RFA-2

AM&FM POWER AMPLIFIERS

MODEL: RFA-2

DESCRIPTION:

AM & FM Power Amplifiers

SUMMARY

The RFA-2 amplifiers are used to boost all the commercial broadcast stations, typically 20 to 30 carriers per band. The amplifiers are designed with special linear characteristics and continuous operation, with 100% duty cycle 24 hours/7 days a week.

The AM and FM amplifiers are independent of each other. Each amplifier has its own power supply. All power supplies have over-current and over-voltage protection. This will immediately drop the supply voltage to prevent damage to other components.

The AM&FM Power Amplifiers modules are provided with a modular heat sink case, which are fully interchangeable and are mounted to the back of the heat exchangers with four bolts.

Features:

- The Amplifier Housing is solid aluminum 6061-T6 anodized, using a single flat cover. It has shielding between stages to improve amplifier stability.
- The model number and input/output labels are punched in the housing, in addition to standard printed label customized for CANAM Technology.
- The Amplifiers have an external output band pass filters, so if any harmonic or spurious products at the amplifiers output are created it shall be suppressed to levels lower than 60 dB below the carriers level, for all frequencies above 140 MHz and below 78 MHz in the FM model, and for all frequencies above 3 MHz and below 0.35 MHz in the AM band.
- The amplifiers provide a status indicator (normal operation) as a form-C dry-contact.

The amplifiers are placed inside a chimney-heat-sink cabinet with cooling fans on either side to remove the heat. These heat sinks have adequate capacity to dissipate five times the maximum anticipated heat being generated by the two amplifiers. It is recommended the temperature of the room be maintained below 80^0 F to assure the longest possible life of the amplifier transistors.

The Fans used to cool the heat sink are selected for long life and minimum maintenance with maximum reliability. Air Flow alarms can also be provided as an option to indicate a clogged filter or fan malfunction.

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A meter panel for each amplifier provides current and voltage readings, as well as readings for output forward and reflected power so the condition of the radiators can be monitored.

Optionally, Integrated Fiber-Optic receiver/RF-converters can be supplied to provide a low loss path between the RF source and the fiber-in RFA which is located in a remote location in the tunnel or equipment/utility room. RF over fiber-optic links allows multi-carrier signals to be transported long distances over fiber optic cable with minimal degradation of the original RF signals.

MODEL	AM-250C (AM band)	FM-250C (FM band)
Frequency response (Operating bandwidth)	0.53 to 1.7 MHz	88 to 108 MHz
Power output @ 1dB compression point for a single carrier (CW)	+51 dBm (125W)	+51 dBm (125W)
Max. input power for no damage	+10 dBm	+10 dBm
OIP3 (Output third order harmonics Intercept Point) two-tone	+56 dBm	+56 dBm
Gain	55 dB	55 dB
gain flatness (at maximum gain) over the operating bandwidth	+/- 1.5 dB	+/- 1.5 dB
Gain Control range (mechanical input attenuator - screw driver type- accessible through a hole in the cover)	10 dB	10 dB
Noise Figure	10 dB	10 dB
Band pass filtering	see note 3	see note 3
Input VSWR	2.0:1	2.0:1
Output VSWR	2.0:1	2.0:1
Output VSWR tolerance with no damage, loads @ any phase	20.0:1	20.0:1
Input & Output Impedance	50 ohms	50 ohms
Class of Operation	A	A
Typical Operating voltage and current	28VDC, 7.5A. @50 W RF out	28VDC, 7.5A. @50 W RF out
Operating Temperature range, in degrees Celsius	0 to +60 degrees	0 to +60 degrees
Temperature protection: Active Temperature sensing with auto reset (cut-off) at	+70 degrees C.	+70 degrees C.
Input DC power reverse polarity and shorting/un-shorting transients protection	built-in	built-in

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Mechanical Features	
Mounting options	Rack Mount, 7U height typical
	Wall mount
Rack Mount Enclosure Dimensions (Typical)	12.25” (H) x 19” (W) x 23” (D)
Rack Mount Housing Material	Aluminum, anodized, color
Rack Mount Input/Output RF Connectors	N-female, silver shell, gold center pin. Rear access.
Wall Mount Dimensions (typical)	40.35” (H) x 32.42” (W) x 12.0” (D)
Wall Mount Housing	NEMA 4X (Either Stainless Steel or Fiberglass)
Wall Mount Input/Output RF Connectors	N-female, silver shell, gold center pin. (Location of Connector is Dependant on Contract Requirements)

Front panel Features	
Front panel Digital Meter, with push-button selection	Power Supply Voltage, DC Current, Forward Power, Reflected Power for both AM & FM.
Amplifier Status	Independent AM & FM LED indicators
Amplifier Control Gain Control Cursor	Independent AM & FM Control potentiometers
Amplifier High-VSWR Alarm	Independent AM & FM LED indicators
High-VSWR Alarm reset	Independent AM & FM push buttons
Amplifier On/Off Switches	General AC Switch and independent AM & FM switches

Remote Monitoring Interface	
Amplifier Status	Independent AM & FM Status Outputs, Form-C relay contacts
Amplifier Shutdown	Independent AM & FM Shutdown Opto-isolated inputs, 12Vdc
Amplifier High VSWR Alarm	Independent AM & FM High-VSWR Alarm Outputs, Form-C relay contacts
Amplifier High VSWR Alarm reset	Independent AM & FM Hi-VSWR Reset Opto-isolated inputs, 12Vdc
Loss of Cooling-Air Alarm	General Loss-of-cooling Alarm Output, Form-C relay contacts
Service Power Interface	12 VDC
Connector	DB-25, female, rear access (typical)

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Fiber Optic receiver-Converter

- RF/Fiber Optical Receiver Module
- 530-1700 kHz Bandwidth for AM
- 87-110 MHz Bandwidth for FM
- Small package outline
- 1.3 µm Low Noise FP Lasers (DFB optional)
- -40°C to +75°C Operating Temperature (case)
- Wide Dynamic Range
- Automatic Optical Power Control
- Monitoring and Alarm
- One Way Single-Mode Fiber link
- Slow-Start circuitry to prevent Laser damage

The CT-AF-FO-RX is a modular RFA high performance AM/FM optical receiver with very wide Dynamic Range designed for RF/Fiber applications,. It is designed as a compact RF plug in package for single-mode fibers operation. The Standard optical connector is SC/APC (FC/APC available) for low back reflection applications. The receiver features a high performance InGaAs photodiode operating at 1.3 µm over 9/125 µm single mode fibers. Average Automatic Power Control (AAPC) is incorporated for optimal optical power stability over the full temperature range. The RF interface is via a 50 ohms N connector and alarm and monitoring functions are available.

Absolute Maximum Ratings				
Parameter	Symbol	Min.	Max.	Units
Storage Temperature (Case)	TS	-40	+85.0	°C
Operating Temperature (Case)	TO	-40	+75.0	°C
Maximum RF Input into the Transmitter			+10	dBm
Maximum Optical Input into the Receiver			4	mW

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AM Link Characteristics					
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Units**
Receiver Operating Wavelength	λ		1310		nm
Frequency Response (530-1700 kHz)			± 0.5		dB
Input/Output Impedance			50		Ohm
Input/Output VSWR (530-1700 kHz)			1.5:1	2:1	
Spur Free Dynamic Range[1]	SFDR	96	102		dB/Hz
RF Link Gain (Tx-Rx), typical[1]		-1	0	+1	dB
Input Noise Floor[1]	EIN		-125	-120	dBm-Hz
Input Third Order Intercept[1]	IIP3	25	28		dBm

FM Link Characteristics					
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Units**
Receiver Operating Wavelength	λ		1310		nm
Frequency Response (48-2500 MHz)			± 1.5		dB
Input/Output Impedance			50		Ohm
Input/Output VSWR (48-2500 MHz)			1.8:1	2:1	
Spur Free Dynamic Range[1]	SFDR		109		dB/Hz
RF Link Gain (Tx-Rx), typical[1]		-1	0	+1	dB
Input Noise Floor[1]	EIN		-133	-120	dBm-Hz
Input Third Order Intercept[1]	IIP3		30		dBm

Notes: 1. Measured @ 25°C

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