



**Pb-free
HEAT**



KW1305A

3.5 x 3.5 mm (h=1.6 mm) Type White LED

Features

Package	3.5 x 3.5 mm (h=1.6 mm) Type, Water clear resin
Product features	• Outer Dimension 3.5 x 3.5 x 1.6mm (L x W x H) • Temperature range Storage Temperature : -40°C~100°C Operating Temperature : -30°C~85°C • Lead-free soldering compatible • RoHS compliant
Chromaticity coordinates	x = 0.33TYP., y = 0.37TYP. (Condition : I _F =20mA)
Spatial distribution	55 deg.
Die materials	InGaN
Optical efficiency	52 lm/W
Rank grouping parameter	Sorted by luminous intensity and chromaticity per rank taping
Assembly method	Auto pick & place machine (Auto Mounter)
Soldering methods	Reflow soldering and manual soldering
Taping and reel	1,000pcs per reel in a 12mm width tape. (Standard) Reel diameter: ϕ 180mm
ESD	1kV (HBM)

Recommended Applications

Cellular Phone, Mobile Equipment, Electric Household Appliances, Other General Applications



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Color and Luminous Intensity

(Ta=25°C)

Part No.	Material	Emitted Color	Lens Color	Luminous Intensity			Luminous Flux	
				I _v (mcd)			φ _v (lm)	
				MIN.	TYP.	I _f	TYP.	I _f
KW1305A	InGaN	White	Water Clear	6,800	10,000	20/chip	10	20/chip

※Note : The above luminous intensity(I_v) is the setup values of the sorting machine.
(Tolerance : I_v...±10%)



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Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings	Unit
Power Dissipation	P_d	210(3chips)	mW
Forward Current	I_F	20(1chip)	mA
Pulse Forward Current ※1	I_{FRM}	50(1chip)	mA
Derating (Ta=60°C or higher)	ΔI_F	0.60	mA/°C
	ΔI_{FRM}	1.5	mA/°C
Reverse Voltage	V_R	5(1chip)	V
Operating Temperature	T_{opr}	-30~+85	°C
Storage Temperature	T_{stg}	-40~+100	°C

※1 I_{FRM} Measurement condition : Pulse Width $\leq 500ms$, Duty $\leq 1/4$



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Electro-Optical Characteristics

(Ta=25°C)

Item	Condition	Symbol	Characteristics		Unit
Forward Voltage※1	I _F =20mA/1chip	V _F	TYP.	3.2	V
			MAX.	3.5	
Reverse Current	V _R =5V/1chip	I _R	MAX.	50	μ A
Half Intensity Angle	I _F =20mA/1chip	2 θ 1/2	TYP.	55	deg.
Chromaticity Coordinates	I _F =20mA/1chip	x	TYP.	0.33	-
		y	TYP.	0.37	-

※1 Forward Voltage Tolerance Range : ±0.1V



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Luminous Intensity Rank

(Ta=25°C)

Intensity Tolerance each Rank : +/-10%

Rank	I _v (mcd)		Condition
	MIN.	MAX.	
DY	6,800	8,200	I _F =20mA/1chip
DZ	8,200	10,000	
E1	10,000	12,000	
E2	12,000	15,000	

Please contact our sales staff concerning rank designation.

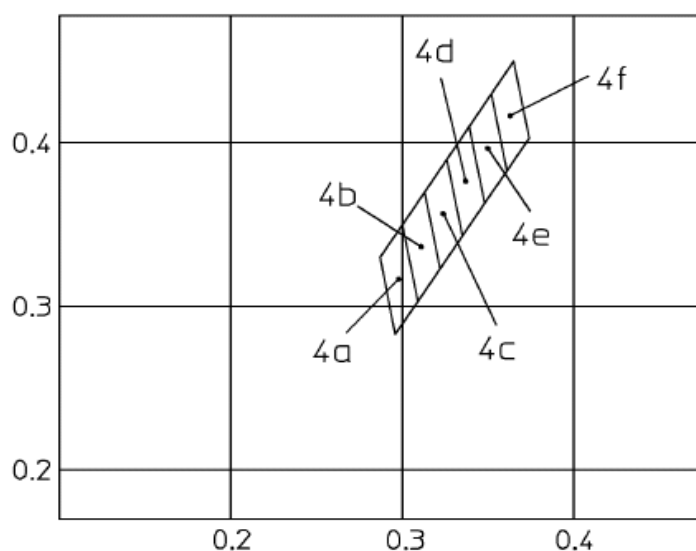
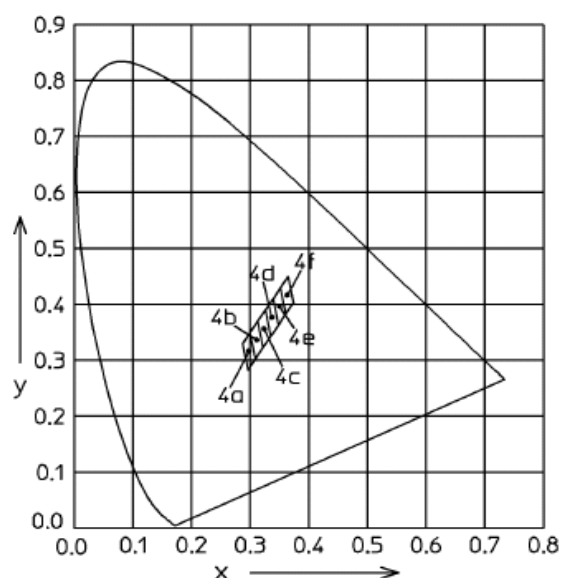


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Sorting Chart for Chromaticity Coordinates

(Ta=25°C)



Chromaticity Coordinates Tolerance Each Rank : ± 0.02

Rank	LEFT DOWN point		LEFT UP point		RIGHT UP point		RIGHT UP point	
	x	y	x	y	x	y	x	y
4a	0.296	0.283	0.287	0.330	0.300	0.350	0.309	0.303
4b	0.309	0.303	0.300	0.350	0.313	0.370	0.322	0.323
4c	0.322	0.323	0.313	0.370	0.326	0.390	0.335	0.343
4d	0.335	0.343	0.326	0.390	0.339	0.410	0.348	0.363
4e	0.348	0.363	0.339	0.410	0.352	0.430	0.361	0.383
4f	0.361	0.383	0.352	0.430	0.365	0.450	0.374	0.403

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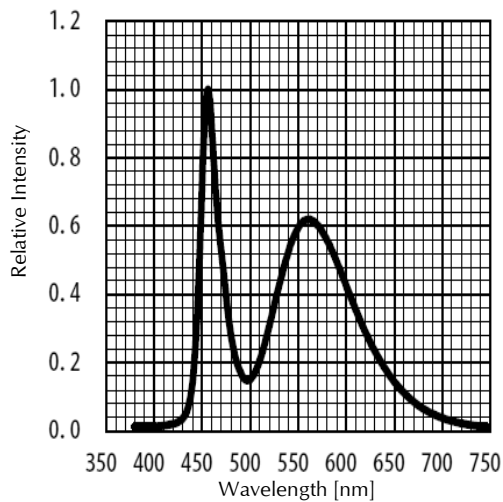
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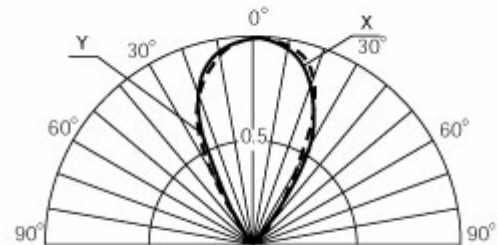
Technical Data

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : $T_a = 25^\circ\text{C}$, $I_F = 20\text{mA}/\text{chip}$

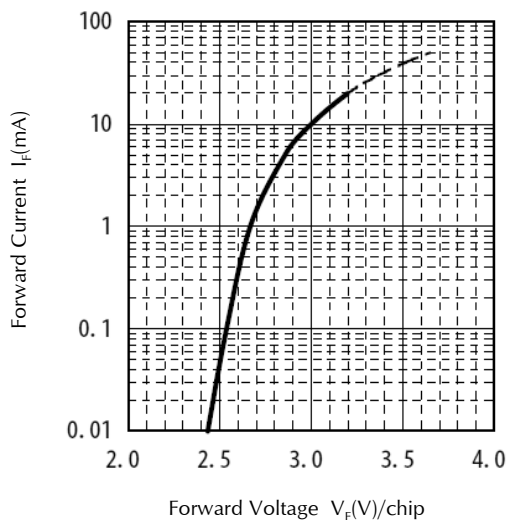


Spatial Distribution Example

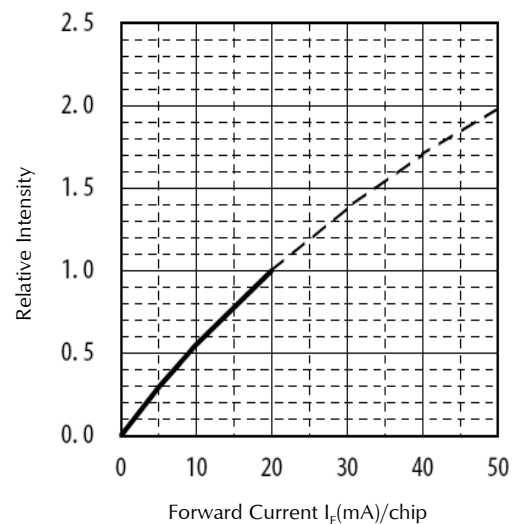
Condition : $T_a = 25^\circ\text{C}$



Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$

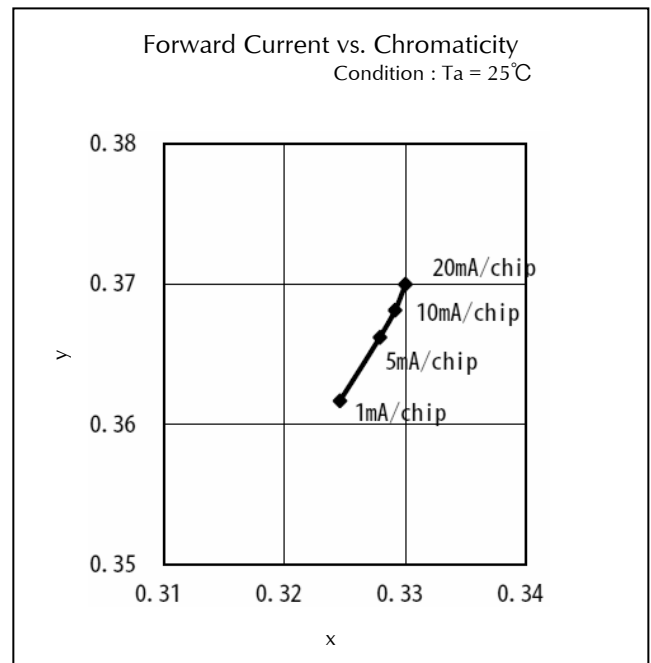
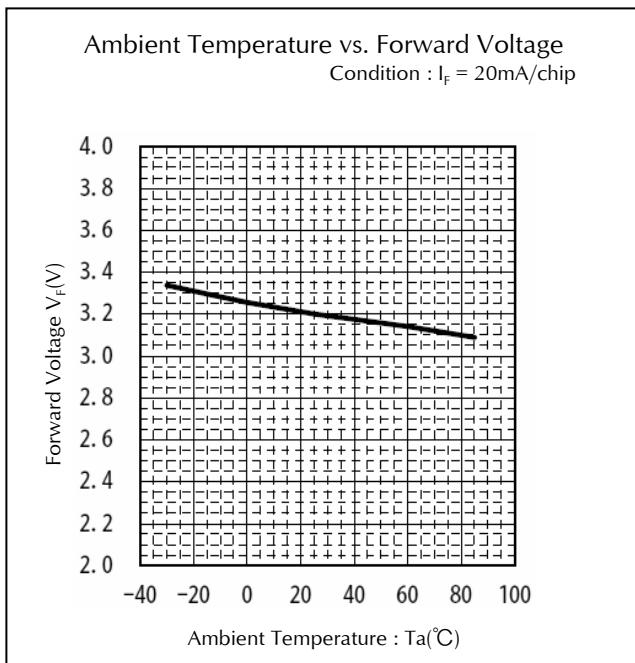
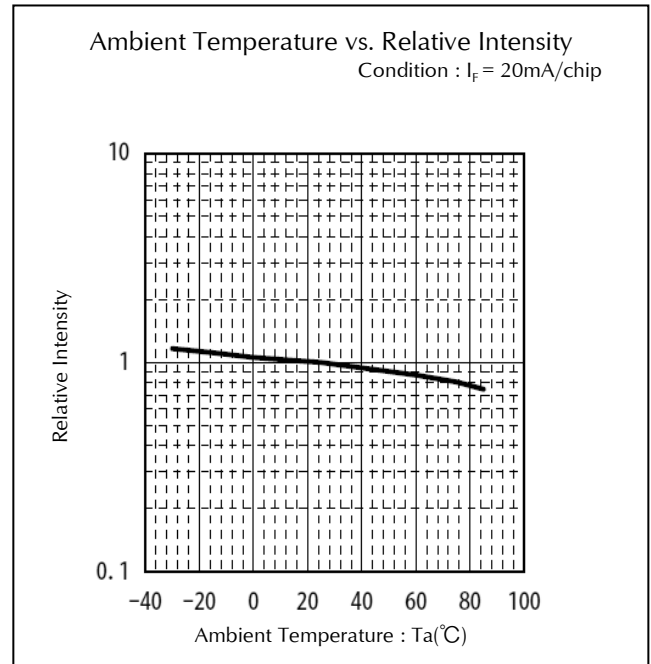
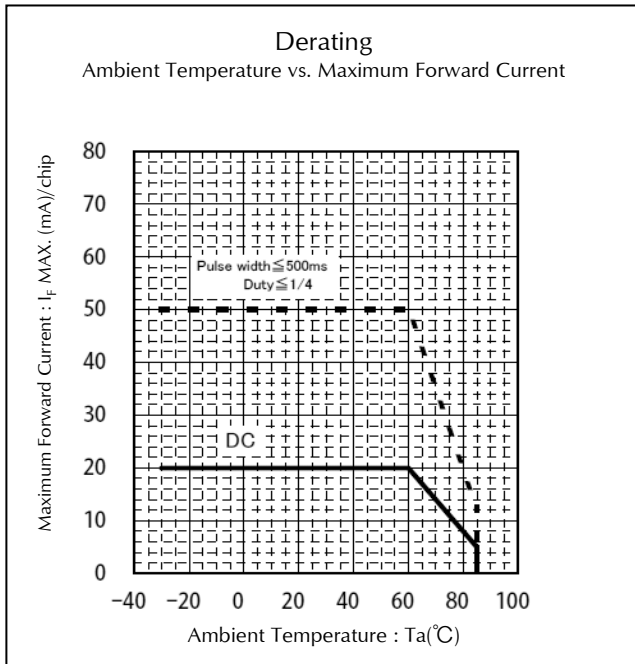




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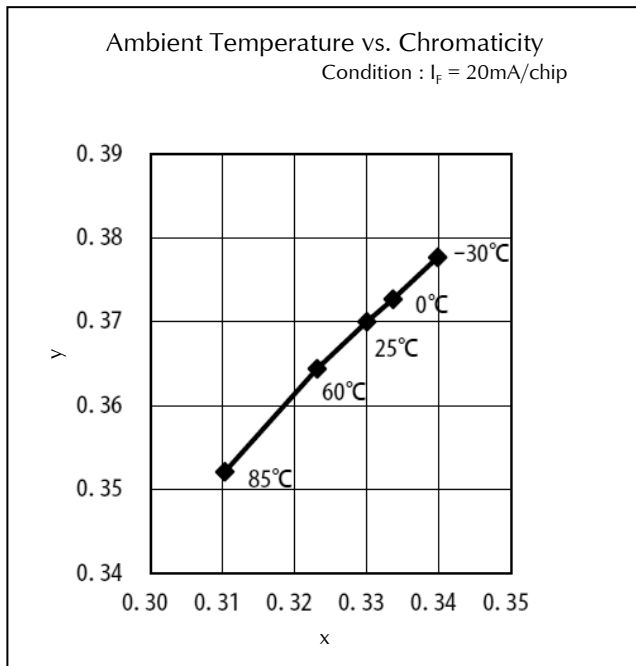




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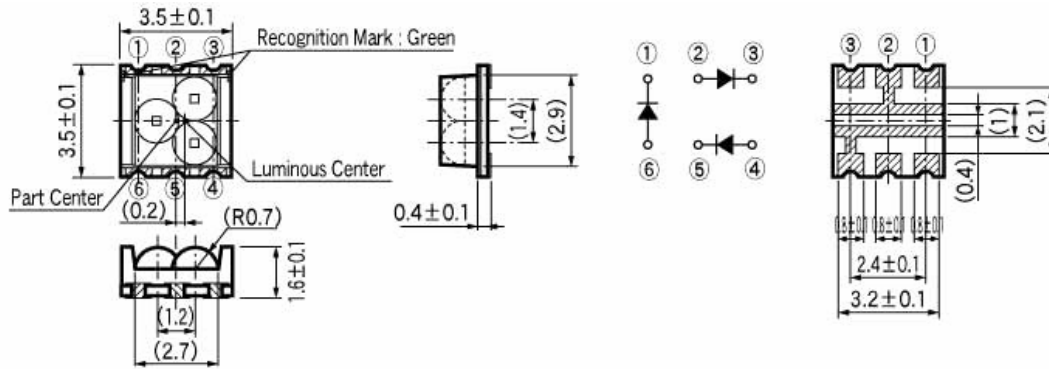
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Package Dimensions

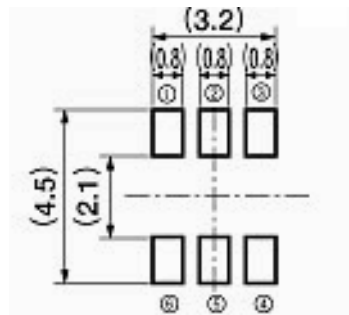
(Unit: mm)

Weight: (24)mg



Recommended Soldering Pattern

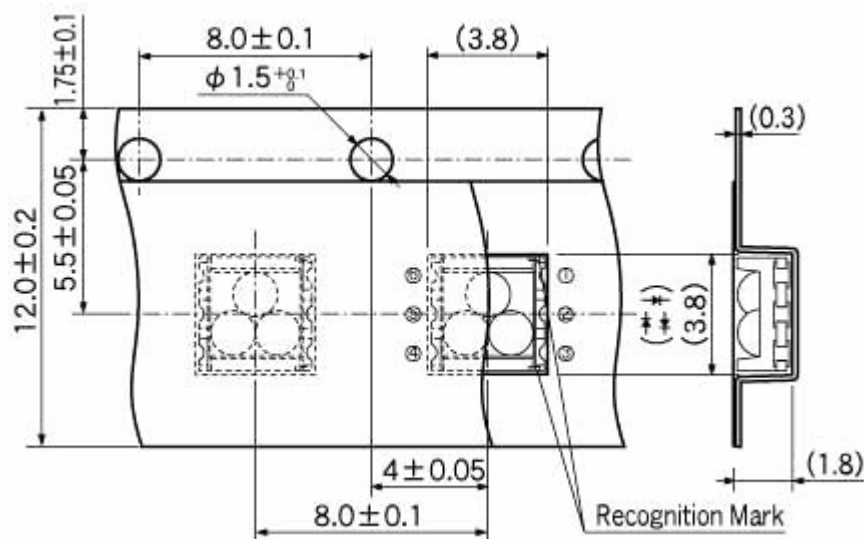
(Unit: mm)



Taping Specification

(Unit: mm)

- Quantity: 1,000pcs/ reel (standard)

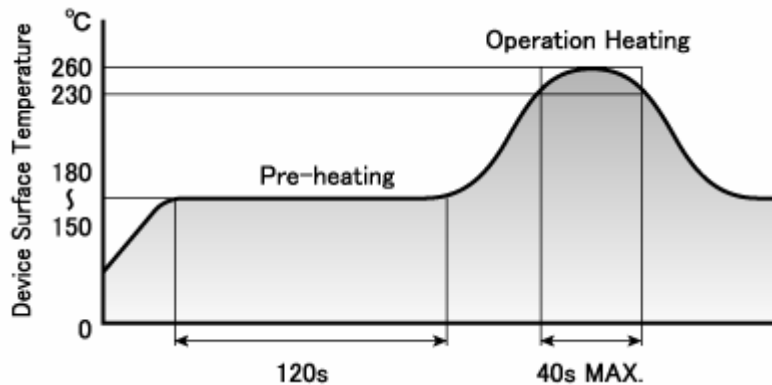




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Reflow Soldering Conditions



- 1) The above profile temperature gives the maximum temperature of the LED resin surface. Please set the temperature so as to avoid exceeding this range.
- 2) Total times of reflow soldering process shall be no more than 2 times. When the second reflow soldering process is performed, intervals between the first and second reflow should be short as possible (while allowing some time for the component to return to normal temperature after the first reflow) in order to prevent the LED from absorbing moisture.

Manual Soldering Conditions

Iron tip temp.	350 °C	(MAX.)
Soldering time and frequency	3 s	(MAX.)
	1 time	(MAX.)



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Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25°C, If = 20mA/1 chip	500 h	0/24
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 85°C, If = 5mA/1 chip	500 h	0/24
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -30°C, If = 20mA/1 chip	500 h	0/24
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60°C, 90%, If = 20mA/1 chip	500 h	0/24
Dynamic Operating Life	EIAJ ED-4701/100(101)	Ta = 60°C, I _{FRM} = 50mA/1 chip, Pulse Width = 0.5s, Duty = 1/4	20,000 cycles	0/24
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60°C, 90%	1,000 h	0/24
Thermal Shock	EIAJ ED-4701/100(105)	Ta = -40°C ~ 100°C (each 15min.)	200 cycles	0/24
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = 100°C	1,000 h	0/24
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = -40°C	1,000 h	0/24
Cycled Temp. Humidity Life	EIAJ ED-4701/200(203)	Ta = -10°C ~ 65°C, 95%, 24h/cycle	10 cycles	0/24
Resistance to Reflow Soldering	EIAJ ED-4701/300(301)	Preheat : 150 ~ 180°C(120s Max.) Soldering Temp. : 260°C(5s) Moisture Soak : 30°C, 70%, 72h	Twice	0/24
Electric Static Discharge (ESD)	EIAJ ED-4701/300(304)	C = 100pF, R2 = 1.5KΩ, ±1,000V	once each polarity	0/24
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s ² (10G), 100 ~ 2KHz, 20min, XYZ each direction	2 h	0/12

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	Iv	If=20mA/1 chip	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	Vf	If=20mA/1 chip	Testing Max. Value ≥ Spec. Max. Value x 1.2
Reverse Current	Ir	Vr=5V/1 chip	Testing Max. Value ≥ Spec. Max. Value x 2.5
Cosmetic Appearance	-	-	Occurrence of notable decoloration, deformation and cracking



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