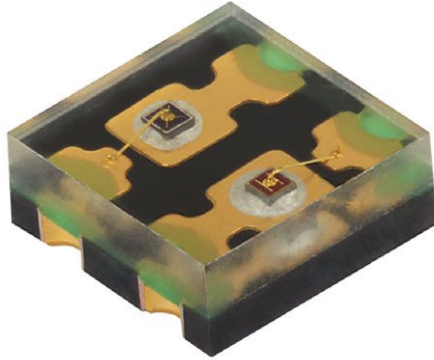


Dual Color Emitting Diodes, 660 nm and 940 nm



FEATURES

- Package type: surface mount
- Package form: square PCB
- Dimensions (L x W x H in mm): 2 x 2 x 0.87
- Peak wavelength: $\lambda_p = 660$ nm and 940 nm
- High reliability
- High radiant power
- Angle of half intensity: $\phi = \pm 60^\circ$
- 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

VSMD66694 is a dual color emitting device with 660 nm and 940 nm peak wavelength. The emitters are based on the [SurfLight™](#) technology, providing high radiant power.

APPLICATIONS

- Wearables
- Health monitoring
- Pulse oximetry

PRODUCT SUMMARY

COMPONENT	COLOR	I_e (mW/sr)	ϕ (deg)	λ_p (nm)	t_r (ns)
VSMD66694	Red	2.3	± 60	660	10
	IR	1.5		940	

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMD66694	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	square PCB

Note

- MOQ: minimum order quantity

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

PARAMETER	TEST CONDITION	SYMBOL	COLOR	VALUE	UNIT
Reverse voltage		V_R		5	V
Forward current		I_F	Red	70	mA
			IR	70	
Peak forward current	$t_p/T = 0.1, t_p = 100 \mu\text{s}$	I_{FM}	Red	140	mA
			IR	140	
Surge forward current	$t_p = 100 \mu\text{s}$	I_{FSM}	Red	1	A
			IR	1	
Power dissipation		P_V	Red	161	mW
			IR	119	
Junction temperature		T_j		100	$^\circ\text{C}$
Operating temperature range		T_{amb}		-25 to +85	$^\circ\text{C}$
Storage temperature range		T_{stg}		-25 to +85	$^\circ\text{C}$
Soldering temperature	According fig. 10, J-STD-020	T_{sd}		260	$^\circ\text{C}$
Thermal resistance junction / ambient	J-STD-051	R_{thJA}		390	K/W



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

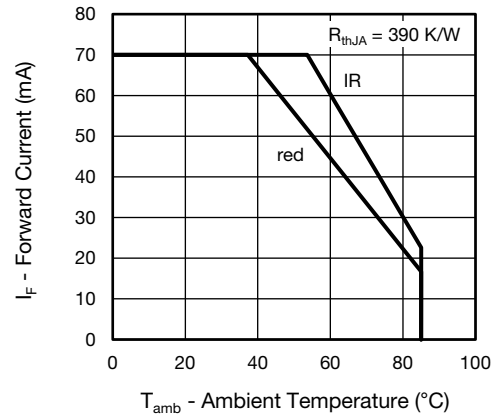
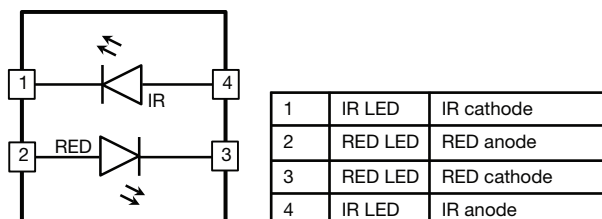


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	SYMBOL	COLOR	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$	V_F	Red	-	2.0	2.3	V
			IR	-	1.4	1.7	
Temperature coefficient	$I_F = 20\text{ mA}$	TK_{VF}	Red	-	-2.3	-	mV/K
			IR	-	-2.3	-	
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	Red	-	7	-	pF
			IR	-	5	-	
Radiant intensity	$I_F = 20\text{ mA}$	I_e	Red	1.9	2.3	-	mW/sr
			IR	0.8	1.5	-	
Radiant power	$I_F = 20\text{ mA}$	ϕ_e	Red	-	9.5	-	mW
			IR	-	8.5	-	
Angle of half intensity	$I_F = 20\text{ mA}$	ϕ		-	± 60	-	deg
Peak wavelength	$I_F = 20\text{ mA}$	λ_p	Red	650	660	670	nm
			IR	920	940	960	
Spectral bandwidth	$I_F = 20\text{ mA}$	$\Delta\lambda$	Red	-	20	-	nm
			IR	-	40	-	
Temperature coefficient of λ_p	$I_F = 20\text{ mA}$	TK_{λ_p}	Red	-	0.2	-	nm/K
			IR	-	0.3	-	
Rise time	$I_F = 20\text{ mA}$	t_r	Red	-	10	-	ns
			IR	-	10	-	
Fall time	$I_F = 20\text{ mA}$	t_f	Red	-	10	-	ns
			IR	-	10	-	

CIRCUIT BLOCK DIAGRAM


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

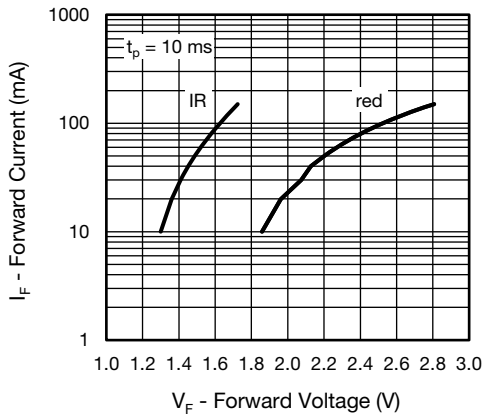


Fig. 3 - Forward Current vs. Forward Voltage

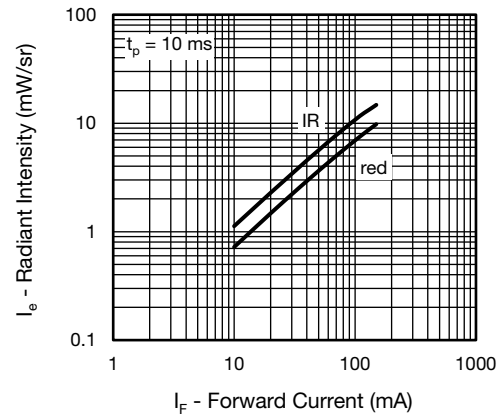


Fig. 6 - Radiant Intensity vs. Forward Current

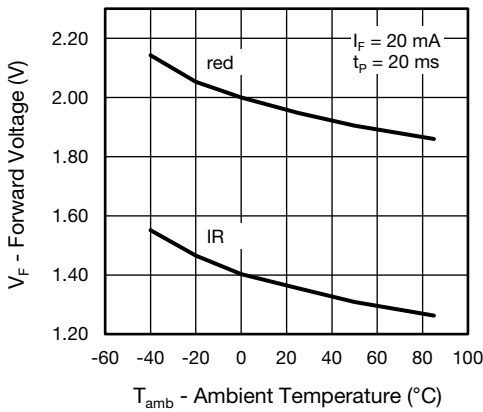


Fig. 4 - Forward Voltage vs. Ambient Temperature

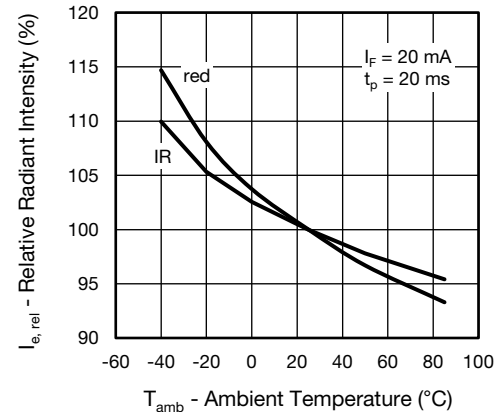


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

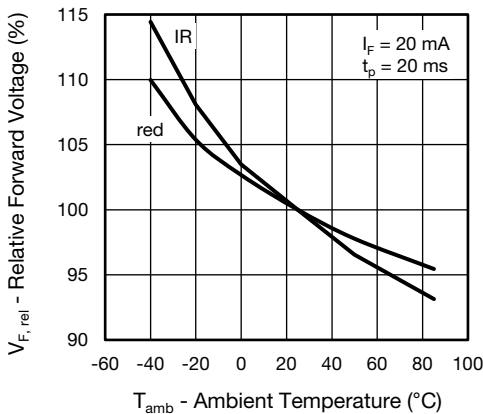


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

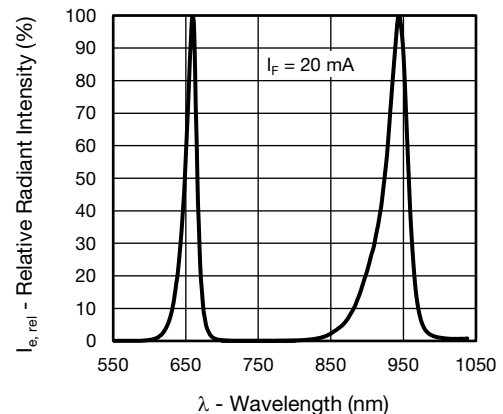


Fig. 8 - Relative Radiant Intensity vs. Wavelength

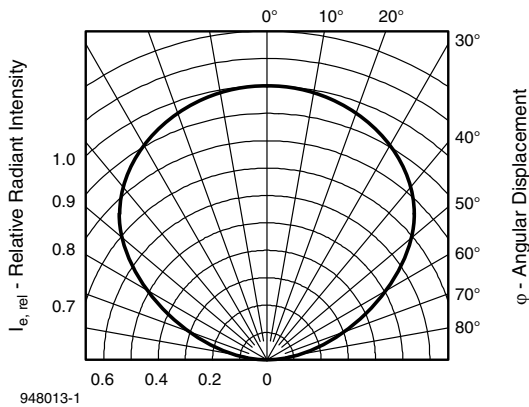


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

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

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

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 $40\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $RH < 5\text{ }\%$.

REFLOW SOLDER PROFILE

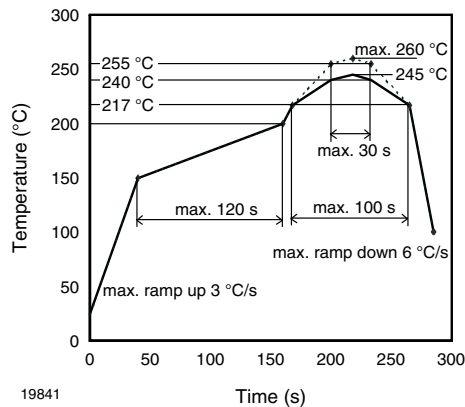
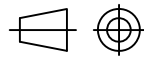
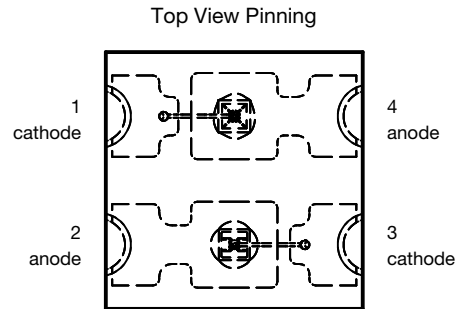
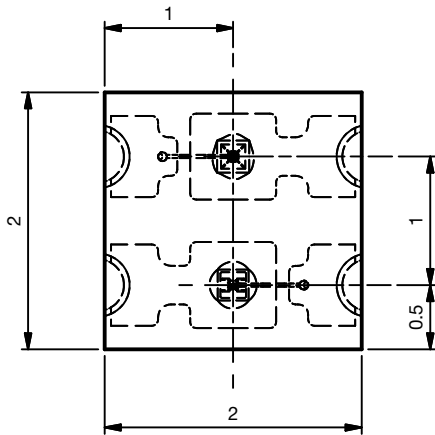
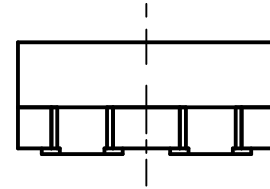
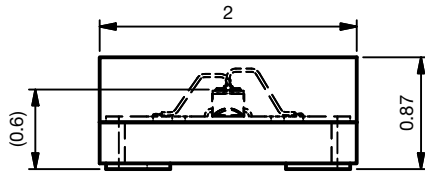


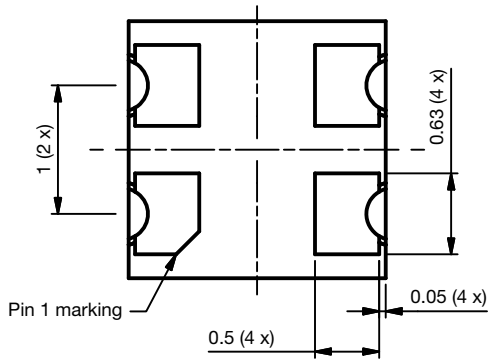
Fig. 10 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020



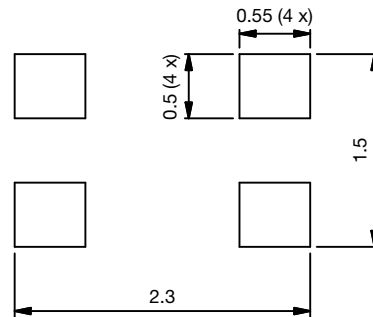
PACKAGE DIMENSIONS in millimeters



Technical drawings according to DIN specification



Recommended Footprint

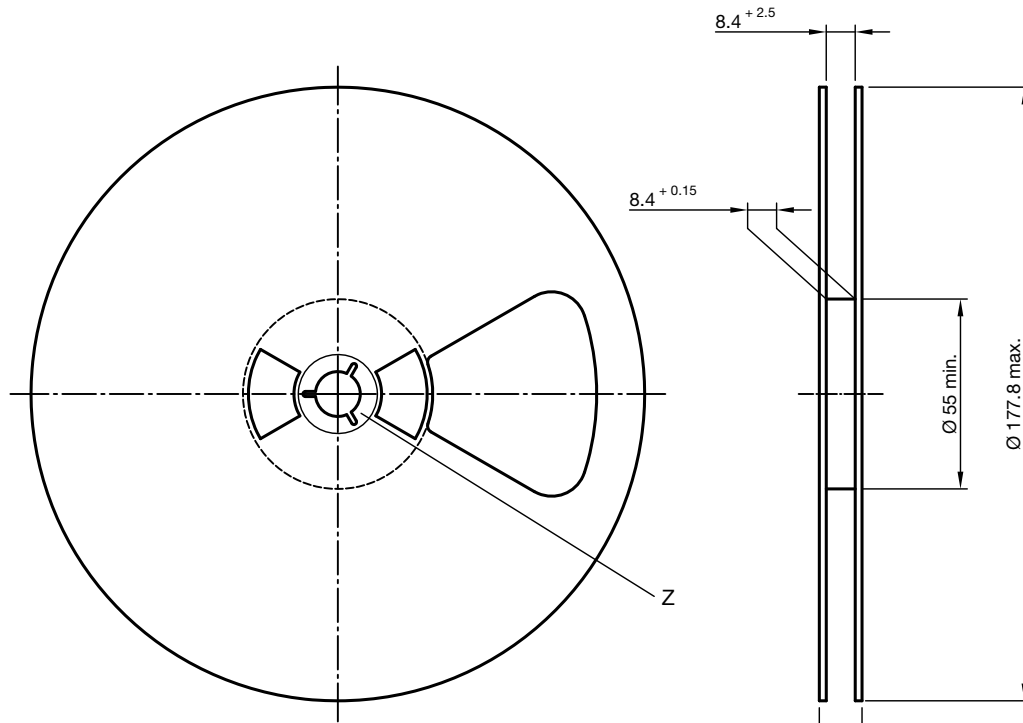


Drawing No.: 6.550-5347.01-4
Issue: 1; 19.02.16

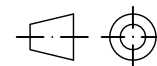
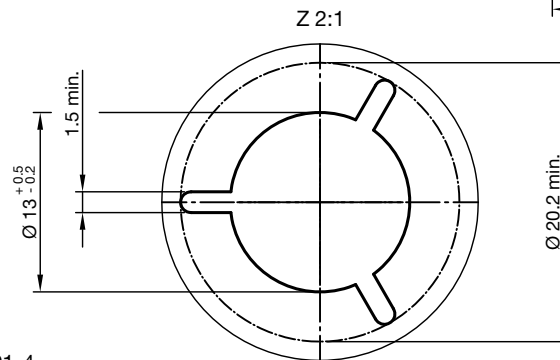
Not indicated tolerances ± 0.1



REEL DIMENSIONS in millimeters



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



technical drawings according to DIN specifications

Drawing-No.: 9.800-5096.01-4

Issue: 4; 08.03.2016



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