849 NW State Road 45
Newberry, FL 32669 USA
Phone: 352.472.5500
Fax: 352.472.2030
Email: info@timcoengr.com
Website: www.timcoengr.com

TEST REPORT

FCC PART 15

for

FCC ID: K6620515X20

Applicant	**YAESU MUSEN CO., LTD.**
Address	**TENNOZU PARKSIDE BUILDING 2-5-8 HIGASHI-SHINAGAWA, SHINAGAWA-KU, TOKYO 140-0002 JAPAN**
Model Number	FT-70DR
Product Description	HH AMATEUR SCANNING RECEIVER
Date Sample Received	11/16/2016
Date Tested	11/29/2016
Tested By	Tim Royer
Approved By	Cory Leverett
Test Results	☒ PASS ☐ FAIL

Report Number	Version Number	Description	Issue Date
2305BUT16TestReport	Rev1	Initial Issue	12/13/2016

TABLE OF CONTENTS

GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.

☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Tested by:
Name and Title: Tim Royer, Project Manager/Testing Engineer

Date: 11/30/2016

Reviewed and approved by:
Name and Title: Cory Leverett, Project Manager

Date: 12/13/2016

GENERAL INFORMATION

The test results relate only to the items tested.	
EUT Description	**HH AMATEUR SCANNING RECEIVER**
FCC ID	**K6620515X20**
Model Number	**FT-70DR**
Highest Tuned Frequency	480MHz
I/O Port Type	USB Mini
EUT Power Source	☐ 110–120Vac/50– 60Hz
	☐ 12.6 VDC Nominal
	☒ Battery Operated Exclusively
Test Item	☐ Prototype
	☐ Pre-Production
	☒ Production
Environmental Condition in the laboratory	Temperature: 24-26ºC Relative humidity: 50-65% Barometric Pressure: 30.01”

EUT CABLES USED FOR TESTING

Description	Type	Connector	Length
Data	USB	USB mini	0.5m

TEST INFORMATION

Regulatory Standard	CFR Title 47 FCC Rule part 15B § 15.109, 15.107
Test Procedures	FCC Part 15.31, 15.33, 15.35 ANSI C63.4 – 2014
Operational Modes	The EUT was switched on and powered with a AC adapter with the battery removed per the instruction provided by the manufacture. Test software on a host PC provided a simulated firmware update via USB port in a continuous loop to the EUT
Setup	The EUT was configured as a computer peripheral through the supplied USB cable, the setup used was a tabletop arrangement for IT equipment as specified in the standard
Modifications required for Testing	None
Deviation from the standard / procedure	No deviation
Host PC Model	Dell Latitude E6330

RESULTS SUMMARY

Requirement	**Frequency MHz**	**Level (dBuV/m)**		**RESULTS Pass/Fail**
15.109 Radiated Emissions	30 – 88	40.0		Pass
	80 – 216	43.0		Pass
	216 – 960	46.0		Pass
	Above 960	54.0		Pass
15.107 AC Powerline Conducted	**Frequency MHz**	**Quasi Peak Limits (dBµV)**	**Average Limits (dBµV)**	**RESULTS Pass/Fail**
	0.15 – 0.5	66 – 56	56 – 46 *	Pass
	0.5 – 5.0	56	46	Pass
	5.0 – 30	60	50	Pass

Decrease with logarithm of frequency

RADIATED SPURIOUS EMISSIONS

Rule Part No.: FCC Part 15 Subpart B

Requirements: FCC Part 15.109(a) Radiated Emission Limit

Class B Field Strength Limits @ 3 Meters	
Frequency (MHz)	**Level (dBuV/m)**
30 – 88	40.0
80 – 216	43.5
216 – 960	46.0
Above 960	54.0

Procedure: FCC Part 15.33(b)(1) Frequency range of radiated measurements

FCC Part 15.35(a) Measurement detector functions and bandwidths

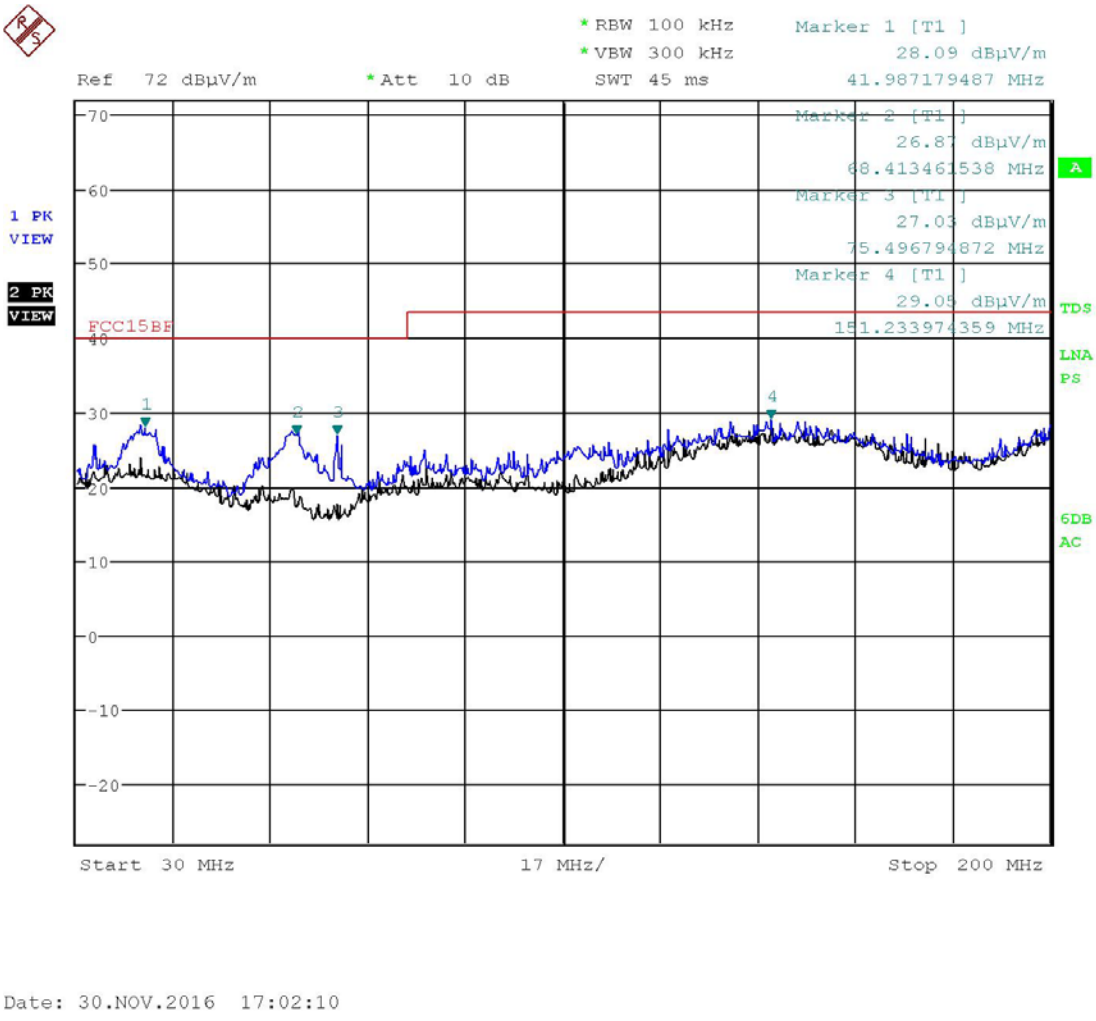
ANSI C63.4 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment 9 kHz to 40 GHz

§ 11.2 Operating conditions
§ 11.3 Peripherals / Accessories
§ 11.5 Tabletop equipment arrangement
§ 11.9 Radiated emission measurements

Configuration: The EUT is configured as a computer peripheral through a USB cable connected to a partially configured host PC. A firmware update to the EUT was used to transfer data between the EUT and the host PC.

RADIATED SPURIOUS EMISSIONS

30–200 MHZ PEAK PLOT

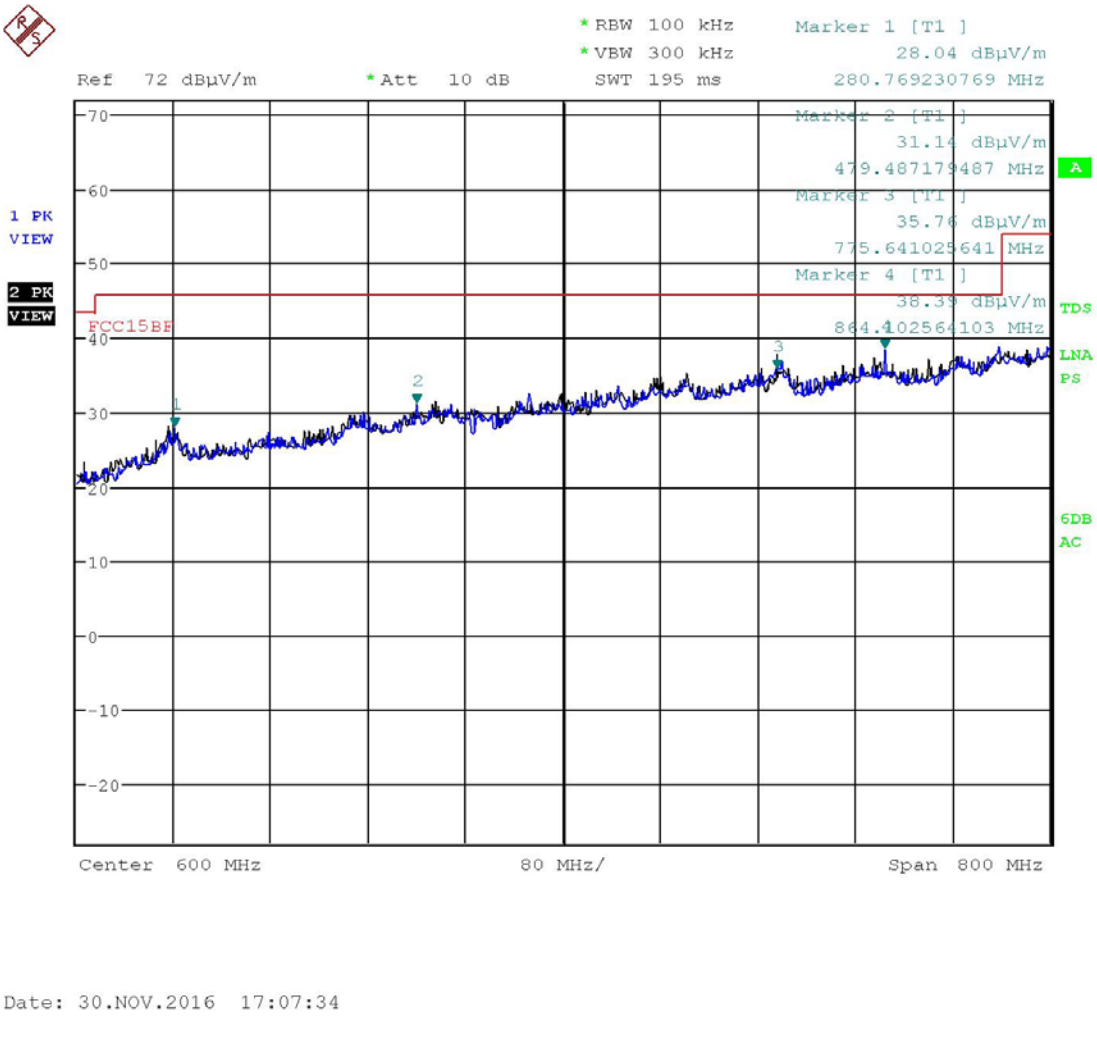


Results - Meets Requirements

Ant Polarity: T1 (Blue) =Vertical, T2 (Black) =Horizontal

RADIATED SPURIOUS EMISSIONS

200-1000 MHZ PEAK PLOT

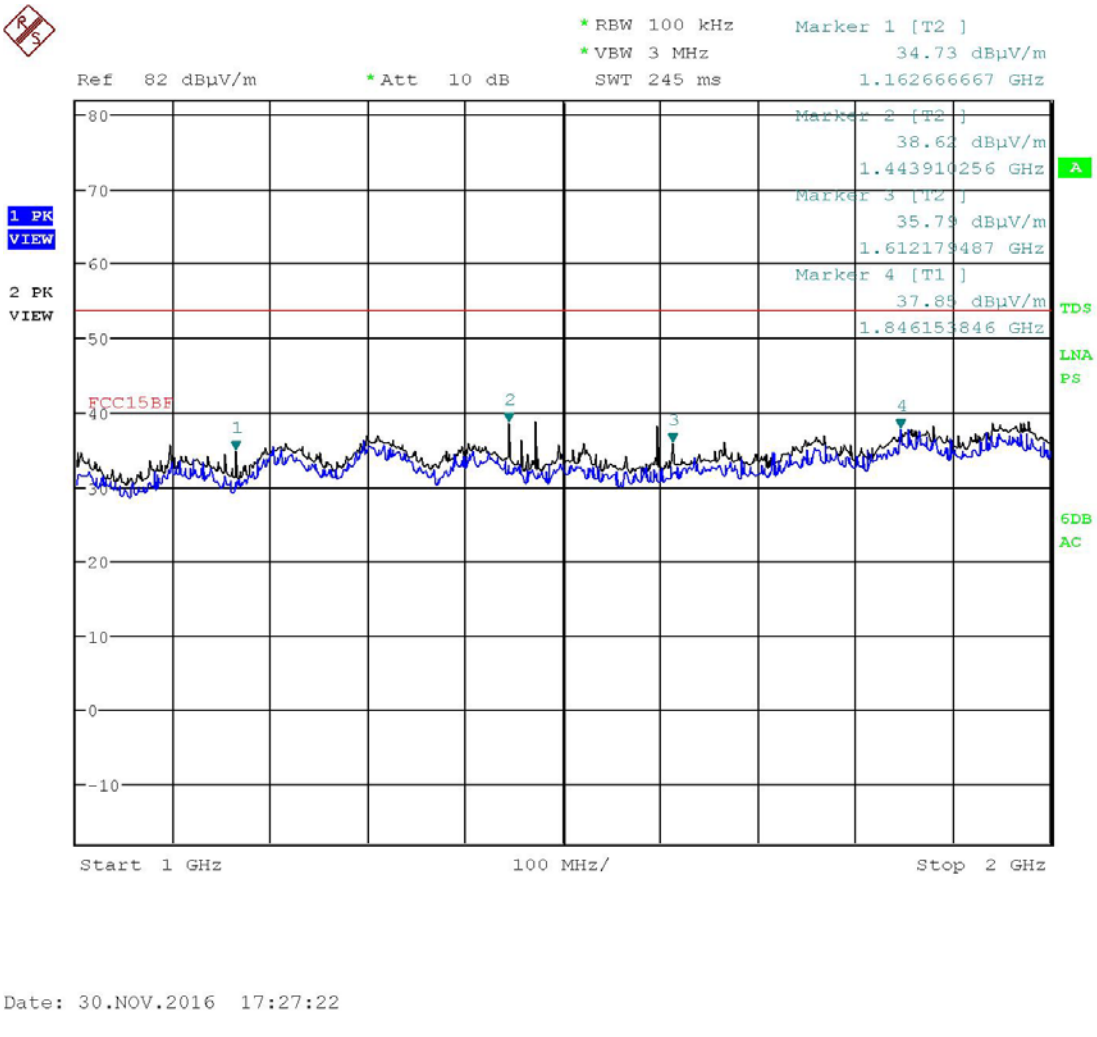


Results - Meets Requirements

Ant Polarity: T1 (Blue) =Vertical, T2 (Black) =Horizontal

RADIATED SPURIOUS EMISSIONS

1000-2000 MHZ PEAK PLOT



Date: 30.NOV.2016 17:27:22

Results - Meets Requirements

Ant Polarity: T1 (Blue) =Vertical, T2 (Black) =Horizontal

POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: FCC Subpart B

Requirements: FCC 15.107 (a) Conducted Limits

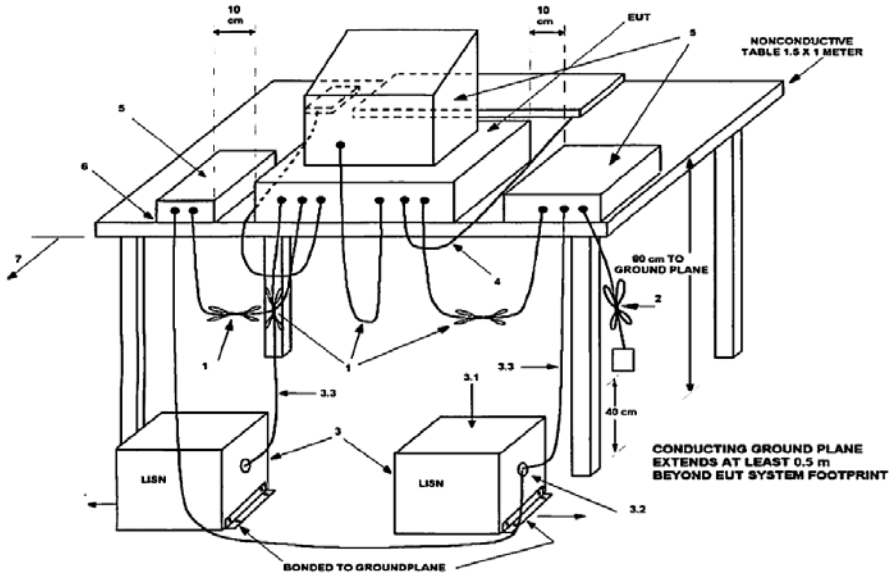
Frequency (MHz)	Quasi Peak Limits (dBµV)	Average Limits (dBµV)
0.15 – 0.5	66 – 56 *	56 – 46 *
0.5 – 5.0	56	46
5.0 – 30	60	50
* Decrease with logarithm of frequency		

Procedure: ANSI C63.4 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment 9 kHz to 40 GHz

§ 11.2 Operating conditions
§ 11.3 Peripherals / Accessories
§ 11.5 Tabletop equipment arrangement
§ 11.8 AC power-line conducted emission measurements

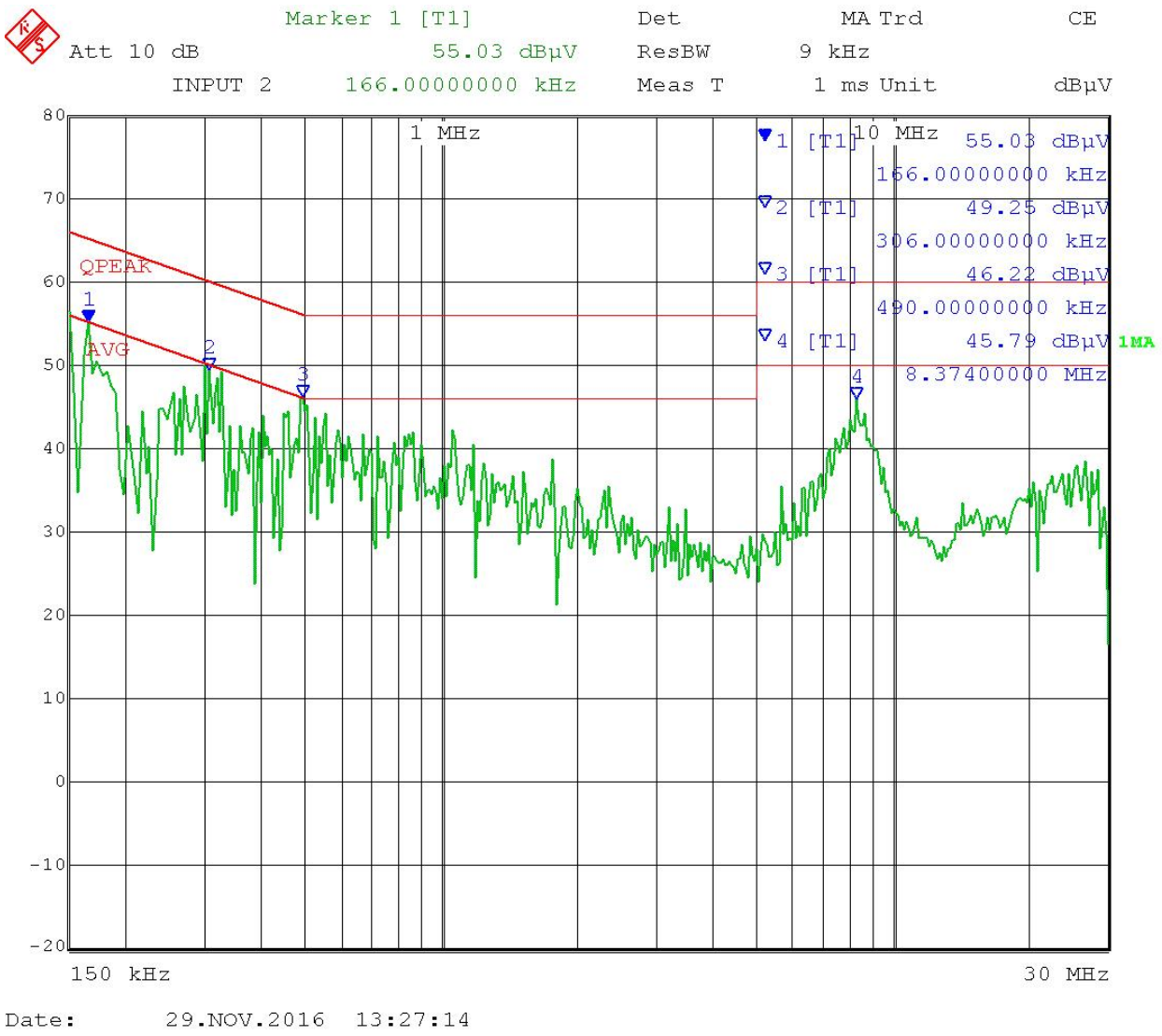
Configuration: The EUT is configured as a computer peripheral through a USB cable connected to a partially configured host PC. A firmware update to the EUT was used to transfer data between the EUT and the host PC

Setup:



POWER LINE CONDUCTED INTERFERENCE

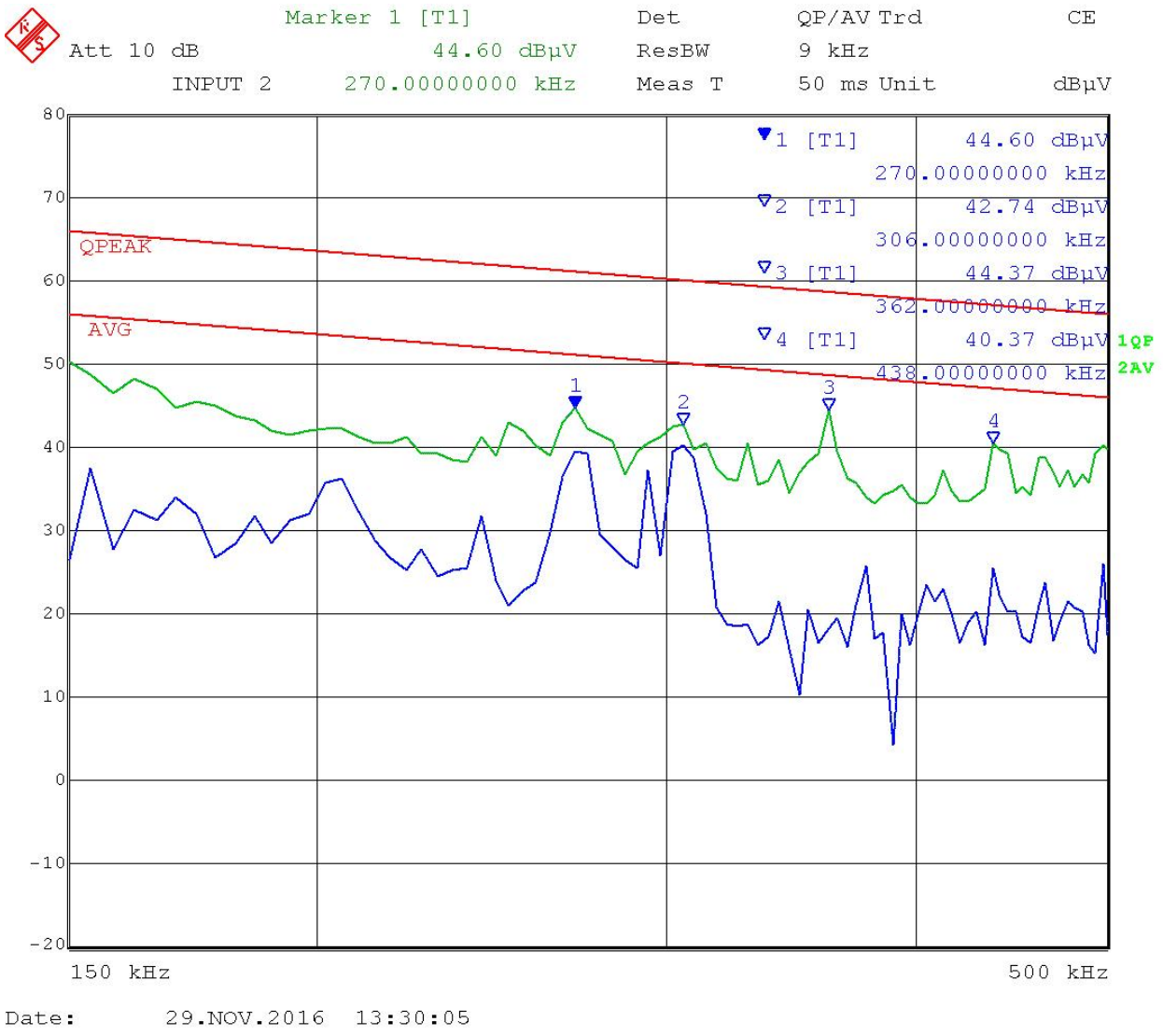
POWERLINE 1 PEAK PLOT



Results - Meets Requirements

POWER LINE CONDUCTED INTERFERENCE

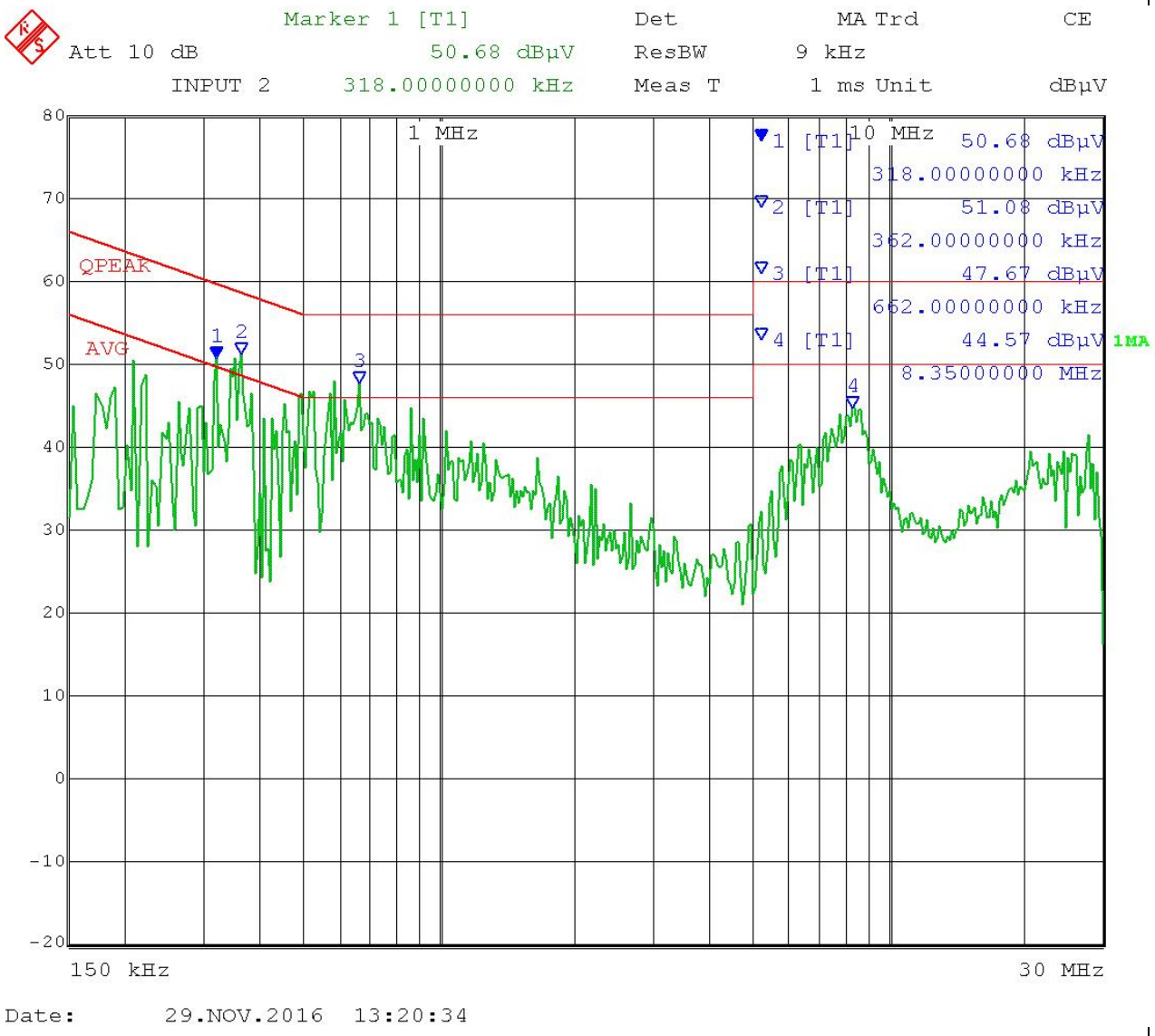
POWERLINE 1 QUASIPEAK/AVERAGE PLOT



Results - Meets Requirements

POWER LINE CONDUCTED INTERFERENCE

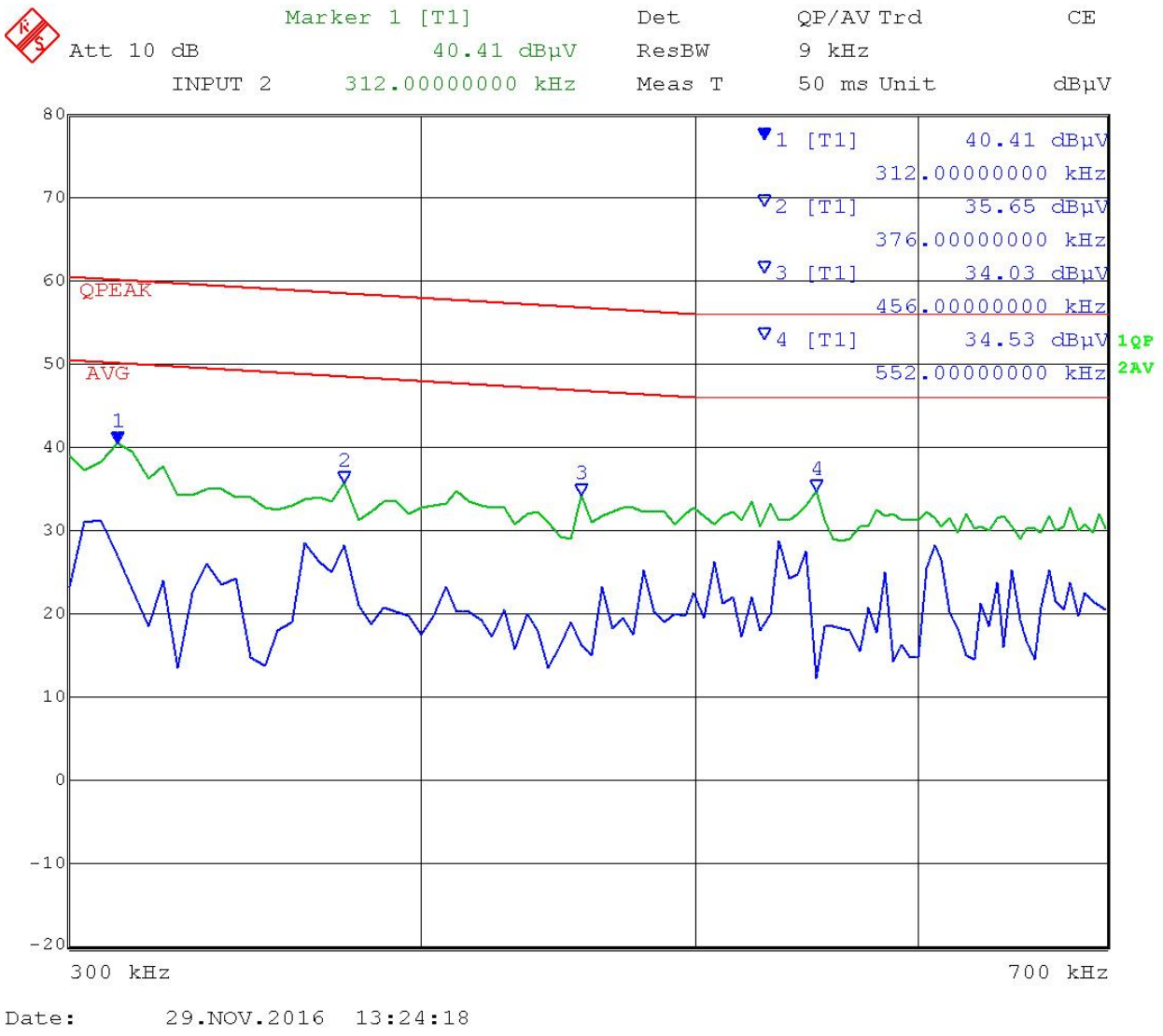
POWERLINE 2 PEAK PLOT



Results - Meets Requirements

POWER LINE CONDUCTED INTERFERENCE

POWERLINE 2 QUASIPEAK/AVERAGE PLOT



Results - Meets Requirements

UNCERTAINTY TABLE

State of the measurement uncertainty

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16 – 4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: "Uncertainty in EMC Measurements" and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

Test Items	Measurement Uncertainty	Notes
Radiated Emissions to 6.0GHz	± 4.4dB	(1)
Power line conducted emissions	± 3.9dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconical 1096 Chamber	Eaton	94455-1	1096	07/14/15	07/14/17
Antenna: Log-Periodic 1122	Electro-Metrics	-25	1122	07/14/15	07/14/17
LISN (Primary)	Electro-Metrics	ANS-25/2	2604	07/13/15	07/13/17
LISN (Secondary)	Electro-Metrics	EM-7820	2682	05/08/15	05/08/17
CHAMBER	Panashield	3M	N/A	04/25/16	12/31/17
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren Chamber	3117	00041534	02/25/15	02/25/17
EMI Test Receiver R & S ESIB 40 Screen Room	Rohde & Schwarz	ESIB 40	100274	08/16/16	08/16/18
Software: Field Strength Program	Timco	N/A	Version 4.0	N/A	N/A
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100460	01/05/16	01/05/17
Coaxial Cable - BMBM-1000-00 Silver	Semflex	LISN Cable	BMBM-1000-00	01/05/16	01/04/17
Coaxial Cable - Chamber 3 cable set (Primary)	Micro-Coax	Chamber 3 cable set (Primary)	KMKM-0244-01; KMKM-0670-00; KFKF-0198-01	08/08/16	08/08/18
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	N/A	N/A
Pre-amp	RF-LAMBDA	RLNA00M45GA	NA	01/04/16	01/04/18

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

END OF TEST REPORT