

Model: TBLC 90-112

EMC - Test Report for Radiated Emission acc. CISPR 16-2-3

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It should be noted, that combining two or more CE compliant finished appliances does not automatically produce a compliant system. The manufacturer of an apparatus or a fixed installation as defined in the EMC Directive 2014/30/EU, 29 March 2014 is responsible for the EMC-compliance of the final apparatus.

EMC - Test Report For Radiated Emission

EUT Description

Product Type: Standalone Power Supply
Model No: TBLC 90-112
Manufacturers No.: 090ECO182
Manufacturer: Traco Power Solutions Ltd.
Whitemill Industrial Estate
Wexford
Ireland
Serial No: 31625335788
Shipment No: 6963
Nominal input: 100-240Vac
Nominal output: 12.0V DC / 7.5A

Tested by: Gunnar Tapper
Date tested: 03/10/2016
Test facility: Traco Power Solutions Ltd.
3m Free Field Measurement
Whitemill Industrial Estate
Wexford, Ireland

Report by: Gunnar Tapper
Issue date: 13/10/2016

Executive summary:

The EUT was tested for radiated EMC emission according following Standards

Standard	Result Pass/Fail
EN 55022:2010 - Class B Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement	Pass
EN 55011:2009 + A1:2010 - Class B – Group 1 Equipment Industrial, scientific and medical equipment — Radio-frequency disturbance characteristics — Limits and methods of measurement	Pass

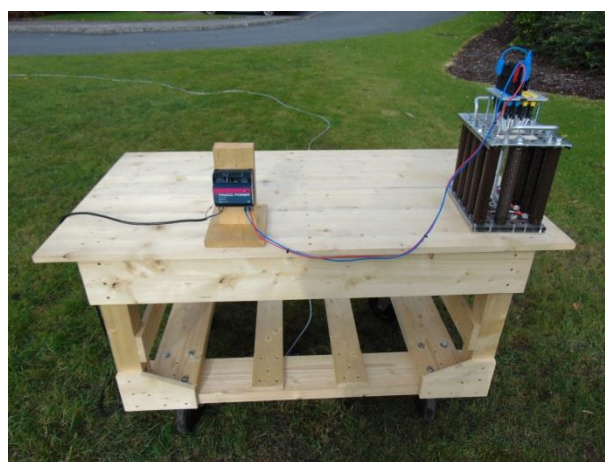
Comment: Highest emission appeared at full load

Radiated Emissions

Test setup:

The measurement was carried out in 3m Free Field Measurement site as outlined in CISPR 16-2-3. The Antenna and the EUT were setup at least 3m away from any surrounding object. The EUT was setup 0.8m above the ground. The EUT was connected to a resistive load and operated at its normal performance parameters.

Radiated Emission was measured with a Rohde & Schwarz EMI Receiver - ESVS 30 and a Schwarzbeck Antenna – VHBB 9124. Appropriate correction factors for the Antenna were applied. The antenna was mounted onto an antenna mast to enable measurement heights between 1 and 4 m. The resolution bandwidth of the Spectrum Analyser was set to 120kHz.



Input Power Cable:	2m	H05VV-F3G 1.0mm ² - PVC isolated cable
Output Power Cable:	1m	2 x 16AWG wires - BS6231 tri rated PVC 105°C

The cable arrangement is in accordance to CISPR 16-2-3.

Test procedure:

A pre-scan was first performed in order to find prominent radiated emissions. The points closest to the limit line were examined. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded.

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of - 7dBμV means the emission is 7dBμV below the stated limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Measured QP} - \text{Limit}$$

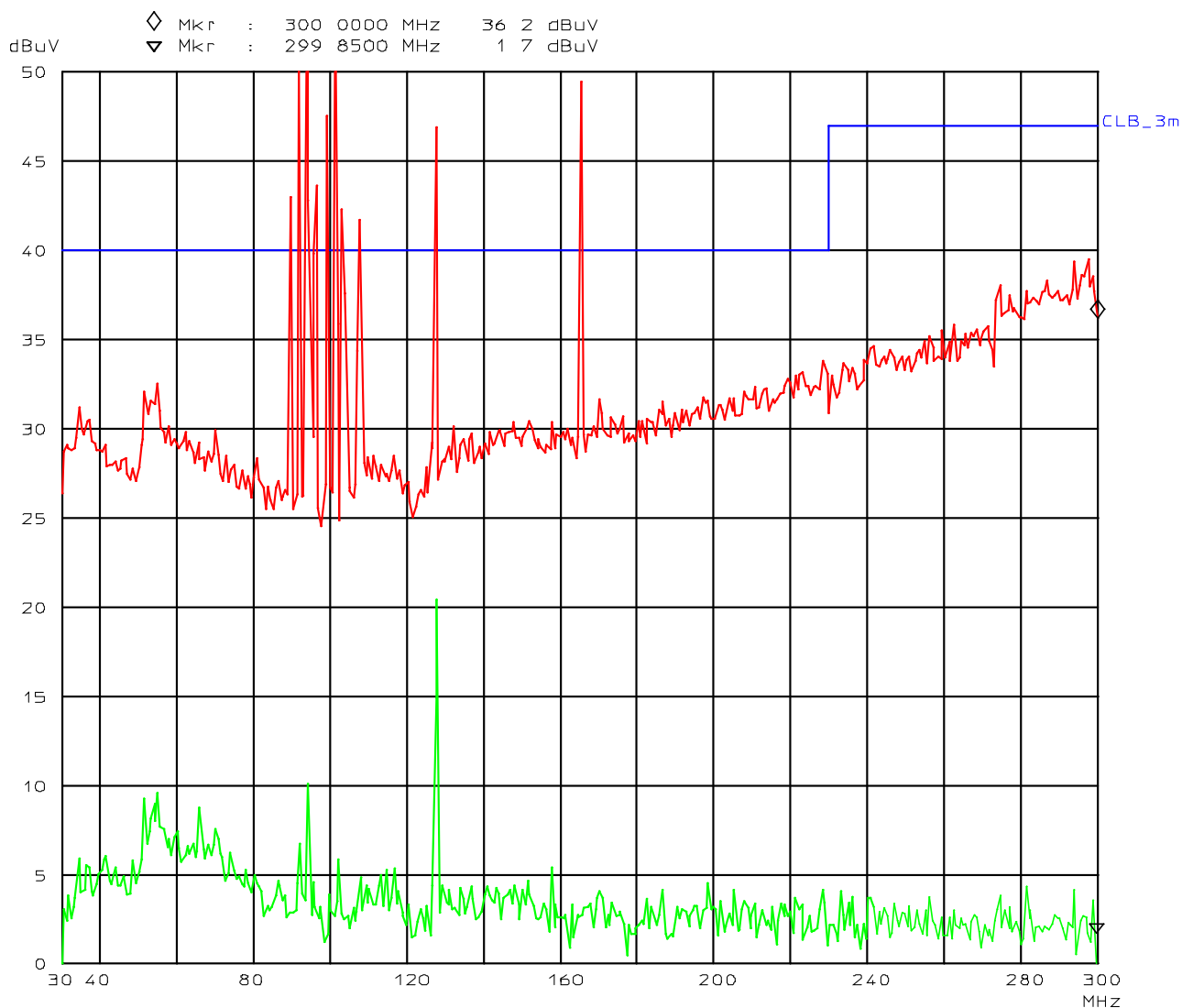
Deviations: None

Input Voltage: 230V/50Hz
Output voltage: 12.0V
Load Current/Type of load: 7.5A / Resistive
Polarization: Horizontal

Scan Settings (1 Range)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
30M	300M	50k	120k	PK	1ms	AUTO	LN	OFF	60dB

Transducer	No	Start	Stop	Name
	13	25M	300M	ANT3MK10



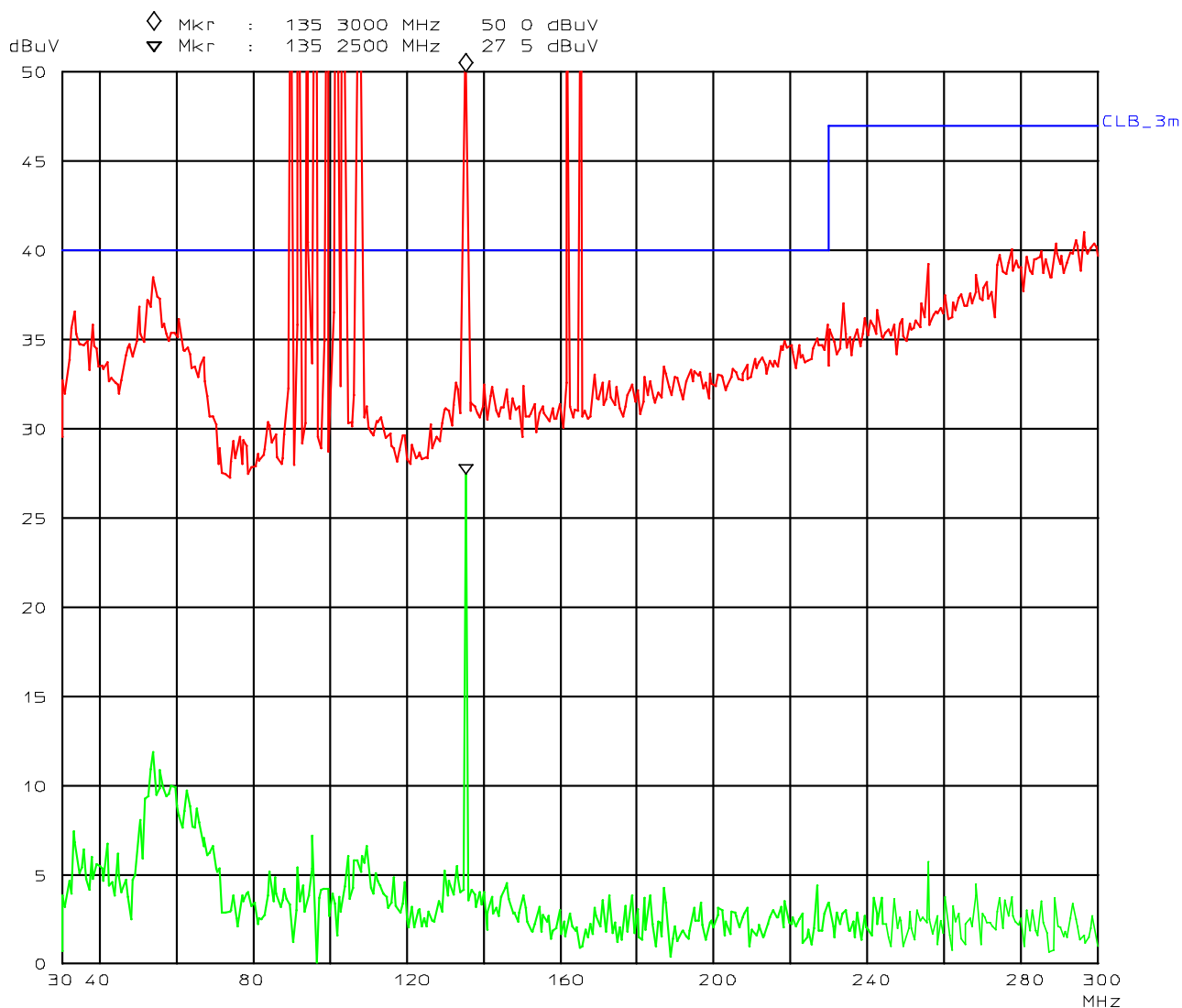
Note: The red graph shows the scan with in peak detector mode. The green graph shows the scan in peak detector mode when the ambient noise is subtracted. The graph for the ambient noise cannot be shown because the EMI Receiver can only show a max of 2 traces. The ambient noise is shown in Appendix 1.

Input Voltage: 230V/50Hz
Output voltage: 12.0V
Load Current/Type of load: 7.5A / Resistive
Polarization: Vertical

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	300M	50k	120k	PK	1ms	AUTO	LN OFF	60dB

Transducer	No	Start	Stop	Name
	13	25M	300M	ANT3MK10



Note: The red graph shows the scan with in peak detector mode. The green graph shows the scan in peak detector mode when the ambient noise is subtracted. The graph for the ambient noise cannot be shown because the EMI Receiver can only show a max of 2 traces. The ambient noise is shown in Appendix 1.

Measurements

Input Voltage: 230V/50Hz
Output voltage: 12.0V
Load Current/Type of load: 7.5A / Resistive

Frequency	QP	Limit	Margin	Antenna Height	Table rotation	Polarization
[MHz]	[dBuV/m]	[dBuV/m]	[dB]	[m]	[°] ¹	
53.4	32.8	40	-7.2	3.8	0	Horizontal
65.9	31.5	40	-8.5	3	0	
33.5	31.0	40	-9.0	1	0	Vertical
52.6	38.8	40	-1.2	1	270	
58.4	35.6	40	-4.4	1	270	

¹ the rotation of the table is given in clockwise direction

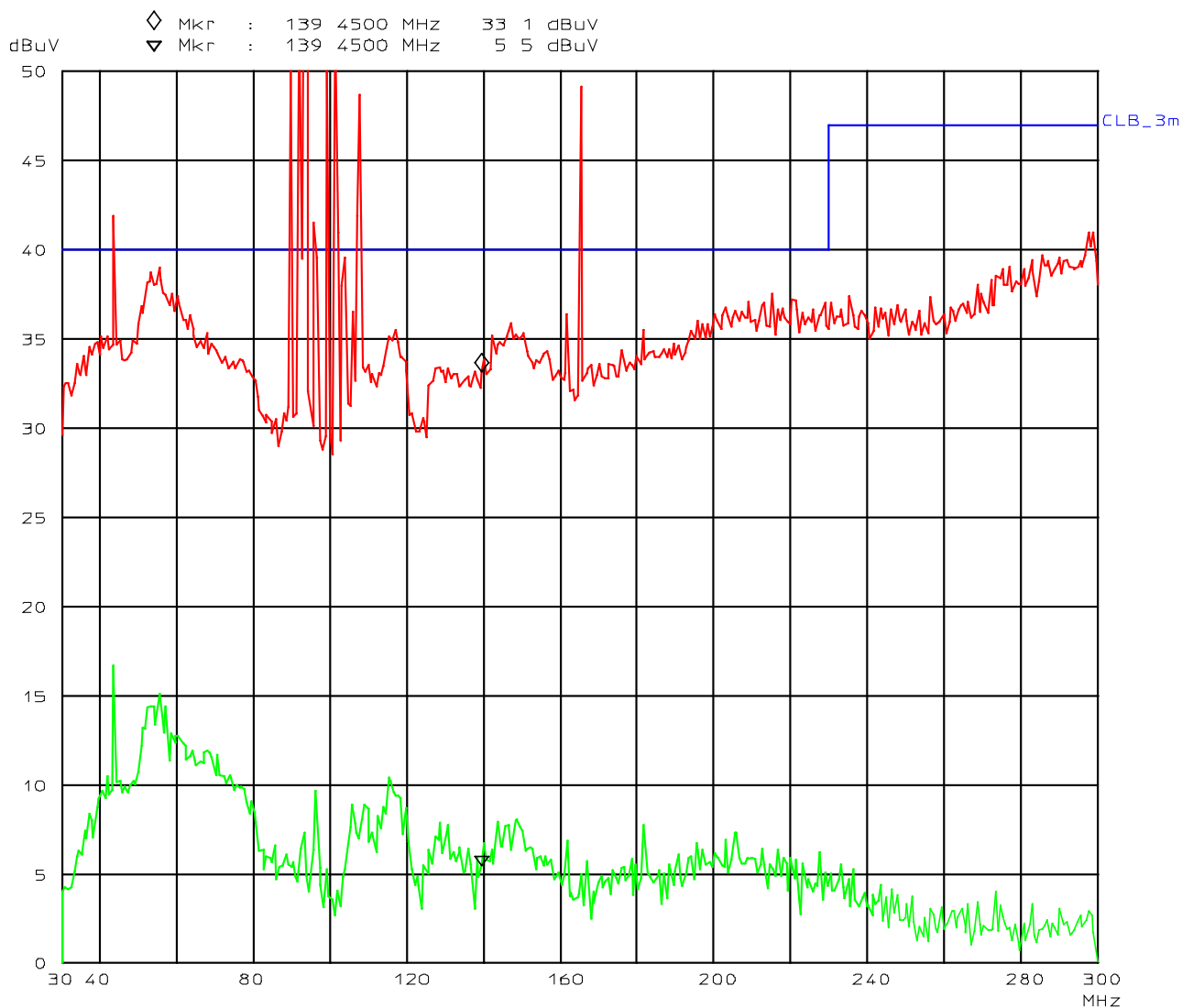
Test result: Pass

Input Voltage: 115V/50Hz
Output voltage: 12.0V
Load Current/Type of load: 7.5A / Resistive
Polarization: Horizontal

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	300M	50k	120k	PK	1ms	AUTO	LN OFF	60dB

Transducer	No	Start	Stop	Name
	13	25M	300M	ANT3MK10



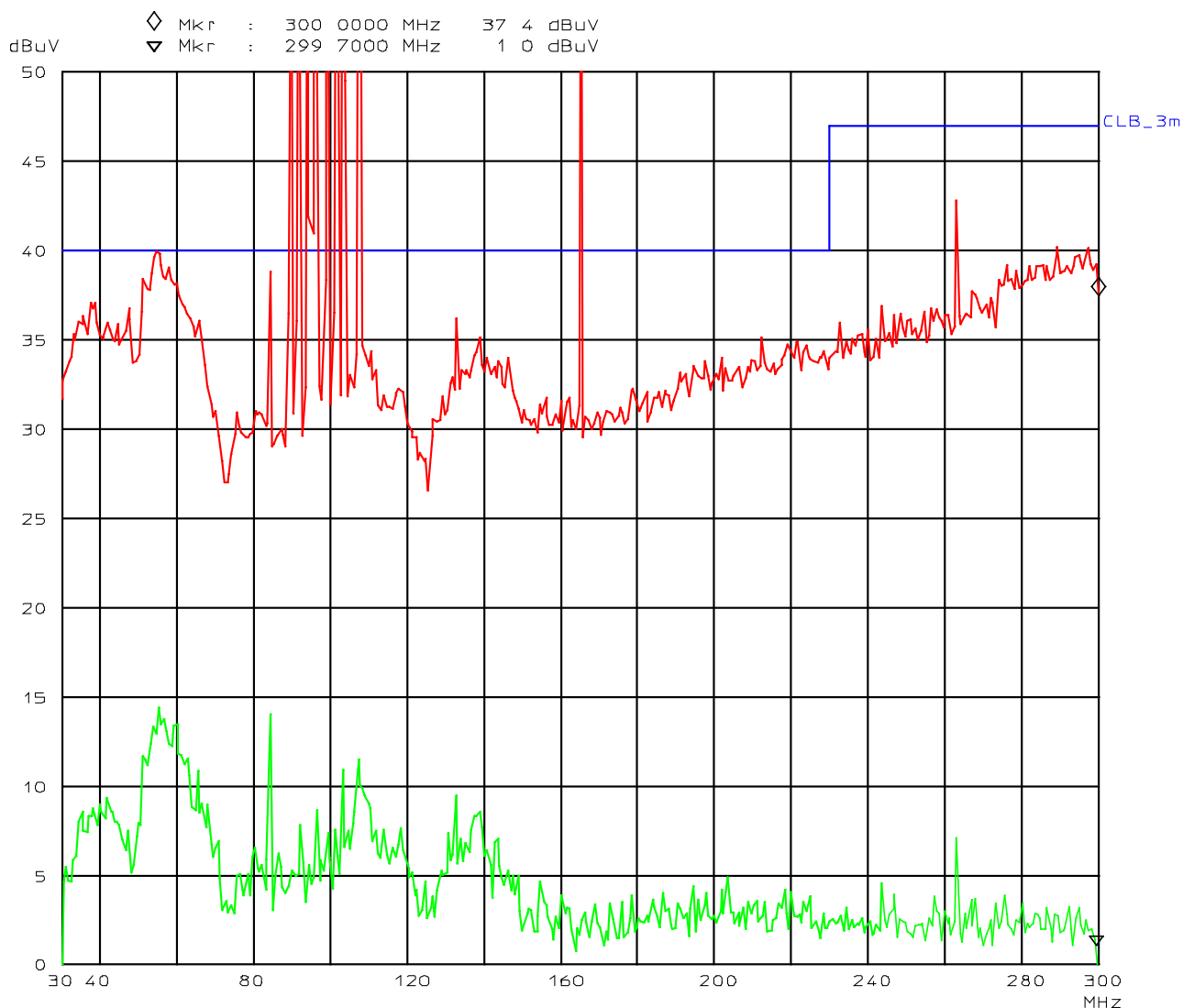
Note: The red graph shows the scan with in peak detector mode. The green graph shows the scan in peak detector mode when the ambient noise is subtracted. The graph for the ambient noise cannot be shown because the EMI Receiver can only show a max of 2 traces. The ambient noise is shown in Appendix 1.

Input Voltage: 115V/50Hz
Output voltage: 12.0V
Load Current/Type of load: 7.5A / Resistive
Polarization: Vertical

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	300M	50k	120k	PK	1ms	AUTO	LN OFF	60dB

Transducer	No	Start	Stop	Name
13	25M	300M	ANT3MK10	



Note: The red graph shows the scan with in peak detector mode. The green graph shows the scan in peak detector mode when the ambient noise is subtracted. The graph for the ambient noise cannot be shown because the EMI Receiver can only show a max of 2 traces. The ambient noise is shown in Appendix 1.

Measurements

Input Voltage: 115V/50Hz
Output voltage: 12.0V
Load Current/Type of load: 7.5A / Resistive

Frequency	QP	Limit	Margin	Antenna Height	Table rotation	Polarization
[MHz]	[dBuV/m]	[dBuV/m]	[dB]	[m]	[°]	
53.1	35.1	40	-4.9	3	0	Horizontal
61.6	32.0	40	-8.0	3	0	
110.6	30.2	40	-9.8	1.8	315	
116.1	35.7	40	-4.3	2	315	
144.7	35.2	40	-4.8	1.5	315	
204.5	33.4	40	-6.6	1.5	45	
38.0	35.5	40	-4.5	1	90	Vertical
55.2	38.7	40	-1.3	1	270	
107.5	32.8	40	-7.2	1	90	
141.3	29.1	40	-10.9	1	270	

¹ the rotation of the table is given in clockwise direction

Test result: Pass

Test Equipment Used:

Description	Model	Manufaturer	Serial No
EMC Analyzer	ESVS 30	Rodhe & Schwarz	846814/004
Antenna	VHBB 9124	Schwarzbeck	9124-0222
10m Coaxial cable	n/a	n/a	n/a
Multimeter	U1252B	Agilent	MY54480049
Multimeter	U1252B	Agilent	MY54260106

Appendix 1

Ambient Radiation level

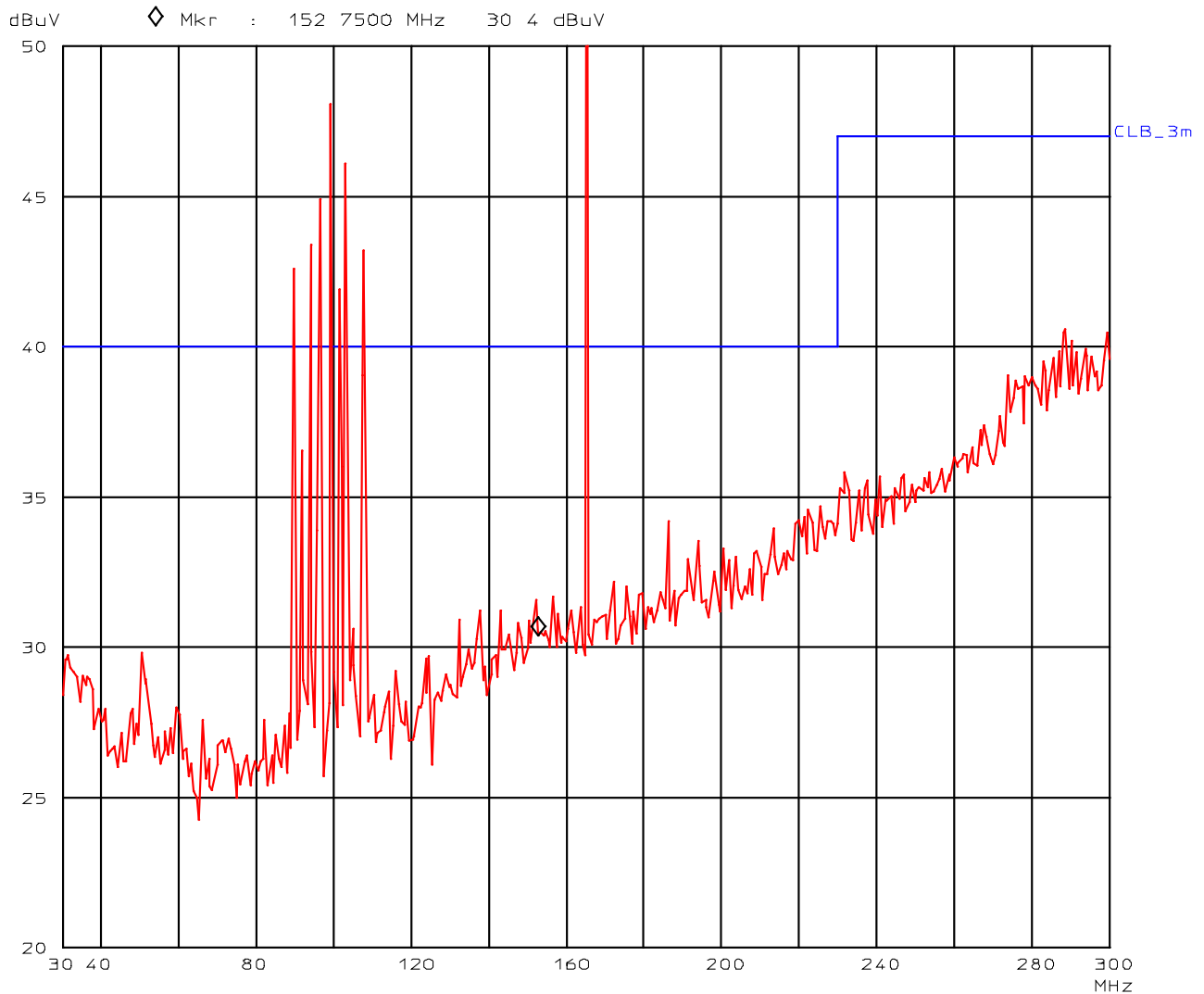
The ambient noise level was measured with the same receiver settings than for the radiated emission measurement. Any equipment in the close proximity was disconnected or turned off, including the EUT. The graphs below gives an indication of the constantly appearing radio broadcasting.

A1.1 Ambient radiation in Horizontal Orientation of the Antenna

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	300M	50k	120k	PK	1ms	AUTO	LN OFF	60dB

Transducer	No	Start	Stop	Name
	13	25M	300M	ANT3MK10



A1.2 Ambient radiation in Vertical Orientation of the Antenna

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	300M	50k	120k	PK	1ms	AUTO	LN OFF	60dB

Transducer	No	Start	Stop	Name
	13	25M	300M	ANT3MK10

