

# TLB-3020-C

20 mW Full Band Tunable CW Laser Butterfly

## Full C Band Tunable CW Laser

### Features

- Wide tuning range using highly reliable DFB laser arrays
- Excellent wavelength stability
- CW output power of 20 mW
- Excellent Relative Intensity Noise (RIN): -140 dB/Hz typical
- High Side Mode Suppression Ratio (SMSR): 50 dB typical
- Reduced package size and pin count

### Applications

- LR, LR2 and LH DWDM optical transport
- Large form factor full band tunable transponders

### Benefits

- DFB laser performance
- Simple control loops
- Integrated laser switch IC

*The **TLB-3020-C** is the third generation of compact 20 mW widely tunable transmission lasers built with Santur's own proprietary DFB laser array, MEMs coupling and packaging technology. Santur's technology provides for a highly efficient, small form factor full band tunable butterfly with the lowest power dissipation in the industry.*

*Ideally suited for use in a wide variety of DWDM Metro and LH systems, the Santur **TLB-3020-C** provides the best combination of performance features available, offering a unique combination of optical power, wide tunability, and low power dissipation. The **TLB-3020-C** includes an integrated wavelength locker a stable DFB laser array and an integrated laser switch IC.*

*High-power performance, reliability, ease of control, and economies of scale derived from the exclusive, proven technology, differentiate this product from others in the industry.*



TLB-3020-C-DS

This is a technical data sheet – parameters are subject to change without notice.

## Specifications:

<b>Absolute Maximum Ratings</b>						
<b>#</b>	<b>Parameter</b>	<b>Symbol</b>	<b>Min.</b>	<b>Max.</b>	<b>Unit</b>	<b>Comments</b>
1	Storage temperature	$T_{stg}$	-40	85	C	
2	Laser diode reverse voltage	$V_{R\_max}$		2	V	
3	Laser diode forward current	$I_{f\_max}$		400	mA	
4	Etalon photodiode reverse voltage	$V_{EPD\_max}$		10	V	
5	Etalon photodiode reverse current	$I_{EPD\_max}$		3	mA	
6	Quad detector reverse voltage	$V_{quad\_max}$		5	V	
7	Quad detector reverse current	$I_{quad\_max}$		3	mA	
8	MEMs voltage X	$V_{X\_max}$		210	V	
9	MEMs voltage Y	$V_{Y\_max}$		175	V	
10	MEMs current	$I_{MEMS\_max}$		100	$\mu$ A	
11	Laser TEC current	$I_{OSATEC\_max}$		3	A	
12	Locker TEC current	$I_{WLTEC\_max}$		1.5	A	
13	Lead Soldering			250C, 5sec		
14	Electrostatic discharge (ESD)	$V_{ESD}$		500	V	C=100pF, R=1.5k $\Omega$ , Human Body Model

#	Parameter	Symbol	Test Condition	Min.	Typical	Max.	Unit
1	Fiber-coupled power	$P_{op}$	CW		20		mW
2	Wavelength range	$\lambda_{min}$		1528.77		1563.86	nm
4	Total Tuning Range			35			nm
5	Laser Set Temperature	$T_{set}$		17		52	C
6	Case Temperature	$T_{case}$	TEC Active	-5	-	75	C
7	Power variation over case temp			-0.5		0.5	dBm
8	Laser Forward Current @ rated power	$I_{op}$	-	-	-	350	mA
9	Laser Forward Voltage @ rated power	$V_{op}$	-	-	-	2.5	V
10	Threshold Current	$I_{th}$	-	-	65	-	mA
11	Spectral Width	$\Delta\lambda$	FWHM	-	2	5	MHz
12	Side-mode Suppression Ratio	SMSR	-	40	50	-	dB
13	Relative Intensity Noise	RIN	20 MHz to 10 GHz	-	-143	-135	dB/Hz
14	Extinction Ratio	TE/TM	-	20	-	-	dB
15	Optical Isolation	ISO	-	30	35	-	dB
16	MEMS X Voltage	$V_{xp}, V_{xn}$	-	-	-	205	V
17	MEMS Y Voltage	$V_{yp}, V_{yn}$	-	-	-	170	V
18	MEMS X snapdown Voltage*	$V_{x snap}$	-	$ V_{x cal}  + 10$	-	-	V
19	Laser TEC Current	$I_{TEC}$	-	-	-	2.1	A
20	Laser TEC Voltage	$V_{TEC}$	-	-	-	2.5	V
21	Laser Thermistor Resistance	$R_{TH}$	@ 25 C	9.5	10	10.5	k $\Omega$
22	Laser Thermistor Beta	$\beta$		3800		4000	K
23	Locker TEC Current	$I_{TEC}$	-	-	-	0.8	A
24	Locker TEC Voltage	$V_{TEC}$	-	-	-	1.3	V
25	Locker Thermistor Resistance	$R_{TH}$	@ 25 C	9.5	10	10.5	k $\Omega$
26	Locker Thermistor Beta	$\beta$		3800		4000	K
27	Etalon max/min ratio			3		8	
28	Total quad detector photocurrent	$I_{quad}$			0.6		mA
29	Peak etalon photodiode photocurrent	$I_{EPD}$			0.04		mA
30	Power Dissipation	$P_{dis}$	70 C			4.0	W
			75 C			4.8	W

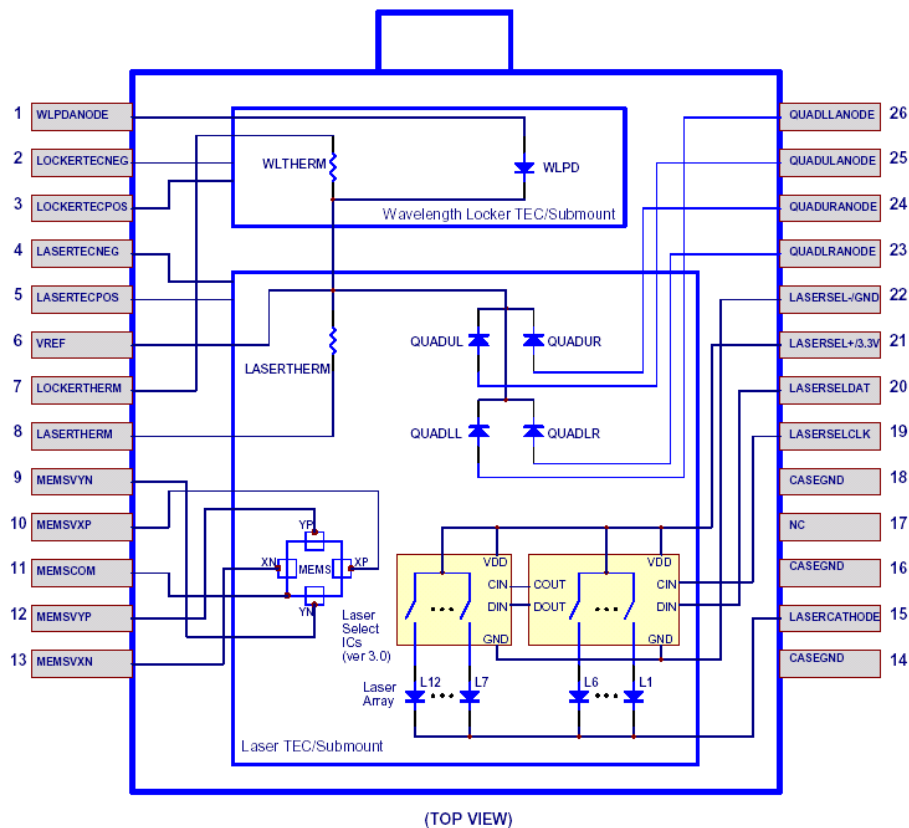
#	Parameter	Symbol	Test Condition	Min.	Typical	Max.	Unit
31	Change of emission frequency with chip temperature			-15		-10	GHz/C
32	Change of emission frequency with laser bias current			-1.5		0	GHz/mA
33	Etalon photodiode linearity	$\Delta I_{EPD}/\Delta P_{op}$		-5		+5	%
34	Etalon photodiode dark current		$V_{EPD}=5V,$ $T_{laser}=25C$			10	nA
35	Quad photodiode dark current		$V_{quad}=5V,$ $T_{laser}=25C$			25	nA
36	Etalon photodiode capacitance		$V_{EPD}=5V,$ $f=1MHz,$ $T_{laser}=25C$		90		pF
37	Quad photodiode capacitance		$V_{quad}=5V,$ $f=1MHz,$ $T_{laser}=25C$		50		pF
38	Frequency capture range			+/-20			GHz
39	Thermal crosstalk	$\alpha$		0	0.02	0.06	

## Fiber Pigtail

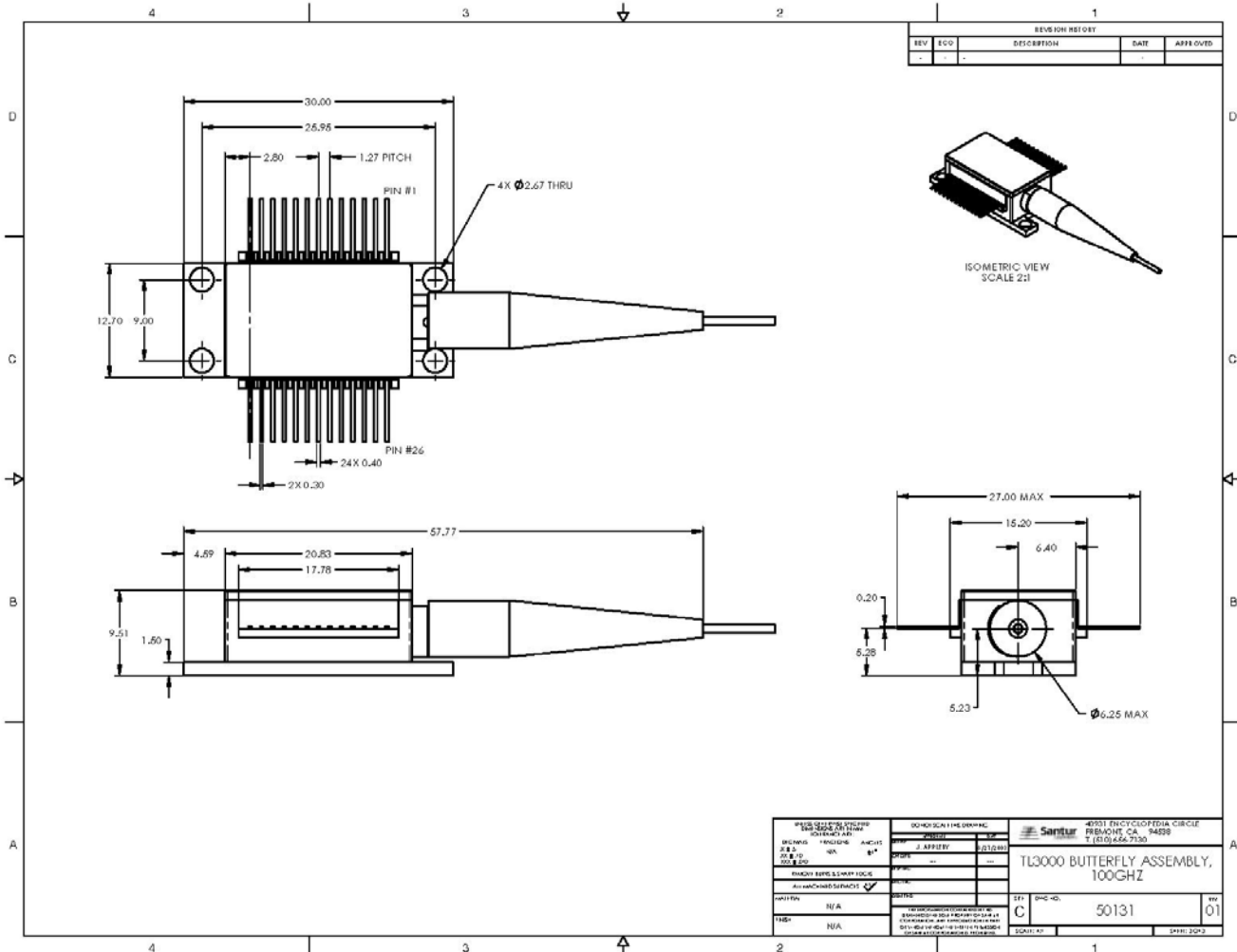
#	Parameter	Notes	Min	Max	Unit
1	Fiber type	Fujikura Panda PM			
2	Connector type	FC/UPC			
3	Pigtail length		0.8	2.1	m
4	Jacket diameter	900 $\mu$ m			
5	Mode field diameter		9.5	10.5	$\mu$ m
6	Cladding diameter		122	128	$\mu$ m
7	Bending radius		15		mm
8	Fiber proof strength		100		Kpsi
9	Polarization alignment	Parallel to slow axis			

## Pin Assignment

Pin	Description	Pin	Description
1	Locker PD anode	14	Case Ground
2	Locker TEC (-)	15	Laser Cathode
3	Locker TEC (+)	16	Case Ground
4	Laser TEC (-)	17	NC
5	Laser TEC (+)	18	Case Ground
6	Locker PD cathode/Quad Cathode/ Locker / Laser Thermistors (-)	19	Laser Select CLK
7	Locker Thermistor (+)	20	Laser Select serial DATA input
8	Laser Thermistor (+)	21	Laser Select (+)
9	MEMs $V_{yn}$	22	Laser Select (-)
10	MEMs $V_{xp}$	23	Quad LR Anode
11	MEMs Ground	24	Quad UR Anode
12	MEMs $V_{yp}$	25	Quad UL Anode
13	MEMs $V_{xn}$	26	Quad LL Anode



# Mechanical Outline





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This is an OEM product that does not comply with the requirements of 21 CFR Subchapter 1 as applicable. It is the responsibility of the user to report the end product and to certify that it meets all applicable requirements.



**DANGER:** Fiber output is >10 mWatt at 1555 nm.  
Do not look into fiber end.

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