HERMON LABORATORIES

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839.01
Electrical

Hermon Laboratories Ltd.
P.O.Box 23, Binyamina 30500, Israel
Tel. +972 4628 8001
Fax. +972 4628 8277
E-mail: mail@hermonlabs.com

TEST REPORT

ACCORDING TO: FCC 47CFR part 15: 2005, subpart B, Class B

FOR:

CROW Electronic Engineering Ltd.

Alarm detertors

Models:
LC-104-PIMW (10.525),
LC-103-PIMSK (9.9),
LC-104-PIMW (9.9),
LC-104-PIMW (10.687),
LC-103-PIMSK (10.687),
LC-103-PIMSK (10.525)
LC-100-PI,
LC-102-PIGBSS,
LC-105-DGB,
LC-101-CAM COLOR PAL,
LC-101-CAM COLOR NTSC,
LC-120-PI,
LC-101-CAM (NO CAM),
LC-101-CAM B&W EIA,
LC-101-CAM B&W CCIR

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1 Applicant information

Client name:	CROW Electronic Engineering Ltd.
Address:	12 Kineret Street, P.O.Box 293, Ben Gurion Airport, Airport City, 70100, Israel
Telephone:	+972 3972 6000
Fax:	+972 3972 6001
E-mail:	shukis@crow.co.il
Contact name:	Mr. Shuki Segal

2 Equipment under test attributes

Product name:	Alarm detertors
Models:	LC-104-PIMW (10.525), LC-103-PIMSK (9.9), LC-104-PIMW (9.9), LC-104-PIMW (10.687), LC-103-PIMSK (10.687), LC-103-PIMSK (10.525) LC-100-PI, LC-102-PIGBSS, LC-105-DGB, LC-101-CAM COLOR PAL, LC-101-CAM COLOR NTSC, LC-120-PI, LC-101-CAM (NO CAM), LC-101-CAM B&W EIA, LC-101-CAM B&W CCIR
Receipt date	5/8/2006

3 Manufacturer information

Manufacturer name:	CROW Electronic Engineering Ltd.
Address:	12 Kineret Street, P.O.Box 293, Ben Gurion Airport, Airport City, 70100, Israel
Telephone:	+972 3972 6000
Fax:	+972 3972 6001
E-mail:	shukis@crow.co.il
Contact name:	Mr. Shuki Segal

4 Test details

Project ID:	17114
Location:	Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started:	5/8/2006
Test completed:	7/13/2006
Test specification:	FCC 47CFR part 15: 2005, subpart B, Class B

5 Tests summary

Test	Status
FCC 47 CFR part 15, subpart B	
Section 15.107 Class B, AC power lines conducted emissions	Pass
Section 15.109 Class B, Radiated emissions	Pass

Testing was completed against the relevant requirements of the test standards. The results obtained indicate that the product under test complies in full with the requirements tested.
The test results relate only to the items tested. Pass / fail decision was based on nominal values.

	Name and Title	Date	Signature
Tested by:	Mr. O. Attias, test engineer	July 13, 2006	
Reviewed by:	Ms. N. Averin, certification engineer	August 20, 2006	
Approved by:	Mr. M. Nikishin, EMC and radio group leader	August 20, 2006	

6 EUT description

6.1 General information

The EUTs are the following alarm detectors:

Zone No.	EUT model	EUT description	Version
3	LC-104-PIMW (10.525)	PIR & MW 10.525GHz Detector	3202672
4	LC-103-PIMSK (9.9)	Anti-Mask PIR & MW 9.9GHz Detector	3202673
10	LC-104-PIMW (9.9)	PIR & MW 9.9GHz Detector	3202672
11	LC-104-PIMW (10.687)	PIR & MW10.687GHz Detector	3202672
12	LC-103-PIMSK (10.687)	Anti-Mask PIR & MW 10.687GHz Detector	3202673
13	LC-103-PIMSK (10.525)	Anti-Mask PIR & MW 10.525GHz Detector	3202673
1	LC-100-PI	PIR Detector	3202670
2	LC-102-PIGBSS	PIR & Glass break Detector	3202671
5	LC-105-DGB	Glass break Detector	3201675
6	LC-101-CAM COLOR PAL	PIR Detector with Color PAL Camera	3202674
7	LC-101-CAM COLOR NTSC	PIR Detector with Color NTSC Camera	3202674
8	LC-120-PI	PIR Detector (NO/NC)	3203670
9	LC-101-CAM (NO CAM)	PIR Detector with Camera option (no camera)	3202674
14	LC-101-CAM B&W EIA	PIR Detector with Monochrome EIA Camera	3202674
15	LC-101-CAM B&W CCIR	PIR Detector with Monochrome CCIR Camera	3202674

The EUTs are powered from 12 VDC supplied by a control panel.

6.2 Ports and lines

Port type	Port description	Connected		Connector type	Qty.	Cable type	Cable length	Indoor / outdoor
		From	To					
LC-104-PIMW (10.525), LC-104-PIMW (9.9), LC-104-PIMW (10.687)								
Power In	-12 VDC (GND)	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Power In	+12 VDC	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	NC - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	C - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T1 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T2 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Passive	EOL - End of Line Option	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
LC-103-PIMSK (10.525), LC-103-PIMSK (9.9), LC-103-PIMSK (10.687)								
Power In	- 12VDC (GND*)	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Power In	+ 12VDC	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	NC - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	C - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T1 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T2 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Passive	EOL - End of Line Option	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	NO - Trouble relay out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12 m	Indoor
Signal Out	C - Trouble relay out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12 m	Indoor

6.3 Ports and lines (continued)

Port type	Port description	Connected		Connector type	Qty.	Cable type	Cable length	Indoor / outdoor
		From	To					
LC-100-PI, LC-120-PI, LC-105-DGB								
Power In	-12 VDC (GND)	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Power In	+12 VDC	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	NC - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	C - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T1 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T2 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Passive	EOL - End of Line Option	EUT	Control Panel	Terminal Block	1	22AWG single wire	1 2m	indoor
LC-102-PIGBSS								
Power In	- 12VDC (GND)	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Power In	+ 12VDC	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	NC - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	Indoor
Signal Out	C - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T1 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	T2 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Passive	EOL - End of Line Option	EUT	Control Panel	Terminal Block	1	22AWG single wire	12 m	indoor
Signal Out	NC - MIC Alarm relay out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12 m	Indoor
Signal Out	C - MIC Alarm relay out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12 m	Indoor
LC-101-CAM COLOR PAL, LC-101-CAM COLOR NTSC, LC-101-CAM (NO CAM), LC-101-CAM B&W EIA, LC-101-CAM B&W CCIR								
Power In	- 12VDC (GND)	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	Indoor
Power In	+ 12VDC	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	Indoor
Signal Out	NC - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	Indoor
Signal Out	C - Alarm relay out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	indoor
Signal Out	T1 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	indoor
Signal Out	T2 - Tamper switch out	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	indoor
Passive	EOL - End of Line Option	EUT	Control Panel	Terminal Block	1	22AWG single wire	12m	indoor
Signal Out	NO - Alarm relay out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12m	Indoor
Signal Out	AUDIO OUT Microphone out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12m	Indoor
Signal Out	VIDEO OUT Camera out	EUT	Control Panel	Terminal Block	1	Shielded Wire	12m	Indoor

6.4 Auxiliary equipment

Description	Manufacturer	Model number	Serial number
RUNNER 8 COMPACT - Control Panel	CROW	003163(x)	N/A
AC/DC adapter	Midas	AAS715166	NA
CR 16 ST - LED ICON Keypad	CROW	003105(x)	N/A

6.5 Operating frequencies

Source	Frequency, MHz					
MW Module	10525	9900	10687	NA	NA	NA

6.6 EUT modes of operation

6.6.1 Alarm mode

The detector connected to DC power, there is movement or glass breakage and the detector activates the ALARM; LED's – ON.
Relay output - OPEN - There is indication of the zone number on the Control Panel Keypad.

6.6.2 Arm mode

The detector connected to DC power, there is NO movement or glass breakage detection.
LED's OFF (MW LED maybe flashing)
Relay output - Close, no indication on the Control Panel Keypad

6.7 Changes made in the EUT

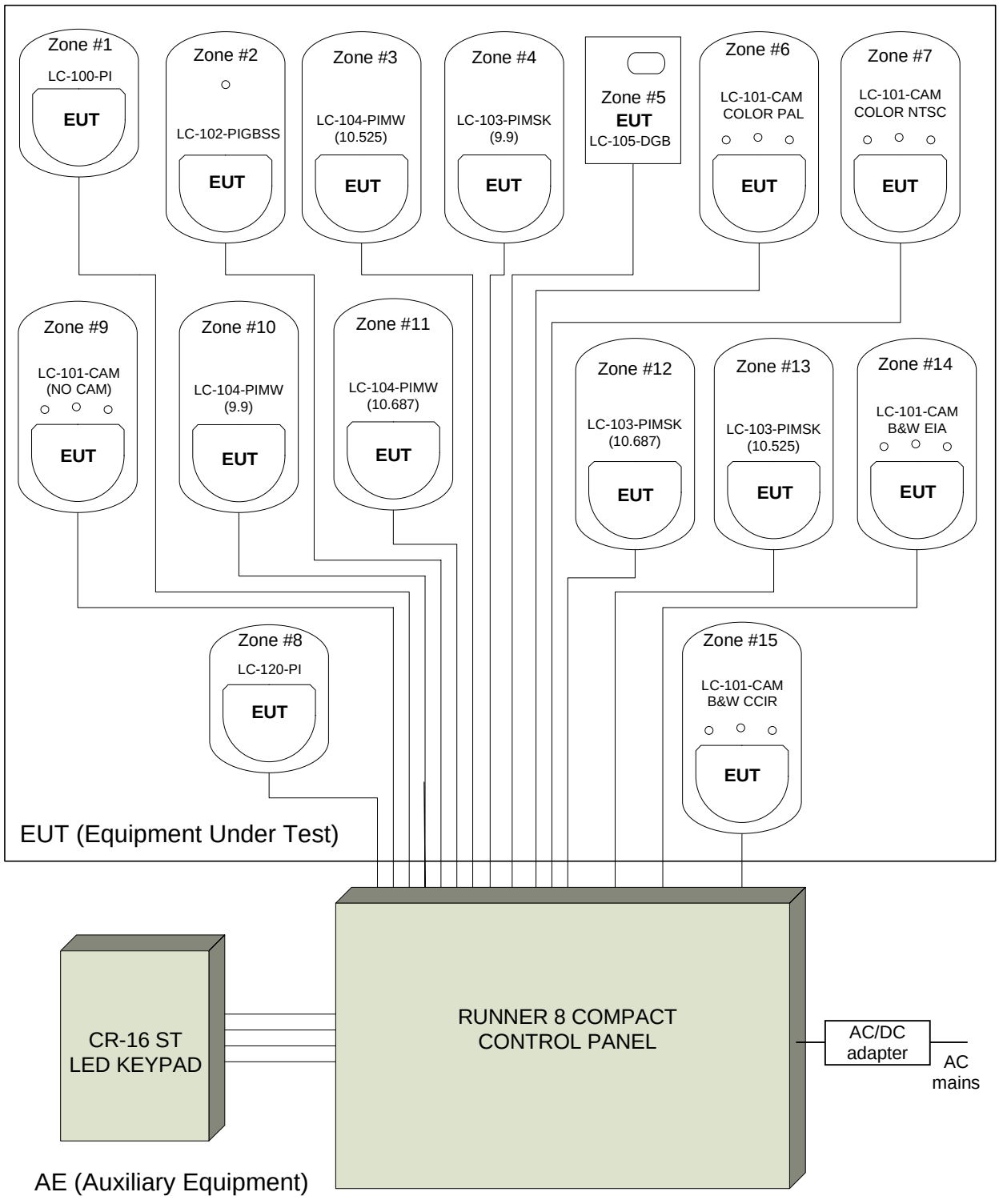
To withstand standard requirements, the following change was made in the EUT during the testing.

Zone No.	EUT model	Change implemented
1	LC-100-PI	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.
2	LC-102-PIGBSS	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.
6	LC-101-CAM COLOR PAL	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.
7	LC-101-CAM COLOR NTSC	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.
9	LC-101-CAM (NO CAM)	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.
14	LC-101-CAM B&W EIA	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.
15	LC-101-CAM B&W CCIR	One capacitor 2.2nF / X7R / 10% / 16VDC / 0805 was installed between pins No. 4 and No. 5 of IC No. CT-204 marked as U1.

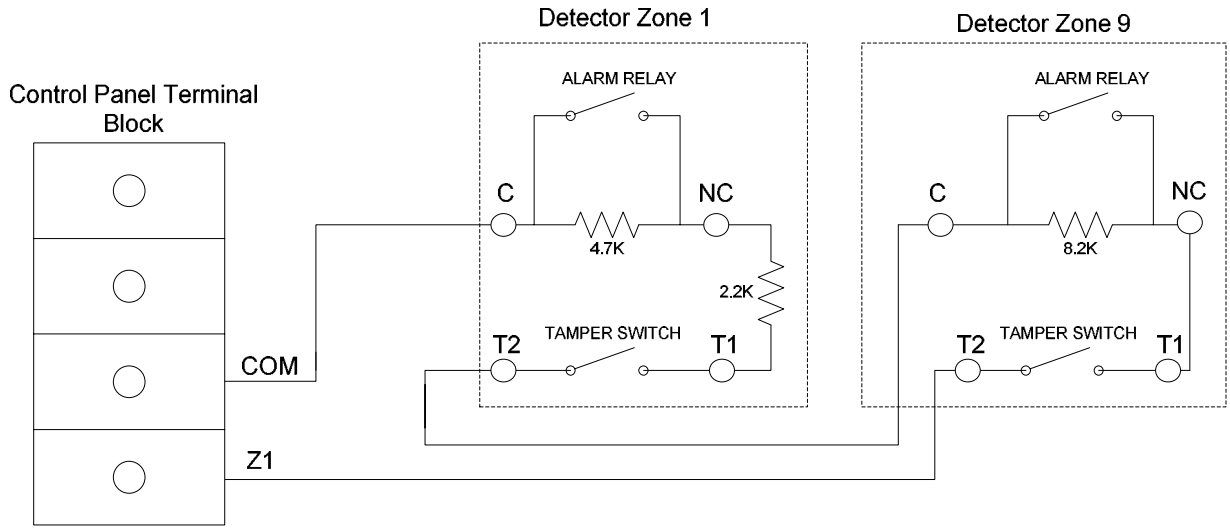
It is manufacturer responsibility to implement the change in the production version of the EUT. In any case the test report applies to the tested item only.

6.8 Test configuration

6.8.1 Block diagram



6.8.2 Typical detector connection



Test specification:	Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	7/13/2006 3:11:18 PM		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks: The EUT was tested in arm mode as the worst case.			

7 Emissions tests according to FCC 47CFR part 15 subpart B requirements

7.1 Conducted emissions

7.1.1 General

This test was performed to measure common mode conducted emissions at the AC power port. The specification test limits are given in Table 7.1.1.

Table 7.1.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(µV)		Class A limit, dB(µV)	
	QP	AVRG	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*	79	66
0.5 - 5.0	56	46	73	60
5.0 - 30	60	50	73	60

* The limit decreases linearly with the logarithm of frequency.

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1 and the associated photograph, energized and the EUT performance was checked.

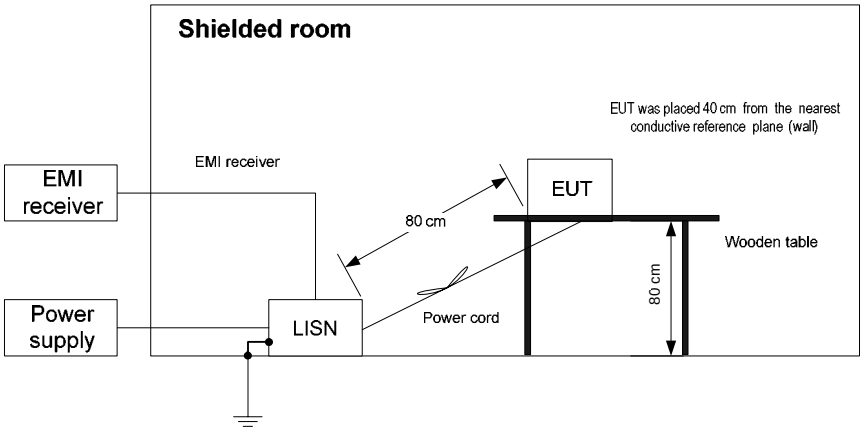
7.1.2.2 The measurements were performed at the AC power terminals with the LISN, connected to the EMI receiver in the frequency range referred to in Table 7.1.2. The unused coaxial connector of the LISN was terminated with 50 Ohm.

7.1.2.3 The position of the EUT cables was varied to find the highest emission.

7.1.2.4 The worst test results with respect to the limits were recorded in Table 7.1.2 and shown in the associated plots.

Test specification:	Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	7/13/2006 3:11:18 PM		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks: The EUT was tested in arm mode as the worst case.			

Figure 7.1.1 Setup for conducted emission measurements, table-top EUT



Photograph 7.1.1 Setup for conducted emissions measurements

Test specification:	Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	7/13/2006 3:11:18 PM		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks: The EUT was tested in arm mode as the worst case.			

Table 7.1.2 Conducted emission test results

LINE: AC mains input of control panel adapter
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.150300	60.18	53.81	65.99	-12.18	20.92	55.99	-35.07	L1	Pass
0.157350	59.86	53.35	65.64	-12.29	20.59	55.64	-35.05		
0.310891	39.04	31.67	59.95	-28.28	0.01	49.96	-49.95		
0.521571	23.20	14.66	56.00	-41.34	-9.57	46.00	-55.57		
8.945172	19.50	16.28	60.00	-43.72	7.97	50.00	-42.03		
18.435884	38.97	36.17	60.00	-23.83	31.95	50.00	-18.05		
0.151975	60.45	53.82	65.90	-12.08	21.00	55.90	-34.90	L2	Pass
0.177768	58.07	51.23	64.65	-13.42	18.78	54.65	-35.87		
0.272584	43.43	36.19	61.10	-24.91	4.23	51.10	-46.87		
8.945841	17.53	14.81	60.00	-45.19	6.78	50.00	-43.22		
17.892421	36.67	33.60	60.00	-26.40	31.80	50.00	-18.20		
16.524897	37.39	34.01	60.00	-25.99	31.08	50.00	-18.92		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

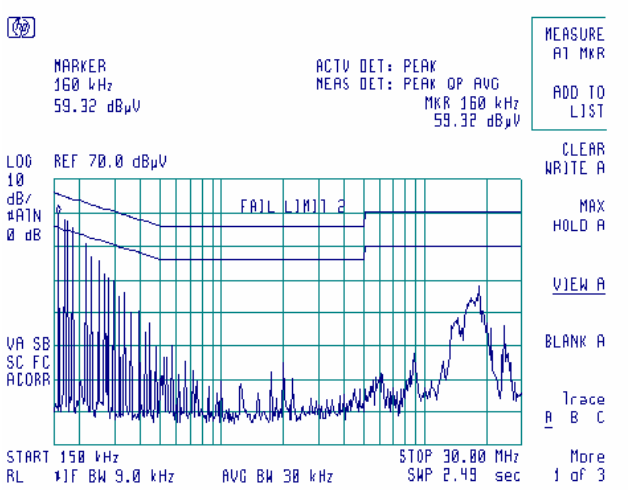
HL 0447	HL 0672	HL 0787	HL 1503	HL 1215	HL 1430		

Full description is given in Appendix A.

Test specification:	Section 15.107 Class B, AC power lines conducted emissions		
Test procedure:	ANSI C63.4, Section 11.5		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	7/13/2006 3:11:18 PM		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks: The EUT was tested in arm mode as the worst case.			

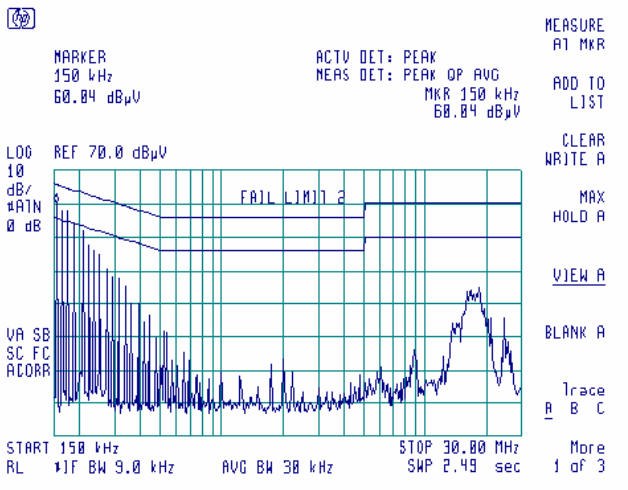
Plot 7.1.1 Conducted emission measurements, AC mains input of control panel adapter

LINE: L1
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Plot 7.1.2 Conducted emission measurements, AC mains input of control panel adapter

LINE: L2
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Test specification:	Section 15.109 Class B, Radiated emissions		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	Air Pressure: 1010 hPa	Relative Humidity: 28 %	Power Supply: 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

7.2 Radiated emission measurements

7.2.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Radiated emission test limits

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
Above 960	43.5*	54.0	49.5	60.0*

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where S_1 and S_2 – standard defined and test distance respectively in meters.

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1 and the associated photograph, energized and the EUT performance was checked.

7.2.2.2 The preliminary measurements were performed in the anechoic chamber at 3 m test distance. The specified frequency range was investigated with the antenna connected to the EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal polarizations. The EUT cables position was varied to maximize emission.

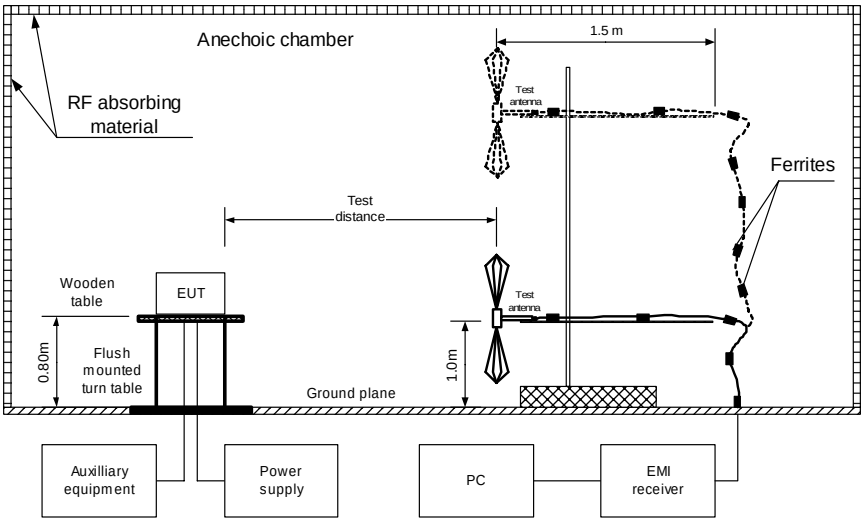
7.2.2.3 The EUT was set up as shown in Figure 7.2.2 and the associated photographs, energized and the EUT performance was checked.

7.2.2.4 The final measurements were performed at the open area test site at 10 m test distance with the antenna connected to the EMI receiver. The EUT wires and cables were arranged to produce the highest emission as it was found during the preliminary measurements. The frequencies, produced the highest emissions with respect to the limits during the preliminary test, were investigated. To find the highest emission the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal polarizations. At frequencies, where high ambient noise was encountered, the final measurements were taken at 3 m distance.

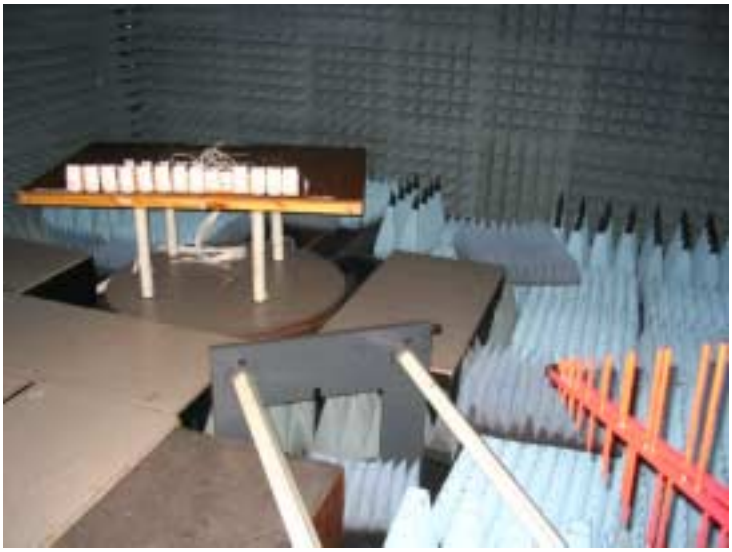
7.2.2.5 The worst test results with respect to the limits were recorded in Table 7.2.2 and shown in the associated plots.

Test specification:	Section 15.109 Class B, Radiated emissions		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	Air Pressure: 1010 hPa	Relative Humidity: 28 %	Power Supply: 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

Figure 7.2.1 Setup for radiated emission measurements in anechoic chamber, table-top EUT

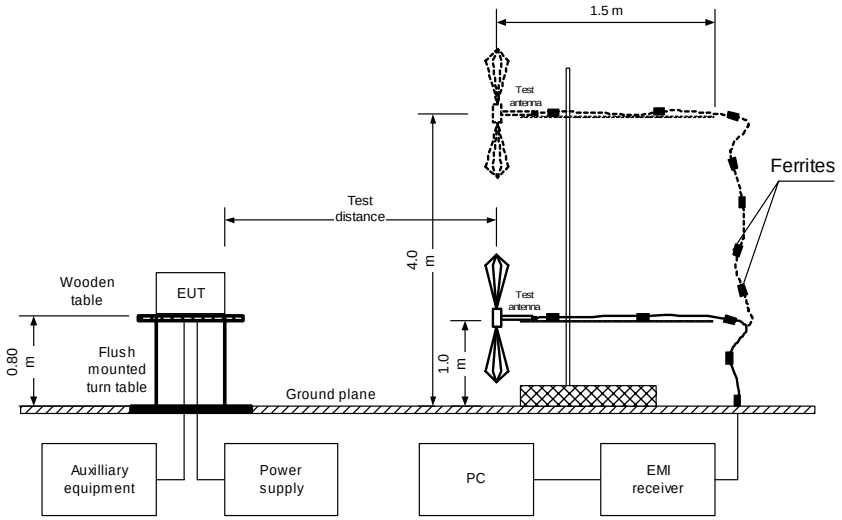


Photograph 7.2.1 Setup for radiated emission measurements in anechoic chamber



Test specification:	**Section 15.109 Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 28 %	**Power Supply:** 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

Figure 7.2.2 Setup for radiated emission measurements at OATS, table-top EUT



Test specification:	Section 15.109 Class B, Radiated emissions		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	Air Pressure: 1010 hPa	Relative Humidity: 28 %	Power Supply: 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

Photograph 7.2.2 Setup for radiated emission measurements at OATS, general view

Photograph 7.2.3 Setup for radiated emission measurements at OATS, EUT cabling

Test specification:	**Section 15.109 Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 28 %	**Power Supply:** 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

Table 7.2.2 Radiated emission test results

EUT SET UP: TABLE-TOP
FREQUENCY RANGE: 30 MHz – 1000 MHz
TEST SITE: OATS
TEST DISTANCE: 10 m
DETECTORS USED: PEAK / QUASI-PEAK
RESOLUTION BANDWIDTH: 120 kHz

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
284.073000	31.26	30.07	35.50	-5.43	Horizontal	1.0	205	Pass
321.947750	30.58	28.88	35.50	-6.62	Vertical	1.0	284	
340.874650	29.39	27.32	35.50	-8.18	Horizontal	1.0	218	
692.760200	35.62	31.50	35.50	-4.00	Horizontal	1.0	201	

TEST SITE: OATS
TEST DISTANCE: 3 m

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
303.015000	44.02	40.09	46.00	-5.91	Horizontal	1.0	80	Pass
312.478750	38.49	37.57	46.00	-8.43	Horizontal	1.0	76	

TEST SITE: ANECHOIC CHAMBER
TEST DISTANCE: 3 m

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
190.702050	30.22	29.04	43.50	-14.46	Horizontal	1.1	221	Pass

FREQUENCY RANGE: 1000 MHz – 40000 MHz
TEST SITE: ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTOR USED: PEAK
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz	Peak emission, dB(µV/m)	Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
No emissions were found.								Pass

*****- Margin = Measured emission - specification limit.
******- EUT front panel refers to 0 degrees position of turntable.

Reference numbers of test equipment used

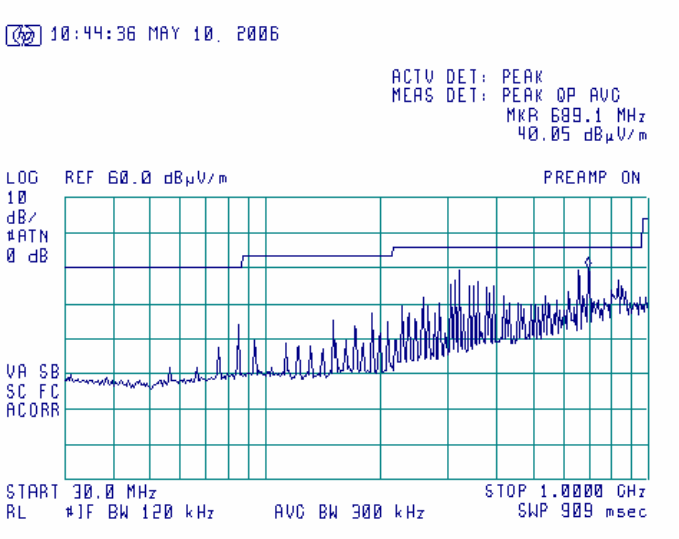
HL 0034	HL 0415	HL 0768	HL 0769	HL 0784	HL 0813	HL 1425	HL 1430
HL 1552	HL 1553	HL 1566	HL 1848	HL 1849	HL 1850	HL 1947	HL 1984
HL 2109	HL 2697						

Full description is given in Appendix A.

Test specification:	**Section 15.109 Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 28 %	**Power Supply:** 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

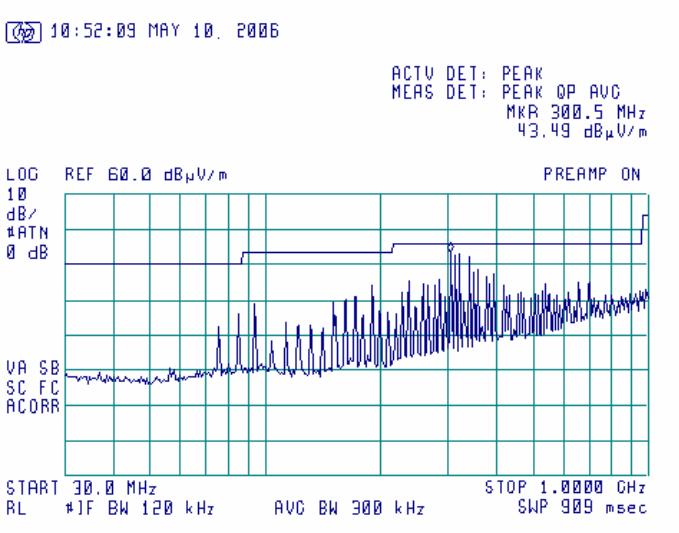
Plot 7.2.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.2 Radiated emission measurements in 30 - 1000 MHz range, horizontal antenna polarization

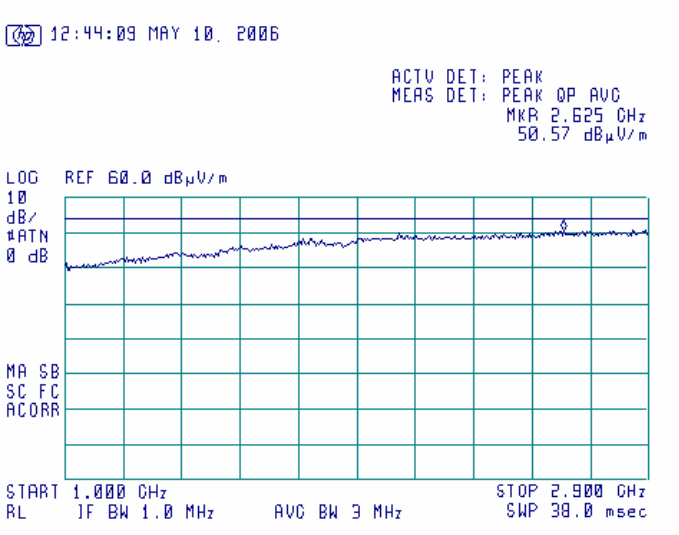
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Test specification:	Section 15.109 Class B, Radiated emissions		
Test procedure:	ANSI C63.4, Section 11.6		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	6/6/2006 4:32:37 AM		
Temperature: 24.3 ºC	Air Pressure: 1010 hPa	Relative Humidity: 28 %	Power Supply: 12 VDC
Remarks: The EUT was tested in arm mode as the worst case.			

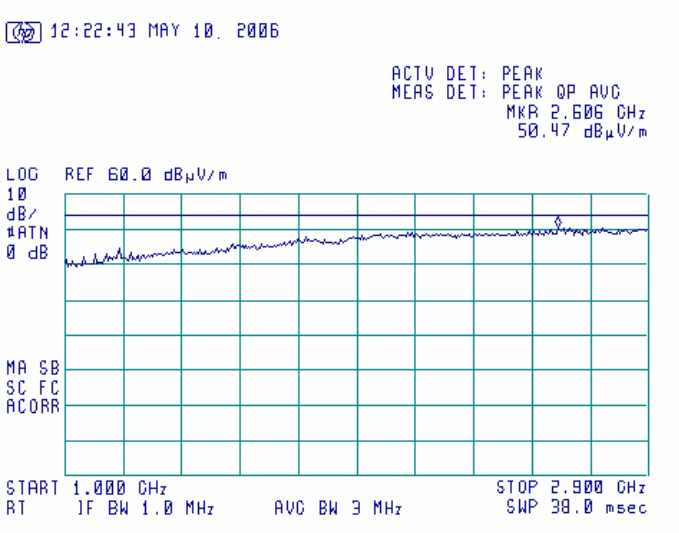
Plot 7.2.3 Radiated emission measurements in 1000 - 2900 MHz range, vertical antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.2.4 Radiated emission measurements in 1000 - 2900 MHz range, horizontal antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Note: Due to setup hardware restrictions, the plots are provided in 30 – 2900 MHz range only.

8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0034	Antenna, Log Periodic, 200 - 1000 MHz	Electro-Metrics	LPA 25/30	1988	10-Jan-06	10-Jan-07
0415	Cable, Coax, RF, RG-214	HL	CC-3	056	02-Dec-05	02-Dec-06
0447	LISN, 16/2, 300V RMS	HL	LISN 16 - 1	066	03-Nov-05	03-Nov-06
0672	Shielded Room 4,6(L) x 4,2(W) x 2,4(H) m	HL	SR - 3	027	11-Nov-05	11-Nov-06
0768	Antenna Standard Gain Horn,18-26.5 GHz, WR-42, K-band, Gain - 25 dB	Quinstar Technology	QWH-4200-BA	110	21-Jul-04	21-Jul-07
0769	Antenna Standard Gain Horn, 26.5-40 GHz, WR28, Ka band, Gain 25 dB	Quinstar Technology	QWH-2800-BA	112	21-Jul-04	21-Jul-07
0784	Antenna X-WING BILOG 20 MHz - 2 GHz	Schaffner-Chase EMC	CBL6140 A	1120	10-Jan-06	10-Jan-07
0787	Transient Limiter	Hewlett Packard	11947A	3107A01877	21-Nov-05	21-Nov-06
0813	Cable Coax, RG-214, 12 m, N-type connectors	HL	C214-12	149	02-Dec-05	02-Dec-06
1215	Gertsch ratio transformer, 350V	Singer, Alfred, Eaton	RT-60	1077	01-Jan-06	01-Jan-07
1425	EMI Receiver, 9 kHz - 2.9 GHz	Agilent Technologies	8542E	3710A00222, 3705A00204	01-Sep-05	01-Sep-06
1430	EMI Receiver, 9 kHz - 2.9 GHz	Agilent Technologies	8542E	3807A00262,3705A00217	01-Sep-05	01-Sep-06
1503	Cable RF, 6 m	Belden	M17/167 MIL-C-17	1503	11-Sep-05	11-Sep-06
1552	Cable RF, 8 m	Alpha Wire	RG-214	1552	02-Dec-05	02-Dec-06
1553	Cable RF, 3.5 m	Alpha Wire	RG-214	1553	02-Dec-05	02-Dec-06
1566	Cable RF, 2 m	Huber-Suhner	Sucoflex 104PE	13094/4PE	02-Dec-05	02-Dec-06
1848	Antenna mast 4m/6m with polarity control (OATS)	Sh. I. Machines	AM-5	1	18-Apr-06	18-Apr-07
1849	Antenna mast with polarity control (Small Anechoic chamber)	Sh. I. Machines	AM-F4	1849	18-Jan-06	18-Jan-07
1850	Turntable	Sh. I. Machines	TT-M-3	1850	11-Nov-05	11-Nov-06
1947	Cable 18GHz, 6.5 m, blue	Rhophase Microwave Limited	NPS-1803A-6500-NPS	T4974	17-Oct-05	17-Oct-06
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type	EMC Test Systems	3115	9911-5964	03-Mar-06	03-Mar-07
2109	Anechoic Chamber 6(L) x 5.5(W) x 2.95(H) m	HL	AC-2	2109	11-Nov-05	11-Nov-06
2697	Antenna, 30 MHz - 3.0 GHz	Sunol Sciences. Corp. Pleasanton, California USA	JB3	A022805	10-Jan-06	10-Jan-07

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted emissions at mains port with LISN and HP 8542E or HP 8546A receiver	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 10 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.0 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.1 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 5.5 dB Biconical antenna: ± 5.5 dB Log periodic antenna: ± 5.6 dB Double ridged horn antenna: ± 5.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

The test equipment has been calibrated according to its recommended procedures and is within the manufacturer's published limit of error. The standards and instruments used in the calibration system conform to the present requirements of ISO/IEC 17025 (or alternately ANSI/NCSL Z540-1).
The laboratory calibrates its measurement standards by a third party (traceable to NIST, USA) on a regular basis according to equipment manufacturer requirements. The Hermon Labs EMC measurements uncertainty is given in the table above.
Person for contact: Mr. Alex Usoskin, CEO.

10 APPENDIX C Test facility description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility. Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47) and by Industry Canada for electromagnetic emissions (file numbers IC 2186-1 for OATS and IC 2186-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), assessed by TNO Certification EP&S (Netherlands) for a number of EMC, telecommunications, environmental, safety standards, and by AMTAC (UK) for safety of medical devices. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01) and approved by Israel Ministry of environmental protection, radiation hazards department (Permit number 1158).

Address: P.O. Box 23, Binyamina 30500, Israel.
Telephone: +972 4628 8001
Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

FCC 47CFR part 15: 2005 subpart B	Radio Frequency Devices
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

12 APPENDIX E Abbreviations and acronyms

A	ampere
AC	alternating current
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
DC	direct current
EMC	electromagnetic compatibility
EMI	electromagnetic interference
EUT	equipment under test
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
kV	kilovolt
L	length
LISN	line impedance stabilization network
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
NP	normal performance
OATS	open area test site
Ω	Ohm
QP	quasi-peak
PS	power supply
RE	radiated emission
RF	radio frequency
rms	root mean square
s	second
V	volt
W	width

13 APPENDIX F Test equipment correction factors

Correction factor
Line impedance stabilization network
Model LISN 16 - 1
Hermon Laboratories

Frequency, MHz	Correction factor, dB
0.01	5.0
0.02	2.2
0.03	1.1
0.04	0.7
0.05	0.5
0.1	0.2
0.2	0.1
0.4	0.1
0.6	0.1
0.8	0.1
1	0.1
2	0.1
3	0.1
4	0.1
6	0.2
10	0.3
12	0.4
16	0.5
18	0.6
20	0.7
25	0.9
28	1.2
30	1.3

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.

Log periodic antenna factor

Electro-Metrics, model LPA-25/30, serial number 1988

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
200	12.6	625	20.4
225	12.2	650	20.9
250	13.4	675	22.0
275	14.3	700	22.2
300	15.2	725	22.7
325	15.7	750	22.5
350	15.9	775	22.7
375	16.4	800	22.8
400	17.0	825	23.2
425	17.4	850	23.5
450	17.9	875	23.9
475	18.6	900	24.0
500	19.1	925	24.0
525	19.3	950	24.2
550	19.6	975	24.7
575	19.8	1000	25.1
600	20.0		

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna calibration
Sunol Sciences Inc., model JB3, serial number A022805

Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain	Frequency, MHz	ACF, dB	Gain, dBi	Num gain
30	22.2	-22.5	0.01	620	19.7	6.3	4.27	1215	24.9	7.0	5.05	1810	28.3	7.1	5.08	2405	30.9	6.9	4.93
35	18.5	-17.4	0.02	625	19.7	6.5	4.42	1220	24.9	7.0	4.99	1815	28.5	6.9	4.91	2410	30.9	6.9	4.89
40	14.7	-12.5	0.06	630	19.6	6.6	4.57	1225	25.1	6.9	4.91	1820	28.6	6.8	4.74	2415	31.0	6.9	4.85
45	11.3	-8.1	0.16	635	19.7	6.5	4.48	1230	25.2	6.8	4.82	1825	28.7	6.8	4.75	2420	31.0	6.8	4.82
45	11.3	-8.1	0.16	640	19.9	6.4	4.40	1235	25.1	7.0	4.96	1830	28.7	6.8	4.76	2425	31.1	6.8	4.81
50	8.9	-4.7	0.34	645	19.9	6.5	4.45	1240	25.0	7.1	5.09	1835	28.7	6.7	4.72	2430	31.0	6.9	4.87
55	7.9	-2.8	0.52	650	19.9	6.5	4.51	1245	25.0	7.1	5.12	1840	28.8	6.7	4.69	2435	31.0	6.9	4.88
60	7.8	-2.1	0.62	655	19.9	6.6	4.60	1250	25.0	7.1	5.15	1845	28.6	6.9	4.90	2440	31.2	6.8	4.74
65	8.5	-2.0	0.63	660	19.9	6.7	4.69	1255	25.0	7.2	5.25	1850	28.4	7.1	5.12	2445	31.1	6.9	4.91
70	9.0	-1.9	0.64	665	19.9	6.7	4.70	1260	24.9	7.3	5.36	1855	28.5	7.0	5.07	2450	31.0	7.0	4.96
75	8.8	-1.1	0.78	670	20.0	6.7	4.71	1265	25.0	7.3	5.31	1860	28.6	7.0	5.01	2455	31.0	7.0	5.01
80	8.4	-0.2	0.97	675	20.1	6.7	4.71	1270	25.1	7.2	5.26	1865	28.5	7.1	5.17	2460	30.9	7.2	5.19
85	8.0	0.8	1.20	680	20.1	6.7	4.71	1275	25.3	7.0	5.05	1870	28.4	7.3	5.33	2465	31.1	6.9	4.95
90	8.2	1.1	1.29	685	20.1	6.8	4.79	1280	25.5	6.8	4.84	1875	28.4	7.2	5.28	2470	31.3	6.8	4.76
95	9.2	0.5	1.13	690	20.1	6.9	4.88	1285	25.4	7.0	4.97	1880	28.5	7.2	5.22	2475	31.4	6.7	4.69
100	10.6	-0.4	0.92	695	20.2	6.8	4.82	1290	25.3	7.1	5.10	1885	28.5	7.2	5.22	2480	31.3	6.8	4.79
105	11.7	-1.1	0.78	700	20.3	6.8	4.76	1295	25.3	7.2	5.22	1890	28.6	7.2	5.21	2485	31.1	7.0	5.00
110	12.6	-1.6	0.70	705	20.4	6.8	4.75	1300	25.2	7.3	5.33	1895	28.6	7.2	5.24	2490	31.1	7.0	4.99
115	13.3	-1.9	0.65	710	20.5	6.8	4.75	1305	25.3	7.2	5.21	1900	28.6	7.2	5.27	2495	31.2	7.0	4.99
120	13.9	-2.1	0.62	715	20.5	6.8	4.80	1310	25.5	7.1	5.09	1905	28.5	7.3	5.36	2500	30.9	7.2	5.27
125	14.2	-2.0	0.63	720	20.5	6.9	4.85	1315	25.4	7.2	5.23	1910	28.5	7.4	5.45	2505	31.1	7.1	5.15
130	14.2	-1.7	0.68	725	20.6	6.8	4.81	1320	25.3	7.3	5.36	1915	28.5	7.3	5.38	2510	31.0	7.2	5.22
135	13.8	-1.0	0.79	730	20.7	6.8	4.77	1325	25.5	7.2	5.21	1920	28.6	7.3	5.31	2515	31.0	7.2	5.26
140	13.4	-0.3	0.94	735	20.9	6.7	4.65	1330	25.6	7.0	5.06	1925	28.6	7.3	5.35	2520	31.2	7.0	5.05
145	13.1	0.3	1.08	740	21.0	6.6	4.53	1335	25.7	7.1	5.07	1930	28.6	7.3	5.39	2525	30.8	7.4	5.54
150	12.9	0.8	1.21	745	21.0	6.6	4.59	1340	25.7	7.1	5.09	1935	28.5	7.4	5.54	2530	31.0	7.3	5.37
155	12.7	1.3	1.34	750	21.0	6.7	4.64	1345	25.7	7.1	5.13	1940	28.4	7.6	5.70	2535	31.2	7.0	5.06
160	12.7	1.6	1.44	755	21.0	6.8	4.74	1350	25.7	7.1	5.17	1945	28.5	7.5	5.59	2540	31.2	7.1	5.09
165	12.5	2.0	1.59	760	21.0	6.8	4.83	1355	25.8	7.0	5.06	1950	28.6	7.4	5.48	2545	31.0	7.3	5.43
170	12.2	2.6	1.83	765	21.1	6.8	4.73	1360	25.9	6.9	4.95	1955	28.6	7.5	5.57	2550	31.0	7.3	5.39
175	11.8	3.3	2.13	770	21.3	6.7	4.64	1365	26.0	6.9	4.95	1960	28.6	7.5	5.65	2555	31.1	7.2	5.30
180	11.6	3.7	2.36	775	21.3	6.7	4.68	1370	26.0	7.0	4.96	1965	28.7	7.4	5.47	2560	31.0	7.4	5.47
185	11.5	4.0	2.54	780	21.3	6.7	4.72	1375	26.0	7.0	5.01	1970	28.9	7.2	5.29	2565	30.8	7.6	5.70
190	11.6	4.2	2.61	785	21.3	6.8	4.77	1380	26.0	7.0	5.06	1975	28.9	7.2	5.22	2570	31.1	7.3	5.37
195	12.1	3.9	2.47	790	21.3	6.8	4.82	1385	26.0	7.0	4.99	1980	29.0	7.1	5.16	2575	31.5	7.0	4.96
200	13.1	3.2	2.07	795	21.4	6.8	4.79	1390	26.1	6.9	4.92	1985	29.1	7.1	5.11	2580	31.6	6.9	4.87
205	12.0	4.4	2.76	800	21.5	6.8	4.77	1395	26.2	6.9	4.94	1990	29.1	7.0	5.06	2585	31.6	6.8	4.79
210	11.0	5.6	3.66	805	21.6	6.7	4.71	1400	26.2	7.0	4.96	1995	29.1	7.1	5.09	2590	31.6	6.9	4.88
215	11.3	5.6	3.59	810	21.7	6.7	4.65	1405	26.1	7.0	5.02	2000	29.1	7.1	5.11	2595	31.5	7.0	4.97
220	11.6	5.5	3.52	815	21.7	6.7	4.72	1410	26.1	7.1	5.09	2005	29.1	7.1	5.16	2600	31.6	6.9	4.86
225	11.7	5.5	3.55	820	21.7	6.8	4.80	1415	26.2	7.0	5.02	2010	29.1	7.1	5.15	2605	31.3	7.2	5.30
230	11.9	5.5	3.57	825	21.7	6.8	4.82	1420	26.3	7.0	4.96	2015	29.2	7.1	5.13	2610	31.4	7.1	5.15
235	12.1	5.5	3.56	830	21.7	6.9	4.85	1425	26.2	7.1	5.10	2020	29.2	7.1	5.18	2615	31.7	6.9	4.88
240	12.3	5.5	3.54	835	21.8	6.8	4.82	1430	26.1	7.2	5.25	2025	29.3	7.1	5.08	2620	31.6	7.0	4.97
245	12.3	5.7	3.71	840	21.9	6.8	4.80	1435	26.1	7.2	5.24	2030	29.3	7.0	5.05	2625	31.4	7.1	5.17
250	12.3	5.9	3.88	845	21.9	6.8	4.83	1440	26.2	7.2	5.24	2035	29.3	7.1	5.07	2630	31.6	7.0	5.00
255	12.5	5.9	3.85	850	21.9	6.9	4.86	1445	26.3	1	5.11	2040	29.3	7.1	5.13	2635	31.8	6.8	4.82
260	12.7	5.8	3.83	855	22.0	6.8	4.80	1450	26.5	7.0	4.98	2045	29.2	7.2	5.23	2640	31.7	7.0	4.98
265	13.2	5.5	3.54	860	22.1	6.8	4.74	1455	26.4	7.1	5.07	2050	29.2	7.2	5.27	2645	31.7	6.9	4.93
270	13.7	5.2	3.27	865	22.0	6.9	4.92	1460	26.4	7.1	5.17	2055	29.3	7.2	5.21	2650	31.8	6.9	4.85
275	13.7	5.3	3.39	870	21.9	7.1	5.11	1465	26.4	7.2	5.19	2060	29.5	7.0	5.02	2655	31.8	6.9	4.85
280	13.7	5.4	3.50	875	22.0	7.1	5.08	1470	26.4	7.2	5.22	2065	29.4	7.1	5.08	2660	31.7	7.0	5.02
285	13.7	5.6	3.61	880	22.1	7.0	5.05	1475	26.4	7.1	5.17	2070	29.4	7.1	5.10	2665	32.0	6.7	4.71
290	13.7	5.7	3.72	885	22.1	7.0	5.06	1480	26.5	7.1	5.12	2075	29.5	7.0	5.01	2670	32.0	6.7	4.67
295	13.8	5.8	3.77	890	22.1	7.0	5.06	1485	26.5	7.1	5.14	2080	29.8	6.8	4.76	2675	31.9	6.8	4.81
300	13.9	5.8	3.81	895	22.2	7.1	5.09	1490	26.5	7.1	5.17	2085	29.7	6.9	4.89	2680	31.7	7.0	5.04
305	14.0	5.9	3.85	900	22.2	7.1	5.12	1495	26.5	7.2	5.24	2090	29.7	6.9	4.86	2685	31.9	6.8	4.83
310	14.1	5.9	3.88	905	22.3	7.1	5.09	1500	26.5	7.2	5.31	2095	29.8	6.8	4.78	2690	32.1	6.7	4.72
315	14.3	5.9	3.89	910	22.3	7.0	5.05	1505	26.5	7.2	5.27	2100	29.9	6.8	4.75	2695	32.1	6.7	4.71
320	14.4	5.9	3.90	915	22.4	7.0	4.99	1510	26.6	7.2	5.23	2105	29.8	6.8	4.81	2700	32.0	6.8	4.81
325	14.5	5.9	3.92	920	22.6	6.9	4.92	1515	26.6	7.2	5.30	2110	29.9	6.8	4.78	2705	32.0	6.8	4.80
330	14.6	5.9	3.93	925	22.7	6.9	4.85	1520	26.5	7.3	5.38	2115	29.9	6.8	4.76	2710	32.1	6.8	4.79
335	14.7	6.0	4.02	930	22.8	6.8	4.77	1525	26.6	7.3	5.37	2120	29.9	6.8	4.84	2715	32.1	6.7	4.71
340	14.7	6.2	4.12	935	22.8	6.8	4.83	1530	26.6	7.3	5.36	2125	29.9	6.9	4.89	2720	32.4	6.5	4.47
345	14.9	6.1	4.06	940	22.8	6.9	4.89	1535	26.6	7.4	5.44	2130	29.9	6.9	4.90	2725	32.2	6.7	4.63
350	15.1	6.0	3.99	945	22.8	6.9	4.87	1540	26.5	7.4	5.53	2135	29.8	6.9	4.94	2730	31.9	7.0	5.05
355	15.3	5.9	3.88	950	22.9	6.9	4.85	1545	26.5	7.5	5.58	2140	29.8	7.1	5.08	2735	31.6	7.4	5.44
360	15.6	5.8	3.78	955	23.0	6.8	4.81	1550	26.5	7.5	5.63	2145	29.9	6.9	4.92	2740	31.6	7.1	5.46
365	15.5	5.9	3.89	960	23.1	6.8	4.77	1555	26.7	7.3	5.39	2150	29.9	7.0	4.98	2745	31.9	7.0	5.06
370	15.5	6.0	4.01	965	23.1	6.7	4.73	1560	26.9	7.1	5.16	2155	29.8	7.1	5.10	2750	32.0	6.9	4.94
375	15.6	6.1	4.03	970	23.2	6.7	4.69	1565	26.9	7.2	5.23	2160	29.8	7.1	5.09	2755	32.0	7.0	4.98
380	15.7	6.1	4.05	975	23.3	6.6	4.62	1570	26.9	7.2	5.30	2165	29.9	7.0	5.00	2760	32.0	7.0	5.06
385	15.7	6.2	4.15	980	23.5	6.6	4.54	1575	27.0	7.2	5.23	2170	29.9	7.1	5.07	2765	32.2	6.8	4.80
390	15.7	6.3	4.25	985	23.5	6.6	4.52	1580	27.0	7.1	5.17	2175	29.8	7.2	5.20	2770	32.3	6.8	4.73
395	15.9	6.3	4.22	990	23.6	6.5	4.50	1585	27.0	7.2	5.20	2180	29.8	7.2	5.27	2775	32.3	6.8	4.77
400	16.0	6.2	4.18	995	23.6	6.5	4.48	1590	27.0	7.2	5.22	2185	29.8	7.2	5.27	2780	32.3	6.8	4.82
405	16.3	6.1	4.07	1000	23.7	6.5	4.46	1595	27.0	7.2	5.29	2190	29.8	7.2	5.28	2785	32.7	6.4	4.41
410	16.5	6.0	3.96	1005	23.7	6.5	4.51	1600	27.0	7.3	5.36	2195	29.8	7.2	5.30	2790	32.8	6.3	4.25
415	16.5	6.0	4.00	1010	23.7	6.6	4.57	1605	27.0	7.3	5.38	2200	29.7	7.3	5.38	2795	32.8	6.4	4.33
420	16.6	6.1	4.03	1015	23.7	6.6	4.55	1610	27.0	7.3	5.41	2205	29.7	7.3	5.41	2800	32.5	6.7	4.66
425	16.6	6.1	4.10	1020	23.8	6.6	4.54	1615	27.1	7.3	5.33	2210	29.7	7.4	5.47	2805	32.5	6.6	4.62
430	16.7	6.2	4.16	1025	23.8	6.6	4.62	1620	27.2	7.2	5.27	2215	29.7	7.4	5.54	2810	32.5	6.7	4.70
435	16.9	6.1	4.05	1030	23.7	6.7	4.70	1625	27.2	7.2	5.30	2220	29.7	7.5	5.57	2815	32.3	6.9	4.85
440	17.1	5.9	3.93	1035	23.7	6.8	4.81	1630	27.2	7.3	5.33	2225	29.8	7.3	5.43	2820	32.2	7.0	5.01
445	17.2	6.0	3.97	1040	23.6	6.9	4.92	1635	27.2	7.3	5.35	2230	29.8	7.4	5.45	2825	32.3	7.0	4.96
450	17.2	6.0	4.00	1045	23.7	6.9	4.91	1640	27.2	7.3	5.36	2235	29.7	7.5	5.61	2830	32.4	6.8	4.80
455	17.3	6.1	4.04	1050	23.7	6.9	4.91	1645	27.3	7.2	5.22	2240	29.5	7.7	5.86	2835	32.5	6.7	4.68
460	17.4	6.1	4.07	1055	23.7	7.0	5.01	1650	27.5	7.1	5.09	2245	29.8	7.4	5.53	2840	32.5	6.8	4.78
465	17.5	6.1	4.05	1060	23.6	7.1	5.11	1655	27.5	7.1	5.11	2250	30.0	7.3	5.35	2845	32.6	6.6	4.62
470	17.6	6.1	4.04	1065	23.7	7.0	5.06	1660	27.5	7.1	5.13	2255	30.0	7.2	5.28	2850	32.6	6.7	4.70
475	17.7	6.0	3.99	1070	23.8	7.0	5.01	1665	27.6	7.0	5.06	2260	30.1	7.2	5.24	2855	32.4	6.9	4.88
480	17.9	5.9	3.93	1075	23.8	7.0	5.01	1670	27.7	7.0	4.99	2265	30.1	7.2	5.20	2860	32.4	7.0	4.98
485	18.0	5.9	3.88	1080	23.9	7.0	5.01	1675	27.7	7.0	5.02	2270	30.2	7.1	5.12	2865	32.8	6.5	4.52
490	18.2	5.8	3.82	1085	24.0	7.0	4.96	1680	27.7	7.0	5.05	2275	30.3	7.0	5.05	2870	33.0	6.3	4.30
495	18.0	6.0	4.02	1090	24.0	6.9	4.91	1685	27.7	7.0	5.01	2280	30.0	7.0	5.06	2875	33.0	6.4	4.38
500	17.9	6.3	4.23	1095	24.1	6.9	4.86	1690	27.8	7.0	4.98	2285	30.3	7.0	5.05	2880	32.5	6.9	4.87
505	17.9	6.3	4.29	1100	24.2	6.8	4.82	1695	27.8	7.0	5.01	2290	30.3	7.1	5.07	2885	33.0	6.4	4.40
510	18.0	6.4	4.36	1105	24.3	6.8	4.80	1700	27.8	7.0	5.03	2295	30.3	7.1	5.13	2890	33.1	6.3	4.28
515	18.1	6.4	4.34	1110	24.3	6.8	4.78	1705	27.8	7.1	5.09	2300	30.2	7.2	5.23	2895	33.1	6.4	4.34
520	18.2	6.4	4.32	1115	24.3	6.8	4.79	1710	27.7	7.1	5.16	2305	30.3	7.2	5.20	2900	33.0	6.4	4.41
525	18.2	6.4	4.36	1120	24.4	6.8	4.80	1715	27.8	7.1	5.08	2310	30.2	7.3	5.35	2905	32.9	6.6	4.58
530	18.3	6.4	4.39	1125	24.3	6.9	4.90	1720	27.9	7.0	5.00	2315	30.1	7.4	5.45	2910	32.9	6.5	4.51
535	18.3	6.4	4.41	1130	24.3	7.0	5.00	1725	28.0	7.0	4.99	2320	30.3	7.2	5.27	2915	33.1	6.4	4.33
540	18.4	6.4	4.41	1135	24.4	6.9	4.90	1730	28.0	7.0	4.98	2325	304	7.2	5.22	2920	33.3	6.2	4.16
545	18.4	6.5	4.47	1140	24.5	6.8	4.81	1735	28.0	7.0	5.02	2330	30.4	7.1	5.13	2925	33.0	6.5	4.45
550	18.4	6.6	4.53	1145	24.6	6.8	4.76	1740	28.0	7.1	5.07	2335	30.5	7.0	5.07	2930	33.0	6.5	4.51
555	18.6	6.5	4.45	1150	24.7	6.7	4.71	1745	28.0	7.0	5.04	2340	30.5	7.1	5.11	2935	33.0	6.5	4.48
560	18.8	6.4	4.37	1155	24.7	6.8	4.76	1750	28.1	7.0	5.01	2345	30.6	7.0	5.07	2940	33.0	6.5	4.52
565	18.9	6.4	4.33	1160	24.7	6.8	4.80	1755	27.9	7.1	5.17	2350	30.5	7.1	5.12	2945	33.1	6.5	4.42
570	19.0	6.3	4.28	1165	24.7	6.8	4.81	1760	27.8	7.3	5.34	2355	30.6	7.1	5.08	2950	33.2	6.4	4.32
575	19.1	6.3	4.31	1170	24.7	6.8	4.81	1765	27.9	7.3	5.31	2360	30.9	6.8	4.79	2955	33.3	6.3	4.27
580	19.1	6.4	4.33	1175	24.8	6.8	4.84	1770	27.9	7.2	5.28	2365	31.0	6.7	4.66	2960	33.3	6.3	4.30
585	19.1	6.5	4.43	1180	24.8	6.9	4.86	1775	27.9	7.3	5.32	2370	31.1	6.6	4.61	2965	33.4	6.2	4.21
590	19.1	6.6	4.52	1185	24.8	6.9	4.92	1780	27.9	7.3	5.35	2375	31.1	6.6	4.60	2970	33.3	6.4	4.36
595	19.0	6.6	4.62	1190	24.7	7.0	4.99	1785	28.1	7.2	5.21	2380	31.1	6.6	4.61	2975	33.0	6.6	4.60
600	19.0	6.7	4.72	1195	24.7	7.0	5.02	1790	28.2	7.0	5.07	2385	31.1	6.7	4.62	2980	32.9	6.8	4.74
605	19.1	6.8	4.74	1200	24.7	7.0	5.05	1795	28.2	7.0	5.07	2390	31.2	6.6	4.56	2985	32.8	6.9	4.93
610	19.1	6.8	4.76	1205	24.08	7.1	5.08	1800	28.3	7.0	5.06	2395	31.2	6.6	4.60	2990	32.9	6.8	4.82
615	19.4	6.5	4.51	1210	24.8	7.1	5.11	1805	28.3	7.1	5.07	2400	30.9	6.9	4.93	3000	33.4	6.4	4.33

Biconilog antenna factor

Schaffner Chase EMC, model CBL 6140A, serial number 1120

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
20	12.1	600	19.1
22	8.8	620	19.8
24	5.5	640	20.6
26	3.0	660	20.7
28	2.8	680	20.9
30	3.9	700	21.0
40	8.4	720	21.4
50	9.3	740	21.7
60	9.7	760	21.6
70	9.3	780	21.6
80	7.5	800	21.9
90	6.8	820	22.2
100	7.6	840	22.6
110	6.6	860	22.7
120	6.9	880	22.7
140	7.6	900	22.9
160	11.6	920	23.2
170	8.3	940	23.7
190	9.2	960	24.3
200	9.9	980	24.6
220	10.5	1000	24.4
240	11.2	1.060	24.3
260	12.9	1.120	24.8
280	12.1	1.180	25.3
300	12.9	1.240	26.1
320	13.2	1.300	26.9
340	13.9	1.360	27.6
360	15.2	1.420	26.8
380	15.3	1.480	26.9
400	15.7	1.520	28.1
420	16.6	1.560	28.1
440	16.8	1.640	28.2
460	17.6	1.700	28.6
480	18.3	1.760	30.0
500	18.0	1.840	31.3
520	18.0	1.900	31.8
540	18.7	1.960	31.6
560	19.2	2.000	32.0
580	19.0		

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(µV) to convert it into field intensity in dB(µV/m).

Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH

Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)
18.000	26.500	32.01
26.500	40.000	35.48
40.000	60.000	39.03
60.000	90.000	42.55
90.000	140.000	46.23
140.000	220.000	50.11

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(µV) to convert it into field intensity in dB(µV/m).

Antenna factor
Double-ridged wave guide horn antenna
Model 3115
Serial number: 9911-5964

Frequency, MHz	Antenna factor. dB(1/m)
1000.0	24.5
1500.0	24.8
2000.0	27.6
2500.0	28.7
3000.0	30.8
3500.0	32.9
4000.0	32.7
4500.0	32.0
5000.0	33.6
5500.0	35.3
6000.0	35.7
6500.0	35.8
7000.0	36.2
7500.0	37.2
8000.0	37.2
8500.0	38.1
9000.0	38.6
9500.0	38.3
10000.0	38.4
10500.0	38.3
11000.0	38.8
11500.0	39.9
12000.0	39.6
12500.0	39.5
13000.0	40.5
13500.0	41.1
14000.0	41.5
14500.0	40.8
15000.0	39.5
15500.0	38.1
16000.0	38.1
16500.0	40.1
17000.0	42.6
17500.0	45.4
18000.0	48.7

Antenna factor is to be added to receiver meter reading in dB(µV) to convert it into field intensity in dB(µV/m).