Pb-free HEAT

XW1147B

PLCC-4 Type White LED

Features

Package	PLCC-4 Type, Diffused pale yellow resin
Product features	• Outer Dimension 3.5 x 2.8 x 1.9mm(L x W x H) • Temperature range Storage Temperature : -40℃~100℃ Operating Temperature : -30℃~85℃ • Spatial distribution characteristics. ($2\theta 1/2$: 120deg) • No lead package and lead-free soldering compatible • RoHS compliant
Chromaticity coordinates	x = 0.31TYP., y = 0.32TYP. (Condition : I_F=20mA)
Spatial distribution	120 deg.
Die materials	InGaN
Optical efficiency	19 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, TTW (Through The Wave) soldering and manual soldering
Taping and reel	2,000pcs per reel in a 8mm width tape. (Standard) Reel diameter: Φ180mm
ESD	1kV (HBM)

Recommended Applications

Cellular Phone, Mobile Equipment, Amusement Equipment, Other General Applications

Color and Luminous Intensity

(Ta=25℃)

Part No.	Material	Emitted Color	Lens Color	Luminous Intensity Iv (mcd)			Luminous Flux Φv (lm)	
				MIN.	TYP.	I_F	TYP.	I_F
XW1147B	InGaN	White	Pale Yellow	400	500	20	1.4	20

※ 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	120	mW
Forward Current	I_F	30	mA
Pulse Forward Current ※1	I_{FRM}	100	mA
Derating (Ta=67.5℃ or higher)	ΔI_F	0.50	mA/℃
	ΔI_{FRM}	1.67	mA/℃
Reverse Voltage	V_R	5	V
Operating Temperature	T_{opr}	-30～+85	℃
Storage Temperature	T_{stg}	-40～+100	℃

※1 I_{FRM}Measurement condition : Pulse Width ≦ 1ms., Duty ≦1/20.

Electro-Optical Characteristics

(Ta=25℃)

Item	Condition	Symbol	Characteristics		Unit
Forward Voltage	I_F=20mA	V_F	TYP.	3.7	V
			MAX.	4	
Reverse Current	V_R=5V	I_R	MAX.	50	μA
Half Intensity Angle	I_F=20mA	2θ1/2	TYP.	120	deg.
Chromaticity Coordinates	I_F=20mA	x	TYP.	0.31	-
		y	TYP.	0.32	-

Luminous Intensity Rank

(Ta=25℃)

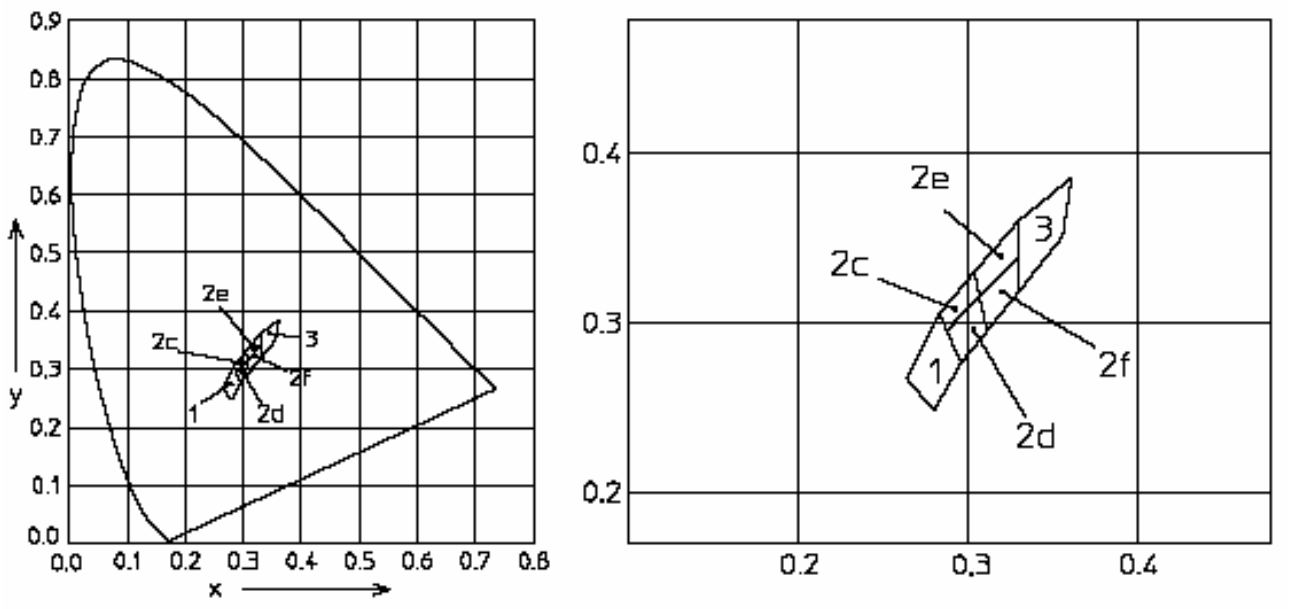
Intensity Tolerance each Rank : +/-10%

Rank	I_V(mcd)		Condition
	MIN.	MAX.	
C	400	475	I_F=20mA
D	475	565	
E	565	672	

※Please contact our sales staff concerning rank designation.

Sorting Chart for Chromaticity Coordinates

Chromaticity Coordinates Tolerance Each Rank : +/-0.02

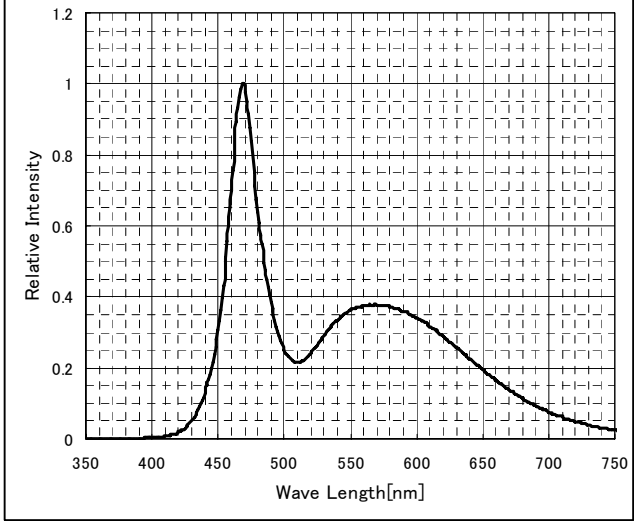


	LEFT DOWN point		LEFT UP point		RIGHT UP point		RIGHT UP point	
Rank	x	y	x	y	x	y	x	y
1	0.280	0.248	0.264	0.267	0.283	0.305	0.296	0.276
2c	0.287	0.295	0.283	0.305	0.304	0.330	0.307	0.315
2d	0.296	0.276	0.287	0.295	0.307	0.315	0.311	0.294
2e	0.307	0.315	0.304	0.330	0.330	0.360	0.330	0.339
2f	0.311	0.294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

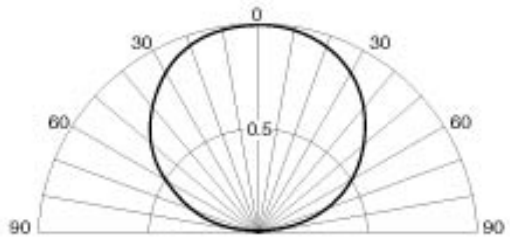
Technical Data

Relative Intensity vs. Wave Length
Condition:IF = 20mA Ta=25℃

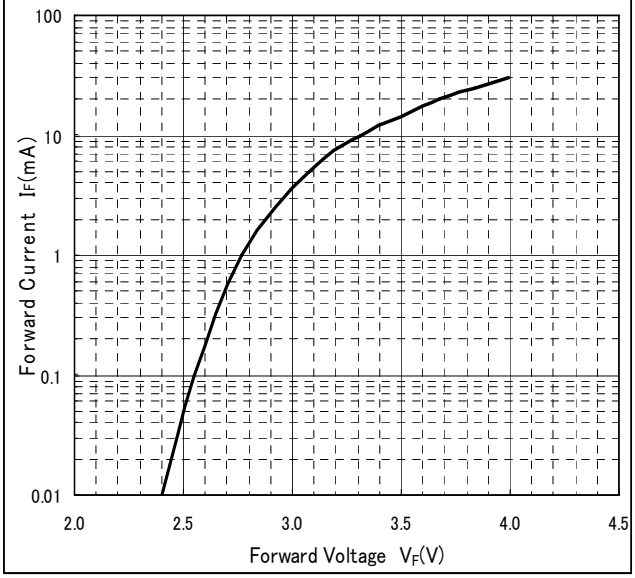


Spatial Distribution Example

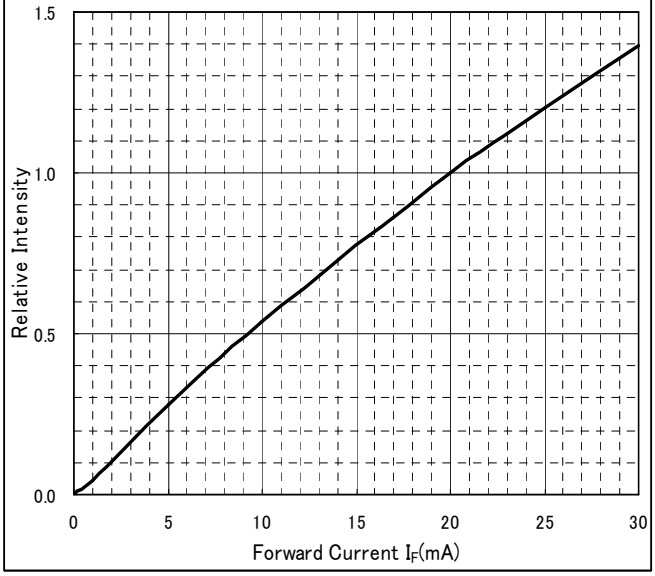
Condition: Ta=25℃



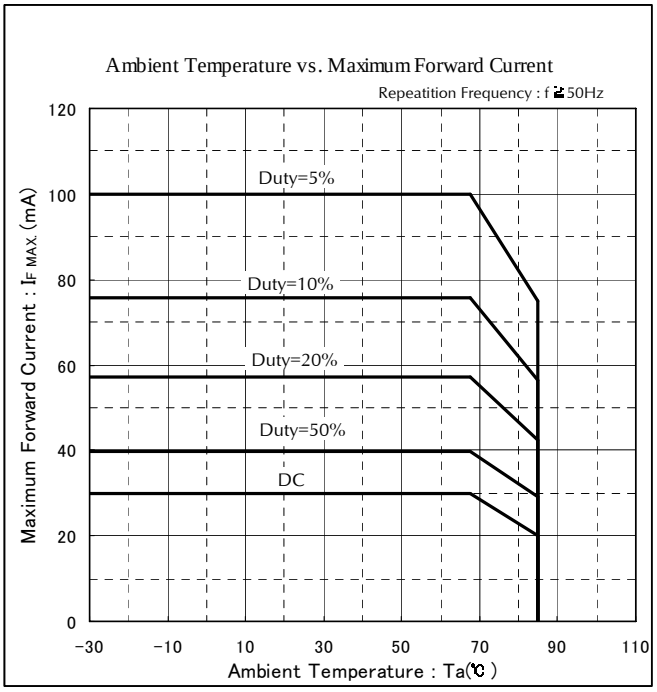
Forward Voltage vs. Forward Current
Condition:Ta=25 ℃

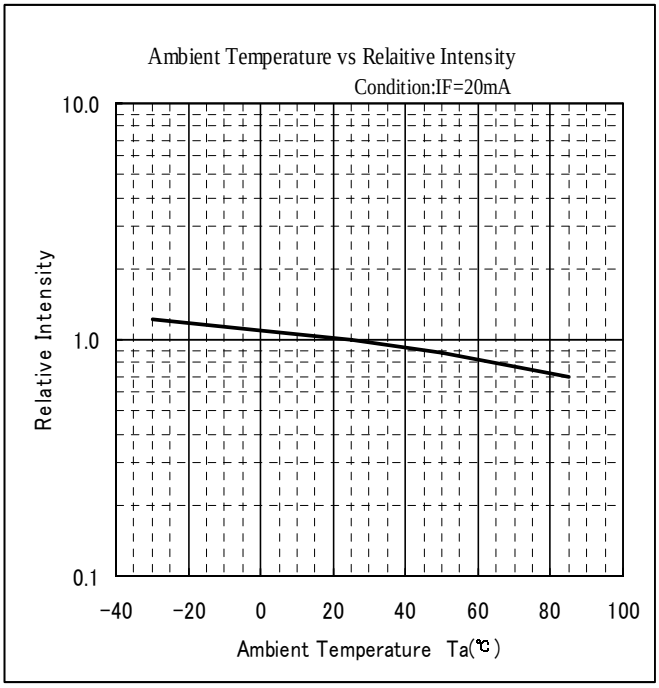


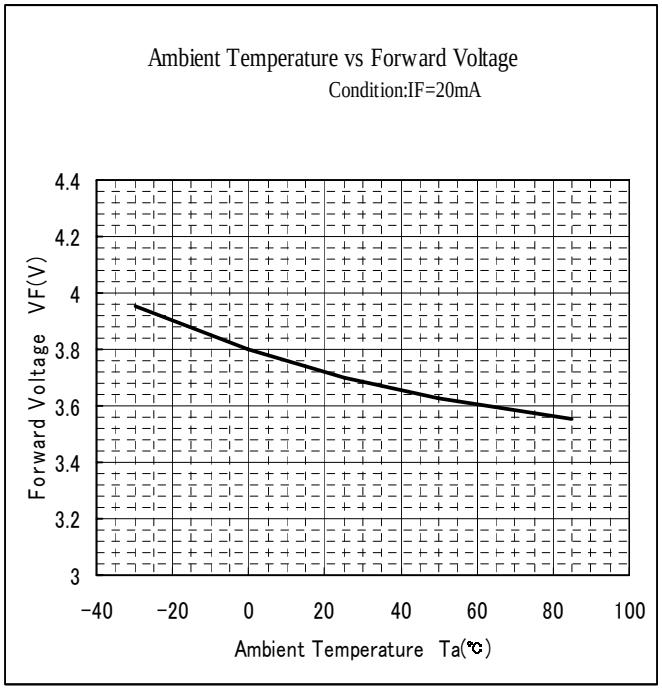
Forward Current vs. Relative Intensity
Condition:Ta=25 ℃

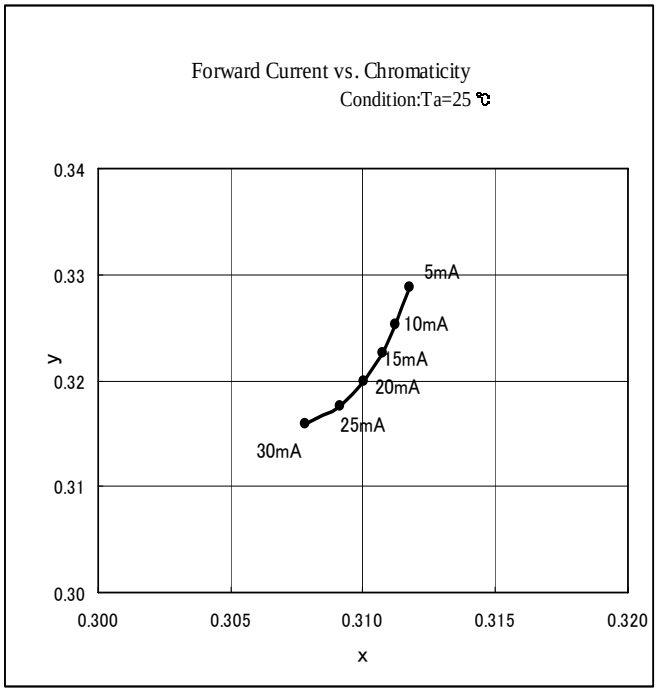


Technical Data

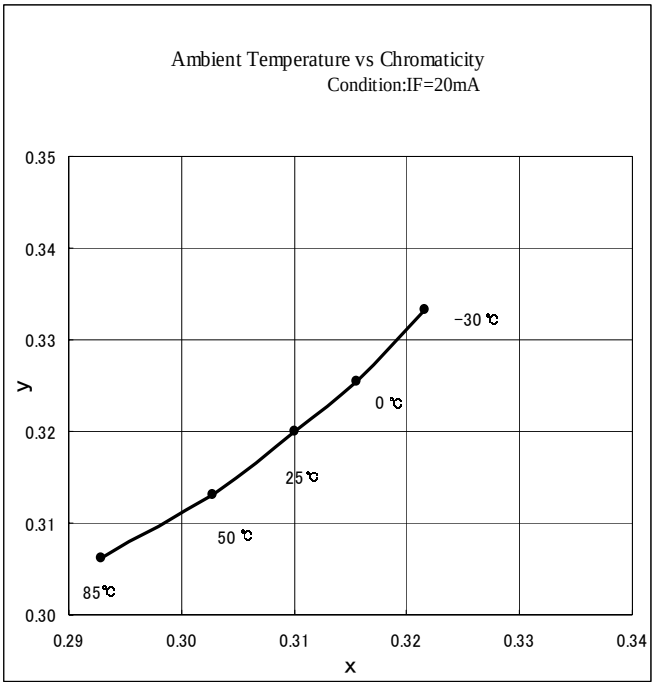






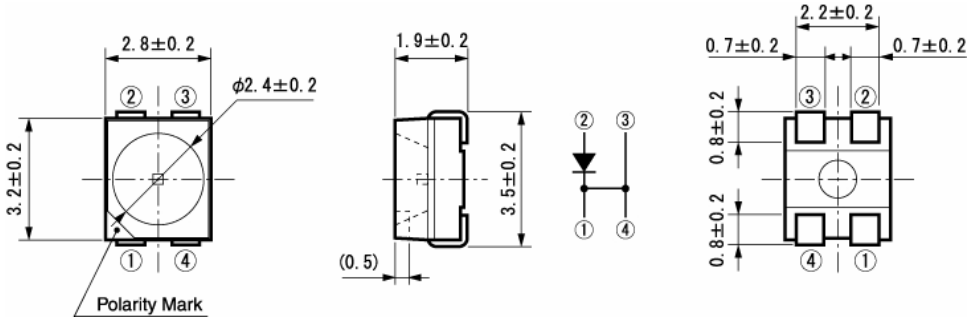


Technical Data



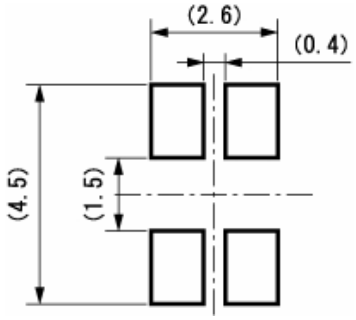
Package Dimensions

(Unit: mm)



Recommended Soldering Pattern

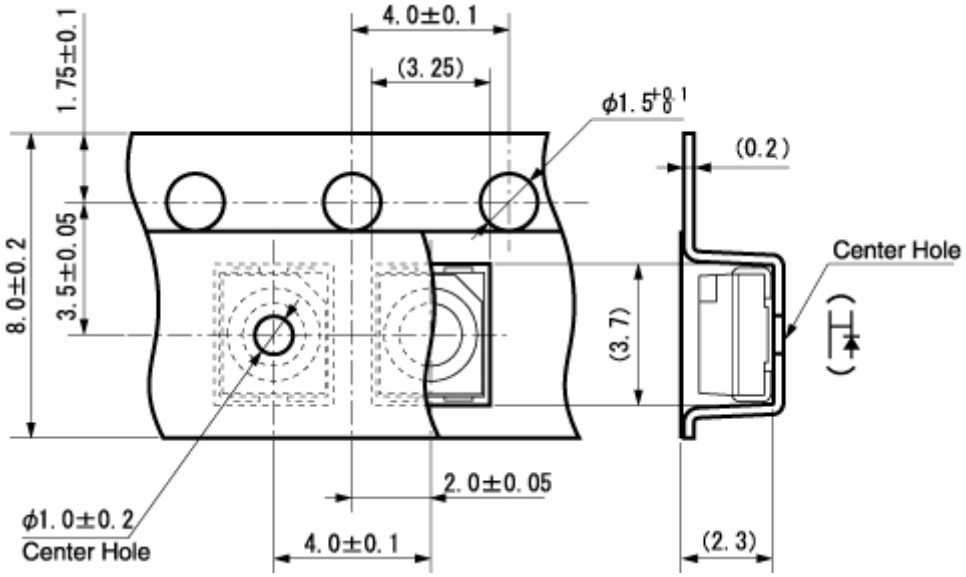
(Unit: mm)



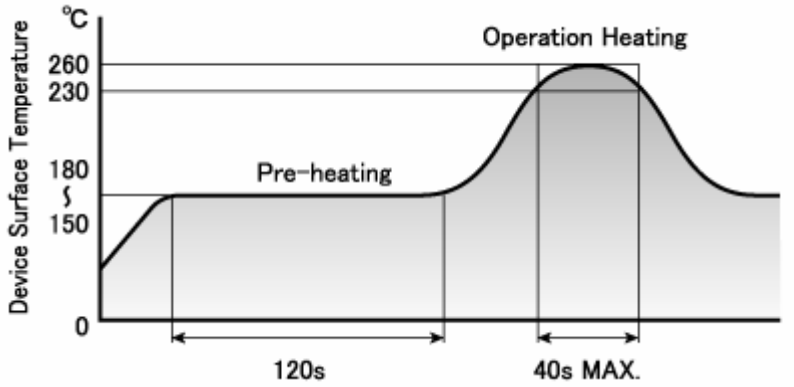
Taping Specification

(Unit: mm)

・Quantity: 2,000pcs/ 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)

TTW (Through The Wave) soldering Conditions

Pre-heating	120 ℃ 60 s	(MAX.) (MAX.)
Solder Bath Temp.	265 ℃	(MAX.)
Dipping Time	5 s	(MAX.)

1) The dip soldering process shall be 2 times maximum.
2) The product shall be cooled to room temp. before the second dipping process.

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 = 30mA	1,000 h	0/20
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 85℃, I_F = 20mA	1,000 h	0/20
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -30℃, I_F = 30mA	1,000 h	0/20
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60℃, 90%, I_F = 30mA	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℃~100℃(each 15min.)	200 cycles	0/20
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = 100℃	1,000 h	0/20
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = -40℃	1,000 h	0/20
Cycled Temp. Humidity Life	EIAJ ED-4701/200(203)	Ta = -10℃~60℃, 95%, 24h/cycle	10 cycles	0/20
Resistance to Reflow Soldering	EIAJ ED-4701/300(301)	Preheat : 150℃~180℃(120s Max.) Soldering Temp. : 260℃(5s) Moisture Soak : 30℃, 70%, 72h	2 times	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 each direction	2 h	0/20

※1 Reference test

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	I_V	I_F=20mA	Testing Min. Value≤ Spec. Min. Value x 0.5
Forward Voltage	V_F	I_F=20mA	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	-	-	No notable, decoloration, deformation and cracking

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