

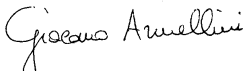


RAPPORTO DI PROVA / TEST REPORT

Rif./Ref.No. FCCTR_140655C-3	Data / Date: 30/09/2014	Pagine / Pages : 25
Scopo delle prove / Test object :	Prove di tipo in accordo a / Type test according to: FCC Cfr 47 Parts 2.815, 2.1033, 2.1046, 2.1053 Parts 97.305, 97.307 (d) (e), 97.313, 97.315, 97.317	
Richiedente / Applicant :	RM Costruzioni elettroniche S.r.l. Via IV Novembre, 42 – 40050 Ponte della Venturina – BO – ITALY Tel. +39 0534 60460	
Persona di riferimento / Applicant's referee :	Mr. Andrea Molinari	
Marchio commerciale / Trade mark :		
Fabbricante / Manufacturer :	RM COSTRUZIONI ELETTRONICHE S.r.l.	
Prodotto / Product :	240W HF Linear Power Amplifier	
Modello / Model :	KL 7505V	
Modello derivato/Derived Model	KL 7505	
Data ricevimento campioni / Date of test sample receipt:	27/05/2014	
Campioni verificati / No. of tested samples	1	
Data verifiche / Testing date :	27-28/05/2014	
Sito di prova / Testing site :	Prima Ricerca & Sviluppo Via Campagna - 92 I-22020 FALOPPIO (CO)	
Esito delle valutazioni / Assessment results :	CONFORME / COMPLIANT	
Verifiche effettuate da / Verifications carried out by :	Enrico BANFI Tecnico di laboratorio EMC e RADIO / EMC and RADIO Test Engineer	
Approvato / Approved by :	Giacomo ARMELLINI Responsabile Laboratorio EMC e RADIO/ EMC and RADIO Laboratory Manager	

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati./The test results reported in this test report shall refer only to the samples tested

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1 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_140655C-0	Original release	03/06/2014
FCCTR_140655C-1	Added EUT Dimension; Corrected absorbing current	23/06/2014
FCCTR_140655C-2	Added spurious Radiated Emission	29/09/2014
FCCTR_140655C-3	Correct typing error	30/09/2014

2 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

2.1 EUT Identification EUT Identification

DESCRIPTION :	240W HF Linear Power Amplifier
TRADEMARK:	
MODEL:	KL 7505V
S/N:	Prototype
DERIVED MODEL	KL 7505
MANUFACTURER:	RM COSTRUZIONI ELETTRONICHE S.r.l.
COUNTRY OF MANUFACTURER:	ITALY
COMPOSED BY:	SINGLE
EUT DIMENSIONS :	H:85 X W:190 x L:335 (mm)
EUT DIMENSIONS DERIVED MODEL :	H:70 X W:190 x L:335 (mm)
EUT STANDING:	Vehicle

2.2 EUT Technical Data

POWER SOURCE :	EXTERNAL
POWER SUPPLY NOMINAL VOLTAGE:	12-14V DC
NOMINAL POWER OR ABSORBING CURRENT :	Max 30A
TYPICAL USAGE :	Amateur Radio

2.3 EUT ports identification

This section contains descriptions of all ports, the length and the type of the cable provided by manufacturer needed for the tests. Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connector	Max cable length
1	Enclosure	Metallic	---	---
2	AC mains input/output ports	Port NOT present	---	---
3	DC mains input/output ports	12V	---	---

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

2.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

2.5 Auxiliary equipment

- None

2.6 Difference of derived model

The **KL 7505** is a derived model of the 240W HF Linear Power Amplifier **KL 7505V**. (basic model)

The differences declared by the manufacturer are listed in the following table (see also next photographs)

Table1: Difference between basic and derived model as declared by manufacturer		
Basic model	Derived model	Difference between basic and derived model
KL 7505V	KL 7505	No cooling fan

3 OTHER INFORMATION

The amplifier operates only in the amateur radio bands below 30 MHz.

The amplifier is NOT capable of operation on any frequency outside of the amateur bands including 26-28 MHz.

The amplifier typically requires 10 Watts of drive to obtain full output power depending upon which transmit band it is on.

The gain of the amplifier is less than 15dB on all bands under all conditions.

In *off* or *standby* positions the amplifier does NOT amplify. The exciter energy is simply passed on to the antenna at the same level in which it entered the amplifier. The spurious emissions of the transceiver remain unaffected.

PART 2.815 (b) (1) (2)

The HLA 305 external RF amplifier is not capable of amplification in the frequency band 26-28 MHz and cannot be modified to operate in the 26-28 MHz frequency band. Any attempt to drive the amplifier in the 26-28 MHz frequency band will result in 0 dB gain from input to output of the amplifier.

PART 97.313

The output power will not exceed 250 Watts into 50 Ohm resistive load. Therefore, it is impossible for the output power to reach or exceed the 1500 Watts PEP legal limit.

PART 2.1033 (c) (8)

Input Power: DC Voltage (12 Volts) x DC Current (30 Amps) = 360 Watts

4 OPERATING TEST MODES AND CONDITIONS

OPERATING CONDITION	DESCRIPTION
#1	Input Power 10W, max GAIN

5 SUMMARY OF TEST RESULTS

Port		Phenomena	Reference Standard	Operating condition	Result
1	RF Power Output	Max Gain	Part 2.1046 (a), Part 97.317 (a) (2)	#1	Within the limit
2	RF Power Output	Spurious Conducted Emissions	Part 2.1053, Part 97.307 (d) (e)	#1	Within the limit
3	RF Power Output	Spurious Radiated Emissions	Part 2.1053, Part 97.307 (d) (e)	#1	Within the limit

6 TEST RESULTS

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**TEST
1.**

RF POWER OUTPUT

REFERENCE
DOCUMENT

FCC Cfr 47 **Part 2.1046 (a), Part 97.317 (a) (2)**
Part 2.1033 (b) (6)
Part 15.31 (a) (3) [see also] Note to paragraph (a) (3); Part 97

- TEST SETUP: Acc. to reference standard
- TEST LOCATION: Radio Test Area
- TEST EQUIPMENT USED FOR TEST: Power Meter Rohde & Schwarz NRVD,
Thermal Power Sensor NRV-Z53
RF Generator Agilent N9310A
- TESTED PORT: RF Output

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :			12V

OPERATING CONDITION (Rif. Section. 2.6) : **#1**

RESULT: WITHIN THE LIMITS

TEST RESULT

The setup to measure the RF power output was made by connecting the output of the the exciter to the input of the KL7505V amplifier.

A watt-meter was placed in-line between the amplifier and a 50 ohm load. The exciter was tuned to a frequency in the center of each band shown. The amplifier was powered with the voltage and current previously indicated. The input and output power was recorded by a Powermeter, and the gain was calculated. The gain does not exceed 15dB and the output power is under 1.5kW PEP into a 50 ohm load.

Frequency (MHz)	Input level (W)	Output level (W)	GAIN
28,2	10	218,8	13,4
29	10	229,1	13,6
30	10	229,1	13,6

**TEST
2.**

STRENGTH OF SPURIOUS EMISSIONS (CONDUCTED)

REFERENCE
DOCUMENT

Part 2.1053, Part 97.307 (d) (e)

- TEST SETUP: In according to manufacturer specifications
- TEST LOCATION: Radio Test Area
- TEST EQUIPMENT USED FOR TEST: Spectrum Analyzer Rohde & Schwarz Mod. FSP 40
RF Generator Agilent N9310A
- TESTED PORT: RF Output Port

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :			12 Vdc

OPERATING CONDITION (Rif. Section. 2.6) : **#1**

RESULT: **WITHIN THE LIMIT**

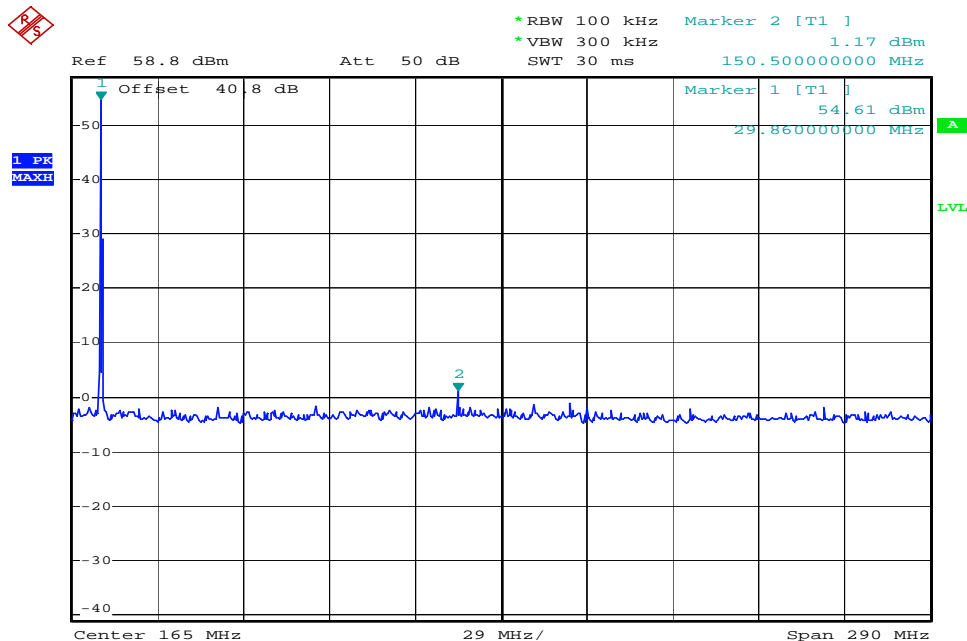
The setup to measure the strength of spurious emissions was made by connecting the output of the exciter to the input of the KL 7505V amplifier. A 50 ohm load was connected to the amplifier, and a spectrum analyzer was connected to the 50 ohm load. The exciter was tuned to the frequency shown and each harmonic of that frequency up to the tenth was observed on the spectrum analyzer.

For the execution of the tests have been used two Resolution BW: 30kHz and 100kHz.

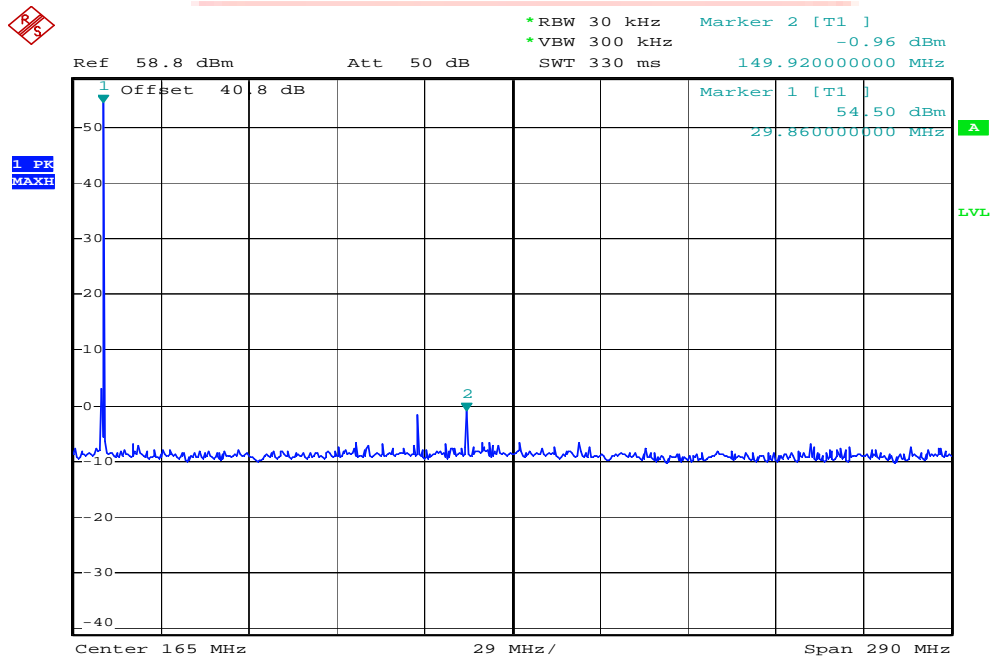


Frequency: 30MHz; Wavelength band:10m

Frequency (MHz)	Harmonics (MHz)	dB Below Main	>43dB Below
30,000	30		Yes
30,000	60	>60	Yes
30,000	90	>60	Yes
30,000	120	>60	Yes
30,000	150	>60	Yes
30,000	180	>60	Yes
30,000	210	>60	Yes
30,000	240	>60	Yes
30,000	270	>60	Yes
30,000	300	>60	Yes



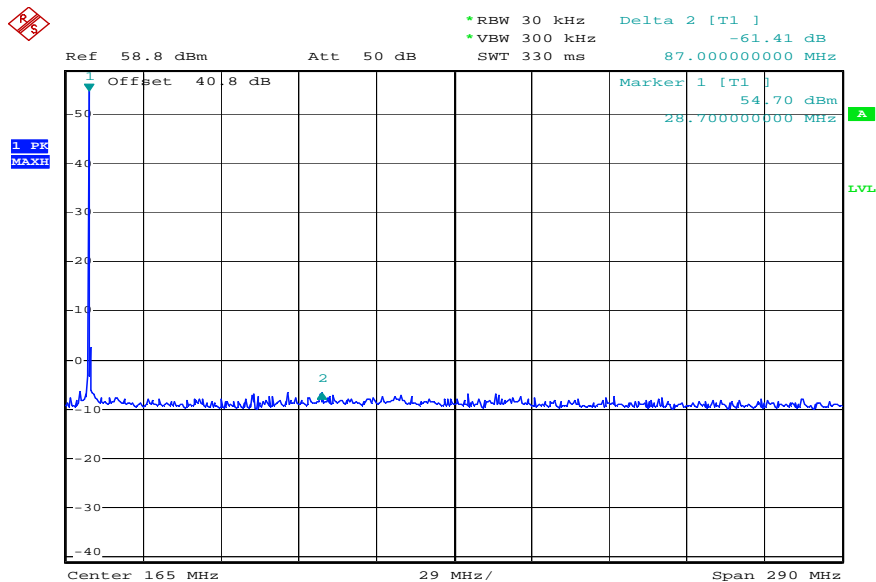
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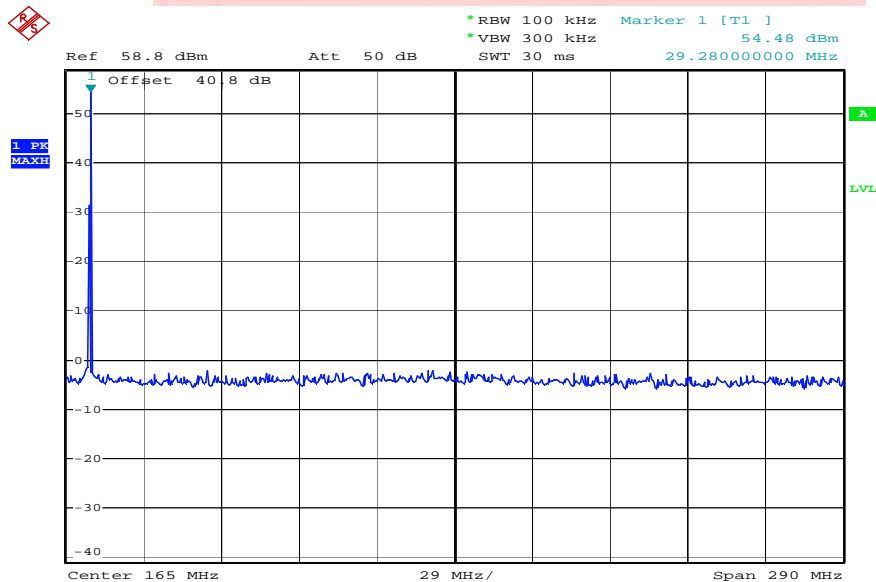
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Frequency: 28.850MHz; Wavelength band:10m

Frequency (MHz)	Harmonics (MHz)	dB Below Main	>43dB Below
28,85	28,85		Yes
28,85	57,70	>60	Yes
28,85	86,55	>60	Yes
28,85	115,40	>60	Yes
28,85	144,25	>60	Yes
28,85	173,10	>60	Yes
28,85	201,95	>60	Yes
28,85	230,80	>60	Yes
28,85	259,65	>60	Yes
28,85	288,50	>60	Yes



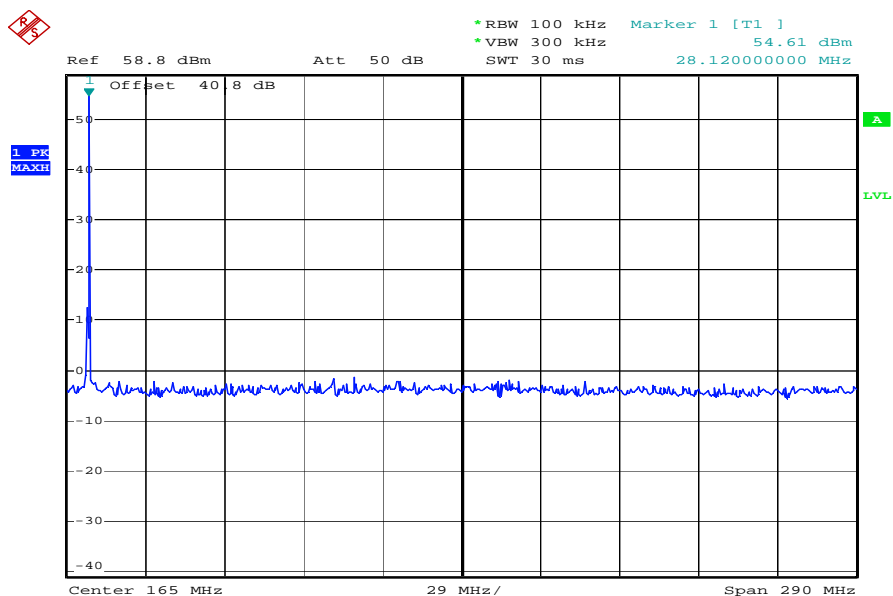
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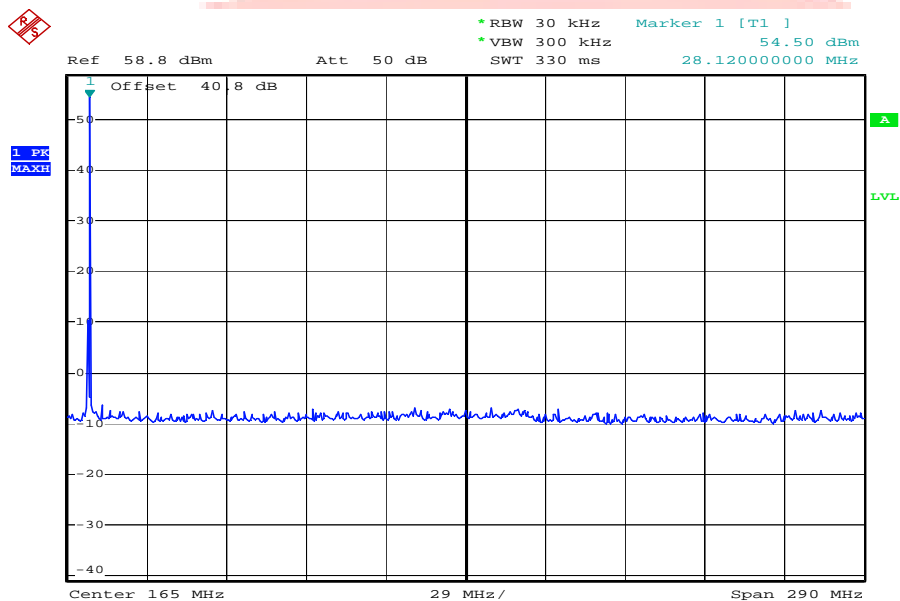
Date: 1.JAN.2000 03:01:56

Frequency: 28.10MHz; Wavelength band:10m

Frequency (MHz)	Harmonics (MHz)	dB Below Main	>43dB Below
28,1			Yes
28,1	56,2	>60	Yes
28,1	84,3	>60	Yes
28,1	112,4	>60	Yes
28,1	140,5	>60	Yes
28,1	168,6	>60	Yes
28,1	196,7	>60	Yes
28,1	224,8	>60	Yes
28,1	252,9	>60	Yes
28,1	281,0	>60	Yes



Date: 1.JAN.2000 03:07:31



Date: 1.JAN.2000 03:08:36

**TEST
3.**

STRENGTH OF SPURIOUS EMISSIONS (RADIATED)

REFERENCE
DOCUMENT

Part 2.1053, Part 97.307 (d) (e)

- TEST SETUP: In according to manufacturer specifications
- TEST LOCATION: Semi-anechoic chamber (CISPR 16-1 :1993)
Siemens+Matsushita type B84117-D6019-T232
Measure distance 3 meters
- TEST EQUIPMENT USED FOR TEST: EMI receiver Rohde & Schwarz Mod. ESU40
Chase Antenna Mod. CBL 6111

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :			12 Vdc

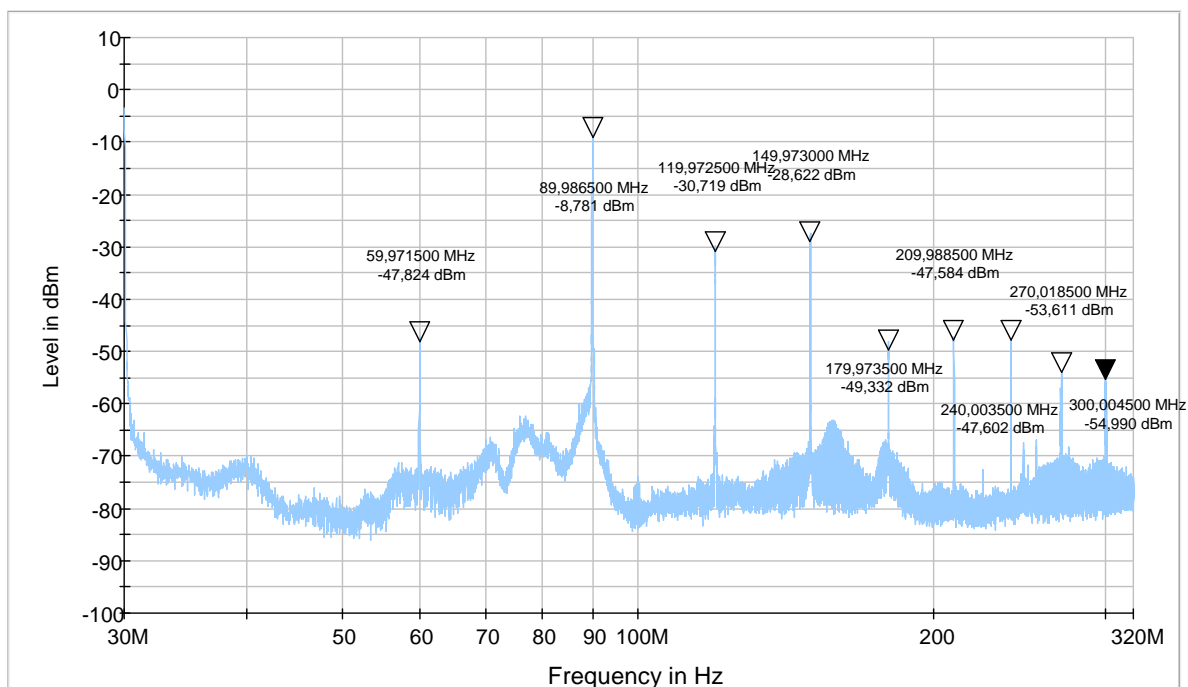
OPERATING CONDITION (Rif. Section. 2.6) : **#1**

RESULT: **WITHIN THE LIMIT**

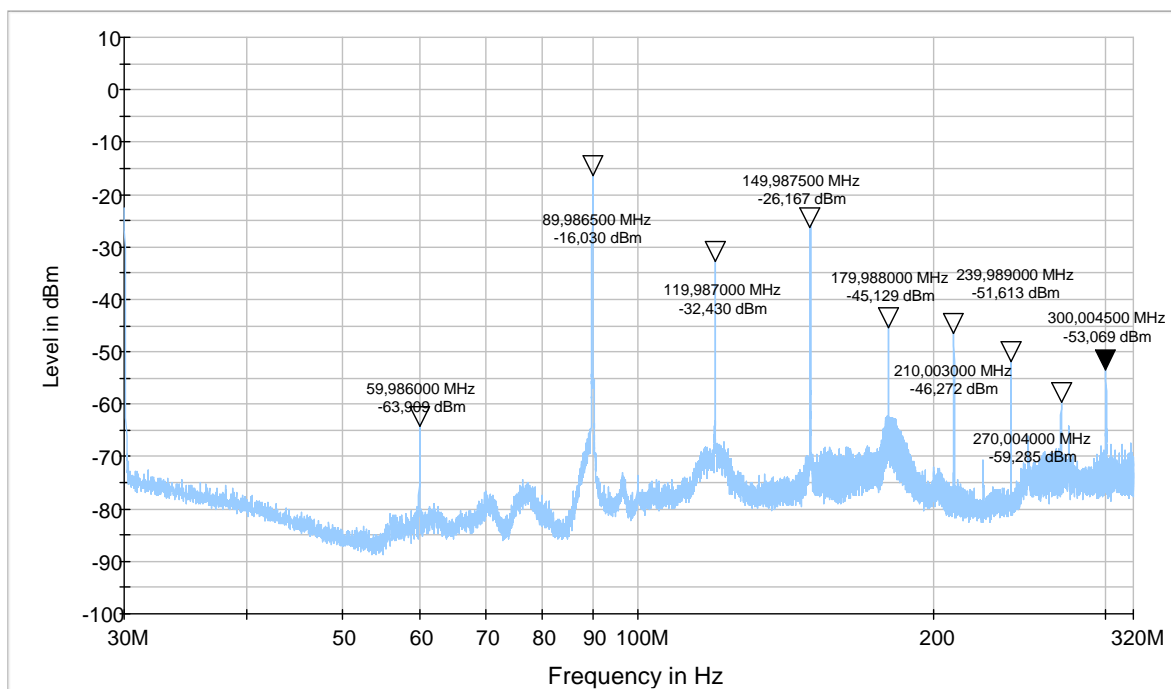
Frequency: 3.0000MHz; Wavelength band:10m

Frequency (MHz)	Harmonics (MHz)	dB Below Main	>43dB Below
30,000	-----	-----	Yes
	59.9715	101.42	Yes
	89.9865	62.38	Yes
	119.9725	84.32	Yes
	149.9730	79.76	Yes
	179.9735	98.72	Yes
	209.9885	99.87	Yes
	240.0035	101.20	Yes
	270.0185	107.21	Yes
	300.0045	106.66	Yes

Vertical polarization



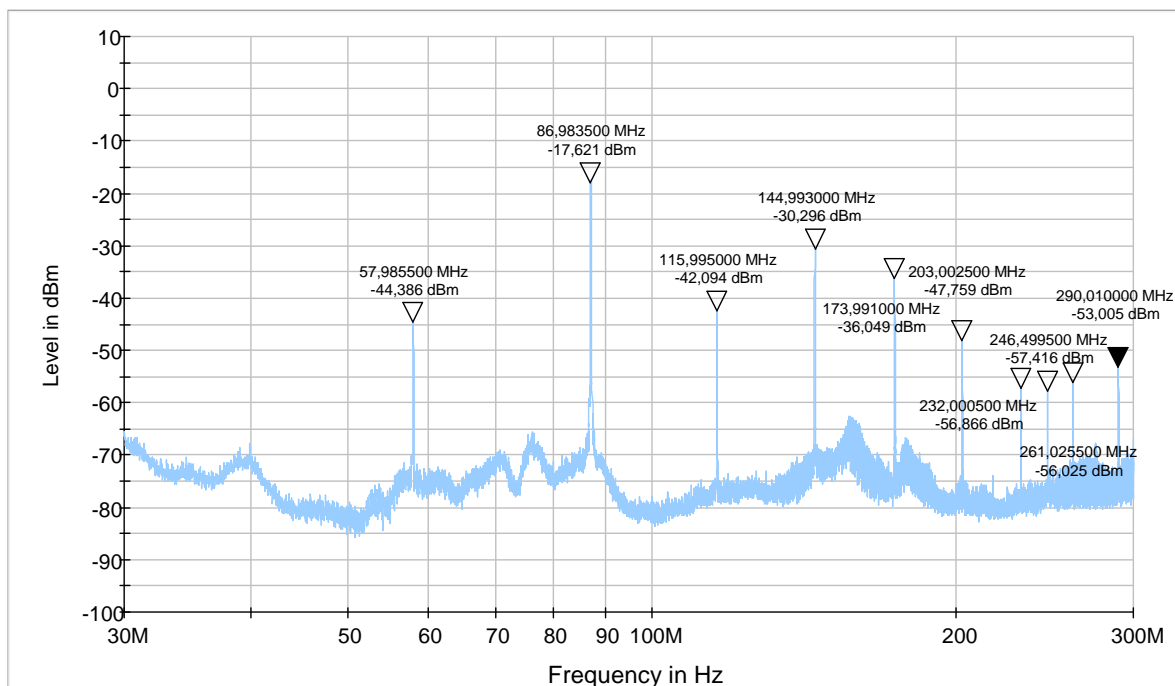
Horizontal polarization



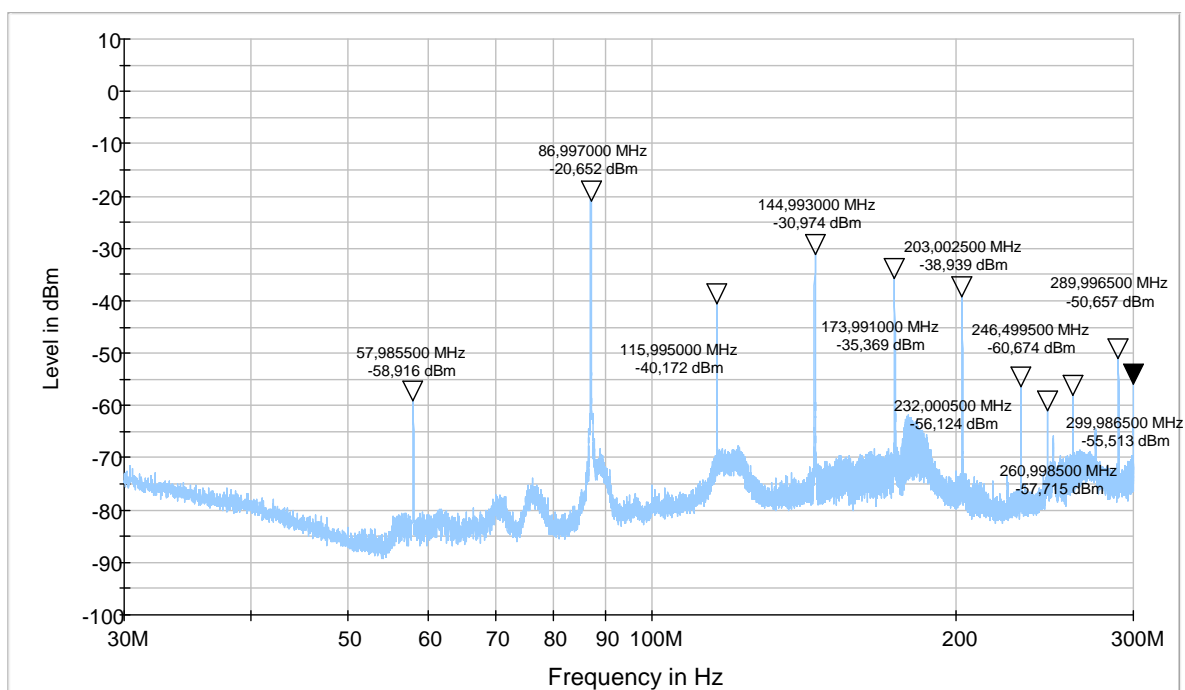
Frequency: 29.000MHz; Wavelength band:10m

Frequency (MHz)	Harmonics (MHz)	dB Below Main	>43dB Below
29.000	----	----	Yes
	57.9885	97.986	Yes
	86.9835	71.220	Yes
	115.9950	93.601	Yes
	144.9930	83.896	Yes
	173.9810	88.989	Yes
	203.0025	92.539	Yes
	232.0050	109.724	Yes
	261.0255	109.625	Yes
	289.9900	104.267	Yes

Vertical polarization



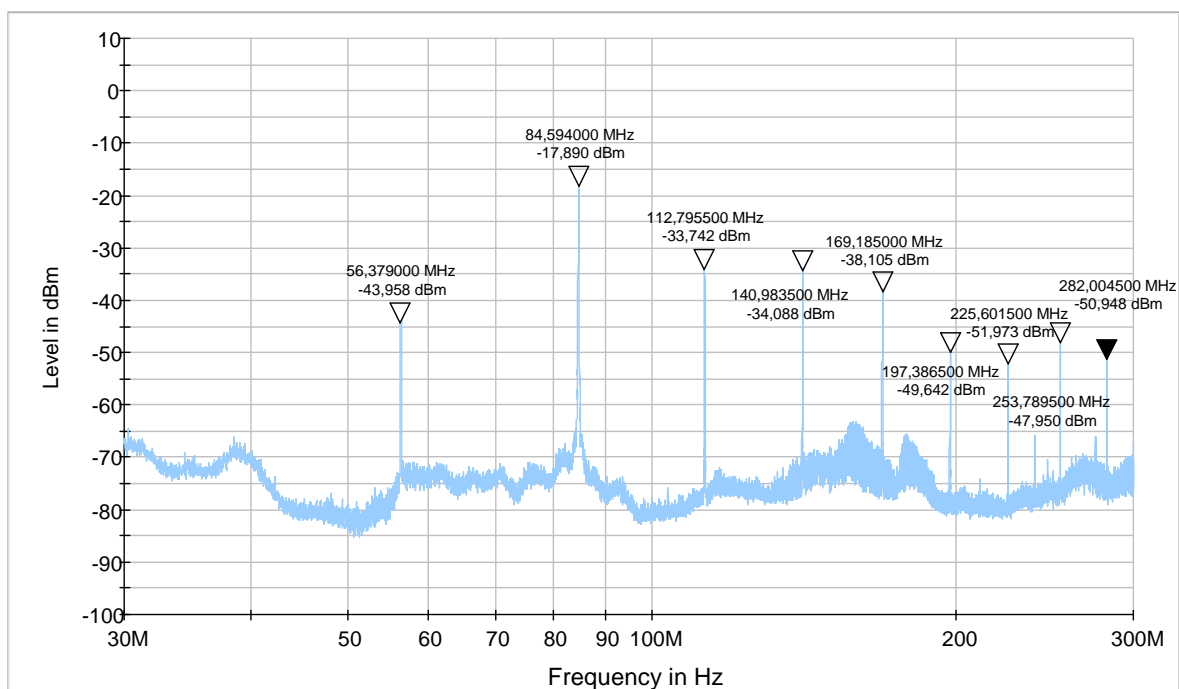
Horizontal polarization



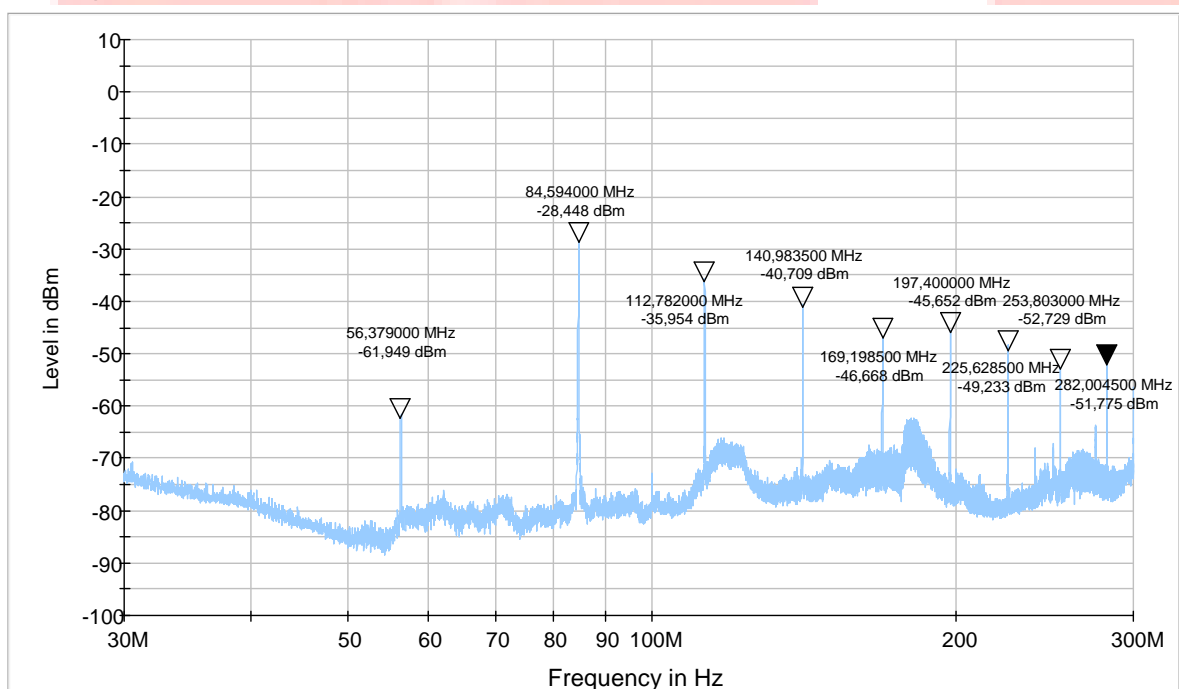
Frequency: 28.200MHz; Wavelength band:10m

Frequency (MHz)	Harmonics (MHz)	dB Below Main	>43dB Below
28,200	----	----	Yes
	56.379	97.358	Yes
	84.594	71.290	Yes
	112.7955	87.142	Yes
	140.9835	87.488	Yes
	169.1850	91.500	Yes
	197.3865	99.025	Yes
	225.6015	102.633	Yes
	253.7895	101.350	Yes
	282.0045	104.380	Yes

Vertical polarization



Horizontal polarization



7 LIST OF EQUIPMENT USED

EQUIPMENT	IDENTIFICATION NUMBER	CAL. DUE
POWER METER	EMC.359	JEN.2015
VOLTAGE GENERATOR	EMC.397	MAR.2015
SPECTRUM ANALYZER	EMC.332	APR.2015
RF GENERATOR	--	--
SEMI ANECHOIC CHAMBER	EMC.191	MAR.2015
EMI RECEIVER	EMC.359	SEPT.2015
ANTENNA	EMC.022	MAY.2015