Micro-MBC-2

A Dual Channel, Small Form, PCB Mountable Modulator Bias Controller

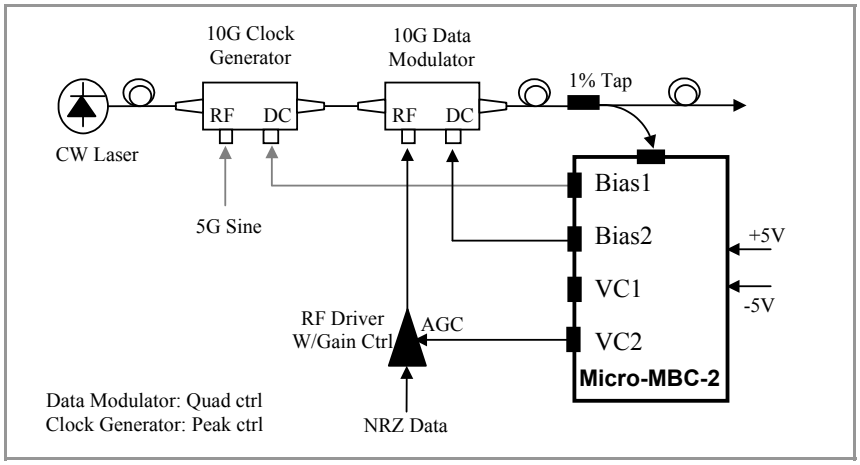
Micro-MBC-2 is a dual channel, low profile Lithium-Niobate modulator bias controller. Based on digital signal processing (DSP) technique and highly sensitive and low noise circuits, the **Micro-MBC-2** can perform excellent bias control for two modulators simultaneously. Each channel can be configured by the user to work in one of the two control modes: Peak/Null control or Quad control. The locking slope (Negative or Positive) is also selectable on board, which makes **Micro-MBC-2** a versatile bias control solution for external modulators.

Micro-MBC-2 is designed to be integrated into transmitter boards. A photo diode with a low profile LC receptacle is built-in for space saving purpose. With an embedded serial communication interface, the bias controller can be monitored and controlled on-line.

All bias and dither output channels have a minimum of 30mA, 500pF load driving capability with short circuit protection. **Micro-MBC-2** can work continuously in a 0°C-70°C environment.

Typical Application

10Gbps RZ
Data Transmission



Micro-MBC-2

Features

- **Low Profile: L 40mm, W40mm, H 13mm**
- **PCB Mountable**
- **Integrated Photo Detector**
  Low Profile RLC Receptacle
- **DSP Signal Processing**
- **Small DC Bias Ripple Voltage:**
  2mV Typical
- **Two Bias Channels**
  Up to two modulators can be controlled simultaneously
- **Two Control Modes**
  Peak/Null or Quad
- **Very Small Dither Signal Amplitude**
  0.1%Max of V_{π} for Peak control
  0.1%Typ Modulation Depth for Quad control
- **Wide Power Supply Range: ±5V ~ ±12V DC**

Applications

- **Data transmission system with NRZ or RZ modulation schemes**
- **Photonics signal processing**
- **Instrumentation**

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Micro-MBC-2 Technical Specifications

Connector J1 Pins Description

No	Name	DIR	Description
1	Vd	In	Positive DC power supply for analog circuit (+5~+12V)
2	Vc	In	Positive DC power supply for digital circuit. Vc may be connected to Vd directly or through a power resistor.
3	GND	In/Out	Power Ground
4	Vs	In	Negative DC power supply (-5~-12V)
5	RXD	In	Serial data receiving pin
6	-5V	In/Out	-5V DC power. When Vs is used as the negative power entry, leave this pin open. If this pin is used as the -5V input, connect it to Vs.
7	TXD	Out	Serial data transmission pin
8	+5V	In/Out	+5V DC power. When Vd is used as the positive power entry, leave this pin open. If this pin is used as the +5V input, connect it to Vd & Vc
9	TCK/ SLP 1	In	Slope selection for channel #1. For positive slope locking, leave it open; for negative slope locking, connect it to GND (pin 3).
10	TDI/ SLP2	In	Slope selection for channel #2. For positive slope locking, leave it open; for negative slope locking, connect it to +5V (pin 8).
11	TDO	Reserved for factory testing.	
12	TMS		
13	TRST		
14	EMU0		
15	EMU1		
16	FLT	Out	Filter output, reserved for factory testing
17	AGND		No user access
18	+5VA		No user access

Connector J2 Pins Description

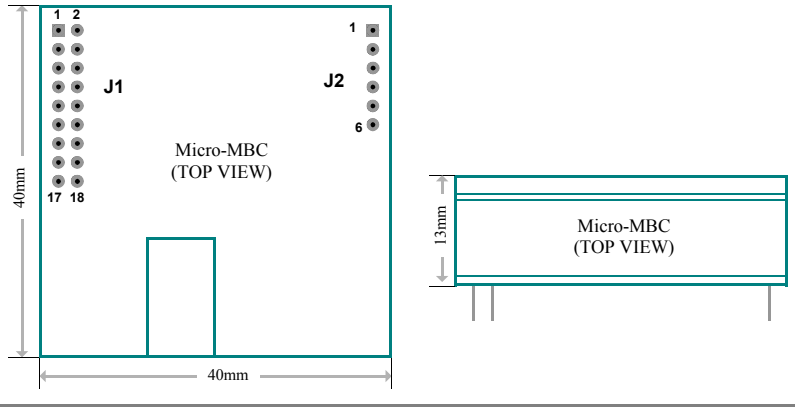
No	Name	DIR	Description
1	BIAS 1	Out	Bias voltage / Peak control dither output #1
2	BIAS 2	Out	Bias voltage / Peak control dither output #2
3	VC 1	Out	Quad control dither output #1
4	VC 2	Out	Quad control dither output #2
5	PDK	In	External photo detector cathode
6	PWR	Out	Optical power voltage output

Ordering information

Micro-MBC-2

Parameters	Symbol	Conditions	Min	Typ.	Max	Unit
Optical performance						
Input optical power	P_i		-30		-10	dBm
Optical wavelength	λ	With integrated photo detector	1000		1650	nm
Dynamical performance						
Rise time	T_r	$-20 \le P_i \le -10$		2		s
Bias ripple voltage	V_r	When bias is locked			2	mV
Locking accuracy	Θ			1	3	Degree
Bias channel						
DC bias voltage	V_b		V_{ee}+2		V_{dd}-2	V
DC bias voltage resolution	R_b			14		Bit
Load current	I_b		0		30	mA
Load capacitance	C_b		0		500	pF
Peak control dither						
Frequency	F_m			9.8		KHz
Amplitude range	V_m		0		200	mV
Quad control dither						
VC Dither frequency	F_{vc}			9.8		KHz
VC Dither amplitude range	V_{vc}		0		200	mV
VC DC voltage	V_{dcvc}		V_{ee}+2		V_{dd}-2	V
Load current	I_{vc}	(Source or sink)			30	mA
Load capacitance	C_{vc}		0		500	pF
Power supply						
Positive supply	V_{dd}		5		12	V
Negative supply	V_{ee}		-5		-12	V
Positive supply current	I_{dd}	No load			160	mA
Negative supply current	I_{ee}	No load			50	mA
Power dissipation	W	No load			2.52	W
General						
Operating temperature	T_o		0		70	°C
Storage temperature	T_s		-40		85	°C
Dimension	L40mm x W40mm x H13mm					
Weight	0.3 lb					

Package information



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