MegiQ
RF Development Tools

RMS0440 – RMS0460
RMS0640 – RMS0660

Radiation Measurement System

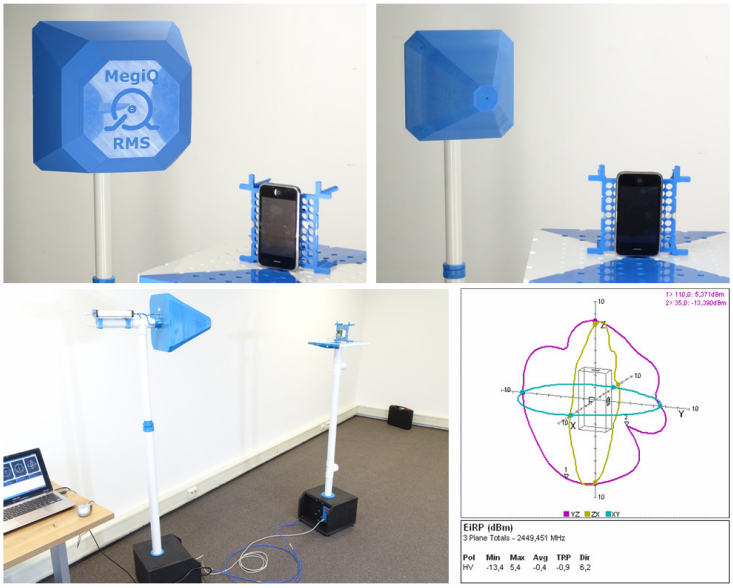
370/600 MHz to 4/6 GHz

The MegiQ Radiation Measurement System (RMS) is a compact test system that performs 3-axis radiation pattern measurement in non-anechoic spaces.

With a frequency range of 370 or 600MHz to 4GHz or 6GHz it is well suited for characterization and measurement of **Antenna Radiation Patterns, Antenna Gain, ERP, TRP, Field Strength.**

Extensive evaluation has shown that – with reasonable setup - the accuracy of the RMS is similar to that of anechoic test labs.

Characterize wireless devices of today, like IOT devices, routers, phones, domotica products, electronic gadgets, tablets, laptops, RF-modules etc.



Measure Antenna Patterns in minutes

No anechoic chamber required

The RMS has proven to be a tremendous asset during the development and evaluation of wireless devices. The improved product performance as well as the savings on time consuming range tests and test-lab measurements will pay for the RMS in just a few projects.

Features

- Measurement of RF device constant carrier or packet stream radiation patterns.
- Frequency range 370 / 600 MHz to 4 / 6 GHz.
- Uncertainty 1dB (anechoic). Repeatability 0.5dB.
- Measuring distance 0.8 to 3 meter.
- 3-axis measurement. Plots per axis and 3D.
- Simultaneous Horizontal and Vertical polarization measurement.
- Simultaneous measurement of harmonic radiation.
- Narrow antenna beam width for non-anechoic environments.
- Minimum step size 2 degrees.
- Integrated PC software suite supports measurement setup, rotation control, graphing, data storage and report generation.
- Plots of radiated power ERP (dBm), Antenna Gain (dBi), Field Strength (dBuV/m).
- Calculation of TRP, Minimum, Maximum and Average radiation.
- Optional Generator output for standalone antenna measurement.
- Optional Heavy Duty turntable (30kg).
- Optional Laser direction pointer.

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www.megiq.com

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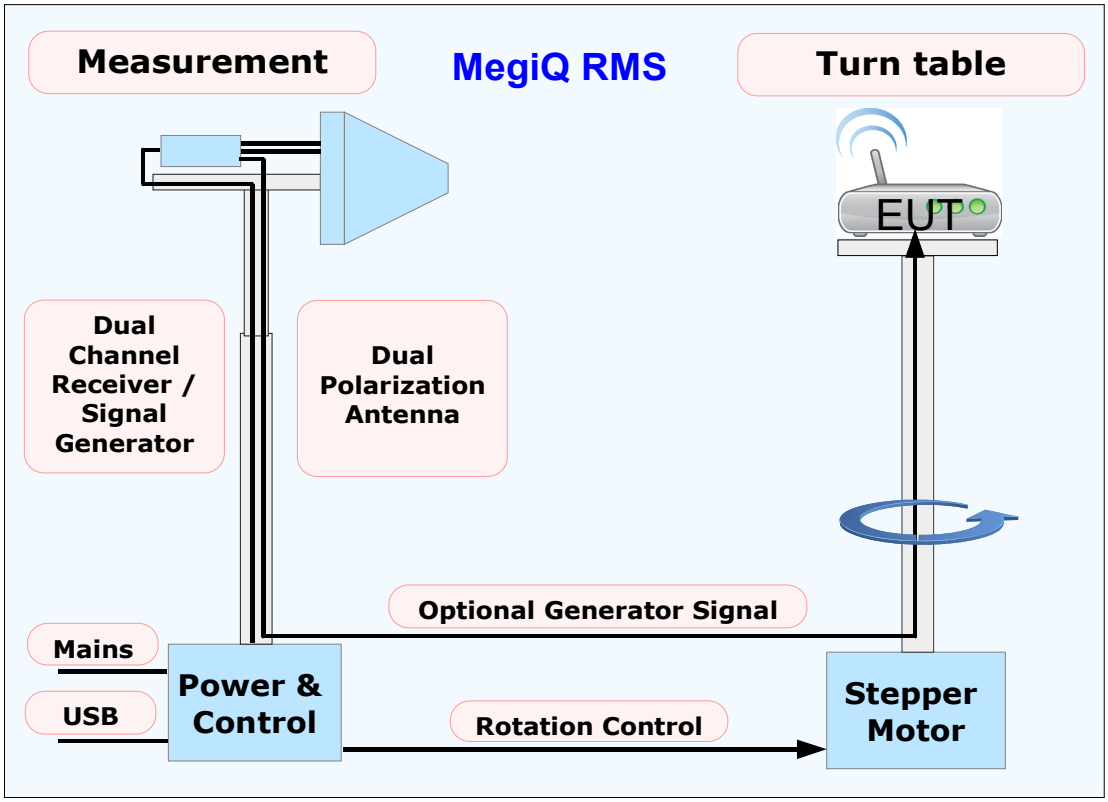
Measurement System



Measurement

- Antenna height 100cm to 170cm.
- Dual Polarization Antenna.
- Dual channel measuring receiver.
- Generator output (option).
- Rotation controller unit.
- Power supply.
- USB connection for computer control.

Turn Table

- Height 70cm and 130cm.
- Stepper motor drive.
- 30 seconds per rotation.
- Smooth acceleration.
- Table size 28 x 28cm.
- Max EUT weight: 7.5kg.
- Heavy Duty table: 100 x 50cm, 30kg.

The RMS rotates an object on the turntable and measures the radiation. With a rotation around the X, Y and Z axis the software plots the patterns and calculates statistics including Total Radiated Power (TRP). Each measuring point can contain a sweep of multiple frequencies, so that multiple radiation patterns can be measured in one rotation sequence.

With the Generator option the RMS can also perform an antenna sweep and show the antenna gain over frequency.

The RMS comes with an object fixture for small devices that allows easy positioning of the EUT in orthogonal positions on the object table. A labeling system helps the user to keep track of the axes.

The RMS system works well in a moderate space. A 4 x 4 x 3 meter room works well above 800MHz. For smaller spaces or lower frequencies a few strategic absorbers may be required.

Software

The RMS software controls the measurement system and allows easy setup and performing the measurements, organizing the data and create reports. It will guide the user through the 3 rotation axis steps.

For EUT with a constant carrier or packet stream mode the RMS is used in a passive mode to rotate the EUT and record the field strength. For constant carriers, the receiver can measure multiple frequencies for each measurement point so that harmonic patterns (up to 4 or 6 GHz) can be measured simultaneously. The minimum step size is 2 degrees.

For EUT without a transmitter (prototype or standalone antenna) the Generator output can be used to feed a test signal to the EUT. In this mode the RMS can measure rotation patterns (at up to 30 frequencies simulations) or perform a frequency sweep of the antenna gain. The S-parameters of the feed coax can be imported to compensate for the loss and impedance of the cable.

In idle mode the RMS monitors the signal and shows the polarization in real time. It can also transmit a carrier with a calibrated power on the horizontal or vertical antenna.

The results can be presented in Antenna Gain (dBi), Radiated Power EiRP (dBm) or Field Strength (dBuV/m). The software calculates statistics such as Min/Max level, Average, Total Radiated Power (TRP), Antenna Efficiency (dBi) and Directivity (dB).

The rotation table can be controlled manually and a rotation offset aides in the rotation of large objects.

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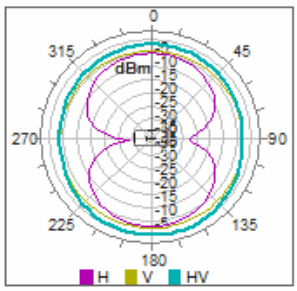
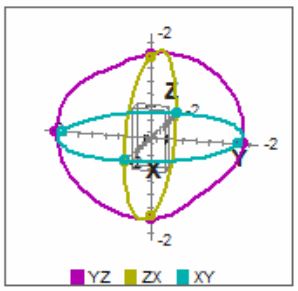
Measurements

Antenna rotation and linear patterns

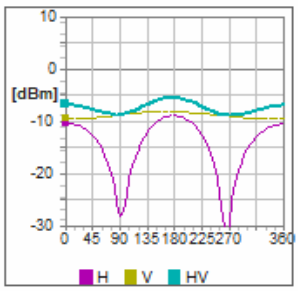
XY EiRP 915.04 MHz



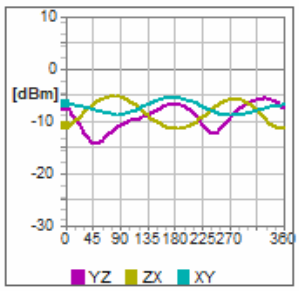
3D EiRP 915.04 MHz



XY EiRP 915.04 MHz

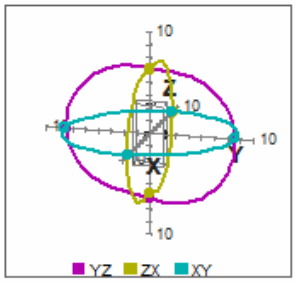


3D EiRP 915.04 MHz



Harmonics

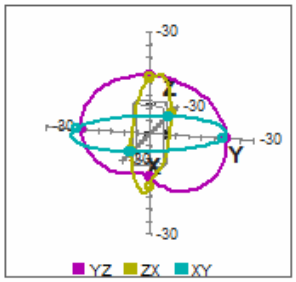
3D EiRP 868,256 MHz



EiRP (dBm)
3 Plane Totals - 868,256 MHz

Pol	Min	Max	TRP	Dir
HV	-6,4	3,2	1,4	1,8

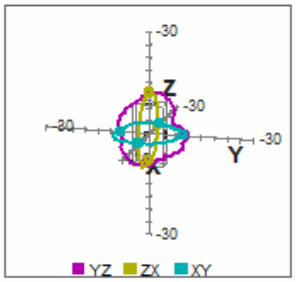
3D EiRP 1736,512 MHz



EiRP (dBm)
3 Plane Totals - 1736,512 MHz

Pol	Min	Max	TRP	Dir
HV	-53,7	-39,1	-43,3	4,3

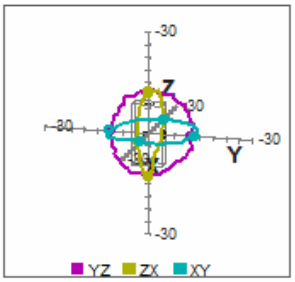
3D EiRP 2604,768 MHz



EiRP (dBm)
3 Plane Totals - 2604,768 MHz

Pol	Min	Max	TRP	Dir
HV	-59,7	-52,6	-56,0	3,5

3D EiRP 3473,024 MHz

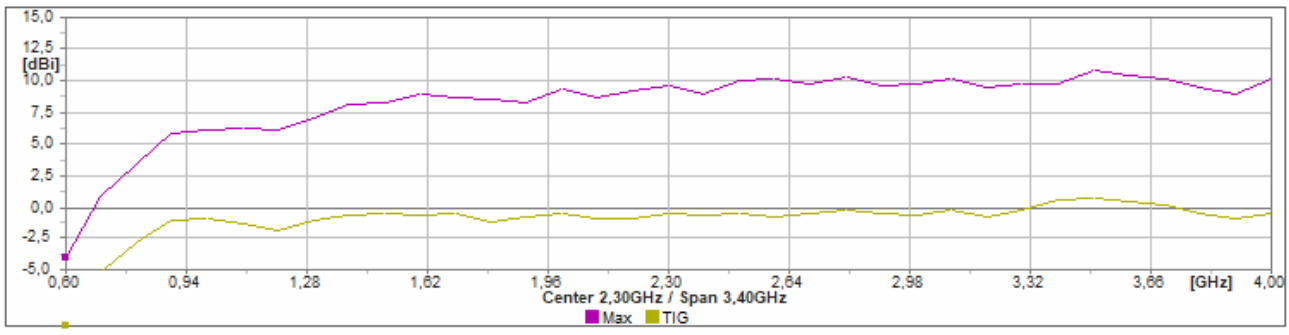


EiRP (dBm)
3 Plane Totals - 3473,024 MHz

Pol	Min	Max	TRP	Dir
HV	-57,9	-48,2	-52,8	4,7

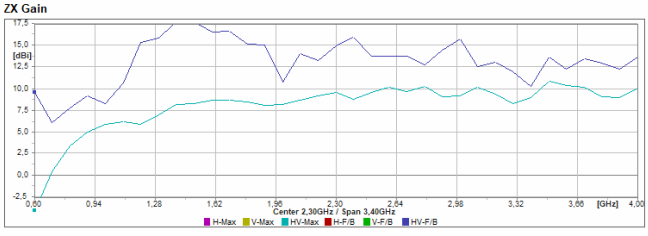
Max gain and efficiency over frequency

3D Gain

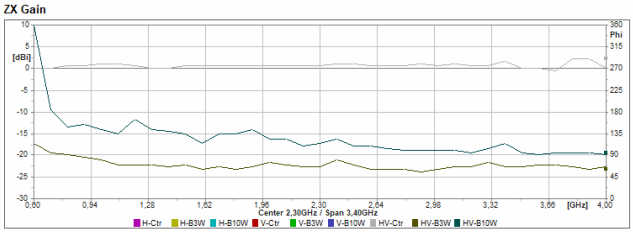


Beam Max Gain, Front to Back ratio, Beam Width over frequency

ZX Gain



ZX Gain



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RMS Specifications

	RMS0440 / RMS0460 RMS0640 / RMS0660	unit
Frequency		
Frequency range	370 – 4000 / 370 - 6000 600 – 4000 / 600 – 6000	MHz
Frequency accuracy	2	ppm
Frequency resolution	5	kHz
Measurement		
Antenna Height	100 - 164	cm
Measuring distance	80 - 300	cm
Antenna polarization	Dual polarization antennas	
Receiver	Dual channel receiver	
Phase coherency	Phase coherent between H and V polarization	
Base Receiver bandwidth	20	kHz
Minimum Field Strength	75 – 90 / 75 - 100	dBuV/m
Measurement accuracy (anechoic)	+/- 1.0	dB
Repeatability	0.5	dB
Turn Table		
Height	70 / 130	cm
Platform	28 x 28	cm
Max load	7.5	kg
Stepper motor rotation speed	30	sec / Rot
Connections		
Power	95 - 240	VAC
PC Interface	USB 2.0	

Generator (option)		
Port Connector	SMA female	
Frequency range	370 - 4000 600 – 4000	MHz
Output level	-30 - +5	dBm
Heavy Duty Turn Table (option)		
Height	110	cm
Platform	100 x 50	cm
Max load	30	kg
Laser Pointer (option)		
Laser class	Class 2 / < 1mW	
PC Software		
Operating System	Windows XP – Windows 10	
PC minimum requirements	Pentium I3 – 2 GHz	
PC recommended requirements	Pentium I5 – 2.4 GHz	
Measurement Characteristics		
Physical Quantities	Field Strength Effective Isotropic Radiated Power Antenna Isotropic Gain Antenna efficiency	dBuV/m dBm dBi dB, %
Amplitude Statistics	Min, Max, Average Total Radiated Power Total Isotropic Gain	
Beam Statistics	Beam Center 3dB Beam Width 10dB Beam Width Front / Back ratio	
Graphs	Gain, Phase over Frequency Statistics over Frequency Polar Rotation Patterns Linear Rotation Patterns	