



Dual Polarised L-Band Receiver

Polarised L-band observations are highly valuable for remote sensing surface observations. Therefore, RPG has developed a Dual Polarisation (DP) receiver module. The L-band receiver, operating at 1.4 GHz, uses a compact patch antenna. It can be combined with other modules observing at different frequencies. (6, 10, 19, 36, 90, and 150 GHz). Each module measures at two orthogonal polarisations.

Applications

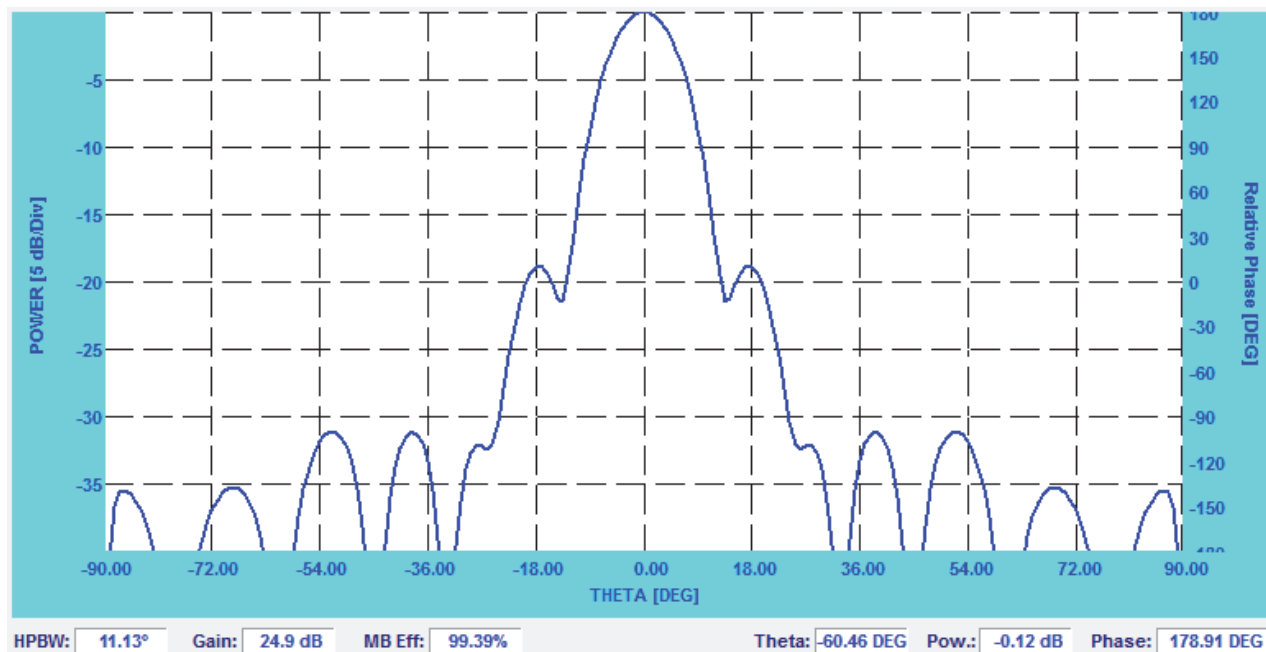
RPG's modular surface radiometers (RPG-DP-SR series) can be used in a wide field of applications, where polarisation effects are significant.





Antenna Performance

Parameter	Specification
Geometry	Planar 64 square patch array
Antenna dimensions	1200 x 1200 x 65 mm ³
HPBW (half power beam width)	11°
Antenna gain	24.9 dB
Main beam efficiency	99.4% (same envelope as dual-mode horn)
Side-lobe level	< -30 dBc
Minimum observation distance	5 m
Mass	36 kg
Operating temperature range	-40° to +50°
Operating humidity range	0-100% (rain protected)



L-band antenna pattern

Receiver Performance

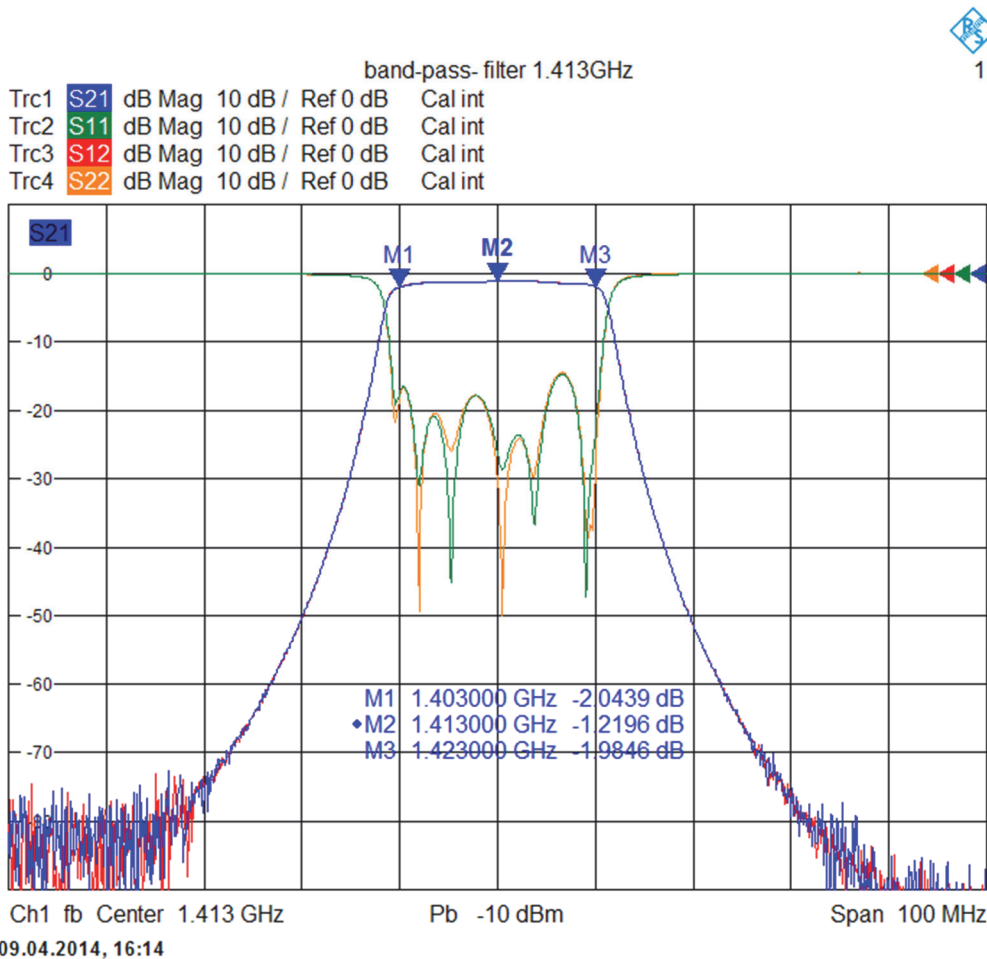
Parameter	Specification
Calibration	<ul style="list-style-type: none"> • Dicke switch (internal ambient target), cold FET target • Pin switch (1p3t) for antenna/cold target/ambient target
Ambient calibration temperature	315 K (typical)
Cold calibration temperature	55 K (typical, cold FET)
Receiver system noise	< 200 K (typical)



Parameter	Specification
Calibration switch leakage	< 0.01%
Detection bandwidth	20 MHz, 1.40 to 1.42 GHz
Out-of-band rejection	-50 dB @ 1.39 / 1.43 GHz
Polarisation	Horizontal and vertical
Total system noise	500 K (typical, including patch antenna array)
Brightness temperature range	0 K to 800 K
Accuracy	1 K (typical)
Radiometric noise	< 0.15 K RMS
Thermal receiver stability	< 30 mK over full environmental temperature range
Operating temperature range	-40° to +50°
Operating humidity range	0-100% (rain protected)

Filter Characteristic

Super steep filter function with out-of-band rejection of -50 dB @ 10 MHz off band. The 1.40 to 1.42 GHz band is protected.



Sweep range: 1.36 GHz to 1.46 GHz

Elevation / Azimuth Scanner

Depending on the selected receiver modules, RPG's surface radiometers are delivered with two different positioner sizes.

Parameter	Specification
Elevation range	-90° (Nadir) to +90° (Zenith)
Elevation scanning speed	3°/sec
Azimuth range	0° to 360°
Azimuth scanning speed	3°/sec



Additional Sensors

RPG's surface radiometers are turn-key instruments for standalone operational use. A complete software package (for an embedded PC and an external host PC), an Ethernet interface (for network capability and secure data transmission), and additional sensors are included.

Parameter	Specification
GPS receiver	Position and UTC time reference, North alignment by solar scanning
Environmental temperature	Accuracy: 0.5°C, range: -60°C to 80°C
Barometric pressure	Accuracy: 0.5 hPa, range: 250 to 1400 hPa
Rain sensor	Digital rain flag