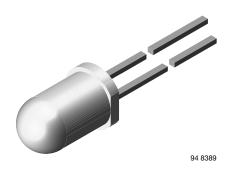


High Power Infrared Emitting Diode, 940 nm, GaAlAs, MQW



DESCRIPTION

TSAL6100UL is an infrared, 940 nm emitting diode in GaAlAs multi quantum well (MQW) technology with high radiant power and high speed molded in a blue-gray plastic package. It is certified according to UL217 standard for smoke alarms.

FEATURES

- Package type: leaded
- Package form: T-1¾
- Dimensions (in mm): Ø 5
- Peak wavelength: $\lambda_p = 940 \text{ nm}$
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 10^{\circ}$
- UL217 recognized
- Low forward voltage
- Suitable for high pulse current operation
- · Good spectral matching with Si photodetectors
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

• IR source for smoke detectors

PRODUCT SUMMARY					
COMPONENT	l _e (mW/sr)	φ (deg) λ _p (nm)		t _r (ns)	
TSAL6100UL	170	± 10	940	15	

Note

• Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TSAL6100UL	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾	

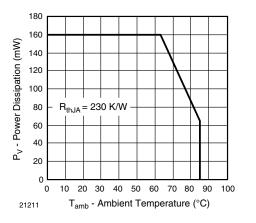
Note

• MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V _R	5	V
Forward current		I _F	100	mA
Peak forward current	t _p /T = 0.5, t _p = 100 μs	I _{FM}	200	mA
Surge forward current	t _p = 100 μs	I _{FSM}	1.5	A
Power dissipation		Pv	160	mW
Junction temperature		Тj	100	°C
Operating temperature range		T _{amb}	-40 to +85	°C
Storage temperature range		T _{stg}	-40 to +100	°C
Soldering temperature	$t \le 5$ s, 2 mm from case	T _{sd}	260	°C
Thermal resistance junction / ambient	J-STD-051, leads 7 mm soldered on PCB	R _{thJA}	230	K/W

1 For technical questions, contact: <u>emittertechsupport@vishay.com</u> Document Number: 84388

e3 RoHS compliant HALOGEN FREE GREEN (5-2008)



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Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

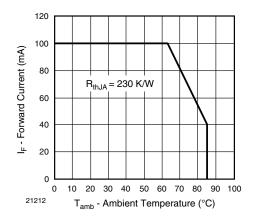


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	l _F = 100 mA, t _p = 20 ms	V _F	-	1.35	1.6	V
	$I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$	V _F	-	2.2	-	V
Temperature coefficient of V_F	I _F = 1 mA	TK _{VF}	-	-1.8	-	mV/K
Reverse current	V _R = 5 V	I _R	-	-	10	μA
Junction capacitance	V _R = 0 V, f = 1 MHz, E = 0	Cj	-	40	-	pF
Radiant intensity	l _F = 100 mA, t _p = 20 ms	l _e	80	170	400	mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$	l _e	-	1450	-	mW/sr
Radiant power	I _F = 100 mA, t _p = 20 ms	φ _e	-	40	-	mW
Temperature coefficient of ϕ_{e}	I _F = 20 mA	TKø _e	-	-0.6	-	%/K
Angle of half intensity		φ	-	± 10	-	deg
Peak wavelength	I _F = 100 mA	λρ	-	940	-	nm
Spectral bandwidth	I _F = 100 mA	Δλ	-	30	-	nm
Temperature coefficient of λ_p	I _F = 100 mA	ΤΚλρ	-	0.2	-	nm/K
Rise time	I _F = 100 mA	t _r	-	15	-	ns
Fall time	I _F = 100 mA	t _f	-	15	-	ns

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

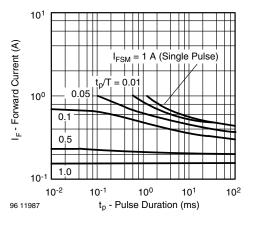


Fig. 3 - Pulse Forward Current vs. Pulse Duration

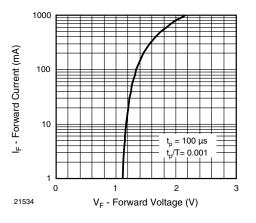
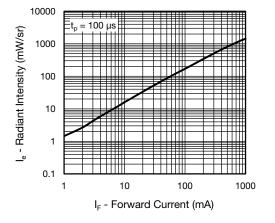


Fig. 4 - Forward Current vs. Forward Voltage

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Fig. 5 - Radiant Intensity vs. Forward Current

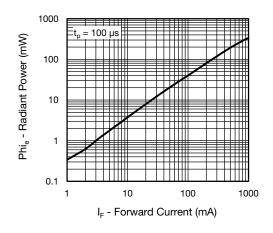


Fig. 6 - Radiant Power vs. Forward Current

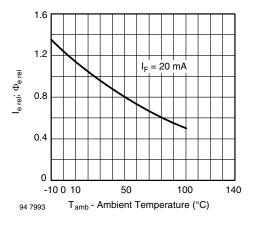


Fig. 7 - Relative Radiant Intensity / Power vs. Ambient Temperature

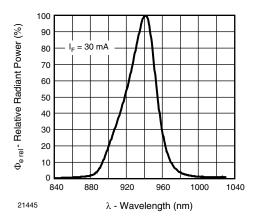


Fig. 8 - Relative Radiant Power vs. Wavelength

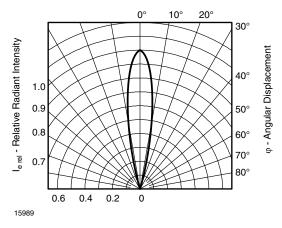


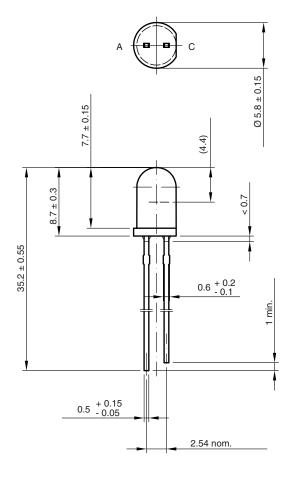
Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

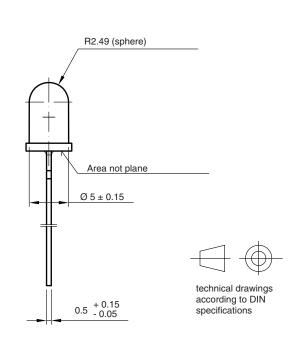
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PACKAGE DIMENSIONS in millimeters





6.544-5259.08-4 Issue: 3; 19.05.09 14436



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