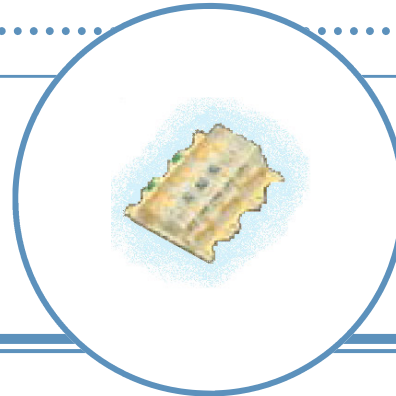


Full Color SMT Chip LED (3.5 x 3.0 x 1.4 mm)

OVSTRGBFC6

- Red/green/blue + white in single surface mount package
- 8 mm tape on 7" reel compatible with automatic placement equipment
- Each chip individually addressable to provide color on-demand
- ESD protected [± 1 kV, 1 time (200 pF 0 Ω)]

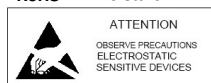
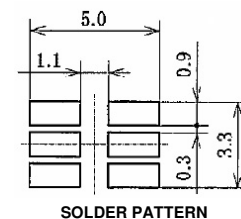
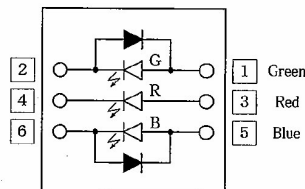
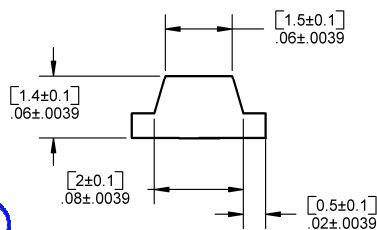
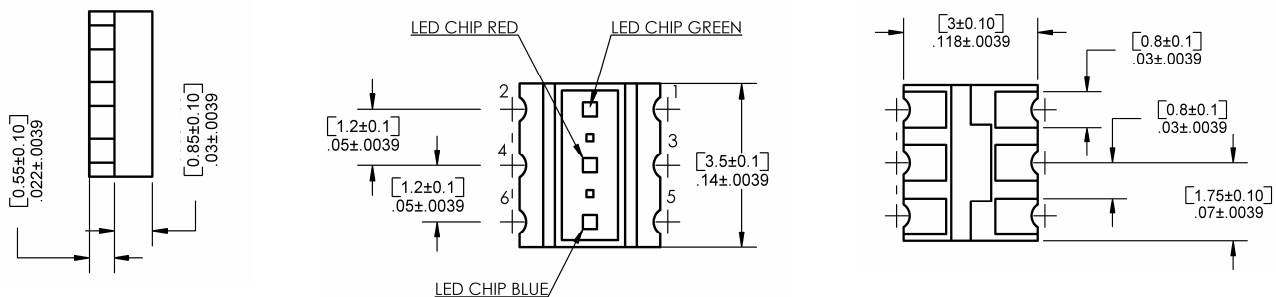


The **OVSTRGBFC6** is a full-color chip LED with multiple viewing angles and the ability to produce all colors of the visible spectrum, plus white. This small package, combined with high-light output, is ideal for miniature applications.

Applications

- Automotive (backlighting in dashboard and switches)
- Telecommunications (indicator and backlighting in telephone and fax)
- Flat backlight (LCDs, membrane switches and symbols)
- Personal/portable appliances (mobile phones, pagers, audio/video players and GPS)

Part Number	Material	Emitted Color	Intensity Typ. mcd	Lens Color
OVSTRGBFC6	AlInGaP/InGaN	Red/Green/Blue	53/165/46	Water Clear



**DO NOT LOOK DIRECTLY
AT LED WITH UNSHIELDED
EYES OR DAMAGE TO
RETINA MAY OCCUR.**

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Full-Color SMT Chip LED

OVSTRGBFC6

Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$ unless otherwise noted

SYMBOL	PARAMETER	VALUE			UNIT
		RED	GREEN	BLUE	
P _D	Power Dissipation (1 chip on)	68	98	98	mW
I _F	DC Forward Current (1 chip on)	25	25	25	mA
P _D	Power Dissipation (2 or 3 chips on)	22	33	33	mW
I _F	DC Forward Current (2 or 3 chips on)	10	10	10	mA
I _{FP}	Pulsed Forward Current ¹	100	100	100	mA
ΔI _F	DC forward Current Reduction ² (T _A ≥40°C) (1 chip on)	-0.425			mA/°C
	DC forward Current Reduction ² (T _A ≥40°C) (3 chips on)	-0.1			
T _{OPR}	Operating Temperature	-30 ~ +80			°C
T _{STG}	Storage Temperature	-40 ~ +100			°C

Notes:

1. Duty $\leq 5\%$, Pulse Width ≤ 1 msec.
2. $T_{OPR} = 40 \sim 80^\circ\text{C}$. Use under this condition.

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

RED						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
V_F	Forward Voltage	----	1.9	2.4	V	$I_F = 20$ mA
I_R	Reverse Current	----	----	100	μA	$V_R = 5$ V
I_V	Luminous Intensity (Axial Direction)	22	----	127	mcd	$I_F = 20$ mA
λ_d	Dominant Wavelength	621	----	631	nm	$I_F = 20$ mA
λ_Δ	Spectral Line Half Width	----	15	----	nm	$I_F = 20$ mA

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Full-Color SMT Chip LED

OVSTRGBFC6

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

GREEN						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
V_{F1}	Forward Voltage	----	3.3	3.9	V	$I_F = 20 \text{ mA}$
V_{F2}		2.0	----	----	V	$I_F = 5 \mu\text{A}$
I_V	Luminous Intensity (Axial Direction)	82	----	372	mcd	$I_F = 20 \text{ mA}$
λ_d	Dominant Wavelength	520	----	540	nm	$I_F = 20 \text{ mA}$
$\Delta\lambda$	Spectral Line Half Width	----	35	----	nm	$I_F = 20 \text{ mA}$

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

BLUE						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
V_{F1}	Forward Voltage	----	3.4	3.9	V	$I_F = 20 \text{ mA}$
V_{F2}		2.0	----	----	V	$I_F = 5 \mu\text{A}$
I_V	Luminous Intensity (Axial Direction)	25	----	101	mcd	$I_F = 20 \text{ mA}$
λ_d	Dominant Wavelength	460	----	480	nm	$I_F = 20 \text{ mA}$
$\Delta\lambda$	Spectral Line Half Width	----	25	----	nm	$I_F = 20 \text{ mA}$

Ranking

$I_F = 20 \text{ mA}$

LUMINOUS INTENSITY (mcd)			
RANK	RED	GREEN	BLUE
J	22 ~ 53	82 ~ 165	25 ~ 46
K			46 ~ 101
L		165 ~ 372	25 ~ 46
M			46 ~ 101
N	53 ~ 127	82 ~ 165	25 ~ 46
P			46 ~ 101
Q		165 ~ 372	25 ~ 46
R			46 ~ 101

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Full-Color SMT Chip LED

OVSTRGBFC6

Reliability Tests

TEST ITEM	STANDARD TEST METHOD ¹	TEST CONDITIONS		FAILURE RATE ^{2, 3}
Operating Test	ED-4701 D-511	1 chip on ⁴	T _A = 25° C, I _F = 25 mA, DC ₂ t = 1000 hours	0/20
		3 chips on ⁴	T _A = 25° C, I _F = 10 mA, DC ₂ t = 1000 hours	0/20
High Temp Storage Test	ED-4701-3 B-111A	T _A = 100° C, t = 1000 hours		0/20
Low Temp Storage Test	ED-4701-3 B-112A	T _A = 30° C, t = 1000 hours		0/20
High Humidity Storage Test	ED-4701-3 B-121A	T _A = 85° C, RH ≥ 85%, t = 1000 hours		0/20
High Temp Operating Test	----	1 chip on ⁴	T _A = 80° C, I _F = 8 mA, DC ₂ t = 1000 hours	0/20
High Temp and High Humidity Operating Test	ED-4701-3 B-122A	1 chip on ⁴	T _A = 60° C, RH ≥ 90%, t = 1000 hours, I _F = 16 mA, DC	0/20
Temperature Cycle Test	ED-4701-3 B-131A	T _A = (-30° C, 30 minutes ~ 100° C, 30 minutes) x 100 cycles		0/20
Thermal Shock Test	ED-4701-3 B-141A	T _A = (-40° C, 5 minutes ~ 80° C, 5 minutes) x 50 cycles		0/20
Fall Test	----	h = 1 m, maple tree board, 10 times		0/20

Failure Criteria

SYMBOL	ITEM	MIN	MAX	CONDITIONS
V _F	Forward Voltage	----	U.S.L. x 1.1 ⁵	I _F = 20 mA
V _R		2.0	----	I _F = 5 μA
I _R	Reverse Current (red only)	----	100μA	V _R = 5 V
I _V	Luminous Intensity	L.S.L. x 0.5 ⁶	----	I _F = 20 mA

Notes:

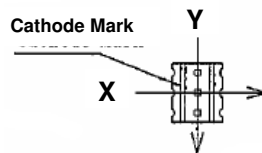
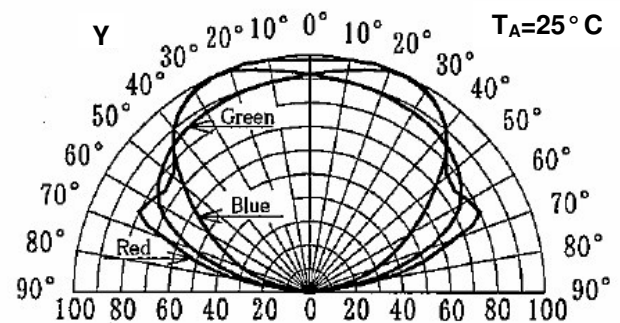
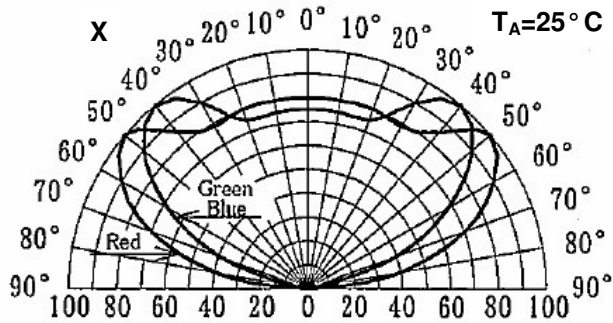
1. Number: EIAJ ("Electronic Industries Association of Japan") standard methods are used.
2. Failure rate is obtained when there is no damage by static electricity.
3. Failure rate evaluated based on "Criteria for Judging the Damage" table.
4. One (1) chip on = electric current only to one color in one LED. Three (3) chips on = electric current to the red, the green and the blue simultaneously.
5. U.S.L.: Upper Standard Level (see maximum values on red, green and blue Electrical tables on pages 2 and 3).
6. L.S.L.: Lower Standard Level (see minimum values on red, green and blue Electrical tables on pages 2 and 3).

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Full-Color SMT Chip LED

OVSTRGBFC6

Radiation Patterns

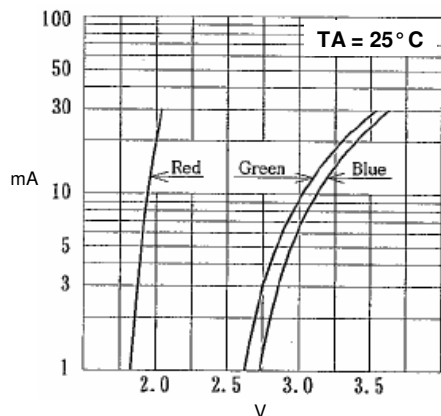


OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

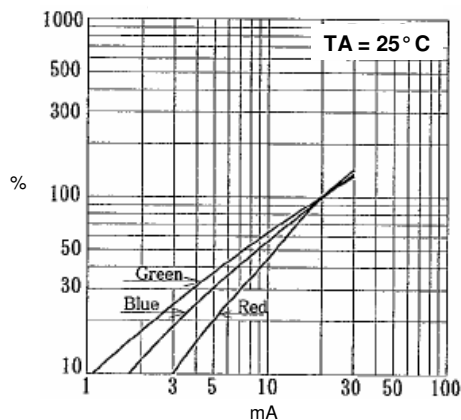
Full-Color SMT Chip LED

OVSTRGBFC6

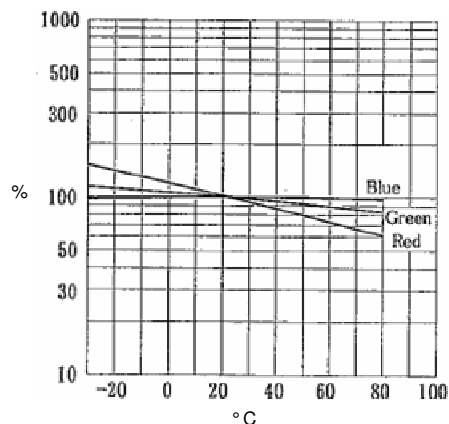
Typical Electro-Optical Characteristics Curves



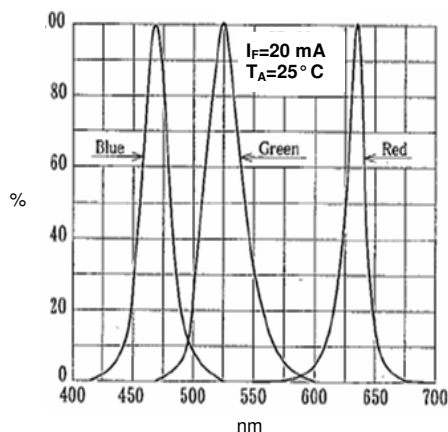
Forward Voltage vs Forward Current



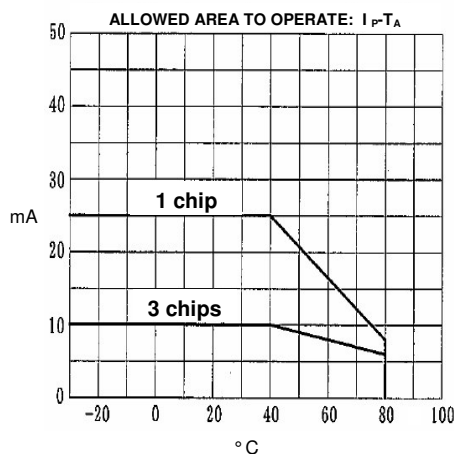
Forward Current vs Relative Luminous Intensity



Ambient Temperature vs Relative Luminous Intensity



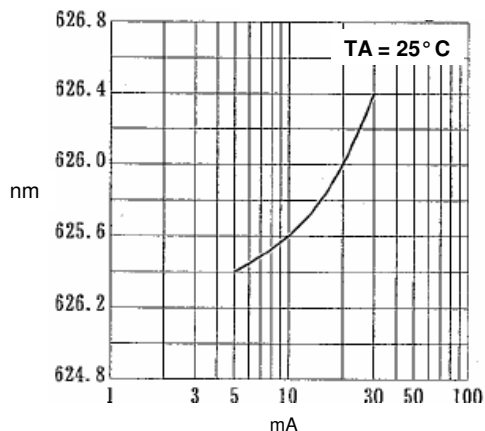
Wavelength vs Relative Intensity



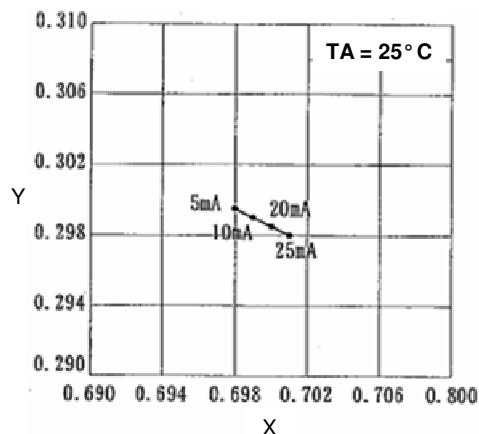
Forward Current vs Ambient Temperature

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

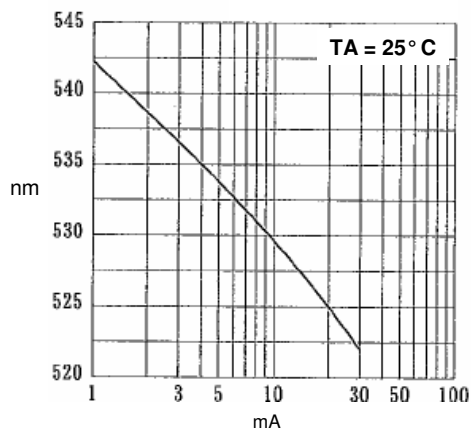
Typical Electro-Optical Characteristics Curves



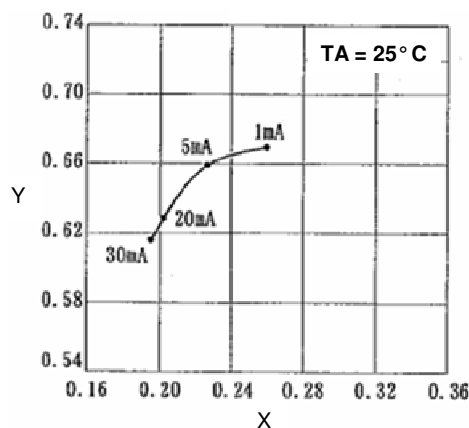
Red: Forward Current vs Dominant Wavelength



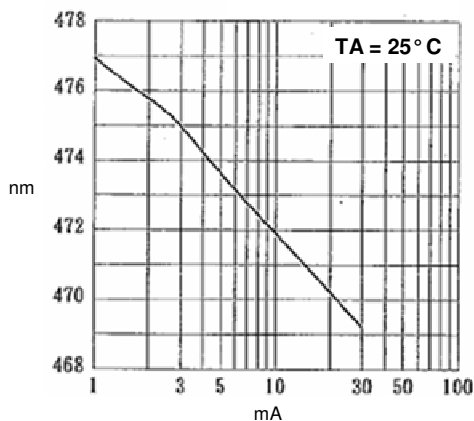
Red: Forward Current vs Chromaticity Diagram



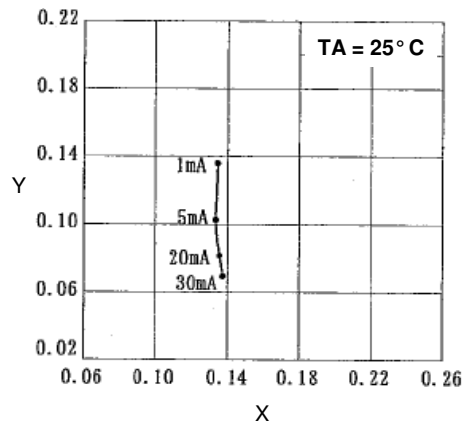
Green: Forward Current vs Dominant Wavelength



Green: Forward Current vs Chromaticity Diagram



Blue: Forward Current vs Dominant Wavelength



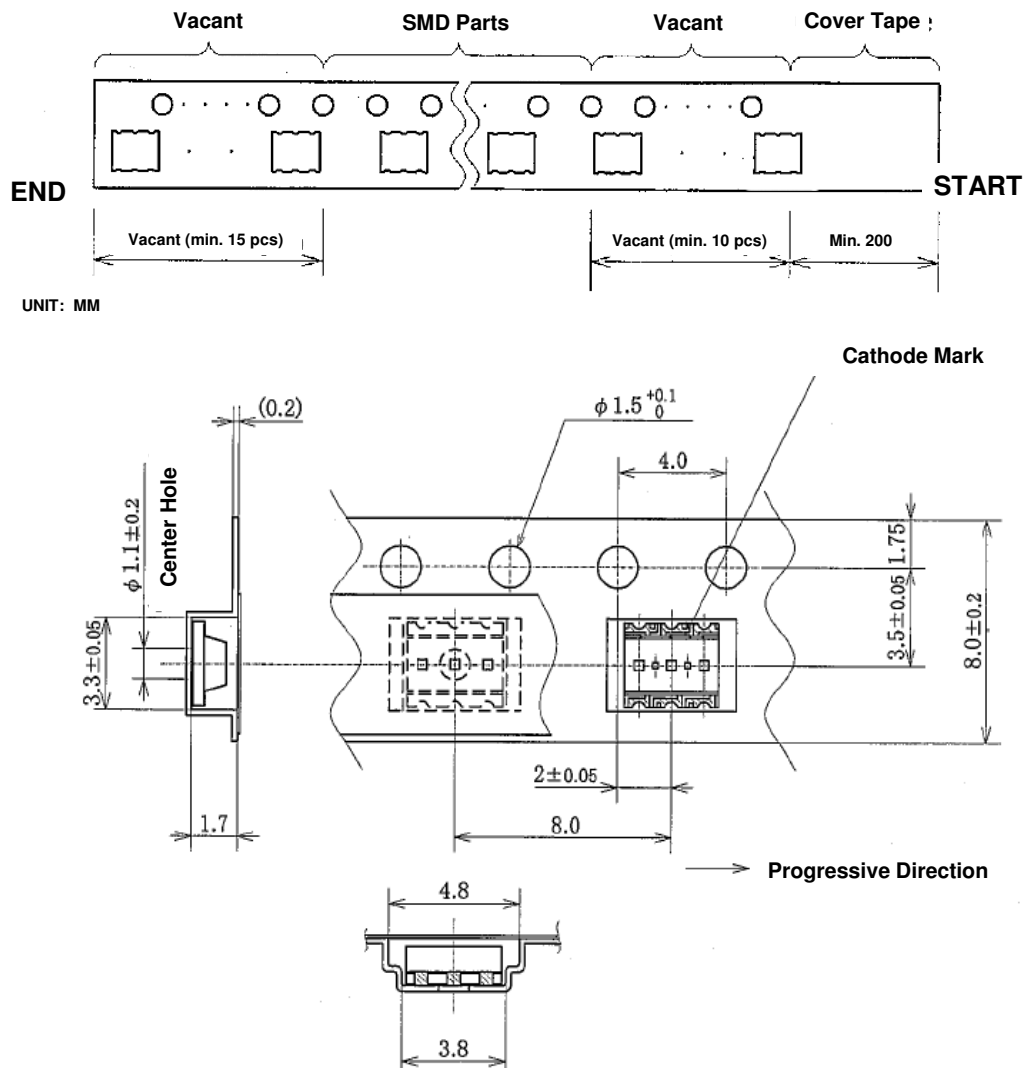
Blue: Forward Current vs Chromaticity Diagram

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Full-Color SMT Chip LED

OVSTRGBFC6

Carrier Tape Dimensions: Loaded quantity 1000 pieces per reel



Notes:

1. General tolerance is ± 0.1 .
2. Cover tape peeling-off strength is 0.29 - 0.58 N (10° tear-away angle of the cover tape and the carrier tape).

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

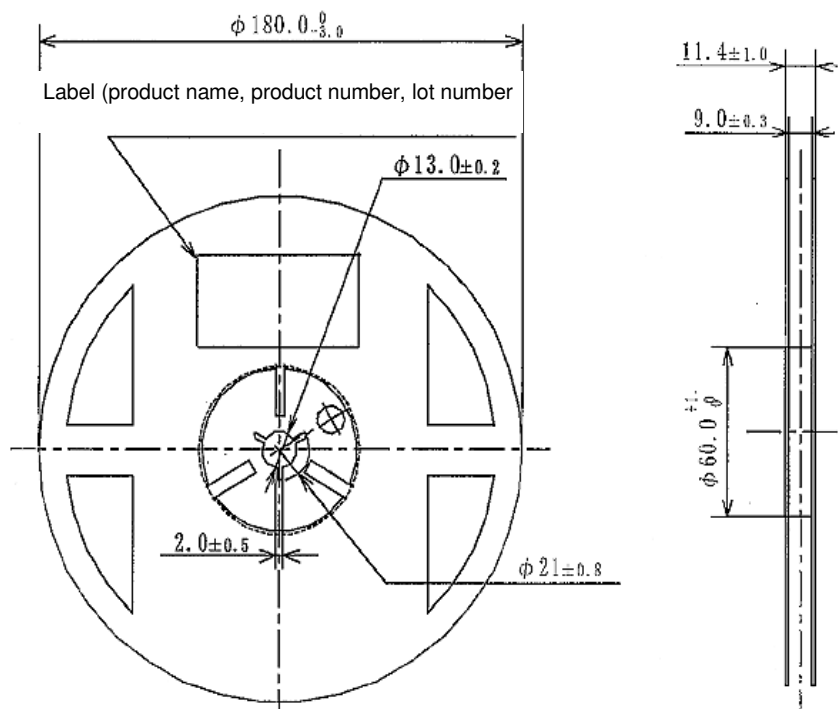
Full-Color SMT Chip LED

OVSTRGBFC6

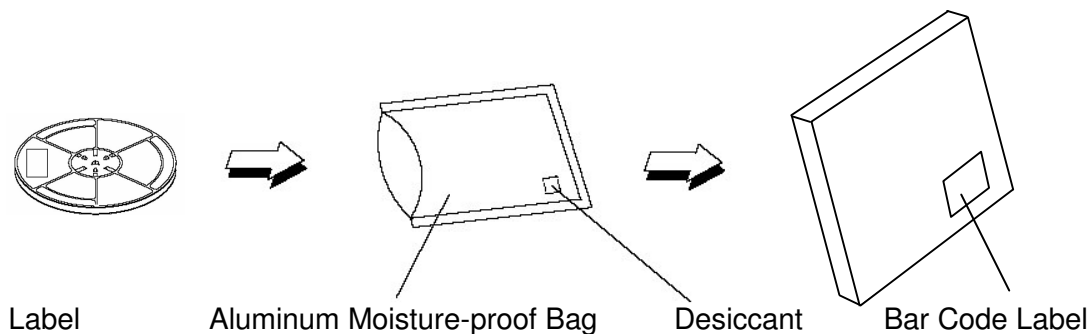
Packing Information: 1000 pieces on 7-inch reel sealed in ESD protected bag

TAPING REEL DIMENSION

UNIT: MM



Moisture Resistant Packaging



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.