Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Pb-free HEAT

VLW1148LS

PLCC-2 Type White LED
(High Reliability type, White V-Series)

Features

Package	PLCC-2 Type, Diffused pale yellow resin
Product features	・Outer Dimension 2.17 x 1.4 x 1.3mm(L x W x H) ・Wide operation temperature range. Storage Temperature : -40℃～110℃ Operating Temperature : -40℃～100℃ Operation Guarantee ・Spatial distribution characteristics. (2θ1/2 : 120deg) ・Corresponding to a use requiring high reliability in cars etc... ・Lead-free soldering compatible ・RoHS compliant
Chromaticity coordinates	x = 0.31TYP., y = 0.32TYP. (Condition : I_F=10mA)
Spatial distribution	120 deg.
Die materials	InGaN
Optical efficiency	10.0lm/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	3,000pcs per reel in a 8mm width tape. (Standard) Reel diameter : φ180mm
ESD	1kV (HBM)

Recommended Applications

SW lighting for car indicators, meter panel, car audio and heater control, etc...

Color and Luminous Intensity

(Ta=25℃)

Part No.	Material	Emitted Color	Lens Color	Luminous Intensity Iv (mcd)			Luminous Flux ϕ v (lm)	
				MIN.	TYP.	I_F	TYP.	I_F
VLW1148LS	InGaN	White	Pale Yellow	47	100	10	0.31	10

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

Absolute Maximum Ratings

(Ta=25℃)

Item	Symbol	Absolute Maximum Ratings	Unit
Power Dissipation	P_d	78	mW
Forward Current	I_F	20	mA
Pulse Forward Current ※1	I_{FRM}	100	mA
Derating (Ta=60℃ or higher)	ΔI_F	0.40	mA/℃
	ΔI_{FRM}	2	mA/℃
Reverse Voltage	V_R	5	V
Operating Temperature	T_{opr}	-40～+100	℃
Storage Temperature	T_{stg}	-40～+110	℃

※1 I_{FRM} Measurement condition : Pulse Width≦1ms, Duty≦1/10

Thermal Characteristics

Item	Symbol	Ratings	Unit
Junction Temperature (MAX.)	T_j	110	℃
Thermal Resistance (TYP.) (Junction/ ambient)	$R_{(th\ j\text{-}a)}$	350	℃/W
Thermal Resistance (TYP.) (Junction/ Solder Point)	$R_{(th\ j\text{-}s)}$	200	℃/W

※Rth(j-a) Measurement Condition / Substrate: FR4(t=1.6mm) Pattern Size: 16mm^2.

Electro-Optical Characteristics

(Ta=25℃)

Item	Condition	Symbol	Characteristics		Unit
Forward Voltage	I_F=10mA	V_F	TYP.	3.1	V
			MAX.	3.7	
Reverse Current	V_R=5V	I_R	MAX.	10	μA
Half Intensity Angle	I_F=10mA	2θ 1/2	TYP.	120	deg.
Chromaticity Coordinates	I_F=10mA	x	TYP.	0.31	-
		y	TYP.	0.32	-

Luminous Intensity Rank

(Ta=25℃)

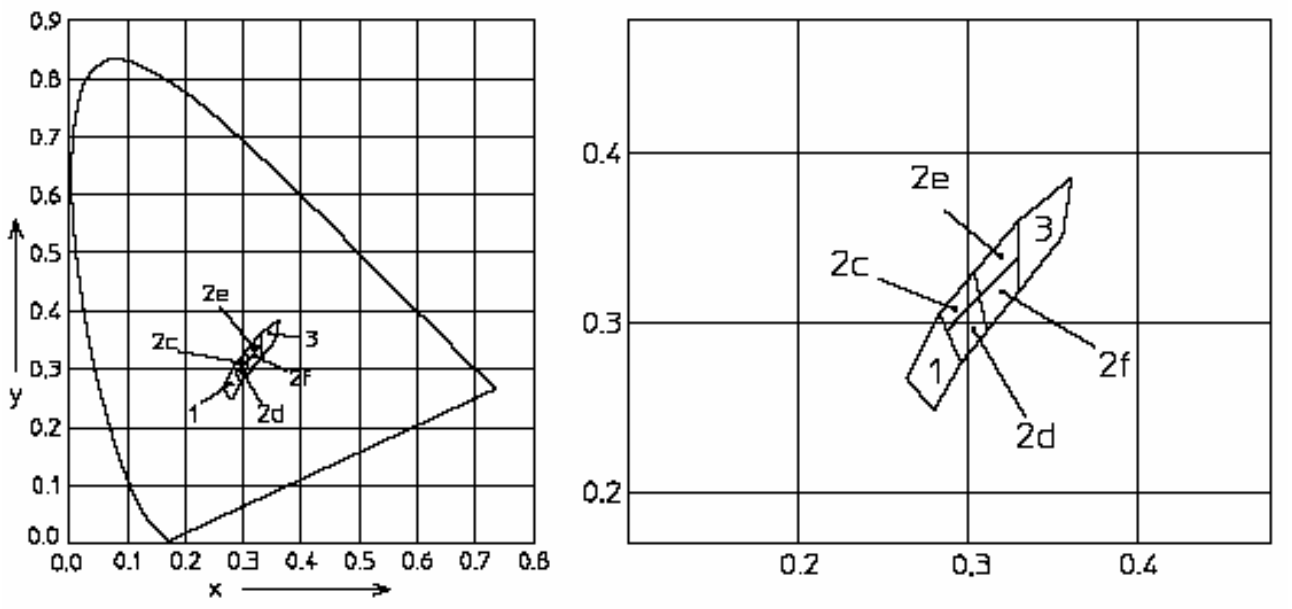
Intensity Tolerance each Rank : +/-10%

Rank	I_V(mcd)		Condition
	MIN.	MAX.	
B9	47	56	I_F=10mA
BX	56	68	
BY	68	82	
BZ	82	100	
C1	100	120	
C2	120	150	
C3	150	180	

※ Please contact our sales staff concerning rank designation.

Sorting Chart for Chromaticity Coordinates

Chromaticity Coordinates Tolerance Each Rank : +/-0.01



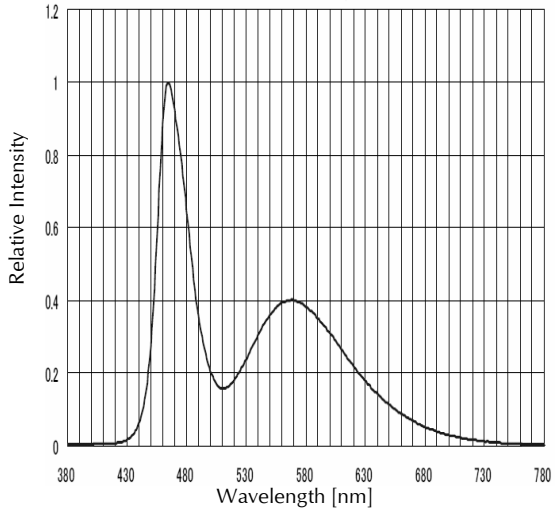
	LEFT DOWN point		LEFT UP point		RIGHT UP point		RIGHT UP point	
Rank	x	y	x	y	x	y	x	y
1	0.280	0.248	0.264	0.267	0.283	0.305	0.296	0.276
2c	0.287	0.295	0.283	0.305	0.304	0.330	0.307	0.315
2d	0.296	0.276	0.287	0.295	0.307	0.315	0.311	0.294
2e	0.307	0.315	0.304	0.330	0.330	0.360	0.330	0.339
2f	0.311	0.294	0.307	0.315	0.330	0.339	0.330	0.318
3	0.330	0.318	0.330	0.360	0.361	0.385	0.356	0.351

※Please contact our sales staff concerning rank designation.

Technical Data

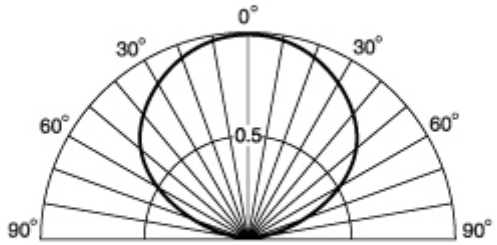
Spectral Distribution

Relative Intensity vs. Wavelength
Condition : Ta = 25℃, I_F = 10mA



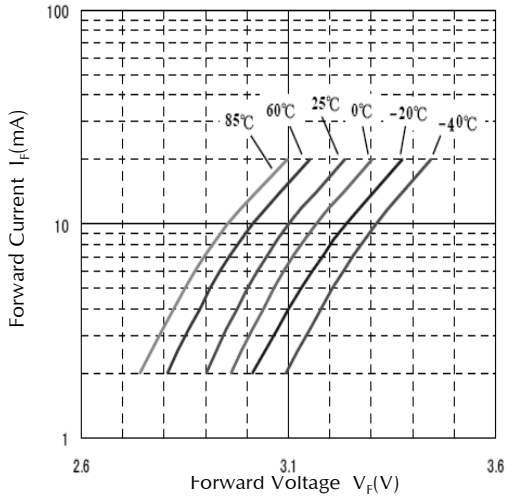
Spatial Distribution Example

Condition : Ta = 25℃



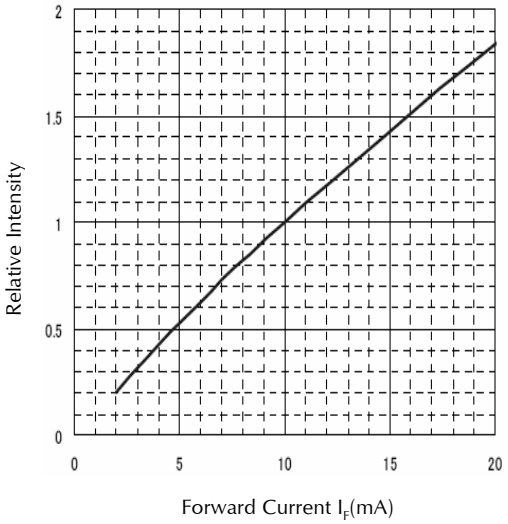
Forward Voltage vs. Forward Current

Condition : Ta = -40℃～85℃



Forward Current vs. Relative Intensity

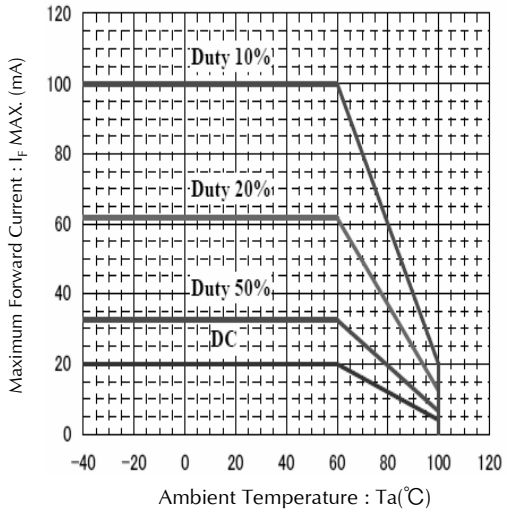
Condition : Ta = 25℃



Technical Data

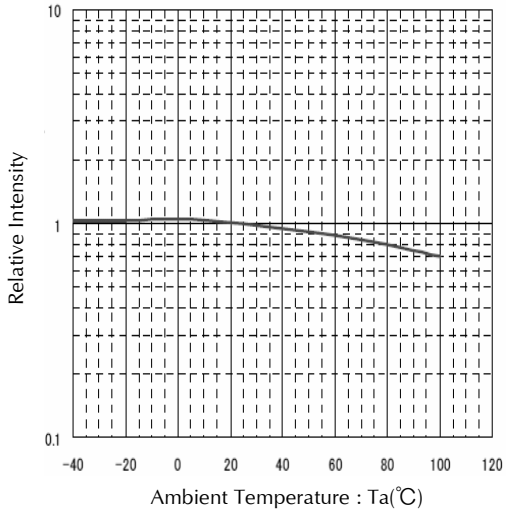
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 10Hz

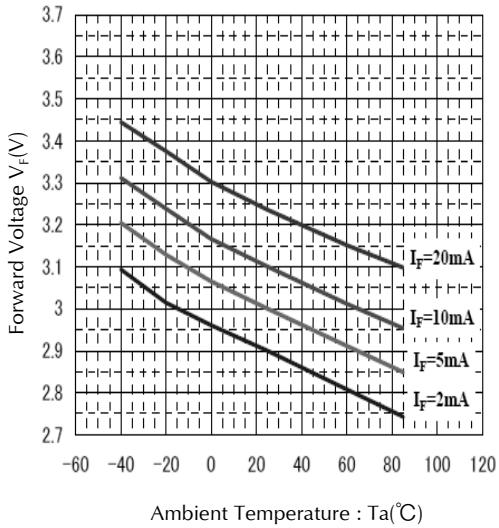


Ambient Temperature vs. Relative Intensity

Condition : I_F=10mA

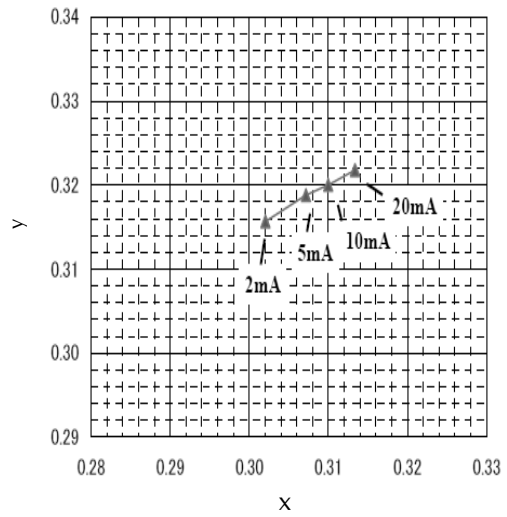


Ambient Temperature vs. Forward Voltage



Forward Current vs. Chromaticity

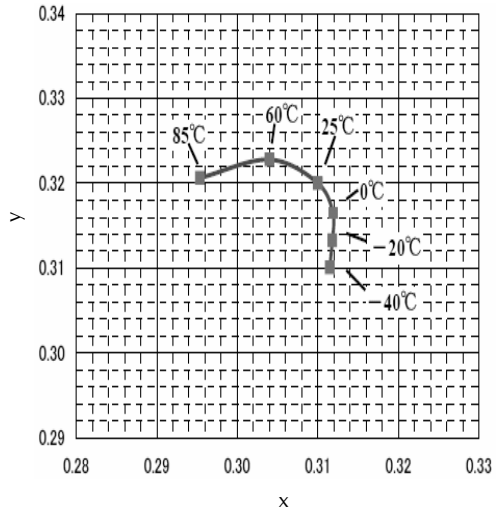
Condition : Ta = 25℃



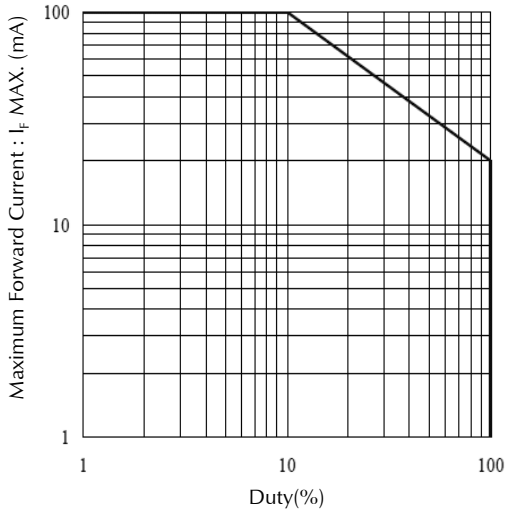
Technical Data

Ambient Temperature vs. Chromaticity

Condition : I_F = 10mA



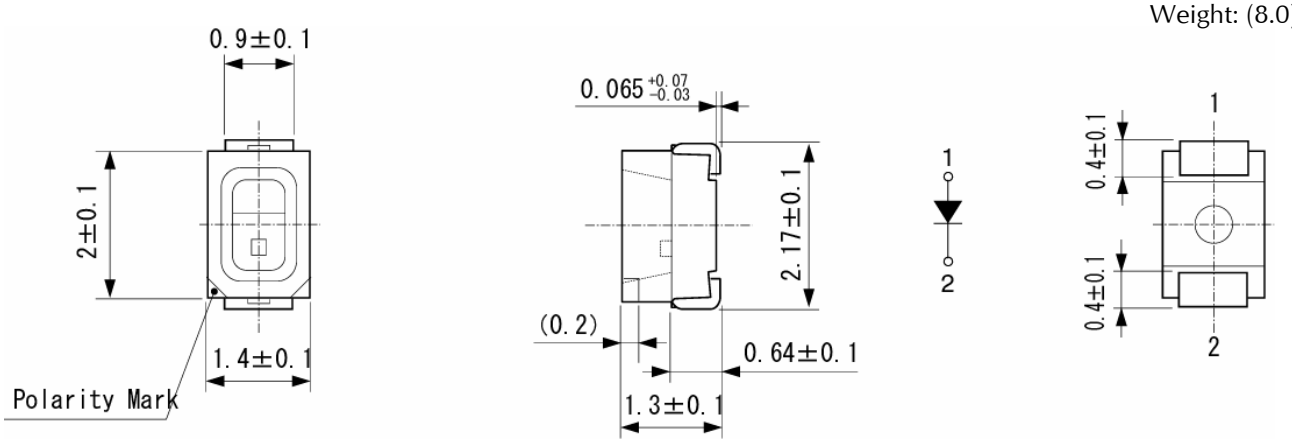
Duty Cycle vs. Maximum Forward Current



Package Dimensions

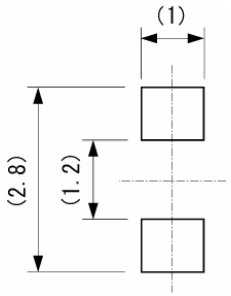
(Unit: mm)

Weight: (8.0)mg



Recommended Soldering Pattern

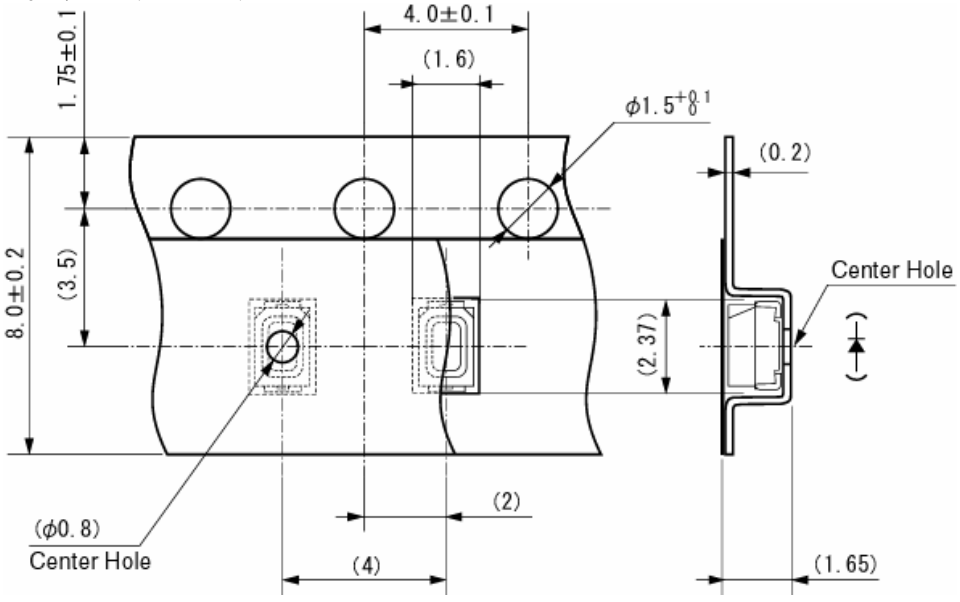
(Unit: mm)



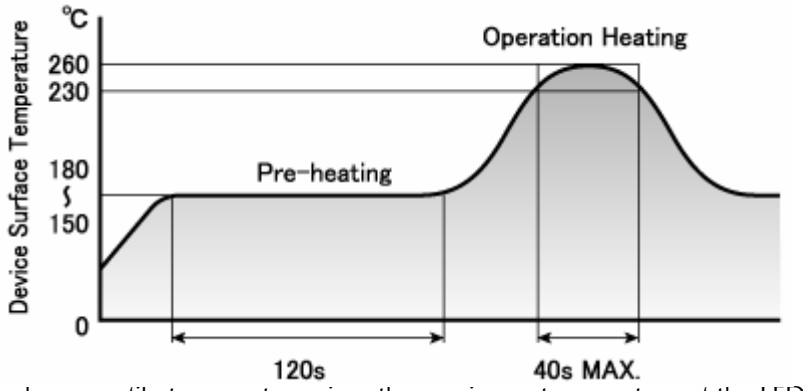
Taping Specification

(Unit: mm)

・Quantity: 3,000pcs/ reel (standard)



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 room temperature after the first reflow) in order to prevent the LED resin from absorbing moisture.

3) Temperature fluctuation to the LED during the pre-heating process shall be minimized. (6℃ maximum)

Manual Soldering Conditions

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

Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25℃, I_F = 20mA	1,000 h	0/20
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 85℃ ,I_F = 10mA	1,000 h	0/20
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -40℃, I_F = 20mA	1,000 h	0/20
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60℃, 90%, I_F = 20mA	1,000 h	0/20
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60℃, 90%	1,000 h	0/20
Thermal Shock	EIAJ ED-4701/100(105)	Ta = -40℃ ～ 110℃ (each 15min.)	1,000 cycles	0/20
Thermal Shock Operating	EIAJ ED-4701/100(105)	Ta = -40℃(OFF) ～ 85℃(I_F = 10mA ON) (each 15min.)	1,000 cycles	0/20
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = 110℃	1,000 h	0/20
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = -40℃	1,000 h	0/20
Cycled Temp. Humidity Operating Life	EIAJ ED-4701/200(203)	Ta = -30℃ ～ 80℃, 95%, 8h/cycle	30 cycles	0/20
Resistance to Reflow Soldering	EIAJ ED-4701/300(301)	Moisture Soak : 30℃, 70%, 168h Preheat : 150℃～180℃ (120s Max.) Soldering Temp. : 260℃ (5s)	Twice	0/20
Electric Static Discharge (ESD)※1	EIAJ ED-4701/300(304)	C = 100pF, R2 = 1.5KΩ, ±2,000V	once each polarity	0/20
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s^2(10G), 100 ～ 2KHz, 20min. XYZ各方向	2 h	0/20

※1 Reference test

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	I_V	I_F=10mA	Testing Min. Value ＜ Spec. Min. Value x 0.5
Forward Voltage	V_F	I_F=10mA	Testing Max. Value ≧ Spec. Max. Value x 1.2
Reverse Current	I_R	V_R=5V	Testing Max. Value ≧ Spec. Max. Value x 2.5
Cosmetic Appearance	-	-	Occurrence of notable decoloration, deformation and cracking

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