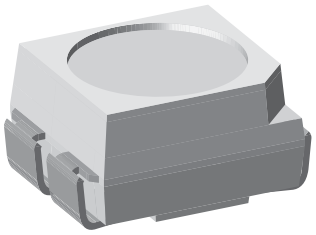
Power SMD LED PLCC-4



19210_1

DESCRIPTION

The VLMW321.. white LED is an advanced product in terms of heat dissipation.

The leadframe profile of this PLCC-4 SMD package is optimized to reduce the thermal resistance.

This allows higher drive current and doubles the light output compared to Vishay's high intensity SMD LED in PLCC-2 standard package.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-4
- Product series: power
- Angle of half intensity: ± 60°

FEATURES

- 3 anode pins, 1 cathode pin
- High efficient INGaN technology
- Long life time, due to silicone casting
- Angle of half intensity $\varphi = \pm 60°$
- Available in 8 mm tape
- Luminous intensity and color categorized per packing unit
- Luminous intensity ratio per packing unit $I_{Vmax.}/I_{Vmin.} \leq 1.6$
- ESD-withstand voltage: Up to 2 kV (HBM) according to JESD22-A114-B
- Preconditioning: according to JEDEC level 2a
- Compatible with IR-reflow, vapor phase and wave soldering processes according to CECC 00802 and J-STD-020
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Camera flash light
- Signals, signs, and symbol luminaire
- Marker lights
- Interior and exterior automotive lighting (brake lights, turn lights, backlighting, side markers)
- Indicator lighting
- General and architectural lighting
- Backlighting (advertising, displays, LCDs, switches, ...)

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I_F (mA)	COORDINATE (x, y)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMW321ABBB5K8L-08	White	1400	2200	2850	30	-	0.33, 0.33	-	30	2.9	3.4	4	30	InGaN on SiC
VLMW321BACA5K8L-08	White	1800	2800	3550	30	-	0.33, 0.33	-	30	2.9	3.4	4	30	InGaN on SiC

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMW321..

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage (1)		V_R	5	V
DC forward current	$T_{amb} \leq 60$ °C	I_F	50	mA
Surge forward current	$t_p \leq$ 10 µs	I_{FSM}	0.3	A
Power dissipation		PV	200	mW
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 110	°C
Storage temperature range		T_{stg}	- 40 to + 110	°C
Thermal resistance junction/ambient	Mounted on PC board (pad design see page 6)	R_{thJA}	300	K/W

Note

(1) Driving the LED in reverse direction is suitable for a short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMW321.., WHITE

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 30 mA	VLMW321ABBB5K8L	I_V	1400	2200	2850	mcd
		VLMW321BACA5K8L	I_V	1800	2800	3550	mcd
Luminous flux	I_F = 30 mA	VLMW321ABBB5K8L	ϕ_V	-	7000	-	mlm
		VLMW321BACA5K8L	ϕ_V	-	8900	-	mlm
Chromaticity coordinate x, y acc. to CIE 1931	I_F = 30 mA		x	-	0.33	-	
			y	-	0.33	-	
Angle of half intensity	I_F = 30 mA		φ	-	± 60	-	deg
Forward voltage	I_F = 30 mA		V_F	2.9	3.4	4	V
Reverse voltage	I_R = 10 µA		V_R	5	-	-	V
Temperature coefficient of V_F	I_F = 30 mA		TC_{VF}	-	- 3.6	-	mV/K
Temperature coefficient of I_V	I_F = 30 mA		TC_{IV}	-	- 0.5	-	%/K
Temperature coefficient of x	I_F = 30 mA		TC_x	-	- 0.0002	-	Dx/K
Temperature coefficient of y	I_F = 30 mA		TC_y	-	- 0.0003	-	Dy/K

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LIGHT INTENSITY (mcd)	
STANDARD	MIN.	MAX.
AB	1400	1800
BA	1800	2240
BB	2240	2850
CA	2850	3550

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 on any one reel.
  In order to ensure availability, single wavelength groups will not be orderable.

CHROMATICITY COORDINATED GROUPS FOR WHITE SMD LED						
	X	Y			X	Y
5L	0.291	0.268		7L	0.330	0.330
	0.285	0.279			0.330	0.347
	0.307	0.312			0.347	0.371
	0.310	0.297			0.345	0.352
5K	0.296	0.259		7K	0.330	0.310
	0.291	0.268			0.330	0.330
	0.310	0.297			0.338	0.342
	0.313	0.284			0.352	0.344
6L	0.310	0.297		8L	0.345	0.352
	0.307	0.312			0.347	0.371
	0.330	0.347			0.367	0.401
	0.330	0.330			0.364	0.380
6K	0.313	0.284		8K	0.352	0.344
	0.310	0.297			0.338	0.342
	0.330	0.330			0.364	0.380
	0.330	0.310			0.360	0.357

Note

- Chromaticity coordinate groups are tested at a current pulse direction of 25 ms and a tolerance of ± 0.01.

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

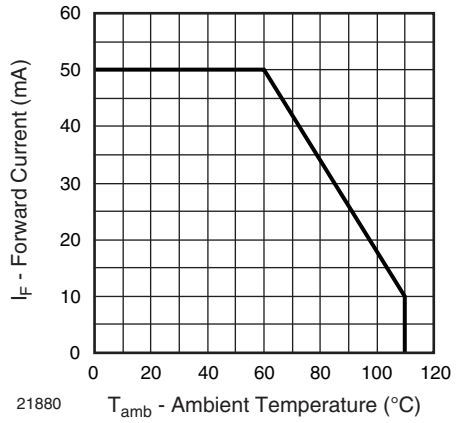


Fig. 1 - Forward Current vs. Ambient Temperature

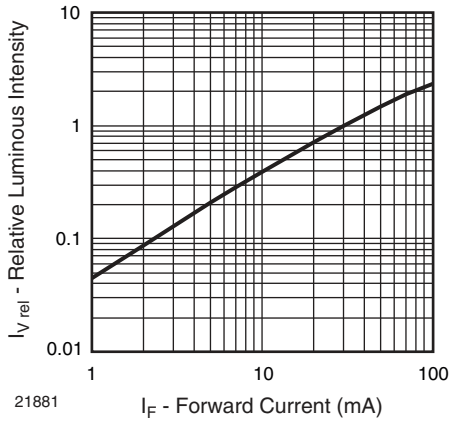


Fig. 2 - Relative Luminous Intensity vs. Forward Current

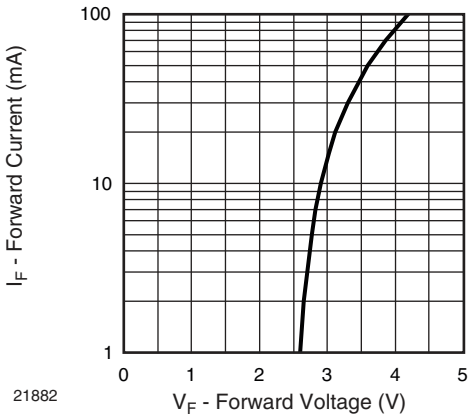


Fig. 3 - Forward Current vs. Forward Voltage

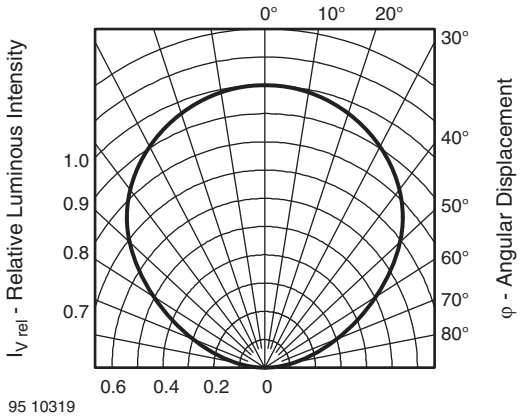


Fig. 5 - Relative Luminous Intensity vs. Angular Displacement

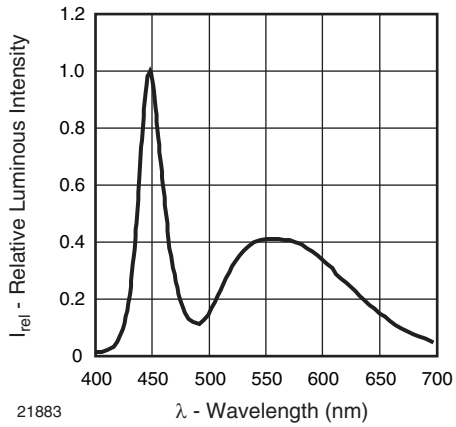


Fig. 4 - Relative Intensity vs. Wavelength

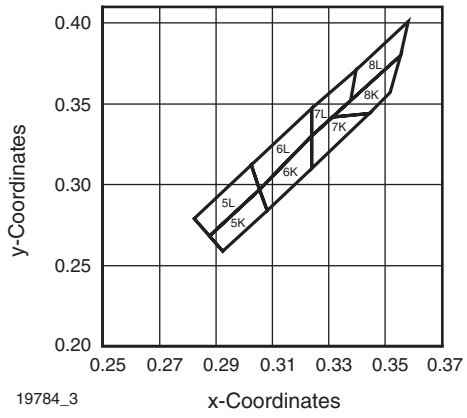
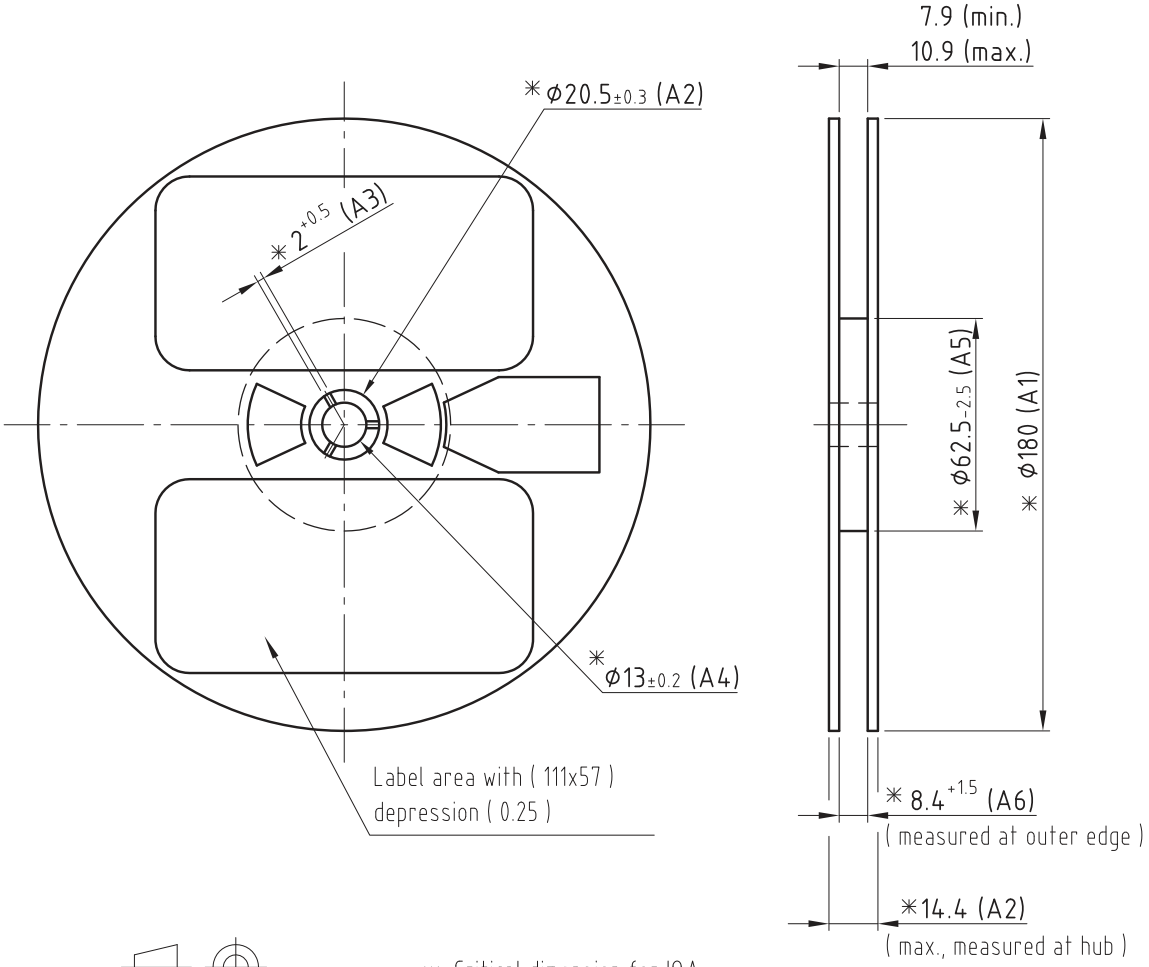


Fig. 6 - White Grouping SMD

REEL DIMENSIONS in millimeters



technical drawings according to DIN specifications

✳ Critical dimension for IQA.

GS08 = 2000 pcs

Not indicated tolerances ±0.05
Material: black static dissipative

Drawing refers to following types: ϕ180 mm Plastic reel

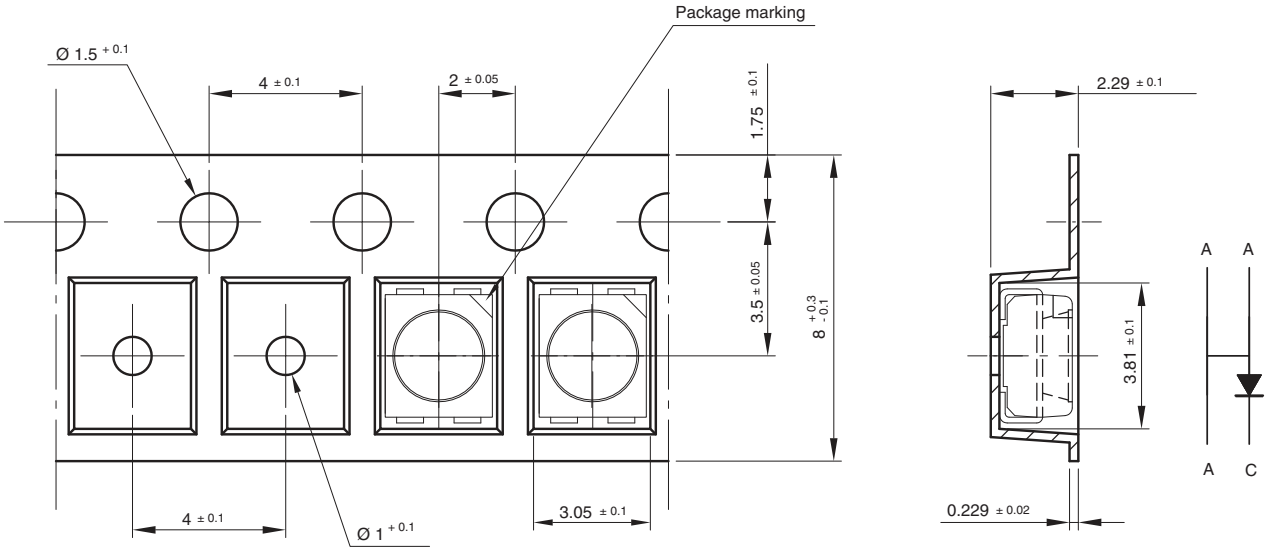
Drawing-No.: 9.800-5086.01-4
Issue: 2; 05.05.08

20983

TAPING DIMENSIONS in millimeters

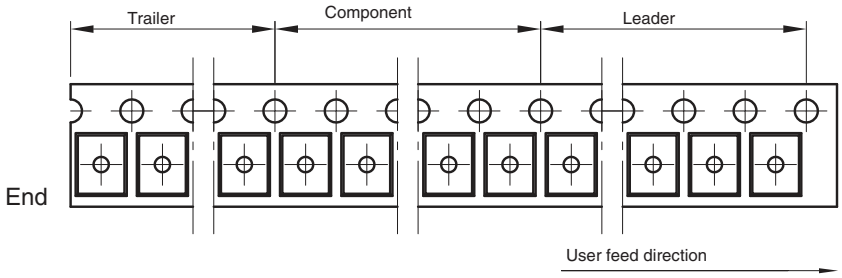
Taping and orientation

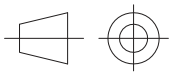
180 reel come in quantity of 2000 units
330 reel come in quantity of 8000 units



200 mm min. for 180 reel
200 mm min. for 330 reel

480 mm min. for 180 reel
960 mm min. for 330 reel

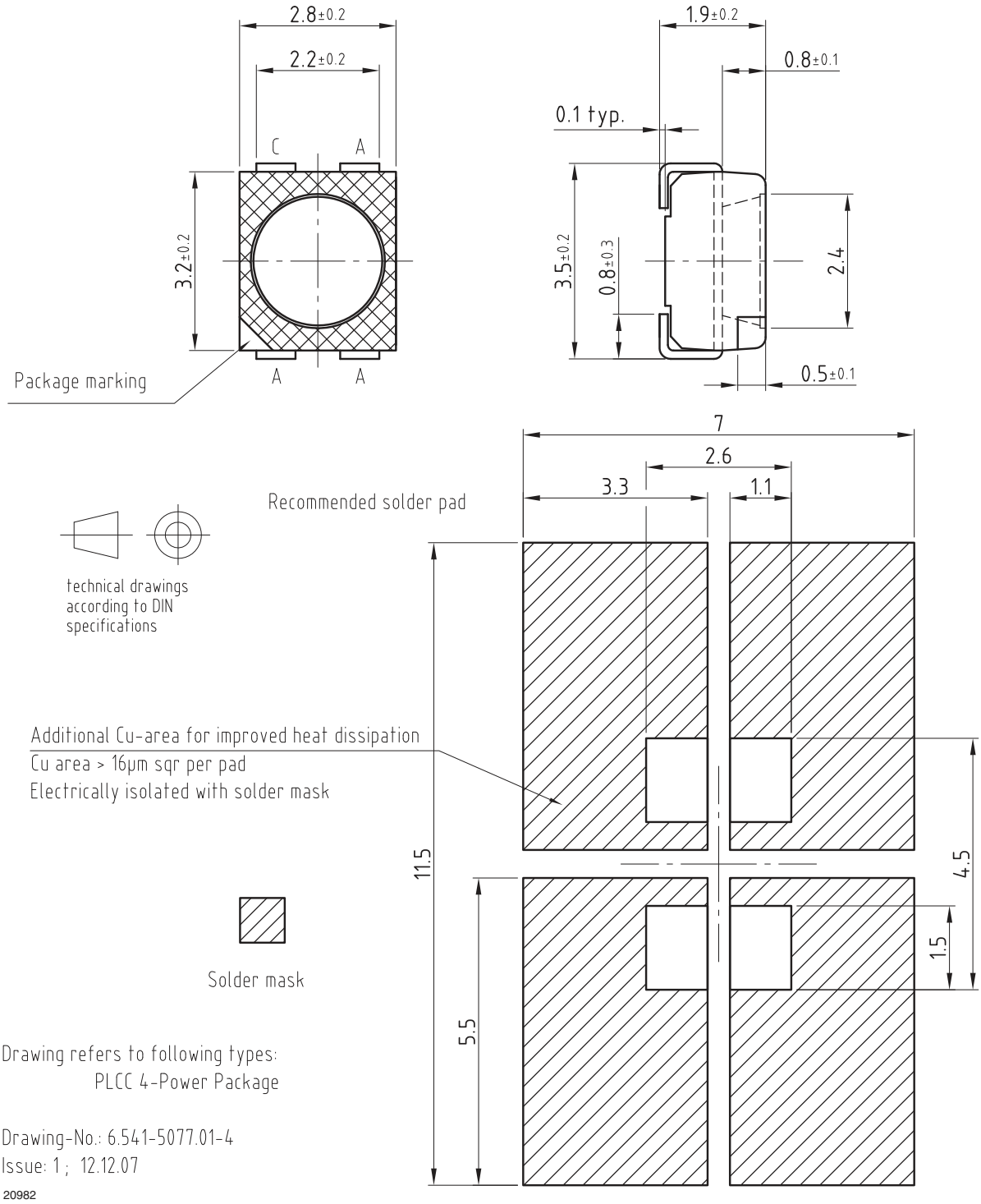




technical drawings
according to DIN
specifications

Drawing-No.: 9.700-5334.01-4
Issue: 3; 27.11.08
21066

OPTIONAL PAD DESIGN DIMENSIONS in millimeters
(Reflow-Soldering), R_{thJA} = 290 K/W



SOLDERING PROFILE

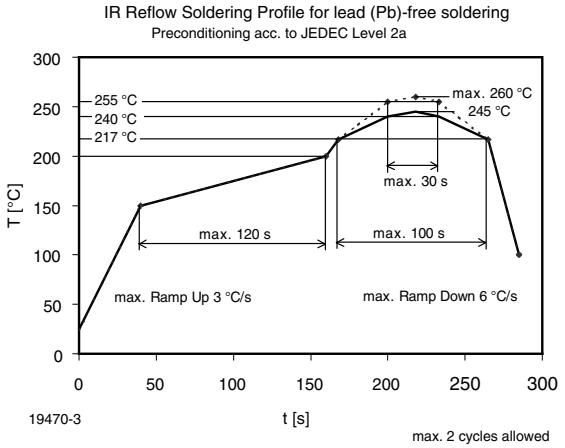


Fig. 7 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

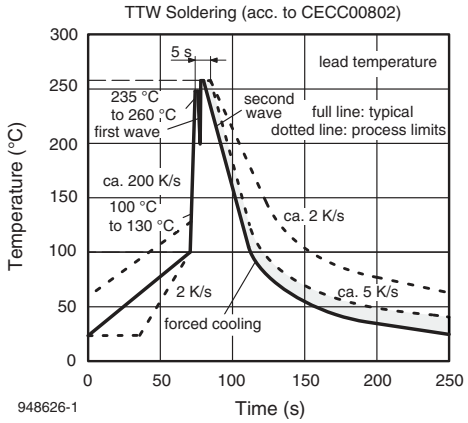
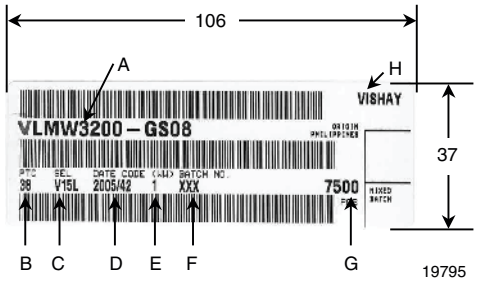


Fig. 8 - Double Wave Soldering of Opto Devices (all Packages)

BAR CODE PRODUCT LABEL (example)



A. Type of component

B. Manufacturing plant

C. SEL - selection code (bin):
e.g.: V1 = code for luminous intensity group
5L = code for chrom. coordinate group

D. Date code year/week

E. Day code (e. g. 1: Monday)

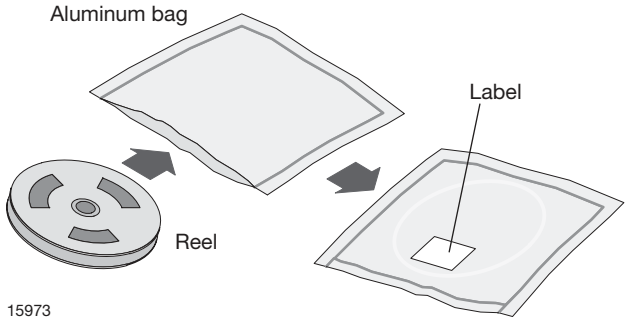
F. Batch no.

G. Total quantity

H. Company code

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:

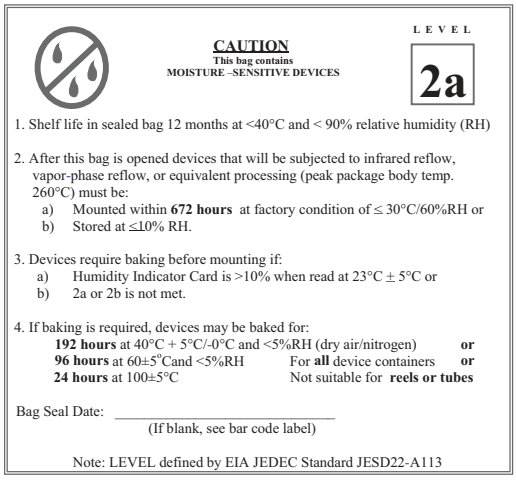
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

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. Electro-static sensitive devices warning labels are on the packaging.

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