

Description

The HL1341A/AC/MF/BF/DL are 1.3 μm InGaAsP distributed feedback (DFB) laser diodes with a double heterostructure. They are suitable as light sources for high-bit-rate long distance optical fiber communication systems and various other types of optical equipment.

Features

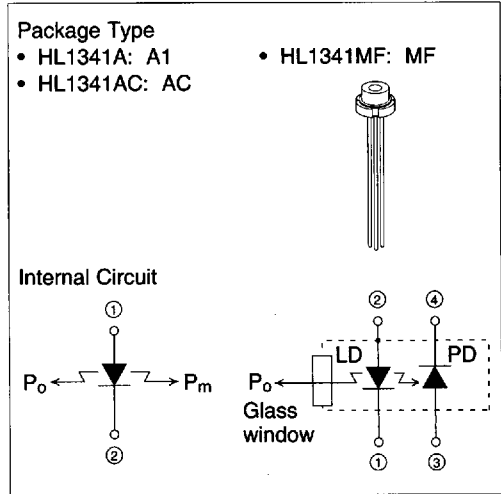
- Long wavelength oscillation:
 $\lambda_p = 1290$ to 1330 nm
- Room temperature 5 mW CW operation (A/AC/MF)
- High output:
 $P_f = 1.0$ mW (CW, pulse operation) (BF/DL)
- Dynamic single mode to side mode ratio $Sr = 35$ dB (typ)
- Built-in monitor photo diode (MF/BF/DL)
- High speed pulse response:
 $t_r, t_f \leq 0.5$ ns (A/AC/MF)

Fiber Specifications (BF, DL only)

Mode field diameter: 10.0 ± 1.0 μm
 Cutoff wavelength: 1.10 to 1.20 μm
 Core diameter: 10 μm
 External diameter: 125 μm
 Jacket diameter: 900 μm
 Fiber length: More than 500 mm

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

Item		Symbol	Rated Value	Unit
Optical output power	HL1341A/AC/MF	P_O	5	mW
Fiber optical output power	HL1341BF/DL	P_f	1.0	mW
LD reverse voltage		V_R (LD)	2	V
PD reverse voltage	HL1341MF/BF/DL	V_R (PD)	15	V
PD forward current		I_F (PD)	1	mA
Cooler current	HL1341BF/DL	I_C	1.4	A
Operating temperature		T_{opr}	0 to +60	$^\circ\text{C}$
Storage temperature	HL1341A/AC	T_{stg}	0 to +80	$^\circ\text{C}$
	HL1341MF		-40 to +80	
	HL1341BF/DL		-40 to +70	



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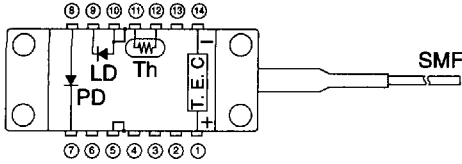
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HL1341A/AC/MF/BF/DL

Pin Connections (Bottom view)

• HL1341BF

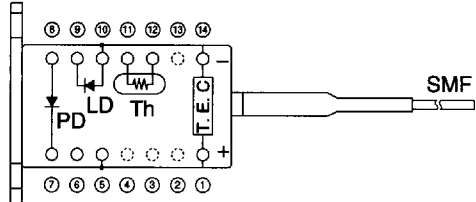


LD: Laser diode
 PD: Photodiode
 Th: Thermistor
 T. E. C.: T. E. cooler
 SMF: Single-mode fiber

- ① T.E.C. anode
- ② N. C.
- ③ N. C.
- ④ N. C.
- ⑤ Case
- ⑥ N. C.
- ⑦ PD cathode
- ⑧ PD anode
- ⑨ LD cathode
- ⑩ LD anode (case)
- ⑪ Thermistor
- ⑫ Thermistor
- ⑬ N. C.
- ⑭ T. E. C. cathode

Package Type
 • HL1341BF: BF

• HL1341DL



LD: Laser diode
 PD: Photodiode
 Th: Thermistor
 T. E. C.: T. E. cooler
 SMF: Single-mode fiber

- ① T.E.C. anode
- ② —
- ③ —
- ④ —
- ⑤ Case
- ⑥ N. C.
- ⑦ PD cathode
- ⑧ PD anode
- ⑨ LD cathode
- ⑩ LD anode (case)
- ⑪ Thermistor
- ⑫ Thermistor
- ⑬ —
- ⑭ T. E. C. cathode

Package Type
 • HL1341DL: DL

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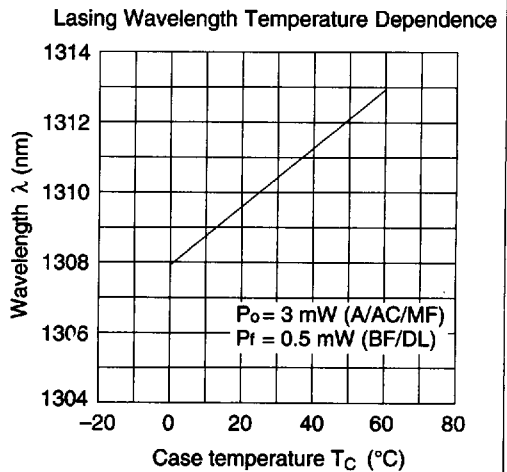
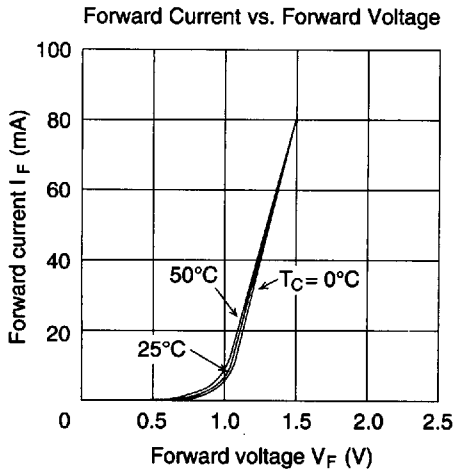
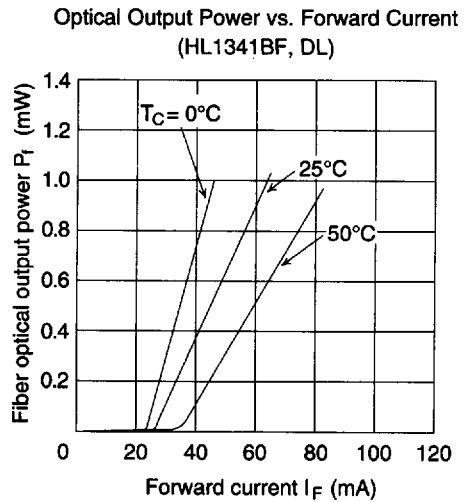
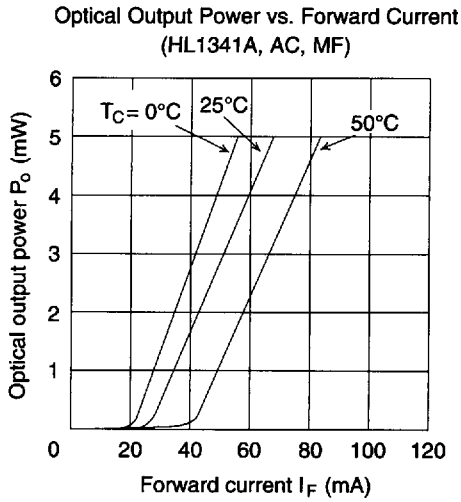
Optical and Electrical Characteristics ($T_C = 25^\circ\text{C}$)

Item		Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current		I_{th}	—	25	50	mA	
Optical output power	HL1341A/AC/MF	P_O	5	—	—	mW	Kink free
			2.5	—	—		$I_F = I_{th} + 20 \text{ mA}$
Fiber optical output power	HL1341BF/DL	P_f	1	—	—	mW	Kink free
			0.5	—	—		$I_F = I_{th} + 20 \text{ mA}$
Monitor output	HL1341A/AC	P_m	1	—	—	mW	$I_F = I_{th} + 20 \text{ mA}$
Lasing Wave-length	HL1341A/AC/MF	λ_p	1290	1310	1330	nm	$P_O = 3 \text{ mW}$
	HL1341BF/DL		1290	1310	1330		$P_f = 0.5 \text{ mW}$
Side mode suppression ratio	HL1341A/AC/MF	S_r	30	35	—	dB	$P_O = 3 \text{ mW}$
	HL1341BF/DL		30	35	—		$P_f = 0.5 \text{ mW}$
Beam divergence (parallel)	HL1341A/AC/MF	$\theta_{//}$	—	30	—	deg.	$P_O = 3 \text{ mW}$, FWHM
Beam divergence (perpendicular)	HL1341A/AC/MF	θ_{\perp}	—	40	—	deg.	$P_O = 3 \text{ mW}$, FWHM
Rise time		t_r	—	—	0.5	ns	$I_{bias} = I_{th}$ 10 to 90 %
Fall time		t_f	—	—	0.5	ns	$I_{bias} = I_{th}$ 90 to 10 %
PD dark current	HL1341MF/BF/DL	I_{DARK}	—	—	350	nA	$V_R (PD) = 5 \text{ V}$
Monitor current	HL1341MF	I_S	50	—	—	μA	$V_R (PD) = 5 \text{ V}$, $P_O = 3 \text{ mW}$
	HL1341BF/DL		50	—	—		$V_R (PD) = 5 \text{ V}$, $P_f = 0.5 \text{ mW}$
PD capacitance	HL1341MF/BF/DL	C_t	—	10	20	pF	$V_R (PD) = 5 \text{ V}$, $f = 1 \text{ MHz}$
Photosensitivity saturation bias voltage	HL1341MF/BF/DL	$V_{R(S)}$	—	—	2	V	
Cooling capacity	HL1341BF/DL	ΔT	40	—	—	$^\circ\text{C}$	$P_f = 0.5 \text{ mW}$, $T_C = 60^\circ\text{C}$
Cooler current		I_C	—	—	1.4	A	$\Delta T = 40^\circ\text{C}$
Cooler voltage		V_C	—	—	1.8	V	$\Delta T = 40^\circ\text{C}$
Thermistor resistance		R_{TM}	—	10	—	k Ω	

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HL1341A/AC/MF/BF/DL

Typical Characteristic Curves



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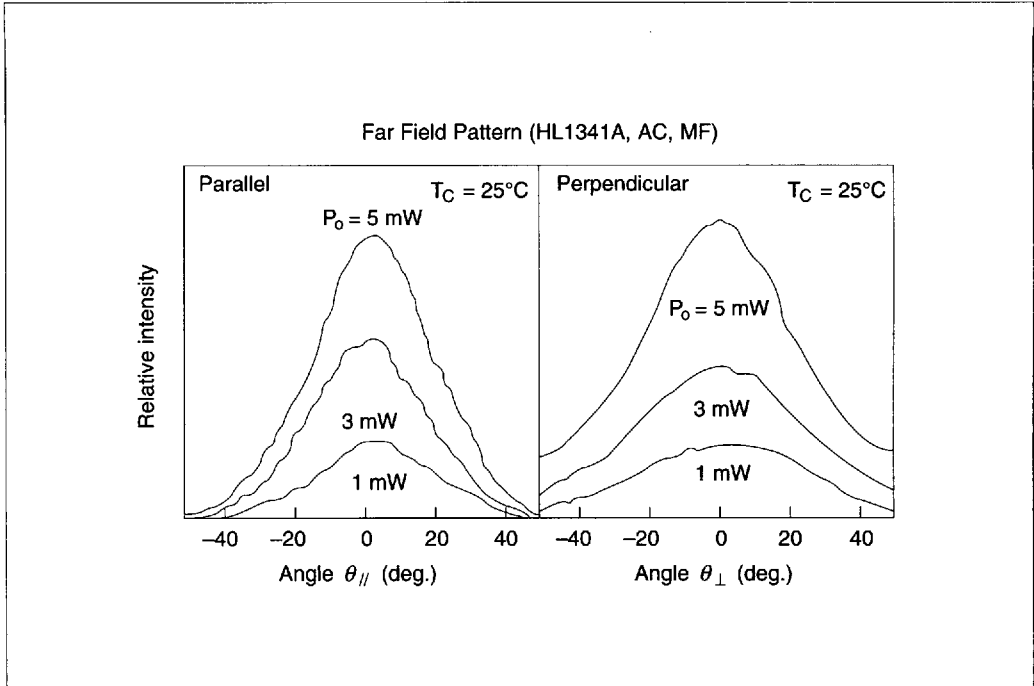
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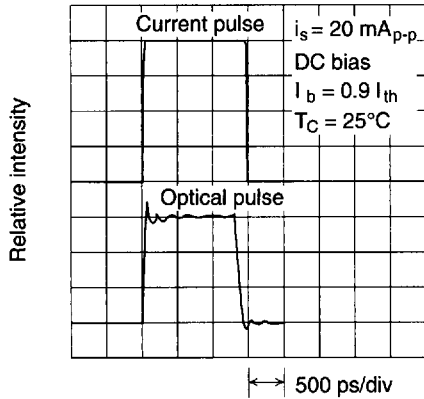
Typical Characteristic Curves (cont.)



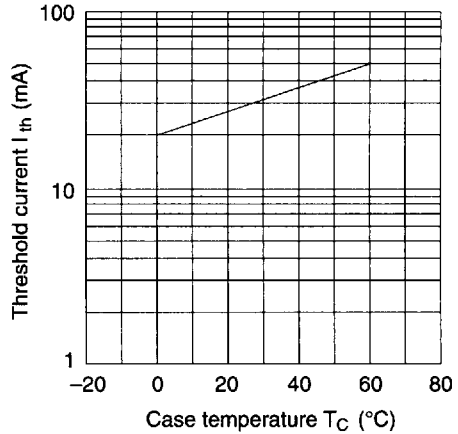
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Typical Characteristic Curves (cont.)

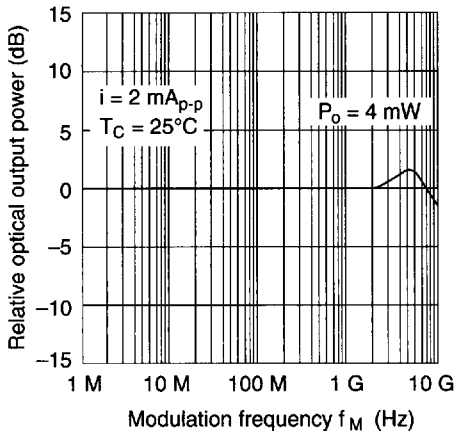
Pulse Response Characteristics (LD)



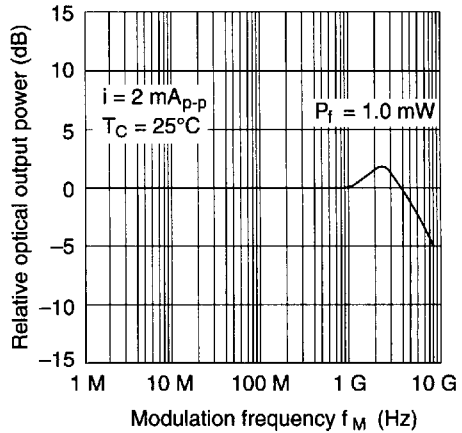
Threshold Current vs. Case Temperature



Frequency Response Characteristics (HL1341A, AC, MF)

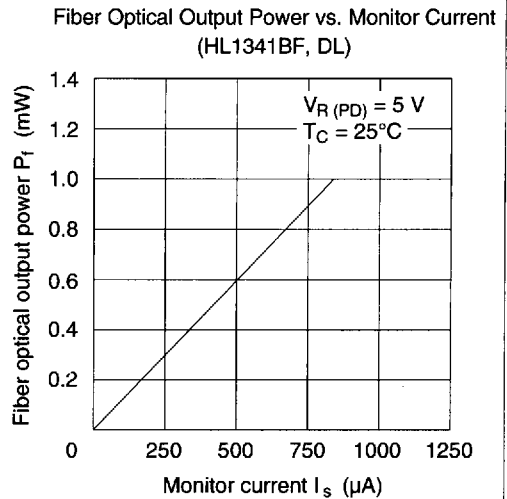
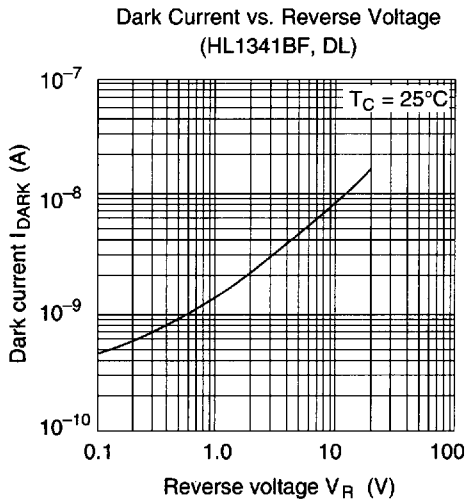
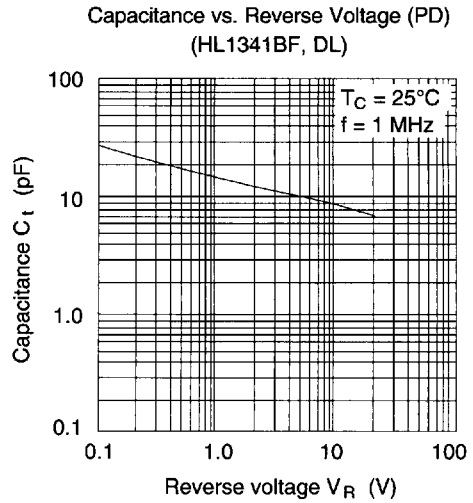
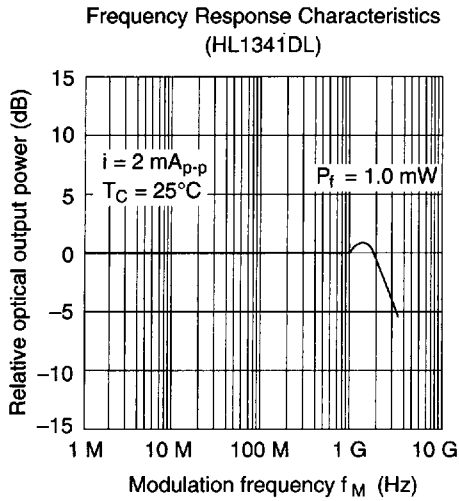


Frequency Response Characteristics (HL1341BF)



HL1341A/AC/MF/BF/DL

Typical Characteristic Curves (cont.)



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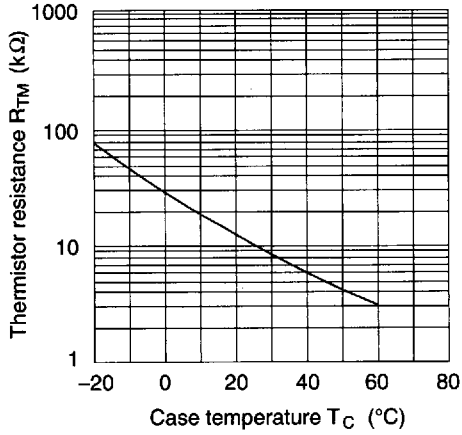
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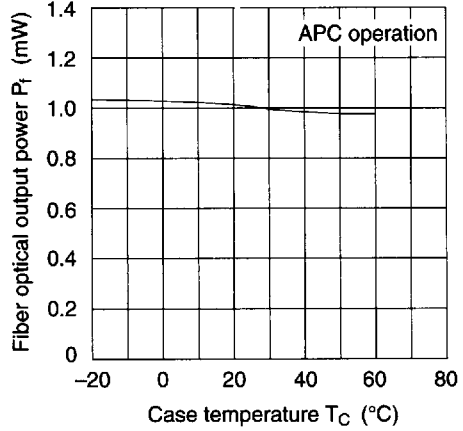
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Typical Characteristic Curves (cont.)

Thermistor Resistance vs. Case Temperature
(HL1341BF, DL)



Tracking Characteristics
(HL1341BF, DL)



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