

# 3541C-E05, 10341C-E18 18 GHz DFB Laser Transmitters



## Applications

- Antenna Remoting
- Cellular and PCS Networks
- Military Triband Communications
- Tracking, Telemetry, and Control

## Features

- High-Dynamic-Range
- Long Distance Communications
- 10 MHz to 18 GHz Bandwidth
- Built-in Optical Isolator, 1310 nm
- CE Certified

The 3541C-E05 and 10341C-E18 Distributed Feedback (DFB) laser transmitters provide exceptional performance for linear fiber optics communications in very wide bandwidth applications. EMCORE's linear fiber optics are excellent alternative to using coaxial cable systems to transmit 10 MHz to 18 GHz signals. They offer significant improvements in reliability in microwave communications 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.

The 3541C-E05 is a flange-mount design for extreme environments and the 10341C-E18 is 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

Parameter	Min	Typ	Max	Units
Available Wavelengths	1290	-	1340	nm
Optical Output Power 1310 nm	-	9	-	dBm
Temperature Range				
Plug-in	-10	-	+50	°C
Flange-Mount	-40	-	+65	°C
Frequency Range	0.01	-	18.00	GHz

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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

## Optical Specifications

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

## RF Characteristics

Parameter	Specifications	Units
Model Number		
Flange-Mount TX	3541C-E05	-
Plug-in TX	10341C-E18	-
Maximum Frequency	18	GHz
Minimum Frequency	10	MHz
Amplitude Flatness <sup>1 &amp; 2</sup>	5.0	dB p-p
Input Return Loss (50 $\Omega$ )	7.5	dB
Input 1 dB Compression	+20	dBm
Input Third Order Intercept <sup>3</sup>		
0.01 GHz - 10.0 GHz	+30	-
10.0 GHz - 13.0 GHz	+25	-
Noise Figure (dB) <sup>4</sup>		
0.01 GHz - 5.0 GHz	41	-
5.0 GHz - 10.0 GHz	47	-
10.0 GHz - 15.0 GHz	49	-
15.0 GHz - 18.0 GHz	53	-

Note 1: Specifications guaranteed when unit is connected to an optical path with return loss > 35 dB.

Note 2: Peak to Peak

Note 3: Two Carrier Test

Note 4: No RF Input

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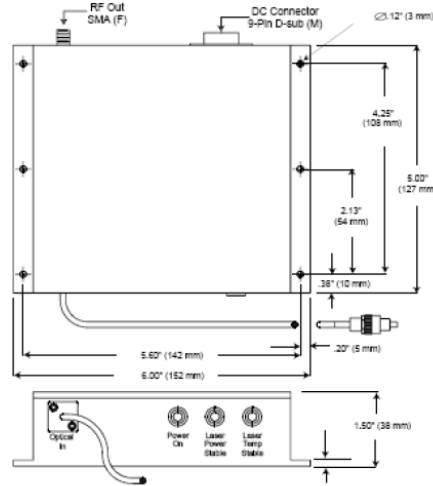
## DC

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

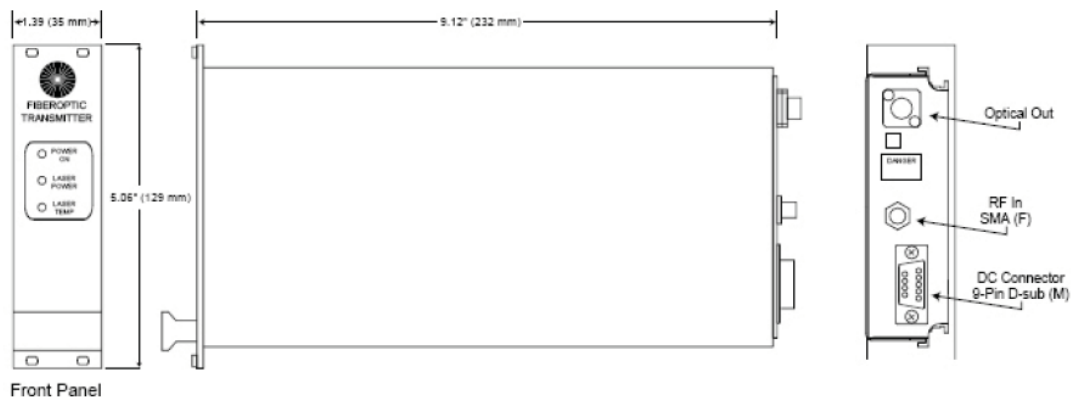
## Connector Options

Parameter	Specifications
	Model Number
Flange-Mount TX	3541C-E05
Plug-in TX	10341C-E18
	RF Connector
Flange-Mount	SMA (f)
Plug-in	k-conn (f)

## 3541C-E05 Transmitter Mechanical Dimensions



## 10341C-E18 Transmitter Mechanical Dimensions



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## Front Panel LEDs

- Power On
- Laser Power Stable
- Laser Temperature Stable

## DC Monitor Voltages

- Photodiode Current, Pin 6  
1 V/mA  $\pm$  2% accuracy (into 1 M $\Omega$  load)  
Proportional to laser output power.
- Laser DC Current, Pin 8  
1 V/100 mA  $\pm$  2% accuracy (into 1 M $\Omega$  load)

## Alarm Circuits

- The alarms are open-collector outputs capable of providing 20 mA when active and with standing 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  $\pm 2^\circ\text{C}$  of set point nominally  $25^\circ\text{C}$

## Pin Information

Pin Number	Description
1	+ 15 VDC
2	+ 5 VDC
3	NC
4	Power Ground
5	Reference Ground
6	Photodiode Current Monitor
7	Low Optical Power Alarm <sup>1</sup>
8	Laser Current Monitor
9	Over-Temperature Alarm <sup>1</sup>

Note 1: Open Collector Outputs

## Ordering Information

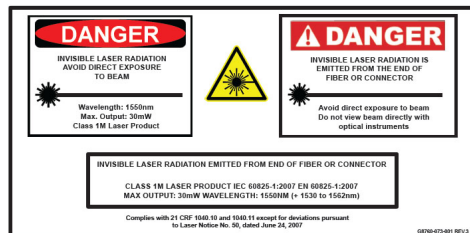
Option	Connector Pigtail	Flange	Plug-in
-020	FC/APC Bulkhead Optical Connector	X	X

## Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser product, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example: eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example: telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5  $\mu\text{m}$ .

Maximum power = 30 mW.



\*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

\*IEC is a registered trademark of the International Electrotechnical Commission.

