Power SMD LED PLCC-2 Plus

22038

FEATURES

- High efficient InGaN technology
- Long life, due to silicone resin casting
- Compact package outline 3.5 mm x 3.5 mm x 1.2 mm
- Angle of half intensity $\varphi = \pm 60°$
- Luminous flux and color categorized per packing unit
- Luminous flux ratio per packing unit $\phi_{max.}/\phi_{min.} < 1.2$
- ESD-withstand voltage: up to 2 kV (HBM) according to JESD22-A114-B
- Preconditioning according to JEDEC® level 2
- Compatible with IR-reflow soldering profiles according to J-STD-020
- AEC-Q101 qualified
- 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 VLMW51.. white LED in PLCC-2 plus package is an advanced product in terms of high luminous flux and low thermal resistance.

In combination with the small package outline (3.5 mm x 3.5 mm x 1.2 mm) the PLCC-2 plus is an ideal choice for backlighting, signage, exterior and interior automotive lighting as well as all general lighting applications.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-2 plus
- Product series: power
- Angle of half intensity: ± 60°

APPLICATIONS

- Camera flash light
- Marker lights
- Interior and exterior automotive lighting
- Decorative lighting
- Architectural lighting
- All kinds of general lighting
- Backlighting (TFT LCD displays)

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (mlm)			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.		
VLMW51Q2R3-GS08	White	30 600	40 000	51 700	150	-	0.33, 0.33	-	150	3	3.4	4.1	150	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMW51Q2R3

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
DC Forward current		I_F	180	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	350	mA
Power dissipation		PV	738	mW
Junction temperature		$T_{jmax.}$	125	°C
Operating temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Thermal resistance junction-to-solder point		R_{thJS}	45	K/W
Thermal resistance junction-to-ambient	Mounted on PC board total Cu area > 900 mm²	R_{thJA}	125	K/W

Note

- Not designed for reverse bias

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMW51P2Q3, WHITE

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux	I_F = 150 mA	VLMW51Q2R3	ϕV	30.6	40	51.7	lm
Luminous intensity	I_F = 150 mA	VLMW51Q2R3	I_V	-	13	-	cd
Chromaticity coordinate x, y according to CIE 1931	I_F = 150 mA		x y	-	0.33 0.33	-	
Angle of half intensity	I_F = 150 mA		φ	-	± 60	-	deg
Forward voltage	I_F = 150 mA		V_F	3	3.4	4.1	V
Temperature coefficient of V_F	I_F = 150 mA		TC_{VF}	-	-3.7	-	mV/K
Temperature coefficient of I_V	I_F = 150 mA		TC_{IV}	-	-0.25	-	%/K
Temperature coefficient of x	I_F = 150 mA		TC_x	-	-0.00022	-	1/K
Temperature coefficient of y	I_F = 150 mA		TC_y	-	-0.00016	-	1/K

Note
- Not designed for reverse bias

LUMINOUS FLUX CLASSIFICATION

GROUP	LUMINOUS FLUX (lm)	
STANDARD	MIN.	MAX.
Q2	30.6	34.8
Q3	34.8	39.8
R2	39.8	45.2
R3	45.2	51.7

Note
- Luminous flux 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 PLCC-2 PLUS

	X	Y		X	Y
YU	0.274	0.301	WL	0.317	0.325
	0.283	0.284		0.319	0.310
	0.307	0.316		0.329	0.319
	0.303	0.333		0.329	0.336
YL	0.283	0.284	VU	0.329	0.354
	0.290	0.270		0.329	0.336
	0.310	0.299		0.345	0.350
	0.307	0.316		0.347	0.368
XU	0.303	0.333	VL	0.329	0.336
	0.307	0.316		0.329	0.319
	0.317	0.325		0.343	0.331
	0.315	0.343		0.345	0.350
XL	0.307	0.316	UU	0.347	0.368
	0.310	0.299		0.345	0.350
	0.319	0.310		0.361	0.365
	0.317	0.325		0.364	0.383
WU	0.315	0.343	UL	0.345	0.350
	0.317	0.325		0.343	0.331
	0.329	0.336		0.357	0.343
	0.329	0.354		0.361	0.365

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)

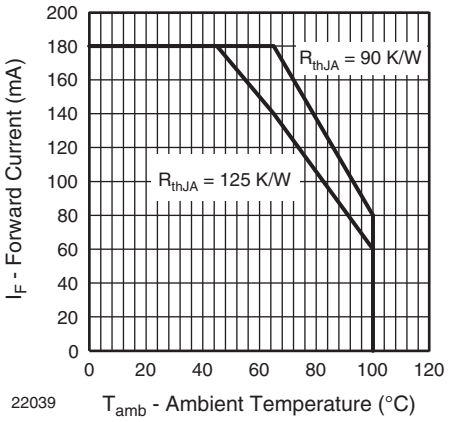


Fig. 1 - Forward Current vs. Ambient Temperature

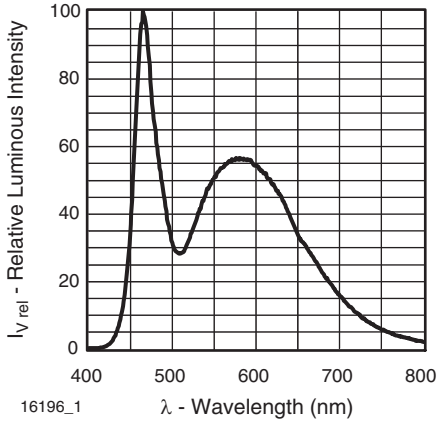


Fig. 4 - Relative Intensity vs. Wavelength

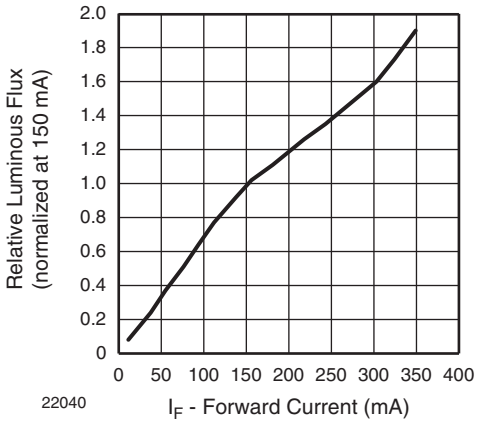


Fig. 2 - Relative Luminous Intensity vs. Forward Current

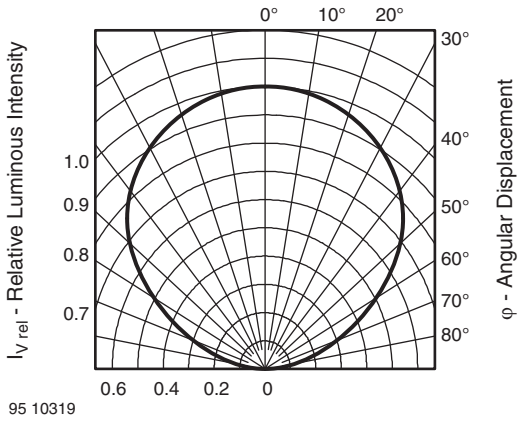


Fig. 5 - Relative Luminous Intensity vs. Angular Displacement

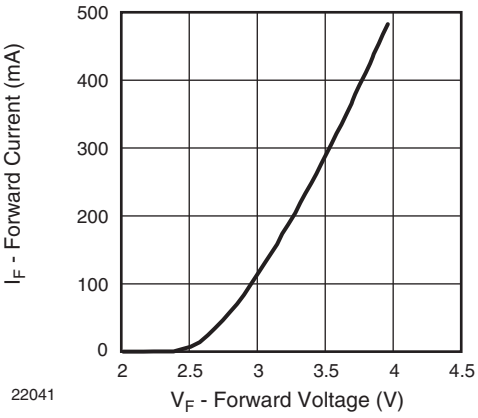


Fig. 3 - Forward Current vs. Forward Voltage

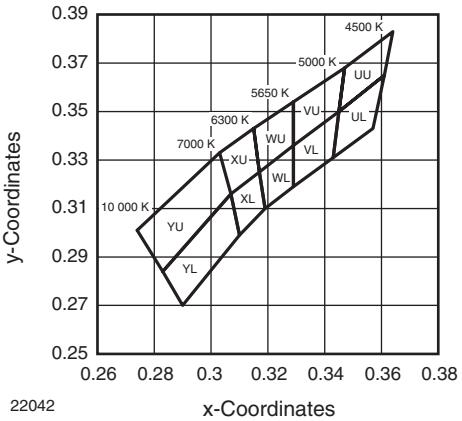
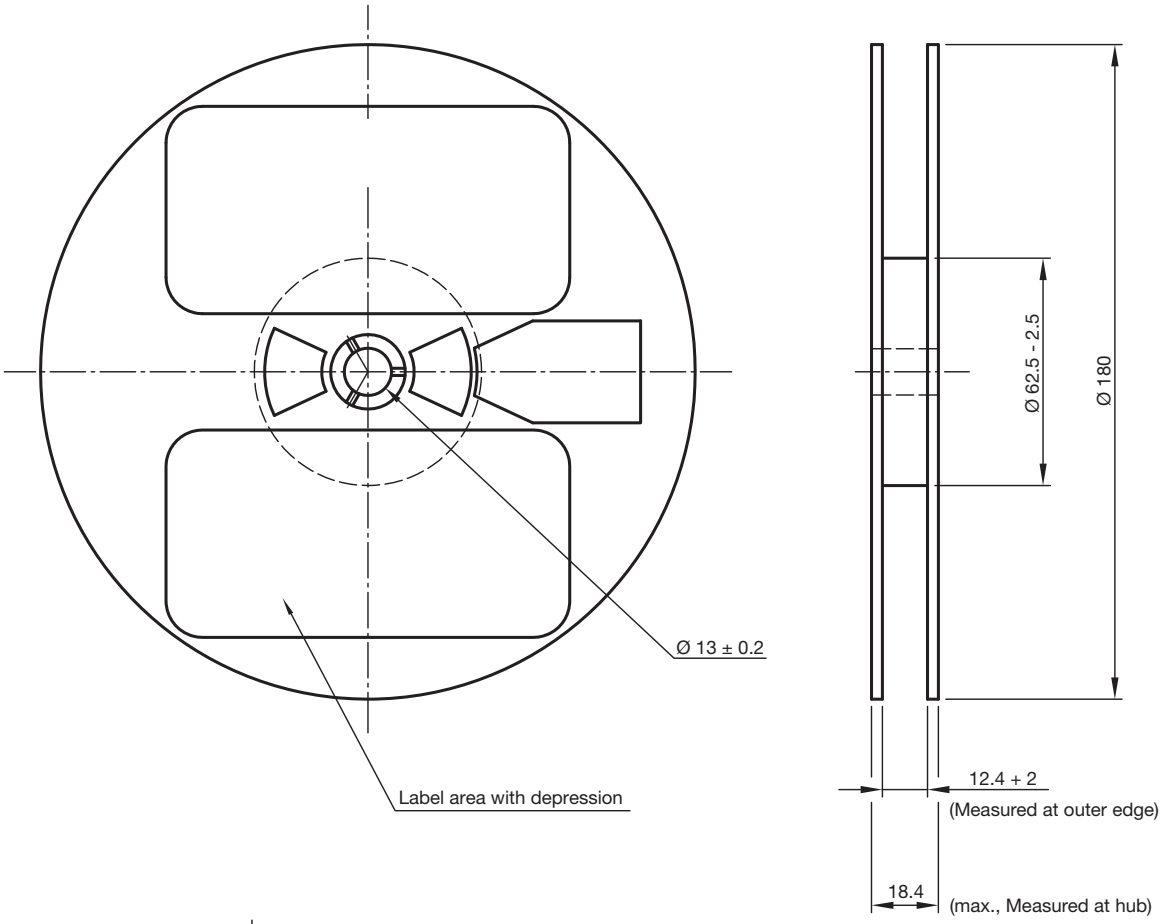


Fig. 6 - White Grouping SMD

REEL DIMENSIONS in millimeters



technical drawings
according to DIN
specifications

Not indicated tolerances ± 0.5

Material: black static dissipative

GS08 = 1000 pcs

Drawing-No.: 9.800-5104.01-4
Issue: 2; 19.03.10

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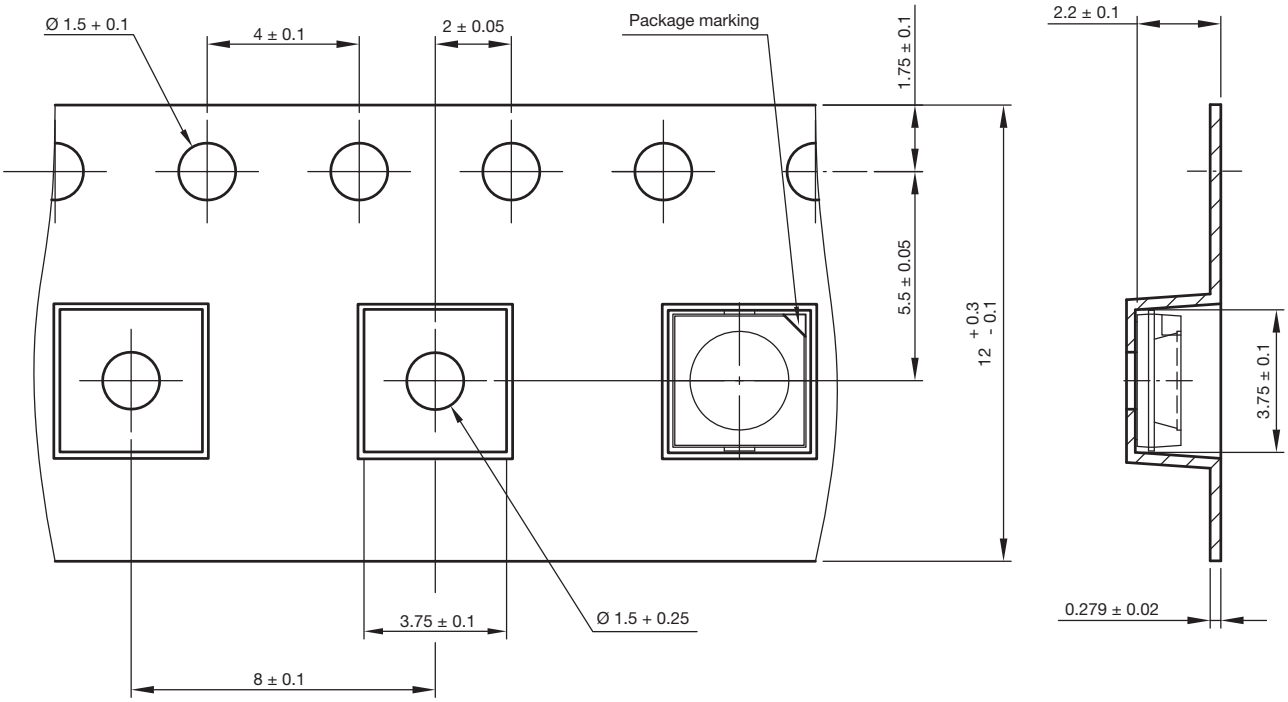
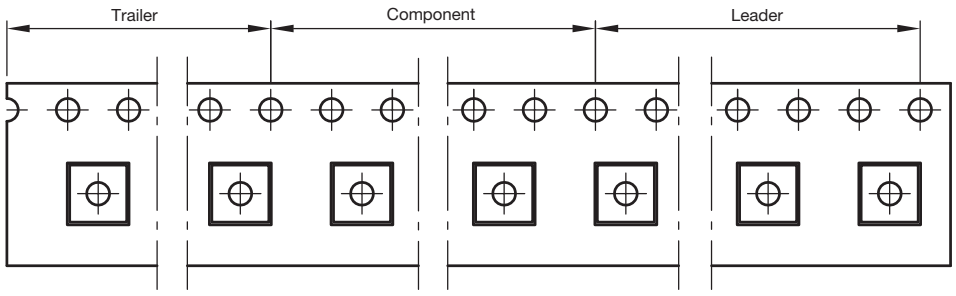
TAPING AND ORIENTATION DIMENSIONS in millimeters

Reels come in quantity of 1000 units.



200 mm min. for Ø 180 reel

480 mm min. for Ø 180 reel



User feed direction

technical drawings according to DIN specifications

Drawing-No.: 9.700-5348.01-4

Issue: 1; 01.03.10

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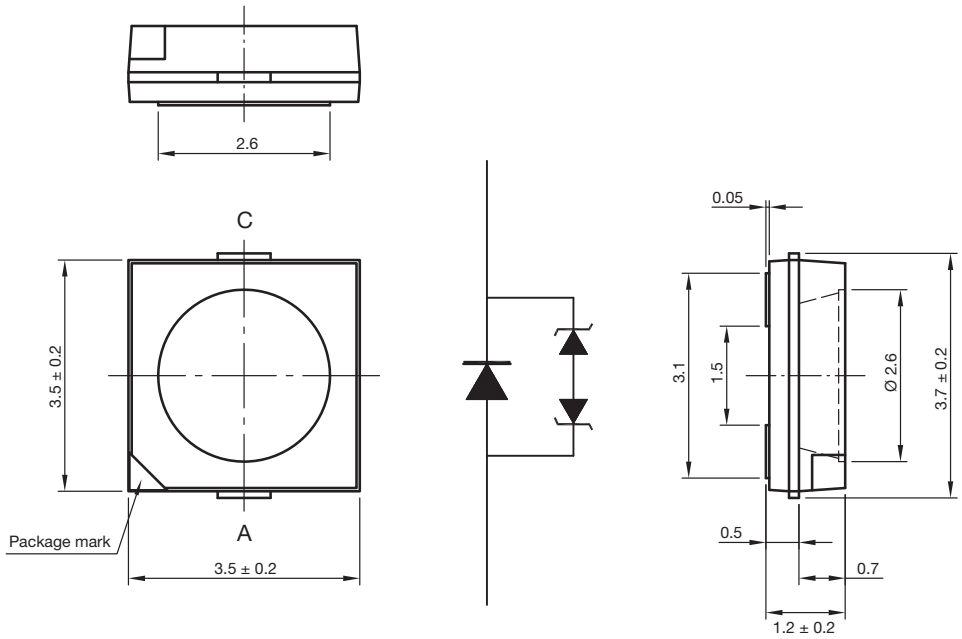
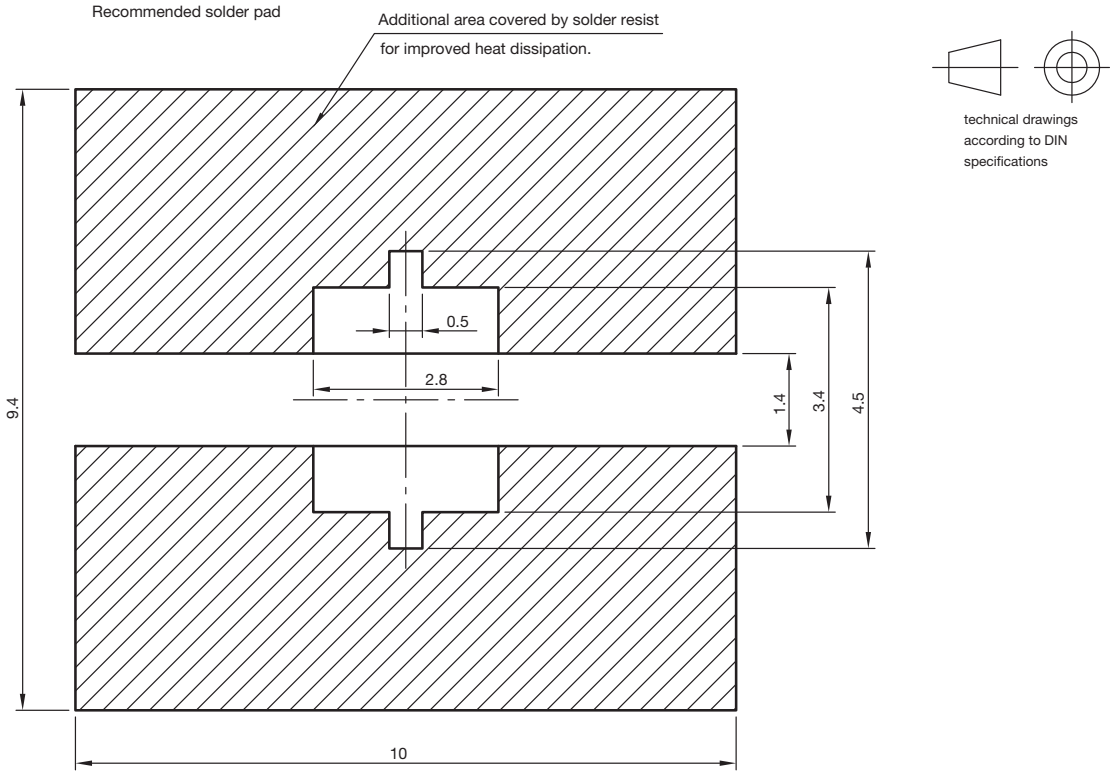
RECOMMENDED PAD DESIGN DIMENSIONS in millimeters





Drawing-No.: 6.541-5082.01-4
Issue: 2; 23.07.10
22065

SOLDERING PROFILE

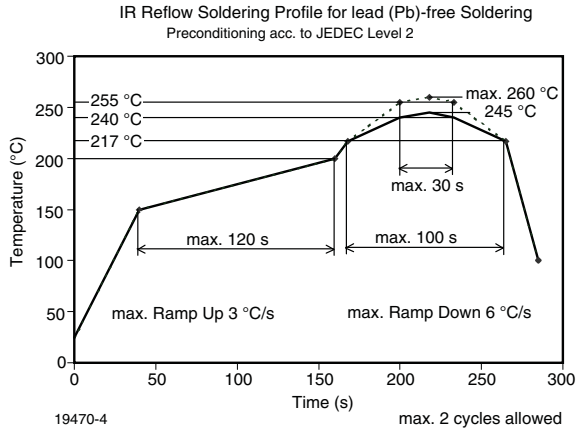
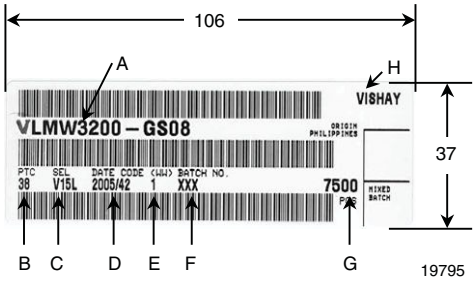


Fig. 7 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020)

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)

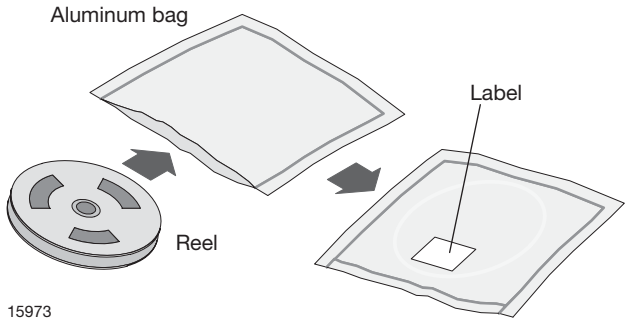
F) Batch no.

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:

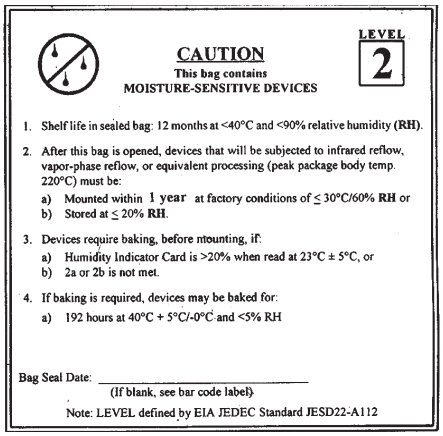
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 1 year 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 2 label is included on all dry bags.



Example of JESD22-A112 level 2 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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