

**Advanced Product Information**  
**January 2000** (1 of 2)

## 30 kHz to 20 GHz GaAs MMIC Optical Modulator Driver Amplifier

### 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**

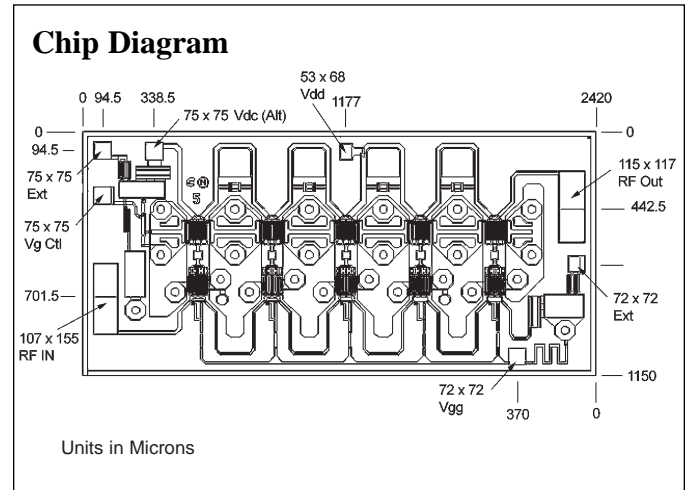
### Applications

- ❑ **Driver for LiNbO<sub>3</sub> 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.

<b>Specifications (T<sub>A</sub> = 25°C, V<sub>DD</sub> = 8V)</b>				
<b>Parameters</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
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

## Absolute Maximum Ratings

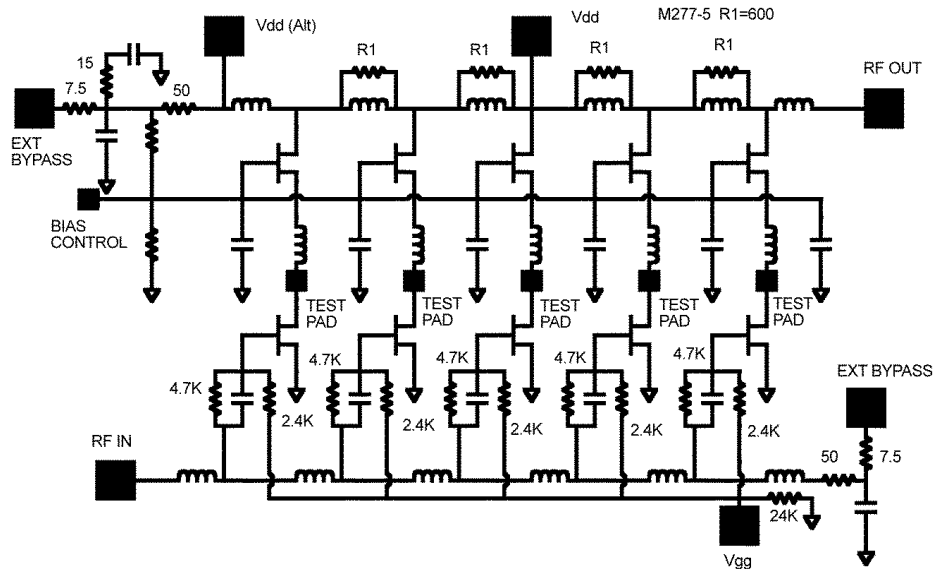
Parameter	Rating
Drain Voltage	12 V
Gate Voltage	-5 V
Drain Current	350 mA
Continuous Power Dissipation	3.0 W
Channel Temperature	+175°C
Storage Temperature	-65°C to +175°C
Mounting Temperature	+320°C
Input Power	+23 dBm

## 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

Celeritek reserves the right to make changes without further notice to any products herein. Celeritek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Celeritek assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Celeritek does not convey any license under its patent rights nor the rights of others. Celeritek products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Celeritek product could create a situation where personal injury or death may occur. Should Buyer purchase or use Celeritek products for any such unintended or unauthorized application, Buyer shall indemnify and hold Celeritek and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Celeritek was negligent regarding the design or manufacture of the part. Celeritek is a registered trademark of Celeritek, Inc. Celeritek, Inc. is an Equal Opportunity/Affirmative Action Employer.