

High Speed Infrared Emitting Diodes, 890 nm, Surface Emitter Technology


AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.8
- Peak wavelength: $\lambda_p = 890$ nm
- AEC-Q101 qualified
- High speed
- Angle of half intensity: $\phi = \pm 60^\circ$
- 0805 standard surface-mountable package
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY5890X01 is an infrared, 890 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, high optical power and high speed, in a low profile 0805 surface mount (SMD) package.

APPLICATIONS

- Miniature light barrier
- Automotive sensors
- Optical switch
- IR point source

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr) at $I_F = 100$ mA	ϕ (°)	λ_p (nm)	t_r (ns)
VSMY5890X01	13	± 60	890	7

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY5890X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.1$, $t_p = 100\text{ }\mu\text{s}$	I_{FM}	200	mA
Surge forward current	$t_p = 100\text{ }\mu\text{s}$	I_{FSM}	500	mA
Power dissipation		P_V	210	mW
Junction temperature		T_j	125	$^{\circ}\text{C}$
Operating temperature range		T_{amb}	-40 to +110	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +110	$^{\circ}\text{C}$
Soldering temperature	According to Fig. 7, J-STD-020	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction-to-ambient	EIA / JESD51	R_{thJA}	280	K/W

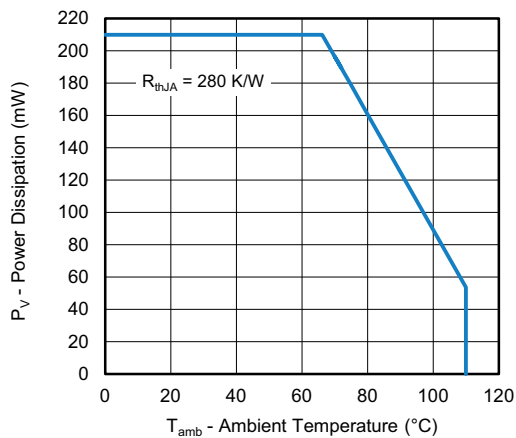


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

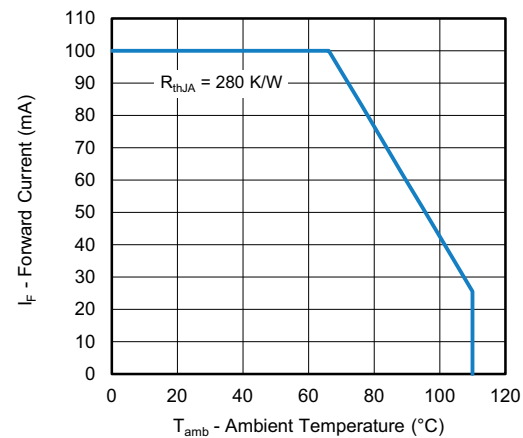


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	V_F	-	1.8	2.1	V
Temperature coefficient of V_F	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	TK_{VF}	-	-1.6	-	mV/K
Reverse current		I_R	Not designed for reverse operation			μA
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ mW/cm}^2$	C_J	-	30	-	pF
Radiant intensity	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	I_e	10	13	18	mW/sr
Temperature coefficient of radiant power	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	TK_{ϕ_e}	-	-0.2	-	%/K
Angle of half intensity		ϕ	-	± 60	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	λ_p	-	890	-	nm
Spectral bandwidth	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	$\Delta\lambda$	-	40	-	nm
Temperature coefficient of λ_p	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	TK_{λ_p}	-	0.25	-	nm/K
Rise time	$I_F = 100\text{ mA}$, 10 % to 90 %	t_r	-	8	-	ns
Fall time	$I_F = 100\text{ mA}$, 10 % to 90 %	t_f	-	8	-	ns

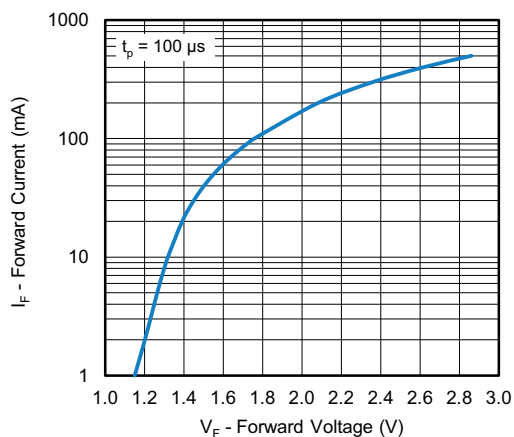
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

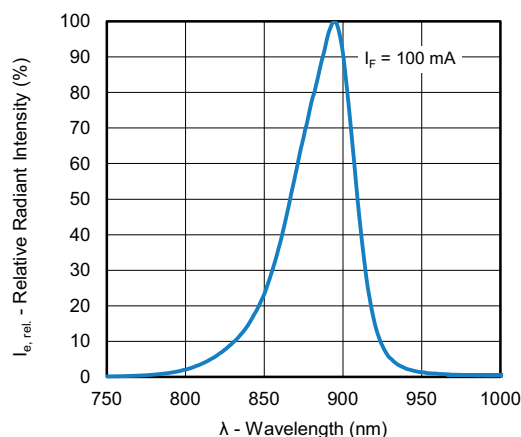


Fig. 5 - Relative Radiant Power vs. Wavelength

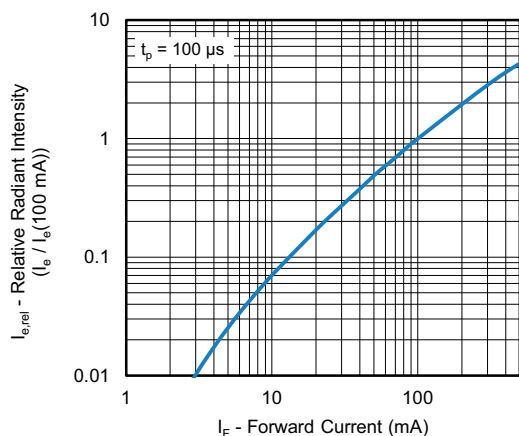


Fig. 4 - Relative Radiant Intensity vs. Forward Current

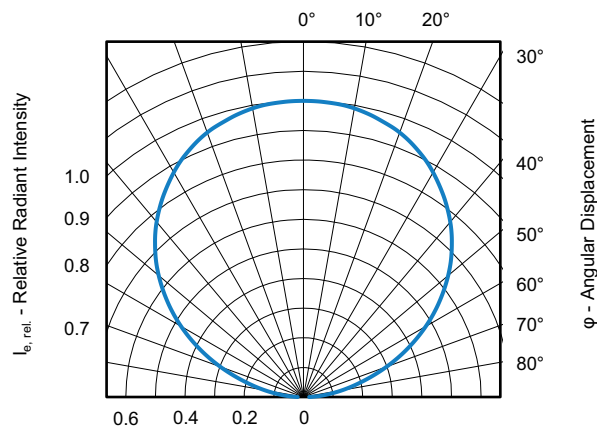


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

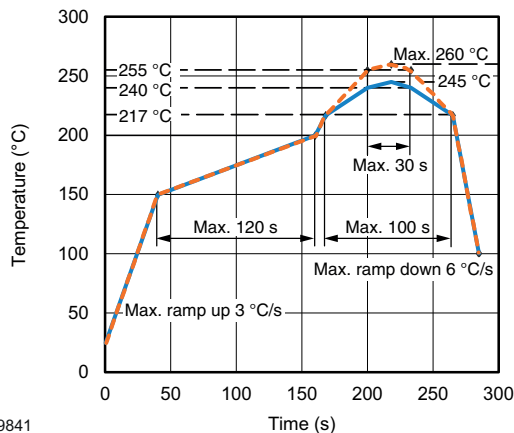
REFLOW SOLDER PROFILE


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

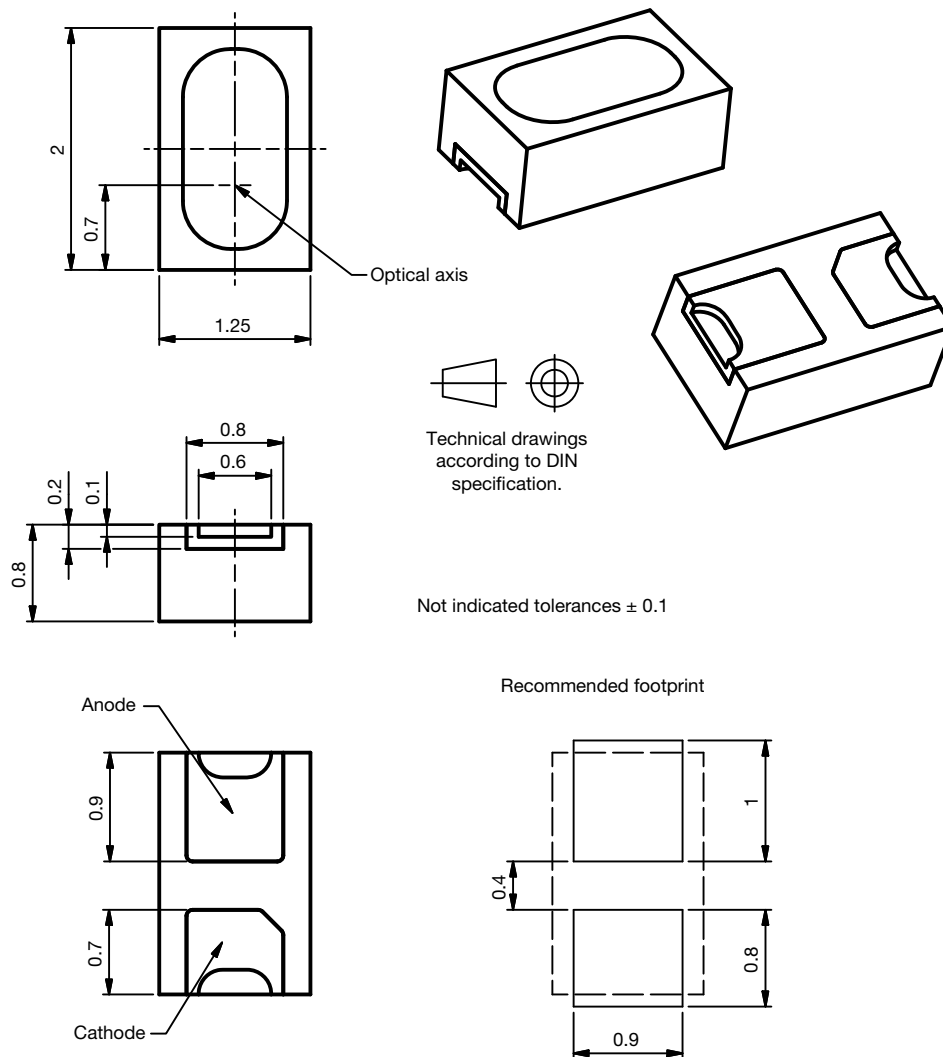
Floor life: 168 h

Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, RH < 60 %

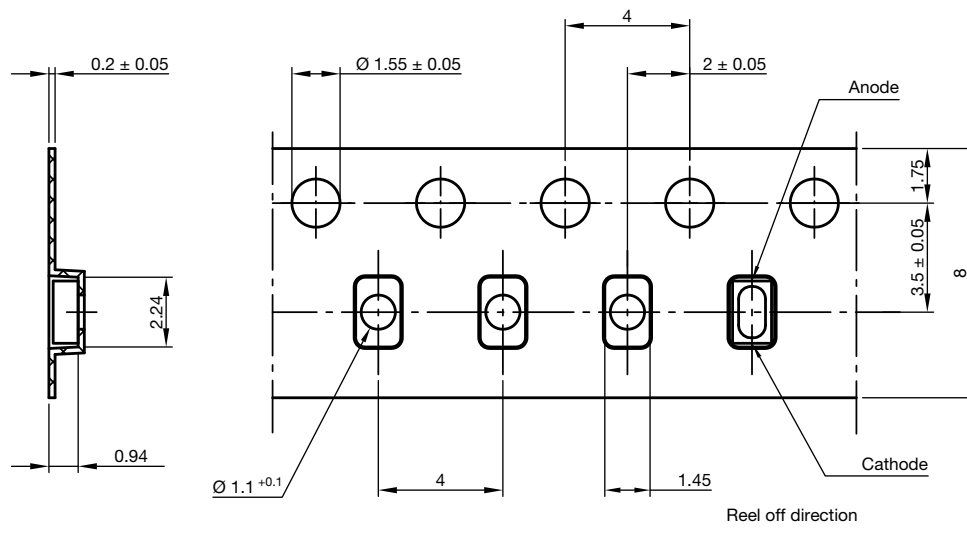
DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at $40\text{ }^{\circ}\text{C}$ (+ 5 °C), RH < 5 %.

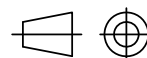
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PACKAGE DIMENSIONS in millimeters


Drawing- No.: 6.550-5352.01-4
Issue: 1; 20.12.2016

BLISTER TAPE DIMENSIONS in millimeters


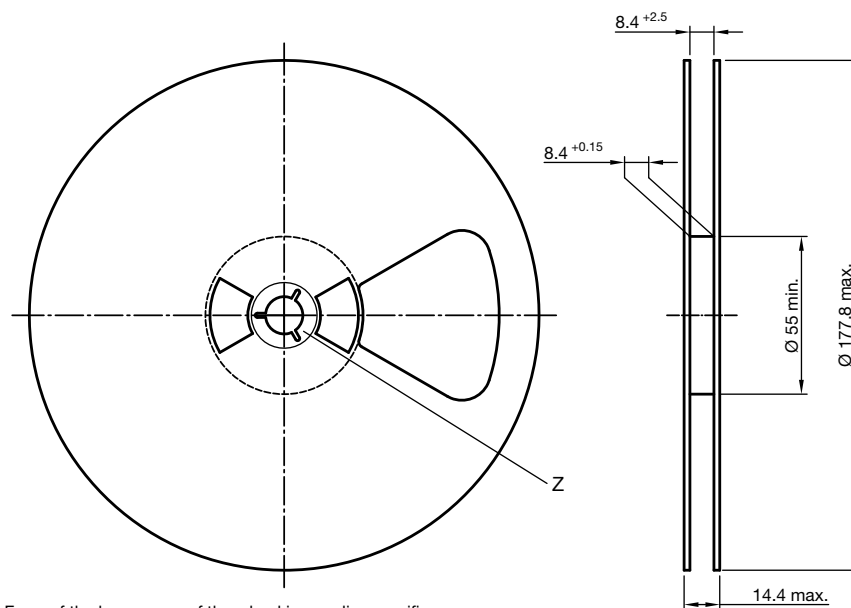
Not indicated tolerances ± 0.1



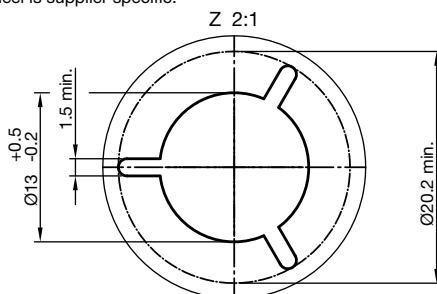
Technical drawings
according to DIN
specification.

Drawing-No.: 9.700-5352.02-4

Issue: 1; 20.12.2016

REEL DIMENSIONS in millimeters


Form of the leave open of the wheel is supplier specific.



Technical drawings
according to DIN
specification.

Drawing-No.: 9.800-5096.01-4

Issue: 5; 20.12.2016



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