
HL1553

1.55 μm Laser Diode with EA Modulator

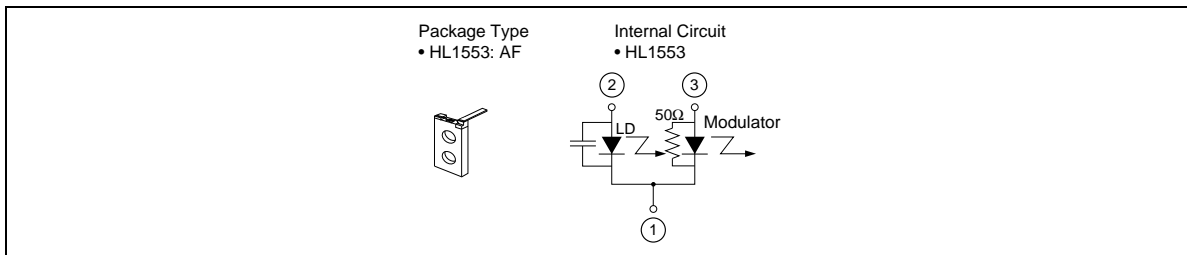
HITACHI

Description

The HL1553 is a 1.55 μm InGaAsP distributed-feedback laser diode (DFB-LD) with a multi-quantum well (MQW) structure. An electroabsorption (EA) modulator is integrated with the laser diode. It is suitable as a light source for high-bit-rate, long haul fiberoptic communication systems, such as 2.5 Gbps external modulation systems.

Features

- Long wavelength output: $\lambda_p = 1556 \text{ nm Typ.}$
- High extinction ratio: 13 dB Min. at $V_{R(EA)} = -2 \text{ V}$
- Fast pulse response: $t_r/t_f \leq 125 \text{ ps}$
- Dynamic single longitudinal mode: $S_r = 40 \text{ dB Typ.}$
- Package: open air package (chip on carrier) with micro strip-line



HL1553

Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$)

Item	Symbol	Value	Unit
LD forward current	I_F	100	mA
Optical output power ¹	P_o	1.5	mW
Laser diode reverse voltage	$V_{R(LD)}$	2	V
Modulator reverse voltage	$V_{R(EA)}$	-5	V
Operating Temperature	T_{opr}	10 to 40	$^\circ\text{C}$
Storage temperature	T_{stg}	0 to 60	$^\circ\text{C}$

Note: 1. $T_c = 40^\circ\text{C}$; Life time of the HL1553 is determined under the conditions at $T_c = 40^\circ\text{C}$, $P_o = 1.5$ mW ($V_{R(EA)} = 0$).

Optical and Electrical Characteristics ($T_c = 25^\circ\text{C}$)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current	I_{th}	—	20	40	mA	
Optical output power	P_o	3.0	—	—	mW	Kink free, $V_{R(EA)} = 0$ V
Slope efficiency	η_s	0.04	—	—	mW/mA	$I_{F(LD)} \leq 70$ mA, $V_{R(EA)} = 0$ V
Extinction ratio	ER	13	—	—	dB	$I_{F(LD)} = 70$ mA, $V_{R(EA)} = 0/-2$ V
Lasing wavelength	λ_p	1545	1556	1565	nm	2.5 Gbps (NRZ)
Side-mode suppression ratio	Sr	30	40	—	dB	2.5 Gbps (NRZ)
Beam divergence (parallel)	$\theta_{//}$	—	30	—	deg.	$P_o = 3$ mW, FWHM
Beam divergence (perpendicular)	θ_{\perp}	—	40	—	deg.	$P_o = 3$ mW, FWHM
Rise time	t_r	—	—	125	ps	2.5 Gbps (NRZ)
Fall time	t_r	—	—	125	ps	2.5 Gbps (NRZ)
Cutoff frequency	S_{21}	4	—	—	GHz	$I_{F(LD)} = 70$ mA, $V_{R(EA)} = -1$ V
RF return loss	S_{11}	10	—	—	dB	$I_{F(LD)} = 70$ mA, $V_{R(EA)} = -1$ V, $f \geq 3$ GHz

Typical Characteristics Curves

