

30 kHz-20 GHz GaAs MMIC Optical Modulator Driver Amplifier



August 2006 - Rev 02-Aug-06

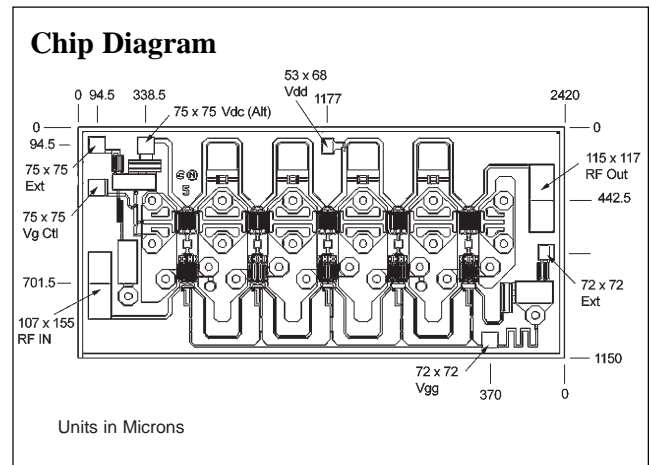
CMM3020-BD

Features

- Small Size: 43 x 92 mils**
- High Gain: 10 dB Typical**
- Output Voltage up to 7.5 V Peak-to-Peak**
- 30 kHz to 20 GHz Bandwidth**
- Low Gain Ripple: 1.0 dB pp Typical**
- Sub 0.25 Micron Ion/Implant Process**

Applications

- Driver for LiNbO₃ Modulator @ OC192 bit rate SONET/SHD Transmission Systems**
- Medium Power Linear Gain Block for Broadband Systems**



Description

The CMM3020-BD is a precision GaAs MMIC, medium power amplifier and is part of Celeritek's family of WideFiber™ products.

The CMM3020-BD optical driver amplifier gives fiber optic system designers a unique combination of wideband frequency coverage, along with a flat response and very low internal jitter. It is a precision Ion/Implanted GaAs RF IC medium power amplifier with +23 dBm @ P1dB (Typ). It operates from 30 kHz to 20 GHz with a 10 dB linear gain. Low internal

jitter makes it especially well suited for high speed digital data applications. Typical output voltage is 7.5 V peak-to-peak.

It is an excellent choice for driving Lithium Niobate external optical modulators, where a high extinction ratio is necessary. Targeted for OC-192 and other high speed applications, the bit rate can be as high as 15 Gb/s. The bias voltage can be adjusted to reduce the output voltage as needed.

CMM3020-BD amplifiers are shipped in Gel Pack from Celeritek's foundry.

Specifications ($T_A = 25^\circ\text{C}$, $V_{DD} = 8\text{V}$)				
Parameters	Units	Min	Typ	Max
Frequency Range	—	30 kHz		20.0 GHz
Small Signal Gain	dB	9.0	10.0	
Gain Flatness	±dB		0.5	0.75
Input/Output VSWR	—		1.8:1	2.0:1
Power Output (@1 dB Gain Compression)	dBm	22.0	23.0	
Second Order Intercept Point	dBm		40.0	
Third Order Intercept Point	dBm		30.0	
Current	mA	225		275

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Absolute Maximum Ratings

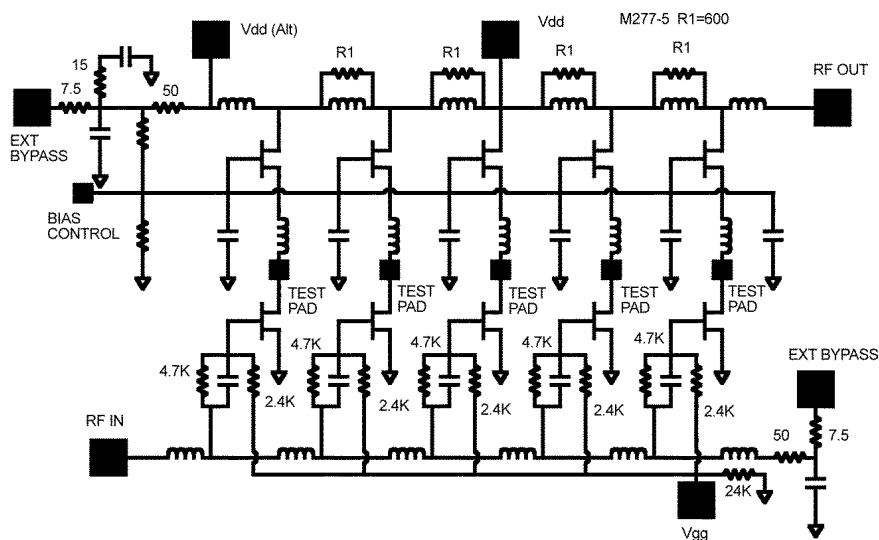
Parameter	Rating
Drain Voltage	12 V
Gate Voltage	-5 V
Drain Current	350 mA
Continuous Power Dissipation	3.0 W
Channel Temperature	+175°C
Storage Temperature	-65°C to +175°C
Mounting Temperature	+320°C
Input Power	+23 dBm

Die Attach and Bonding Procedures

Die Attach: Eutectic die attach is recommended. For eutectic die attach: Preform: AuSn (80% Au, 20% Sn); Stage Temperature: 290°C, ±5°C; Handling Tool: Tweezers; Time: 1 min or less.

Wire Bonding: Wire Size: 0.7 to 1.0 mil in diameter (pre-stressed); Thermocompression bonding is preferred over thermosonic bonding. For thermocompression bonding: Stage Temperature: 250°C; Bond Tip Temperature: 150°C; Bonding Tip Pressure: 18 to 40 gms depending on size of wire.

Schematic Diagram



Ordering Information

Part Number for Ordering
CMM3020-BD-0048
CMM3020-BD-0192

System Application/Description
OC-48/STM-16
OC-192/STM-64