

TSD-9A20-704

Implant VCSEL Emitter(940nm)

ELECTRO-OPTICAL CHARACTERISTICS :

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	CONDITIONS
Threshold Current	I_{th}		2	4.4	mA	
Output Power	P_o	3.5	4.5	5.5	mW	$I_F=9mA$
Slope Efficiency	η		0.60		mW/mA	
Forward Voltage	V_F	1.75	2.0	2.25	V	$I_F=9mA$
Series Resistance	R_s		50	70	Ω	
Wavelength	λ_P	930	940	955	nm	$I_F=9mA$
Beam Divergence	θ		15		degree	$I_F=9mA (1/e^2)$

Notes:

All parameters except mentioned are measured at 25°C, CW operation.

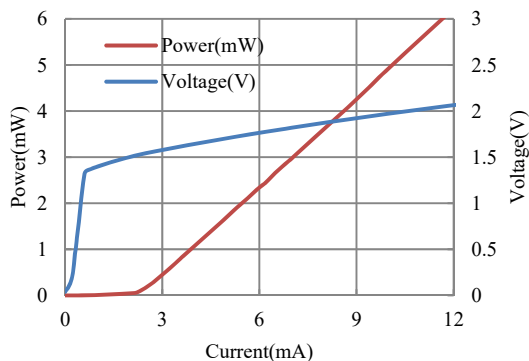
THERMAL CHARACTERISTICS :

PARAMETERS	MIN	TYP	MAX	UNIT	CONDITIONS
P_o Temperature Coefficient		-1.0		%/°C	$T_a=0\sim70^\circ C / I_F=9mA$
V_F Temperature Coefficient		-2.5		mV/°C	$T_a=0\sim70^\circ C / I_F=9mA$
λ_P Temperature Coefficient		0.065		nm/°C	$T_a=0\sim70^\circ C / I_F=9mA$

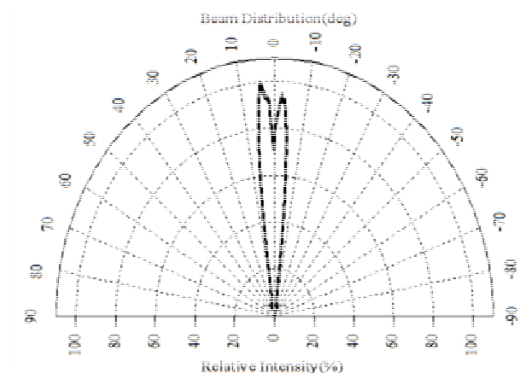
ABSOLUTE MAXIMUM RATINGS :

PARAMETERS	MIN	MAX	UNIT	CONDITIONS
Storage Temperature	-40	125	°C	
Operating Temperature	-20	70	°C	
Continuous Forward Current		12	mA	
Reverse Voltage		5	V	

ELECTRO-OPTICAL CHARACTERIZATION :



Typical electro / optical characteristics curves
measured at 25°C, CW operation



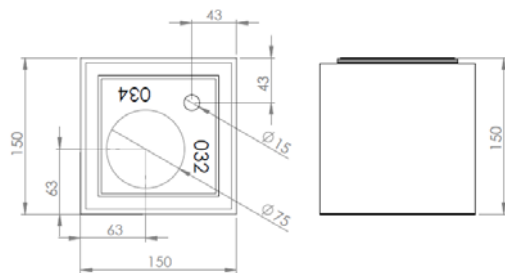
Beam profile measured at 25°C, 9mA CW
operation

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OUTLINE DIAGRAM :

- Chip length : $150\ \mu\text{m} \pm 10\ \mu\text{m}$
- Chip width : $150\ \mu\text{m} \pm 10\ \mu\text{m}$
- Chip thickness : $150 \pm 15\ \mu\text{m}$
- Anode bond pad : $\Phi 75\mu\text{m} \pm 2\ \mu\text{m}$



Note :

The VCSEL bare die is class 1 laser with safety standard IEC/EN 60825:2014.



CLASS 1 LASER PRODUDUCT
CONSUMER LASER PRODUCT
EN50689 : 2021