3541C-E05, 10341C-E18
Microwave DFB Laser Transmitters

MICROWAVE

Features

- High dynamic range
- Long distance communications
- 10 MHz to 18 GHz bandwidth
- Built-in optical isolator, 1310 nm
- CE certified

Applications

- Antenna remoting
- Cellular and PCS networks
- Military triband communications
- Tracking, telemetry, and control

The distributed feedback (DFB) laser transmitters provide exceptional performance for linear fiber-optics communications in very wide bandwidth applications. Emcore's linear fiberoptics are an excellent alternative to using coaxial cable systems to transmit 10 MHz to 18 GHz signals. They offer significant improvements in reliability in microwave communication networks by transmitting the RF signal in its original format. As a result of these properties, these microwave DFB laser transmitters provide significant improvements in signal quality for a wide variety of applications, including antenna remoting, timing and reference signal distribution, telemetry, measurement, and delay lines.

Microwave DFB lasers are available in several packaging styles either as a flange-mount for extreme environments or as a plug-in for integration with Emcore's System 10000 rack-mountable chassis and power supplies. Electronics within the flange-mount and plug-in transmitters control the laser temperature and dc bias current and provide warnings whenever the temperature or power deviates from their intended levels, thus providing a self regulating, fully integrated microwave product. These units provide high-quality noise performance in sensitive optical links.

Performance Highlights

	Minimum	Typical	Maximum	Units
Available wavelengths	1290	-	1340	nm
Optical Output Power 1310 nm	-	9	-	dBm
Temperature Range Plug-in Flange Mount	 -10 -40	 - -	 +50 +65	°C
Frequency Range	0.01	-	18.00	GHz

Ordering Information

Option	Connector Pigtail	Package Type	
		Flange	Plug-in
-020	FC/APC Bulkhead Optical Connector	X	X

DC

Pin Number	Min	Typical	Max	Max Ripple	Current
1	14V	15V	16V	100 mV p-p	0.3 A max
2	4.75V	5V	5.5V	200 mV p-p	1.5 A max

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Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min	Max	Units
Operating Temperature Range of Baseplate: Flange-mount Plug-in	T_{OP}	continuous	 -40 -10	 +65 +50	 ˚C ˚C
Delay		-	4	10	ns
Storage Temperature	T_{STG}	-	-40	+85	˚C
ESD	-	HBM: R = 1500 Ohm, C = 100 pF	-500	500	V

Electrical / Optical Characteristics: Optical

Parameter	Specifications
Model Number Flange-mount Tx Plug-in Tx	 3541C-E05 10341C-E18
Wavelength	1310 nm ± 30 nm
Optical Power, Typical @ ITH + 55 mA	9 dBm min
Delay	8 ns
Optical Power Stability vs. Temperature	± 15 %
Transmitter Gain (TG)	-21 dB mW/mA

Connector Options

Parameter	Specifications
Model Number Flange-mount Tx Plug-in Tx	 3541C-E05 10341C-E18
RF Connector Flange Mount Plugin	 SMA (f) k-conn (f)[1]

RF Characteristics

Parameter	Specifications
Model Number Flange-mount Tx Plug-in Tx	 3541C-E05 10341C-E18
Maximum Frequency	18 GHz
Minimum Frequency	10 MHz
Amplitude Flatness[1&2]	5.0 dB p-p
Input Return Loss (50 Ω)	7.5 dB
Input 1 dB Compression	+20 dBm
Input Third Order Intercept [3] 0.01 GHz – 10.0 GHz 10.0 GHz –18.0 GHz	 +30 dBm +25 dBm
Noise Figure (dB) [4] 0.01 GHz – 5.0 GHz 5.0 GHz – 10 GHz 10.0 GHz – 15.0 GHz 15.0 GHz – 18.0 GHz	 41 47 49 53

1: Specifications guaranteed when unit is connected to an optical path with return loss > 35 dB.
2: Peak to peak
3: Two carrier test
4: No RF input

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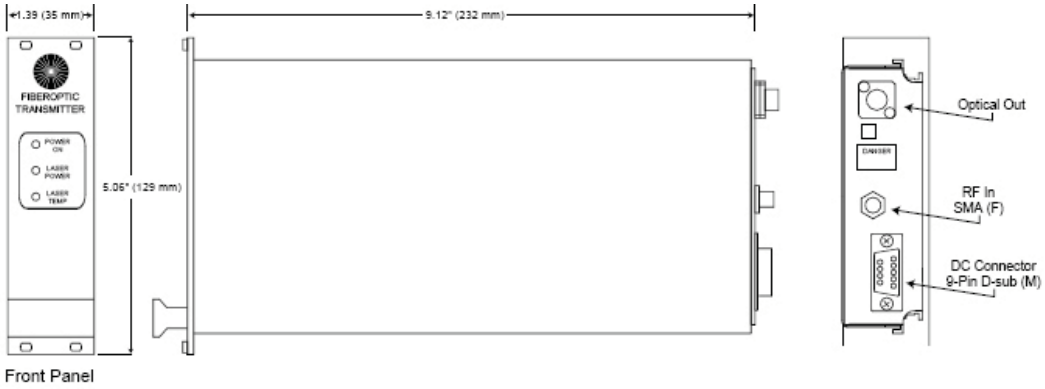
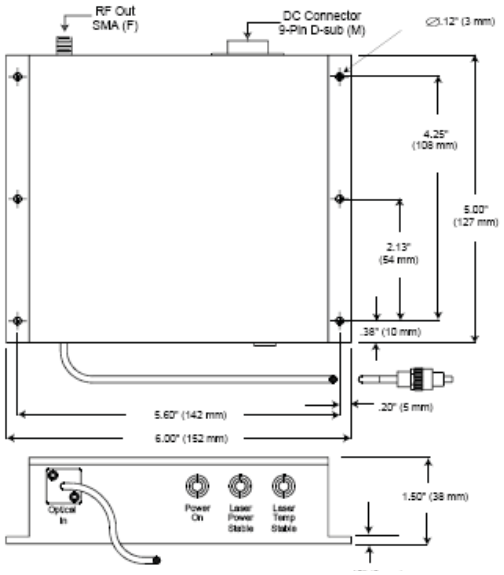
Mechanical Dimensions

10341C-E18 Transmitter



3541C-E05 Transmitter



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Pin Information

Nine-Pin Male D-sub Connector
10341C-E18, 3541C-E05 Transmitters

Pin	Description
1	+15 Vdc
2	+5 Vdc
3	nc
4	Power Ground
5	Reference Ground
6	Photodiode Current Monitor
7	Low Optical Power Alarm[1]
8	Laser Current Monitor
9	Over-temperature Alarm[1]

1: Open collector outputs

Front Panel LEDs

- Power on
- Laser power stable
- Laser temperature stable

dc Monitor Voltages

- Photodiode current, pin 6
  1V/mA ±2% accuracy (into 1 MΩ load
  Proportional to laser output power.
- Laser dc current, pin 8
  1V/100mA ±2% accuracy (into 1 MΩ load).

Alarm Circuits

- The alarms are open-collector outputs capable of providing 20 mA when active and withstanding 15 V when off.
- Low optical power, pin 7
  Sinks current when power is below 90% of set-point.
- Laser temperature, pin 9
  Sinks current when laser internal temperature exceeds ±2°C of setpoint nominally 25°C).

Laser Safety

Class IIIb Laser Product

FDA/CDRH Class IIIb laser product. All versions are Class IIIb laser products per CDHR 1040 Laser Safety Requirements. All versions are class 3B laser products per IEC 60825-1:1993. The device has been classified with the FDA under accession number 220191.

This product complies with 21 CFR 1040.10 and 1040.11.

Single-mode fiber pigtail
Wavelength = 1310 nm
Maximum power = 50 mW

Because of size constraints, laser safety labeling (including an FDA class IIIb label) is not affixed to the module but attached to the outside of the shipping carton.

Product is not shipped with a power supply.

Caution: Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.

Rev: December 9, 2010

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