Standard SMD MiniLED

FEATURES

- Small dimensions (L x W x H in mm): 2.2 x 1.4 x 1.35
- Luminous intensity and color categorized
- Compatible with automatic placement equipment
- EIA and ICE standard package
- IR reflow soldering according to J-STD-020
- Available in 8 mm tape
- Excellent for coupling to light pipes and backlighting
- Preconditioning according to JEDEC® level 3
- Corrosion robustness class: B1
- ESD-withstand voltage: up to 8 kV according to JESD22-A114-B
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

DESCRIPTION

The MiniLED premold package consists of a leadframe which is embedded in a white thermoplast featuring exceptional brightness and small package dimensions 2.2 mm x 1.3 mm x 1.4 mm. The reflector inside this package is filled with a mixture of epoxy and a light conversion phosphor.

The phosphor converts the blue emission partially to yellow, which mixes with the remaining blue to give white.

The MiniLED is an obvious solution for small-scale, high-power products that are expected to work reliably in an arduous environment.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD MiniLED
- Product series: standard
- Angle of half intensity: ± 60°

APPLICATIONS

- Interior automotive lighting
- Signal lights
- Backlight and indicator for office-, entertainment-, and telecommunication equipment
- Flat backlight for LCDs, switches, and symbols
- General use

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.		
VLMW2342-00-08	White	1120	1800	2800	20	-	0.3, 0.29	-	20	2.75	3.1	3.75	20	InGaN / sapphire

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified) **VLMW2342-00-08, WHITE**				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage		Not designed for reverse operation		
DC forward current		I_F	30	mA
Surge forward current (1)	$t_p \leq 10$ µs, $t_p/T = 0.005$	I_{FSM}	250	mA
Power dissipation		P_V	112	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
Peak soldering temperature	Reflow	T_{sld}	260	°C
ESD withstand voltage	HBM	V_{ESD}	8	kV
Thermal resistance junction to ambient	Mounted on PC board (pad size > 5 mm^2)	R_{thJA}	480	K/W
Thermal resistance junction to solder point		R_{thJS}	200	K/W

Note

(1) A minimum DC forward current of 2 mA is recommended to avoid color and brightness deviations

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **VLMW2342-00-08, WHITE**						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity (1)	I_F = 20 mA	I_V	1120	1800	2800	mcd
Luminous flux/luminous intensity		ϕ_V/I_V	-	3.0	-	mlm/mcd
Chromatically coordinate x acc. to CIE 1931	I_F = 20 mA	x	-	0.3	-	
Chromatically coordinate y acc. to CIE 1931	I_F = 20 mA	y	-	0.29	-	
Angle of half intensity	I_F = 20 mA	φ	-	± 60	-	°
Forward voltage (1)	I_F = 20 mA	V_F	2.75	3.1	3.75	V

Note

(1) Tolerances: ± 8 % for I_V, ± 0.05 V for V_F, ± 0.005 for x and y color coordinates

LUMINOUS INTENSITY CLASSIFICATION at 20 mA		
GROUP	**LUMINOUS INTENSITY (mcd)**	
STANDARD	**MAX.**	**MAX.**
AA	1120	1400
AB	1400	1800
BA	1800	2240
BB	2240	2800

Notes

- Luminous intensity is tested with an accuracy of ± 8 %.
- Each reel contains only one luminous intensity group.
- In order to ensure availability, single luminous intensity groups will not be orderable.

CIE 1931 COLOR COORDINATES at 20 mA								
GROUP	X	Y	GROUP	X	Y	GROUP	X	Y
FK0	0.2589	0.2000	FL0	0.2498	0.2053	FM0	0.2388	0.2348
	0.2498	0.2053		0.2402	0.2108		0.2269	0.2185
	0.2597	0.2204		0.2509	0.2264		0.2402	0.2108
	0.2682	0.2146		0.2597	0.2204		0.2509	0.2264
GK0	0.2682	0.2146	GL0	0.2597	0.2204	GM0	0.2509	0.2264
	0.2597	0.2204		0.2509	0.2264		0.2388	0.2348
	0.2700	0.2361		0.2624	0.2431		0.2520	0.2527
	0.2775	0.2292		0.2700	0.2361		0.2624	0.2431
HK0	0.2775	0.2292	HL0	0.2700	0.2361	HM0	0.2624	0.2431
	0.2700	0.2361		0.2624	0.2431		0.2520	0.2527
	0.2797	0.2509		0.2733	0.2590		0.2646	0.2700
	0.2861	0.2427		0.2797	0.2509		0.2733	0.2590
IK0	0.2861	0.2427	IL0	0.2797	0.2509	IM0	0.2733	0.2590
	0.2797	0.2509		0.2733	0.2590		0.2646	0.2700
	0.2898	0.2664		0.2848	0.2757		0.2780	0.2883
	0.2950	0.2568		0.2898	0.2664		0.2848	0.2757
JK0	0.2950	0.2568	JL0	0.2898	0.2664	JM0	0.2848	0.2757
	0.2898	0.2664		0.2848	0.2757		0.2780	0.2883
	0.3007	0.2830		0.2971	0.2935		0.2922	0.3077
	0.3045	0.2717		0.3007	0.2830		0.2971	0.2935
KK0	0.3045	0.2717	KL0	0.3007	0.2830	KM0	0.2971	0.2935
	0.3007	0.2830		0.2971	0.2935		0.2922	0.3077
	0.3113	0.2992		0.3090	0.3108		0.3060	0.3266
	0.3138	0.2862		0.3113	0.2992		0.3090	0.3108
LK0	0.3138	0.2862	LL0	0.3113	0.2992	LM0	0.3090	0.3108
	0.3113	0.2992		0.3090	0.3108		0.3060	0.3266
	0.3219	0.3154		0.3209	0.3281		0.3196	0.3451
	0.3231	0.3008		0.3219	0.3154		0.3209	0.3281
MK0	0.3339	0.3336	ML0	0.3341	0.3472	MM0	0.3345	0.3654
	0.3219	0.3154		0.3209	0.3281		0.3196	0.3451
	0.3231	0.3008		0.3219	0.3154		0.3209	0.3281
	0.3335	0.3172		0.3339	0.3336		0.3341	0.3472
NK0	0.3339	0.3336	NL0	0.3341	0.3472	NM0	0.3345	0.3654
	0.3335	0.3172		0.3339	0.3336		0.3341	0.3472
	0.3447	0.3347		0.3465	0.3530		0.3479	0.3673
	0.3465	0.3530		0.3479	0.3673		0.3498	0.3863
PK0	0.3465	0.3530	PL0	0.3479	0.3673	PM0	0.3498	0.3863
	0.3447	0.3347		0.3465	0.3530		0.3479	0.3673
	0.3567	0.3535		0.3599	0.3735		0.3623	0.3882
	0.3599	0.3735		0.3623	0.3882		0.3655	0.4079

Notes

- Chromaticity is tested with an accuracy of ± 0.05.
- Each reel contains only one color group.
- In order to ensure availability, single color groups will not be orderable.

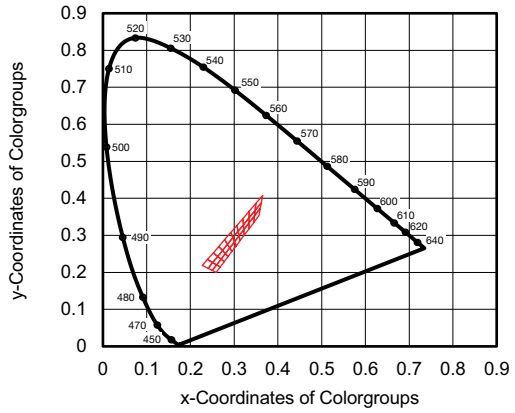


Fig. 1 - Coordinates of Color Groups

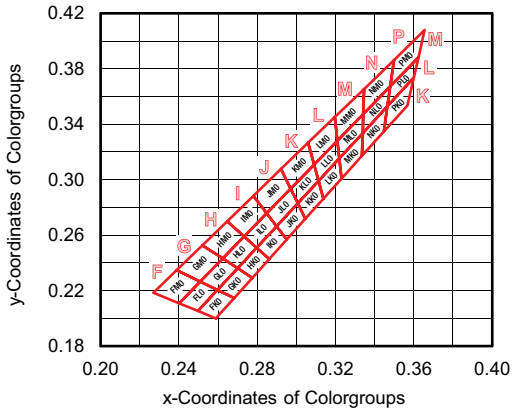


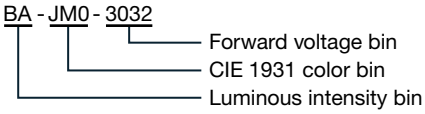
Fig. 2 - Coordinates of Color Groups

FORWARD VOLTAGE CLASSIFICATION at 20 mA		
GROUP	**FORWARD VOLTAGE (V)**	
	MIN.	**MAX.**
2730	2.75	3.00
3032	3.00	3.25
3235	3.25	3.50
3537	3.50	3.75

Notes

- Each reel contains only one forward voltage group.
- Forward voltage is tested with a tolerance of ± 0.05 V.
- In order to ensure availability, single forward voltage groups will not be orderable.

MARKING EXAMPLE FOR SELECTION CODE ON LABEL



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

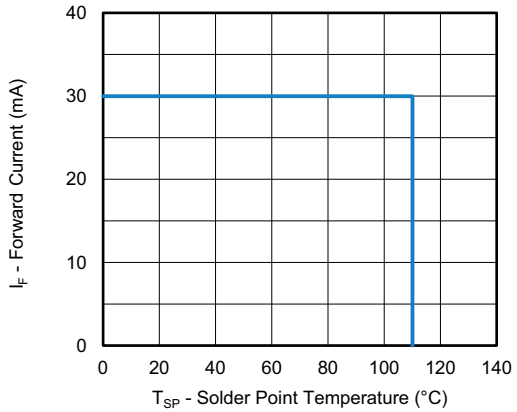


Fig. 3 - Maximum Permissible Forward Current vs. Solder Point Temperature

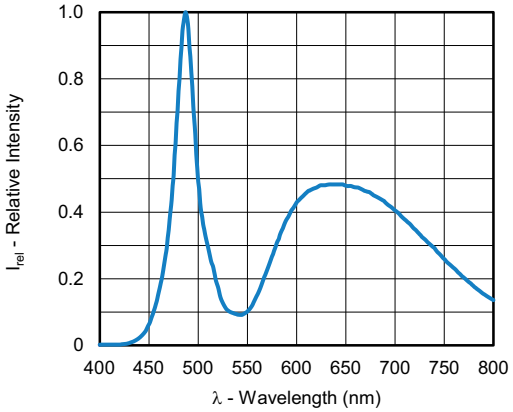


Fig. 6 - Relative Intensity vs. Wavelength

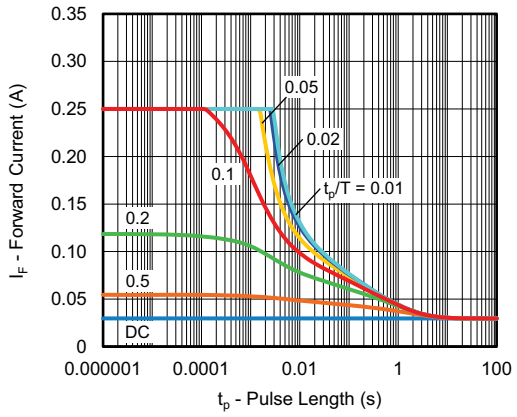


Fig. 4 - Pulse Forward Current vs. Pulse Duration

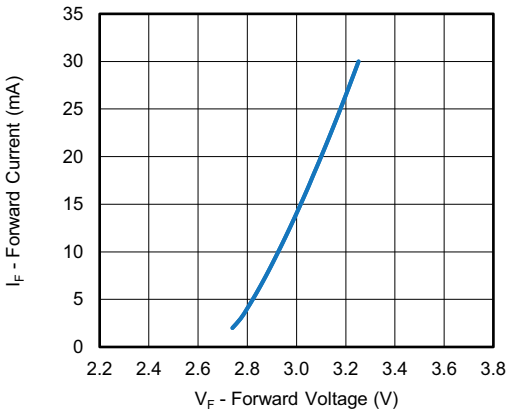


Fig. 7 - Forward Current vs. Forward Voltage

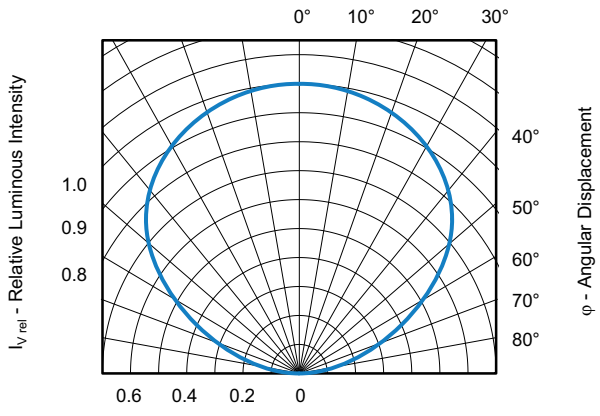


Fig. 5 - Relative Luminous Intensity vs. Angular Displacement

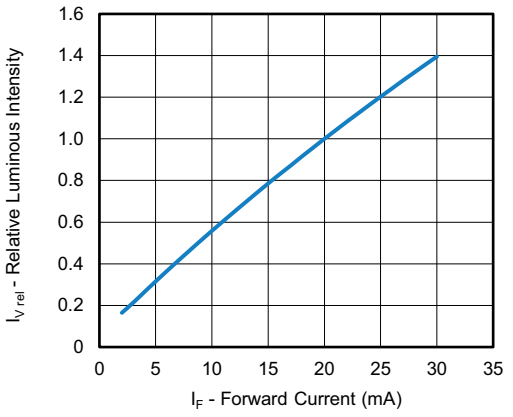


Fig. 8 - Relative Luminous Intensity vs. Forward Current

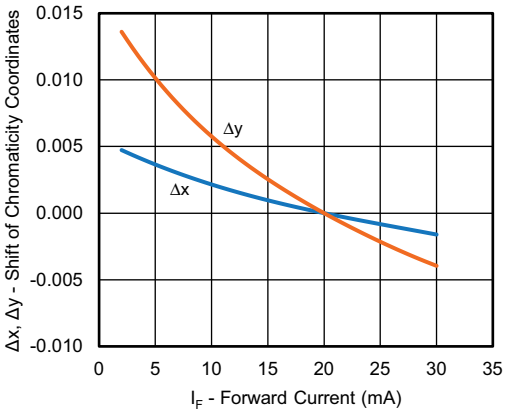


Fig. 9 - Shift of Chromaticity Coordinates vs. Forward Current

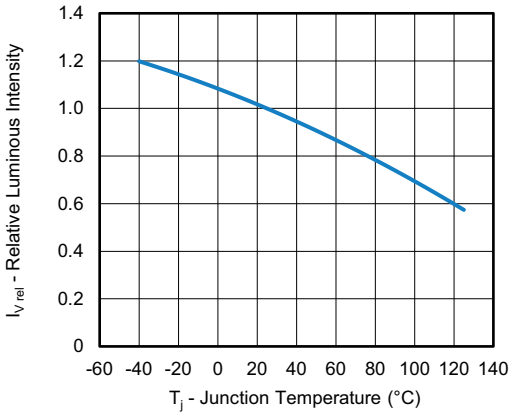


Fig. 11 - Relative Luminous Intensity vs. Junction Temperature

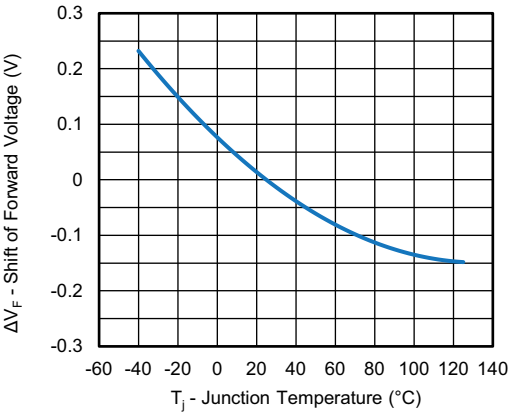


Fig. 10 - Shift of Forward Voltage vs. Junction Temperature

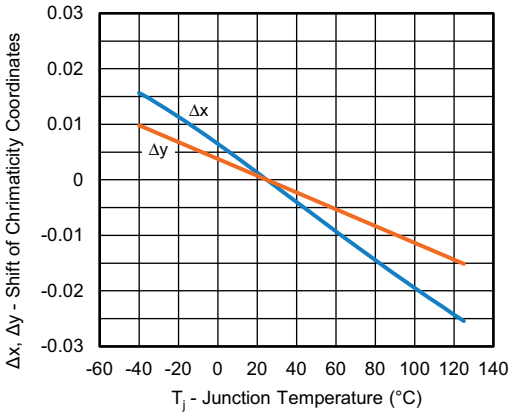
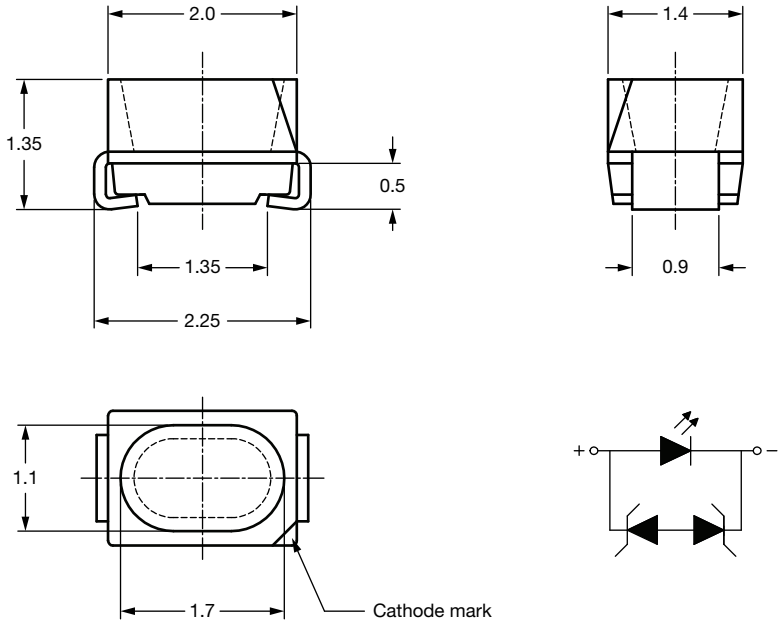
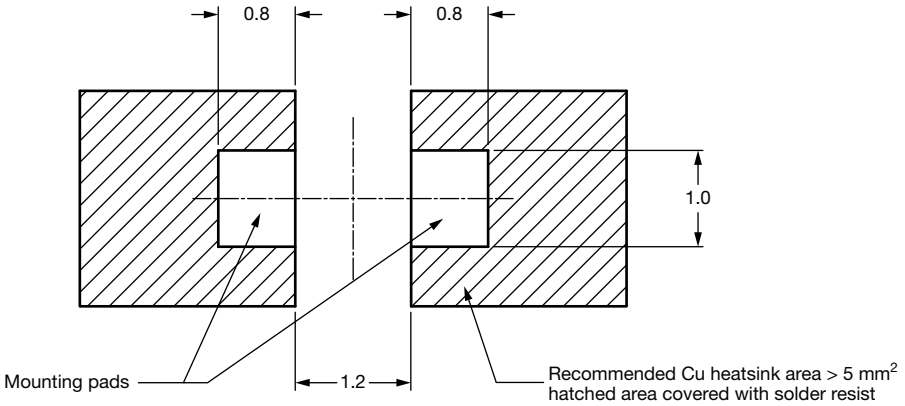


Fig. 12 - Shift of Chromaticity Coordinates vs. Junction Temperature

PACKAGE DIMENSIONS in millimeters



Recommended pad layout (for reference only)

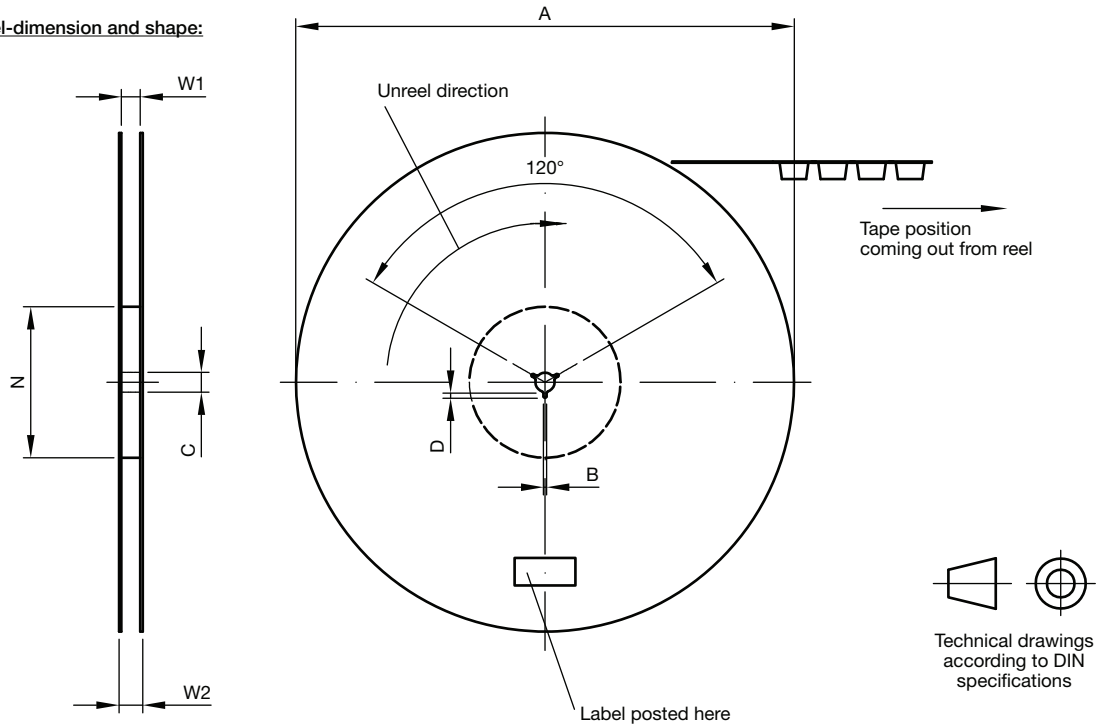


Note

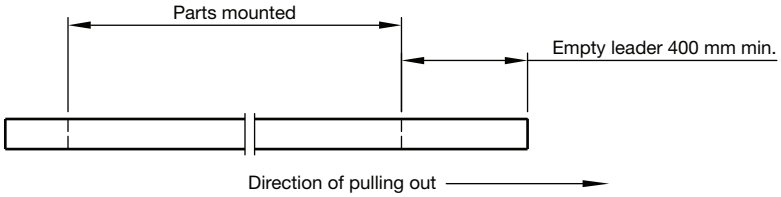
- Not indicated tolerances: ± 0.1 mm

REEL DIMENSIONS in millimeters

Reel-dimension and shape:



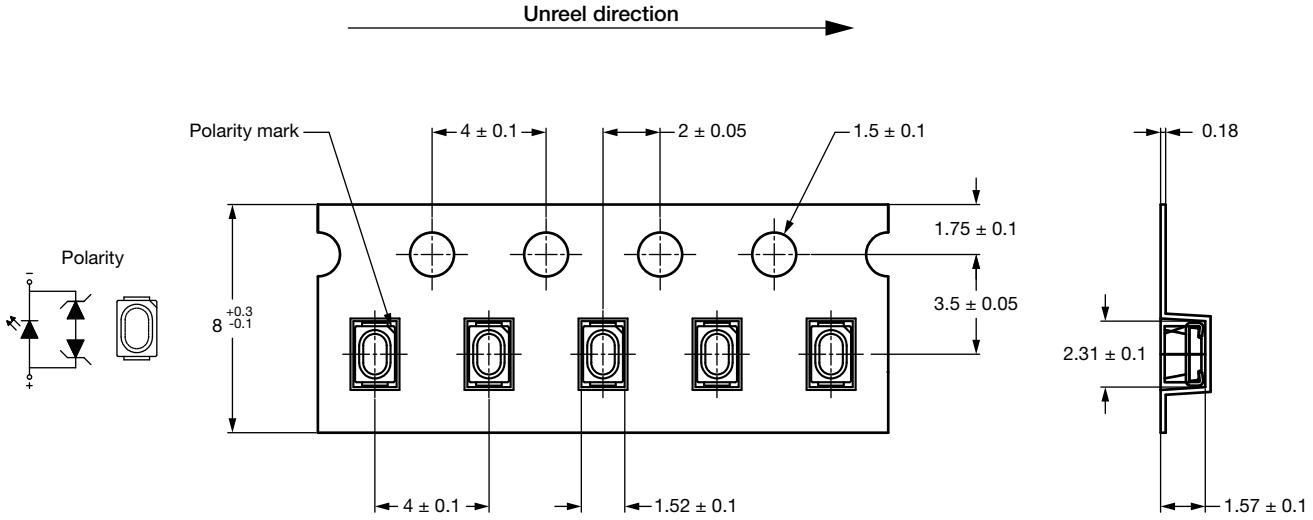
Leader and trailer tape:



Drawing-No.: 9.800-5172.01
Issue: VK; 18.04.2024

DIMENSIONS OF REEL in millimeters (according drawing reference)							
TAPING VERSION	**A**	**B**	**C**	**D**	**N**	**W1**	**W2**
08	Ø 178 ± 1	2.2 ± 0.5	Ø 13 ± 0.5	-	Ø 60 ± 1	9 ±1	12 ± 1

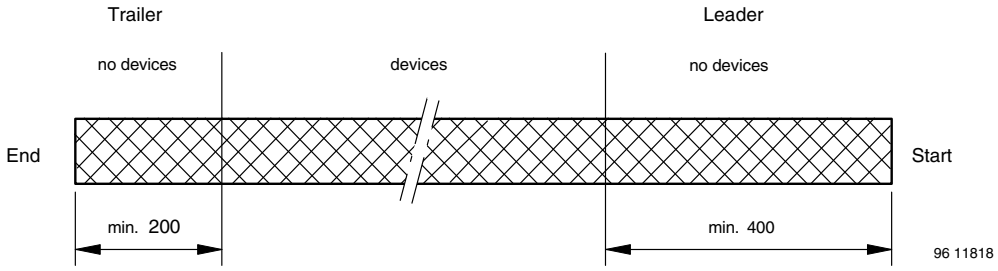
TAPE DIMENSIONS in millimeters



Notes

- 2000 pieces per reel
- Not indicated tolerances: ± 0.1 mm

LEADER AND TRAILER DIMENSIONS in millimeters



LABEL

Standard bar code labels for finished goods

The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

SOLDERING PROFILE

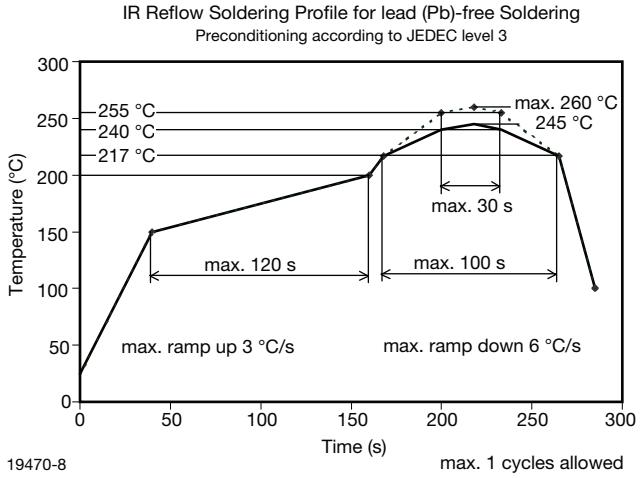
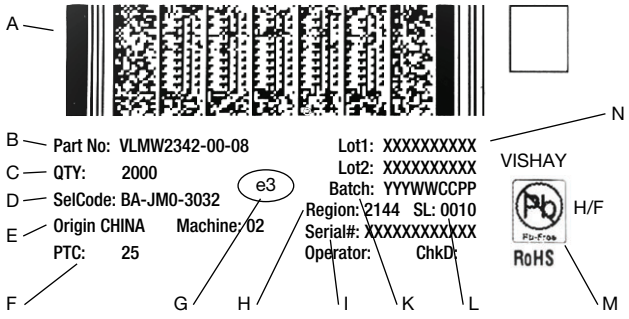


Fig. 13 - Vishay Lead (Pb)-free Reflow Soldering Profile (according to J-STD-020)

BAR CODE PRODUCT LABEL (example)



A. 2D barcode

B. Part No: Vishay part number

C. QTY: quantity

D. SelCode: selection bin code

E. Country of origin

F. PTC: production plant code

G. Termination finish

H. Region code

I. Serial#: serial number

K. Batch Number: year, week, country code, plant code

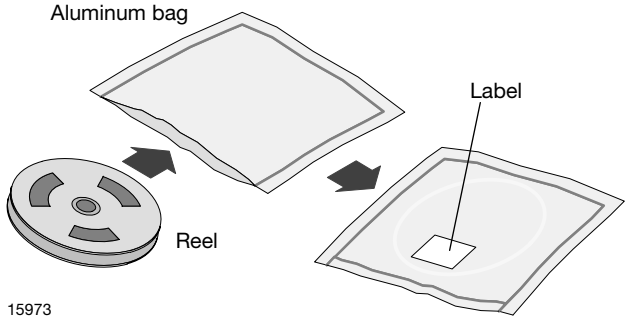
L. SL: sales location

M. Environmental Symbols: RoHS, lead (Pb)-free, halogen-free

N. Lot numbers

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 168 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 condition given in J-STD-033.

A JEDEC J-STD-033 level 3 label is included on all aluminum dry bags.

Example of JEDEC J-STD-033 Level 3 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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