X-BAND FRONT END AND POWER MONITOR

MODEL: RFFE-PM-1030010700-00120

FEATURES

- **RF frequency range ..... 10.3–10.7 GHz**
- **IF frequency range..... 110–130 MHz**
- **LO frequency..... 10.18–10.58 GHz**
- **RF–IF gain..... 40 dB nominal**
- **Low noise figure ..... 3.5 dB maximum**
- **In/out VSWR ..... 1.8:1 maximum**
- **Low spurious signals ..... < -75 dBm maximum**
- **Low DC current ..... 250 mA maximum (±12 VDC combined)**
- **Weight ..... 770 grams maximum**
- **Tx/Rx mode..... LVDS control**
- **Power monitor mode ..... +24 ± 4 VDC/175 mA maximum**

An example of MITEQ's broad capabilities related to subsystem development and multi-function component integration is the RFFE-PM. The Radio Frequency Front End and Power Monitor was developed for a highly demanding and extreme environment application. As was required, it was also successfully integrated into an exceedingly dense and highly irregular outline package.

A single TNC connector serves as both the monitored transmit signal output port and the receiver input port. In reception mode, the RFFE-PM is a single channel, single stage, low noise X-band, downconverter with image rejection and 40 dB of conversion gain across the full 400 MHz RF bandwidth. Out-of-band interference is reduced by a preselector. A phase linear, bandpass-filtered 20 MHz bandwidth IF output is centered at 120 MHz.

As a transmitter, applied high power RF (through another TNC connector) is duplexed out the same antenna port. Receive electronics are protected from transmission leakage by the reverse isolation of a high power circulator. An externally controlled switched limiter also rejects any antenna reflections.

Also by external control, the high power signal can be switched to an external test port to allow direct sampling while being coupled and applied to an internal envelope detector.

ELECTRICAL SPECIFICATIONS

RECEIVER

PARAMETERS	UNITS	MIN.	TYP.	MAX.
RF input frequency	GHz	10.3		10.7
LO input frequency	GHz	10.18		10.58
Conversion Gain	dB, min.	36	40	44
Noise figure	dB		3.0	3.5
LO VSWR	Ratio		1.7:1	1.8:1
Input 1 dB compression point	dBm	-33	-30	
Inband spurious signals	dBm		-85	-80
Center IF frequency	MHz	118	120	122
1 dB IF bandwidth	MHz	20	23	
3 dB IF bandwidth	MHz		35	38
40 dB IF rejection bandwidth	MHz		68	70

TRANSMITTER

PARAMETERS	UNITS	MIN.	TYP.	MAX.
Input power	Watts			400
Transmit path insertion loss	dB		1	1.5
Transmit path input VSWR	Ratio		1.7:1	1.8:1
POWER MONITOR	**UNITS**	**MIN.**	**TYP.**	**MAX.**
Frequency range	MHz	10.3		10.7
Input power range	dBm	50		56
Power monitor @ 50 dBm (1k ohm load)	mV	150		

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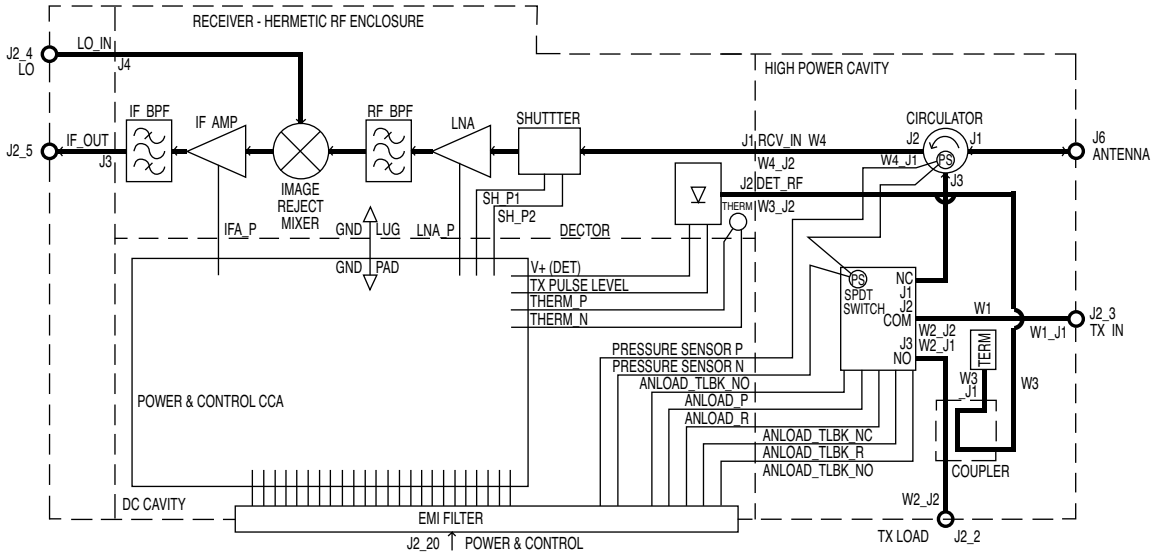
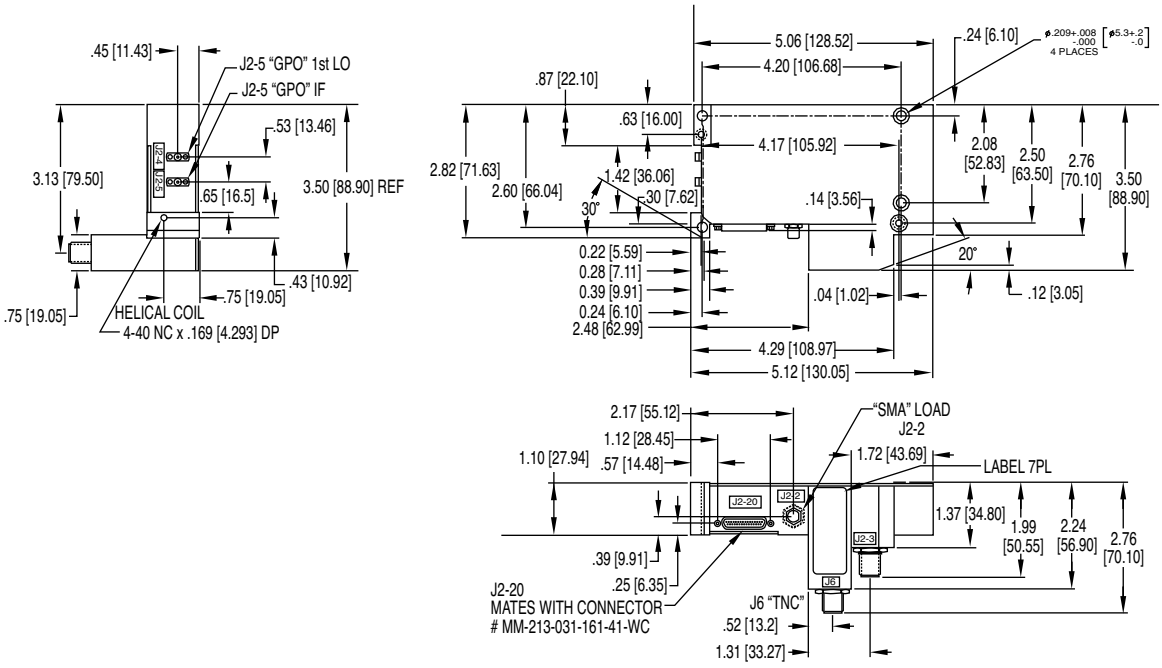
ENVIRONMENTAL CONDITIONS

Operating temperature ..... -20 to +75°C
Storage temperature ..... -30 to +85°C
Humidity..... 95% noncondensing
Vibration..... 18 g's rms, 20-2000 Hz per
MIL-STD-810B Method 514, Procedure 5

FUNCTIONAL BLOCK DIAGRAM



OUTLINE DRAWING



GENERAL NOTES:
1. Dimensions shown in brackets [ ] are in millimeters.
2. Tolerance as follows: .xx = ±0.01 [.xx = ±0.25], .xxx = ±0.005 [.xxx = ±0.13]

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