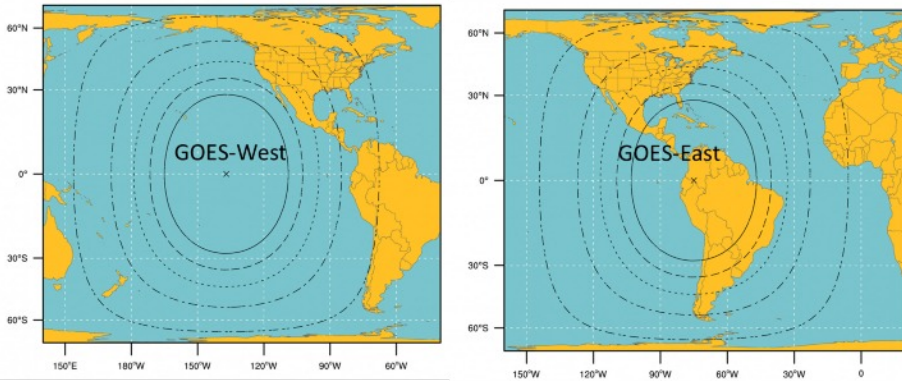


GOES-R Dual Circular Polarity Feed

Model GRBF-100 - Preliminary Information

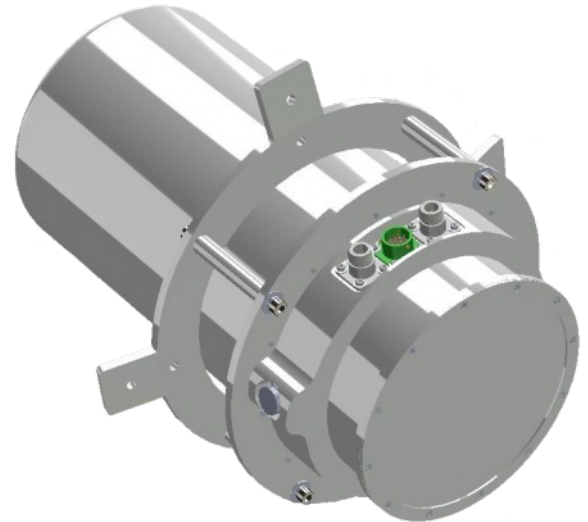


NOTES:

1. Calculations based on available data as of May 2011
2. Each antenna size is usable within the indicated contour
3. Rain attenuations included are:
1.3/1.6/2.0/2.2/2.5 dB (3.8 to 6 m)
4. An operating margin of 2.5 dB is included as the dual polarization isolation is likely to vary within each antenna size area

Antenna Diameters

-----	6.0 m
-----	5.0 m
-----	4.5 m
-----	4.2 m
-----	3.8 m



Key Features

HIGH PERFORMANCE DUAL CIRCULAR POLARIZED - PRIME FOCUS DESIGN FOR SIMULTANEOUS LHCP AND RHCP OPERATION

OPTIMIZED TO MEET GOES-R G/T SPECIFICATIONS

MEETS GOES-R 27 DB CROSS POLARIZATION SPECIFICATION

ADVANCED FILTERING TO MITIGATE POTENTIAL MOBILE PHONE OR OTHER CLOSE-IN INTERFERENCE

DUAL 1686.6 MHz DOWNCONVERTERS

Description

The Quorum Communications model GRBF-100 GOES-R Dual Circular Polarity Feed is intended for use on smaller antennas such as the Prodelin 1374 series, to provide unparalleled reception of the GOES-R GRB downlinks when paired with the Quorum GOES-R GRB-200 Demodulator.

The GOES-R downlink uses simultaneous Left and Right hand circular polarity downlinks to deliver 31 Mbps of environmental data to users. Transmission in L-band with potential close in interfering signals from mobile phones and other wireless internet services provide unique challenges in the design of the GRB reception system components to ensure quality data reception while meeting the GOES-R performance specifications.

The design of the GRBF-100 GOES-R feed provides an optimal tradeoff between size and performance necessary for operation on smaller antennas. This performance is made more difficult by the necessity to eliminate potential performance degradation due to the expected close in interference from mobile phone and new wireless internet services. This is achieved with custom designed narrow band and low loss cavity filtered paired with low noise and high third order LNA's.

While the GRBF-100 feed is appropriate for use with any GOES-R reception system, it is intended primarily for use within the 3.8m to 4.5m signal contours projected for GOES-R series satellites operating at the corresponding east and west locations. Existing GOES GVAR users within these areas will find a familiar upgrade path for GOES-R operation.

Specifications - PN99R015045 (specifications are subject to change without notice)

RF

Feed Structure	Phased dipole cavity feed
Center Frequency	1686.6 MHz
Cross Polarity Isolation	> 27 dB typical
RF Filtering	Multi-pole Hi Q cavity filter (pre LNA) 0.6 dB insertion loss
RF Converted Bandwidth	20 MHz
LNA(s)	25 K noise temperature (0.4 dB noise figure) 34 dB gain
Typical G/T (4.5m / 3.7m)	>14 dB/K / >12.2 dB/K

Downconverter(s)

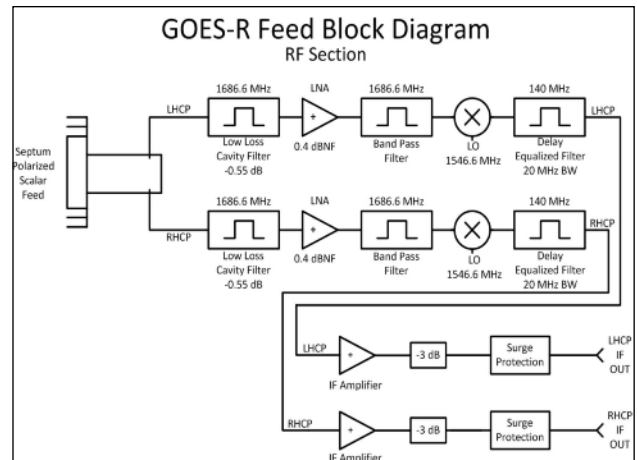
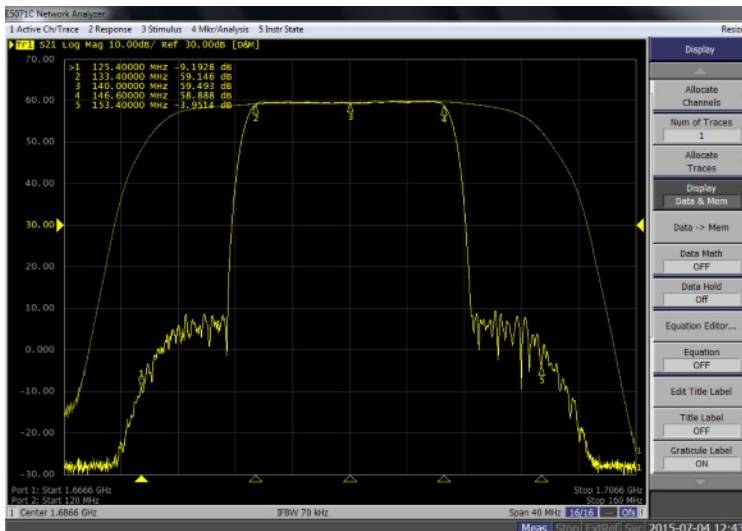
LO Frequency	1546.6 MHz
Image Rejection	> 100 dB
Output Frequency (dual channel)	140 MHz
Overall Conversion Gain	60 dB typical
LO Phase Noise	-95 dBc/Hz @ 10 KHz typical
TOIP	+36 dBm

Electrical / Mechanical

Supply Voltage / Power Current	+18 to +24 VDC supplied from Quorum GRB Demodulator 360 mA typical @ 24 VDC (8.6 watts)
IF Output Connectors (2)	Type N female
Power / Control Connector Size	PT02E-12-10P or 24 VDC on IF coax with indoor bias-t 18.5 cm (7.3") diameter x 38.1 cm (15") long Mounting ring diameter 25.4 cm (10")
Weight	Approx 7.3 Kg (16 lbs)
Housing	Powder coated aluminum

Environmental

Temperature	-40 to +60 C (-40 to +140 F)
Humidity	0 to 100%



Downconverter Response with Demod Overlay

GOES-R Dual Circular Polarity Feed

Model GRBF-200-CLA



Typical Installation on Challenger 4.5m Antenna



Key Features

HIGH PERFORMANCE SEPTUM POLARIZED - PRIME FOCUS DESIGN FOR SIMULTANEOUS LHCP AND RHCP OPERATION
OPTIMIZED TO MEET GOES-R G/T SPECIFICATIONS
MEETS GOES-R 27 DB CROSS POLARIZATION SPECIFICATION
ADVANCED FILTERING TO MITIGATE POTENTIAL MOBILE PHONE OR OTHER CLOSE-IN INTERFERENCE
DUAL 1686.6 MHz DOWNCONVERTERS
FEED OPERATIONAL PARAMETERS MONITORED BY MATCHING QUORUM COMMUNICATIONS GRB DEMODULATOR

Description

The Quorum Communications GOES-R Dual Circular Polarity Feed is intended for use on larger commercial quality antennas, such as the 4.5m and 6.5m, to provide unparalleled reception of the GOES-R GRB downlinks when paired with the Quorum GOES-R GRB Demodulator.

The GOES-R downlink uses simultaneous Left and Right hand circular polarity downlinks to deliver 31 Mbps of environmental data to users. Transmission in L-band with potential close in interfering signals from mobile phones and other wireless internet services provide unique challenges in the design of the GRB reception system components to ensure quality data reception while meeting the GOES-R performance specifications.

The scalar waveguide design of the GOES-R feed with septum polarizer guarantees the high efficiency needed to provide 15.5 dB/K G/T when used on a 4.5m antenna. This performance is made more difficult by the necessity to eliminate potential performance degradation due to the expected close in interference from mobile phone and new wireless internet services. This is achieved with custom designed narrow band and low loss cavity filtered paired with low noise and high third order LNA's.

The GOES-R Feed is pressurized with dry air at 0.25 psi to keep out condensing humidity with automatic monitoring to maintain the optimum humidity and pressure inside the feed.

Extensive monitoring is provided of internal temperature, humidity, pressure, supply voltage and LO status which is read by the Quorum GRB Demodulator and forwarded to the data reception system.

Specifications - PN99R015040 (specifications are subject to change without notice)

RF

Feed Structure	High Efficiency Scalar Waveguide
Center Frequency	1686.6 MHz
Polarizer	Septum type, simultaneous Left and Right Hand Circular
Cross Polarity Isolation	> 27 dB
RF Filtering	Multi-pole Hi Q cavity filter (pre LNA) 0.6 dB insertion loss
RF Converted Bandwidth	20 MHz
LNA(s)	25 K noise temperature (0.4 dB noise figure) 34 dB gain
Typical G/T (6.5 m ASC / 4.5m ASC)	>18.2 dB/K / >15.5 dB/K

Downconverter(s)

LO Frequency	1546.6 MHz
Image Rejection	> 100 dB
Output Frequency (dual channel)	140 MHz
Overall Conversion Gain	60 dB typical
LO Phase Noise	-95 dBc/Hz @ 10 KHz typical
TOIP	+36 dBm

Electrical / Mechanical

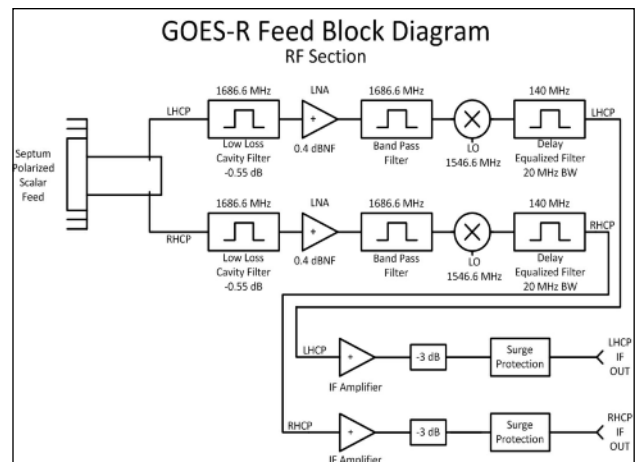
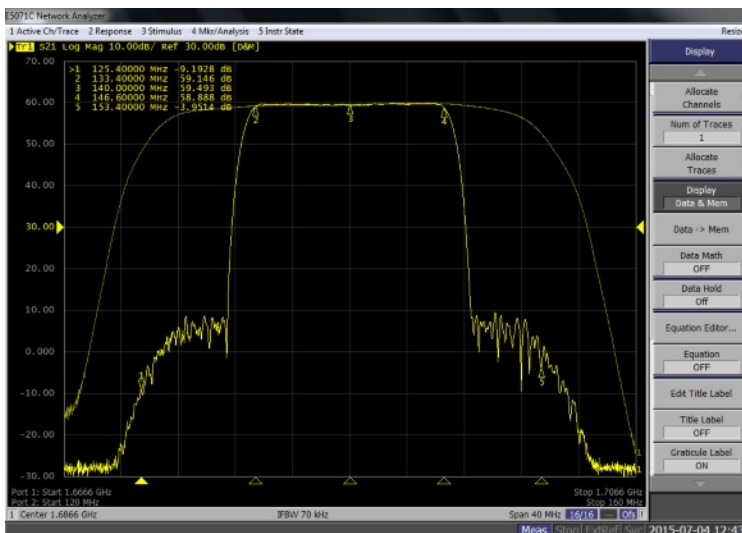
Supply Voltage / Power	+18 to +24 VDC supplied from Quorum GRB Demodulator
Current	360 mA typical @ 24 VDC (8.6 watts)
RF Input Connectors (2)	Type N female
Power / Control Connector	PT02E-12-10P
Size	46 cm (18") diameter x 61 cm (24") long
Weight	Approx 20 Kg (45 lbs) , 27 Kg (60 lbs) with typical mount
Housing	Powder coated aluminum

Environmental

Temperature	-40 to +60 C (-40 to +140 F)
Humidity	0 to 100%
Pressurization	Dry air @ 0.25 psi nominal
Environmental Control	Automatic dry air purging to maintain optimum internal humidity and temperature

Status Monitoring

Status Available (via GRB demod)	LO lock, temperature, humidity, pressure, supply voltage
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Downconverter Response with Demod Overlay