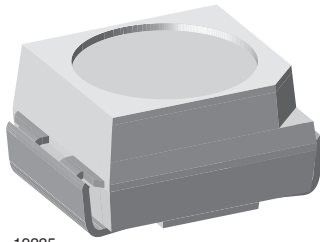


## Power SMD LED PLCC-2



19225

### DESCRIPTION

The VLMK33.. series is an advanced modification of the Vishay VLMK31.. series. It is designed to incorporate larger chips, therefore, capable of withstanding a 50 mA drive current.

The package of the VLMK33.. is the PLCC-2 (equivalent to a size B tantalum capacitor).

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-2
- Product series: power
- Angle of half intensity:  $\pm 60^\circ$

### FEATURES

- Available in 8 mm tape
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- Compatible with IR reflow, vapor phase and wave solder processes according to CECC 00802 and J-STD-020
- Preconditioning according to JEDEC® level 2a
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- Interior and exterior lighting
- Indicator and backlighting purposes for audio, video, LCDs, switches, symbols, illuminated advertising etc.
- Illumination purpose, alternative to incandescent lamps
- General use

### PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I <sub>F</sub> (mA)	WAVELENGTH (nm)			at I <sub>F</sub> (mA)	FORWARD VOLTAGE (V)			at I <sub>F</sub> (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMK33Q2T1-GS08	Amber	90	275	355	20	611	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs
VLMK33Q2T1-GS18	Amber	90	275	355	20	611	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs
VLMK33R1S2-GS08	Amber	112	250	280	20	611	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs
VLMK33R1S2-GS18	Amber	112	250	280	20	611	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs
VLMK33R2T2-2-GS08	Amber	140	275	450	20	614	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs
VLMK33S1T1-GS08	Amber	180	275	355	20	611	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs
VLMK33S1T1-GS18	Amber	180	275	355	20	611	617	622	20	-	1.9	2.5	20	AllnGaP on GaAs

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C unless otherwise specified)

#### VLMK33..

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage <sup>(1)</sup>		V <sub>R</sub>	5	V
DC forward current		I <sub>F</sub>	50	mA
Power dissipation		P <sub>V</sub>	130	mW
Junction temperature		T <sub>J</sub>	125	°C
Operating temperature range		T <sub>amb</sub>	-40 to +100	°C
Storage temperature range		T <sub>stg</sub>	-40 to +100	°C
Soldering temperature	t ≤ 5 s	T <sub>sd</sub>	260	°C
Thermal resistance junction / ambient	Mounted on PC board (pad size > 16 mm <sup>2</sup> )	R <sub>thJA</sub>	400	K/W

#### Note

- <sup>(1)</sup> Driving LED in reverse direction is suitable for a short term application

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)  
**VLMK33.., AMBER**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	$I_F = 20\text{ mA}$	VLMK33Q2T1	$I_V$	90	275	355	mcd
		VLMK33R1S2	$I_V$	112	250	280	mcd
		VLMK33R2T2-2	$I_V$	140	275	450	mcd
		VLMK33S1T1	$I_V$	180	275	355	mcd
Luminous flux/luminous intensity			$\phi_V/I_V$	-	3.14	-	mlm/mcd
Dominant wavelength	$I_F = 20\text{ mA}$	VLMK33Q2T1	$\lambda_d$	611	617	622	nm
		VLMK33R1S2	$\lambda_d$	611	617	622	nm
		VLMK33S1T1	$\lambda_d$	611	617	622	nm
		VLMK33R2T2-2	$\lambda_d$	614	617	622	nm
Peak wavelength	$I_F = 20\text{ mA}$		$\lambda_p$	-	624	-	nm
Spectral bandwidth at 50 % $I_{rel\ max}$ .	$I_F = 20\text{ mA}$		$\Delta\lambda$	-	18	-	nm
Angle of half intensity	$I_F = 20\text{ mA}$		$\phi$	-	$\pm 60$		deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$	-	1.9	2.5	V
Reverse current	$V_R = 5\text{ V}$		$V_R$	-	0.01	10	$\mu\text{A}$

**LUMINOUS INTENSITY CLASSIFICATION**

GROUP	LUMINOUS INTENSITY (mcd)	
	MIN.	MAX.
Q1	71	90
Q2	90	112
R1	112	140
R2	140	180
S1	180	224
S2	224	280
T1	280	355
T2	355	450

**Note**

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ . The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel). In order to ensure availability, single brightness groups will be not orderable. In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped on any one reel. In order to ensure availability, single wavelength groups will be not orderable.

**COLOR CLASSIFICATION**

GROUP	DOMINANT WAVELENGTH (nm)	
	AMBER	
	MIN.	MAX.
1	611	618
2	614	622

**Note**

- Wavelength are tested at a current pulse duration of 25 ms.

**CROSSING TABLE**

VISHAY	OSRAM
VLMK33Q2T1	LAT676-Q2T1
VLMK33R1S2	LAT676-R1S2
VLMK33S1T1	LAT676-S1T1

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

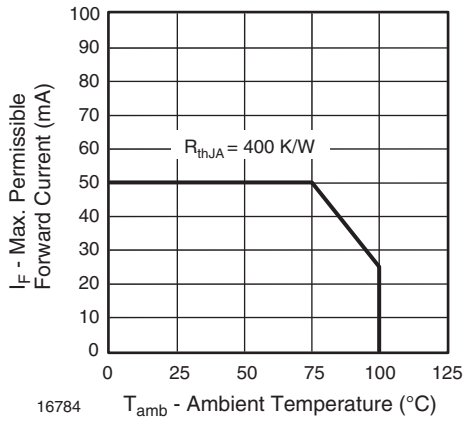


Fig. 1 - Forward Current vs. Ambient Temperature

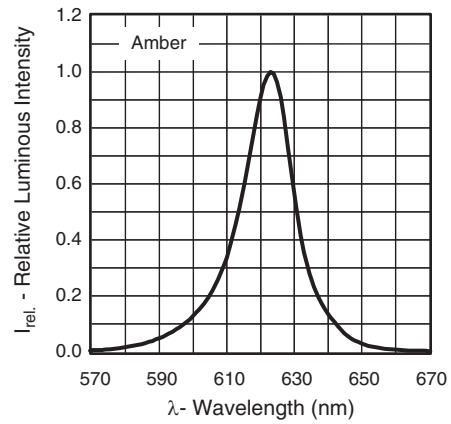


Fig. 4 - Relative Luminous Intensity vs. Angular Displacement

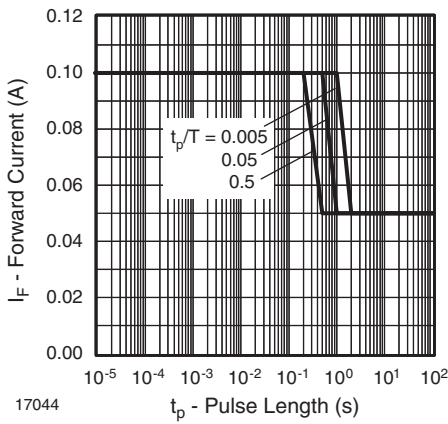


Fig. 2 - Forward Current vs. Pulse Length

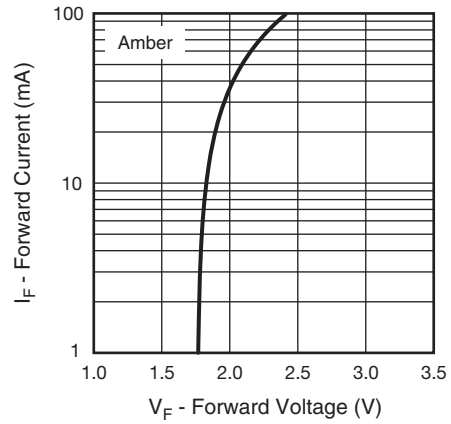


Fig. 5 - Forward Current vs. Forward Voltage

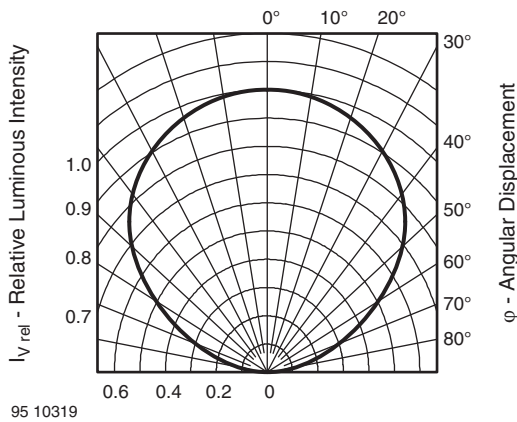


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

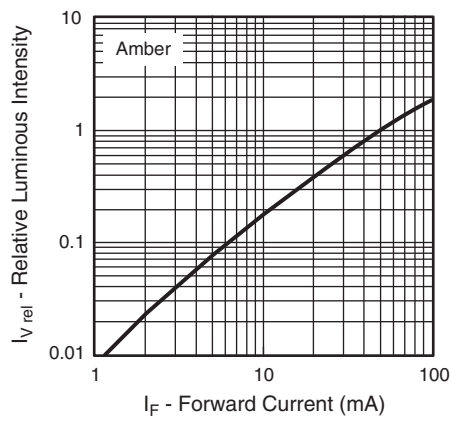


Fig. 6 - Change of Dominant Wavelength vs. Forward Current

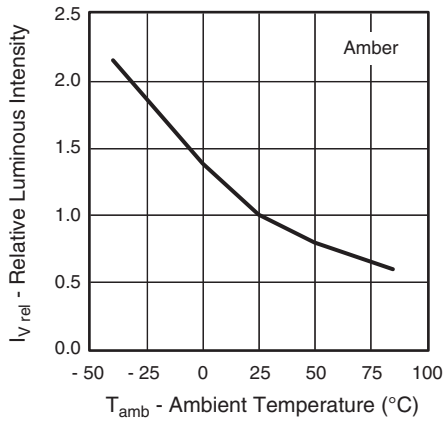


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

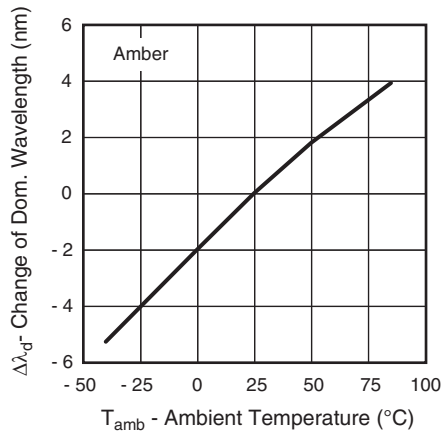


Fig. 8 - Change of Dominant Wavelength vs. Ambient Temperature

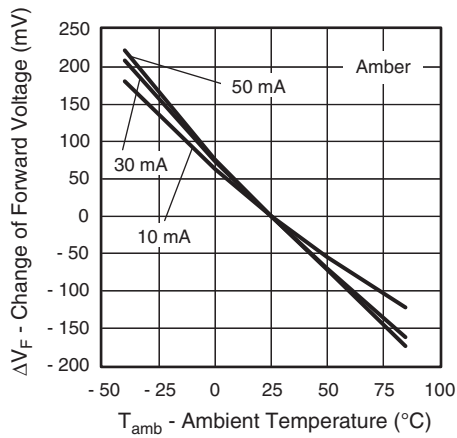
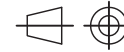
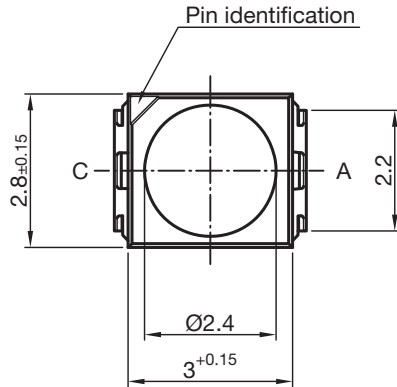
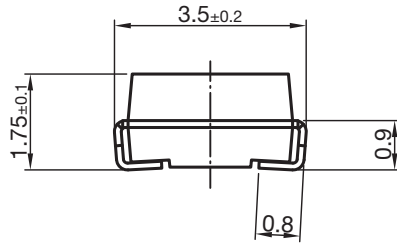


Fig. 9 - Change of Forward Voltage vs. Ambient Temperature



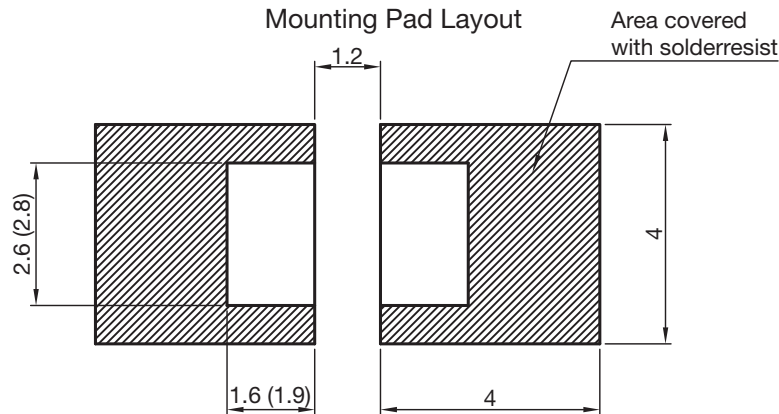
**PACKAGE DIMENSIONS** in millimeters



Technical drawings according to DIN specifications

Dimensions in mm

Drawing-No.: 6.541-5067.01-4  
Issue: 6; 23.09.13

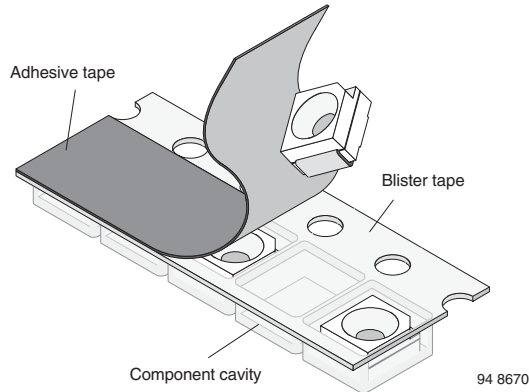


Dimensions: Reflow and vapor phase (wave soldering)

**METHOD OF TAPING / POLARITY AND TAPE AND REEL**

**SMD LED (VLM3-SERIES)**

Vishay's LEDs in SMD packages are available in an antistatic 8 mm blister tape (in accordance with DIN IEC 40 (CO) 564) for automatic component insertion. The blister tape is a plastic strip with impressed component cavities, covered by a top tape.



**REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDs, TAPE OPTION GS18 (= 8000 PCS) PREFERRED**

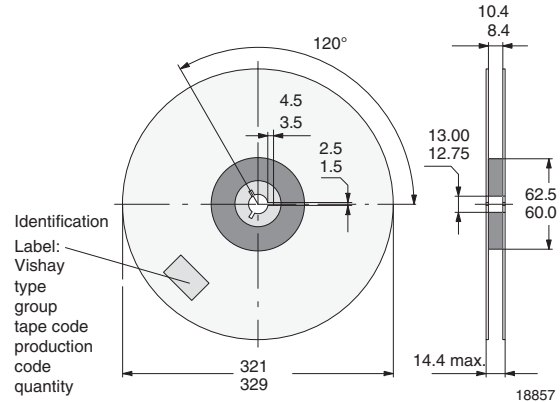


Fig. 12 - Reel Dimensions - GS18

**TAPING OF VLM.3..**

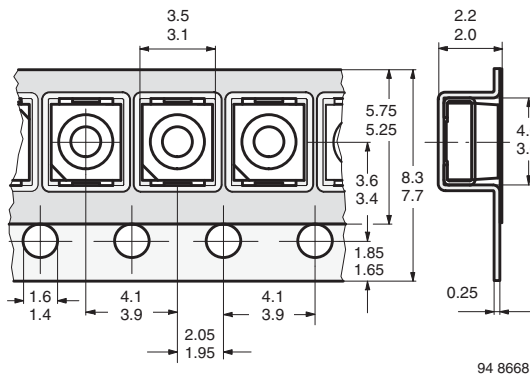


Fig. 10 - Tape Dimensions in mm for PLCC-2

**SOLDERING PROFILE**

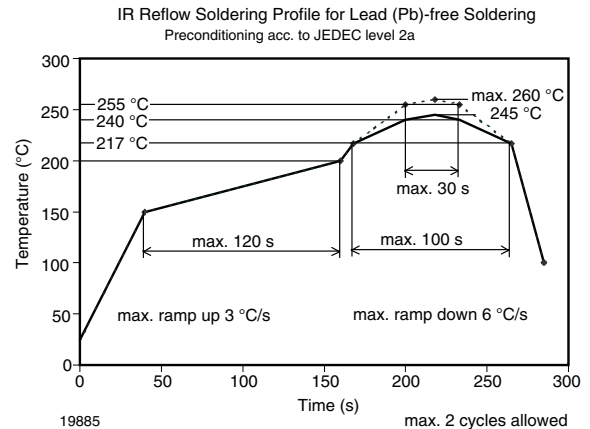


Fig. 13 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

**REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDs, TAPE OPTION GS08 (= 1500 PCS)**

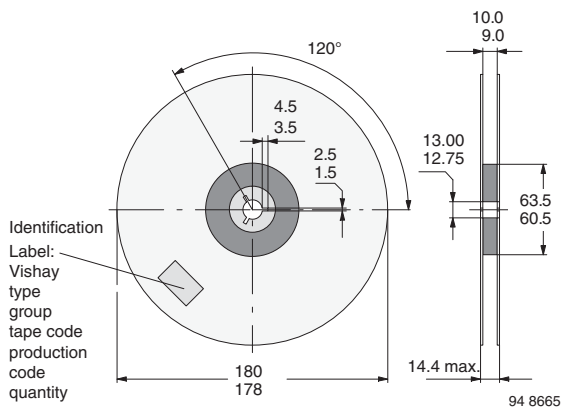


Fig. 11 - Reel Dimensions - GS08

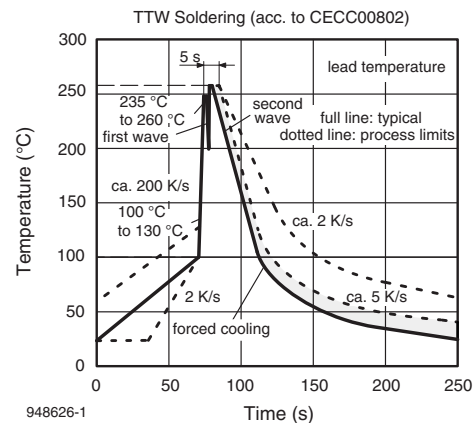
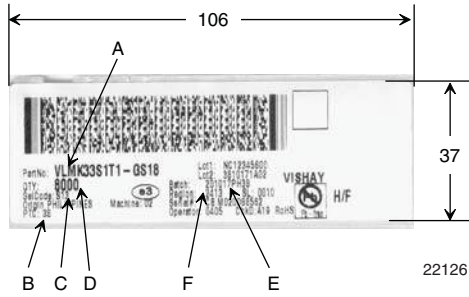


Fig. 14 - Double Wave Soldering of Opto Devices (all Packages)

**BAR CODE PRODUCT LABEL** (example)



- A) Type of component
- B) Manufacturing plant
- C) SEL - selection code (bin):  
e.g.: S1 = code for luminous intensity group  
3 = code for color group
- D) Total quantity
- E) Batch = date code: year / week / manufacturing plant
- F) Region code



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