

High Speed Infrared Emitting Diodes, 940 nm, GaAIAs, MQW

VSMB2943RGX01

VSMB2943GX01



DESCRIPTION

VSMB2943X01 series are infrared, 940 nm emitting diodes in GaAIAs multi quantum well (MQW) technology with high radiant power and high speed, molded in clear, untinted plastic packages (with lens) for surface mounting (SMD).

APPLICATIONS

- IrDA compatible data transmission
- Miniature light barrier
- IR touch panels
- 3D TV
- Photointerrupters
- Optical switch
- Control and drive circuits
- Shaft encoders

FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.55
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 940$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 25^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reserve gullwing
- Package matches with detector VEMD2xx3X01 and VEMT2xx3X01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	ϕ (deg)	λ_p (nm)	t_r (ns)
VSMB2943RGX01	20	± 25	940	15
VSMB2943GX01	20	± 25	940	15

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMB2943RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMB2943GX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

- MOQ: minimum order quantity

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	according 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

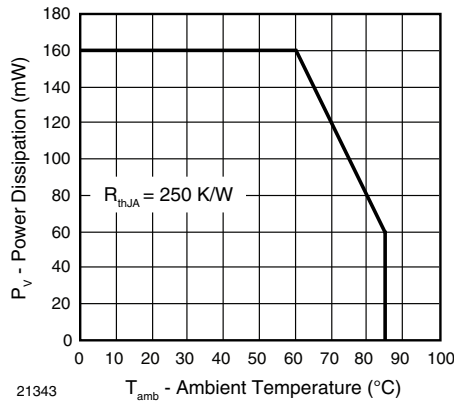


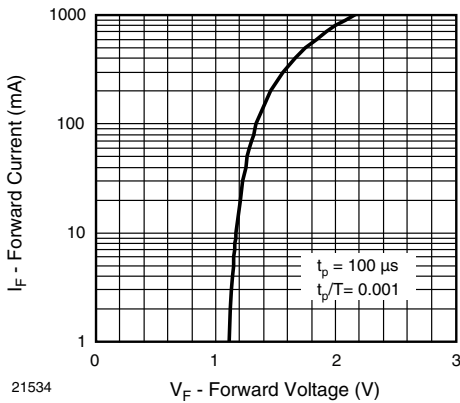
Fig. 1 - Power Dissipation Limit vs. Ambient Temperature



Fig. 2 - Forward Current Limit vs. Ambient Temperature

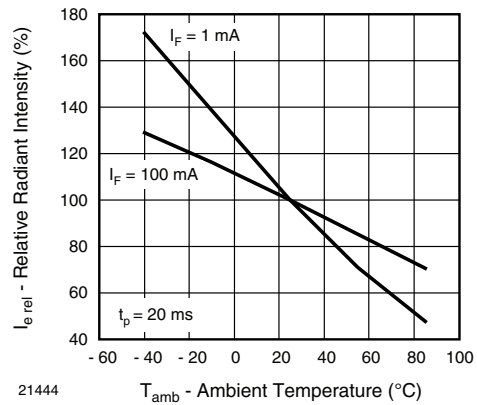
BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 100 mA, t _p = 20 ms	V _F	1.15	1.35	1.6	V
	I _F = 1 A, t _p = 100 μs	V _F		2.2		V
Temperature coefficient of V _F	I _F = 1 mA	TK _{V_F}		-1.8		mV/K
	I _F = 100 mA	TK _{V_F}		-1.1		mV/K
Reverse current		I _R	Not designed for reverse operation			μA
Junction capacitance	V _R = 0 V, f = 1 MHz, E = 0 mW/cm ²	C _J		70		pF
Radiant intensity	I _F = 100 mA, t _p = 20 ms	I _e	10	20	30	mW/sr
	I _F = 1 A, t _p = 100 μs	I _e		170		mW/sr
Radiant power	I _F = 100 mA, t _p = 20 ms	φ _e		40		mW
Temperature coefficient of radiant power	I _F = 1 mA	TK _{φ_e}		-1.1		%/K
	I _F = 100 mA	TK _{φ_e}		-0.51		%/K
Angle of half intensity		φ		± 25		deg
Peak wavelength	I _F = 30 mA	λ _p	920	940	960	nm
Spectral bandwidth	I _F = 30 mA	Δλ		25		nm
Temperature coefficient of λ _p	I _F = 30 mA	TK _{λ_p}		0.25		nm/K
Rise time	I _F = 100 mA, 20 % to 80 %	t _r		15		ns
Fall time	I _F = 100 mA, 20 % to 80 %	t _f		15		ns
Cut-off frequency	I _{DC} = 70 mA, I _{AC} = 30 mA pp	f _c		23		MHz

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



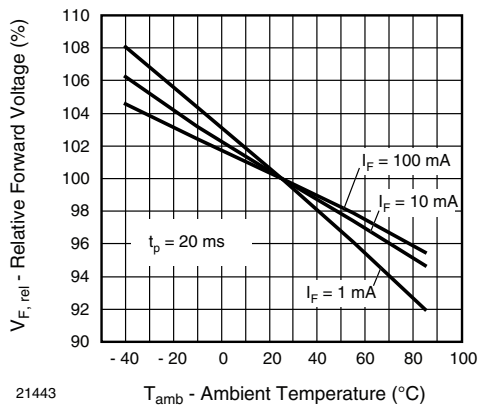
21534

Fig. 3 - Forward Current vs. Forward Voltage



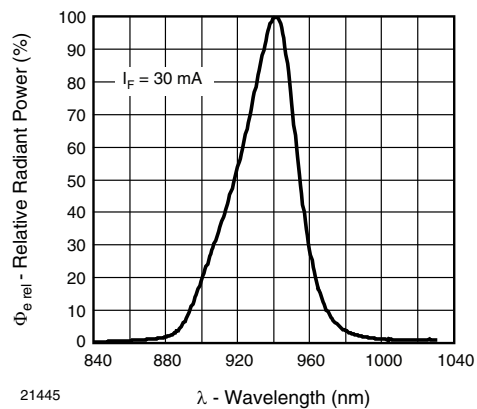
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Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature



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Fig. 4 - Relative Forward Voltage vs. Ambient Temperature



21445

Fig. 7 - Relative Radiant Power vs. Wavelength

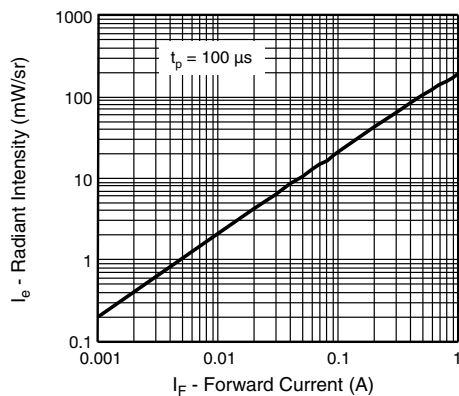
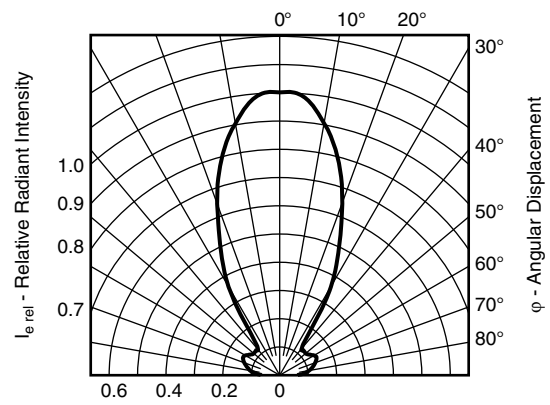


Fig. 5 - Radiant Intensity vs. Forward Current



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Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



SOLDER PROFILE

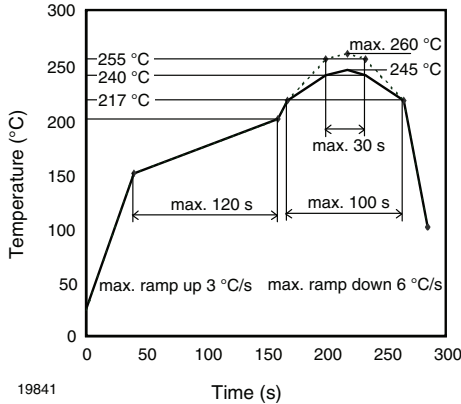


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 4 weeks

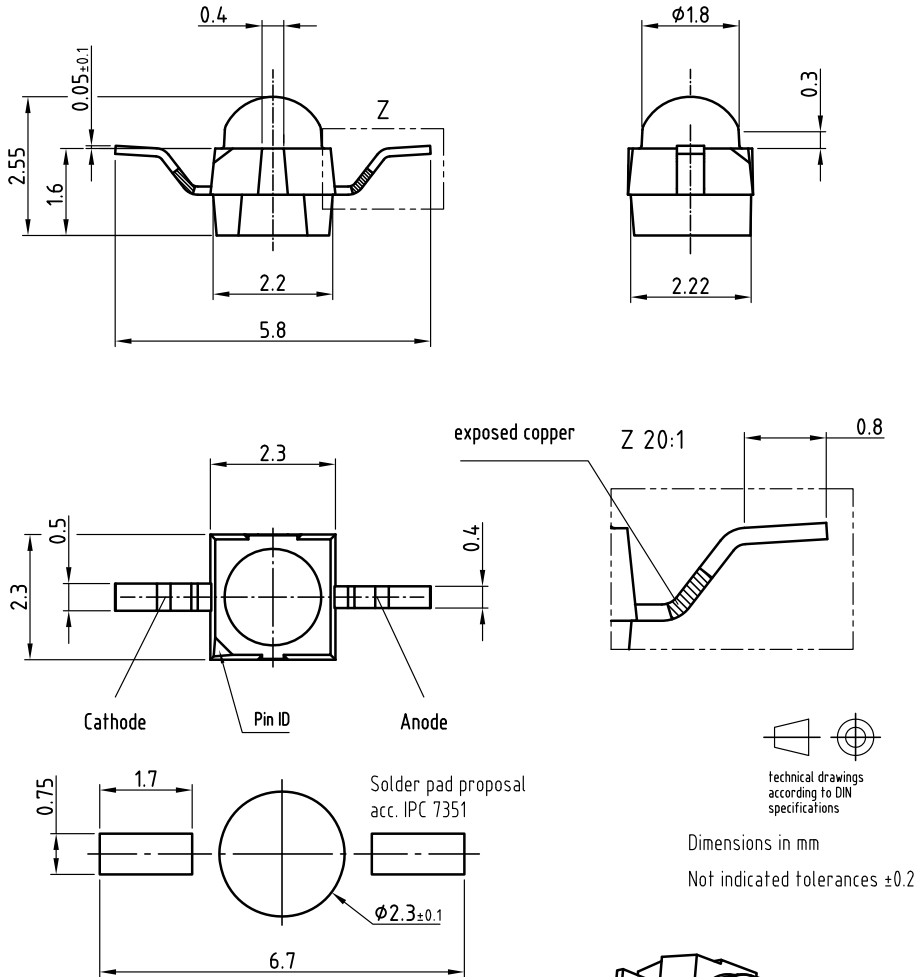
Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

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

DRYING

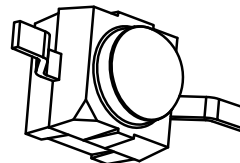
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), $RH < 5\%$.

PACKAGE DIMENSIONS in millimeters: VSMB2943RG



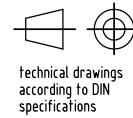
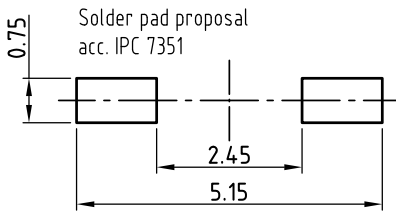
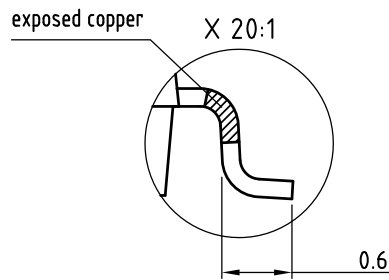
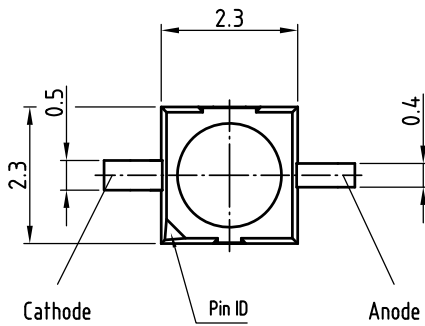
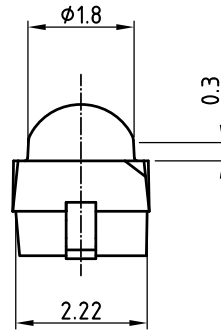
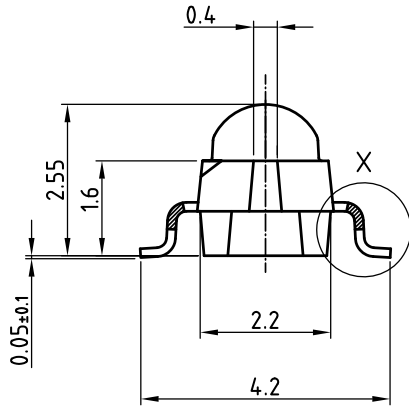
Drawing refers to following types: VSMB2943RGX01
VSMF2893RGX01
VEMD2x23X01

Drawing-No.: 6.544-5409.01-4
Issue: prel. 03.08.12





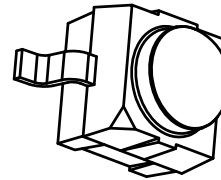
PACKAGE DIMENSIONS in millimeters: VSMB2943G



Dimensions in mm
Not indicated tolerances ±0.2

Drawing refers to following types: VSMB2943GX01
VSMF2893GX01
VEMD2x23X01

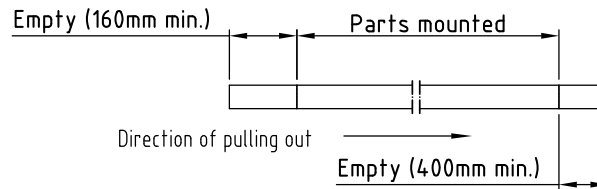
Drawing-No.: 6.544-5408.01-4
Issue: prel; 03.08.12



TAPING AND REEL DIMENSIONS in millimeters: VSMB2943RG



Leader and trailer tape:



Terminal position in tape

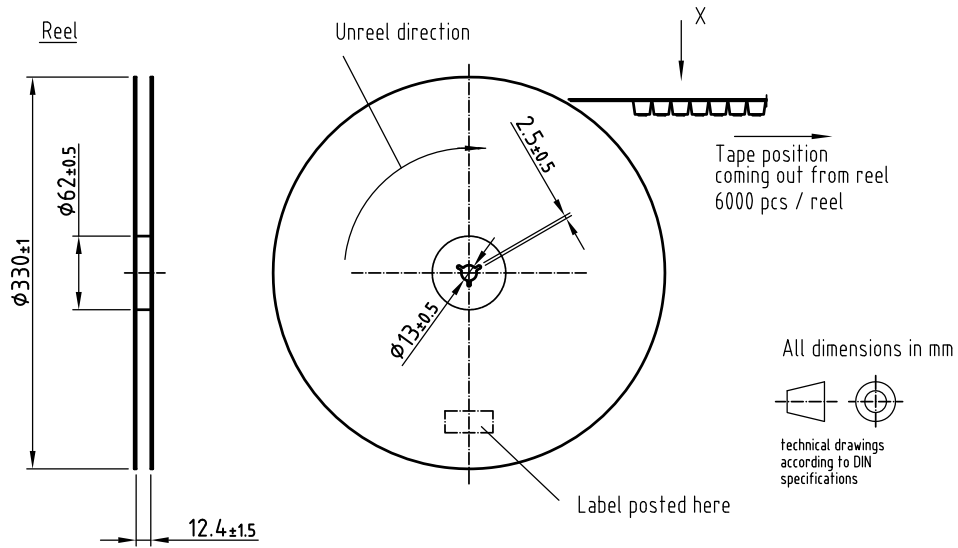
Device	Lead I	Lead II
VSMB2943RGX01	Cathode	Anode
VSMF2893RGX01		
VEMD2x03X01		
VEMT2x03X01	Collector	Emitter
VSMY2853RG	Anode	Cathode



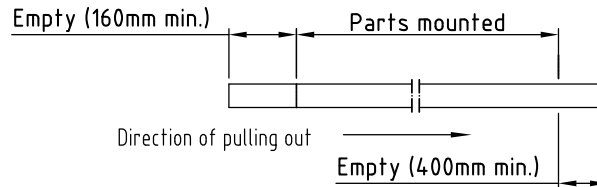
Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5100.02-4
Issue: prel; 03.08.12

TAPING AND REEL DIMENSIONS in millimeters: VSMB2943G



Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VSMB2943GX01	Cathode	Anode
VSMF2893GX01		
VEMD2x23X01		
VEMT2x23X01	Collector	Emitter
VSMY2853G	Anode	Cathode



Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5091.21-4
Issue: prel; 03.08.12



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