

High Speed Infrared Emitting Diodes, 890 nm, GaAlAs, DH

VSMF2890RGX01



VSMF2890GX01



DESCRIPTION

VSMF2890RG(G)X01 series are infrared, 890 nm emitting diodes in GaAlAs (DH) technology with high radiant power and high speed, molded in clear, untinted plastic packages (with lens) for surface mounting (SMD).

FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.8
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 890$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 12^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reserve gullwing
- Package matches with detector VEMD2000X01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

AUTOMOTIVE
GRADE



RoHS
COMPLIANT
GREEN
[5-2008]**

APPLICATIONS

- IrDA compatible data transmission
- 3D TV
- Miniature light barrier
- Photointerrupters
- Optical switch
- Shaft encoders
- IR emitter source for proximity applications

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMF2890RGX01	40	± 12	890	30
VSMF2890GX01	40	± 12	890	30

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMF2890RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMF2890GX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

- MOQ: minimum order quantity

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

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ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.5$, $t_p = 100\ \mu\text{s}$	I_{FM}	200	mA
Surge forward current	$t_p = 100\ \mu\text{s}$	I_{FSM}	1	A
Power dissipation		P_V	160	mW
Junction temperature		T_j	100	$^{\circ}\text{C}$
Operating temperature range		T_{amb}	- 40 to + 85	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^{\circ}\text{C}$
Soldering temperature	Acc. figure 9, J-STD-020	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	250	K/W

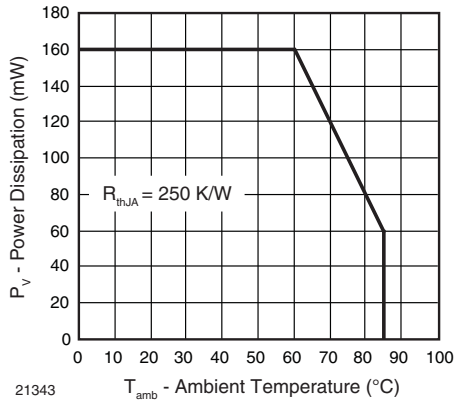


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

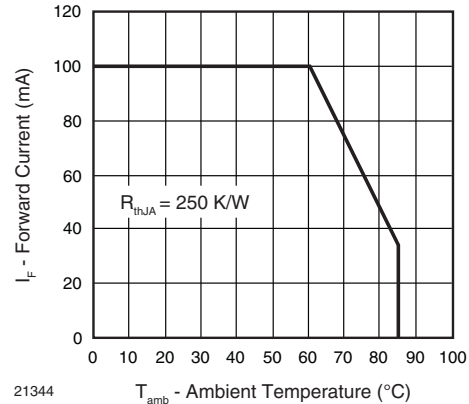


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, 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	1.25	1.4	1.6	V
	$I_F = 1\ \text{A}$, $t_p = 100\ \mu\text{s}$	V_F		2.3		V
Temperature coefficient of V_F	$I_F = 1\ \text{mA}$	TK_{VF}		- 1.8		mV/K
	$I_F = 100\ \text{mA}$	TK_{VF}		- 1.1		mV/K
Reverse current	$V_R = 5\ \text{V}$	I_R			10	μA
Junction capacitance	$V_R = 0\ \text{V}$, $f = 1\ \text{MHz}$, $E = 0\ \text{mW/cm}^2$	C_J		125		pF
Radiant intensity	$I_F = 100\ \text{mA}$, $t_p = 20\ \text{ms}$	I_e	20	40	60	mW/sr
	$I_F = 1\ \text{A}$, $t_p = 100\ \mu\text{s}$	I_e		350		mW/sr
Radiant power	$I_F = 100\ \text{mA}$, $t_p = 20\ \text{ms}$	ϕ_e		40		mW
Temperature coefficient of ϕ_e	$I_F = 100\ \text{mA}$	TK_{ϕ_e}		- 0.35		%/K
Angle of half intensity		ϕ		± 12		deg
Peak wavelength	$I_F = 30\ \text{mA}$	λ_p	870	890	910	nm
Spectral bandwidth	$I_F = 30\ \text{mA}$	$\Delta\lambda$		40		nm
Temperature coefficient of λ_p	$I_F = 30\ \text{mA}$	TK_{λ_p}		0.25		nm/K
Rise time	$I_F = 100\ \text{mA}$, 20 % to 80 %	t_r		30		ns
Fall time	$I_F = 100\ \text{mA}$, 20 % to 80 %	t_f		30		ns
Cut-off frequency	$I_{DC} = 70\ \text{mA}$, $I_{AC} = 30\ \text{mA pp}$	f_c		12		MHz
Virtual source diameter		d		1.5		mm



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

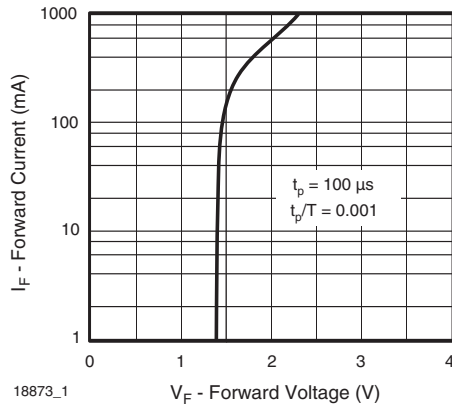


Fig. 3 - Forward Current vs. Forward Voltage

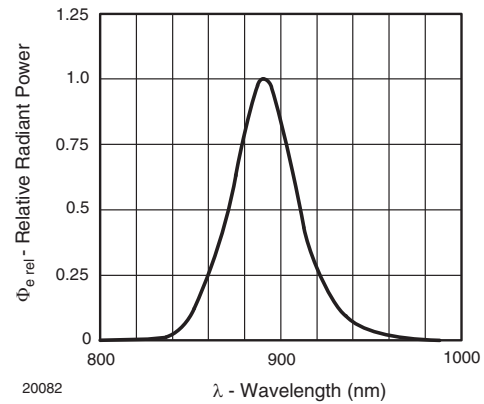


Fig. 6 - Relative Radiant Power vs. Wavelength

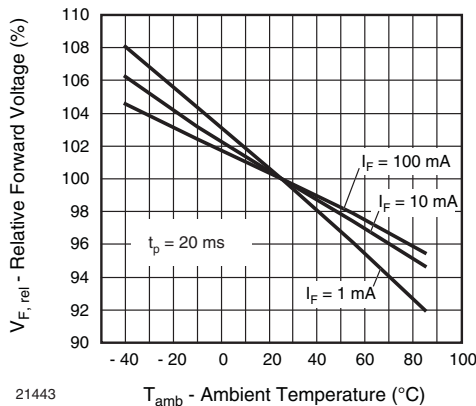


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

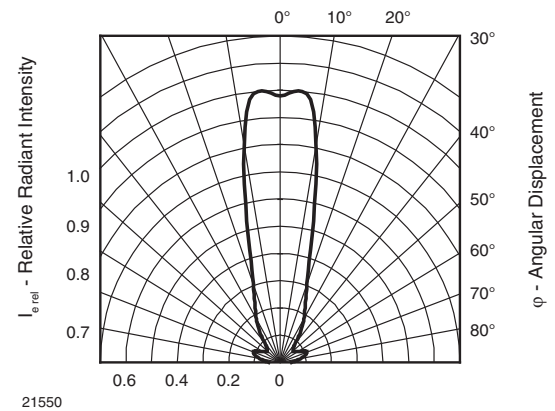


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

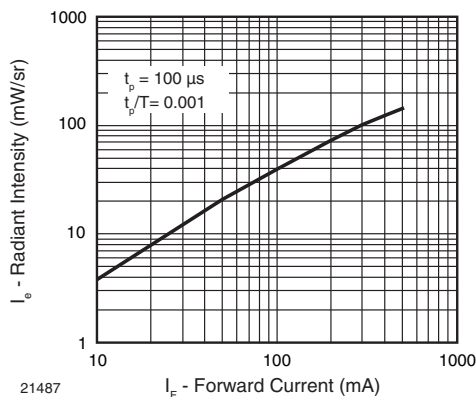


Fig. 5 - Radiant Intensity vs. Forward Current

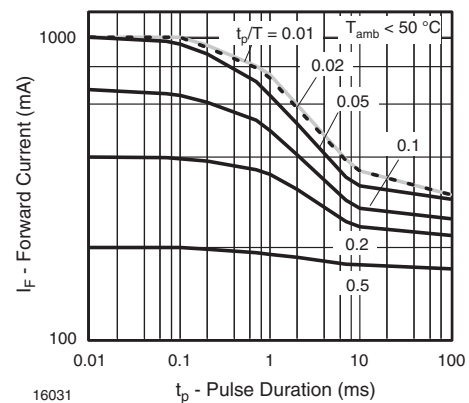


Fig. 8 - Pulse Forward Current vs. Pulse Duration

SOLDER PROFILE



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 on MBB label:

Moisture sensitivity level 2a, acc. to J-STD-020.

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

Technical drawing of a 20-pin connector, showing multiple views and dimensions:

- Top View:** Shows a central circular area with a diameter of 2.2 . The overall width is 5.8 ± 0.2 . The height of the central part is 2.77 ± 0.2 . The distance from the top edge to the center of the circular area is 1.6 . The distance from the center of the circular area to the top edge of the central part is 0.05 ± 0.1 . The distance from the center of the circular area to the side edge of the central part is 0.4 . The distance from the center of the circular area to the side edge of the side part is 6.10 .
- Side View:** Shows a side profile with a width of 2.2 . The height of the central part is 0.3 . The overall width is 1.8 ± 0.1 .
- Bottom View:** Shows a central circular area with a diameter of 2.3 ± 0.2 . The overall width is 2.3 ± 0.2 . The height of the central part is 0.5 . The distance from the center of the circular area to the side edge of the side part is 0.4 . The labels "Cathode", "Pin ID", and "Anode" are shown.
- Detail View:** Shows a detail of the side part with a width of 1.1 ± 0.1 . The height of the side part is 0.254 . The label "exposed copper" is shown.
- Front View:** Shows a central circular area with a diameter of $\varnothing 2.3 \pm 0.1$. The overall width is 6.7 . The height of the central part is 0.75 . The distance from the center of the circular area to the side edge of the side part is 1.7 . The label "Solder pad proposal acc. IPC 7351" is shown.

Technical drawing scale: $Z 20:1$

Technical drawing standard: technical drawings according to DIN specifications

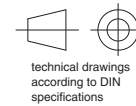
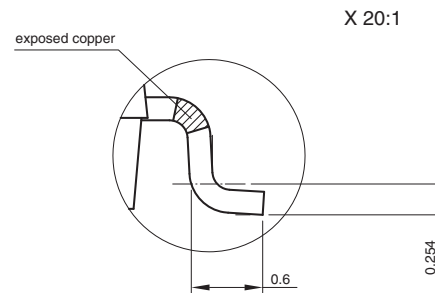
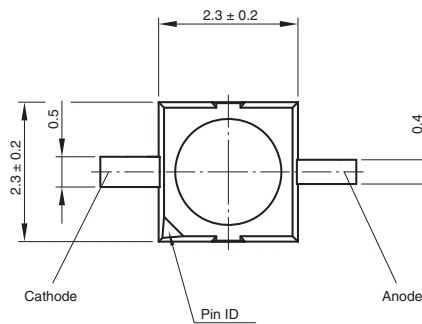
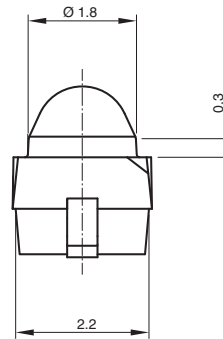
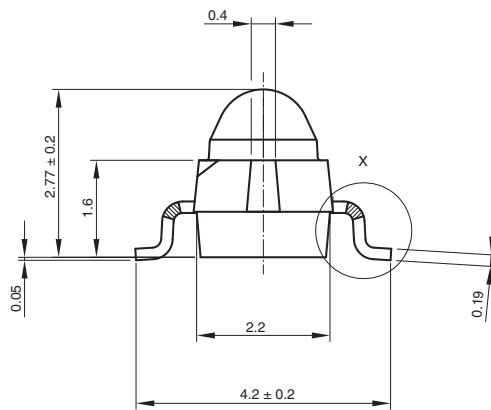
Not indicated tolerances ± 0.1



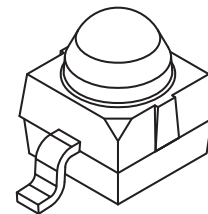
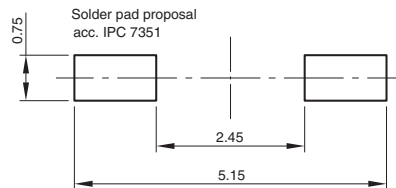
VSMF2890RGX01, VSMF2890GX01

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PACKAGE DIMENSIONS in millimeters: VSMF2890GX01

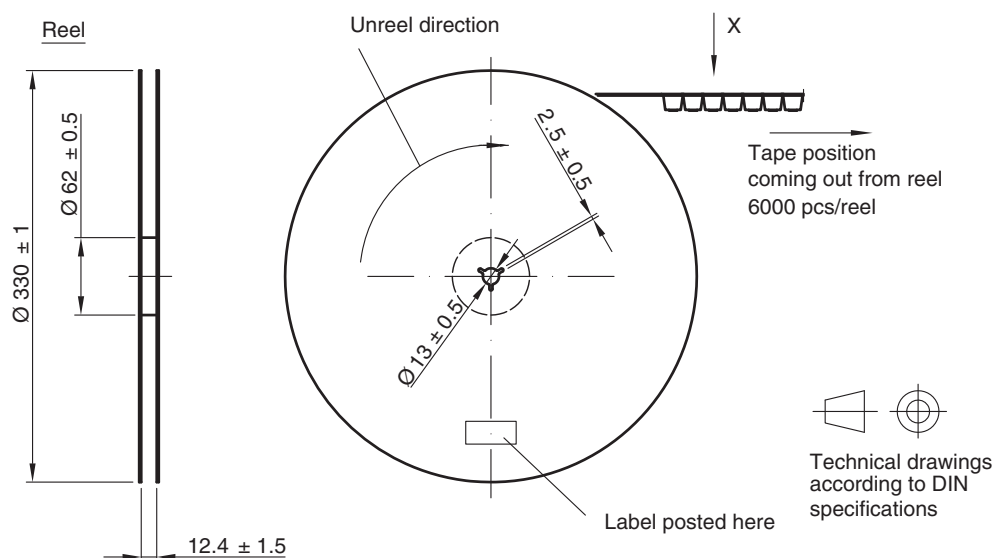


Not indicated tolerances ± 0.1



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Issue: 4; 18.03.10
21488

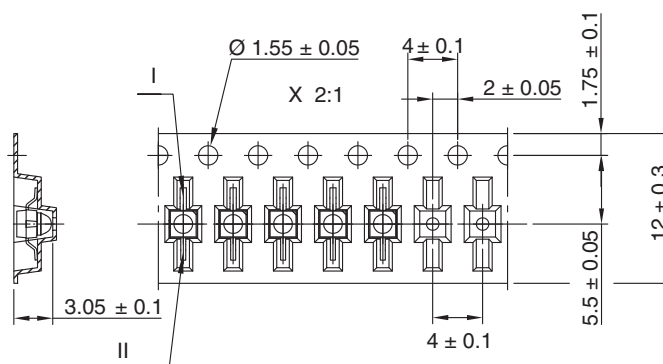
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Empty (160 mm min.) Parts mounted Empty (400 mm min.)

Direction of pulling out

Devicce	Lead I	Lead II
VENT2000	Collector	Emitter
VENT2500		
VEMD2000	Cathode	Anode
VEMD2500		
V SMB2000		
V SMG2000		
VSMY2850RG	Anode	Cathode



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For technical questions, contact: emittertechsupport@vishay.com

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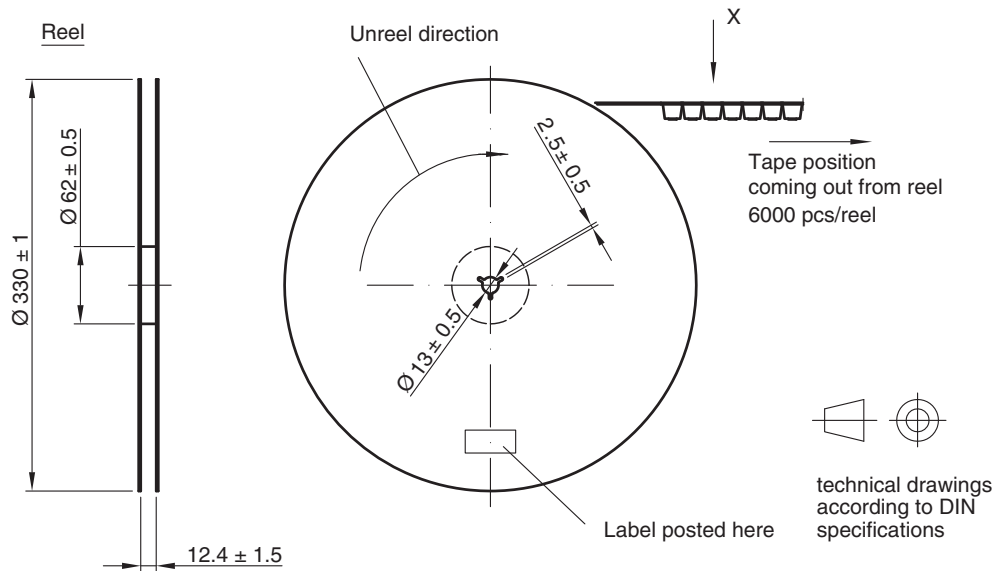
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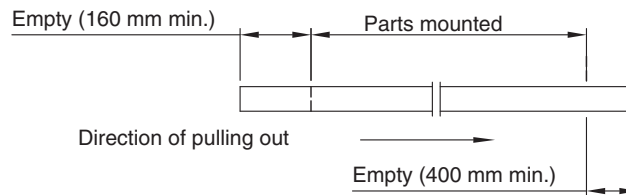
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TAPING AND REEL DIMENSIONS in millimeters: VSMF2890GX01

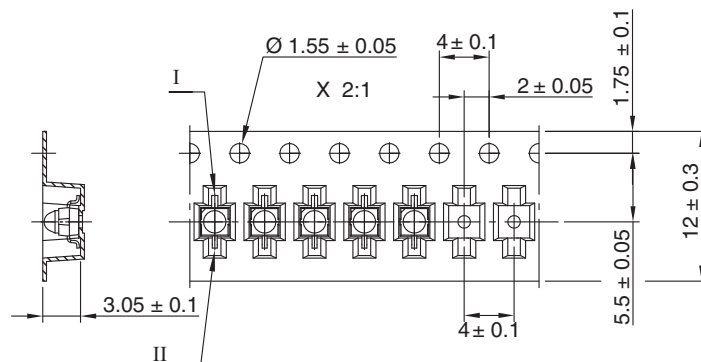


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VENT2020	Collector	Emitter
VENT2520		
VSMB2020	Cathode	Anode
VSMG2020		
VEMD2020		
VEMD2520		
VSMY2850G	Anode	Cathode



Drawing-No.: 9.800-5091.01-4

Issue: 3; 18.03.10

21571



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Как с нами связаться

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