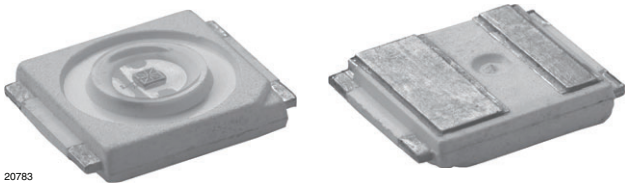
Little Star® 1 W Power SMD LED



20783

FEATURES

- Super high brightness surface mount LED
- High flux output
- 120° viewing angle
- Compact package outline (L x W x H) in mm: 6.0 x 6.0 x 1.5
- Ultra low height profile: 1.5 mm
- Designed for high current drive; typically 400 mA
- Low thermal resistance; R_{thJP} = 20 K/W
- Qualified according to JEDEC® moisture sensitivity level 2a
- Compatible with IR reflow solder processes according to CECC 00802 and J-STD-020C
- Little Star® are class 1M LED products. Do not view directly with optical instrument
- AEC-Q101 qualified
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B
- Optical efficiency typical up to 52 lm/W
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

DESCRIPTION

The VLMR71.., VLMY71.. is one of the most robust and light efficient LEDs in the market. With its extremely high level of brightness and the ultra low high profile, which is only 1.5 mm are highly suitable for both conventional lighting and specialized application such as automotive signal lights, traffic lights, channel lights, tube lights and garden lights among others.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD Little Star
- Product series: power
- Angle of half intensity: ± 60°

APPLICATIONS

- Automotive: exterior applications, e.g. center high mounted stop light (CHMSL), rear combination lights (RCLs), signal lighting, etc.
- Communication: indicator and backlight in mobile phone
- Industry: white goods (e.g. oven, microwave, etc.)
- Lighting: garden light, architecture lighting, general lighting, etc.

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I_F (mA)	WAVELENGTH (nm)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMR71AAAC-GS08	Red	7150	-	14 000	400	620	-	630	400	2.2	-	2.8	400	AlInGaP
VLMY71AAAC-GS08	Yellow	7150	-	14 000	400	585	-	597	400	2.2	-	2.8	400	AlInGaP

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

VLMR71.., VLMY71..

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	400	mA
Power dissipation		P_{tot}	1120	mW
Junction temperature		T_j	+120	°C
Surge current t < 10 µs, d = 0.1		I_{FM}	500	mA
Operating temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Thermal resistance junction / pin		R_{thJP}	20	K/W

Note

- Not designed for reverse operation

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) VLMR71AAAC-GS08, RED							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 400 mA	VLMR71AAAC	I_V	7150	-	14 000	mcd
Dominant wavelength	I_F = 400 mA		λ_d	620	-	630	nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 400 mA		$\Delta\lambda$	-	18	-	nm
Angle of half intensity	I_F = 400 mA		φ	-	± 60	-	°
Forward voltage (1)	I_F = 400 mA		V_F	2.2	-	2.8	V
Optical efficiency	I_F = 400 mA		η_{opt}	-	30	39	lm/W

Note

(1) Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.05 V

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) VLMY71AAAC-GS08, YELLOW							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity	I_F = 400 mA	VLMY71AAAC	I_V	7150	-	14 000	mcd
Dominant wavelength	I_F = 400 mA		λ_d	585	-	597	nm
Spectral bandwidth at 50 % $I_{rel\ max.}$	I_F = 400 mA		$\Delta\lambda$	-	15	-	nm
Angle of half intensity	I_F = 400 mA		φ	-	± 60	-	°
Forward voltage (1)	I_F = 400 mA		V_F	2.2	-	2.8	V
Optical efficiency	I_F = 400 mA		η_{opt}	-	30	39	lm/W

Note

(2) Forward voltages are tested at a current pulse duration of 1 ms and a tolerance of ± 0.05 V

LUMINOUS INTENSITY / FLUX CLASSIFICATION				
GROUP	**LUMINOUS INTENSITY I_V (mcd)**		**LUMINOUS FLUX ϕ_V (mlm) CORRELATION TABLE**	
STANDARD	**MIN.**	**MAX.**	**MIN.**	**MAX.**
AA	7150	9000	20 700	26 100
AB	9000	11 250	26 100	33 000
AC	11 250	14 000	33 000	39 000
AD	14 000	18 000	39 000	52 000
AE	18 000	22 400	52 000	71 000
AF	22 400	28 500	71 000	97 000

Note

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 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 not be orderable. In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped in any one reel. In order to ensure availability, single wavelength groups will not be orderable

COLOR CLASSIFICATION		
GROUP	DOM. WAVELENGTH (nm)	
	YELLOW	
	MIN.	MAX.
A	585	588
B	588	591
C	591	594
D	594	597

Note

- Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm

FORWARD VOLTAGE CLASSIFICATION		
GROUP	FORWARD VOLTAGE (V)	
	MIN.	MAX.
02	2.2	2.5
03	2.5	2.8

Note

- Forward voltages are tested at a current pulse duration of 25 ms and a tolerance of ± 0.05 V. In order to ensure availability, a single forward voltage group can not be ordered

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

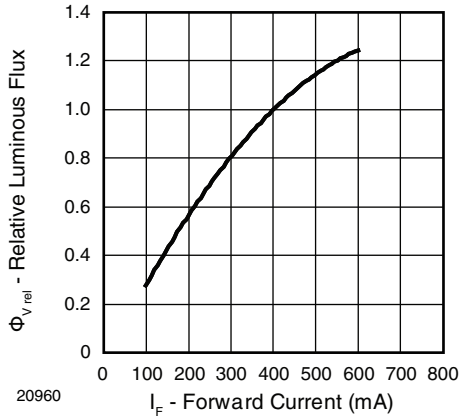


Fig. 1 - Relative Luminous Flux vs. Forward Current

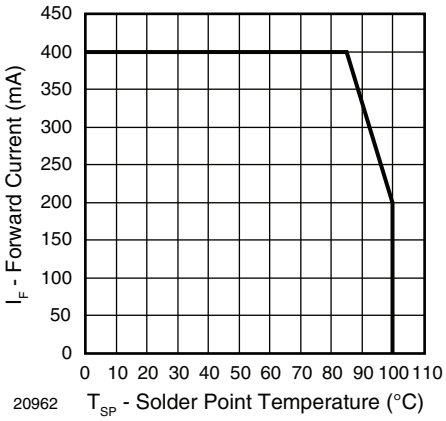


Fig. 3 - Forward Current vs. Solder Point Temperature

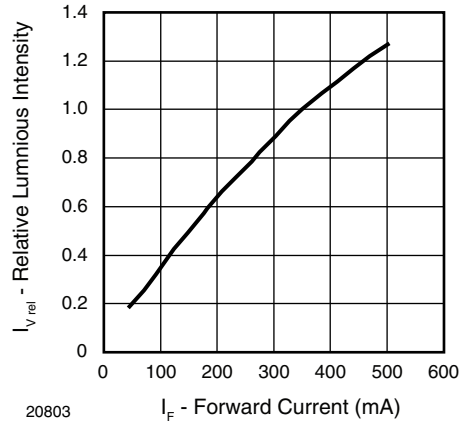


Fig. 2 - Relative Luminous Intensity vs. Forward Current

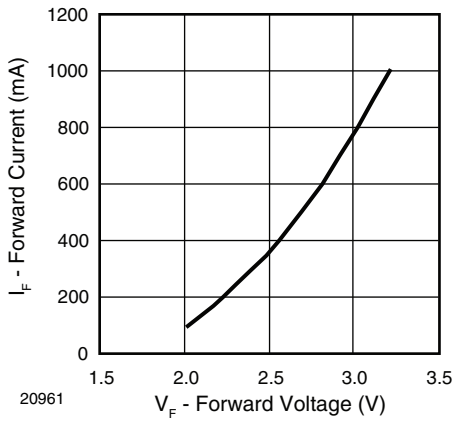


Fig. 4 - Forward Current vs. Forward Voltage

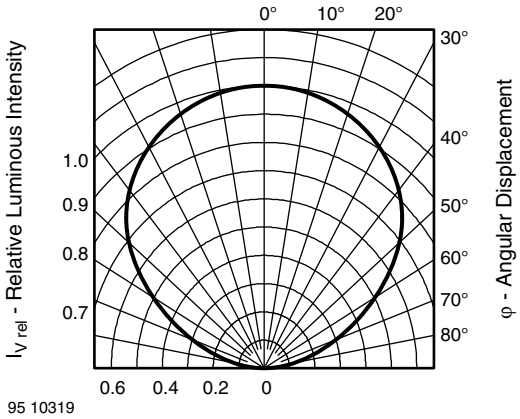
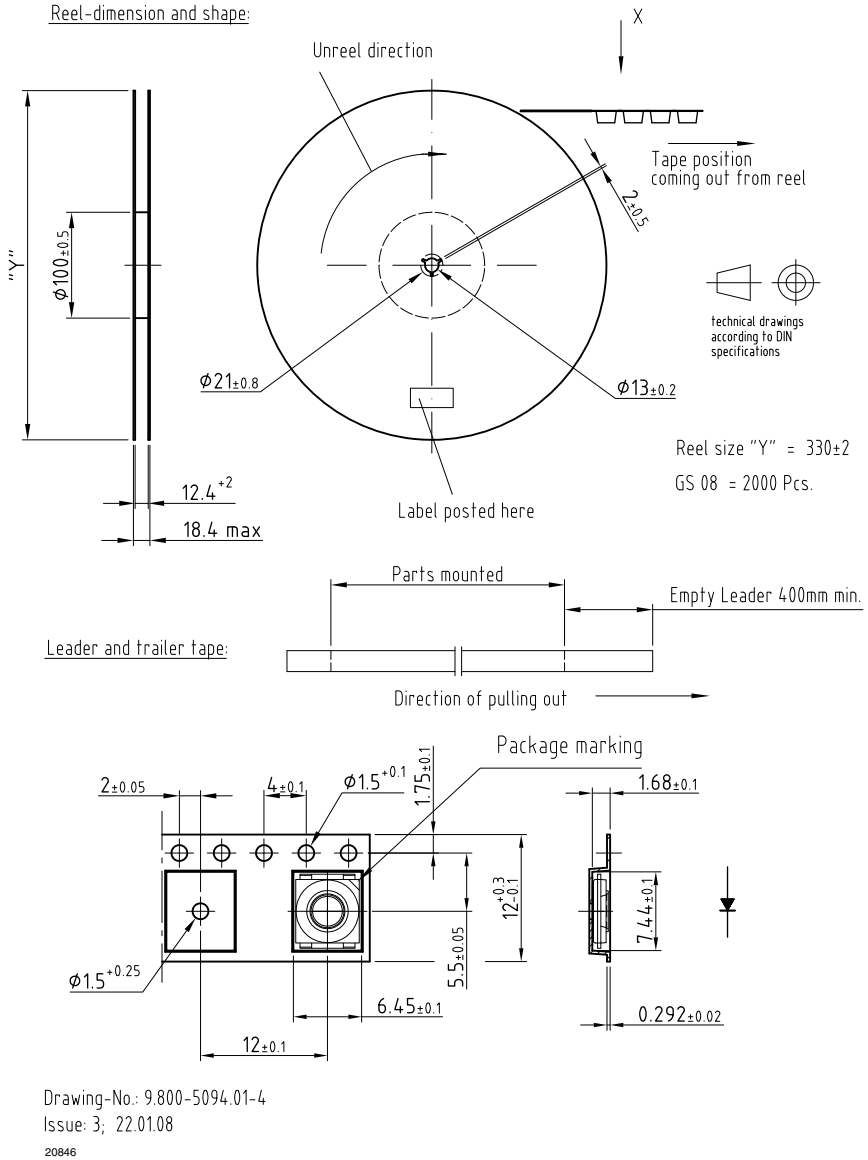
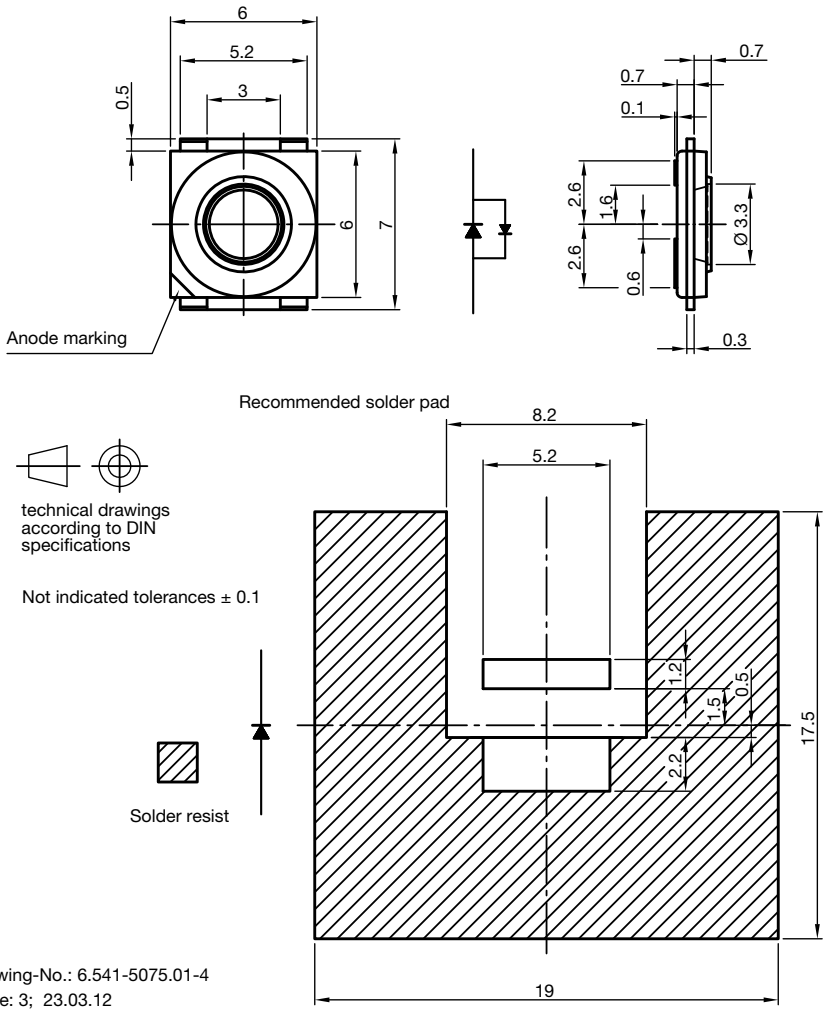


Fig. 5 - Relative Luminous Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters



PACKAGE DIMENSIONS / SOLDERING PADS DIMENSIONS in millimeters



SOLDERING PROFILE

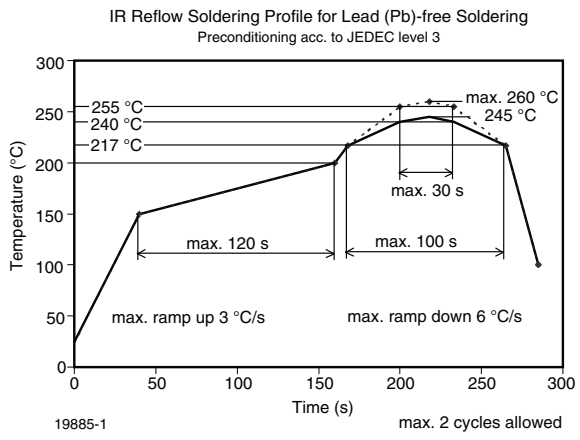
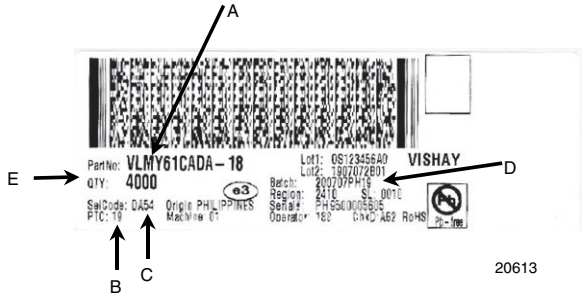


Fig. 6 - Vishay Lead (Pb)-free Reflow Soldering Profile
(according to J-STD-020C)

BAR CODE PRODUCT LABEL (Example)



A. Type of component

B. Manufacturing plant

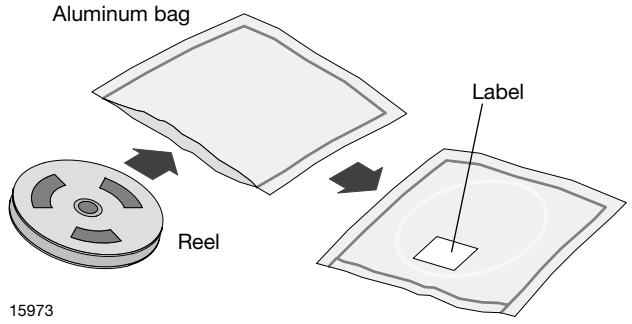
C. SEL - selection code (bin):
e.g.: DA = code for luminous intensity group
5 = code for color group
4 = code for forward voltage

D. Batch no.
20070 = year 2007, week 07
PH19 = plant code

E. Total quantity

DRY PACKING

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



FINAL PACKING

The sealed reel is packed into a cardboard box. A secondary cardboard box is used for shipping purposes.

RECOMMENDED METHOD OF STORAGE

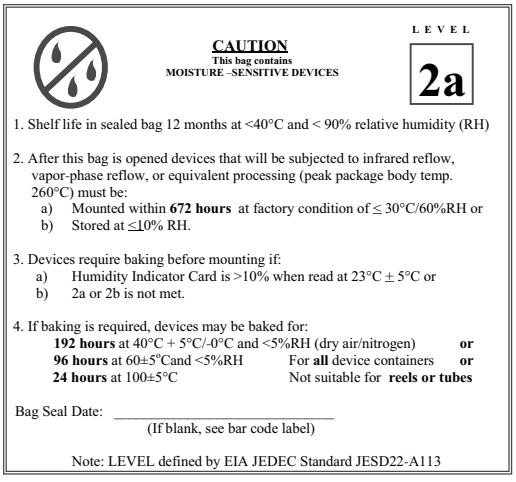
Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 672 h under these conditions moisture content will be too high for reflow soldering.
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

192 h at 40 °C + 5 °C / - 0 °C and < 5 % RH (dry air / nitrogen) or
96 h at 60 °C + 5 °C and < 5 % RH for all device containers or
24 h at 100 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC standard JESD22-A112 level 2a label is included on all dry bags.



Example of JESD22-A112 level 2a label

ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electrostatic sensitive devices warning labels are on the packaging.

VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.

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