



## X Band Front End Assembly

This datasheet is an example of a high power microwave system designed, fabricated and characterized by Aethercomm. This system operates at X band and incorporates a high power transmitter, a low noise receiver, a DC-DC conversion module and BIT and LRU interface module. The complete assembly is packaged in an EMI enclosure. The transmitter consists of redundant driver amplifiers with power splitting that drives four high power, phase and amplitude matched final amplifiers. The output of these amplifiers is recombined and then routed to waveguide. The waveguide components include filters, directional couplers, waveguide switches and circulators. The receive and transmit functions are isolated with a circulator at the front-end. The receive

### **XBFEA Transmitter Performance at X Band**

Parameter	Min	Typ	Max
Peak Output Power (Watts)	110	200	-
Tx Antenna Return Loss (dB)	-	-17.0	-14.0
Duty Cycle (%)	10	15	20
Harmonics (dBc)	-	-70	-65
Non Harmonic Spurs (dBc)	< -100	< -90	< -80
+15Vdc Average Current at Pout = 200 Watts (Amps)	-	11.0	12.0
Pulse Droop (dB)	-	0.30	0.50
DC Blanking Time of Tx PA's (nSec)	-	500	1000
Saturated Gain (dB)	47.0	50.0	-

### **XBFEA Receiver Performance at X Band**

Parameter	Min	Typ	Max
Peak Input Power - No Damage (dBm)	NA	NA	200
Noise Figure (dB)	-	4.8	5.0
Rx Input Return Loss (dB)	-	-16.0	-14.0
Rx Gain (dB)	14.0	14.5	15.0
OIP3 (dBm)	31	33	-
P1dB (dBm)	22	23	-
Rx RF Switch Isolation (dB)	50	80	NA
Rx RF Switch On/Off Timing (nSec)	-	150	200

- **X Band Front End Assembly (XBFEA)**
- **200 Watts Peak Output Power**
- **Low Noise Figure Receiver**
- **System Level Fault Isolation**
- **LRU Level Fault Isolation**



section contains a high power limiter to protect the LNA, a high speed RF switch to perform internal Rx test functions and redundant low noise amplification sections. The DC-DC converter module accepts +15Vdc and -15Vdc and conditions, regulates and switches these voltages when commanded. The BIT and LRU interface module accepts commands from the host computer and commands and controls the other modules to perform their specified operations. This module also monitors the health of the entire system and the individual modules and reports this to the system. The transmitter, receiver and the DC-DC conversion modules are fully redundant to increase the system MTBF.

This X band front end assembly is 26 inches in width, 32 inches in height and 12.5 inches in depth. The bi-directional input port is a waveguide connector for direct connection to the system antenna. The transmitter input connections are redundant Tx exciter inputs. DC and command/control inputs and outputs are mil-circular connectors. The entire assembly is air cooled with fins on the backside of the enclosure.

*Aethercomm Inc. reserves the right to make changes without further notice. Aethercomm recommends that before these items herein are specified into a system or critical application that the performance characteristics be verified by contacting the factory.*