

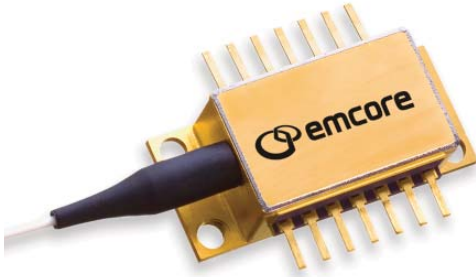
# 1792 ECCW

Narrow Linewidth CW External Cavity Laser Diode



Analog Lasers & Photodiodes

BROADBAND



The 1792 ECCW series external cavity laser is a cost effective solution for a coherent laser source. The laser is fabricated in a 14-pin hermetically sealed butterfly package that incorporates a bias tee circuit, an integrated thermoelectric cooler (TEC), a thermistor, and a back facet monitor photodiode. The 1792 ECCW provides substantially lower phase noise and a longer coherence length than other semiconductor lasers, including DFB lasers. The wavelength stability is assured by design, eliminating the need for wavelength lockers and complex feedback control circuits.

## Features

- Narrow linewidth, < 10 kHz available
- ITU wavelengths across the C-band
- 100 GHz channel spacing
- 10 mW minimum output power
- Industry standard, high reliability, hermetic 14-pin butterfly package
- Excellent long-term wavelength stability eliminates the need for a wavelength locker
- Back-facet monitor
- Designed to meet Telcordia GR-468 qualification standard
- RoHS Compliant

## Applications

- Seismic sensor applications
- Interferometry
- Spectroscopy
- Lidar
- Optical test and instrumentation
- Microwave photonics

## Performance Highlights

Pigtail Type	Optical Power		Linewidth
	Minimum (mW)	Typical (mW)	KHz
SMF	15	20	50
PMF	10	12	50
	15	20	50

See following pages for complete specifications and conditions.

## 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
Storage Temperature	T <sub>STG</sub>	Non-operating	-40	85	°C
Operating Case Temperature	T <sub>OP</sub>	continuous	-20	75	°C
Forward Current	I <sub>OP</sub>	CW	-	300	mA
Reverse Voltage	V <sub>R</sub>	continuous	-	2	V
Photodiode Forward Current	I <sub>MPD,F</sub>	continuous	-	2	mA
Photodiode Reverse Voltage	V <sub>MPD,R</sub>	continuous	-	10	V
TEC Current <sup>2</sup>	I <sub>TEC</sub>	-	-	1.8	A
TEC Voltage	V <sub>TEC</sub>	continuous	-	3.5	V
Fiber Bend Radius	R	continuous	35	-	mm
Tensile Strength, Fiber to Case	F	continuous	-	5	N
Lead Soldering Time <sup>3</sup>	t <sub>SOLD</sub>	<260 °C	-	10	sec
Package Mounting Screw Torque <sup>4</sup>	-	-	-	0.12	m*N
Operating Humidity: Non-Condensing	X <sub>OP</sub>	continuous	5	95	%
Storage Humidity: Non-Condensing	X <sub>OP</sub>	continuous	5	95	%

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## Electrical / Optical Characteristics

Parameter	Symbol	Condition	Min	Type	Max	Units
Minimum Optical Output Power	$P_o$	15mW Option 10mW Option	15 10	20 12	- -	mW
Optical Linewidth <sup>1,2,3,4</sup>	-	Available for all other models	-	25	50	KHz
Threshold Current	$I_{TH}$	-	-	-	30	mA
Laser Bias Current	$T_{OP}$	-	-	-	250	mA
Forward Voltage	$V_f$	CW, $P_o = 10$ mW	-	-	2.0	V
MPD Current	$I_{MON}$	CW, $P_o = 10$ mW	0.05	-	0.5	mA
MPD Tracking Error	TE	$-10^\circ\text{C} < T_c < 65^\circ\text{C}$	-	-	$\pm 0.5$	dB
TEC Set Temperature <sup>5</sup>	$T_s$	Specified for every laser	16	-	35	$^\circ\text{C}$
Center Wavelength (100 GHz ITU Grid)	$\lambda_c$	See ITU Grid Channel Numbering Table				nm
Wavelength Drift with Case (-10 to 65 $^\circ\text{C}$ ) Temperature	$\Delta \lambda_{T_c}$	Relative to 25 $^\circ\text{C}$ Case Temperature	-	-	$\pm 40$	pm
Wavelength Offset from DWDM ITU Grid	$\Delta \lambda_{OFFSET}$	TEC Temperature at $T_s$	-	-	$\pm 80$	pm
Frequency Temperature Coefficient	$\Delta f/\Delta T$	-	-	3.5	5	GHz/ $^\circ\text{C}$
Frequency Current Coefficient	$\Delta f/\Delta I$	-	-	200	250	MHz/mA
Optical Isolation	-	$-10^\circ\text{C} < T_c < 65^\circ\text{C}$	35	-	-	dB
Relative Intensity Noise	RIN	CW, at 200 MHz	-	-155	-	dB/Hz
Side Mode Suppression Ratio	SMSR	CW, $P_o > 1$ mW	40	-	-	dB
Optical Return Loss	ORL	-	40	-	-	dB
TEC Current	$I_{TEC}$	$T_c = 65^\circ\text{C}, T_{OP} = T_s$	-	-	+1.5	A
TEC Voltage	$V_{TEC}$	$T_c = 65^\circ\text{C}, T_{OP} = T_s$	-	-	+3.0	V
TEC Capacity	$\Delta T$	$T_c = 65^\circ\text{C}$	50	-	-	$^\circ\text{C}$
Thermistor Resistance	$R_{TH}$	$T_{OP} = T_s$	9.5	10.0	10.5	K $\Omega$
Thermistor Beta Constant	B	-	-	3891	-	K

## ITU Grid Channel Numbering

Channel	Wavelength (nm)	Channel	Wavelength (nm)
60	1529.55	39	1546.12
59	1530.33	38	1546.92
58	1531.12	37	1547.72
57	1531.90	36	1548.51
56	1532.68	35	1549.32
55	1533.47	34	1550.12
54	1534.25	33	1550.92
53	1535.04	32	1551.72
52	1535.82	31	1552.52
51	1536.61	30	1553.33
50	1537.40	29	1554.13
49	1538.19	28	1554.94
48	1538.98	27	1555.75
47	1539.77	26	1556.56
46	1540.56	25	1557.36
45	1541.35	24	1558.17
44	1542.14	23	1558.98
43	1542.94	22	1559.79
42	1543.73	21	1560.61
41	1544.53	20	1561.42
40	1545.32		

1. CW, at rated power., 2. Lorentzian linewidth measured at -30 dB., 3. Gaussian linewidth measured at -20 dB., 4. Linewidth measured with self-delayed heterodyne method at  $T_s, I_{OP}$ , 5. TEC temperature at the recommended value.

## Ordering Information

**Example: 1792-SMF-043-10-50-FA: ECCW**, SMF fiber pigtail, ITU channel 43, 1542.94 nm, 10 mW minimum output power, 50kHz linewidth, FC/APC optical connector

