 10GHz

6.0 Radiated emissions (E-field) (Radiated Emissions)

Data:

Frequency Range (MHz): 30 ~ 1000 **Test Distance (m):** 3

Input power: 120vac/60hz **Limit:** FCC15 Class B-3m

Modifications for compliance (y/n):

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**3m Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
V	37.800	42.1	15.1	1.2	36.6	21.8	40.0	-18.2	QP/120K/300K
V	51.230	54.2	8.7	1.4	36.6	27.7	40.0	-12.3	QP/120K/300K
V	89.110	50.4	9.1	1.8	36.6	24.8	43.5	-18.7	QP/120K/300K
V	144.000	53.1	11.8	2.3	36.5	30.7	43.5	-12.8	QP/120K/300K
V	330.200	50.9	14.7	3.6	36.5	32.7	46.0	-13.3	QP/120K/300K
H	240.000	58.8	12.3	3.0	36.5	37.6	46.0	-8.4	QP/120K/300K
H	672.000	39.0	19.4	5.2	36.0	27.6	46.0	-18.4	QP/120K/300K
Calculations		G=C+D+E-F		I=G-H					