

CUSTOMER :

PRELIMINARY

DATE : _____.

SPECIFICATIONS FOR APPROVAL

PRODUCT NAME : Module Type High Power LED (Warm white)

MODEL NAME : LEMWM14X80MZ00


CUSTOMER P/N :

APPROVAL	REMARK

APPENDIX

10.12.14 Rev1 : Optical Spectrum Analyzer of LG Innotek change
10.12.22 Rev2 : Characteristics min/max applied
10.12.29 Rev3 : Absolute Maximum Rating added

Designed	Checked	Approved	LG Innotek Co., Ltd.	
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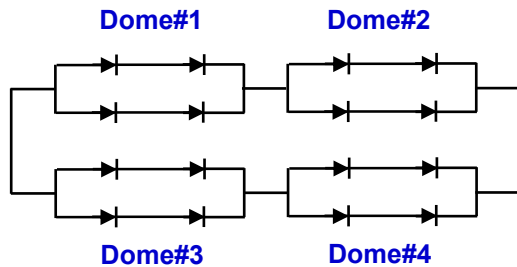
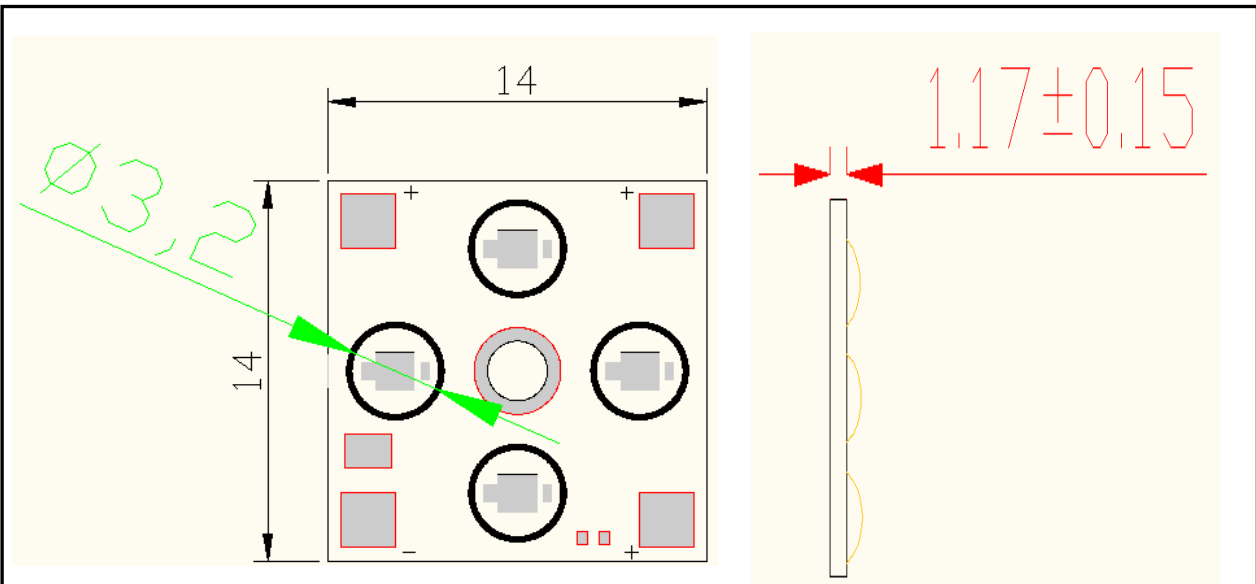
Under Development

1. Features

- High flux power LED module with 4 LED
- Compact design (14mmX14mm)
- 110° light distribution pattern, uniform illumination
- Low thermal resistance $R_{th,j-board} < 5 \text{ K/W}$
- High-power LED in COB technology

2. Outline Dimensions

(Unit : mm)



< Internal Circuit >

◆ Tolerances Unless Dimension $\pm 0.2\text{mm}$



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3. Applications

- General Lighting
- Effect and design lighting
- Emergency lighting
- Spotlights

4. Characteristics, Ta = 25℃

Items	Symbol	Min	Typ	Max	Unit
All data for Ta=25℃, IF=260mA					
Power ^{*1)}	Po	3.04	3.25	3.38	W
Forward Voltage ^{*1)}	VF	11.68	12.50	13.00	V
Luminance Flux ^{*1)}	Φ_v	243	270	-	lm
Luminous Efficacy	Lm/W	80	83	-	Lm/W
Color Temperature ^{*1)}	CCT	2600	2725	2800	K
CRI ^{*1)}	-	80		-	Ra
Viewing Angle ^{*1)}	2 Θ 1/2	-	110	-	deg
Junction Temperature ^{*2)}	Tj			120	℃
Thermal Resistance ^{*2)}	Rth j-b		5		℃/W

CTQ

CTQ

CTQ

※ These values measured by Optical Spectrum Analyzer of LG Innotek Co., LTD
Tolerances are followings as below

- Luminous Flux (lm) : ±20%, CIE Value : ±0.01, CRI : ±2

※ Rthj-b = Thermal Resistance (Junction – Board)

If the maximum temperature limits are exceeded, the life of the module will be greatly reduced or the module may be damaged

1) These values measured without heat sink

These values are based on 16-dies performance

2) These values is allowed to measure with a heat sink of aluminum.

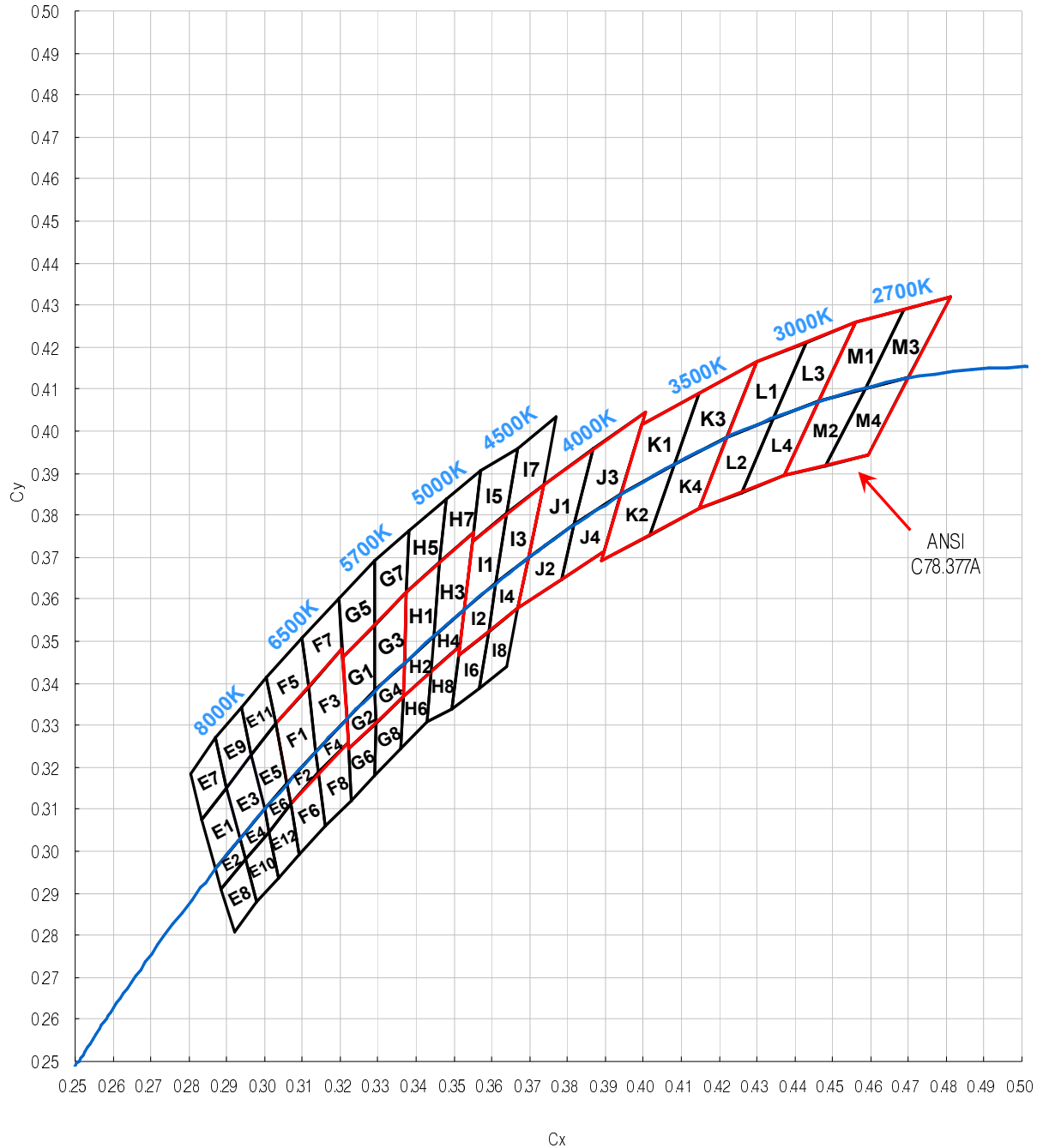
5. Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Forward Current	IF	480	mA
Pulse Forward Current ^{*1)}	IFp	600	mA
Operating Temperature	T _{opr}	-30 ~ +85	℃
Storage Temperature	T _{stg}	-40 ~ +100	℃

*1) Pulse Width ≤ 10msec, Duty ≤ 10%



6. Chromaticity on the 1931 CIE Curve



- Chromaticity coordinate groups are tested at a current pulse duration of 3000 ms and a tolerance of ± 0.01 .
- ANSI Cool/Neutral/Warm white



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7. Performance Groups – Chromaticity

Rank of CIE Value (@260mA)

CCT	Rank	CIE X	CIE Y	CCT	Rank	CIE X	CIE Y	CCT	Rank	CIE X	CIE Y
2700K (2725K ±145K)	M1	0.4562	0.4260	4500K (4503K ±243K)	I1	0.3548	0.3736	5700K (5665K ±355K)	G1	0.3207	0.3462
		0.4687	0.4289			0.3641	0.3804			0.3291	0.3538
		0.4586	0.4103			0.3611	0.3638			0.3292	0.3382
		0.4465	0.4071			0.3526	0.3575			0.3217	0.3314
	M2	0.4465	0.4071		I2	0.3526	0.3575		G2	0.3217	0.3314
		0.4586	0.4103			0.3611	0.3638			0.3292	0.3382
		0.4483	0.3918			0.3590	0.3521			0.3293	0.3305
		0.4373	0.3893			0.3512	0.3465			0.3222	0.3243
	M3	0.4687	0.4289		I3	0.3641	0.3804		G3	0.3291	0.3538
		0.4813	0.4319			0.3736	0.3874			0.3376	0.3616
		0.4700	0.4126			0.3697	0.3697			0.3369	0.3449
		0.4586	0.4103			0.3611	0.3638			0.3292	0.3382
	M4	0.4700	0.4126		I4	0.3697	0.3697		G4	0.3369	0.3449
		0.4593	0.3944			0.3670	0.3578			0.3366	0.3369
		0.4483	0.3918			0.3590	0.3521			0.3293	0.3305
		0.4299	0.4165			0.3571	0.3907			0.3196	0.3602
3000K (3045K ±175K)	L1	0.4430	0.4212	4500K (4503K ±243K)	I5	0.3668	0.3957	5700K (5665K ±355K)	G5	0.3290	0.3690
		0.4344	0.4032			0.3641	0.3804			0.3291	0.3538
		0.4221	0.3984			0.3548	0.3736			0.3207	0.3462
		0.4221	0.3984			0.3512	0.3465			0.3222	0.3243
	L2	0.4344	0.4032		I6	0.3590	0.3521		G6	0.3293	0.3305
		0.4260	0.3853			0.3567	0.3389			0.3290	0.3180
		0.4147	0.3814			0.3495	0.3339			0.3231	0.3120
		0.4430	0.4212			0.3668	0.3957			0.3290	0.3690
	L3	0.4562	0.4260		I7	0.3771	0.4034		G7	0.3381	0.3762
		0.4465	0.4071			0.3736	0.3874			0.3376	0.3616
		0.4344	0.4032			0.3641	0.3804			0.3291	0.3538
		0.4344	0.4032			0.3590	0.3521			0.3293	0.3305
L4	0.4465	0.4071	I8	0.3670	0.3578	G8	0.3366	0.3369			
	0.4373	0.3893		0.3640	0.3440		0.3361	0.3245			
	0.4260	0.3853		0.3567	0.3389		0.3290	0.3180			
	0.3996	0.4015		0.3376	0.3616		0.3028	0.3304			
3500K (3465K ±245K)	K1	0.4146	0.4089	5000K (5028K ±283K)	H1	0.3463	0.3687	6500K (6530K ±510K)	F1	0.3115	0.3391
		0.4082	0.3922			0.3447	0.3513			0.3136	0.3237
		0.3941	0.3848			0.3369	0.3449			0.3059	0.3160
		0.3941	0.3848			0.3369	0.3449			0.3059	0.3160
	K2	0.4082	0.3922		H2	0.3447	0.3513		F2	0.3136	0.3237
		0.4017	0.3752			0.3440	0.3427			0.3144	0.3186
		0.3889	0.3690			0.3366	0.3369			0.3068	0.3113
		0.4146	0.4089			0.3463	0.3687			0.3115	0.3391
	K3	0.4299	0.4165		H3	0.3551	0.3760		F3	0.3205	0.3481
		0.4221	0.3984			0.3526	0.3575			0.3217	0.3314
		0.4082	0.3922			0.3447	0.3513			0.3136	0.3237
		0.4082	0.3922			0.3447	0.3513			0.3136	0.3237
K4	0.4221	0.3984	H4	0.3526	0.3575	F4	0.3217	0.3314			
	0.4147	0.3814		0.3515	0.3487		0.3221	0.3261			
	0.4017	0.3752		0.3440	0.3427		0.3144	0.3186			
	0.3736	0.3874		0.3381	0.3762		0.3005	0.3415			
4000K (3985K ±275K)	J1	0.3870	0.3958	5000K (5028K ±283K)	H5	0.3480	0.3840	6500K (6530K ±510K)	F5	0.3099	0.3509
		0.3819	0.3776			0.3463	0.3687			0.3115	0.3391
		0.3697	0.3697			0.3376	0.3616			0.3028	0.3304
		0.3697	0.3697			0.3366	0.3369			0.3068	0.3113
	J2	0.3819	0.3776		H6	0.3440	0.3427		F6	0.3144	0.3186
		0.3783	0.3646			0.3429	0.3307			0.3161	0.3059
		0.3670	0.3578			0.3361	0.3245			0.3093	0.2993
		0.3870	0.3958			0.3480	0.3840			0.3099	0.3509
	J3	0.4006	0.4044		H7	0.3571	0.3907		F7	0.3196	0.3602
		0.3941	0.3848			0.3551	0.3760			0.3205	0.3481
		0.3819	0.3776			0.3463	0.3687			0.3115	0.3391
		0.3819	0.3776			0.3440	0.3427			0.3144	0.3186
J4	0.3941	0.3848	H8	0.3515	0.3487	F8	0.3221	0.3261			
	0.3898	0.3716		0.3495	0.3339		0.3231	0.3120			
	0.3783	0.3646		0.3429	0.3307		0.3161	0.3059			



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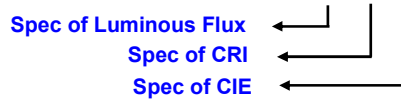
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Rank of CIE Value (@260mA)

CCT	Rank	CIE X	CIE Y	CCT	Rank	CIE X	CIE Y	CCT	Rank	CIE X	CIE Y
8000K (8020K ±980K)	E1	0.2835	0.3075	8000K (8020K ±980K)	E7	0.2803	0.3185				
		0.2772	0.2992			0.2735	0.3100				
		0.2807	0.2884			0.2772	0.2992				
		0.2870	0.2957			0.2835	0.3075				
	E2	0.2870	0.2957		E8	0.2885	0.2910				
		0.2807	0.2884			0.2824	0.2840				
		0.2824	0.2840			0.2860	0.2740				
		0.2885	0.2910			0.2920	0.2810				
	E3	0.2900	0.3150		E9	0.2870	0.3270				
		0.2835	0.3075			0.2803	0.3185				
		0.2870	0.2957			0.2835	0.3075				
		0.2935	0.3029			0.2900	0.3150				
	E4	0.2935	0.3029		E10	0.2950	0.2980				
		0.2870	0.2957			0.2885	0.2910				
		0.2885	0.2910			0.2920	0.2810				
		0.2950	0.2980			0.2980	0.2880				
	E5	0.2965	0.3230		E11	0.2938	0.3343				
		0.2900	0.3150			0.2870	0.3270				
		0.2935	0.3029			0.2900	0.3150				
		0.3000	0.3100			0.2965	0.3230				
	E6	0.3000	0.3100		E12	0.3010	0.3045				
		0.2935	0.3029			0.2950	0.2980				
		0.2950	0.2980			0.2980	0.2880				
		0.3010	0.3045			0.3037	0.2937				

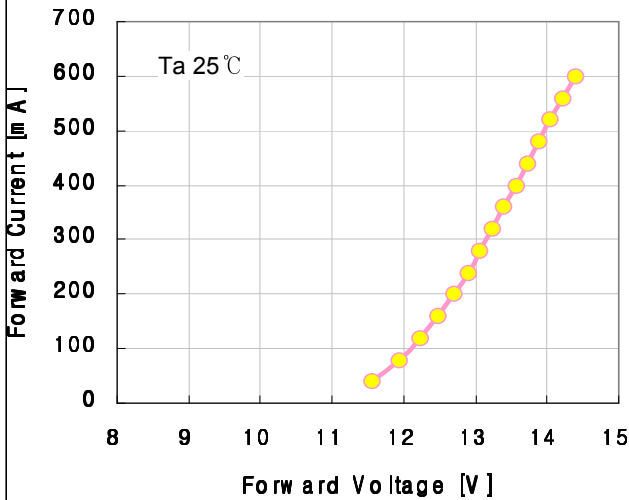
※ Model name method: Please refer to the following example Model Name : LEMWM14 X 80 MZ00



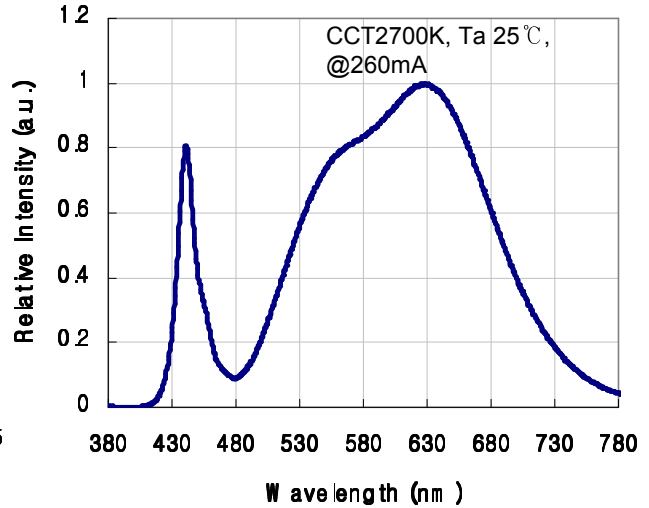


8. Typical Characteristic Curves

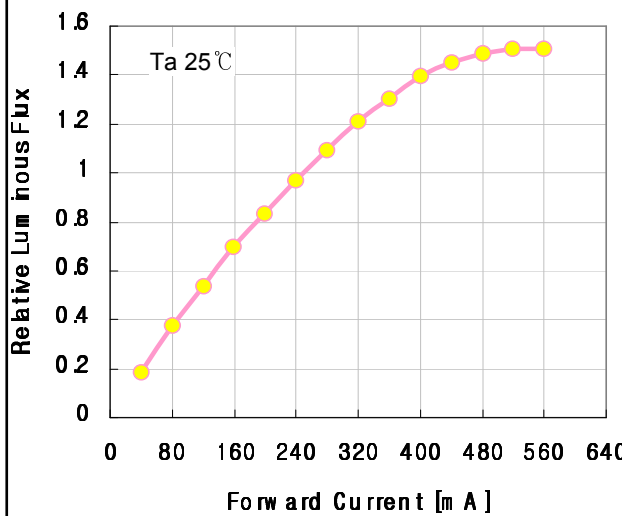
■ Forward Voltage vs. Forward Current



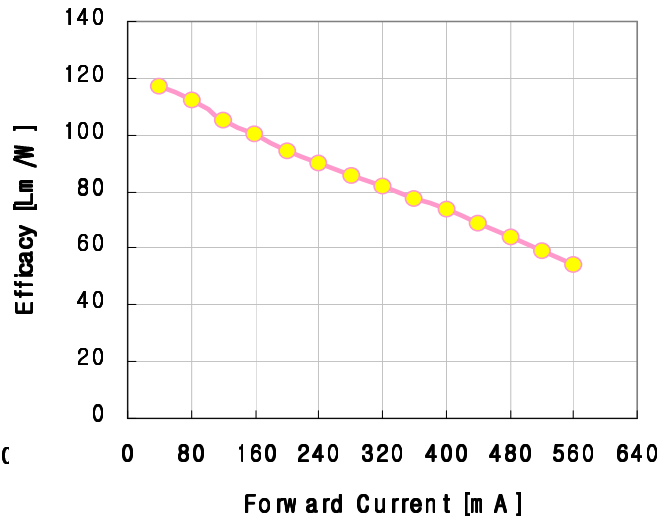
■ Spectrum



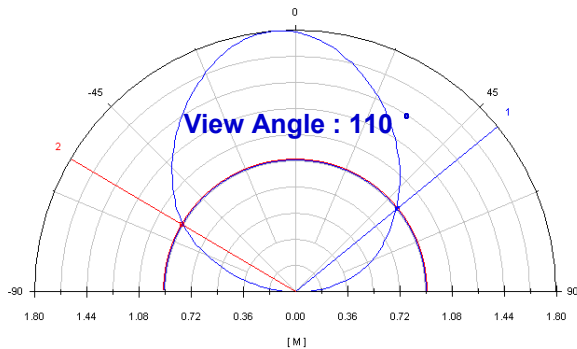
■ Forward Current vs. Luminous Flux



■ Input Watt vs. Luminance Flux



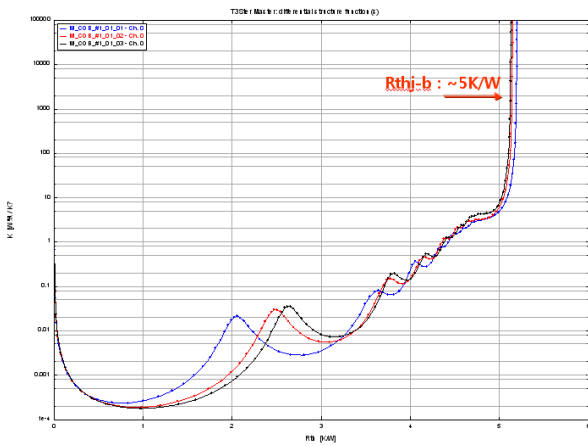
■ Radiation Characteristics



■ CCT variation

8. Typical Characteristic Curves

■ Thermal Resistance (junction~Board)



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9. Reliability Test Items and Conditions

9-1. Items and Results of Reliability Test

No	Item	Test Condition	Test Hours/ Cycles	Sample No	Ac/Re
1	Steady State Operating Life*1	Ta=25℃, I _F =260 [mA]	1000hr	22 pcs	0 / 1
2	High Temp. Humidity Life*1	Ta=60℃, 90% RH, I _F =160 [mA]	1000hr	22 pcs	0 / 1
3	Steady State Operating Life of High Temperature*1	Ta=85℃, I _F =80 [mA]	1000hr	22 pcs	0 / 1
4	Steady State Operating Life of Low Temperature*1	Ta= -30℃, I _F =260 [mA]	1000hr	22 pcs	0 / 1
5	High Temp. Storage	100℃	1000hr	22 pcs	0 / 1
6	Low Temp. Storage	-40℃	1000hr	22 pcs	0 / 1
7	Temperature Cycle	-40℃ (30min) ~ 25℃ (5min) ~ 100℃ (30min) ~ 25℃ (5min)	100cycle	22 pcs	0 / 1
8	Thermal Shock	100℃ (30min) ~ -40℃ (30min)	100cycle	22 pcs	0 / 1
9	Resistance to Soldering Heat (Reflow Soldering)	T _{sld} = 260℃, 10s (pre treat. 30℃, 70%, 168hr)	1 times*1)	22 pcs	0 / 1
10	Vibration	200m/s ² , 100~2000Hz(sweep 4min) 48min, 3 directions	4 times	22 pcs	0 / 1
11	Electrostatic Discharge	R=1.5kΩ, C=100pF, Test Voltage 2kV	3times Negative/ Positive	22 pcs	0 / 1
12	High Temp. Humidity Life, Storage	Ta=85℃, 85% RH	1000hr	22 pcs	0 / 1

*1) The test is allowed with a heat sink of aluminum, Heat sink surface is designed for Bulb product

※ These test conditions are requested by the customer

9-2. Criteria for Judging the Damage

(U.S.L : Upper Spec. Limit, S : Initial Value)

Item	Symbol	Test Condition	Limit	
			Min.	Max.
Forward Voltage	V _F	I _F =	-	U.S.L.× 1.2
Luminous Flux	P _O	I _F =	S × 0.7	-