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
- Automotive qualified AEC-Q101
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- ESD-withstand voltage: up to 1 kV according to JESD22-A114-B

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 (λ_d), LUMINOUS INTENSITY	TECHNOLOGY
VLMRGB343-ST-UV-RS	Red, I_V = (140 to 285) mcd, (typ 625 nm)	AlInGaP
	True green, I_V = (285 to 560) mcd, (typ 525 nm)	InGaN
	Blue, I_V = (100 to 200) mcd, (typ 470 nm)	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 [1] 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

Note:
[1] T_{amb} = 25 °C, unless otherwise specified

ABSOLUTE MAXIMUM RATINGS [1] 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

Note:
[1] T_{amb} = 25 °C, unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] 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
[1] T_{amb} = 25 °C, unless otherwise specified

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		

Note:
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

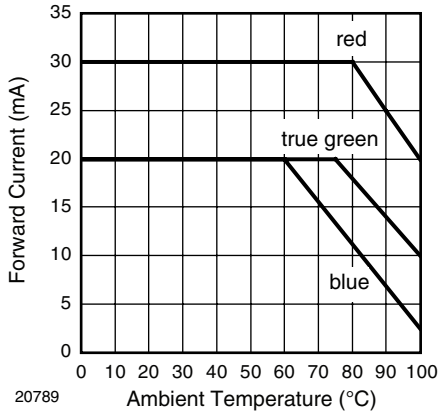


Figure 1. Forward Current vs. Ambient Temperature (1 Chip On)

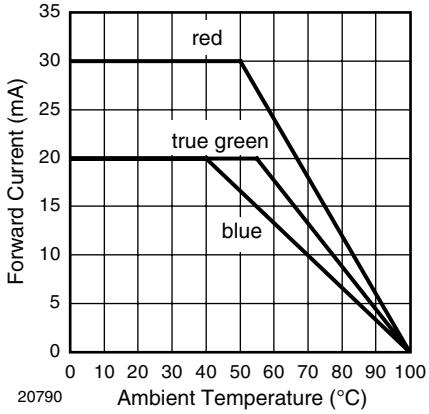


Figure 2. Forward Current vs. Ambient Temperature (3 Chips On)

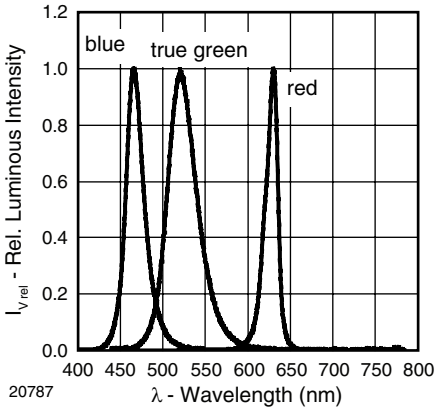


Figure 3. Relative Intensity vs. Wavelength

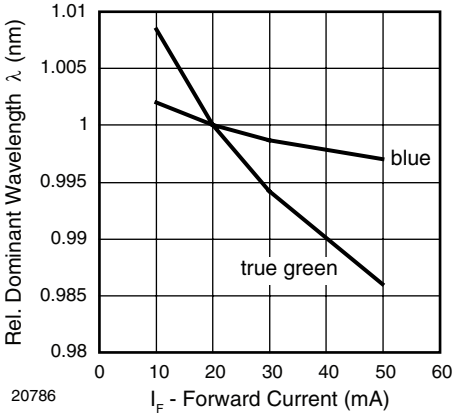


Figure 6. Relative Dominant Wavelength vs. Forward Current

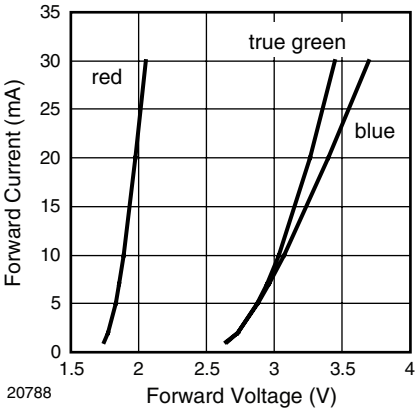


Figure 4. Forward Current vs. Forward Voltage

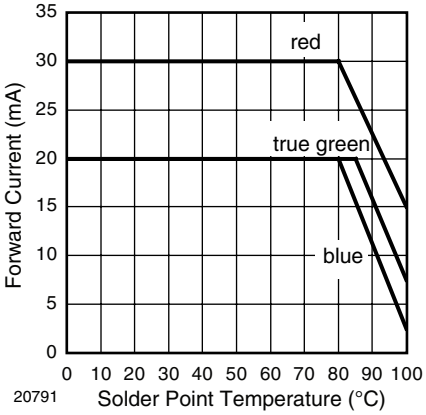


Figure 7. Forward Current vs. Solder Point Temperature (1 Chip On)

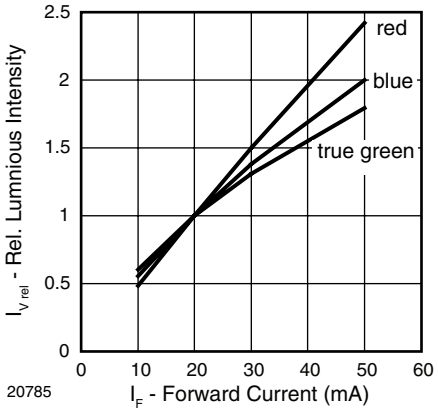


Figure 5. Relative Luminous Intensity vs. Forward Current

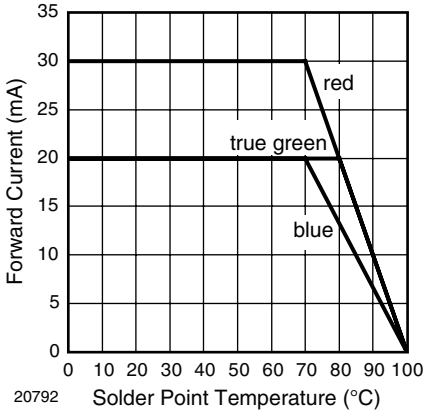
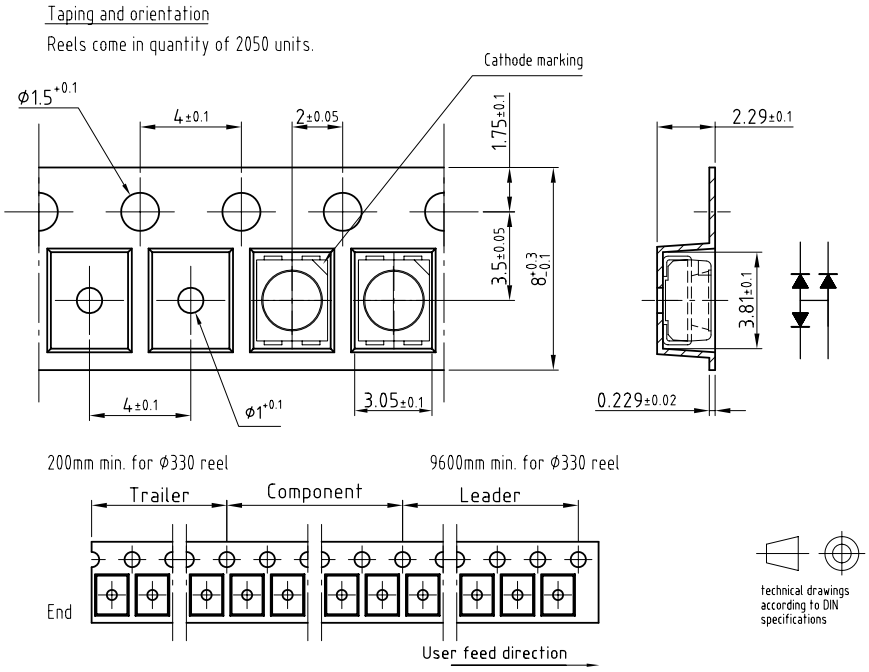


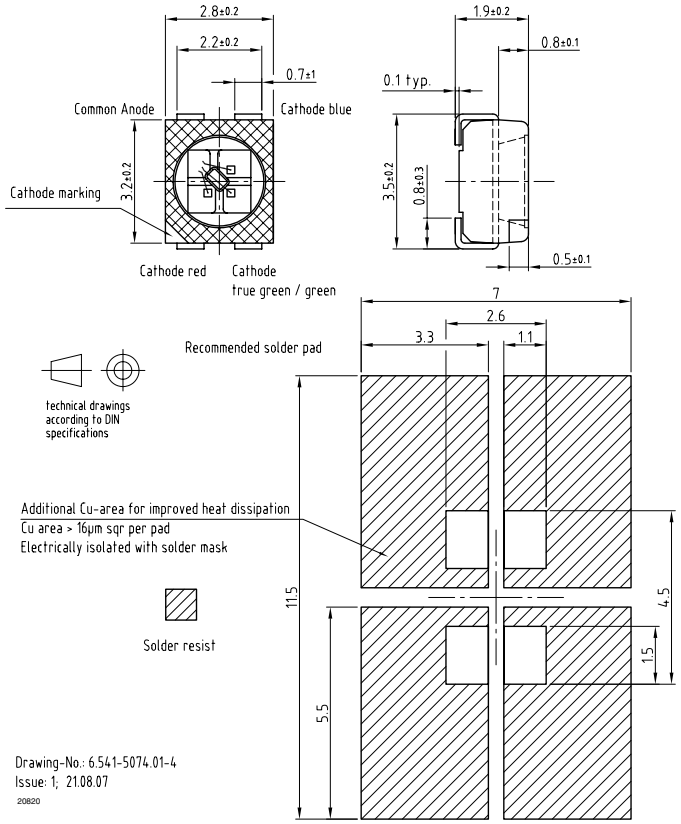
Figure 8. Forward Current vs. Solder Point Temperature (3 Chips On)

TAPING DIMENSIONS in millimeters



Drawing-No.: 9.700-5323.01-4
Issue: 2; 05.02.08
20819

PACKAGE DIMENSIONS/SOLDERING PADS DIMENSIONS in millimeters



Drawing-No.: 6.541-5074.01-4
Issue: 1; 21.08.07
20820

SOLDERING PROFILE

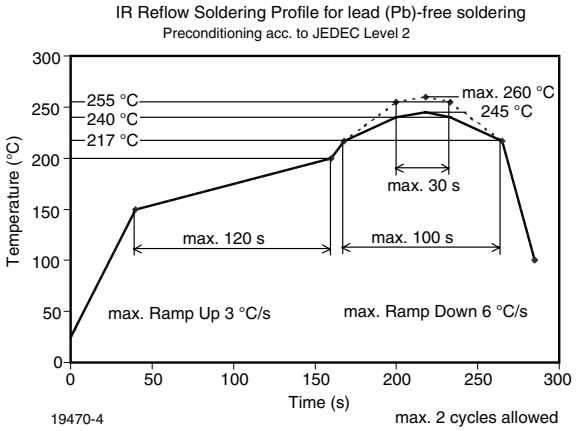
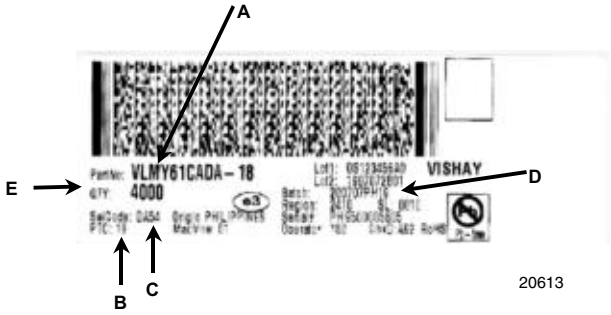


Figure 9. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

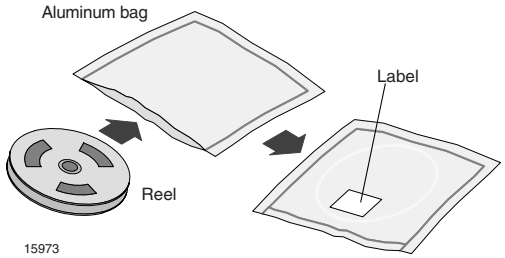
BAR CODE PRODUCT LABEL EXAMPLE:



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:
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.

17028

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.

OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively.
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA.
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

The IEC/EN standards require that the desired classification Accessible Emission Limit shall not be exceeded in “Normal” and “Single Fault Conditions”. This product is in Compliance with the requirement in CEN/IEC/EN60825-1 to ensure that required classifications are not exceeded in single fault conditions.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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