

RoHS

COMPLIANT

HALOGEN FREE

GREEN

High Speed Infrared Emitting Diodes, 940 nm, Surface Emitter Technology



DESCRIPTION

As part of the <u>SurfLight</u>TM portfolio, the VSMY2943 series are infrared, 940 nm emitting diodes based on GaAlAs surface emitter chip technology with extreme high radiant intensities, high optical power and high speed, molded in clear, untinted plastic packages (with lens) for surface mounting (SMD).

APPLICATIONS

- · Miniature light barrier
- Photointerrupters
- · Optical switch
- Emitter source for proximity sensors
- IR illumination

FEATURES

Package type: surface-mountPackage form: GW, RGW



Peak wavelength: λ_p = 940 nm

· High reliability

High radiant power

· Very high radiant intensity

• Angle of half intensity: $\phi = \pm 28^{\circ}$

• Suitable for high pulse current operation

• Terminal configurations: gullwing or reverse gullwing

Package matches with detector VEMD2503X01 series

Floor life: 4 weeks, MSL 2a, according to J-STD-020

 Material categorization: for definitions of compliance please see www.vishav.com/doc?99912

PRODUCT SUMMARY					
COMPONENT	I _e (mW/sr)	φ (deg)	$λ_{\mathbf{p}}$ (nm)	t _r (ns)	
VSMY2943RG	50	± 28	940	10	
VSMY2943G	50	± 28	940	10	

Note

· Test conditions see table "Basic Characteristics"

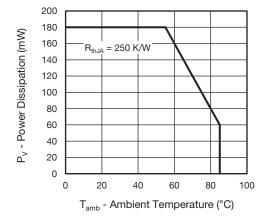
ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM		
VSMY2943RG	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing		
VSMY2943G	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing		

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	$t_p/T = 0.5, t_p = 100 \mu s$	I _{FM}	180	mA
Surge forward current	t _p = 100 μs	I _{FSM}	1	Α
Power dissipation		P _V	180	mW
Junction temperature		Tj	100	°C
Operating temperature range		T _{amb}	-40 to +85	°C
Storage temperature range		T _{stg}	-40 to +100	°C
Soldering temperature	According to Fig. 7, J-STD-020	T _{sd}	260	°C
Thermal resistance junction-to-ambient	J-STD-051, soldered on PCB	R _{thJA}	250	K/W



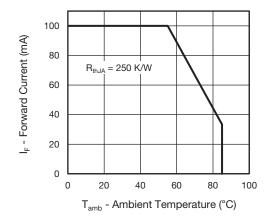


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V _F	-	1.4	1.8	V
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	V _F	-	2.5	-	V
Temperature coefficient of V _F	I _F = 100 mA	TK _{VF}	-	-0.7	-	mV/K
Reverse current		I _R	Not designed for reverse operation μA		μA	
Junction capacitance	$V_R = 0 \text{ V}, f = 1 \text{ MHz}, E = 0 \text{ mW/cm}^2$	CJ	-	55	-	pF
Parity of Colors 2	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l _e	27	50	75	mW/sr
Radiant intensity	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	l _e	-	350	-	mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	φ _e	-	55	-	mW
Temperature coefficient of radiant power	I _F = 100 mA	ТКφ _е	-	-0.2	-	%/K
Angle of half intensity		φ	-	± 28	-	deg
Peak wavelength	I _F = 100 mA	λρ	920	940	960	nm
Spectral bandwidth	I _F = 30 mA	Δλ	-	50	-	nm
Temperature coefficient of λ _p	I _F = 30 mA	TKλ _p	-	0.25	-	nm/K
Rise time	I _F = 100 mA, 20 % to 80 %	t _r	-	10	-	ns
Fall time	I _F = 100 mA, 20 % to 80 %	t _f	-	10	-	ns

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

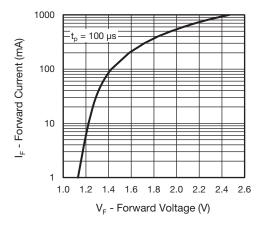


Fig. 3 - Forward Current vs. Forward Voltage

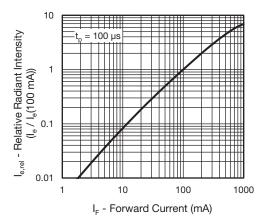


Fig. 4 - Relative Radiant Intensity vs. Forward Current

300 Max. 260 °C 250 255 245 °C 240 °C 217 200 Temperature (°C) Max. 30 s 150 120 s Max. 100 s Max. 100 Max. ramp down 6 °C/s 50 Max. ramp up 3 °C/s 0 50 100 150 200 250 300 19841-1 Time (s)

SOLDER PROFILE

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

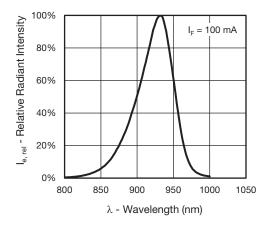


Fig. 5 - Relative Radiant Power vs. Wavelength

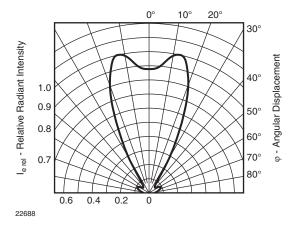


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

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 °C, RH < 60 %

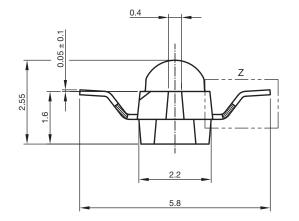
Moisture sensitivity level 2a, according to J-STD-020.

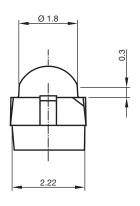
DRYING

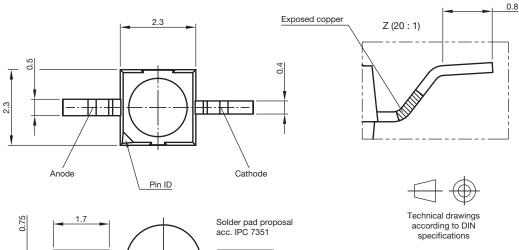
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 $^{\circ}$ C (+ 5 $^{\circ}$ C), RH < 5 $^{\circ}$ M.

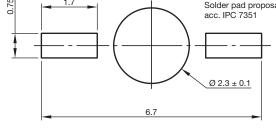


PACKAGE DIMENSIONS in millimeters: VSMY2943RG

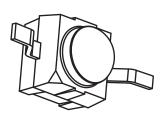






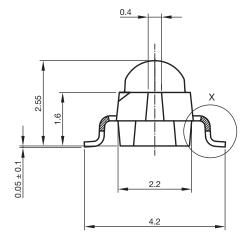


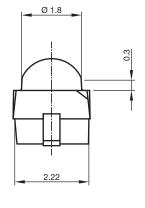
Not indicated tolerances ± 0.2

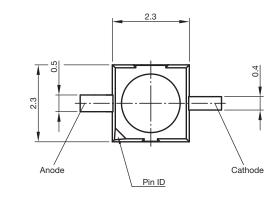


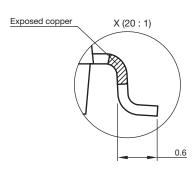
Drawing-No.: 6.544-5409.03-4

PACKAGE DIMENSIONS in millimeters: VSMY2943G



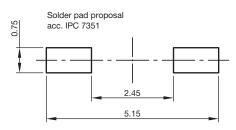




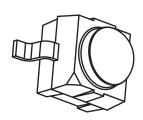




Technical drawings according to DIN specifications



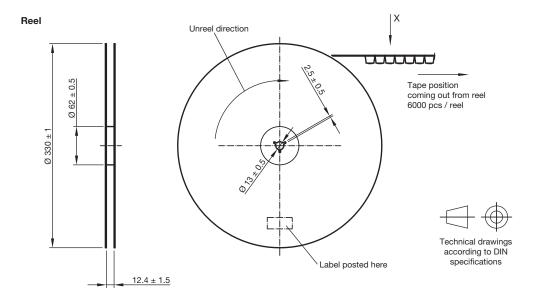
Not indicated tolerances ± 0.2



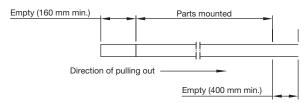
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TAPING AND REEL DIMENSIONS in millimeters: VSMY2943RG

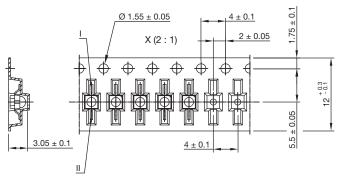


Leader and trailer tape



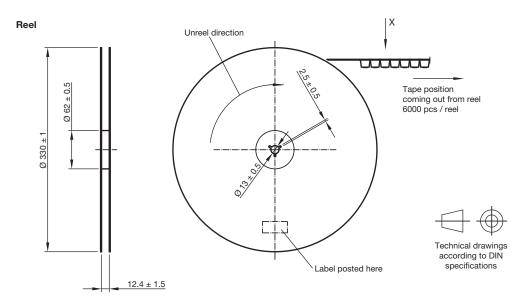
Terminal position in tape

Device	Lead I	Lead II
VSMB2943RGX01		
VSMF2893RGX01	Cathode	Anode
VEMD2x03X01		
VEMT2x03X01	Collector	Emitter
VSMY2853RG		
VSMY2943RG	Anode	Cathode
VSMY294310RG		

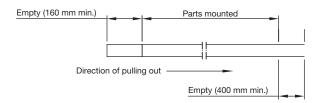


Drawing-No.: 9.800-5100.02-4

TAPING AND REEL DIMENSIONS in millimeters: VSMY2943G



Leader and trailer tape



Terminal position in tape

Device	Lead I	Lead II
VSMB2943GX01		
VSMF2893GX01	Cathode	Anode
VEMD2x23X01		
VEMT2x23X01	Collector	Emitter
VSMY2853G		
VSMY2943G	Anode	Cathode
VSMY294310G		

Drawing-No.: 9.800-5091.21-4



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