

a department of PIONEER TECHNOLOGY BELGIUM N.V.

Pioneer

sound. vision. soul

TEST REPORT

File Number : MR-169-2003

E.U.T. Name : K8058

No Serial

- The Test Report may not be reproduced other than in full except with a written approval of the issuing laboratory.

- The test results relate only to the items tested.

Technical Responsible EMC Centre.

Department Manager ESM



Bellinck
04.09.03.

EMC TEST LABORATORY

Joseph Cardijnstraat 31 - 9420 Erpe-Mere - Tel : 053 /82.13.21 - Fax 053/82.13.00

e-mail : bernard_bellinck@pem.pioneer.be
ivan_vlietinck@pem.pioneer.be
hendrik_meuleman@pem.pioneer.be

Department manager
Technical responsible
Test Engineer

CONTENTS



- * *Front page P. 1*
- * *Contents P. 2*
- * *Data Customer & E.U.T. P. 3*
- * *Radiated emission FCC part 15.231*
 - *Test Setup P. 4 .*
 - *Used equipment P. 5 .*
 - *Overview Test Results P. 6 .*
 - *Test Results P. 7 ~ 12. (30 Mhz ~ 1 GHz)*
 - *Test Results pré-compliance P. 13 ~ 15.(1GHz~ 5GHz)*



If the logo->  is mentioned in front of the standard n° = measurement under accreditation
FCD-0370/2 QP-0017

- Name and address of the customer .

Name : Velleman Components N.V.
 Address : Legen Heirweg 33
 9890 Gavere (Asper) Belgie
 Contact : Dhr Santens Stefaan
 Tel/Fax : 09 /384 36 11 09/384 67 03
 09 /389 94 36 09/384 67 02

- Description of the E.U.T.

Name : K8058
 Serial N°: None
 Quotation N° : None
 Part of : -----
 Short description of the functions : (photo) if applicable
 None

PEMC date in : 24-06-2003
 PEMC date out : 07-07-2003
 Manual : No

- Measurements according following standard(s) :

EMC measurements according : 47 CFR part 15 (2003)

Radiated emission part 15.231 Periodic operations in the band 40.66 - 40.70 Mhz and above 70 MHz
 30 MHz ~ 1 GHz compliant measurements

1 GHz ~ 5 GHz pré-compliance measurements

(Battery operated device basic frequency 433 MHz)

- Sampling method.**- Subcontracting.**

Sampling method :
 If YES how :

Tests :
 Name subcontractor :

- Remarks and actions during measurement:

None

For contents of testplan Refer to QP-0017

- Uncertainty :

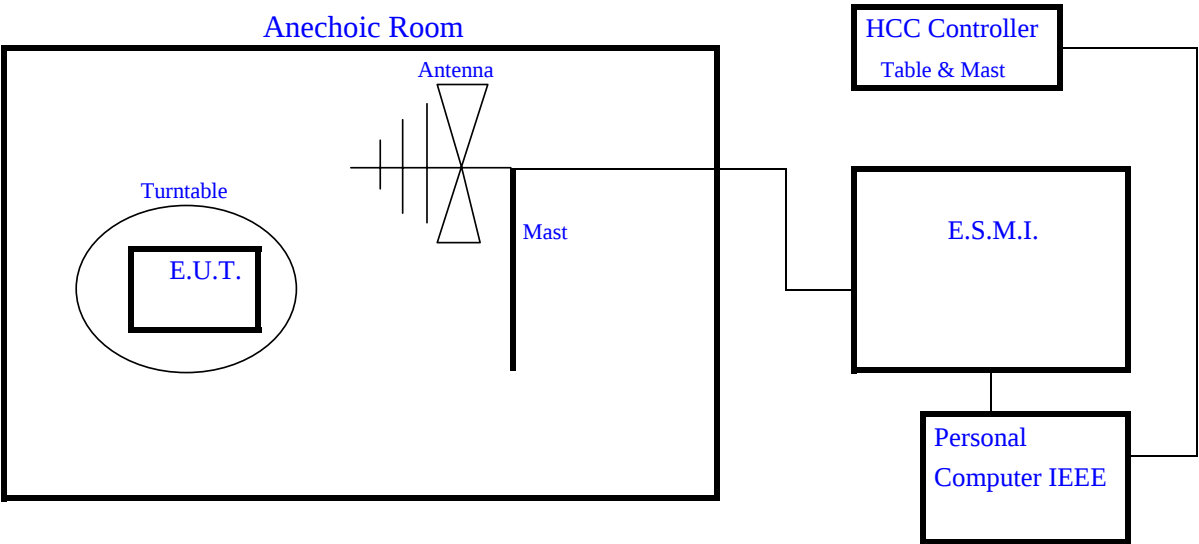
(if the measured value is within the uncertainty of the measuring system, the uncertainty will be indicated into this report. The judge Pass/Fail will not be indicated)

- Temperature & humidity during measurements was between spec:

Humidity :	min 40%	Max.: 70%
Temperature:	min. 18°C	Max.: 24°C
Atmospheric pressure :	1022 hPa	
Mains Voltage :	-----	
DC Voltage :	Value : -----	Spec. : -----

DRAWING AND/OR PICTURE OF TEST SETUP

Test system : PEMC 01 Radiated Emissions periodic operations (40.66-40.70 MHz and above 70 MHz)
According standard N° : FCC part 15.231 (2003)



Picture of Test Setup :



USED EQUIPMENT DURING MEASUREMENT

Test system : PEMC 01

According standard N° : 47 CFR part 15 (2003)

Pemc N°	Description /type	Type	Serial n°	Certificat n°
01-003 K	Bilog antenna 30 MHz-1GHz	CBL6111A	1556	EH-A250/02
01-005 K	Impedance transformer 50 <-> 75 Ohm	RAM	840946/0011	-----
01-006 K	LISN 9 KHz - 30 MHz 2 * 10A, TWO LINE V-NETWORK ESH3-Z5	ESH3-Z5	840730/001	3044201.00
01-007 K	LISN 100 KHz - 200 MHz 100A, 600V DC ESH3-Z6	ESH3-Z6	840522/005	400-2123
01-012 K	Magnetic Loop Antenna	HFH2-Z2	840762/006	-----
01-014 K	EMI test receiver 20 Hz - 26.5 GHz	ESMI	839699/0010 & 840498/004	70979008.00
01-015K	RF Signal generator 5 kHz - 1500 MHz	SMT02	841067/003	020276
01-020 K	Adjustable DC Power supply for DUT, max. 32 V, 10 A	NGSM	451367/0389	030544
01-038 K	Amplifier A.R. 9 kHz - 2 GHz typ 10 dB	CPA923A	3205	-----
01-039 K	ESH3-Z6 V-network 5µH/50ohm LISN 100 kHz - 200 MHz 100A , 600V DC	ESH3-Z6	846422/027	3702939
01-040 K	Active rod antenna 9 kHz - 30 MHz	HFH2-Z6	844857/008	E01080094/1
01-041	RF cable Rod Antenna BNC-BNC	BNC-BNC	None	VR-003-2001
01-042	Power cable rod antenna			
01-043	Antenna probe ROD		4204.1010.02	
01-044 K	Signal divider 1Mhz - 3000Mhz 50 ohm	11N50B	95089	-----
01-045 K	SWR bridge 50 Ohm 5 MHz - 2500 MHz		844979/003	-----
01-051 K	Biconical antenna 20 MHz - 300 MHz	HK116	835291/014	3701468-04
01-052 K	Shielded Calibrated Magnetic field pick-up Coil 5 Hz - 10 MHz	HZ-10	847413/020	EH-A106/01
01-053K	Ultra Broadband Antenna 30MHz ~ 3000MHz	HL562	359524/009	4041.3000.02
01-054K	LISN 50 ohm 5µH 10 KHz-100(200) MHz	NNBM8125	560	CA1457
01-055K	Passive Probe 250v~/50Hz 1500 Ohm 9pF 30 dB 9kHz-30 MHz	ESH2-Z3	837517/002	20-66013
01-056K	Current Probe 20Hz-100 MHz	EZ-17 /02	837394/015	none
01-057K	Decoupling clamp 1...1000 MHz	FTC40x15E	5310	none
01-058K	LOG-PER Antenna 1 GHz ~ 26GHz	HL 025	100193	
01-059K	Pre-amplifier 1 GHz ~ 26GHz	AFS	937326	

OVERVIEW TEST RESULTS

Test System : PEMC -01

According standard : 47 CFR part 15 (Intentional Radiated Emission fundamental & harmonics)

Test mode used	Antenna Polarisation		Requests from customer	Remarks
	Horizontal	Vertical		
Combined horizontal & Vertical .	X	X		
Used test setup and EUT placement				
1 Measured fundamental of transmitter 433 MHz	P	P	Transmitting at full power	
2 Measured 2 harmonic of transmitter	P	P	Transmitting at full power	
3 Measured 3° till 5° harmonic of transmitter	P	P	Transmitting at full power	Pré-compliance measurement
4	--	--		
5	--	--		
6	--	--		
7	--	--		
8	--	--		
9	--	--		
10	--	--		
11	--	--		
12	--	--		
13	--	--		
14	--	--		
15	--	--		

ValidationHardware

Software

Legend

P= Test Pass

- = Test not performed/input not used

F = Test Fail

X = Used Input

Measurement Unintentional Radiated Emissions

MR-169-2003

7/15

EUT: K5058 RF remote
 Manufacturer: Velleman
 Operating Condition: Normal (Fundamental*)
 Test Site: ESM EMC centre
 Operator: Meuleman Hendrik
 Test Specification: FCC15.109 (2003)
 Comment: Battery operated / High level transmitting
 Start of Test: 1/07/2003 / 16:26:53

SCAN TABLE: "FCC15.109"

Unit: dBuV/m

Detector: Mode:

Curve 1: QuasiPeak ClearWrite
 Curve 2: Average ClearWrite

Subrange 1:

Start Frequency: 30.0 MHz Step Size: 60.0 kHz
 Stop Frequency: 1.0 GHz
 Measure Time: 10.0 ms
 IF Bandwidth: 120 kHz

Receiver: ESXI Transducer: CBL61113M
 Signal Path: None System Transducer: None
 Meas. Mode: Lin Add. Transd. 1: AC CP2 (X10) - ANT
 Tracking Gen.: Off Add. Transd. 2: AC CP2 (X10) - RFIN2
 Input: 2DC Add. Transd. 3: None

Preamplifier: 10 dB Demodulation: FM Broad
 RF Att.: 10 dB Volume: 0 %
 Ref. Level: -10.0 dBm Squelch: --
 Min. RF Att.: 10 dB Option: None
 IF Att.: --
 Autorange: On

Curve 1: On Repetition: Single
 Curve 2: On Stop Mark: Off
 Stop Message: On
 Stop Message: mount CBL

Subrange 2:

Start Frequency:
Stop Frequency:
Measure Time:
IF Bandwidth:

1.0 GHz Step Size:
26.5 GHz
10.0 ms
1 MHz

500.0 kHz

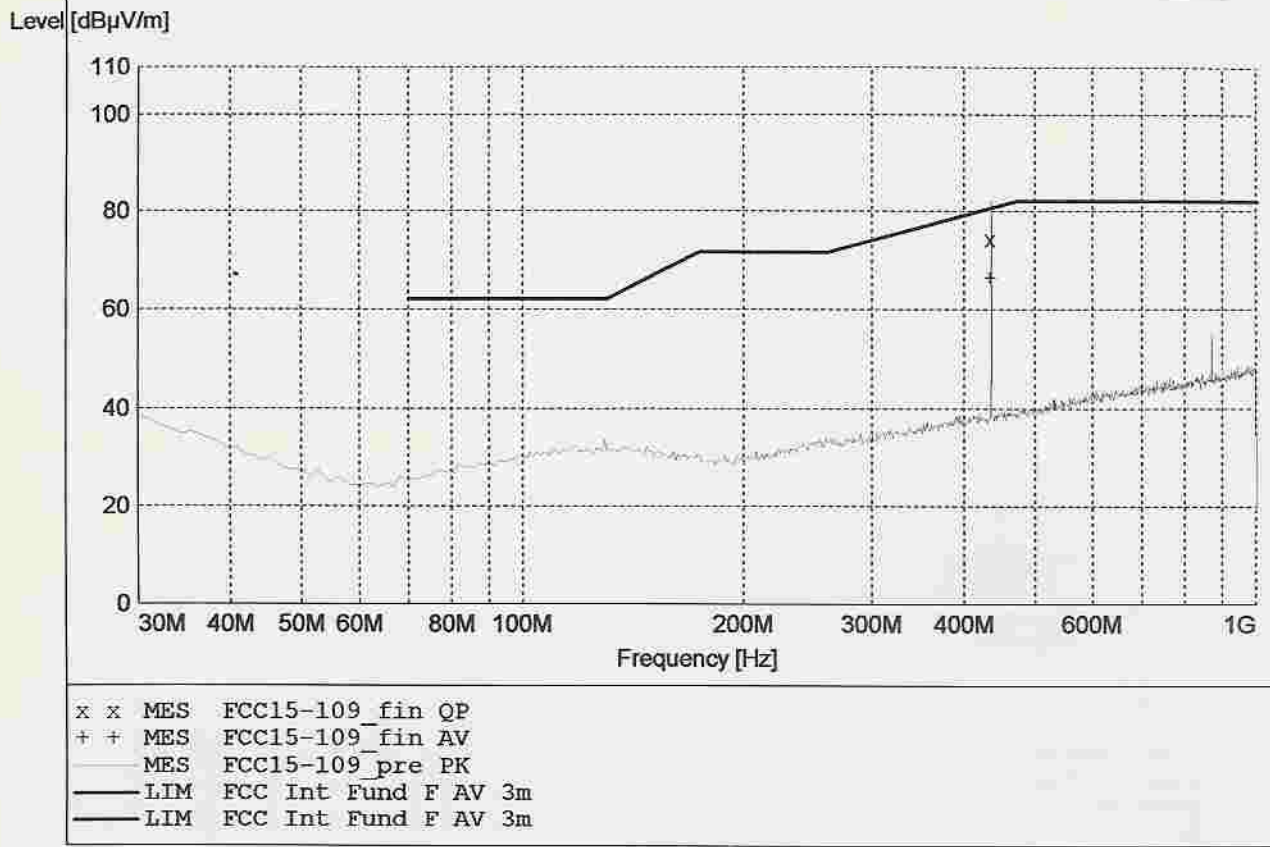
8/15

Receiver:

ESXI Transducer:

HL025

9/15



MEASUREMENT RESULT: "FCC15-109_fin QP"

1/07/2003 16:40

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
*433.680000	74.30	19.9	80.6	6.2	100.0	73.00	HORIZONTAL

MEASUREMENT RESULT: "FCC15-109_fin AV"

1/07/2003 16:40

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
*433.560000	66.30	19.8	80.6	14.3	100.0	73.00	HORIZONTAL

Measurement Unintentional Radiated Emissions

MR-169-2003

EUT: K5058 RF remote
Manufacturer: Velleman
Operating Condition: Normal (Harmonics *)
Test Site: ESM EMC centre
Operator: Meuleman Hendrik
Test Specification: FCC15.109 (2003)
Comment: Battery operated / High level transmitting
Start of Test: 2/07/2003 / 12:29:40

SCAN TABLE: "FCC15.109"

Unit: dBµV/m

Detector: Mode:

Curve 1: QuasiPeak ClearWrite
Curve 2: Average ClearWrite

Subrange 1:

Start Frequency: 30.0 MHz Step Size: 60.0 kHz
Stop Frequency: 1.0 GHz
Measure Time: 10.0 ms
IF Bandwidth: 120 kHz

Receiver: ESXI Transducer: CBL61113M
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: AC CP2 (X10) - ANT
Tracking Gen.: Off Add. Transd. 2: AC CP2 (X10) - RFIN2
Input: 2DC Add. Transd. 3: None

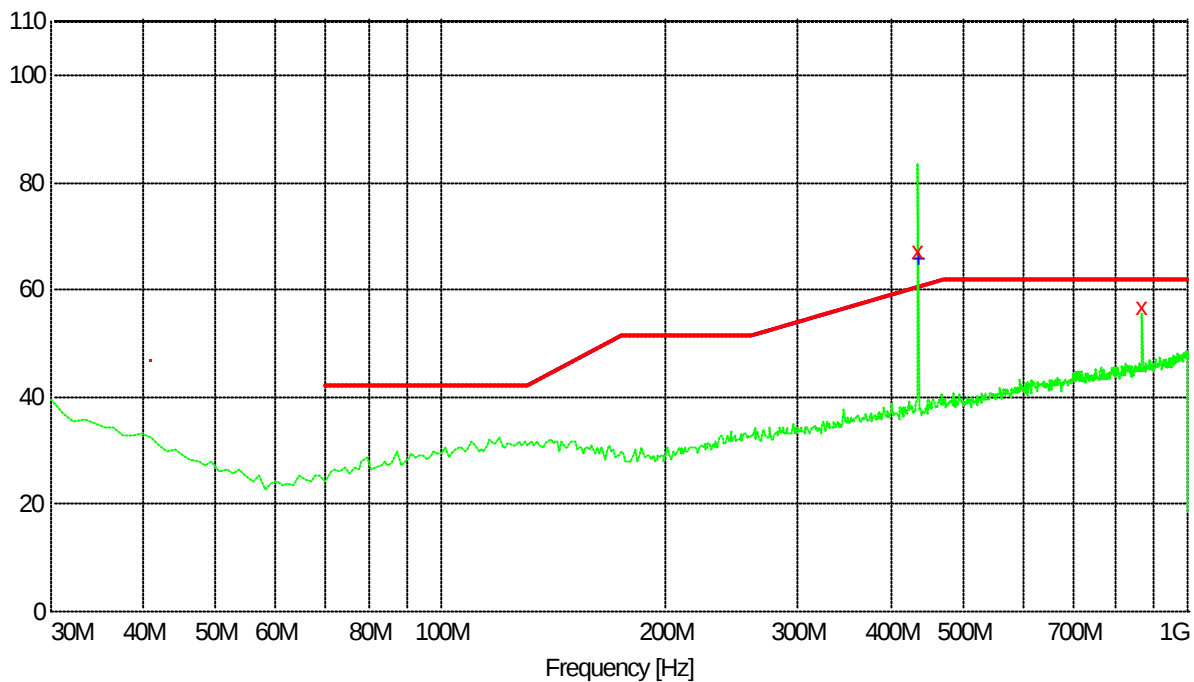
Preamplifier: 10 dB Demodulation: FM Broad
RF Att.: 10 dB Volume: 0 %
Ref. Level: -10.0 dBm Squelch: --
Min. RF Att.: 10 dB Option: None
IF Att.: --
Autorange: On

Curve 1: On Repetition: Single
Curve 2: On Stop Mark: Off
Stop Message: On
Stop Message: mount CBL

Subrange 2:

Start Frequency:	1.0 GHz	Step Size:	500.0 kHz
Stop Frequency:	26.5 GHz		
Measure Time:	10.0 ms		
IF Bandwidth:	1 MHz		
Receiver:	ESXI	Transducer:	HL025
Signal Path:	None	System Transducer:	None
Meas. Mode:	Lin	Add. Transd. 1:	ANT HL025-RFIN2
Tracking Gen.:	Off	Add. Transd. 2:	None
Input:	2DC	Add. Transd. 3:	Pre-amp26GHz
Preamplifier:	10 dB	Demodulation:	FM Broad
RF Att.:	0 dB	Volume:	0 %
Ref. Level:	-10.0 dBm	Squelch:	--
Min. RF Att.:	0 dB	Option:	None
IF Att.:	--		
Autorange:	On		
Curve 1:	On	Repetition:	Single
Curve 2:	On	Stop Mark:	Off
		Stop Message:	On
		Stop Message:	Mount HL025

Level [dBµV/m]



x x > MES FCC15-109_fin QP
 + + + MES FCC15-109_fin AV
 --- MES FCC15-109_pre PK
 --- LIM FCC Int Harm F AV 3m
 --- LIM FCC Int Harm F AV 3m

MEASUREMENT RESULT: "FCC15-109_fin QP"

2/07/2003 12:45

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
433.740000	67.10	19.9	60.6	-6.4	100.0	76.00	HORIZONTAL
*867.240000	56.70	27.0	62.0	5.3	100.0	71.00	HORIZONTAL

MEASUREMENT RESULT: "FCC15-109_fin AV"

2/07/2003 12:45

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
433.680000	65.70	19.9	60.6	-5.1	101.0	77.00	HORIZONTAL

Measurement Unintentional Radiated Emissions

MR-169-2003

EUT: K5058 RF remote
Manufacturer: Velleman
Operating Condition: Normal (Harmonics 1 GHz ~ 5GHz)
Test Site: ESM EMC centre
Operator: Meuleman Hendrik
Test Specification: FCC15.109 (2003)
Comment: Battery operated / High level transmitting
Start of Test: 2/07/2003 / 15:48:28

SCAN TABLE: "FCC15.109"

Unit: dBµV/m

Detector: Mode:

Curve 1: QuasiPeak ClearWrite
Curve 2: Average ClearWrite

Subrange 1:

Start Frequency: 30.0 MHz Step Size: 60.0 kHz
Stop Frequency: 1.0 GHz
Measure Time: 10.0 ms
IF Bandwidth: 120 kHz

Receiver: ESXI Transducer: CBL61113M
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: AC CP2 (X10) - ANT
Tracking Gen.: Off Add. Transd. 2: AC CP2 (X10) - RFIN2
Input: 2DC Add. Transd. 3: None

Preamplifier: 10 dB Demodulation: FM Broad
RF Att.: 10 dB Volume: 0 %
Ref. Level: -10.0 dBm Squelch: --
Min. RF Att.: 10 dB Option: None
IF Att.: --
Autorange: On

Curve 1: On Repetition: Single
Curve 2: On Stop Mark: Off
Stop Message: On
Stop Message: mount CBL

Subrange 2:

Start Frequency: 1.0 GHz Step Size: 500.0 kHz
Stop Frequency: 26.5 GHz
Measure Time: 10.0 ms
IF Bandwidth: 1 MHz

Receiver: ESXI Transducer: HL025
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: ANT HL025-RFIN2
Tracking Gen.: Off Add. Transd. 2: None
Input: 2DC Add. Transd. 3: Pre-amp26GHz

Preamplifier: 10 dB Demodulation: FM Broad
RF Att.: 0 dB Volume: 0 %
Ref. Level: -10.0 dBm Squelch: --
Min. RF Att.: 0 dB Option: None
IF Att.: --
Autorange: On

Curve 1: On Repetition: Single
Curve 2: On Stop Mark: Off
Stop Message: On
Stop Message: Mount HL025

SCAN TABLE: "FCC15.109_pre"

Unit: dBµV/m

Detector: Mode:

Curve 1: MaxPeak ClearWrite

Subrange 1:

Start Frequency: 30.0 MHz Step Size: 60.0 kHz
Stop Frequency: 1.0 GHz
Measure Time: 10.0 ms
IF Bandwidth: 120 kHz

Receiver: ESXI Transducer: CBL61113M
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: AC CP2 (X10) - ANT
Tracking Gen.: Off Add. Transd. 2: AC CP2 (X10) - RFIN2
Input: 2DC Add. Transd. 3: None

Preamplifier: 10 dB Demodulation: FM Broad
RF Att.: 10 dB Volume: 0 %
Ref. Level: -10.0 dBm Squelch: --
Min. RF Att.: 10 dB Option: None
IF Att.: --
Autorange: On

Curve 1: On Repetition: Single
Stop Mark: Off
Stop Message: On
Stop Message: mount CBL

Subrange 2:

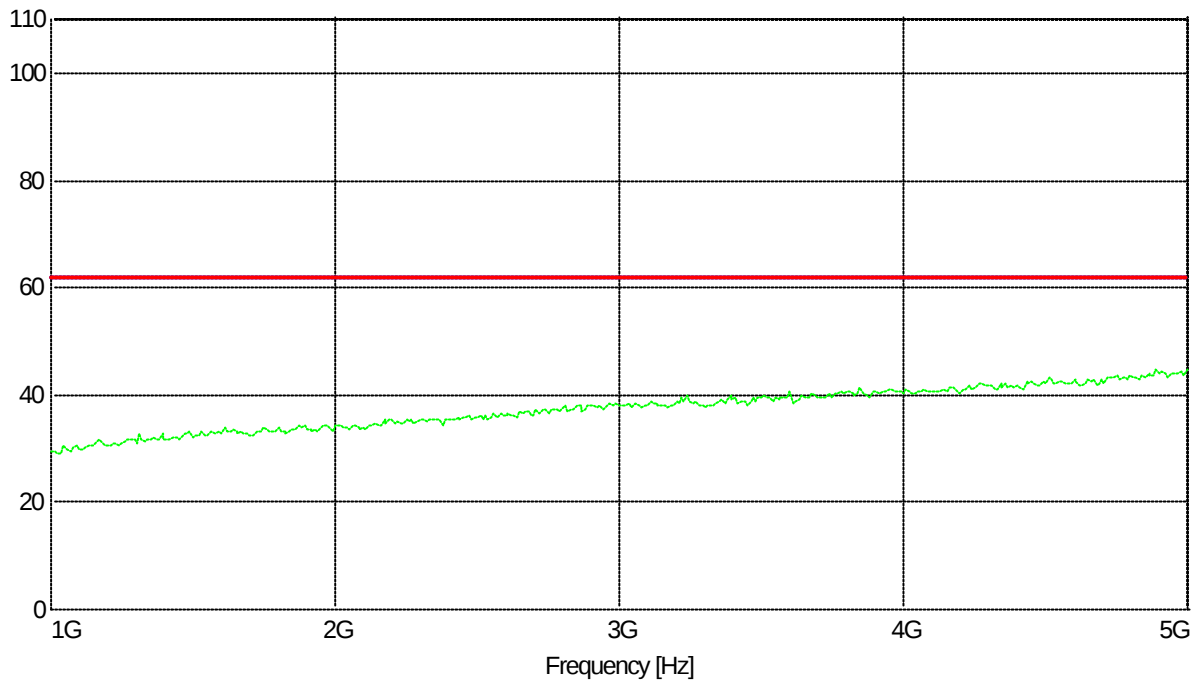
Start Frequency: 1.0 GHz Step Size: 10.0 MHz
Stop Frequency: 26.5 GHz
Measure Time: 10.0 ms
IF Bandwidth: 1 MHz

Receiver: ESXI Transducer: HL025
Signal Path: None System Transducer: None
Meas. Mode: Lin Add. Transd. 1: ANT HL025-RFIN2
Tracking Gen.: Off Add. Transd. 2: None
Input: 2DC Add. Transd. 3: Pre-amp26GHz

Preamplifier: 10 dB Demodulation: FM Broad
RF Att.: 0 dB Volume: 0 %
Ref. Level: -10.0 dBm Squelch: --
Min. RF Att.: 0 dB Option: None
IF Att.: --
Autorange: On

Curve 1: On Repetition: Single
Stop Mark: Off
Stop Message: On
Stop Message: Mount HL025

Level [dBμV/m]



x x > MES FCC15-109_fin QP
+ + + MES FCC15-109_fin AV
- - - MES FCC15-109_pre PK
- - - LIM FCC Int Harm F AV 3m
- - - LIM FCC Int Harm F AV 3m