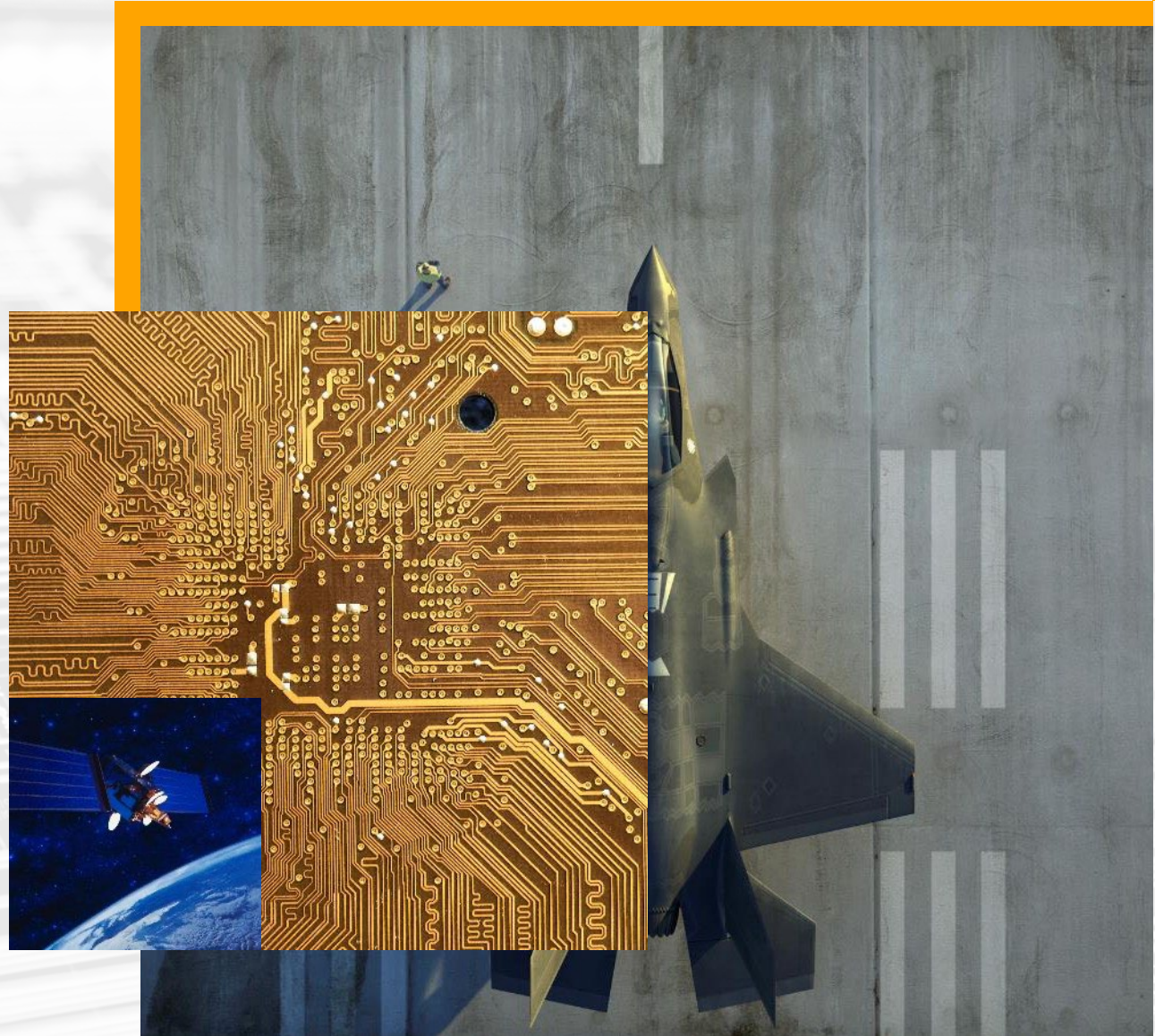




# Research & Development - Multi-Function Modules, Subsystems & Integrated Assemblies

August 17<sup>th</sup>, 2023



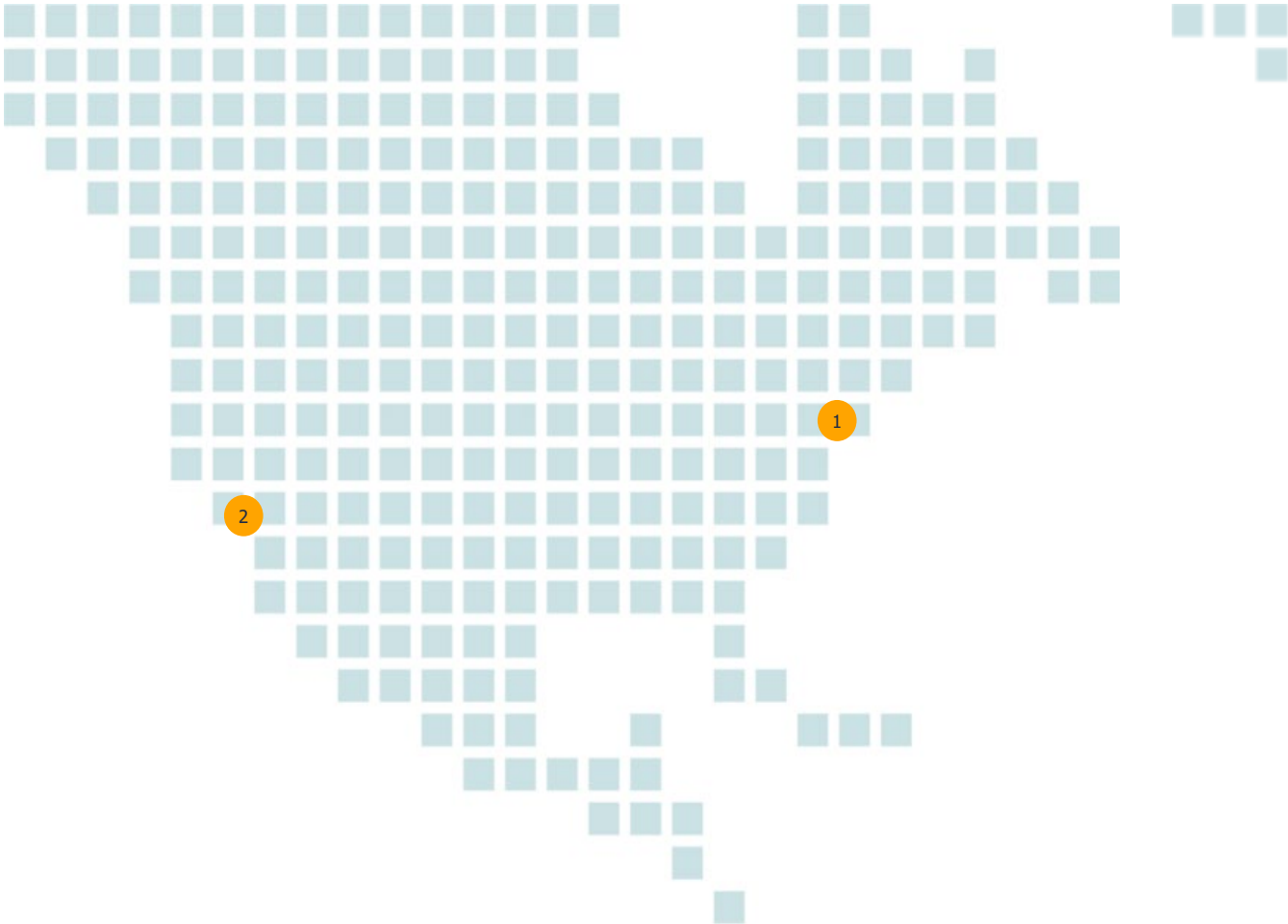
# Quantic PMI Overview

Defining & Delivering the Future  
of Mission-Critical Electronics

- > Global leader within military, space and commercial markets
- > Design & manufacture of Quality RF & Microwave Components & Integrated Module Assemblies
- > Offers more than 4000 commercial off-the-shelf models with test results, S-parameters, 3D models and detailed specs available.
- > Every product is built to rigorous MIL-STD specs
- > ITAR & ISO-9001 Certifications
- > Industry-leading sales and applications support, leading to lower costs and faster lead times than competitive options.



# Design and Manufacturing Locations



## RF & Microwave

- 1 Quantic PMI – Frederick, Maryland  
East Coast Operation  
7309-A Grove Road  
Frederick, MD 21704 USA  
  
Tel: 301.662.5019  
Fax: 301.662.1731
  
- 2 Quantic PMI – EL Dorado Hills, California  
West Coast Operation  
4921 Robert Mathews PKWY, Suite 1  
EL Dorado Hills, CA 95762 USA  
  
TEL: 916.542.1401  
FAX: 916.265.2597

[sales@quanticpmi.com](mailto:sales@quanticpmi.com)

[www.quanticpmi.com](http://www.quanticpmi.com)

# Research & Development

Multifunction Modules, Subsystems & Integrated Assemblies

> Integrated MIC/MMIC Modules & Assemblies (IMAs)

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> Form, Fit & Function Products

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> Frequency Sources, Converters & Discriminators

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> Rack & Chassis Mount Products

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> UP & Down Converters

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> Receiver Front Ends & Transceivers



# Integrated MIC/MMIC Modules & Assemblies (IMAs)

CUSTOM DESIGNS UP TO 70 GHz

Built to your SCD or Specifications...

## > Functions can include:

- Amplification
- Attenuation
- Filtering
- Switching
- Phase Shifting
- Power Detection
- Modulation
- Coupling
- Limiting
- Digital Control

## > Options

- Hermetic Sealing
- Military or Space Screening
- Custom Packaging
- Build to Print or Built to your SCD

## > Form, fit & functionality is our specialty!



# Integrated MIC/MMIC Modules & Assemblies (IMAs)

- > Broadband to 50 GHz
- > Built to your specifications with functions:
  - Amplification
  - Attenuation
  - Filtering
  - Frequency Discrimination
  - Switching
- //
- >
  - Phase Shifting
  - Power Detection
  - Modulation/Demodulation
  - Coupling
  - Limiting
  - Digital/Analog Control
- > Hermetic Sealing, Military Screening available
- > Form, Fit & Function Products & Services
- > Build to Print or Built to your SCD



0.5 to 18.0 GHz, Custom Phase ( $\pm 10^\circ$ ) & Amplitude ( $\pm 1.5$  dB) Matched Integrated Modules/ Assemblies



10.0 GHz, Integrated Phase Shifter and Dielectric Resonator Oscillator (DRO) Module (Inside)



2.6 to 5.2 GHz 8 Channel Selectable LO Frequency Source



7.7 to 8.2 GHz Laser Control Module



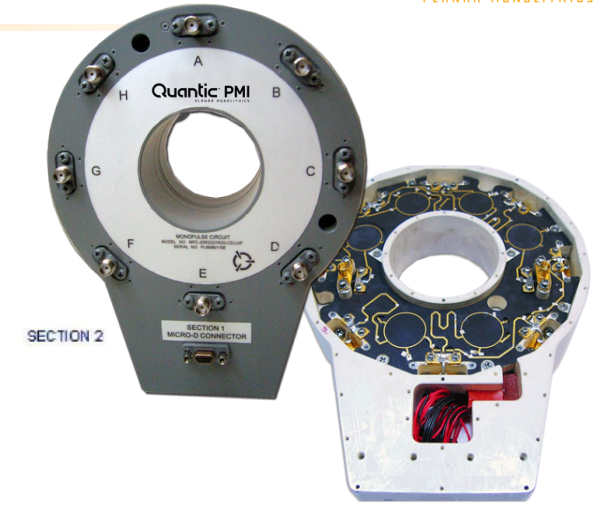
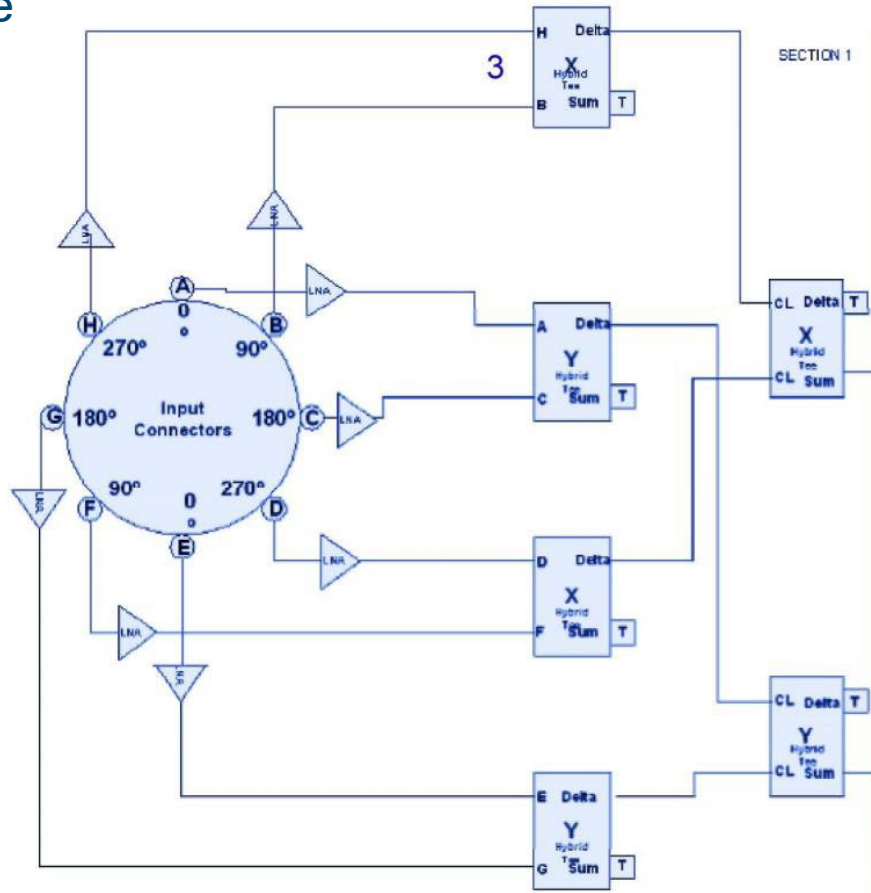
100 MHz to 18 GHz Transceiver (Phase II)

# Monopulse Comparator, MPC-20R2G21R2G-CD-LNF

Monopulse Circuit designed for beamforming applications.

- > Frequency 20.2 to 21.2 GHz
- > Lossless from Input to Output
- > Designed for 100K Noise Temperature
- > Phase Tracking all 8 Inputs

PARAMETERS	SPECIFICATIONS
Frequency	20.2 - 21.2 GHz
Gain	0 to +10 dB
Noise Temperature	100 K
Phase Balance	±3° Max
DC Supply	+12 to +15 VDC Typ
Control Signal	TTL Logic
Connectors	SMA (F)
Finish	Painted Gray
Size	6.25" x Ø4.80" x 2.00"



Section 1

- 8 Antenna Inputs
- Phase Matched LNAs
- Hybrid Tee
- Ringline Couplers
- Phase Matched Outputs

Section 2

- Hybrid 90° Power Divider
- Branchline Coupler
- SPDT Absorptive Switch
- Solid State



# Level, Scan & Pulse Modulator, LSP-0518-SK



## SCAN MODULATION:

Linear transfer function for control voltage of attenuation as expressed in dB. This is an exponential transfer function.

$$V_{out} = A \times 10^{(V_{control} / B)}$$

A and B are constants

A typical Transfer Function Specification would be: 10 dB per Volt.

## LEVEL SETTING:

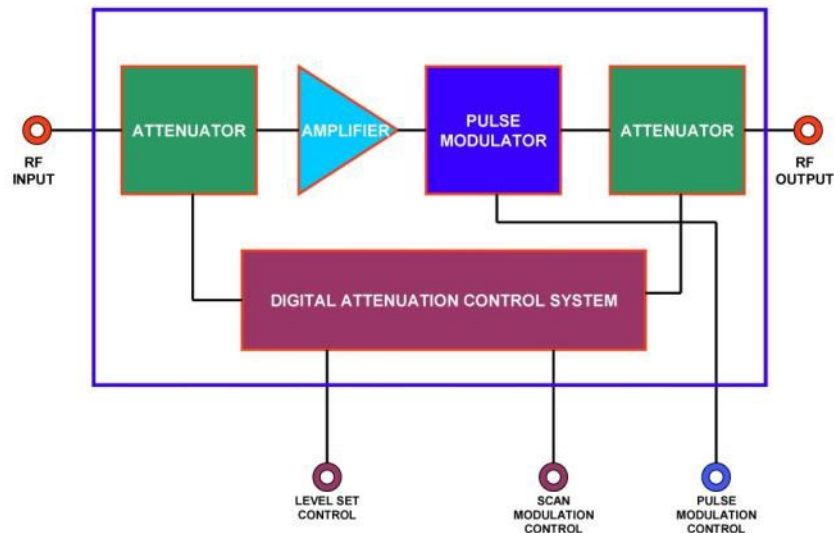
In the LSP module the level setting function is similar to the scan modulation in that a control voltage sets the dBs of attenuation to vary the output level.

## PULSE MODULATION:

This is an on and off function, switching the RF on and off to generate waveforms of a desired shape or characteristic.

## ATTENUATION:

Attenuation is the incremental reduction of signal strength through controlled adjustments of ever-increasing resistance within the RF circuit. These controls can be either through digital or analog inputs. Attenuation is expressed in dBs. The Level set and Scan modulation functions are in reality attenuation controls.

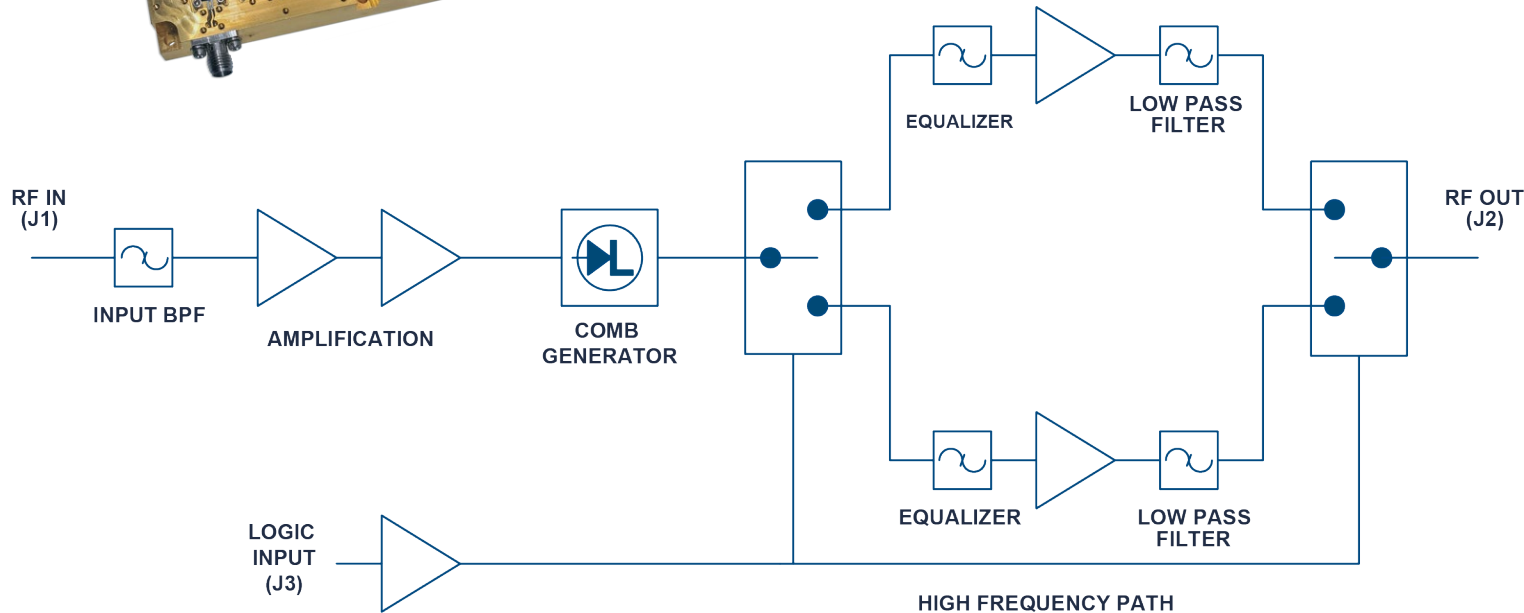


# Frequency Comb Generator, PIM-333M368M-28-816-5V-SFF

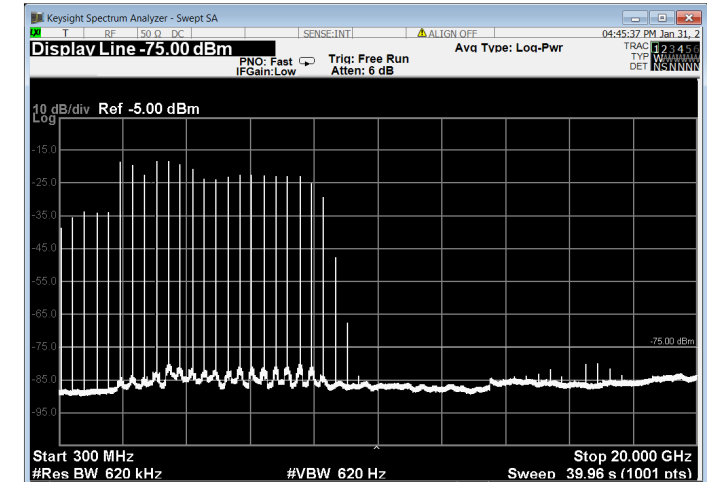
Designed for selectable LO applications



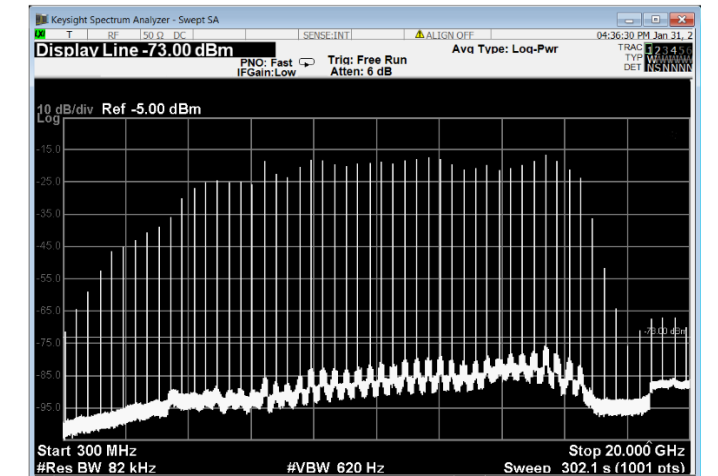
- > Operates over 333 to 368 MHz
- > Input/output VSWR of 1.8:1
- > Built-in +5 VDC power supply
- > Contains SMA female connectors & 9-pin D-Sub male connector
- > Housing measures 4.50" x 3.50" x 0.75"



## Comb Outputs 2 – 8 GHz Channel



## Comb Outputs 8 – 16 GHz Channel

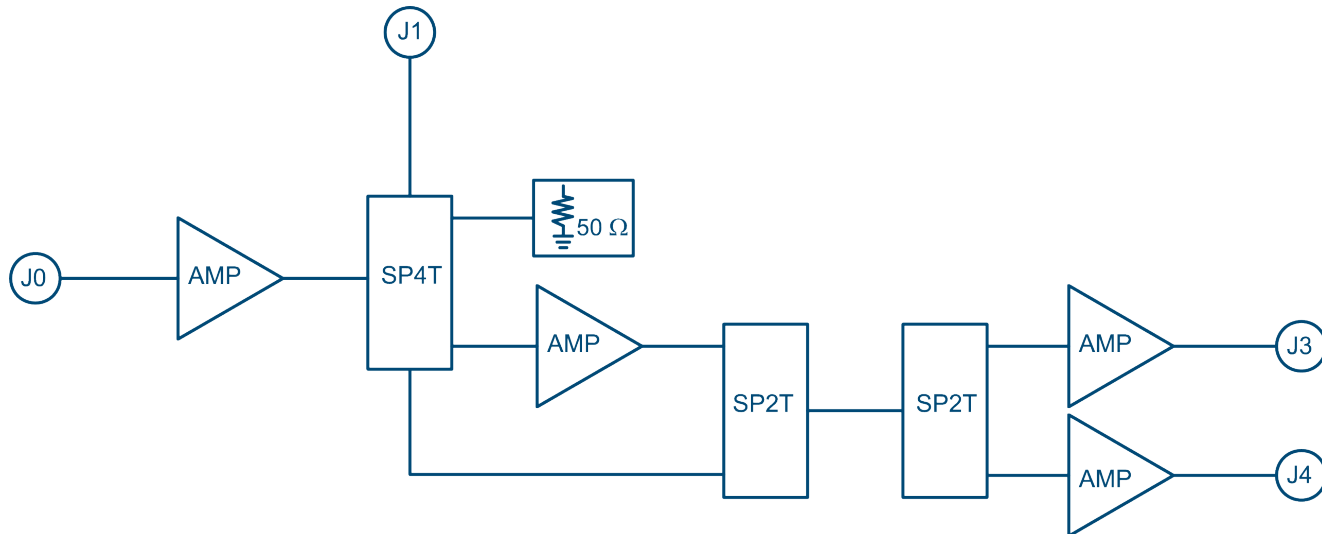


# Integrated Microwave Assembly, PIMA-218-3S3A-32-NS3F-NSI

## Switch-Amplifier Configuration



- > Assembly consists of 3 switches and 4 amplifiers covering a frequency range of 2 to 18 GHz
- > Slimline housing measuring 4.0" x 2.0" x 0.75" with N-type (F) Input and 3 SMA (F) output connectors



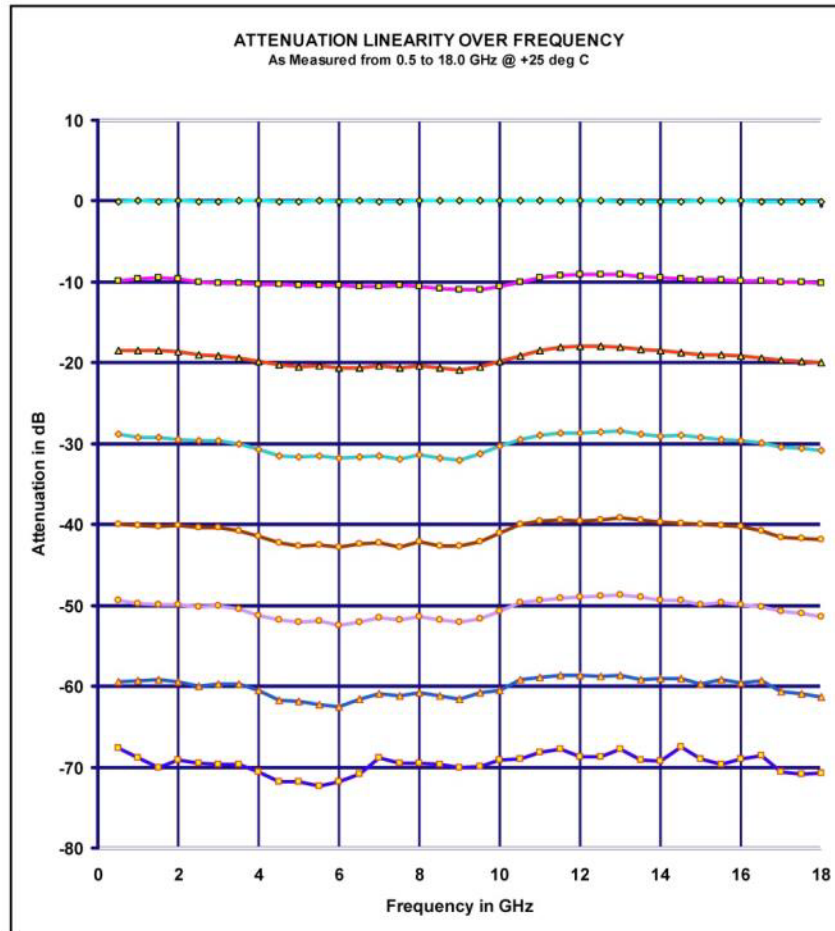
PARAMETERS	SPECIFICATIONS
Frequency Range	2.0 to 18.0 GHz
Insertion Loss (State 0)	4 dB Max
(States 4 & 5)	33.5 dB Max
(States 2 & 3)	2.5 dB Max
(State 1)	60 dB Max
Gain Flatness (States 2, 3, 4 & 5)	1 dB P-P for every 1 GHz
RF Input Power	+20 dBm CW Max
P1dB (J3 / J4)	+32 dBm Typ (High Gain Path)
Isolation	60 dB Min
VSWR (Input / Output)	2.0:1 Max
Noise Figure (States 4 & 5)	6 dB Typ / 7 dB Max
(States 2 & 3)	19 dB Typ, Density <-155 dBm/Hz
(State 1)	Noise Density <-170 dBm/Hz
Switching Speed	1 μs Max (50% TTL to ±5 dB of SS)



# Level, Scan & Pulse Modulator, LSP-0518-SK

## ATTENUATION LINEARITY OVER FREQUENCY

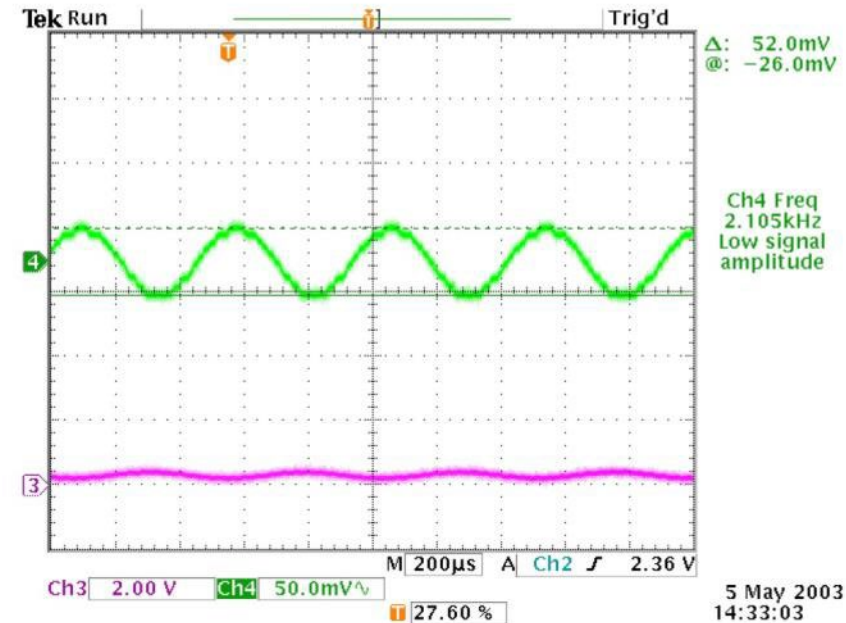
As Measured from 0.5 to 18.0 GHz @ +25°C



## SCAN MODULATION SINE WAVE RESPONSE

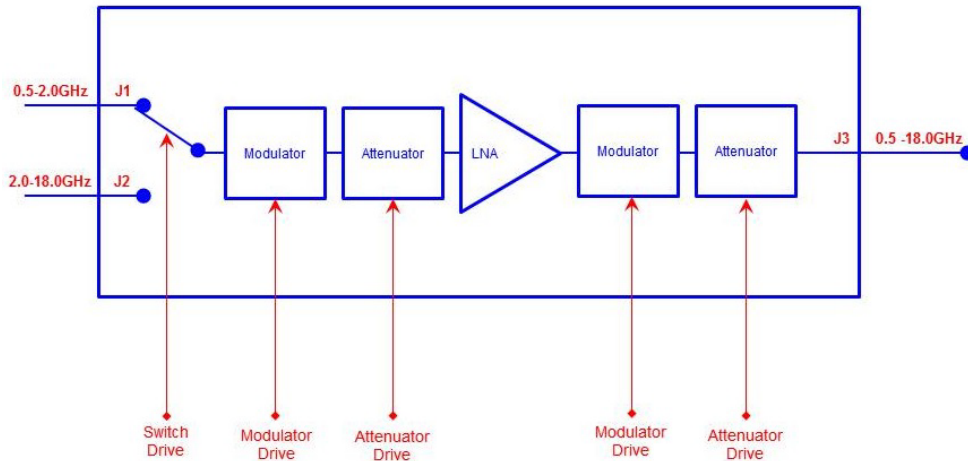
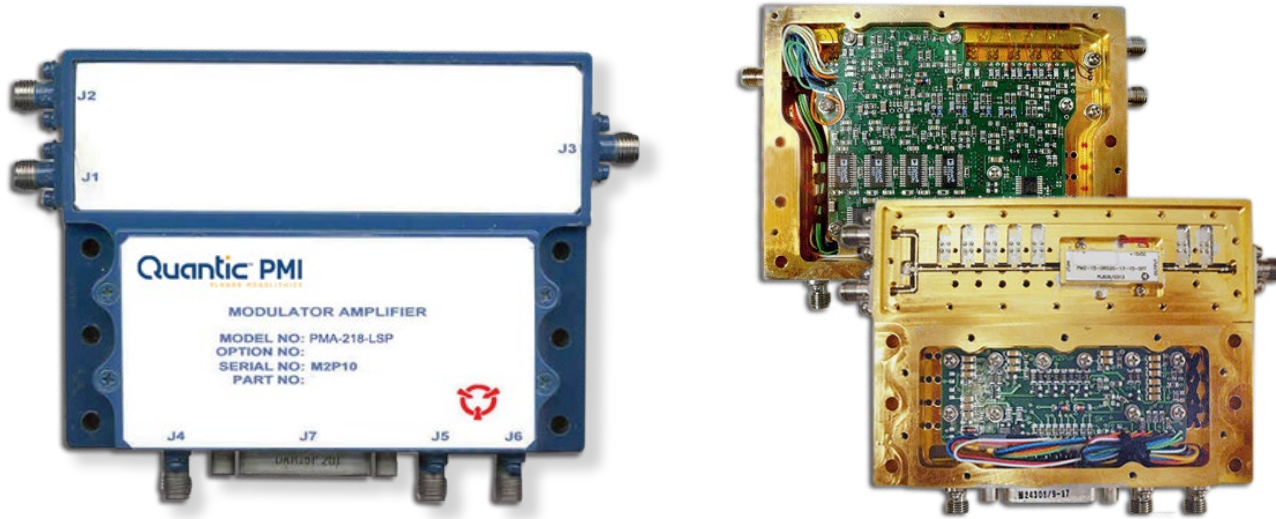
2kHz Sine Wave 1dB Depth Level Set at 3V

12 dBm Input Power @ 4 GHz  
DLVA @ 50mV / dB -or- 500mV / 10dB  
DLVA Output @ 1dB / Division (AC Coupled) : CH4 Green Trace  
CONTROL SIGNAL : Purple Trace  
LSP MODULE LEVEL SET @ 3 Volt  
LSP MODULE AMPLITUDE MODULATION is set for 1dB depth  
2 kHz Sine Wave



# Modulator/Amplifier, PMA-218-LSP

Analog Level, Scan and Pulse Modulation Module

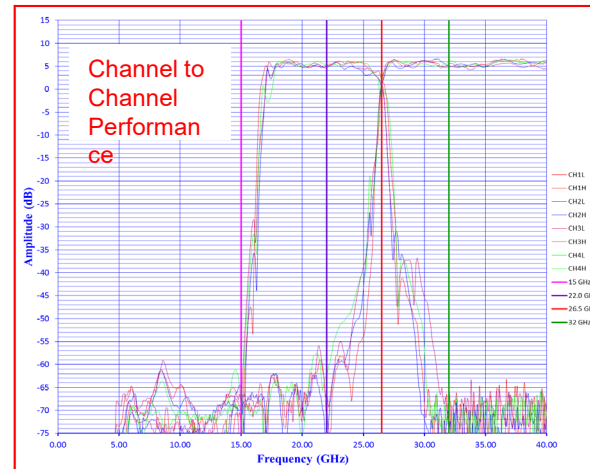


- > RF stimulus path operates from 0.5 to 2.0 GHz and 2.0 to 18.0 GHz.
- > Integrated module contains switches, modulators, attenuators, and amplifiers and is built using MIC/MMIC technology.

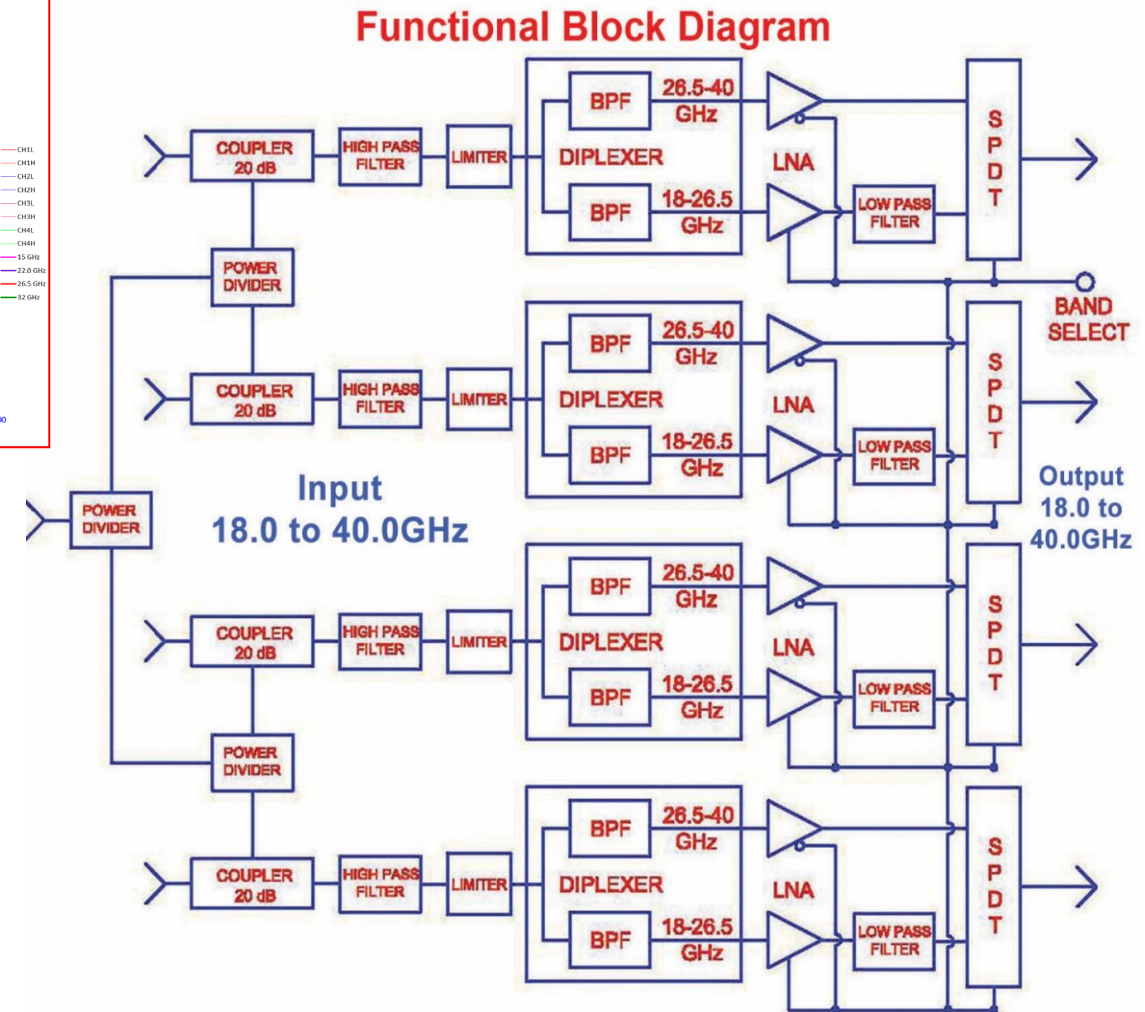
PARAMETERS	SPECIFICATIONS
Frequency Range	0.5 to 18.0 GHz
Output P1 dB	+12 dBm Min
IP3	+22 dBm Min
RF Input Power	+14 dBm Max +12 dBm Operational
Harmonics at P1 dB	-20.0 dBc Min
Spurious Outputs	-60 dBc Min
VSWR (Input / Output)	2.2:1 Max
Level Set (Power Attenuation)	70 dB Range
Scan Modulation (Attenuation)	70 dB Range
Combined Attenuation	100 dB Minimum
System Frequency Flatness	±2 dB
Attenuation Frequency Flatness	0-40 dB (±2 dB) 40-60 dB (±3 dB)
Attenuation Linearity	±1.5 dB
Sensitivity	6 dB/Volt

# Diplexer Gain Module, DGM-18G40G-292FF-DS

Quad-Phase & Amplitude Matched Millimeter wave

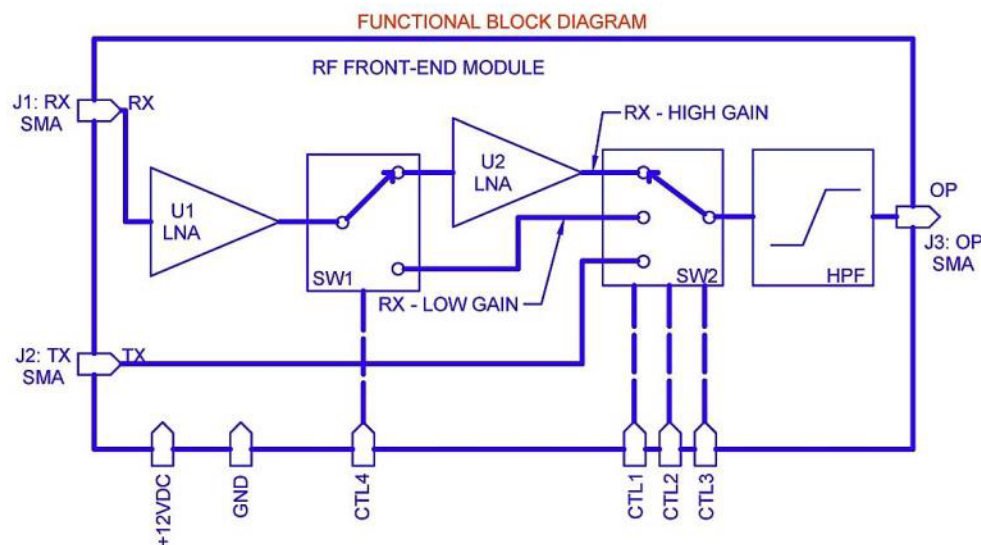


- > Operating Frequency Range: 18.0 to 40 GHz.
- > Switched output and an integrated power divider feeding the four antenna inputs via a 20 dB coupler for ease of system integration.
- > Band select function not only to switch bands but allows the amplified bands not in use to be turned off to reduce power consumption.
- > Designed to have better than 60 dB harmonic suppression.





# Multi-Function Module, PFEM-9D4G-CD-1



- > 9410 MHz operating frequency.
- > Two input channels switchable to a common output.
- > Designed to offer multiple gain level selection, high channel to channel isolation and fast switching speeds.

SPECIFICATIONS	TX (State 1)	RX Low Gain (State 2)	RX High Gain (State 3)
Max Input Power at J1	0 dBm	14 dBm	14 dBm
Frequency	9410 +/- 30 MHz	9410 +/- 30 MHz	9410 +/- 30 MHz
Gain		11 to 15 dBm	30 to 35 dBm
Gain Flatness	<0.1 dBm	<0.1 dBm	<0.1 dBm
Noise Figure	N/A	2 dB Nom, 2.5 dB Max	2 dB Nom, 2.5 dB Max
VSWR	1.5:1 Typ	1.5:1 Typ	1.5:1 Typ
OP3 (Output)	> 18 dBm	>18 dBm	>18 dBm
OP2 (Output)	>8 dBm	>8 dBm	>8 dBm
Port to Port J1-J3 Isolation	>85 dB	N/A	N/A
Max Output Power	+23 dBm		
Output Signal Distortion	No apparent droop or distortion with a pulse width of 500 to 1000 ns, at 500 to 2000 PPS		
Video Switching Transients	< -120 dBm above 1.7 GHz		
Max Out-Of-Band Gain	Below In-Band Gain for $f > 6.5$ GHz -20 dB Below In-Band Gain $< 6.5$ GHz		

# Integrated Front End (IFE), IFE-DRS-KIT

Designed to support a phased array radar automated test set.

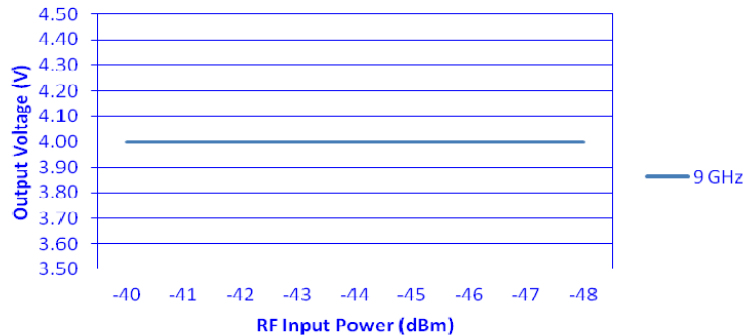


- Consists of a Low Noise Amplifier, RF Log Detector, and Low Noise Video Amplifier
- Form, Fit Function Design

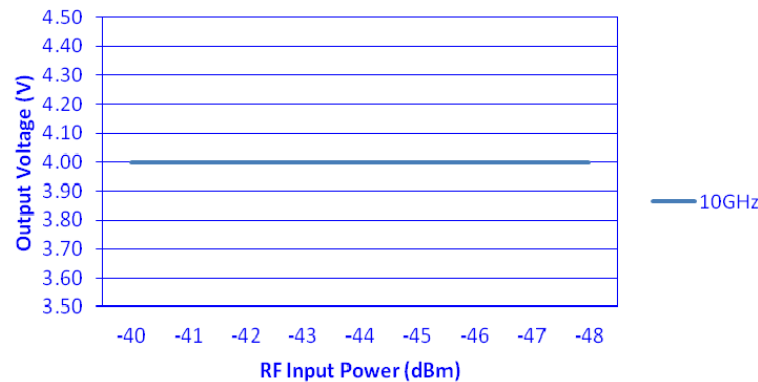
PARAMETERS	SPECIFICATIONS
Frequency Range	9.0 to 10.0 GHz
Video Output (+4 VDC)	Input RF Signal shall be within the range of -40 dBm and -48 dBm
Output Flatness vs Frequency (At +4 VDC Output)	±1 dB
Safe RF Input	0 dBm Max
Operating Temperature	25 °C ± 5 °C
AC Power	115 VAC ± 10%
Connectors	RF Input: SMA Female Video Output: BNC Female
Size	IFE Unit: 11.0" x 7.0" x 3.0" Mounting Plate: 21.25" x 7.0" x 0.25"

**Input Attenuators Set to 4 V at Output Voltage  
Range – 0 dB to 20 dB**

RF Input Power vs. Output Voltage

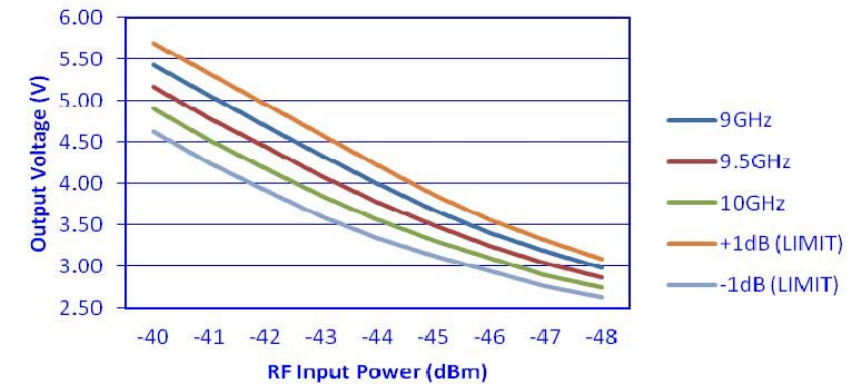


RF Input Power vs. Output Voltage



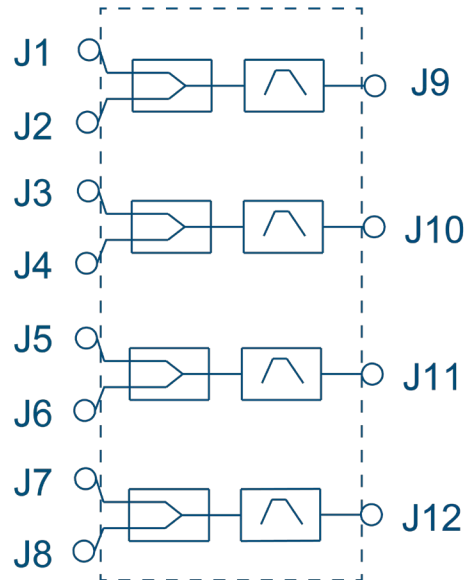
**Input Attenuator Set to 10 dB +/- 0.25 dB**

RF Input Power vs. Output Voltage

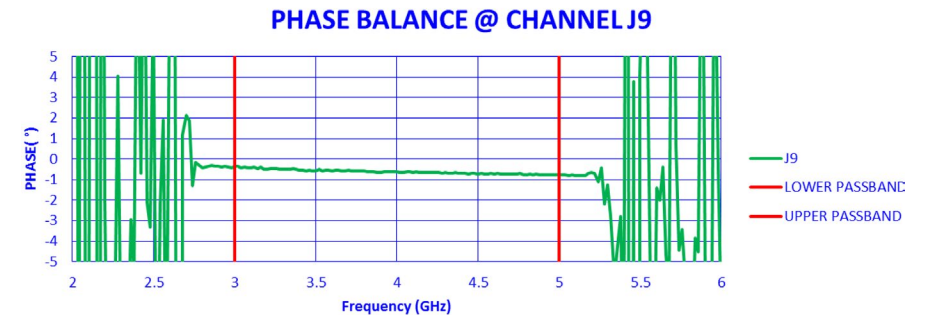
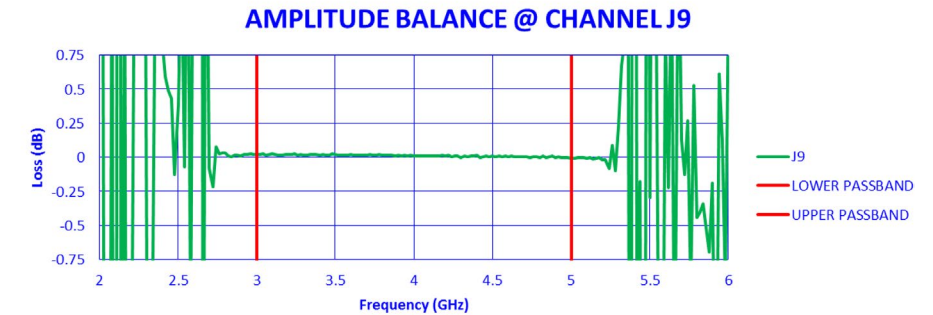
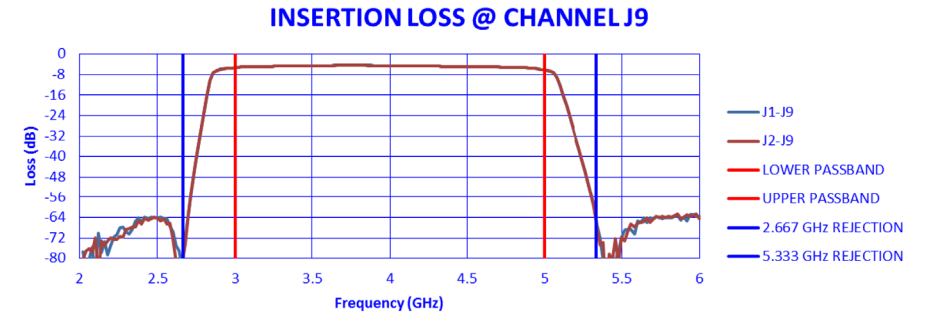


# Integrated Microwave Assembly, PIMA-26-4C-PD2-BPF-L

## 4-Channel Divider / Filter Configuration



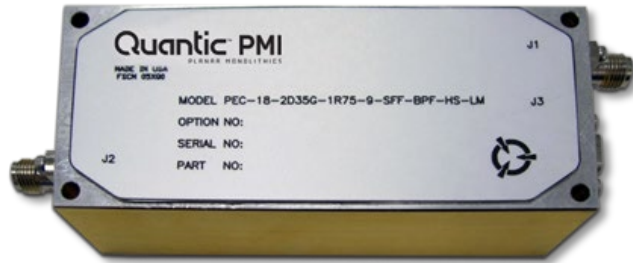
- > Operates over 2 to 6 GHz frequency range
- > Insertion loss of 4.5 dB Max (above 3 dB)
- > Typical amplitude balance of  $\pm 0.1$  dB
- > Max phase balance of  $\pm 5^\circ$
- > Slimline housing measures 4.0" x 3.25" x 0.5" with SMA female connectors



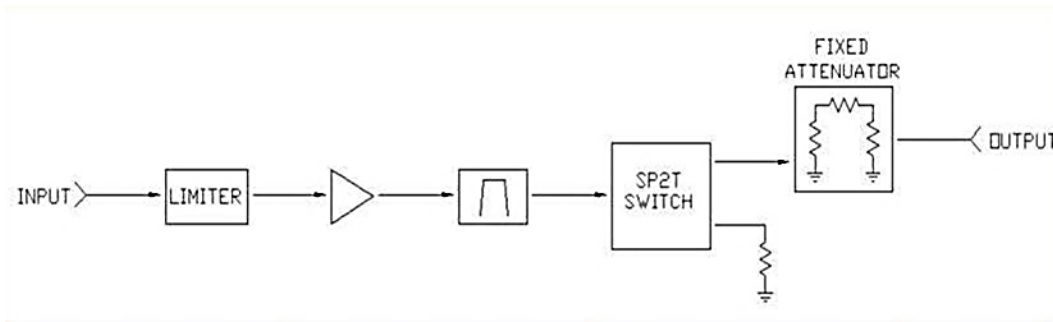


# Integrated LNA Module, PEC-18-2R35G-1R75-9-SFF-HS-LM

Featuring Internal Limiter, Band Pass Filter and RF Blanking Switch



- > Frequency passed is 2350 MHz with a 1 dB bandwidth of 150 MHz.
- > Typical gain of 18 dB
- > Output power is limited to +2 dBm maximum while the input can handle up to +30 dBm CW



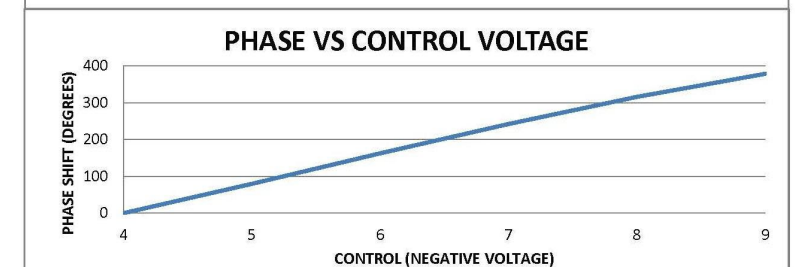
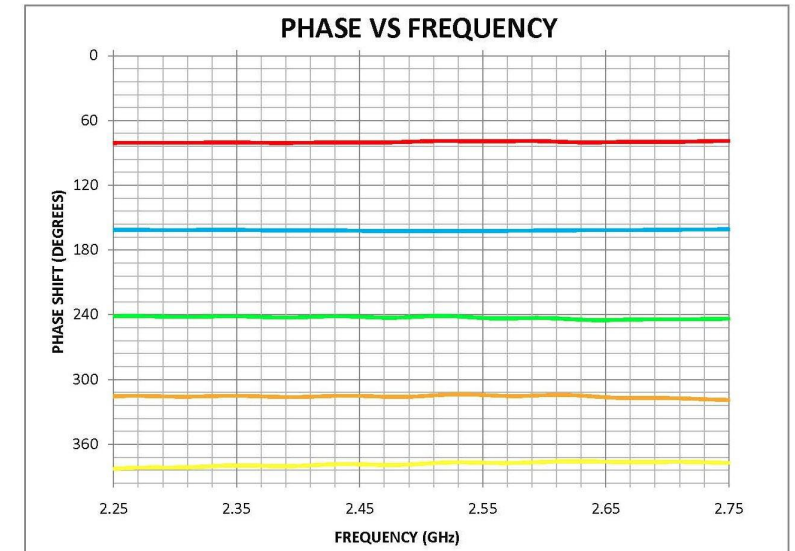
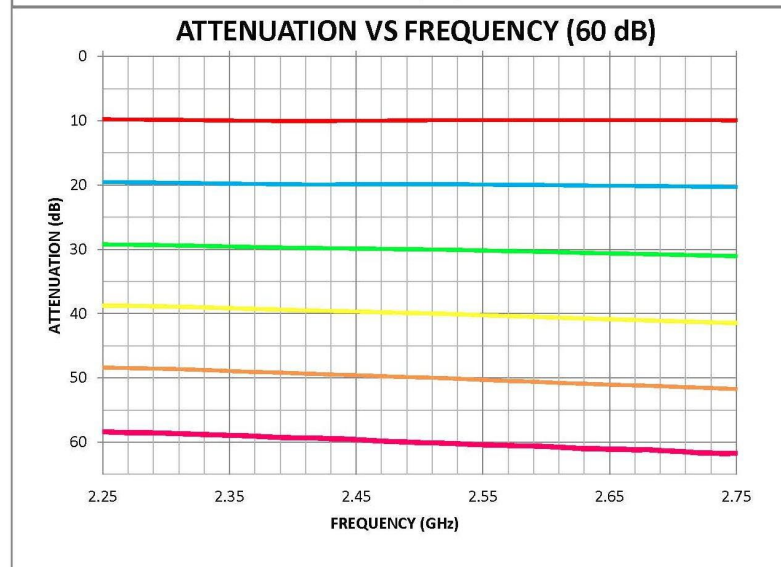
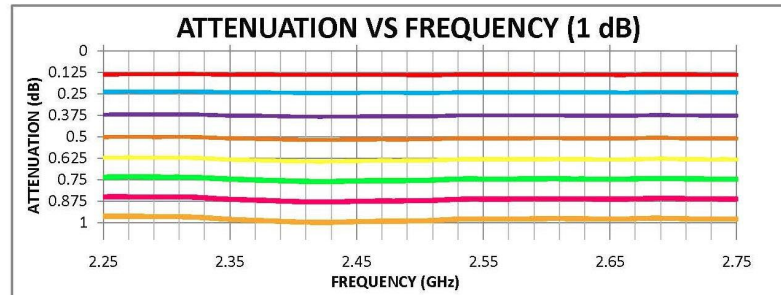
PARAMETERS	SPECIFICATIONS
Center Frequency	2.35 GHz
1dB Bandwidth	150 MHz
≥30 dBc Rejection	2100 and 2600 MHz
Gain (Typ)	18 dB
Noise Figure	1.8 dB Typ 2.0 dB Max
Isolation	40 dB Min
VSWR	2.0:1 Max
RF Input Power	+30 dBm Max
RF Output Power	+2 dBm Max
Switching Speed (On/Off)	100 ns Max
EMI Shielding	60 dB @ 1 Foot Min
Differential Control	A > B = "ON" B > A = "OFF"
DC Power Supply	+9 VDC

# Digital Attenuator/ Analog Phase Shifter, PSAT-2500-11B-CD-1

Designed to offer high levels of phase shift accuracy & attenuation accuracy over time & over temperature.

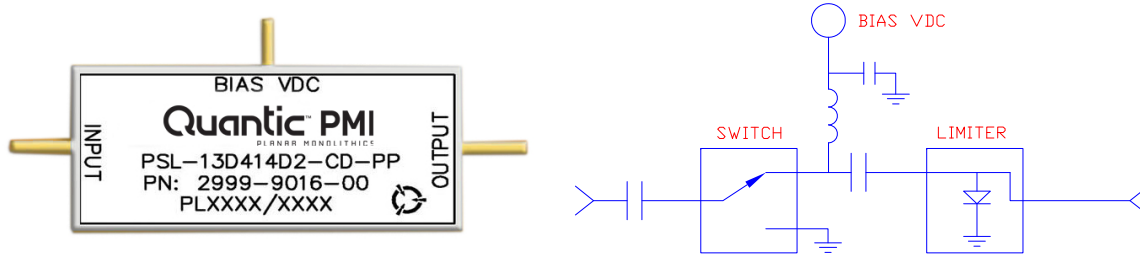


- > Phase shift from 0 to 360°, shift speed is 50 ns Max
- > Attenuation range of 60 dB Min attenuation speed is 1 μs Max
- > Insertion loss of 10 dB maximum
- > Small package size of 3.0" x 2.5" x 0.85"



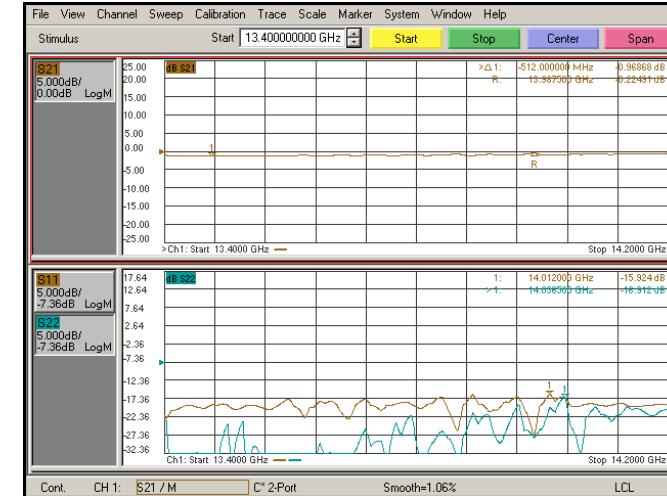
# Integrated High Power Switch Limiter, PSL-13D414D2-CD-PP

Operates in the 13.4 to 14.2 GHz frequency range.

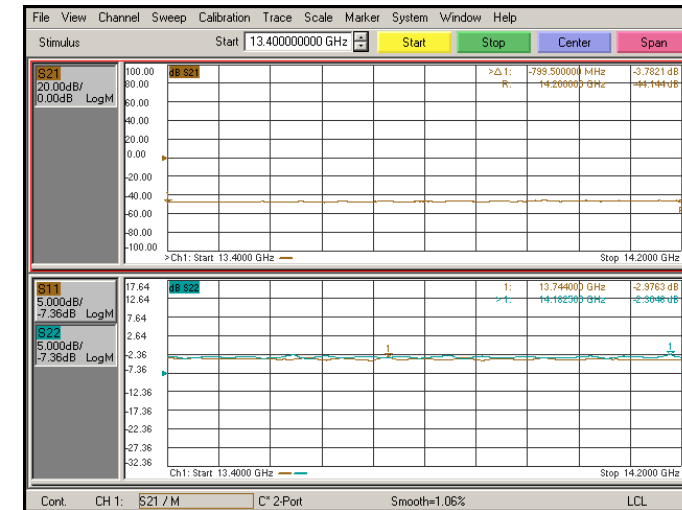


PARAMETERS	SPECIFICATIONS
Frequency Range	13.4 to 14.2 GHz
Maximum Peak Power	75 W for 300 ns Pulse Width (At Switch) 20 W for 2 $\mu$ s Pulse Width (At Limiter)
Maximum Average Power	10 W (@ Switch) 1 W (@ Limiter)
Leakage Power	+20 dBm Max
Switching Bias Conditions	+10 mA (High Loss) -10 mA (Low Loss)
Insertion Loss	1.3 dB Max
Return Loss (-10 mA Condition)	-15 dB Max
Blanking Isolation	40 dB Min
Sealing	Hermetic
Package size	0.522" x 0.247" x 0.31", Tab 0.025" wide x 0.006 thick.

## Typical Insertion Loss & VSWR Plot



## Typical Blanking Performance Plot





# Integrated Switch/Amplifier Modules

(500 kHz to 40 GHz / SPST thru SP16T)

- > Frequency Ranges from 500 kHz to 40 GHz
- > Zero Loss or Gain Levels up to 60 dB
- > Output Power Levels up to +30 dBm
- > Signal Path direction can be forward, reverse, or bidirectional
- > Custom Package Sizes Available
- > Internal Voltage Regulation for +12 to +15 VDC Operation
- > Internal Reverse Voltage Protection
- > TTL Controlled Switches (Ethernet and RS-232 available)
- > Ultra-Fast Switching Speeds
- > High Port-Port Isolation
- > Unconditional Stability

## Options:

- > All switched output amplifiers can be optimized to your specific frequency of interest.
- > Temperature Compensation is available on all units.
- > Hermetic Sealing & full MIL-STD-883 Screening is available.
- > Gain and Phase matching is available on most units.

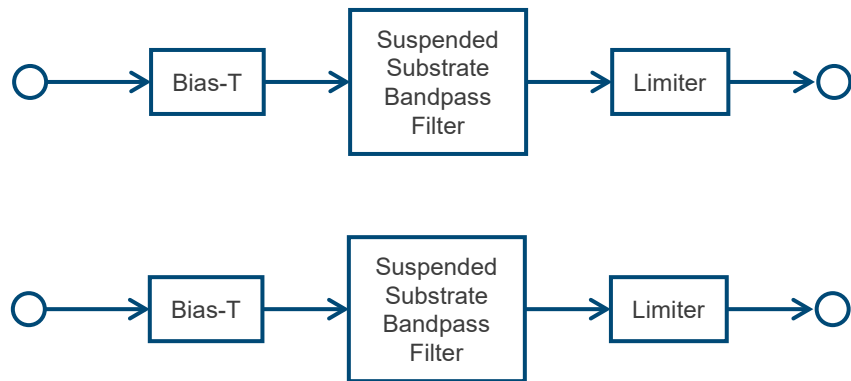


# Dual Channel Integrated Module, PIA-BTFL-GPO-2CH

Bias-Tee, High Pass Filter, and Limiter



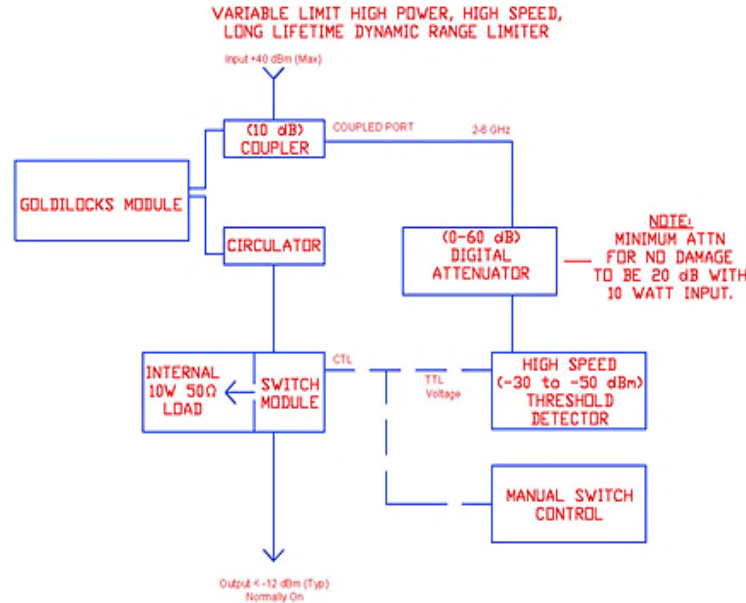
- > Field replaceable GPO – Full Detent Connectors
- > Module is hermetically sealed
- > Package Size: 1.5" x 1.5" x 0.4"



PARAMETERS	SPECIFICATIONS
Passband Power Limit	2.0 GHz Typ
Passband Upper Limit	19.0 GHz Min
-3 dB Cut off	1.85 dB Typ
Passband Insertion Loss	1.85 dB Typ, 2.5 dB Max
Rejection	-15 dBm Min @ 1.7 GHz -20 dBm Min @ DC to 1.5 GHz
Passband VSWR	2.0:1 Max
Bias Rise/Fall 90% to 10% / 10% to 90%	50 ns Max
Limiting Threshold	+8 dBm Min
Pulse Recovery Time	50 ns Max (to within 1 dB of IL)

# High Power Switch/Limiter, PSD-2G6G-CD-X

Ideal for front-end receiver protection applications.



- > Handles input power levels up to 10 Watts CW.
- > Supplied with an external 0 to 69 dB step attenuator used to adjust the input signal levels.
- > Switching speed is 50 ns Max.
- > Operates on 110 VDC, 50/60 Hz & supplied in a housing that measures 6.0" x 8.0" x 2.5".
- > Ruggedized & designed for harsh environments as well as EMI shielded.

Specification	PSD-2G6G-CD-1	PSD-6G18G-CD-2
Frequency Range	2.0 to 6.0 GHz	6.0 to 18.0 GHz
Power	110 VAC Only, 50/60 GHz	
Size	6.0" X 8.0" X 2.5"	
Pin Diode Switch:		
Power Handling	>= 10 W	
Switching Speed	< 50 ns	
Threshold Detector:		
Switching Speed	< 50 ns	
Output Type	TTL (Compatible with Pin Switch)	
Sensitivity	< -40 dBm	
Max Power (No Damage)	10 dBm	
Coupler:		
Power Handling	>= 10 W	
Coupling Factor	20 dB	
50 Ohm LOAD:		
Power Handling	>= 10 W	
Attenuator:		
Power Handling	> 2 W	
Attenuation	0 - 69 By Front Panel Knob or Thumb Wheel	

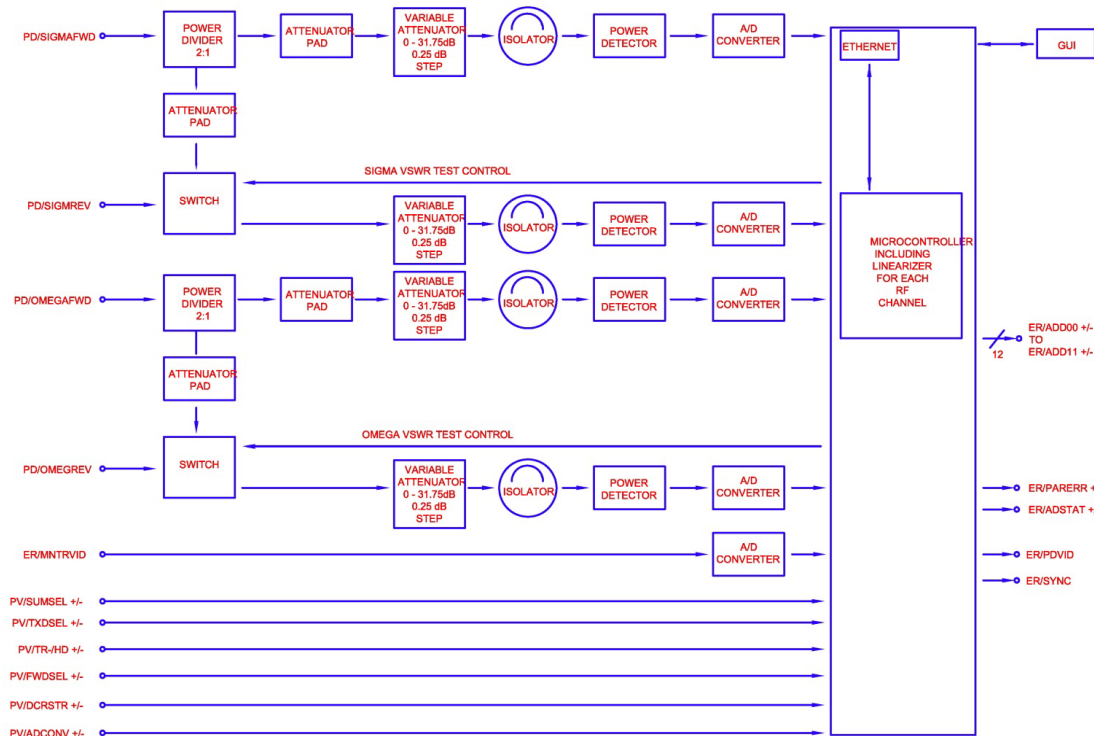


# Power Detector Module, PMOD-PWR-1030M-ATN-SFF



## GUI user interface

- > Operating frequency  $1030 \pm 0.01$  MHz
- > Two pairs of forward and reverse signals are input allowing for a 12-bit linear digital output proportional to the input power.
- > GUI interface via Ethernet allows MCU programming, unit calibration and setting of the variable attenuators.



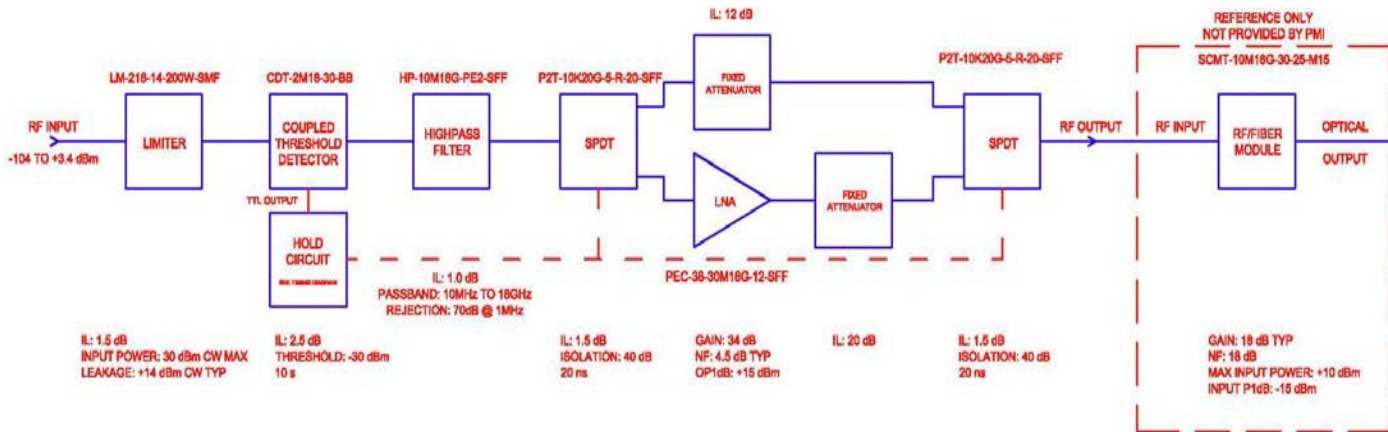
PARAMETERS	SPECIFICATIONS
Sigma Input Signal	
Frequency	1030 MHz $\pm 0.01$ MHz
Forward Input Power (J1)	+37.16 dBm $\pm 5$ dB (+50 dBm No Damage)
Reverse Input Power (J2)	+22.21 dBm $\pm 1$ dB (+35dBm No Damage)
Omega Input Signal	
Frequency	1030 MHz $\pm 0.01$ MHz
Forward Input Power (J3)	+40.83 dBm $\pm 2$ dB (+50 dBm No Damage)
Reverse Input Power (J4)	+15.42 dBm $\pm 2.5$ dB (+35 dBm No Damage)
Synchronize ER/Sync (J11) Specification	
Pulsewidth	38 $\mu$ s
Amplitude	0 to 5 VDC
Impedance	75 Ohms
GUI	<ul style="list-style-type: none"> <li>- Interfaces with unit through Ethernet connection</li> <li>- Allows setting of variable attenuators</li> <li>- Allows calibration of power detectors</li> <li>- Allows programming calibration table to microcontroller without need for additional hardware</li> </ul>
Test Video Specification	
ER/MNTRVID (J5)	0 to 5 VDC Amplitude
Digital Control Lines (Other than ER/Sync)	TTL Differential Pairs

# Amplified Detector Module, ADM-10M18G-SFF-110VAC

State-of-the-art 10 MHz to 18.0 GHz Integrated Subsystem



- > Allows users to input RF signals and provide automatic detection when signal levels fall below -30 dBm and automatically switch in a low noise amplifier such that low level signals can remain detectable.
- > Provides optimum RF signal levels to a RF/fiber converter module.
- > RF input/output are configured such that the end user can change the value of the fixed attenuator level by changing the internal attenuator such that in system optimization can be done.

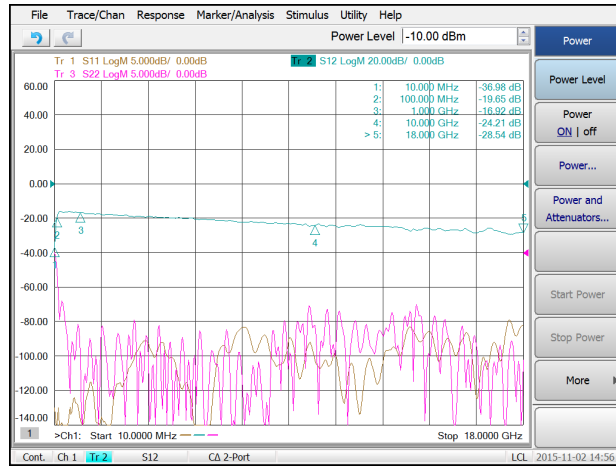


PARAMETERS	SPECIFICATIONS
Frequency Range	10.0 MHz to 18.0 GHz
RF Input Power	1 Watt CW (+30 dBm) Max
Threshold Level	-30 dBm
Insertion Loss (Input to Output)	19 dB Typ (RF input > -29 dBm & with internal fixed 12 dB attenuator)
RF Gain (Input to Output)	15 dB Typ (RF input < -31 dBm & with internal fixed attenuator)
Noise Figure	37 dB Typ (with no LNA selected & >500 MHz) 11 dB Typ (with LNA selected & > 500 MHz)
Output P1dB	1.5 dBm (with internal fixed 12 dB attenuator)
Internal Switch Isolation	40 dB Typ
Gain To No Gain, Switching Speed	<1.5 $\mu$ s Typ and per timing diagram
Internal Fixed Attenuator Value	12 dB (user changeable for in-system optimization)
AC Power	110 VAC, 60 GHz (waterproof receptacle, female sockets, 3 positions)
RF Connector (Input / Output)	SMA (Female)
Size	6.0" x 5.0" x 1.5"

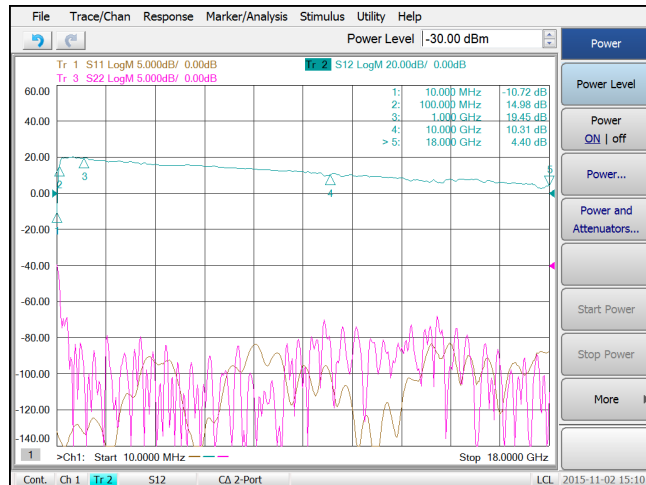
# Amplified Detector Module, ADM-10M18G-SFF-110VAC

## Performance Plots

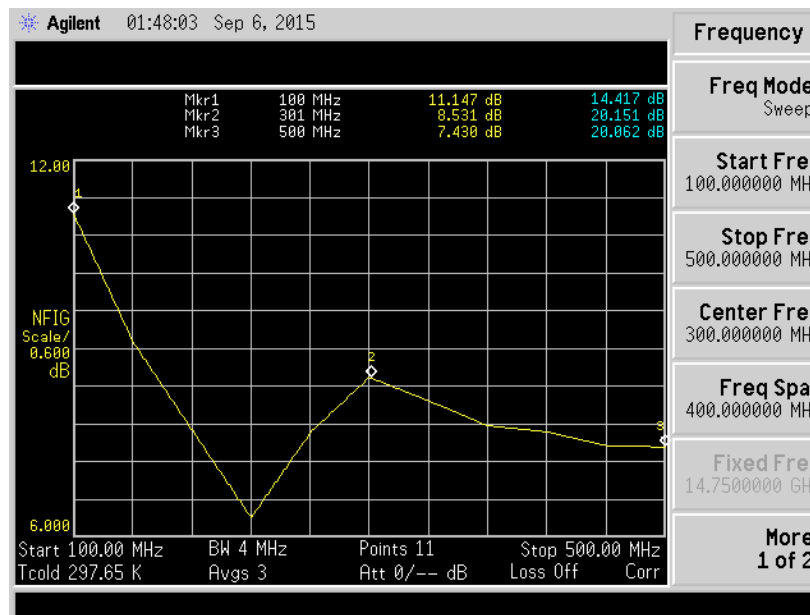
### INSERTION LOSS PATH



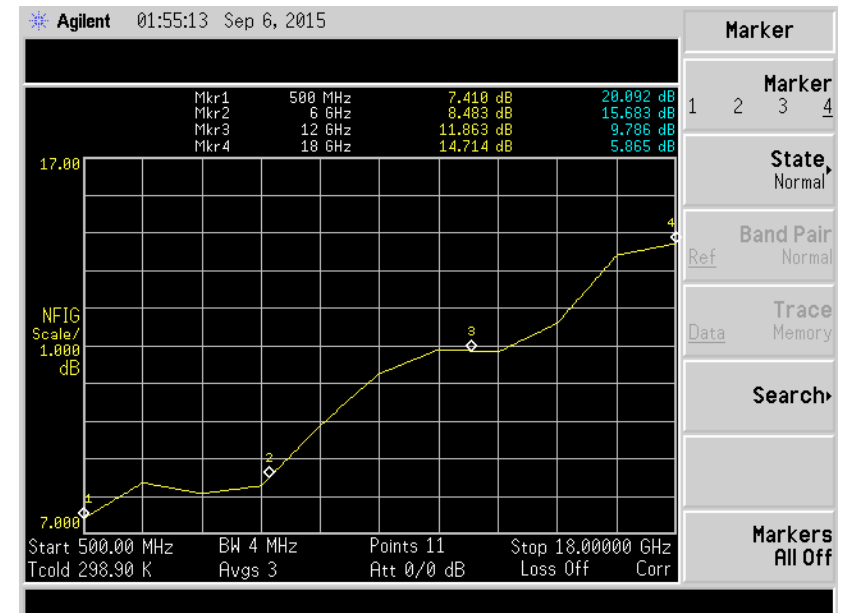
### GAIN PATH



### NOISE FIGURE (100 MHz – 500 MHz) GAIN PATH



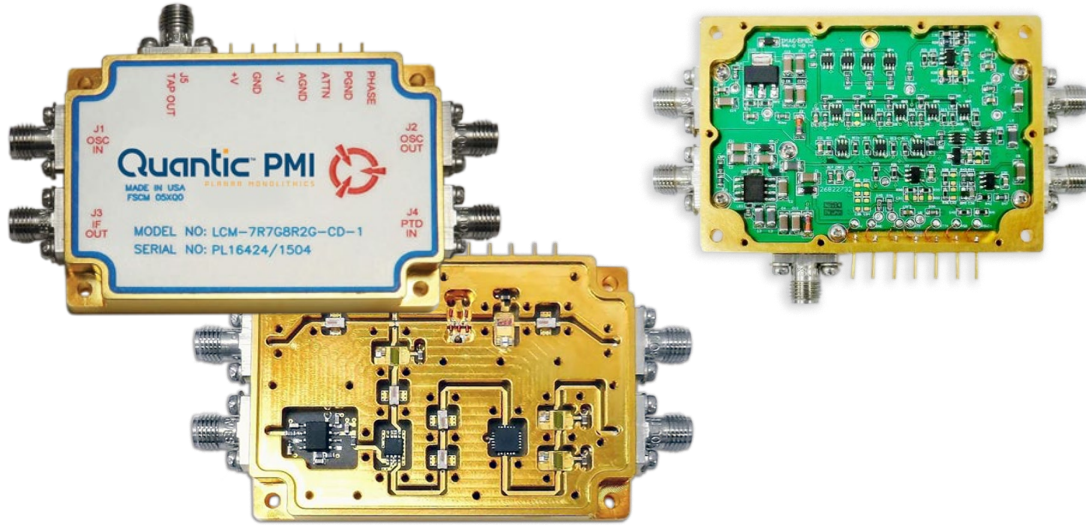
### NOISE FIGURE (500 MHz – 18 GHz) GAIN PATH



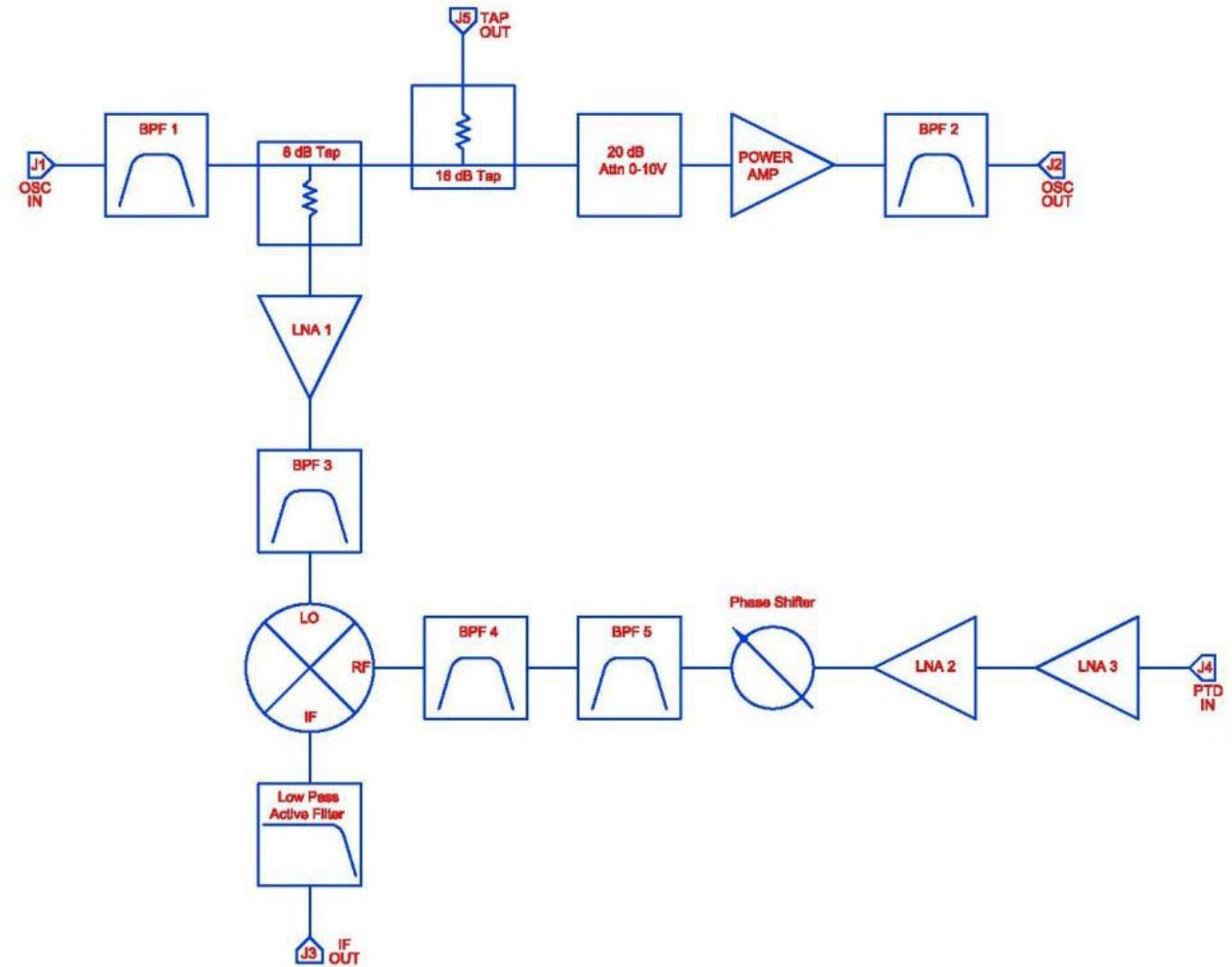


# Amplified RF Laser Control Modules

Designed for low spectral noise and high reverse isolation.



- > Customized Frequency Ranges:  
LCM-7R7G8R2G-CD-1: 7.7 to 8.2 GHz  
LCM-16G100MBW-CD-1: 16.0 GHz  $\pm$  50 MHz
- > IF range of DC to 10 KHz
- > Features a 20 dB voltage programmable attenuator and a 360° phase shifter
- > Slimline housing measuring only 2.5" x 1.75" x 0.4" with SMA female connectors

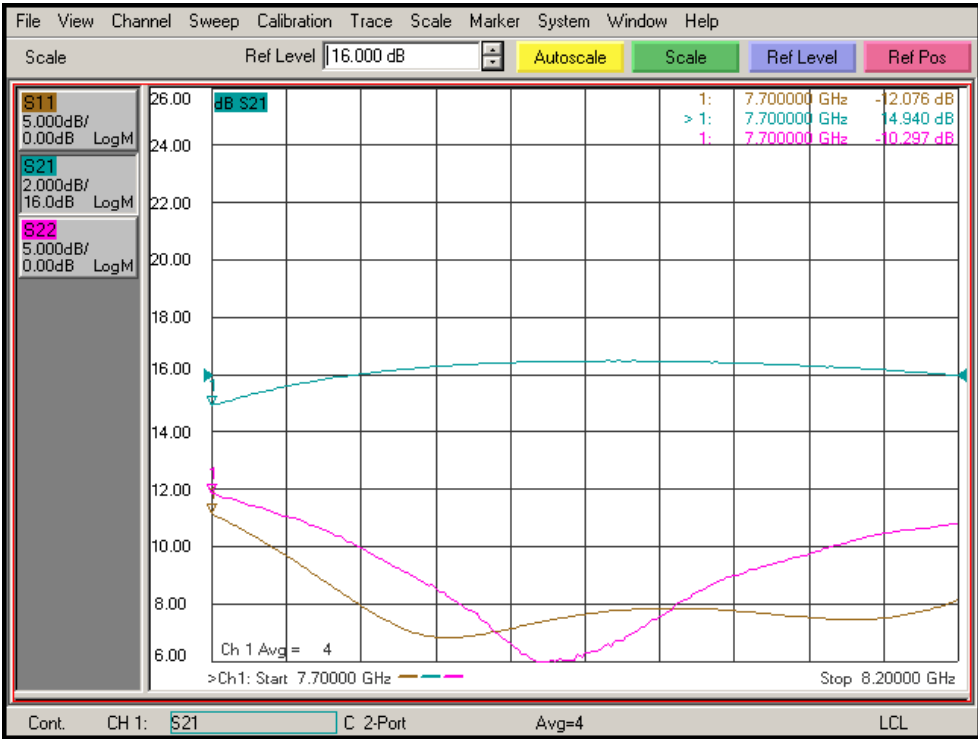


Performance Plots

## Gain J1 to J2 & VSWR



## J4 (PTD) Input VSWR

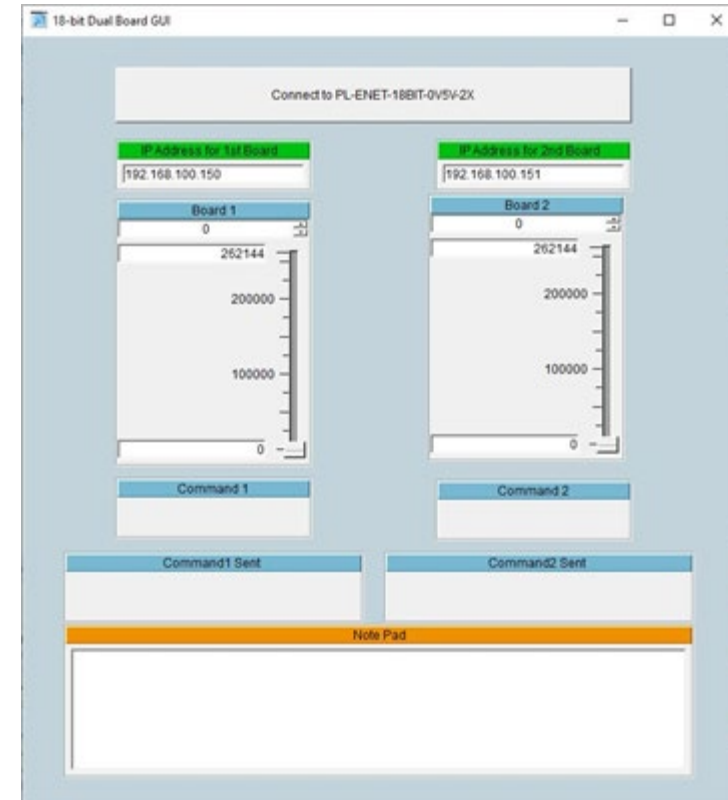


# Ethernet Microcontroller Test Box, PL-MCU-ENET-TTL-MAH

Easy configuration



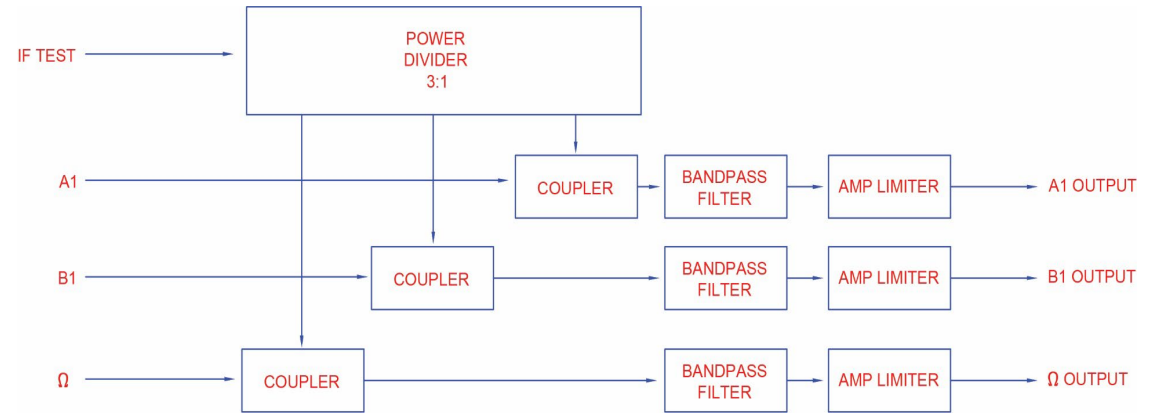
- > Allows for ethernet commands to be sent up to 18 parallel TTL output bits.
- > Compatible many Quantic PMI products that require parallel digital commands, such as [switches](#), [attenuators](#), [phase shifters](#) and [IQ Modulators](#).



# IF Coupler Module, PMOD-IFCPL-60M-AMP-3U

3U Open VPX form Factor

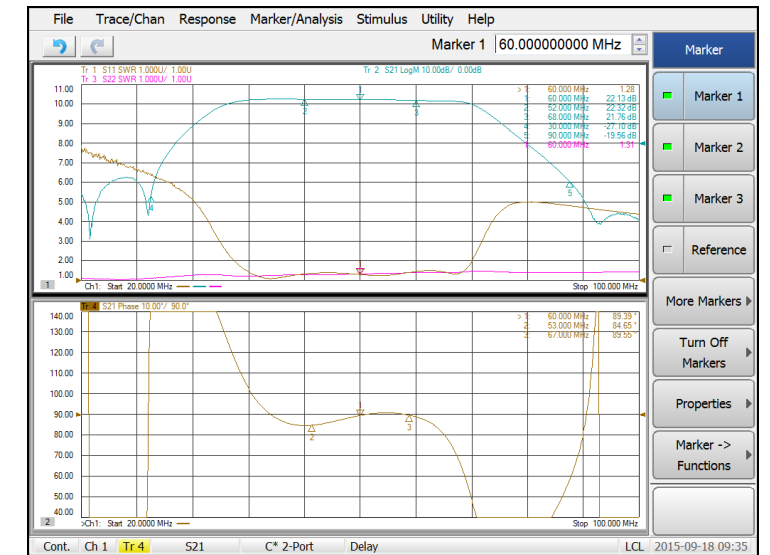
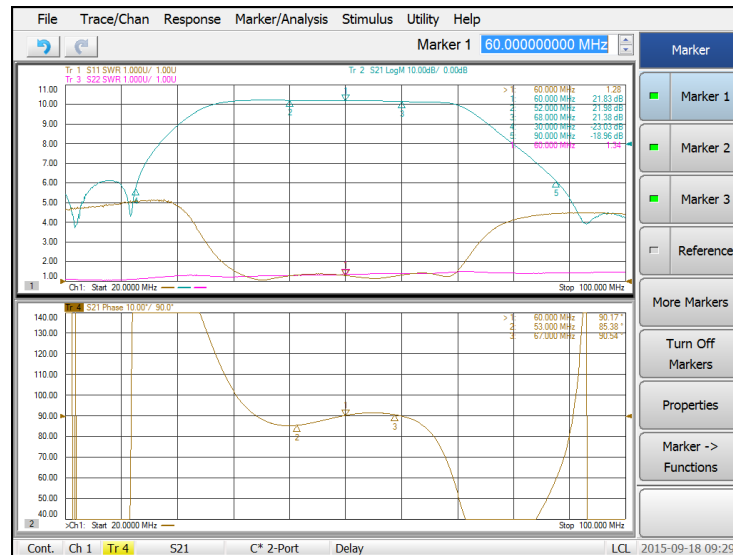
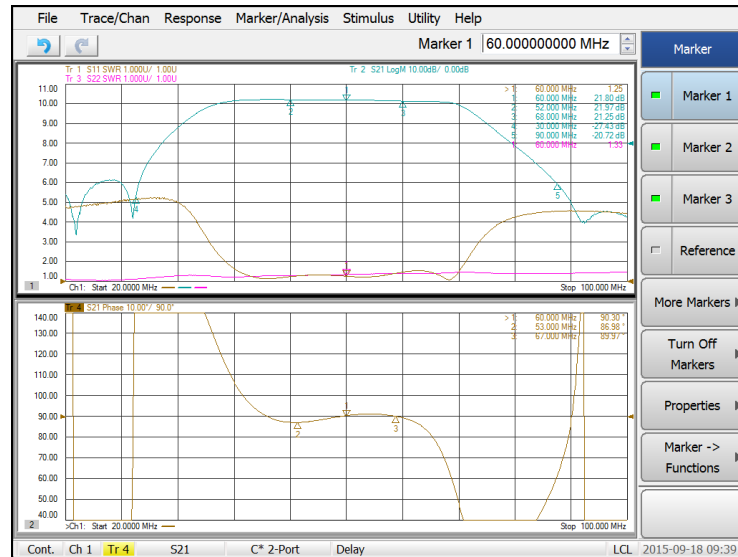
- > 60 MHz Operating frequency.
- > Provides an IF TEST and 3 RF inputs to 3 output signals
- > Each path contains a coupler, bandpass filter, and an amplifier limiter



A1 Channel Gain, Rejection, VSWR, and Phase Linearity

Ω Channel Gain, Rejection, VSWR, and Phase Linearity

B1 Channel Gain, Rejection, VSWR, and Phase Linearity





# IF Coupler Module, PMOD-IFCPL-60M-AMP-3U

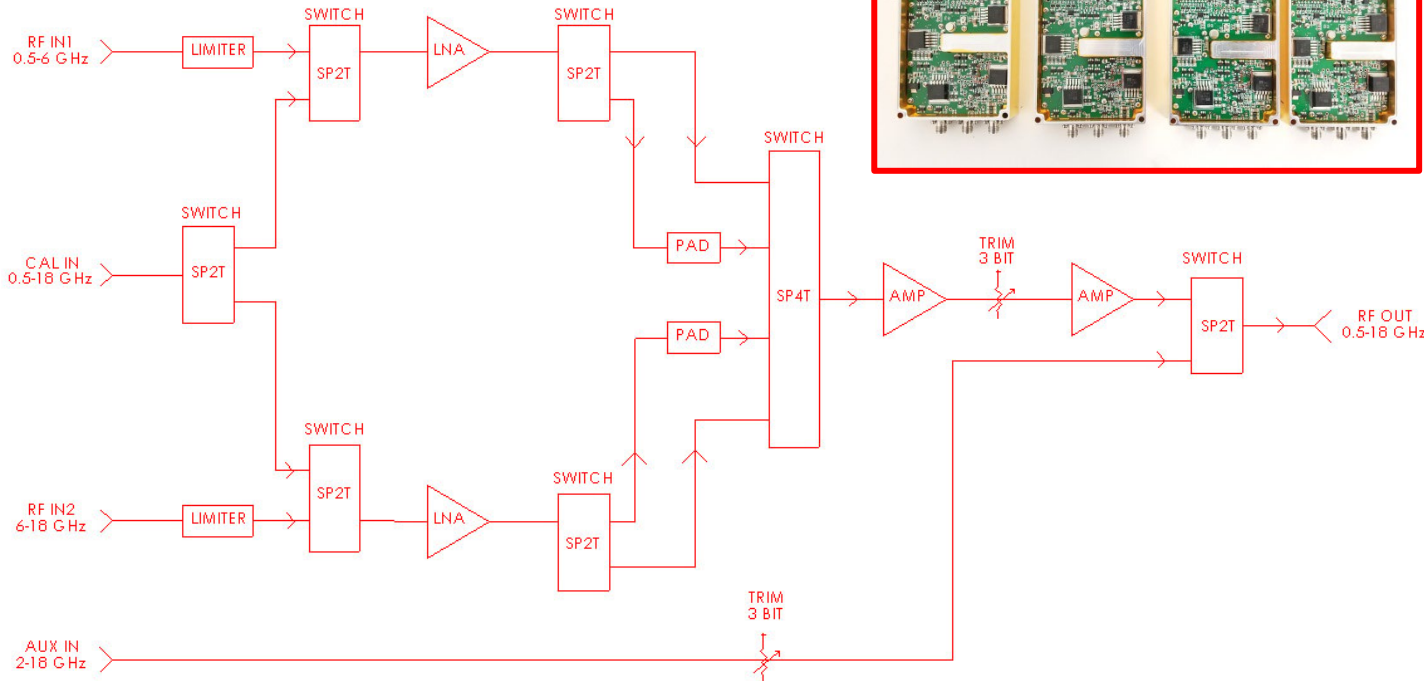
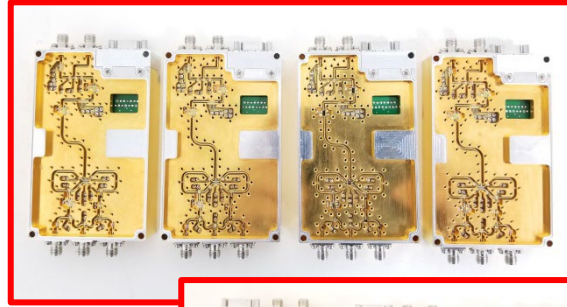
## Specification Overview

PARAMETERS	SPECIFICATIONS
<b>A1 Input Signal</b>	
IF Frequency	60 MHz
Maximum Input Power	-11 dBm
Maximum VSWR	1.5:1 at IF - Measured 1.25:1
<b>B1 Input Signal</b>	
IF Frequency	60 MHz
Maximum Input Power	-11 dBm
Maximum VSWR	1.5:1 at IF - Measured 1.28:1
<b>Ω Output Signal</b>	
IF Frequency	60 MHz
Maximum Input Power	-8 dBm
Maximum VSWR	1;5:1 at IF - Measured 1.28:1
<b>IF Input Signal</b>	
IF Frequency	60 MHz
Input Power Range	-4 dBm to +5 dBm
Maximum VSWR	1.5:1 at IF - Measured 1.19:1
<b>A1, B1 and Ω Output Signals</b>	
Absolute Maximum Output	+10 dBm - Measured +8.32 dBm
Full Scale Output	+3 dBm to +8 dBm - Measured +7.75 dBm
Differential Amplitude Change	All three output gains within ±0.5 dB at IF - Measured ±0.33 dB
Differential Phase Change	±3° for all frequencies within ±3 MHz of IF over the 14 MHz range centered at IF - Measured ±2.28°

PARAMETERS	SPECIFICATIONS
<b>Bandpass Filters (Frequency Response)</b>	
IF Frequency	60 MHz
3 dB Bandwidth	±8 MHz Centered on IF
Cutoff	-40 dBc ±30 MHz Centered on IF No Ripple above -40 dBc – Measured -40.8 dBc
Phase Response	Linear within ±10° over 14 MHz Range Centered on IF - Measured ±2.58°
Differential Amplitude	All three filters within ±0.5 dB at IF
Differential Phase	Channel A and B Filters to within ±3° over the 14 MHz range centered at IF - Measured ±2.28°
<b>Bandpass Filters (Pulse Response)</b>	
Rise Time	160 ns max from 40 dB below Peak to 3 dB above Peak - Measured 36 ns
Fall Time	160 ns max from 3 dB below Peak to 40 dB - Measured 40 ns
<b>Amplifying Limiters</b>	
Absolute Maximum Output	+10 dBm
Full Scale Output	+8 dBm
<b>Connectors/ Finish</b>	
SMA Female	IF Input, A1 Input, B1 Input, Ω Input
SSMC Female	A1 Output, B1 Output, Ω Output
9-Pin Sub-Miniature D Female	Power
Finish	Painted Blue

# Matched Integrated Modules, PCAM-05G18G-INT-S5F

0.5 to 18.0 GHz Custom Phase ( $\pm 10^\circ$ ) & Amplitude ( $\pm 1.5$  dB) Matched Modules

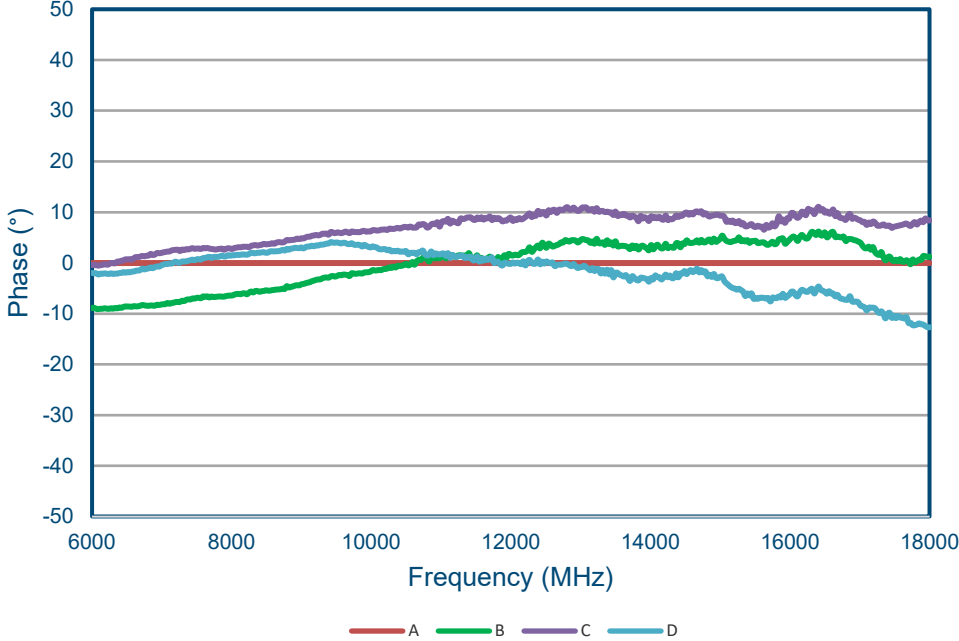


- > Operating Frequency of 0.5 to 18.0 GHz.
- > Built in sets of four, phase and amplitude matched to industry leading levels of  $\pm 10^\circ$  and  $\pm 1.5$  dB over the frequency range.
- > Incorporates limiters, LNAs, switches, and variable digital attenuators.
- > These units allow for high and low gain paths, a calibration input, and an auxiliary channel.
- > A low noise figure and high output P1dB of +15 dBm are achieved by utilizing system analysis software and in-house hybrid/MIC processes.
- > SMA Female connectors and small housing configuration.

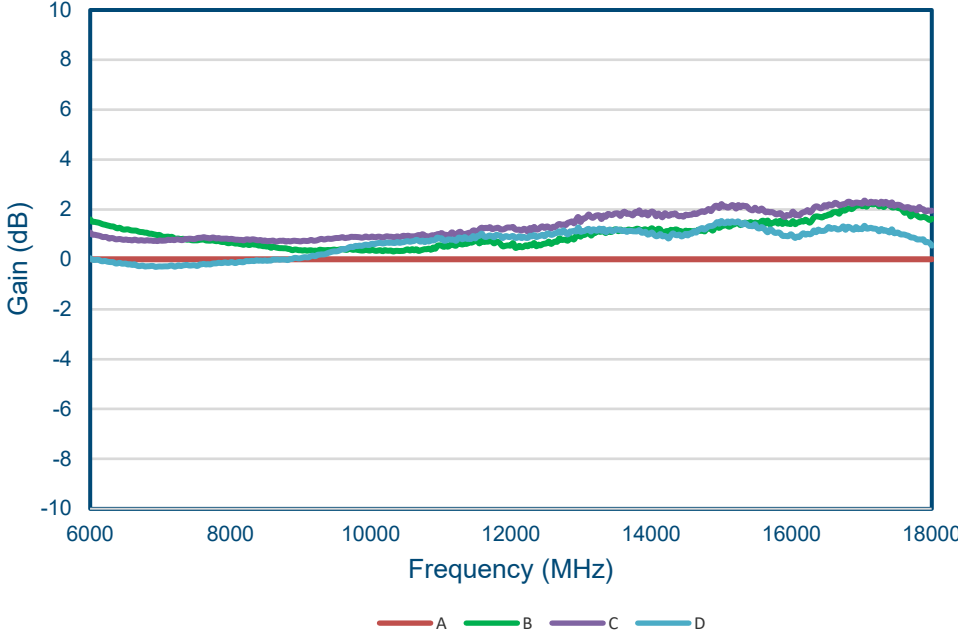
# Matched Integrated Modules, PCAM-05G18G-INT-S5F

Performance Plots @ +25 °C

Phase Tracking RF2 Unit to Unit S21



Gain Tracking Unit to Unit RF2 S21



# Integrated DRO Module, PIA-10G-CD-1

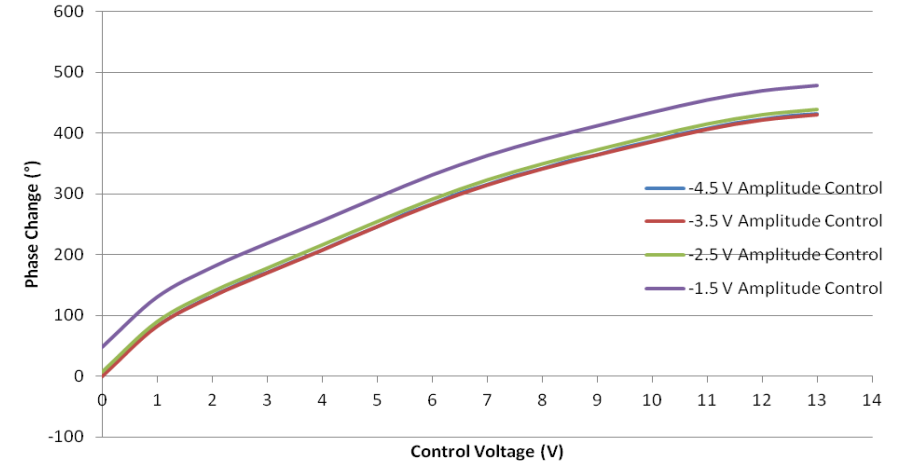
DRO with Internal Phase Shift and Attenuator



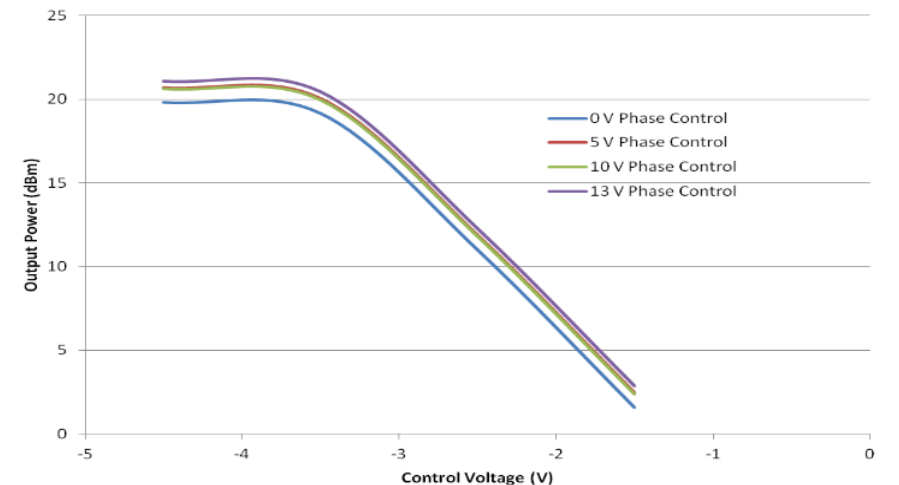
Contains 3 outputs having a 0 to 360° analog controlled variable phase shifter and 0 to 10 dB analog power output control capability.

PARAMETERS	SPECIFICATIONS
Frequency Output	10 GHz
Phase Shift	0° to 360° Typ.
<b>Phase Shift Control</b>	
Analog Voltage	0 to +13 V
Absolute Max	0 to +14 V
Output Power	19 dBm Typ.
Output Power Adjust	0 to 10 dB Typ.
<b>Output Power Control</b>	
Analog Voltage	-1.0 V to -4.5 V
Absolute Max	0 to -5.0 V
Harmonics	-50 dBc Typ.
Sync Input	100 MHz
Sync Input Phase Noise	-155 dBc/Hz @ 10 kHz Offset
Sync Input Frequency Stability	±3 PPM

Phase Change Vs. Phase Control Voltage



Output Power Vs. Amplitude Control Voltage





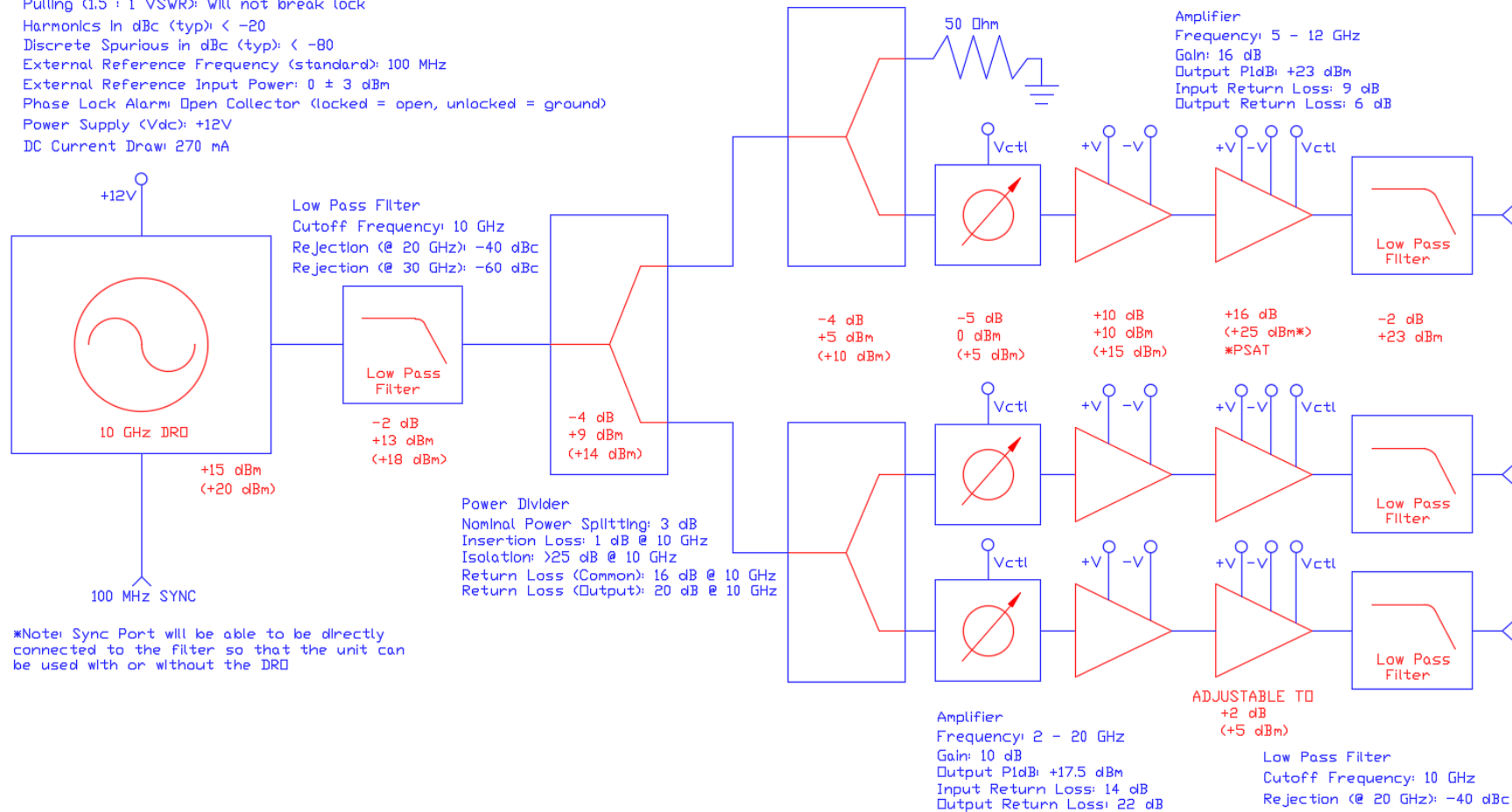
# Integrated DRO Module, PIA-10G-CD-1

## Functional Block Diagram

Frequency: 10 GHz  
 Frequency Stability: Coherent to external reference  
 Frequency Accuracy (+/- ppm @ 25°C): 0  
 Output Power in dBm (over temp): > +15, (+20)  
 Power Variation in dB (over temp): < 3  
 Pulling (1.5 : 1 VSWR): Will not break lock  
 Harmonics in dBc (typ): < -20  
 Discrete Spurious in dBc (typ): < -80  
 External Reference Frequency (standard): 100 MHz  
 External Reference Input Power: 0 ± 3 dBm  
 Phase Lock Alarm: Open Collector (locked = open, unlocked = ground)  
 Power Supply (Vdc): +12V  
 DC Current Draw: 270 mA

Phase Shifter  
 Frequency: 8 - 12 GHz  
 Phase Shift: >400°  
 Insertion Loss: < 5 dB  
 Input Return Loss: > 7.5 dB  
 Output Return Loss: > 6 dB  
 Control Voltage: 0 - 13 V

Amplifier  
 Frequency: 5 - 12 GHz  
 Gain: 16 dB  
 Output P1dB: +23 dBm  
 Input Return Loss: 9 dB  
 Output Return Loss: 6 dB



# Monopulse Comparators

Used to improve receiver path performance of the tracking radar systems.

- > Frequency coverage up to 21.2 GHz
- > Rugged Coaxial Design
- > Low VSWR
- > High Power Handling with Minimum Insertion Loss
- > High Isolation between Channel Ports for Optimum Phase & Amplitude Balance
- > Hermetic Sealing, Military Screening or Aerospace Screening Available
- > Form, Fit & Function Products & Services
- > Custom Designs to Your Specifications



5 to 6 GHz  
Monopulse Comparator



3 to 3.7 GHz  
Monopulse Comparator



9.3 to 9.9 GHz  
4-Way Phase Divider



12 to 13 GHz  
Monopulse Comparator



20.2 to 21.2 GHz  
Monopulse Circuit

# CW Immune EW Detector Modules

Broadband frequency coverage

- > Customized Frequency Ranges:  
EWDM-2G8G-65-70MV: 2.2 to 8.0 GHz  
EWDM-8G18G-65-70MV: 8.0 to 18 GHz
- > Internal switch used to switch between the BIT IN and RF IN with input blanking on both ports.
- > RF output port is provided with a gain of 33 dB min
- > Video output is designed to drive a 150 ft. cable with input dynamic range of 65 dB & TSS of -71 dBm
- > Hermetic Sealing, Military Screening or Aerospace Screening Available
- > Form, Fit & Function Products & Services
- > Custom Designs to Your Specifications







DESIGNED TO WITHSTAND STRINGENT MILITARY GROUND OR AIRBORNE ENVIRONMENTS.

## Designs for Industrial & Military Applications

### > Frequency Products covering various frequencies to 40 GHz

- Digitally Controlled Oscillators (DTOs)
- Dielectric Resonator Oscillators (DROs)
- Phase Locked Oscillators (PLO's)
- Digitally Tuned Oscillator
- Voltage Controlled Oscillators (VCOs)
- OCXO
- Multiple Source PLOs
- Frequency Discriminators & IFM
- Frequency Synthesizers
- Frequency Converters

### > Applications

- EW / SIGINT
- Radar Test Equipment
- Microwave Radio
- Instrumentation Modules

### > Form, fit & functionality is our specialty!



Frequency Discriminators & IFM  
(Narrow & Broadband)



Frequency Sources  
up to 40 GHz



Frequency Converters  
(Up / Down Converter)

# Frequency Sources

- > Designed for Industrial & Military Applications
  - Radar Warning, ECM, ESM & ELINT
  - EW / SIGINT
  - Radar Test Equipment
  - Microwave Radio
  - Instrumentation Modules
- > All models can withstand stringent military ground or airborne environments
- > Frequency Coverage up to 40 GHz
- > High Level of Frequency Accuracy
- > Low Frequency Drift, Phase Noise & Harmonic Content
- > Linearized Frequency Tuning
- > Internal Digital Calibration
- > Temperature Compensation
- > Form, Fit & Function Products & Services



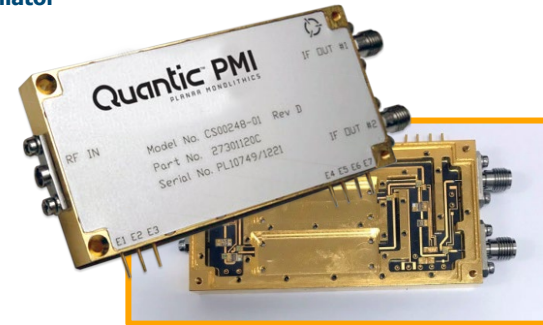
8.8 to 9.46 GHz  
Temperature Stabilized Output  
Medium Power X-Band Gunn-Effect  
Oscillator



2.0 to 18.0 GHz,  
Digitally Tuned Oscillator (DTO)



Digitally Tuned  
Oscillators (DTOs)



Custom Frequency Doubler Module



10 MHz Reference  
Source



6 to 18 GHz, Synthesizer

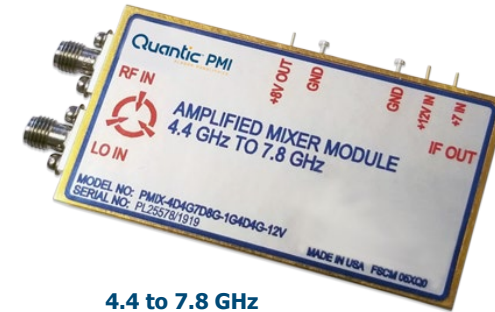


10.0 GHz, Integrated Phase  
Shifter Dielectric Resonator  
Oscillator (DRO) Module



840 MHz Phase-Locked Oscillator

- > Up / Down Converter Designs
- > Ideal for Industrial & Military Applications
  - Radar Warning, ECM, ESM & ELINT
  - EW / SIGINT
  - Radar Test Equipment
  - Microwave Radio
  - Instrumentation Modules
- > Designed to withstand stringent military ground or airborne environments
- > Frequency Coverage up to 40 GHz
- > Form, Fit & Function Products & Services



4.4 to 7.8 GHz  
Down Converter Module



7.8 to 11.2 GHz  
Down Converter Module



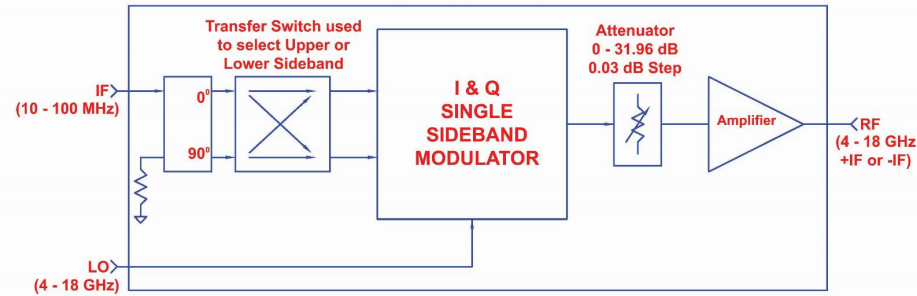
11.2 to 14.6 GHz  
Down Converter Module



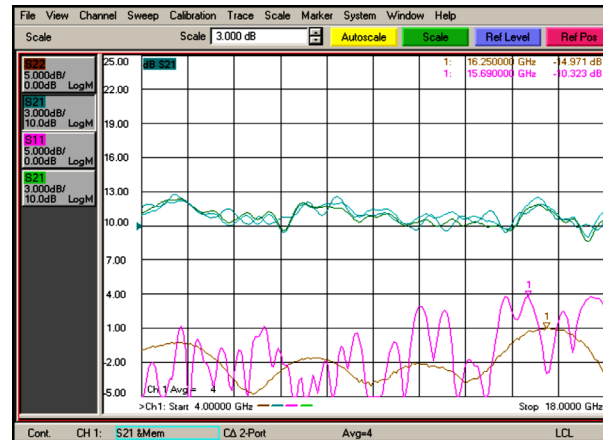
14.6 to 18 GHz  
Down Converter Module

# Up/Down Converter, PUC-4G18G-CD-1

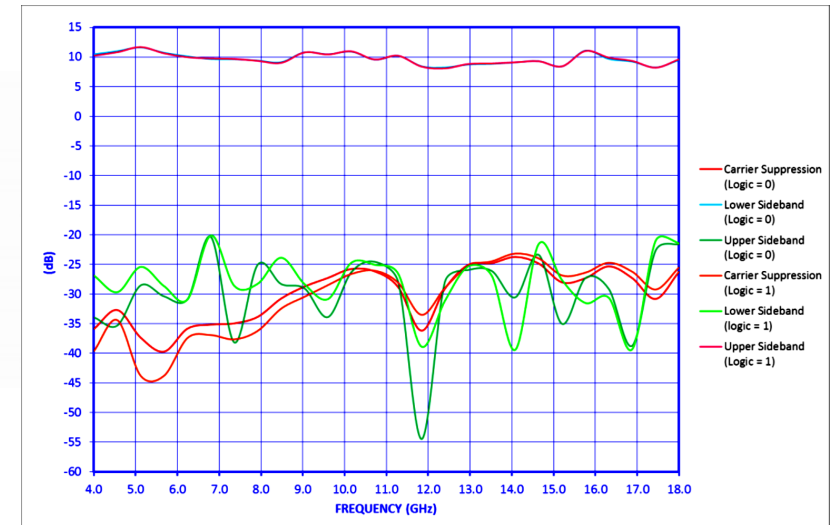
## Amplified Up/Down Converter



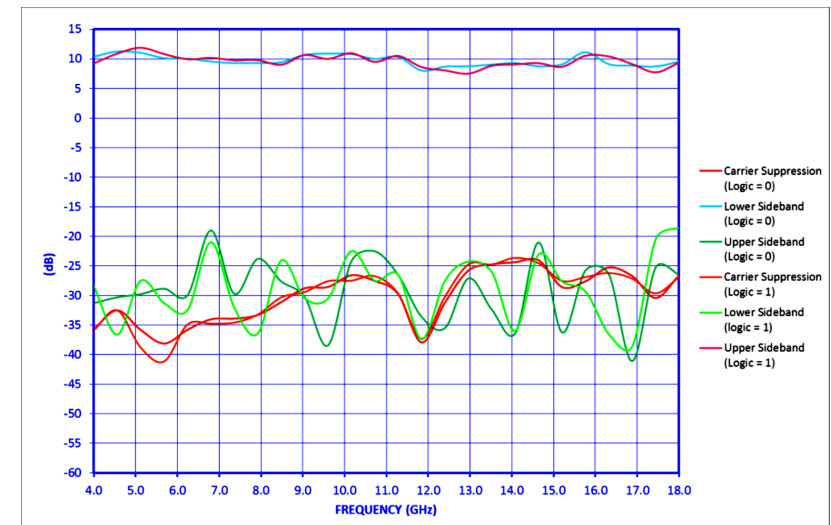
- > 4 to 18 GHz frequency range with IF range of 10 to 100 MHz
- > Features a 32 dB programmable attenuator with 10-bit (1024 Steps) resolution
- > Output amplifier provides conversion gain of  $10 \pm 3$  dB Max (RF+ 0 dBm, IF Modulation = +14 dBm)
- > Includes IF transfer switch to select the upper or lower sideband



RETURN LOSS LO (S11) & RF (S22)



CONVERSION GAIN IF = 10 MHz



CONVERSION GAIN IF = 100 MHz



# Down Converter, PIFA-9D4G-1D8G-1

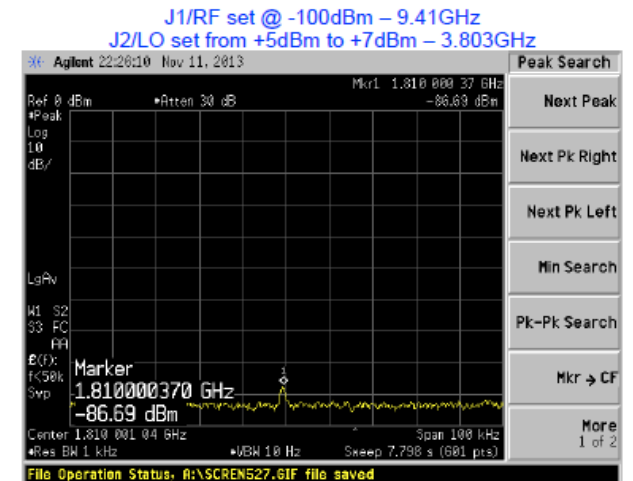
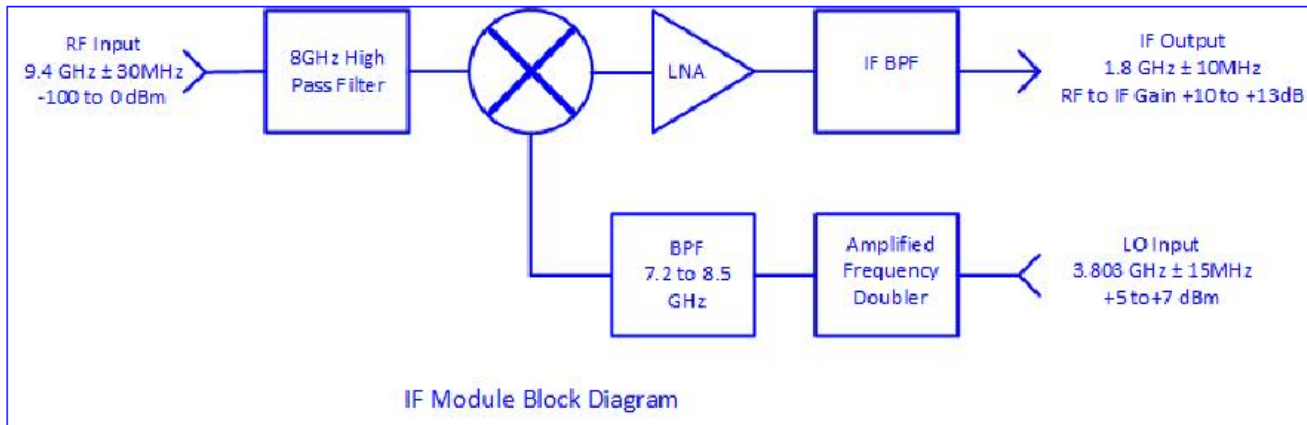
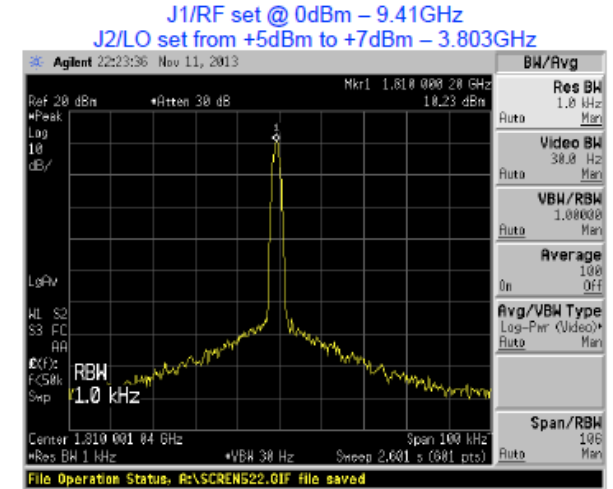
Integrated frequency down converter designed for Doppler Radar Systems Applications

This module incorporates internal RF, IF and LO filtering and amplification for optimum out of band rejection and superior electrical performance.

- > RF Input is 9.4 GHz  $\pm$  30 MHz with an input dynamic range of 100 to 0 dBm
- > LO Input is 3.803 GHz  $\pm$  15 MHz with a power level of +5 to +7 dBm
- > IF Output Frequency is 1.8 GHz  $\pm$  10 MHz
- > RF to IF gain is 10 to 13 dB & OIP3 is >25 dBm



Output (J3/IF) Response



# Filtered Frequency Doubler, PFDM-3R66R65-13-7R5DC-SFF

Excellent sub-harmonic and spurious performance



- > Frequency Range: Input: 3.6 - 6.65 GHz  
Output: 3.6 - 13.3 GHz
- > Dual RF Output - TTL Switchable, Switching Speed: < 20 ns
- > RF Output #1 to RF Output #2 Isolation: >35 dB
- > Slimline housing measuring only 3.0" x 1.5" x 0.375"
- > Other Frequency Ranges and Output Power Levels Available.

PARAMETERS	SPECIFICATIONS
Attenuation Range	10 dB
Harmonic Rejection	-25 dBc
Sub Harmonic / Multiple Harmonic Rejection	-65 dBc
Output Switching Speed	<20 ns
Isolation between Outputs	>35 dB
VSWR In/Out	2.0:1 Max
Current Draw @ +7.5 VDC	600 mA
Operating Temperature	-10 to +65 °C

# Frequency Discriminators & IFM

- > Designed for Industrial & Military Applications
  - Radar Warning (RW)
  - Electronic Countermeasures (ECM)
  - Electronic Support Measures (ESM)
  - Electronic Intelligence (ELINT) Applications
- > Narrow & Broadband Frequency Coverage up to 18 GHz
- > Hermetic Sealing, Military or Aerospace Screening available
- > Form, Fit & Function Products & Services
- > Custom Designs to Your Specifications



30 MHz, Frequency Discriminator



2.0 to 18.0 GHz Digital Frequency Discriminator



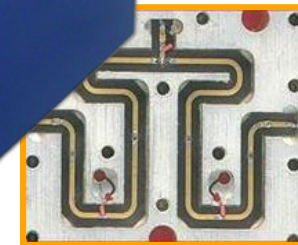
1 GHz, Frequency Discriminator



3.1 to 3.5 GHz Frequency Discriminator



1 to 18 GHz, Frequency Discriminator

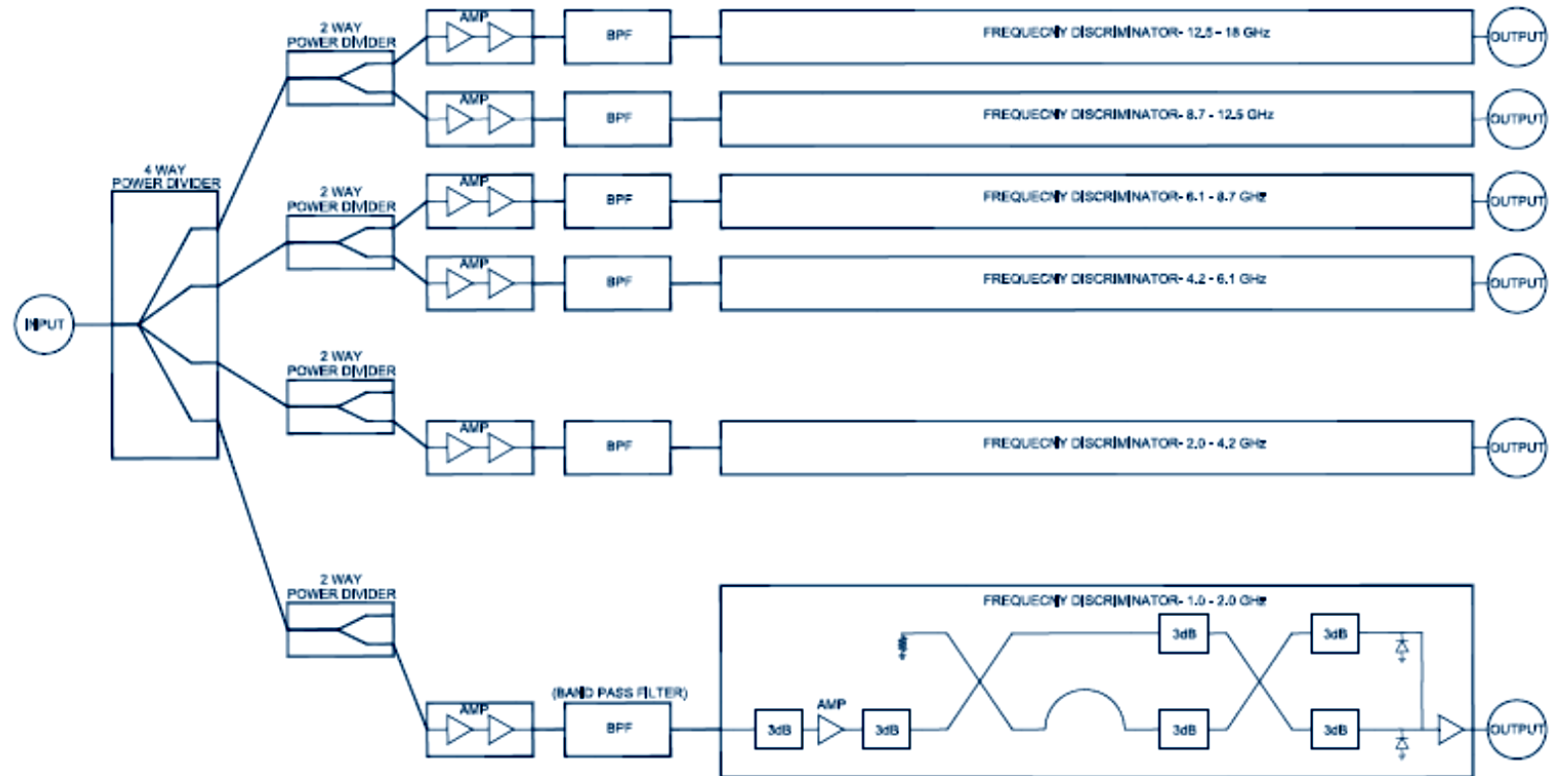


Delay Line in a Frequency Discriminator

# Frequency Discriminator, FD-0518-10

6 Channel, broadband frequency coverage

- > Operating frequency range of 1 to 18 GHz
- > 6 Output Channels,
  - Channel 1: 1.0 to 2.0 GHz,
  - Channel 2: 2.0 to 4.2 GHz,
  - Channel 3: 4.2 to 6.1 GHz,
  - Channel 4: 6.1 to 8.7 GHz,
  - Channel 5: 8.7 to 12.5 GHz,
  - Channel 6: 12.5 to 18.0 GHz
- > Video Output Rise/Fall Time of 20 ns Maximum
- > Video Impedance 100  $\Omega$ , Operating
- > Input Power  $+10 \pm 0.1$  dBm
- > Accuracy of  $\pm 300$  MHz Typical,  $\pm 450$  MHz Maximum
- > RF Connectors: SMA Female  
TTL Control Connector: CDB9





## DESIGNS FOR COMMERCIAL, MILITARY & AEROSPACE APPLICATIONS

### Custom Designs to Your Specifications

#### > Functions Available

- Amplification
- Attenuation (Digital Solid-State)
- Switching (Ultra High Speed)
- Power Detection / Fault Detection
- Phase Shifting / Phase Modulation
- Pulse Modulation / Noise Generation
- RF Filtering
- RF Limiting
- Power Splitting
- RF Signal Distribution

#### > Options Available

- Frequency coverage up to 70 GHz
- Ruggedized, military grade chassis, 1U to 6U
- RS-232, Ethernet or Front Panel Controls
- Military or Customized Screening available.

#### > Form, Fit & Function Products & Services



Ethernet Microcontroller Test Box



Multiagent Radio Frequency Path Simulator



0.1 to 18 GHz High Gain Amplifier  
Integrated Microwave Assembly



RF Signal Distribution Systems



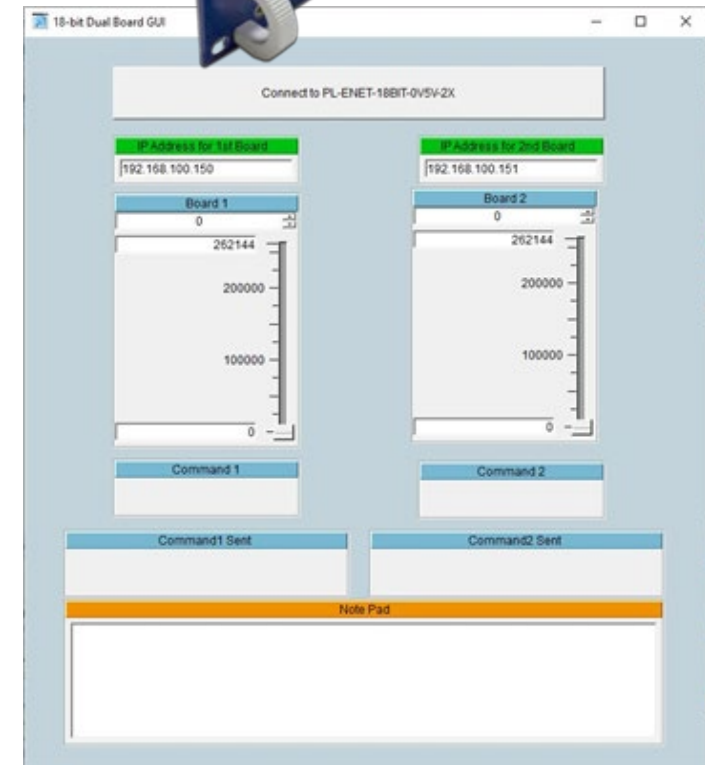
0.5 to 18 GHz  
16-Way Power Divider



10-Way Switch Filter Bank

# Ethernet Microcontroller, PL-MCU-ENET-TTL-14-10B-1U

## Ethernet Microcontroller Test Box



- > Allows for an ethernet command to be sent up to 140 parallel TTL output bits.
- > Fourteen 15-Pin D-Subminiature connectors are provided to control fourteen 10-Bit devices.
- > +15 VDC provided on each connector to provide up to 50 Watts total to the external devices.
- > Custom GUI is provided along with operating instructions with commands to allow the user to write their own GUI for direct control.

# 1U 19" Rack Mount Amplifiers

RF & Microwave Amplifier Designs range up to 70 GHz

- > Any of our standard amplifiers or amplifiers that are designed to meet your specifications can be supplied in a ruggedized, 1U chassis.
- > Supplied Features on all rack mount amplifiers:
  - > Internal AC Power Supply (120 VAC standard – 220 VAC available) with Internal Fuse Protection
  - > Unconditional Stability
  - > Swept Data (S21, S11, S22 and Noise Figure) & Summary data sheet with each unit.
  - > Operating Temperature -20 to +70 °C
- > Available Options:
  - > Digital control and interface for gain control, power on / off.
  - > Connector Types can be specified.
  - > Gain and OP1dB values can be optimized to meet your requirement.
  - > Operating temperature ranges can be increased to -54 to +85 °C.
  - > All amplifiers can be optimized to your specific frequency of interest.
  - > Temperature Compensation is available on all amplifiers.
  - > Military or Space Screening is available.
  - > Gain and Phase matching is available on most amplifiers.



**10 MHz to 6 GHz, High Gain Amplifier Integrated Microwave Assembly**



**0.1 to 18 GHz High Gain Amplifier Integrated Microwave Assembly**

# 16-way, Power Divider, APD-16-0D5G18D0G-SFF

Broadband frequency coverage



- > This model offers an insertion loss of 20 dB with over 14 dB of isolation.
- > The phase balance is  $\pm 9^\circ$  maximum, & amplitude balance is 2.0 dB maximum.
- > Standard 1U 19" Rack configuration
- > SMA female Connectors

PARAMETERS	SPECIFICATIONS
Frequency Range	0.5 to 18.0 GHz
Insertion Loss*	16 dB Max
Isolation	12 dB @ 0.5 to 0.6 GHz 14 dB @ 0.6 to 18 GHz
VSWR (Input/Output)	2.5:1 (0.5 to 1 GHz) 2.0:1 (1 to 18 GHz)
Amplitude Balance	$\pm 2.0$ dB Max
Phase Balance	$\pm 9^\circ$ Max
Power Handling	Forward: 10 W Max Reverse: 0.5 Max
Impedance	50 $\Omega$

\* Theoretical power division in 16 Way Power Divider is 12 dB



# Multiagent Radio Frequency Path Simulator, MARPS-30M6G-3U-1

## Integrated Amplified Attenuator Assembly

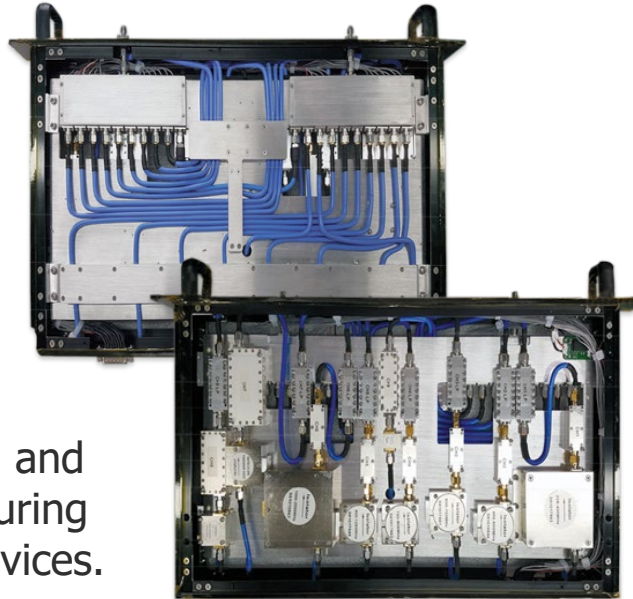


MARPS-30M6G-3U-1 is a Multiagent Radio Frequency Path Simulator consisting of an integrated amplified attenuator assembly and an 8-Way Amplified Power Divider that operates over the 30 MHz to 6.0 GHz frequency range in order to simulate field testing in a reduced, controlled lab environment

PARAMETERS	SPECIFICATIONS
Frequency Range	30 MHz to 6.0 GHz
Gain (Inputs 1 Thru 8 to Output 1)	4.0 dB Min, 6.1 dB Min Measured 10.0 dB Nom, 8.06 dB Min Measured 12.0 dB Max, 10.06 dB Max Measured
Gain (Input 9 to Output 1)	-5 dB Min, -2.6 dB Min Measured 0 dB Nom, 0.5 dB Nom Measured 5 dB Max, 3.7 dB Max Measured
Insertion Loss (Input 10 to Outputs 2 Thru 9)	-4.0 dB Min, -4.5 dB Min Measured -8.0 dB Max, -7.4 dB Max Measured
Isolation (Between Inputs 1 Thru 9)	-29.0 dB Min -36.0 dB Nom, -32.03 dB Measured
Isolation (Output 1 to Inputs 1 Thru 8)	-100.0 dB Min -104.0 dB Nom, -105 dB Measured
Isolation (Output 1 to Input 9)	-48.0 dB Typ, -72 dB Min Measured
Isolation (Outputs 2 Thru 9 to Input 10)	-32.0 dB Min -36.0 dB Nom, -42 dB Measured
Attenuation Range (Inputs 1 Thru 8 to Output 1)	127.5 dB, 124.3 dB Measured
Attenuation Flatness (Inputs 1 Thru 8 to Output 1)	±1.0 dB @ 10 dB, ±0.5 dB Measured ±1.5 dB @ 20 dB, ±0.6 dB Measured ±3.0 dB @ 40 dB, ±1.0 dB Measured ±5.0 dB @ 60 dB, ±2.3 dB Measured
Maximum Power Rating (Inputs 1 Thru 10)	+20 dBm Max Survival* 20 dBm Measured
Switching Speed	50 μs Max, 29.5 μs Measured
External +5 VDC Supply Via 78-Pin Connectors	+5 VDC /8A

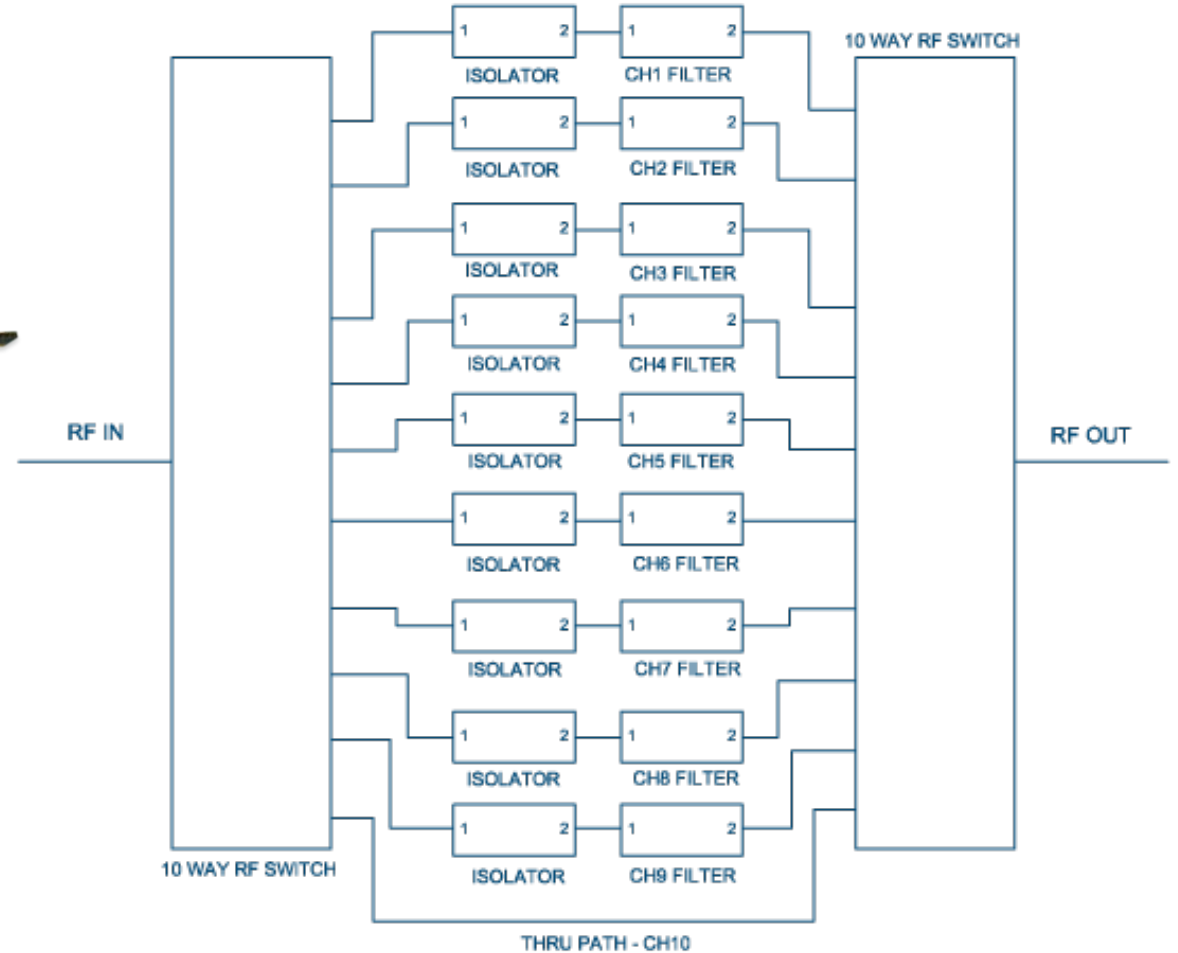
# 10-Channel Switched Filter Bank, 8SFB-250M20G-CD-SFF

Ultrafast switch speed, high rejection with low loss



- > Each filter path includes a narrow band isolator to increase reverse isolation.
- > Ideal for harmonic rejection and improving dynamic range during linearity testing of active devices.
- > Unit is 1U & fits standard 19"

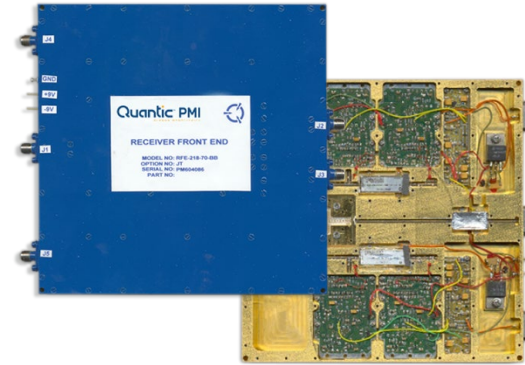
PARAMETERS	SPECIFICATIONS
Frequency Range	0.25 to 20.0 GHz
Number of Channels	10
Insertion Loss	8 dB Max
Switching Speed	100 ns
RF Power Handling	+20 dBm
VSWR	2.0:1



*Internal Block Diagram*

## STANDARD MODELS / CUSTOM DESIGNS TO YOUR SPECIFICATIONS

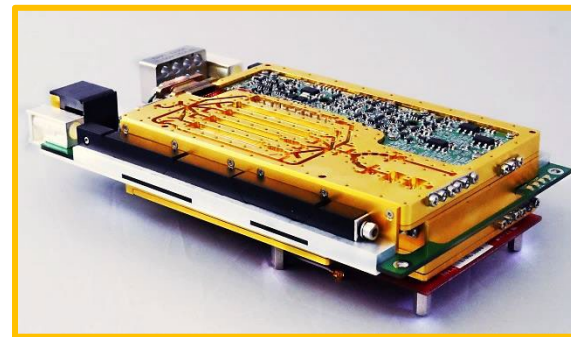
- > Designs for Commercial, Military & Aerospace Applications
- > Broadband Frequency coverage to 50 GHz
- > Hermetic Sealing, Military or Aerospace Screening available
- > Form, Fit & Function Products & Services
- > Custom Designs to Your Specifications



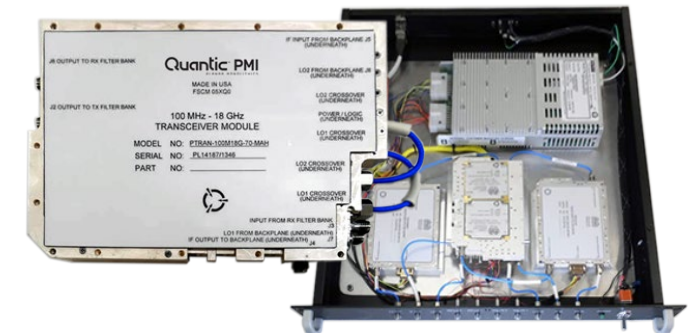
2 to 18 GHz  
Direction Finding Receiver Front End



100 MHz to 18 GHz  
Transceiver (Phase II)



100 MHz to 18 GHz Transceiver (Phase III)

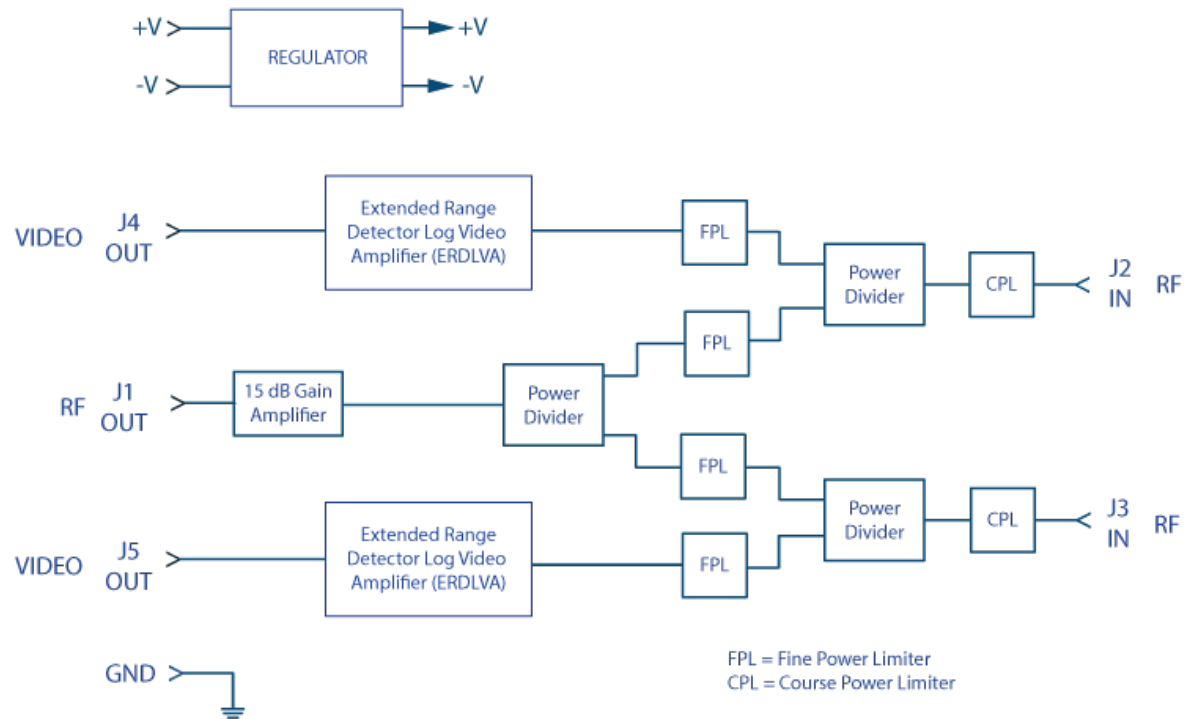


100 MHz to 18 GHz Transceiver Unit

# Direction Finding Receiver Front End, RFE-218-70-BB

High Sensitivity, High Dynamic Range

- > Consists of 3 Power Dividers, 6 Limiters, 1 Low-Noise 15 dB Gain Amplifier, and two 70 dB Extended Dynamic Range Detector Log Video Amplifiers (ERDLVA) integrated in a Miniature Assembly.
- > 2 to 18 GHz Frequency Range

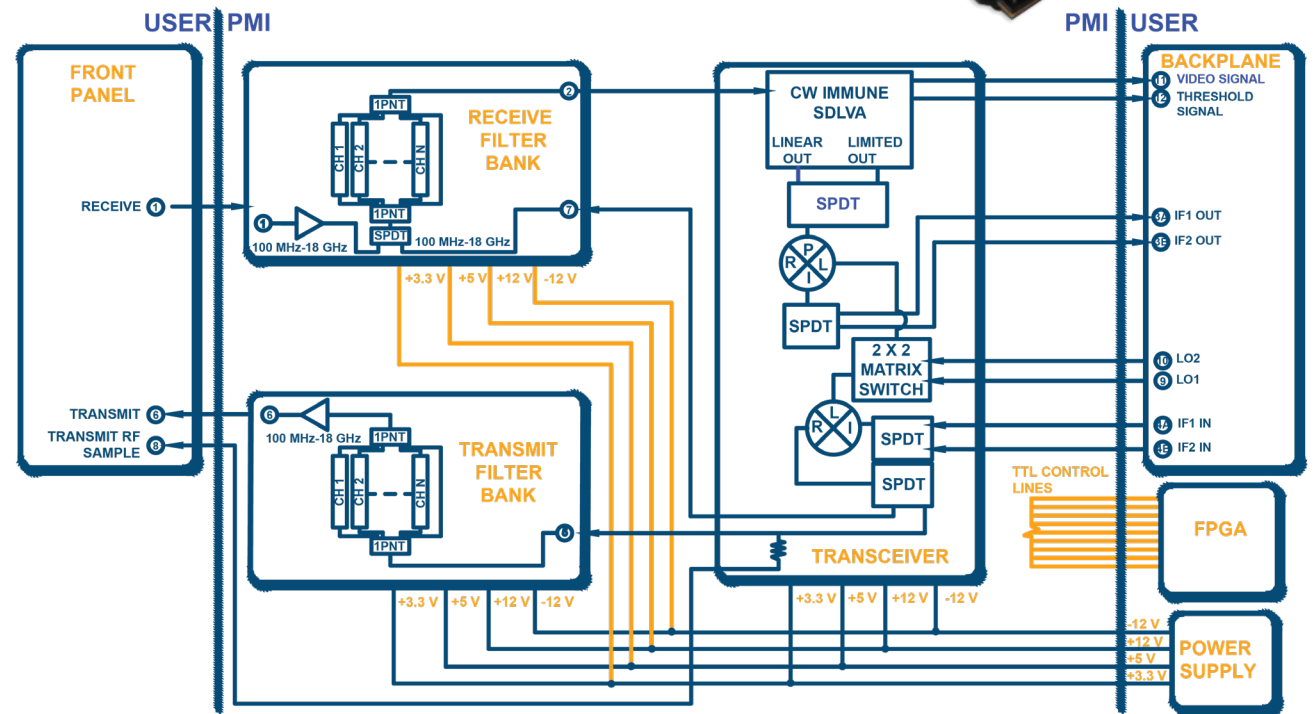




# Transceiver, PTRAN-100M18G-SFB-3UVPX-10HP-MAH

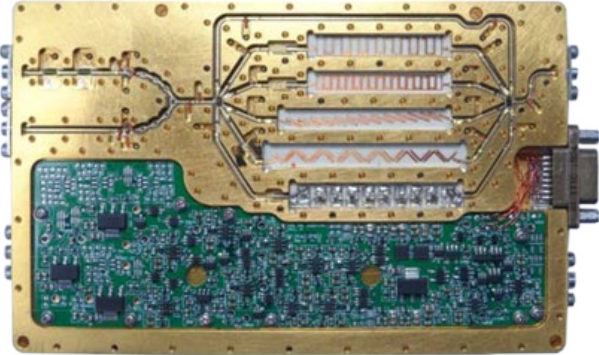
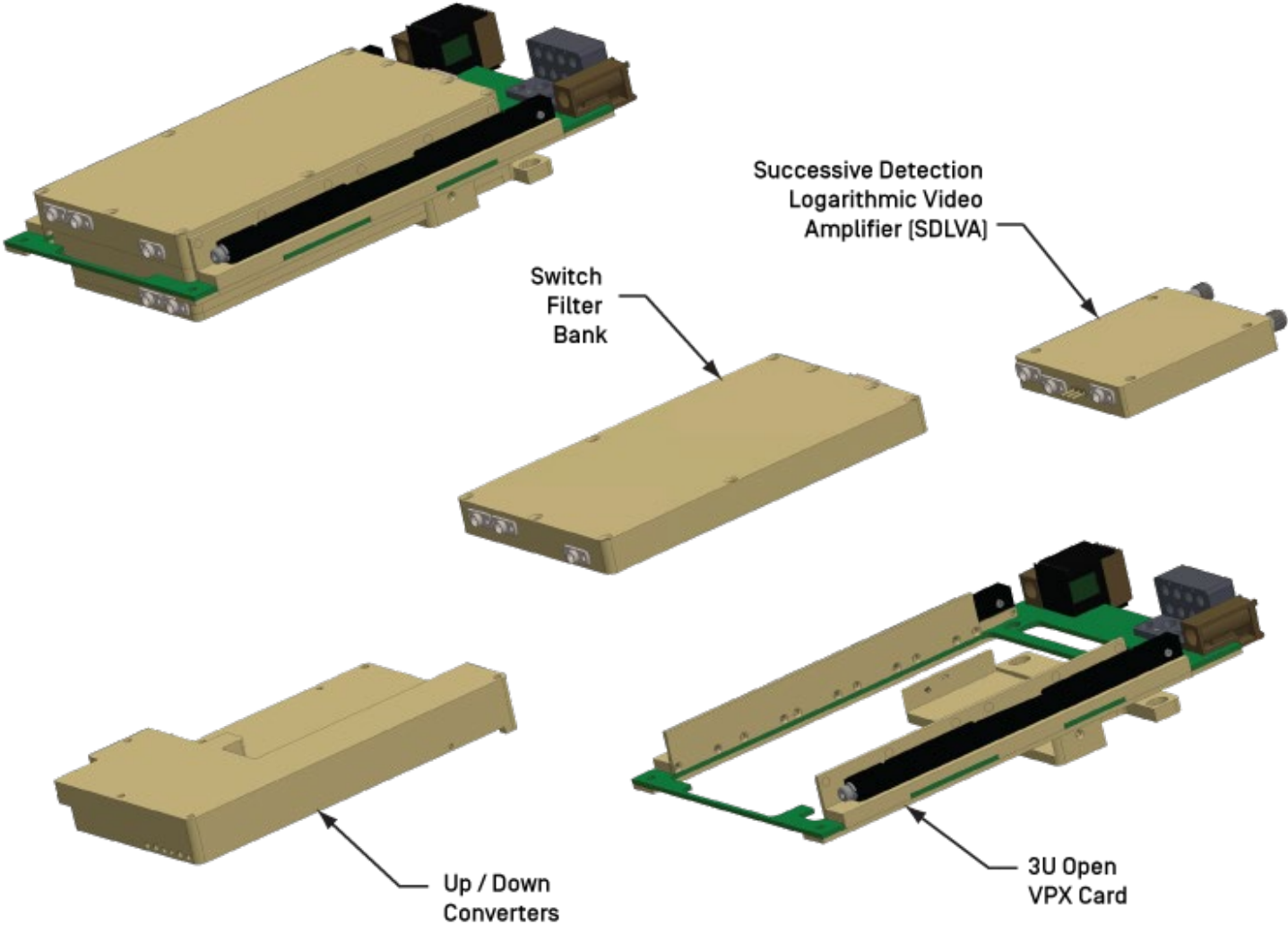
100 MHz to 18 GHz frequency Coverage

- > Integrated Up and Down Converters
- > IF up to 4 GHz
- > Time Gated SDLVA for Pulse Blanking
- > -80 to -10 dBm Input Dynamic Range
- > Customizable Switch Filter Banks
- > 0 to +10 dBm Transmit Power
- > 100 ns Switching Speed
- > Fits into a 3U open VPX form factor utilizing the high-speed VITA 67 RF connector
- > CW Immunity

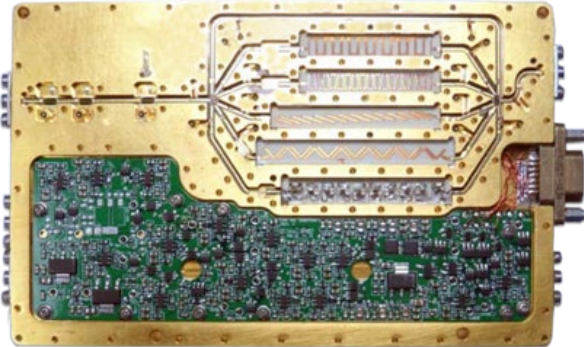


# Transceiver, PTRAN-100M18G-SFB-3UVPX-10HP-MAH

Modular approach using custom block diagrams mixing discrete designs and MMIC Technology for maximized performance



Phase III Transceiver  
Receive Side Switch Filter Bank



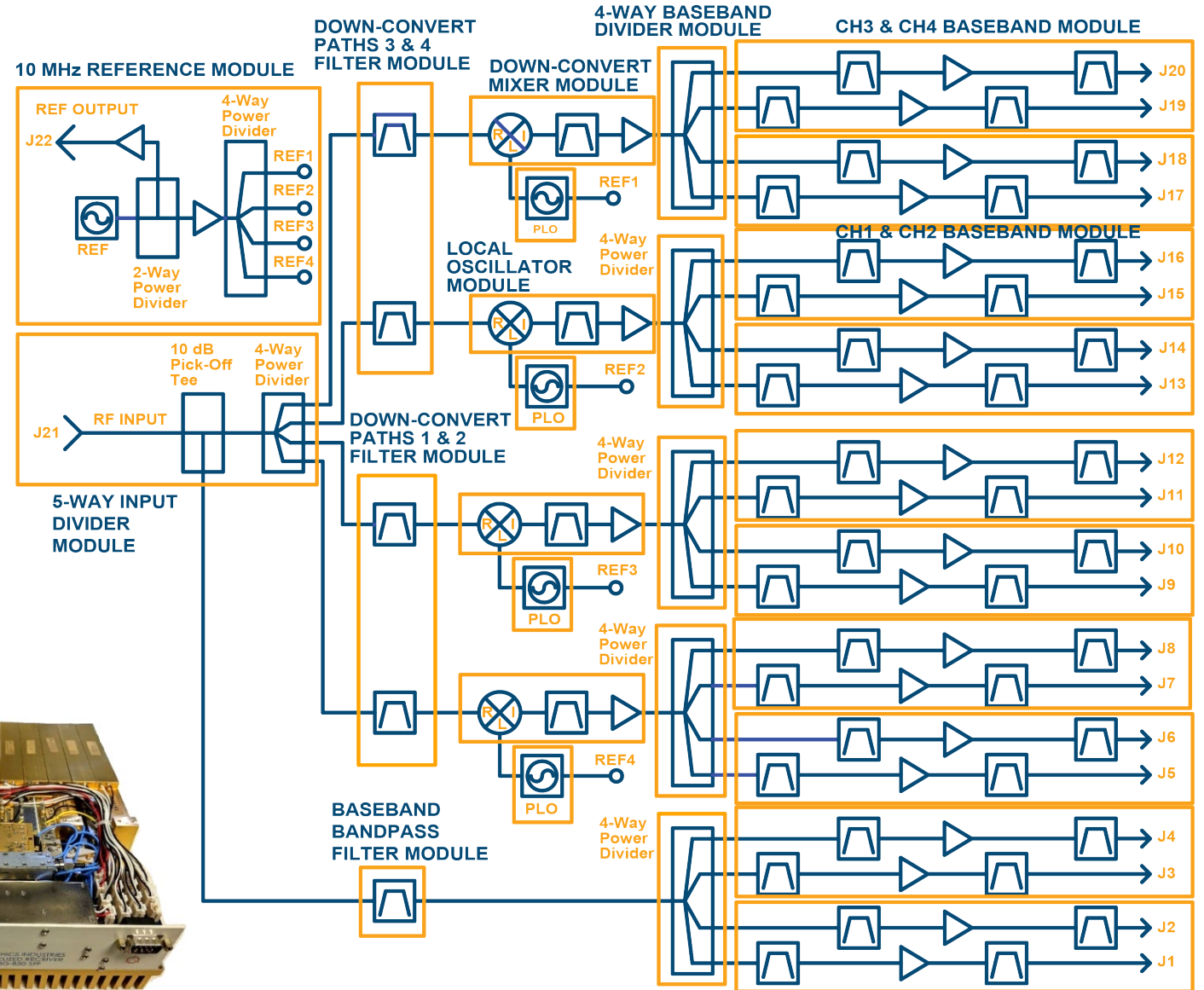
Phase III Transceiver  
Transmit Side Switch Filter Bank

# Channelized Receiver, PRX-20-1G18G-850M-SFF-V2

1-18 GHz Frequency Coverage - 20 Outputs



- > -58 to +2 dBm Input Dynamic Range
- > 60 dB Output Spurious Free Dynamic Range
- > 20 Output Channels, IF Frequencies of 850 MHz BW from 1 to 4.4 GHz (4 Filtered Thru Path and 16 Down-Converted Paths)
- > Overall Gain of  $0 \pm 3$  dB
- > 10 MHz Output Reference with output stability of  $\pm 1$  PPM
- > Less than 50 W Power Consumption





# Transceiver (PHASE I), PTRAN-100M18G-70-MAH

## Rack Mount Modular Design

- > Frequency coverage of 100 MHz to 18 GHz
- > Up-converts a 100 MHz to 4.0 GHz transmit signal to 2 to 18 GHz frequency range.
- > Down-converts a 100 MHz to 18.0 GHz received signal to the 100 MHz to 4.0 GHz intermediate frequency range for analog to digital conversion.
- > Control Logic: LVDS
- > Internal Power Supplies: +12V, -12V, +5V, +3.3V
- > 1U Rack Size: 5.55" x 3.68" x 0.89"
- > Front Panel SMA RF Connectors

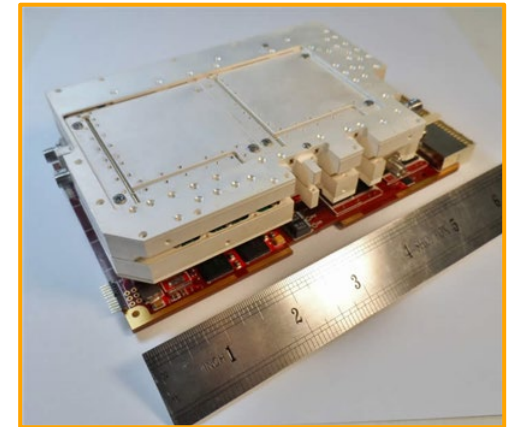
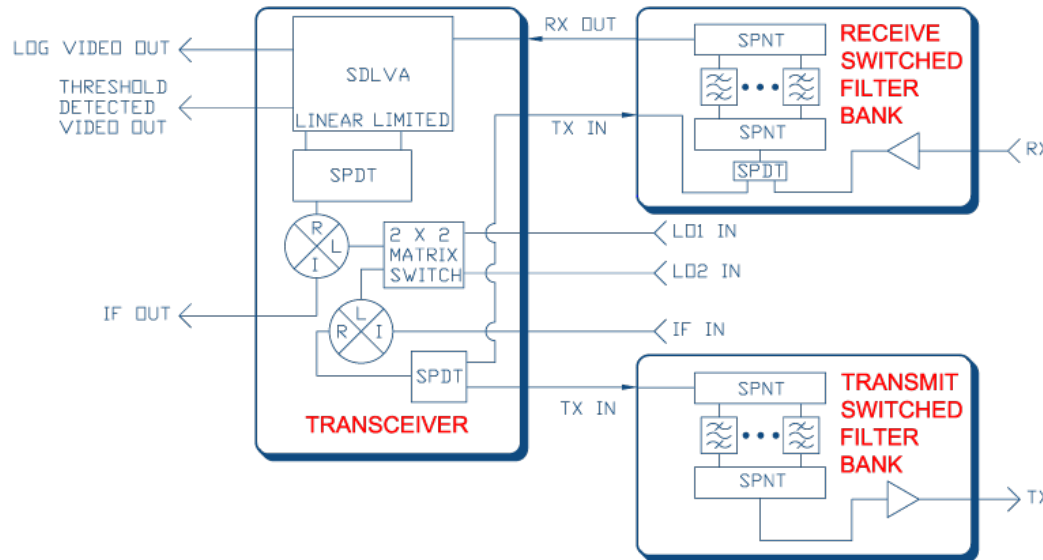




# Open VPX Transceiver, PTRAN-100M18G-SFB-3UVPX-MAH

3U Open VPX from factor utilizing the high-speed VITA 67 RF Connector

- > Covers frequency range of 100 MHz to 18 GHz
- > Up-converts a 100 MHz to 4 GHz transmit signal to 2 to 18 GHz
- > Down converts a 100 MHz to 18 GHz received signal to 100 MHz to 4 GHz intermediate frequency range for analog to digital conversion.
- > Receive filter bank incorporates a 2-way absorptive switch to select an input, along with two 6-way switches allowing one of the six filter paths to be chosen
- > Transmit path filter bank uses two 6-way switches allowing one of the six filter paths to the chosen



## Computer Controlled, Solid-State RF Switch Matrices

### Standard & Custom Designs

#### > Features

- Ultra-Broadband Performance up to 70 GHz
- SPST – SP128T Configurations
- Available in 4 X 4, 8 X 8, 16 X 16, or 32 X 32 blocking or non-blocking matrix
- TTL, RS232, RS422/485, Ethernet and via the front panel touch screen LCD
- Designs feature low insertion loss, high isolation, and fast switching speeds
- Reflective or Absorptive Available
- Can be supplied in a ruggedized 1U to 6U, 19" Chassis
- Operating temperature ranges from -54 °C to +85 °C.
- Custom designs can be supplied using any of our catalog or customer driven specifications.

#### > Options

- Zero Loss
- Ultra-Low Video Transient models available.
- Higher Isolation
- Military and Airborne Screening

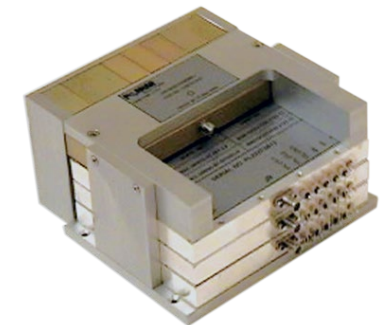
#### > Form, fit & functionality is our specialty!



20 MHz to 40 GHz,  
Switch Matrix Assemblies  
(Blocking & Non-Blocking)



RF Signal Distribution Systems

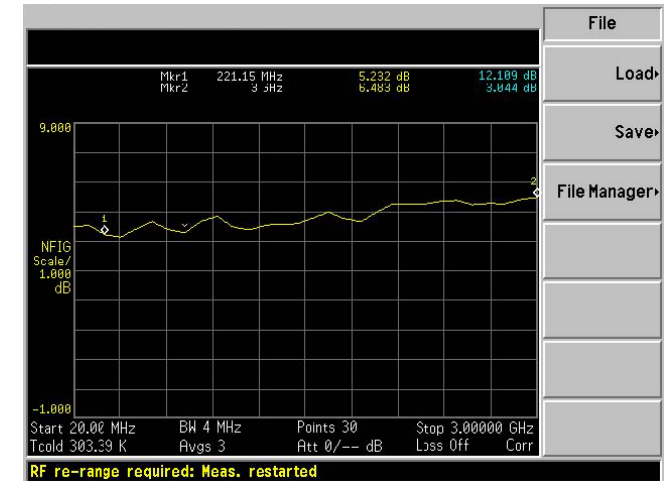
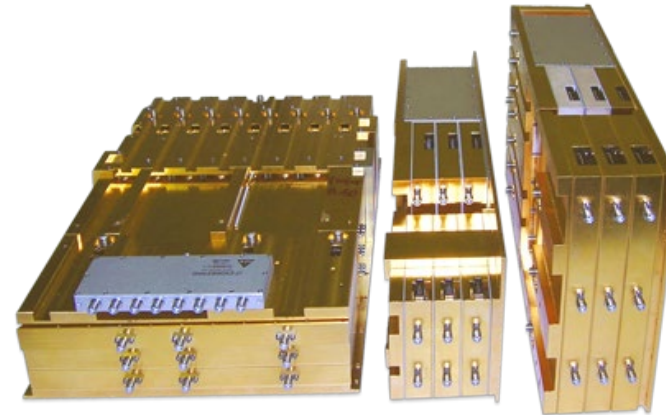


20 MHz to 3 GHz, SP8T  
Switch Matrix Assembly

# RF Signal Distribution Systems

Built to your System Specification and Functionality

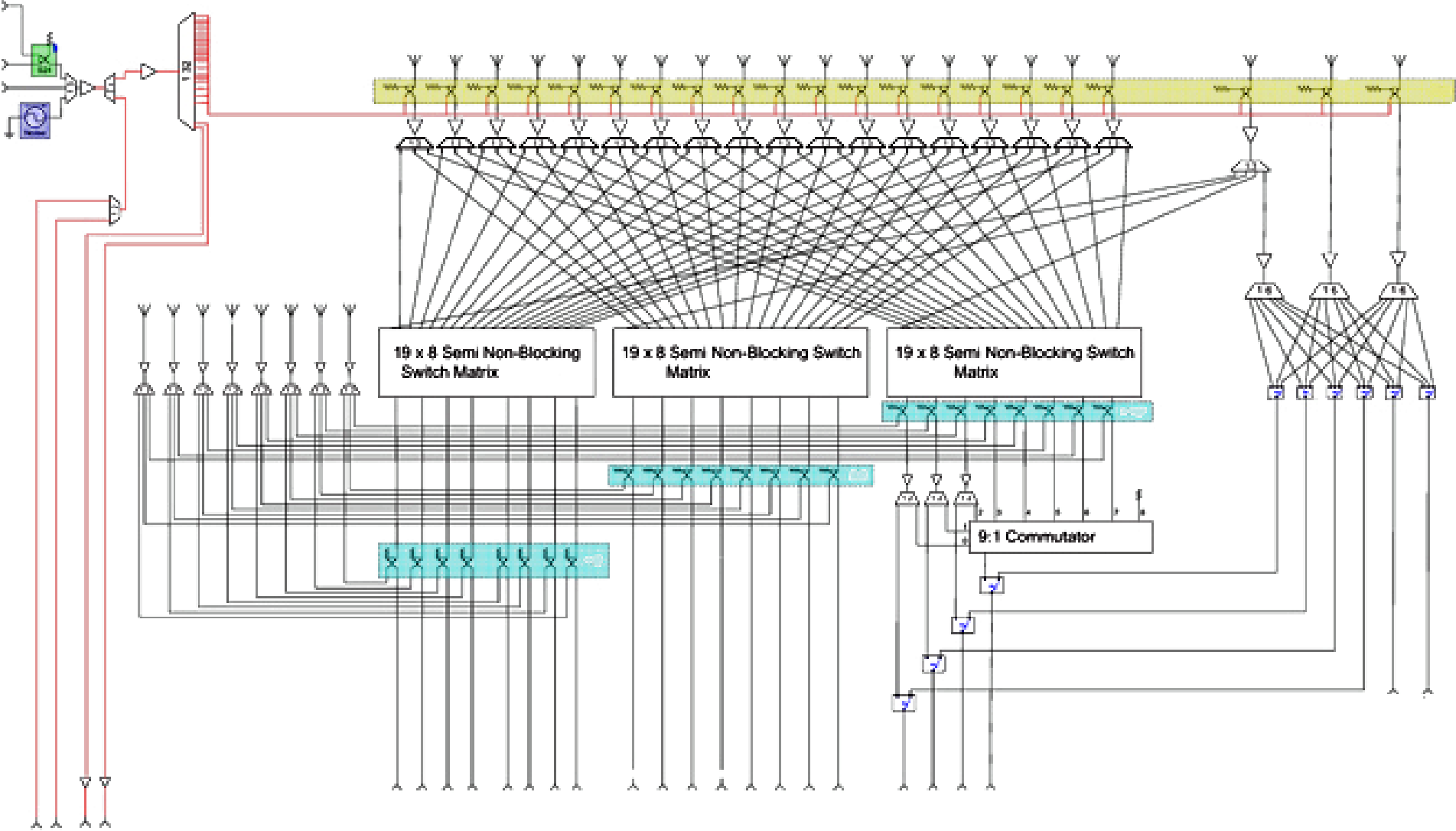
- > Plug & Play Modular Design
- > 19" Rack Mount Chassis, 6U, 18" Deep
- > 6" Color LCD Touch Screen Display
- > 500 MHz Single Board Internal Processor
- > Linux or Windows Operating System
- > Removable Compact Flash Memory which contains all booting & operation software
- > Compatible with RS-232, RS-422 / 485, PECL, TTL & Ethernet
- > Front Panel Troubleshooting to the component level
- > Internal Power monitoring
- > Internal noise source calibration feature
- > RF module internal temperature monitoring
- > Military and Commercial versions are available.
- > Built to meet your exact functionality requirements.



*Swept Data & Noise Figure show typical performance across 20 MHz to 3 GHz frequency band.*

# RF Signal Distribution Systems

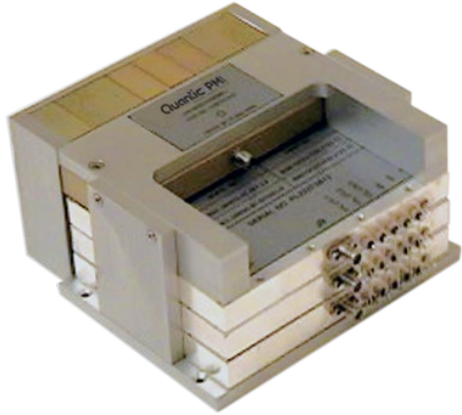
Sample Functional Block Diagram





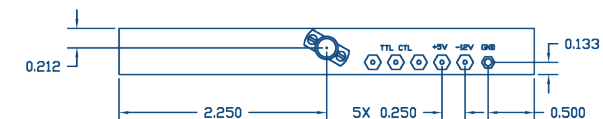
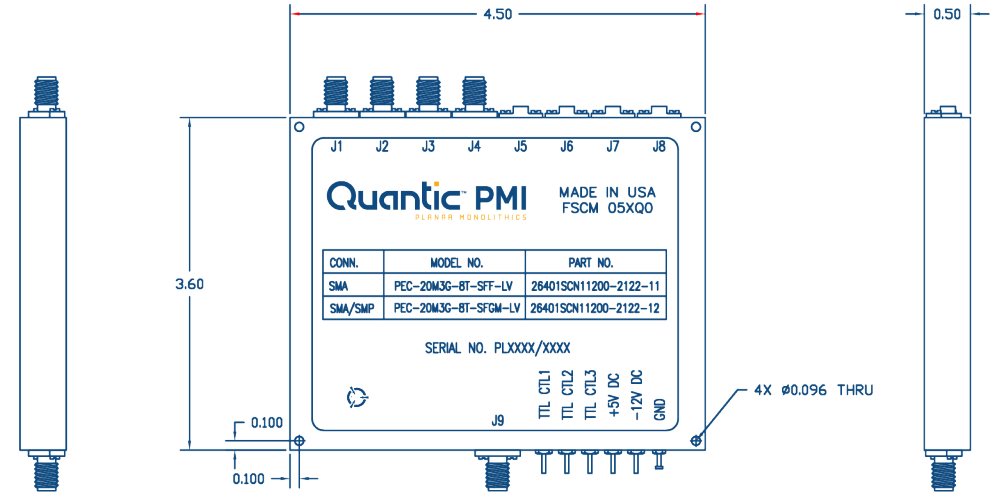
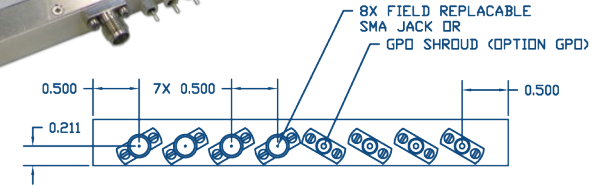
# Switch Matrix with Integrated Power Dividers

## Single Integrated Module



- > Frequency coverage of 20 MHz to 3 GHz
- > Ultra-low Video Transients
- > Integration of SP8T Non-Reflective Switch Modules
- > Rugged Construction with GPO & SMA Connectors

PARAMETERS	SPECIFICATIONS
Frequency Range	20 MHz to 3.0 GHz
Insertion Loss*	3 dB Typ
Isolation	55 dB Typ
VSWR	2.0:1 Max
Input 1 dB Compression Point	+25 dB Typ
Switching Speed	10 μs Off / 20 μs On
Amplitude Balance	±0.25 dB
Phase Balance	±4.0°
Video Transients	Above 20 MHz = -100 dBm Below 20 MHz = -75 dBm





# Solid State Switch Matrices

Quantic PMI offers a full product line of RF Switch Matrices



- > Operates over 20 MHz to 40 GHz frequency range in three frequency Bands, namely 20 MHz to 3.0 GHz, 2.0 to 18.0 GHz, & 18.0 to 40.0 GHz.
- > Any of the three models can be supplied as either a 4 X 4, 8 X 8, 16 X 16, or 32 X 32 blocking or non-blocking matrix.

Model Number	Frequency Range (GHz)	Number of Inputs to Outputs	Insertion Loss (dB)	Isolation (dB)	OIP3 (dB)	Switching Speed (ns)	VSWR	Max Input Power (dBm, CW)	Chassis Size
<a href="#">SM-20M3G-4X4</a>	0.02 - 3.0	4 / 4	10	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-20M3G-8X8</a>	0.02 - 3.0	8 / 8	14	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-20M3G-16X16</a>	0.02 - 3.0	16 / 16	16	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-20M3G-32X32</a>	0.02 - 3.0	32 / 32	19	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-2G18G-4X4</a>	2.0 - 18.0	4 / 4	14	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-2G18G-8X8</a>	2.0 - 18.0	8 / 8	16	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-2G18G-16X16</a>	2.0 - 18.0	16 / 16	19	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-2G18G-32X32</a>	2.0 - 18.0	32 / 32	23	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-18G40G-4X4</a>	18.0 - 40.0	4 / 4	16	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-18G40G-8X8</a>	18.0 - 40.0	8 / 8	18	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-18G40G-16X16</a>	18.0 - 40.0	16 / 16	22	60	45	100	2.0:1	20	6U, 19" Chassis
<a href="#">SM-18G40G-32X32</a>	18.0 - 40.0	32 / 32	25	60	45	100	2.0:1	20	6U, 19" Chassis

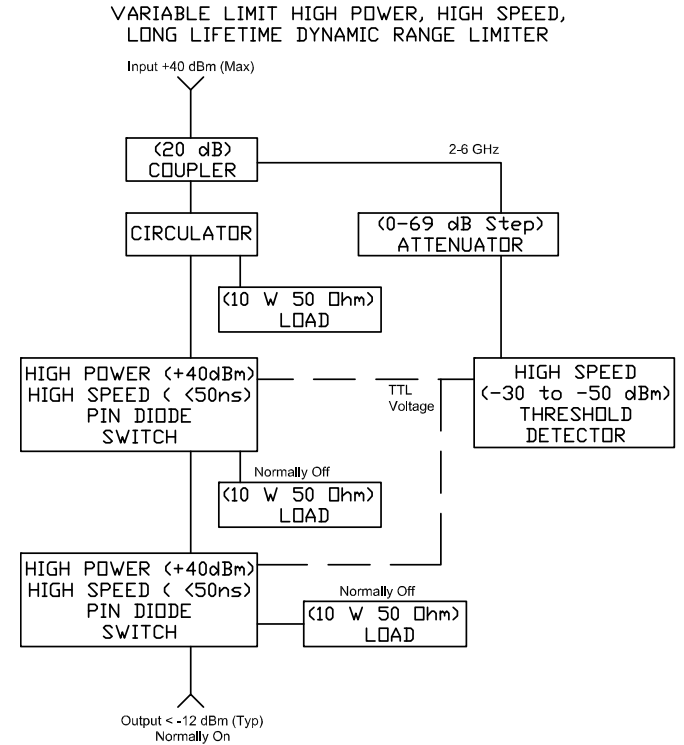
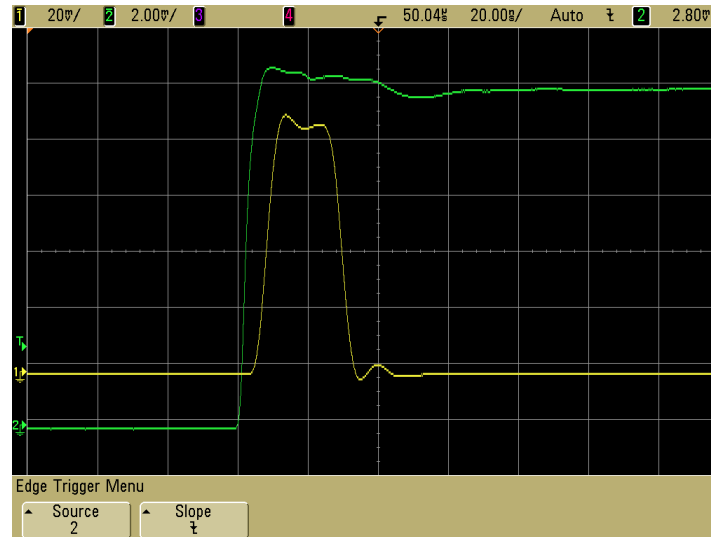
# High Power Switch Box Assembly, PSD-2G6G-CD-1

Ruggedized and designed for harsh environments and is EMI shielded.

- > Provides protection to front-end receivers by sensing the input signal level and then switching the input signal into 50 ohms terminations when a set threshold level is exceeded.
- > Operates from 2.0 to 6.0 GHz and can handle input power levels up to 10 Watts CW.
- > Supplied with an external 0 to 69 dB step attenuator that can be used to adjust the signal levels feeding the internal threshold detector.
- > Switching speed is 50 ns maximum
- > Operates on 110 VDC, 50/60 Hz and is supplied in a housing that measures 15.0" x 10.0" x 4.0"



*RF Input vs. RF Output*



**Thank You!**

