Multi SMD LED RGB

20777

FEATURES

- High brightness tricolor SMD LED
- RGB individual control
- Compact package outline
- Black surface
- Qualified according to JEDEC moisture sensitivity level 2
- Compatible to IR reflow soldering
- AEC-Q101 qualified
- ESD-withstand voltage: Up to 1 kV according to JESD22-A114-B
- 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

VLMRGB343.. tricolor LEDs is a high brightness device designed for demanding applications in efficiency and reduced space. An ideal device in emphasizing visual effects, advertisement, decoration as well as general backlighting needs.

PRODUCT GROUP AND PACKAGE DATA

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

APPLICATIONS

- Wide range of accent and decorative lighting
- Displays: Full color message and displays video boards
- Consumer appliances: Backlight LCDs, PDAs, TVs
- Industry: White goods such as ovens, microwaves, 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.		
VLMRGB343-ST-UV-RS	Red	140	-	285	20	618	625	628	20	-	1.8	2.45	20	AlInGaP
	True green	285	-	560	20	521	526	536	20	-	3.7	4.25	20	InGaN
	Blue	100	-	200	20	465	470	475	20	-	3.6	4.25	20	InGaN

Note

- Reel comes in a quantity of 2050 units per reel. Luminous intensity is measured with an accuracy of ± 11 %. All electrical and optical data are measured at room temperature of 25 °C.

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMRGB343.., RED

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	30	mA
Reverse voltage		V_R	12	V
Power dissipation		P_{tot}	75	mW
Junction temperature		T_j	125	°C
Surge current t_p < 10 µs, duty cycle = 0.005		I_{FM}	1000	mA
Thermal resistance junction/solder point 1 chip on 3 chip on		R_{thJP}	 260 420	K/W
Thermal resistance junction/ambient 1 chip on 3 chip on		R_{thJA}	 480 770	K/W
Operating temperature		T_{amb}	- 40 to + 100	°C
Storage temperature		T_{stg}	- 40 to + 100	°C
Forward voltage	20 mA	V_F	1.8 to 2.45	V

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLMRGB343.., TRUE GREEN, BLUE

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	20	mA
Reverse voltage		V_R	5	V
Power dissipation		P_{tot}	85	mW
Junction temperature		T_j	125	°C
Surge current t_p < 10 µs, duty cycle = 0.005		I_{FM}	200	mA
Thermal resistance junction/solder point 1 chip on 3 chip on		R_{thJP}	 290 470	K/W
Thermal resistance junction/ambient 1 chip on 3 chip on		R_{thJA}	 530 820	K/W
Operating temperature		T_{amb}	- 40 to + 100	°C
Storage temperature		T_{stg}	- 40 to + 100	°C
Forward voltage	20 mA	V_F	3.7 to 4.25	V

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLMRGB343.., RED, TRUE GREEN, BLUE

PARAMETER	TEST CONDITION	PART	FLOATING GROUPS	COLOR	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	I_F = 20 mA	VLMRGB343-ST-UV-RS		red	I_V	140		285	mcd
				true green		285		560	
				blue		100		200	
		VLMRGB343	S3U3R3	red	I_V	140		200	mcd
				true green		285		400	
				blue		100		140	
			S3U3S3	red	I_V	140		200	mcd
				true green		285		400	
				blue		140		200	
			S3V3R3	red	I_V	140		200	mcd
				true green		400		560	
				blue		100		140	
			S3V3S3	red	I_V	140		200	mcd
				true green		400		560	
				blue		140		200	
			T3U3R3	red	I_V	200		285	mcd
				true green		285		400	
				blue		100		140	
			T3U3S3	red	I_V	200		285	mcd
				true green		285		400	
				blue		140		200	
			T3V3R3	red	I_V	200		285	mcd
				true green		400		560	
				blue		100		140	
			T3V3S3	red	I_V	200		285	mcd
				true green		400		560	
				blue		140		200	
Dominant wavelength		VLMRGB343..		red	λ_d	618	625	628	nm
				true green		521	526	536	
				blue		465	470	475	
Angle of half intensity				red	φ		± 60		deg
				true green					
				blue					
Forward voltage				red	V_F		1.8	2.45	V
				true green			3.7	4.25	
				blue			3.6	4.25	

Note
- Not designed for reverse direction

LUMINOUS INTENSITY CLASSIFICATION RED, TRUE GREEN, BLUE		
GROUP	LUMINOUS INTENSITY I_V (mcd)	
STANDARD	MIN.	MAX.
R3	100	140
S3	140	200
T3	200	285
U3	285	400
V3	400	560

Note

- The standard shipping format for serial types includes a family group of 5, 6 or 9 individual brightness groups. Individual brightness groups cannot be ordered.

COLOR CLASSIFICATION						
GROUP	DOM. WAVELENGTH (nm)					
	RED (1)		TRUE GREEN		BLUE	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
	618	628	521	536	465	475
A			521	526	465	470
B			526	531	470	475
C			531	536		

Notes

- Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm. Only one wavelength group is allowed for each chip within one reel.

(1) No color grouping for red. Only for check of color.

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

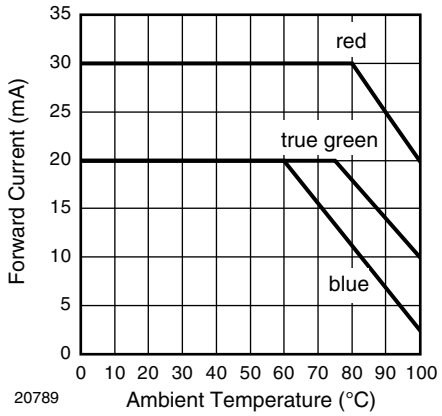


Fig. 1 - Forward Current vs. Ambient Temperature (1 Chip On)

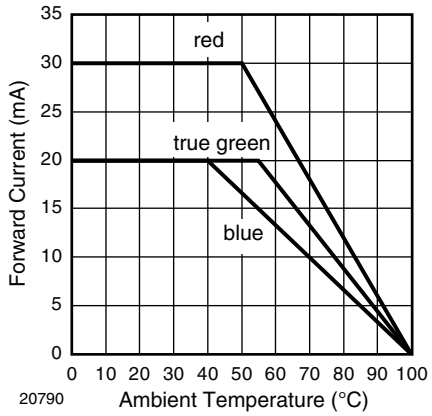


Fig. 2 - Forward Current vs. Ambient Temperature (3 Chips On)

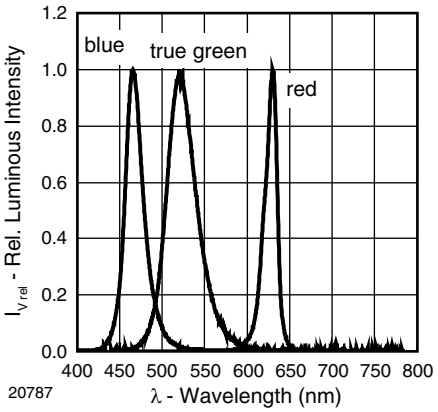


Fig. 3 - Relative Intensity vs. Wavelength

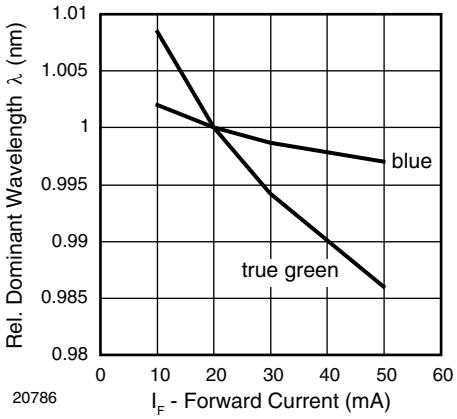


Fig. 6 - Relative Dominant Wavelength vs. Forward Current

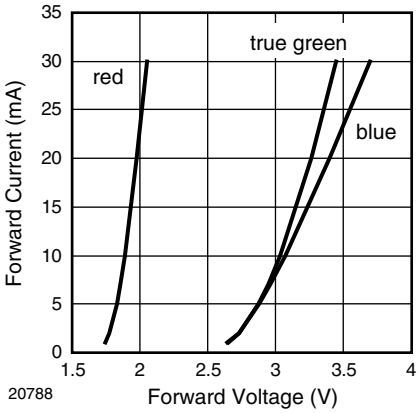


Fig. 4 - Forward Current vs. Forward Voltage

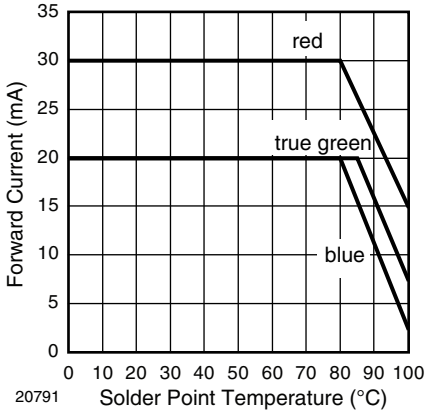


Fig. 7 - Forward Current vs. Solder Point Temperature (1 Chip On)

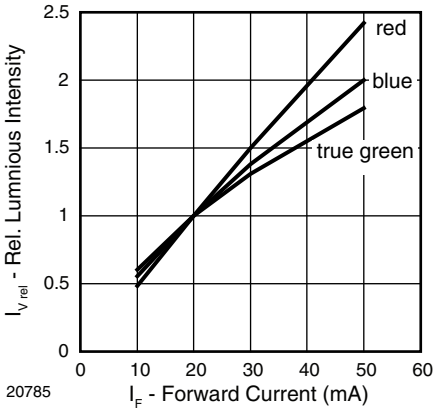


Fig. 5 - Relative Luminous Intensity vs. Forward Current

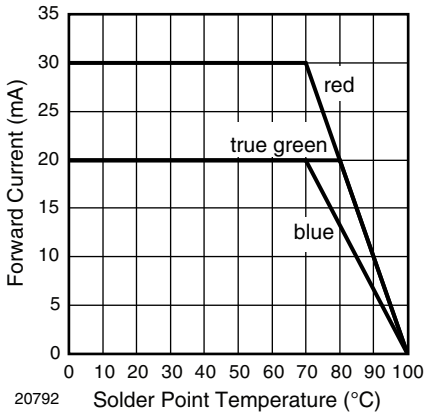
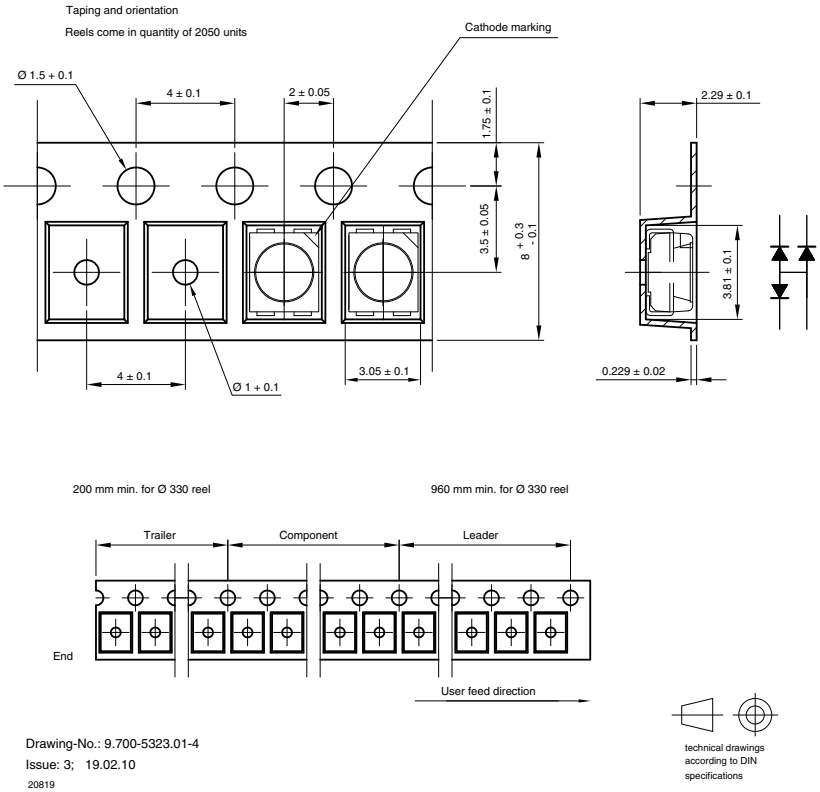


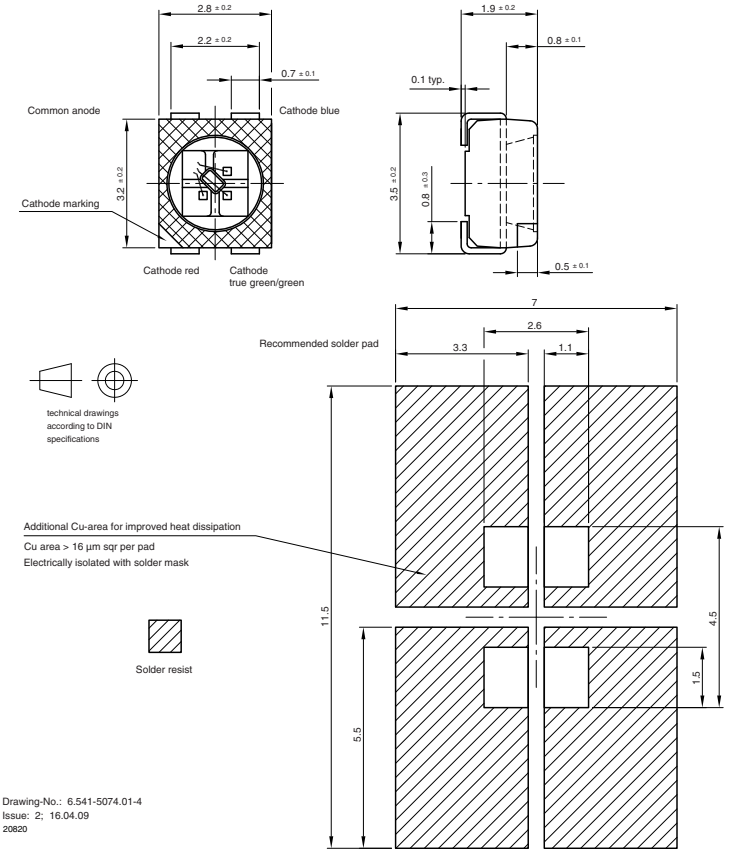
Fig. 8 - Forward Current vs. Solder Point Temperature (3 Chips On)

TAPING DIMENSIONS in millimeters



Drawing-No.: 9.700-5323.01-4
Issue: 3; 19.02.10
20819

PACKAGE DIMENSIONS/SOLDERING PADS DIMENSIONS in millimeters



Drawing-No.: 6.541-5074.01-4
Issue: 2; 16.04.09
20820

SOLDERING PROFILE

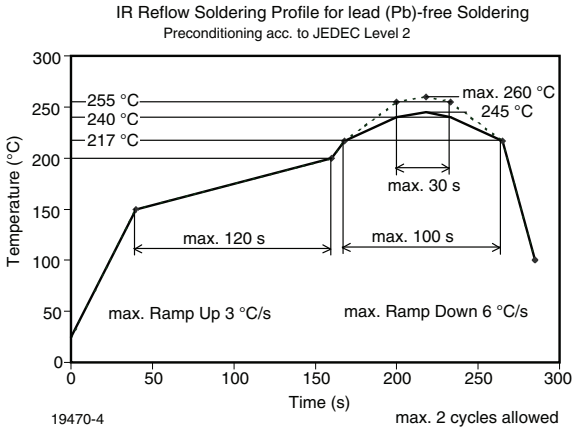
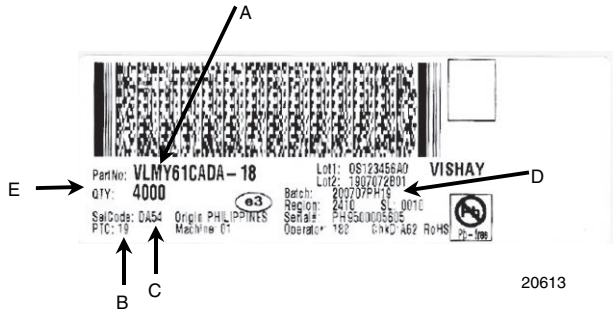


Fig. 9 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

BAR CODE PRODUCT LABEL (example)



A) Type of component

B) Manufacturing plant

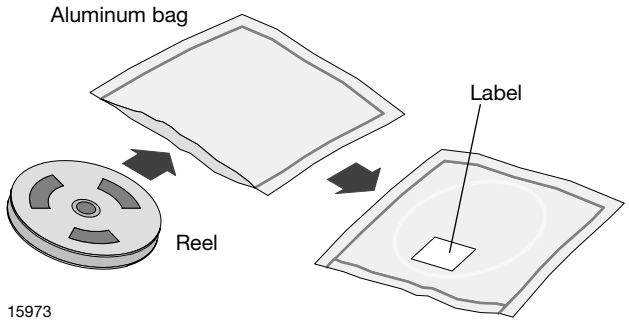
C) SEL - selection code (bin):
e.g.: DA = code for luminous intensity group
5 = code for color group
4 = code for forward voltage

D) Batch:
200707 = 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 72 h under these conditions moisture content will be too high for reflow soldering.

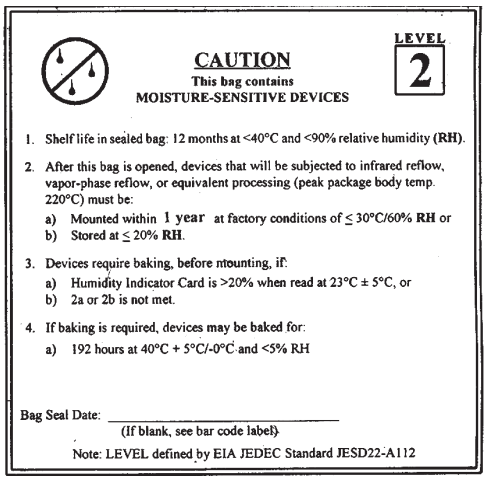
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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 2 label is included on all aluminum 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.

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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