

MITSUBISHI LASER DIODES

# ML7xx16 SERIES

2.5Gbps InGaAsP DFB LASER DIODE

**TYPE  
NAME**

## ML725B16F/ML720J16S/ML725J16F

### DESCRIPTION

ML7xx16 series are uncooled DFB (Distributed Feedback) laser diodes for 2.5Gbps transmission emitting light beam at 1310nm.  $\lambda/4$  shifted grating structure is employed to obtain excellent SMSR performance under 2.5Gbps modulation. Furthermore, ML7xx16 can operate in the wide temperature range from  $-20^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  without any temperature control.

### FEATURES

- $\lambda/4$  phase shifted grating structure
- Wide temperature range operation ( $-20^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ )
- High side-mode-suppression-ratio (typical 45dB)
- High resonance frequency (typical 11GHz)

### APPLICATION

2.5Gbps transmission

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
Po	Output power	CW	6	mW
IF	Laser forward current	-	200	mA
VRL	Laser reverse voltage	-	2	V
IRD	PD forward current	-	2	mA
VRD	PD reverse voltage	-	20	V
Tc	Operation temperature	-	-20 ~+85	$^{\circ}\text{C}$
Tstg	Storage temperature	-	-40 ~+100	$^{\circ}\text{C}$

### ELECTRICAL/OPTICAL CHARACTERISTICS (Tc=25°C)

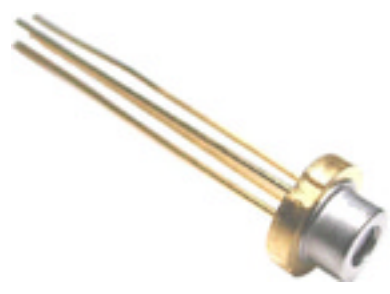
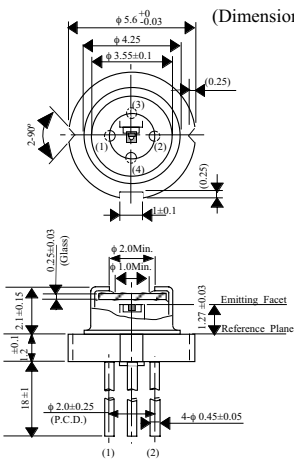
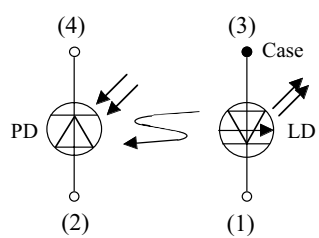
Symbol	Parameter	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Ith	Threshold current	CW	-	10	15	mA
		CW, Tc=85°C	-	35	50	mA
Iop	Operation current	CW, Po=5mW	-	30	40	mA
		CW, Po=5mW, Tc=85°C	-	75	100	mA
Vop	Operating voltage	CW, Po=5mW	-	1.1	1.8	V
$\eta$	Slope efficiency	CW, Po=5mW	0.18	0.25	-	mW/mA
$\lambda_p$	Peak wavelength	CW, Po=5mW, Tc=-20°C~+85°C	1290	1310	1330	nm
SMSR	Side mode suppression ratio	CW, Po=5mW, Tc=-20°C~+85°C	35	45	-	dB
$\theta_{//}$	Beam divergence angle (parallel)	CW, Po=5mW	-	25	40	deg.
$\theta_{\perp}$	(perpendicular)	CW, Po=5mW	-	30	47	deg.
fr	Resonance frequency	2.48832Gbps, I <sub>bias</sub> =I <sub>th</sub> , I <sub>pp</sub> =40mA	-	11	-	GHz
tr,tf	Rise and fall time(10%-90%)	2.48832Gbps, I <sub>bias</sub> =I <sub>th</sub> , I <sub>pp</sub> =40mA not including package	-	100	150	psec
Im	Monitoring current (PD)	CW, Po=5mW, VRD=1V	0.1	-	2.0	mA
Id	Dark current (PD)	VRD=5V	-	-	0.1	$\mu\text{A}$
Ct	Capacitance (PD)	VRD=5V, f=1MHz	-	10	20	pF

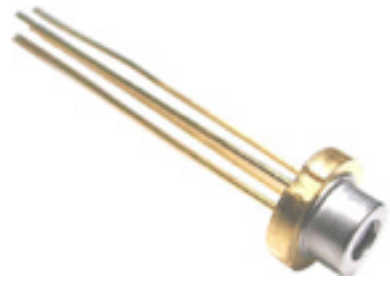
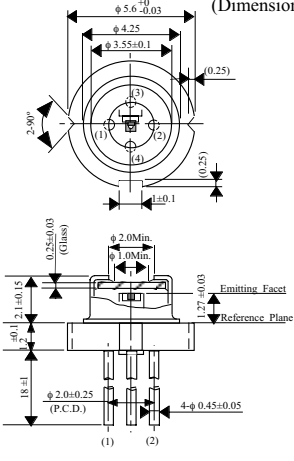
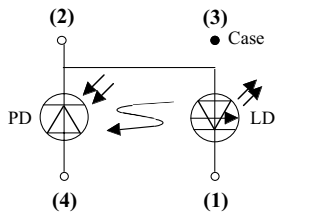


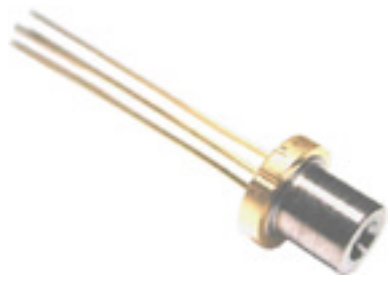
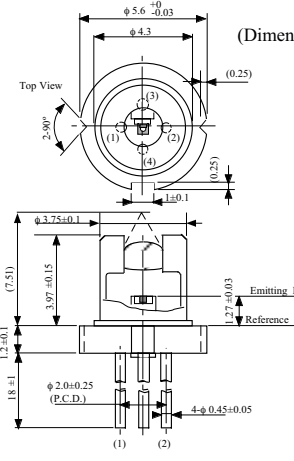
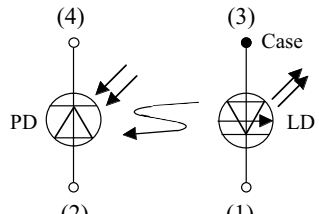
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OUTLINE DRAWINGS

<p><b>ML725B16F</b></p> 	<p>(Dimension:mm)</p>  <p>Top View Dimensions:  <math>\phi 5.6^{+0}_{-0.03}</math>  <math>\phi 4.25</math>  <math>\phi 3.55 \pm 0.1</math>  <math>1 \pm 0.1</math>  <math>0.25</math>  <math>2 \times 90^\circ</math>  <math>0.25</math>  <math>0.25 \pm 0.03</math> (Glass)  <math>\phi 2.0 \text{ Min.}</math>  <math>\phi 1.0 \text{ Min.}</math>  <math>0.25 \pm 0.03</math>  <math>18 \pm 1</math>  <math>\phi 2.0 \pm 0.25</math> (P.C.D.)  <math>4 \phi 0.45 \pm 0.05</math></p> <p>Side View Labels:      Emitting Facet      Reference Plane</p>	 <p>ML725B16F</p>
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<p><b>ML720J16S</b></p> 	<p>(Dimension:mm)</p>  <p>Top View Dimensions:  <math>\phi 5.6^{+0}_{-0.03}</math>  <math>\phi 4.25</math>  <math>\phi 3.55 \pm 0.1</math>  <math>1 \pm 0.1</math>  <math>0.25</math>  <math>2 \times 90^\circ</math>  <math>0.25</math>  <math>0.25 \pm 0.03</math> (Glass)  <math>\phi 2.0 \text{ Min.}</math>  <math>\phi 1.0 \text{ Min.}</math>  <math>0.25 \pm 0.03</math>  <math>18 \pm 1</math>  <math>\phi 2.0 \pm 0.25</math> (P.C.D.)  <math>4 \phi 0.45 \pm 0.05</math></p> <p>Side View Labels:      Emitting Facet      Reference Plane</p>	 <p>ML720J16S</p>
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<p><b>ML725J16F</b></p> 	<p>(Dimension:mm)</p>  <p>Top View Dimensions:  <math>\phi 5.6^{+0}_{-0.03}</math>  <math>\phi 4.3</math>  <math>1 \pm 0.1</math>  <math>0.25</math>  <math>2 \times 90^\circ</math>  <math>0.25</math>  <math>0.25 \pm 0.03</math> (Glass)  <math>\phi 2.0 \text{ Min.}</math>  <math>\phi 1.0 \text{ Min.}</math>  <math>0.25 \pm 0.03</math>  <math>1.2 \pm 0.1</math>  <math>3.97 \pm 0.15</math>  <math>18 \pm 1</math>  <math>\phi 2.0 \pm 0.25</math> (P.C.D.)  <math>4 \phi 0.45 \pm 0.05</math></p> <p>Side View Labels:      Emitting Facet      Reference Plane</p>	 <p>ML725J16F</p>
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TYPICAL CHARACTERISTICS

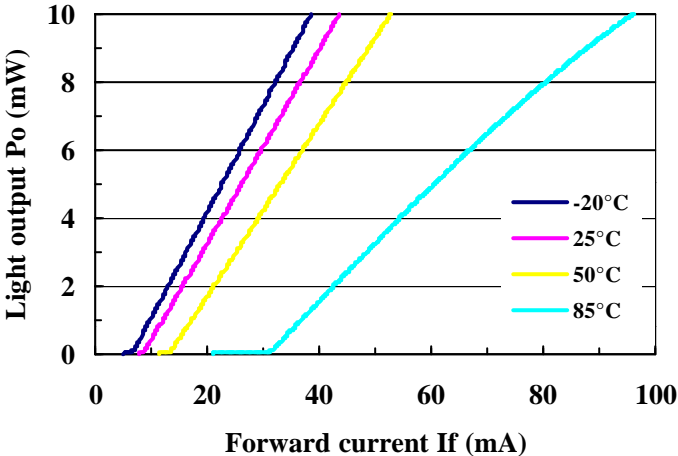


Fig. 1 Light output v.s. forward current

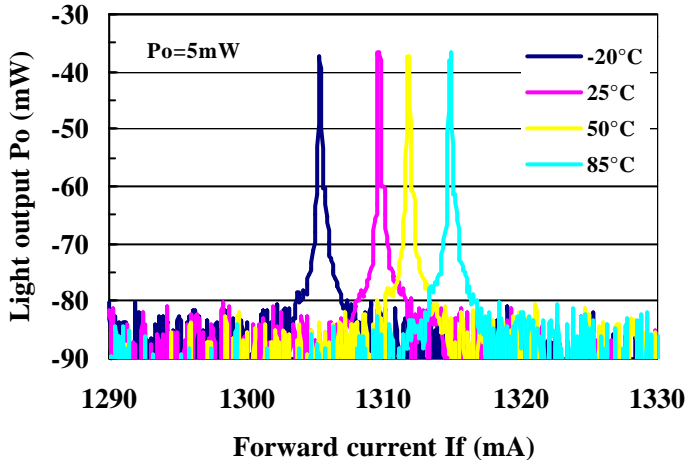


Fig. 2 Spectrum

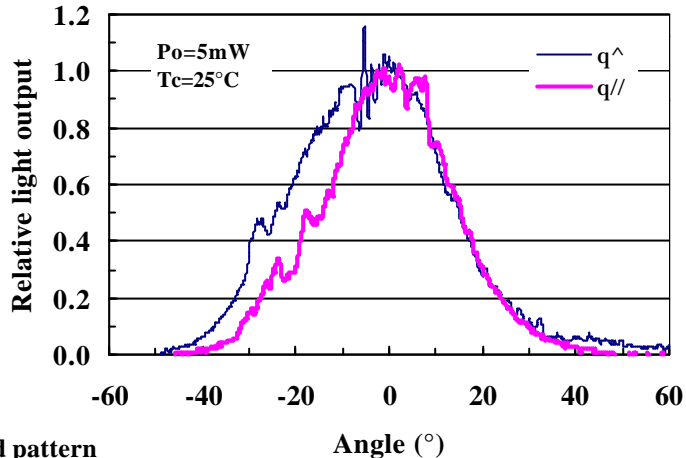


Fig. 3 Far field pattern