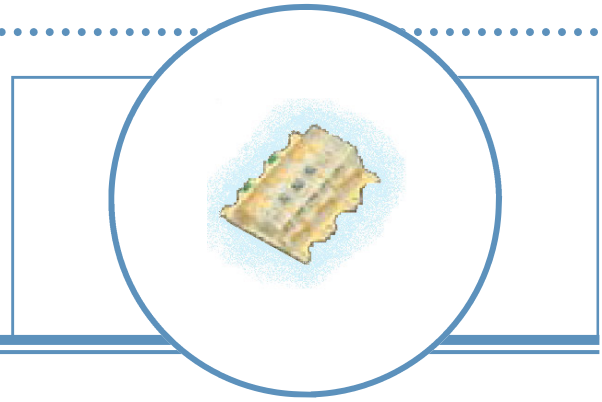
Full Color SMT Chip LED (3.5 x 3.0 x 1.4 mm)

TT electronics
OPTEK Technology

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)]

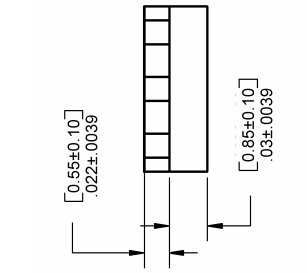


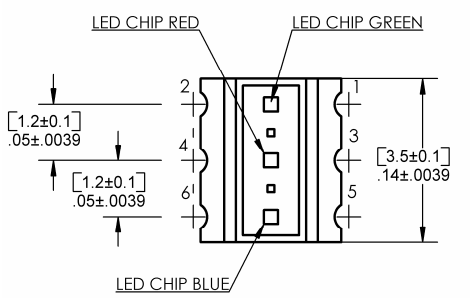
The **OVSTRGBFC6** is a full-color chip LED with multiple viewing angles and the ability to produce all colors of the visible spectrum, plus white. This small package, combined with high-light output, is ideal for miniature applications.

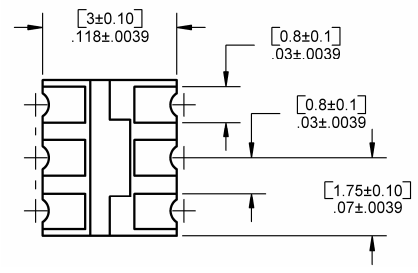
Applications

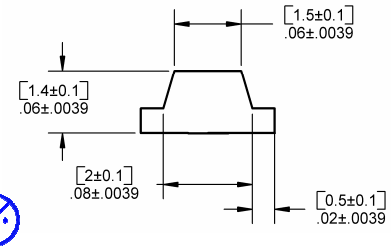
- Automotive (backlighting in dashboard and switches)
- Telecommunications (indicator and backlighting in telephone and fax)
- Flat backlight (LCDs, membrane switches and symbols)
- Personal/portable appliances (mobile phones, pagers, audio/video players and GPS)

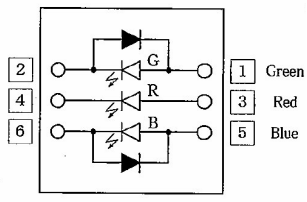
Part Number	Material	Emitted Color	Intensity Typ. mcd	Lens Color
OVSTRGBFC6	AlInGaP/InGaN	Red/Green/Blue	53/165/46	Water Clear

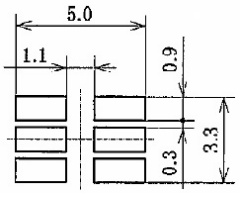












SOLDER PATTERN

RoHS Moisture

ATTENTION
OBSERVE PRECAUTIONS
ELECTROSTATIC
SENSITIVE DEVICES

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.

Absolute Maximum Ratings

T_A = 25°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] ($T_A \geq 40°C$) (1 chip on)	-0.425			mA/°C
	DC forward Current Reduction[2] ($T_A \geq 40°C$) (3 chips on)	-0.1			
T_{OPR}	Operating Temperature	-30 ~ +80			℃
T_{STG}	Storage Temperature	-40 ~ +100			℃

Notes:
1. Duty ≤ = 5%, Pulse Width ≤ 1 msec.
2. T_{OPR} = 40 ~ 80°C. Use under this condition.

Electrical Characteristics

T_A = 25°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
λd	Dominant Wavelength	621	----	631	nm	I_F = 20 mA
λΔ	Spectral Line Half Width	----	15	----	nm	I_F = 20 mA

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Electrical Characteristics

T_A = 25°C unless otherwise noted

GREEN						
SYMBOL	**PARAMETER**	**MIN**	**TYP**	**MAX**	**UNITS**	**CONDITIONS**
V_{F1}	Forward Voltage	----	3.3	3.9	V	I_F = 20 mA
V_{F2}		2.0	----	----	V	I_F = 5 µA
I_V	Luminous Intensity (Axial Direction)	82	----	372	mcd	I_F = 20 mA
λd	Dominant Wavelength	520	----	540	nm	I_F = 20 mA
Δλ	Spectral Line Half Width	----	35	----	nm	I_F = 20 mA

Electrical Characteristics

T_A = 25°C unless otherwise noted

BLUE						
SYMBOL	**PARAMETER**	**MIN**	**TYP**	**MAX**	**UNITS**	**CONDITIONS**
V_{F1}	Forward Voltage	----	3.4	3.9	V	I_F = 20 mA
V_{F2}		2.0	----	----	V	I_F = 5 µA
I_V	Luminous Intensity (Axial Direction)	25	----	101	mcd	I_F = 20 mA
λd	Dominant Wavelength	460	----	480	nm	I_F = 20 mA
Δλ	Spectral Line Half Width	----	25	----	nm	I_F = 20 mA

Ranking

I_F = 20 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

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).

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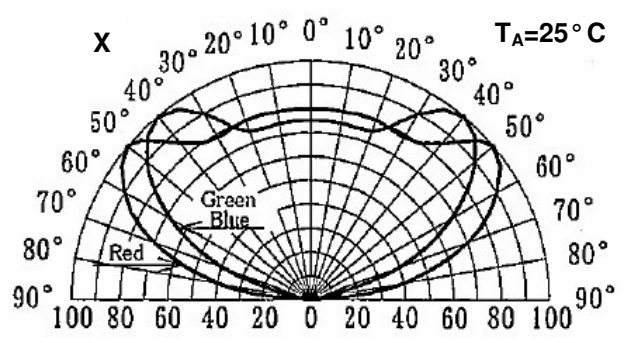
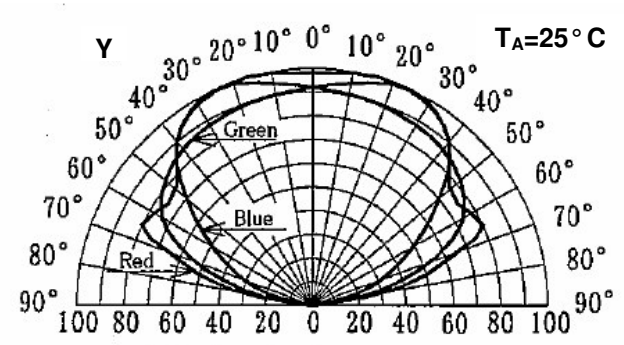
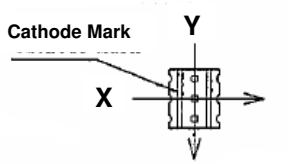
Radiation Patterns



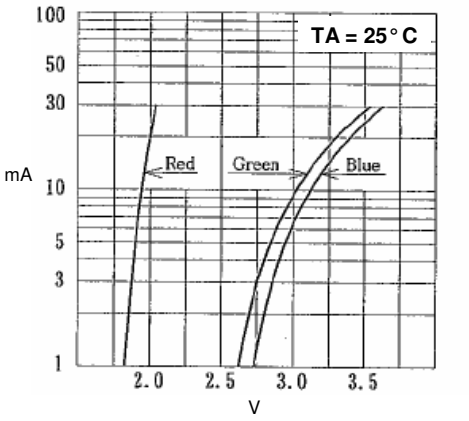
Relative Luminous Intensity



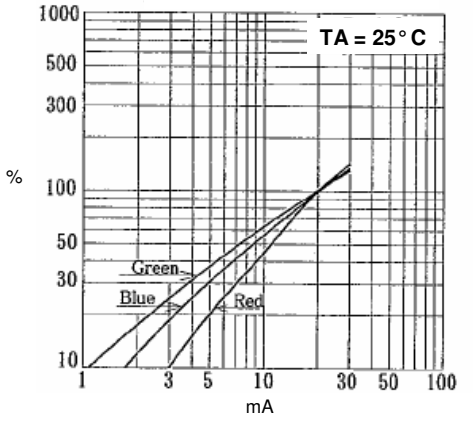
Relative Luminous Intensity



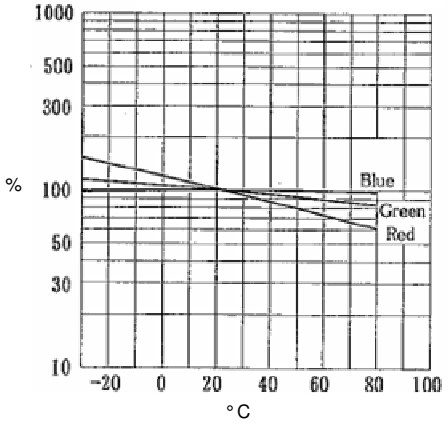
Typical Electro-Optical Characteristics Curves



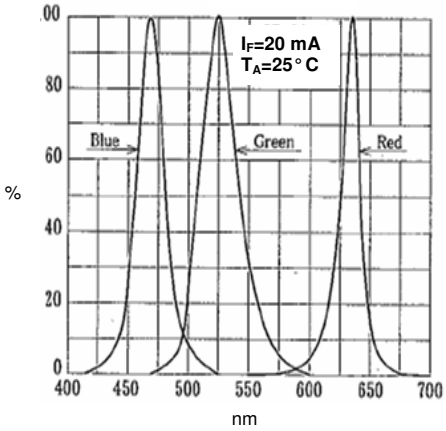
Forward Voltage vs Forward Current



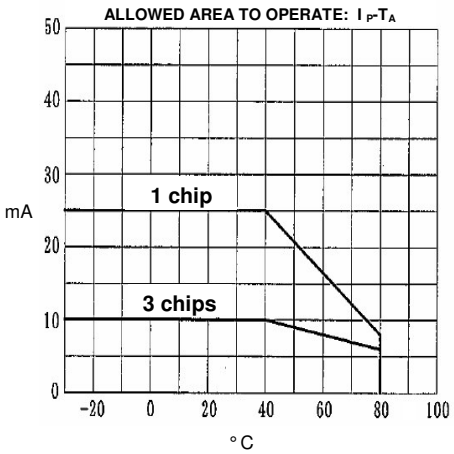
Forward Current vs Relative Luminous Intensity



Ambient Temperature vs Relative Luminous Intensity



Wavelength vs Relative Intensity



Forward Current vs Ambient Temperature

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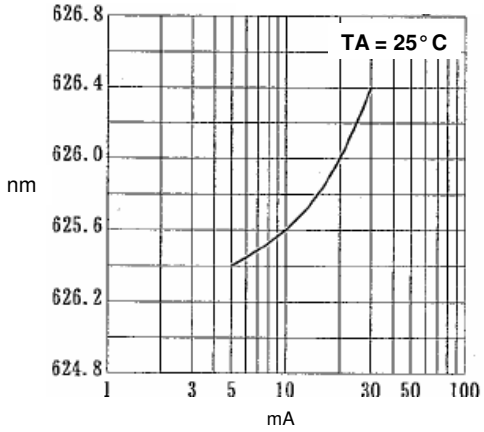
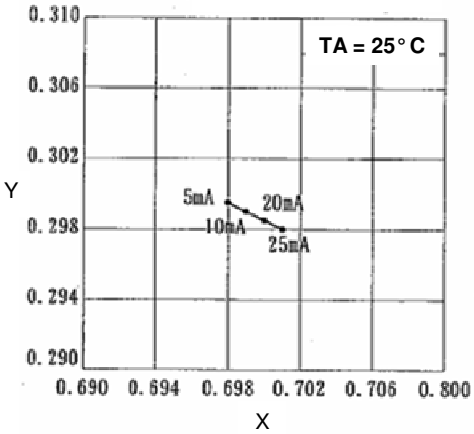
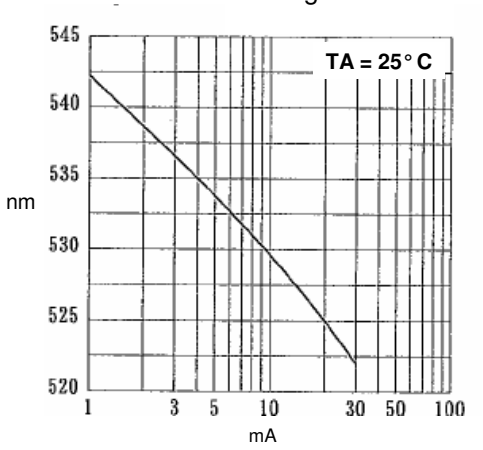
Typical Electro-Optical Characteristics Curves



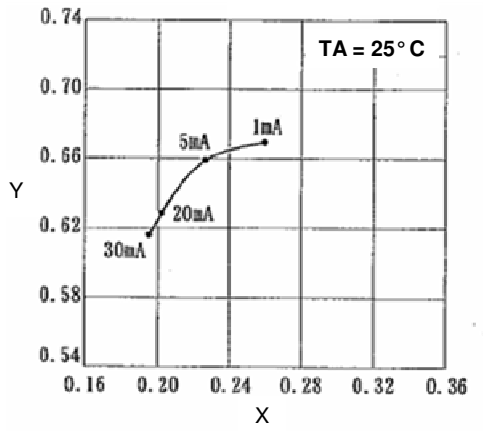
Red: Forward Current vs Dominant Wavelength



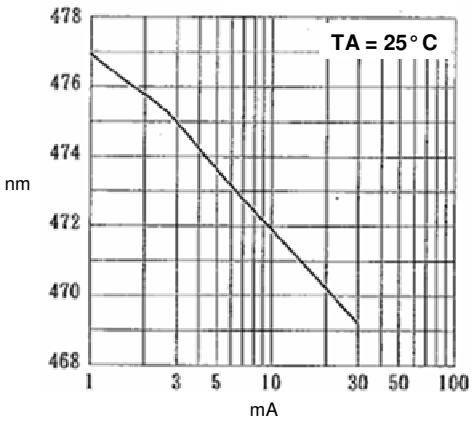
Red: Forward Current vs Chromaticity Diagram



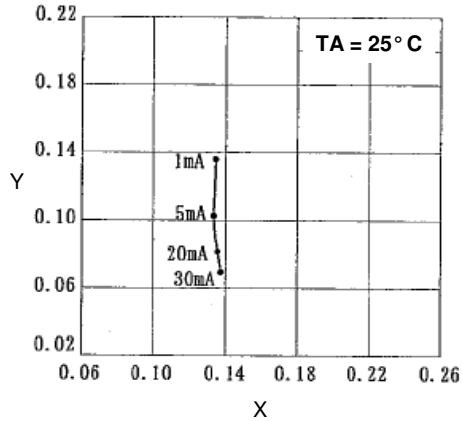
Green: Forward Current vs Dominant Wavelength



Green: Forward Current vs Chromaticity Diagram

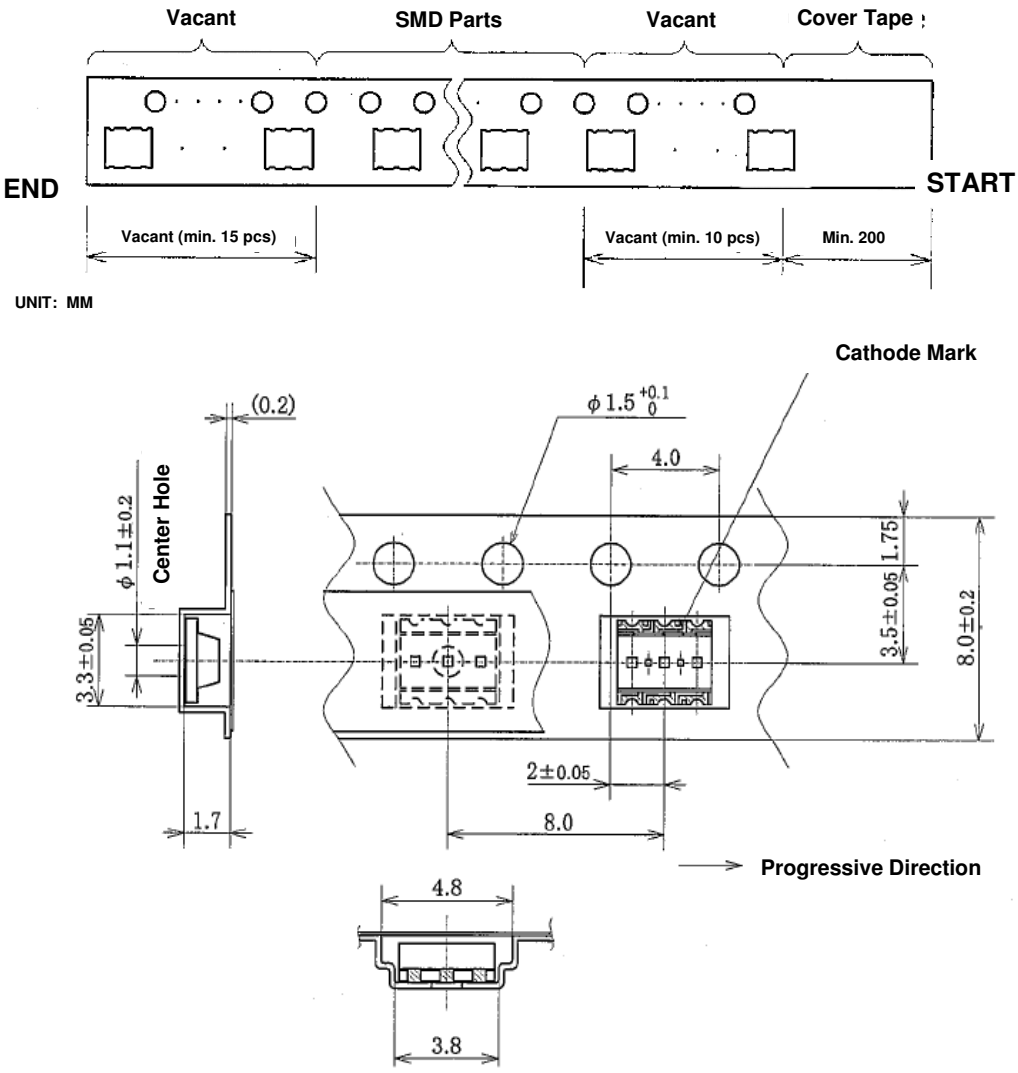


Blue: Forward Current vs Dominant Wavelength



Blue: Forward Current vs Chromaticity Diagram

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).

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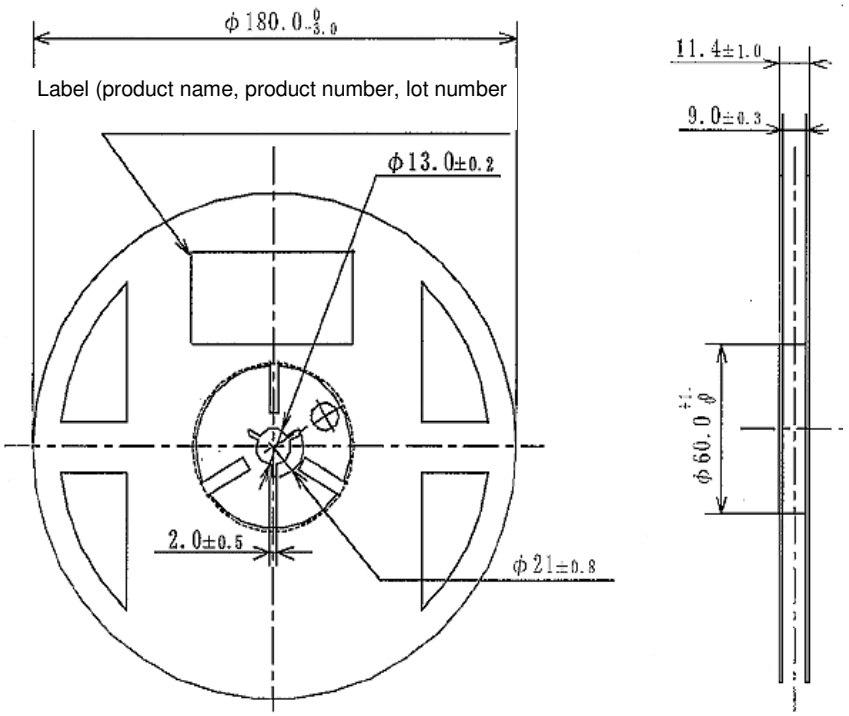
Packing Information: 1000 pieces on 7-inch reel sealed in ESD protected bag

TAPING REEL DIMENSION **UNIT: MM**



Moisture Resistant Packaging