New Generation of WICOP

High-Power LED - WICOP Y11

S1Wx-1111xxxxxx-00000000-00001

MacAdam 3-Step | LM-80 | RoHS

Product Brief

Description

- The WICOP series is designed for high flux output applications with high current operation capability.
- Compact footprint(1.14x1.14mm) enables system level cost saving
- It incorporates state of the art SMD design and low thermal resistant material.
- The WICOP is ideal light sources for directional lighting applications such as Spot Lights, various outdoor applications, automotive lightings and high performance torches .

Features and Benefits

- Designed for high current operation
- Low Thermal Resistance
- A wide CCT range of 2,600~7,000K
- ANSI compliant Binning
- RoHS compliant
- Phosphor film directly attached to chip surface

Key Applications

- Residential - Replacement lamps
- Commercial/Industrial – Retail Display
- Outdoor area - Flood/Street light, High Bay

Table 1-1. Product Selection Table

Reference Code	CCT	Nominal CCT	Part Number	CRI Min	Voltage
SZ8-Y11-W0-C7-A	Cool White	6500K	S1W0-1111657003-00000000-00001	70	3V
		5700K	S1W0-1111577003-00000000-00001		
		5000K	S1W0-1111507003-00000000-00001		
SZ8-Y11-WN-C7-A	Neutral White	4000K	S1W0-1111407003-00000000-00001		
SZ8-Y11-W0-C8-A	Cool White	6500K	S1W0-1111658003-00000000-00001	80	3V
		5700K	S1W0-1111578003-00000000-00001		
		5000K	S1W0-1111508003-00000000-00001		

Table 1-2. Product Selection Table

Reference Code	CCT	Nominal CCT	Part Number	CRI Min	Voltage
SZ8-Y11-WN-C8-A	Neutral White	4000K	S1W0-1111408003-00000000-00001	80	3V
SZ8-Y11-WW-C8-A	Warm White	3500K	S1W0-1111358003-00000000-00001		
		3000K	S1W0-1111308003-00000000-00001		
		2700K	S1W0-1111278003-00000000-00001		
SZ8-Y11-W0-C9-A	Cool White	6500K	S1W0-1111659003-00000000-00001	90	3V
		5700K	S1W0-1111579003-00000000-00001		
		5000K	S1W0-1111509003-00000000-00001		
SZ8-Y11-WN-C9-A	Neutral White	4000K	S1W0-1111409003-00000000-00001		
SZ8-Y11-WW-C9-A	Warm White	3500K	S1W0-1111359003-00000000-00001		
		3000K	S1W0-1111309003-00000000-00001		
		2700K	S1W0-1111279003-00000000-00001		
SZ8-Y11-W0-C8-B	Cool White	6500K	S1WM-1111658006-00000000-00001	80	6V
		5700K	S1WM-1111578006-00000000-00001		
		5000K	S1WM-1111508006-00000000-00001		
SZ8-Y11-WN-C8-B	Neutral White	4000K	S1WM-1111408006-00000000-00001		
SZ8-Y11-WW-C8-B	Warm White	3500K	S1WM-1111358006-00000000-00001		
		3000K	S1WM-1111308006-00000000-00001		
		2700K	S1WM-1111278006-00000000-00001		
SZ8-Y11-WW-C9-B	Warm White	3500K	S1WM-1111359006-00000000-00001	90	6V
		3000K	S1WM-1111309006-00000000-00001		
		2700K	S1WM-1111279006-00000000-00001		
SZ8-Y11-W0-C8-C	Cool White	6500K	S1WM-1111658009-00000000-00001	80	9V
		5700K	S1WM-1111578009-00000000-00001		
		5000K	S1WM-1111508009-00000000-00001		
SZ8-Y11-WN-C8-C	Neutral White	4000K	S1WM-1111408009-00000000-00001		
SZ8-Y11-WW-C8-C	Warm White	3500K	S1WM-1111358009-00000000-00001		
		3000K	S1WM-1111308009-00000000-00001		
		2700K	S1WM-1111278009-00000000-00001		
SZ8-Y11-WW-C9-C	Warm White	3500K	S1WM-1111359009-00000000-00001	90	9V
		3000K	S1WM-1111309009-00000000-00001		
		2700K	S1WM-1111279009-00000000-00001		

Table of Contents

Performance Characteristics

Table 2-1. Electro Optical Characteristics, I_F=150mA, T_j=85℃ (3V)

Min. CRI, R_a[4]	Nominal CCT [K] [1]	Min. Flux [lm]	Typ. Luminous Flux Φ_V [3] [lm]	Typ. Luminous Efficacy [lm/W]	Part Number
70	6500	68	72	173	S1W0-1111657003-00000000-00001
	5700	68	72	173	S1W0-1111577003-00000000-00001
	5000	68	72	173	S1W0-1111507003-00000000-00001
	4000	68	72	173	S1W0-1111407003-00000000-00001
80	6500	60	63	151	S1W0-1111658003-00000000-00001
	5700	60	63	151	S1W0-1111578003-00000000-00001
	5000	60	62	149	S1W0-1111508003-00000000-00001
	4000	60	62	149	S1W0-1111408003-00000000-00001
	3500	56	61	146	S1W0-1111358003-00000000-00001
	3000	56	61	146	S1W0-1111308003-00000000-00001
	2700	56	61	146	S1W0-1111278003-00000000-00001
90	6500	56	61	146	S1W0-1111659003-00000000-00001
	5700	56	61	146	S1W0-1111579003-00000000-00001
	5000	52	56	134	S1W0-1111509003-00000000-00001
	4000	52	56	134	S1W0-1111409003-00000000-00001
	3500	49	52	124	S1W0-1111359003-00000000-00001
	3000	49	52	124	S1W0-1111309003-00000000-00001
	2700	46	49	117	S1W0-1111279003-00000000-00001

Notes :

(1) Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

Color coordinate : ±0.005, CCT ±5% tolerance.

(2) Seoul Semiconductor maintains a tolerance of ±7% on flux and power measurements.

(3) Φ_V is the total luminous flux output as measured with an integrating sphere.

(4) Tolerance is ±2.0 on CRI measurements.

Performance Characteristics

Table 2-2. Electro Optical Characteristics, I_F=175mA, T_j=85℃ (6V)

Min. CRI, R_a [4]	Nominal CCT [K] [1]	Min. Flux [lm]	Typ. Luminous Flux Φ_V [3] [lm]	Typ. Luminous Efficacy [lm/W]	Part Number
80	6500	116	124	124	S1WM-1111658006-00000000-00001
	5700	116	126	125	S1WM-1111578006-00000000-00001
	5000	116	126	125	S1WM-1111508006-00000000-00001
	4000	125	130	129	S1WM-1111408006-00000000-00001
	3500	125	130	129	S1WM-1111358006-00000000-00001
	3000	116	124	124	S1WM-1111308006-00000000-00001
	2700	116	124	124	S1WM-1111278006-00000000-00001
90	3500	102	109	108	S1WM-1111359006-00000000-00001
	3000	96	105	105	S1WM-1111309006-00000000-00001
	2700	96	105	105	S1WM-1111279006-00000000-00001

Notes :

(1) Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

Color coordinate : ±0.005, CCT ±5% tolerance.

(2) Seoul Semiconductor maintains a tolerance of ±7% on flux and power measurements.

(3) Φ_V is the total luminous flux output as measured with an integrating sphere.

(4) Tolerance is ±2.0 on CRI measurements.

Performance Characteristics

Table 2-3. Electro Optical Characteristics, I_F=115mA, T_j=85℃ (9V)

Min. CRI, R_a [4]	Nominal CCT [K] [1]	Min. Flux [lm]	Typ. Luminous Flux Φ_V [3] [lm]	Typ. Luminous Efficacy [lm/W]	Part Number
80	6500	125	133	133	S1WM-1111658009-00000000-00001
	5700	125	133	133	S1WM-1111578009-00000000-00001
	5000	125	133	133	S1WM-1111508009-00000000-00001
	4000	116	125	125	S1WM-1111408009-00000000-00001
	3500	116	125	125	S1WM-1111358009-00000000-00001
	3000	109	115	115	S1WM-1111308009-00000000-00001
	2700	109	115	115	S1WM-1111278009-00000000-00001
90	3500	96	102	102	S1WM-1111359009-00000000-00001
	3000	96	102	102	S1WM-1111309009-00000000-00001
	2700	96	102	102	S1WM-1111279009-00000000-00001

Notes :

(1) Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

Color coordinate : ±0.005, CCT ±5% tolerance.

(2) Seoul Semiconductor maintains a tolerance of ±7% on flux and power measurements.

(3) Φ_V is the total luminous flux output as measured with an integrating sphere.

(4) Tolerance is ±2.0 on CRI measurements.

Performance Characteristics

Table 3. Absolute Maximum Ratings

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Forward Current	I_F	-	150	700	mA
		-	175	350	
		-	115	230	
Power Dissipation	P_D	-	-	2.28	W
Junction Temperature	T_j	-	-	145	ºC
Storage Temperature	T_{stg}	- 40	-	125	ºC
Viewing angle	θ		150		degree
Thermal resistance (J to S) [2]	$R\theta_{J\text{-}S}$	-	10 [3]	-	K/W
ESD Sensitivity(HBM)		Class 2 JEDEC JS-001-2017			

Notes :

(1) At Junction Temperature 85℃ condition.

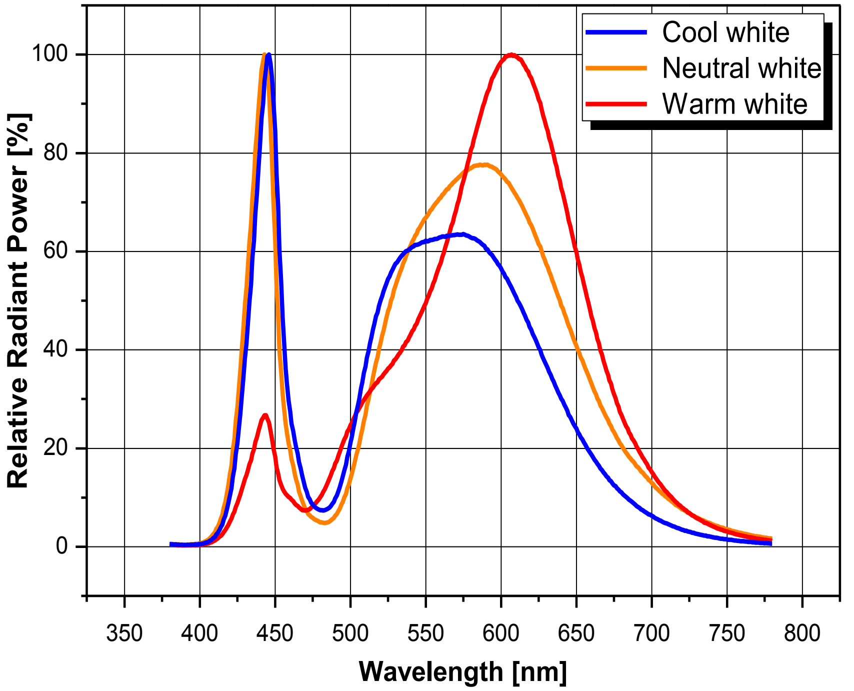
(2) $R\theta_{J\text{-}S}$ is tested at typical forward current.

(3) Using Metal PCB (Normal type).

- Thermal resistance can be increased substantially depending on the heat sink design/operating condition, and the maximum possible driving current will decrease accordingly.

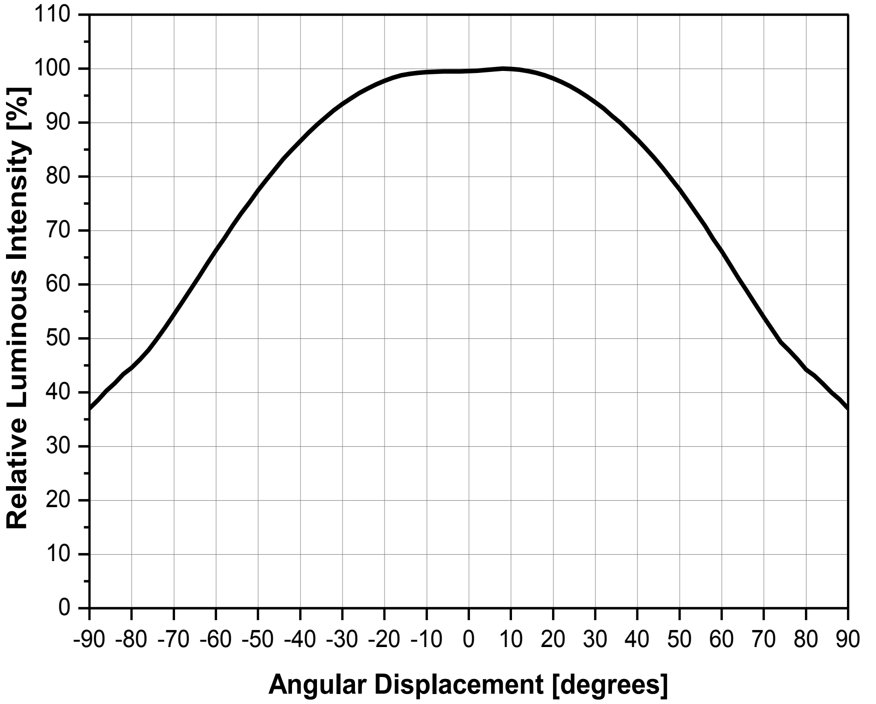
Characteristics Graph

Color Spectrum



(Fig 1)

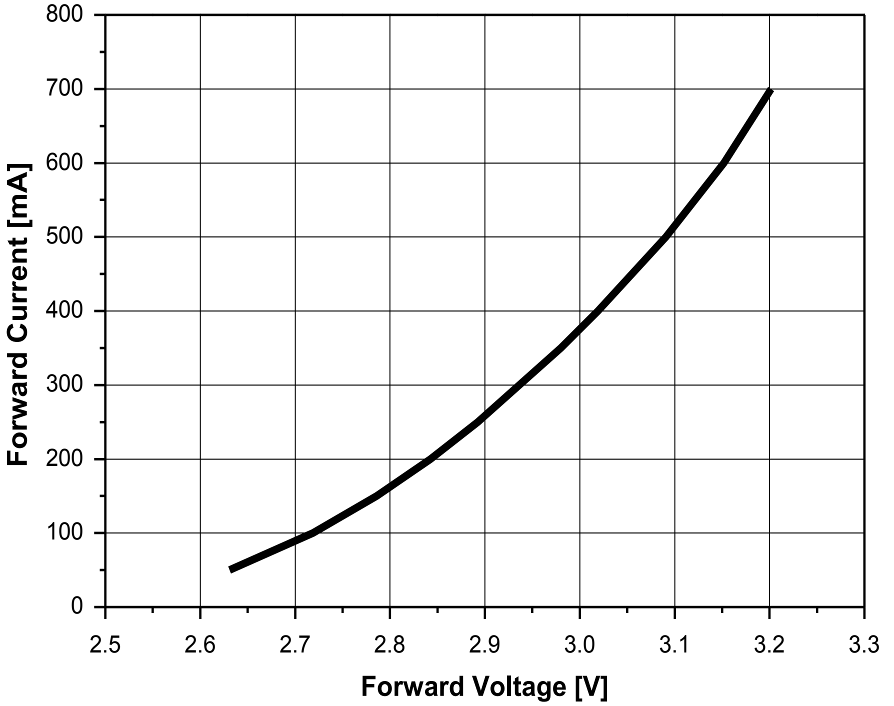
Typical Spatial Distribution



(Fig 2)

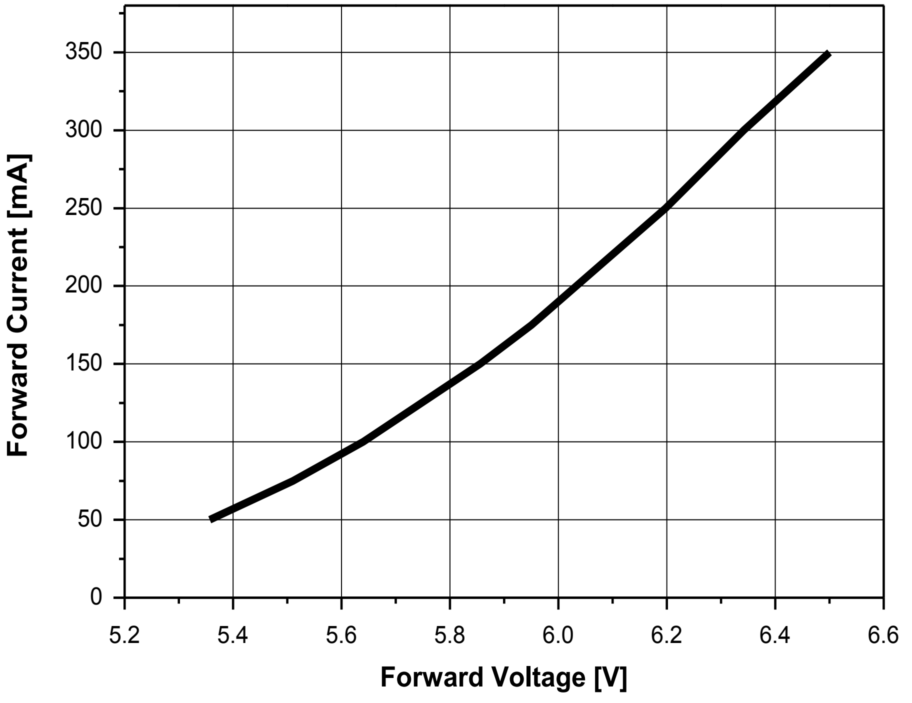
Characteristics Graph

Forward Voltage vs. Forward Current, T_j=85℃ (3V)



(Fig 3-1)

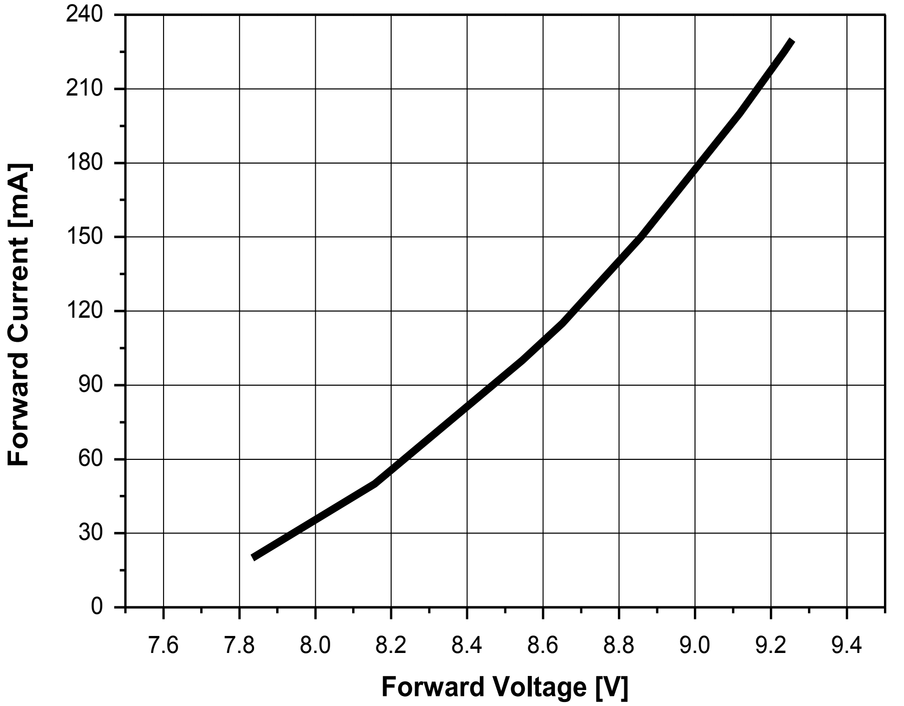
Forward Voltage vs. Forward Current, T_j=85℃ (6V)



(Fig 3-2)

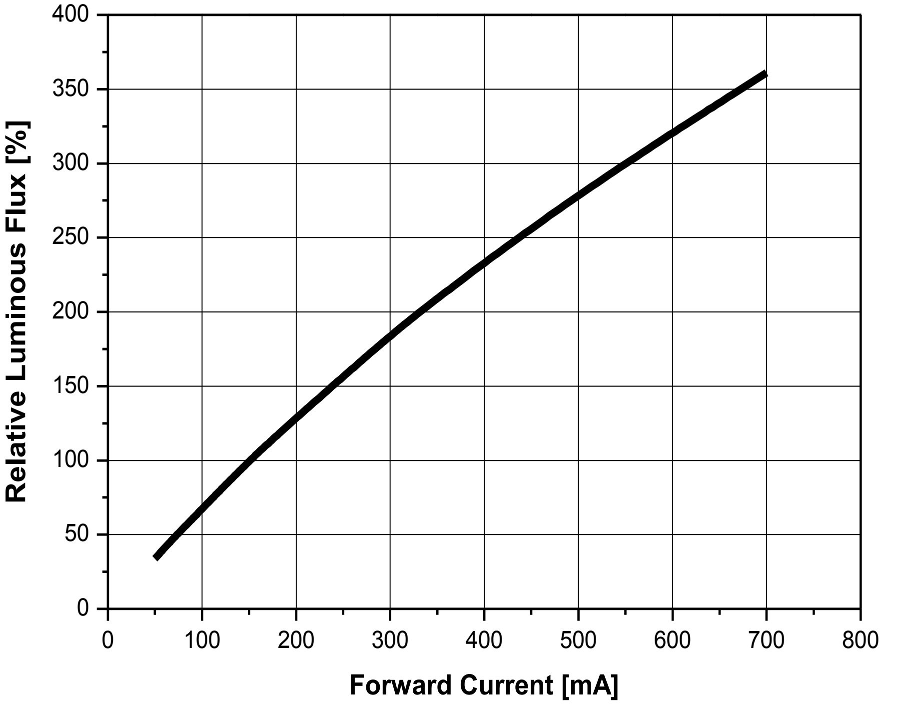
Characteristics Graph

Forward Voltage vs. Forward Current, T_j=85℃ (9V)



(Fig 3-3)

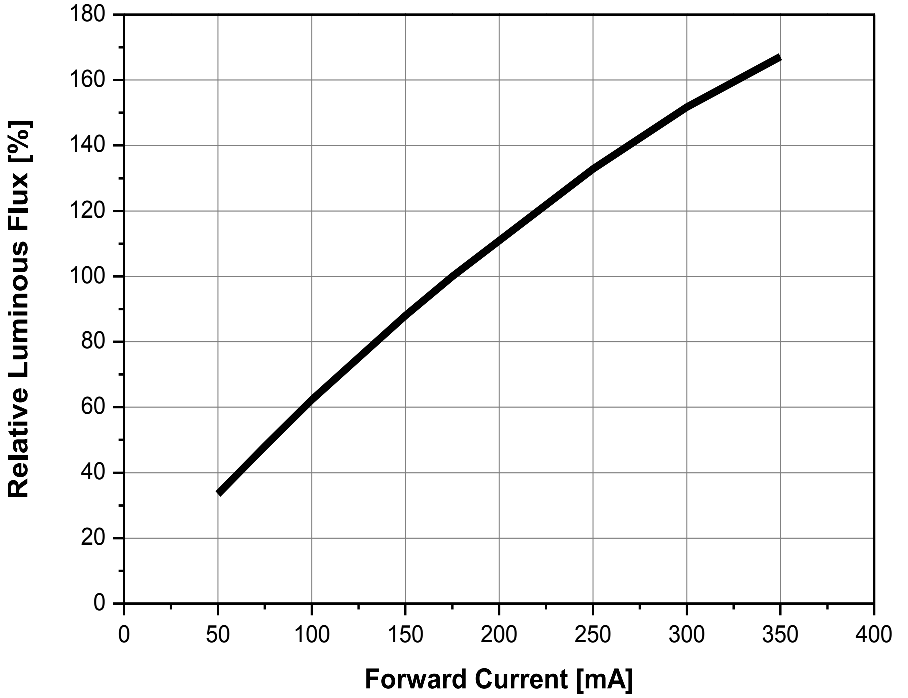
Forward Current vs. Relative Luminous Flux, T_j=85℃ (3V)



(Fig 4-1)

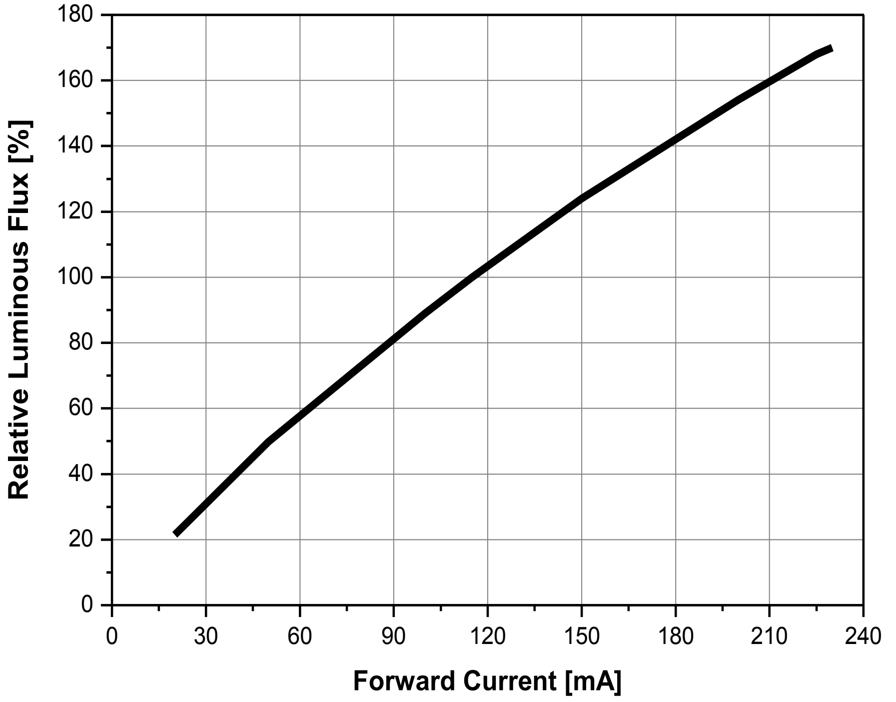
Characteristics Graph

Forward Current vs. Relative Luminous Flux, T_j=85℃ (6V)



(Fig 4-2)

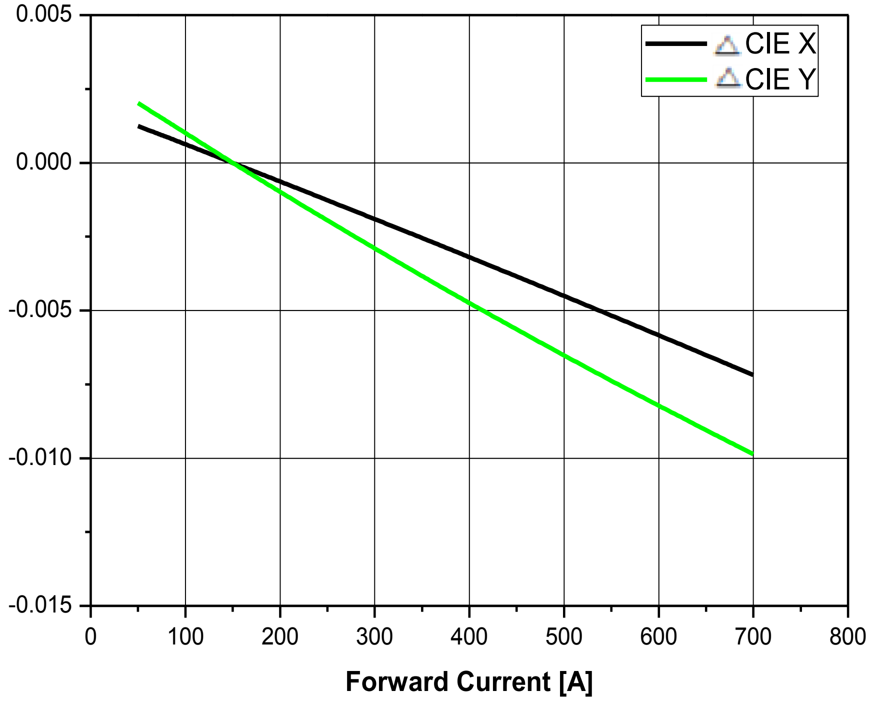
Forward Current vs. Relative Luminous Flux, T_j=85℃ (9V)



(Fig 4-3)

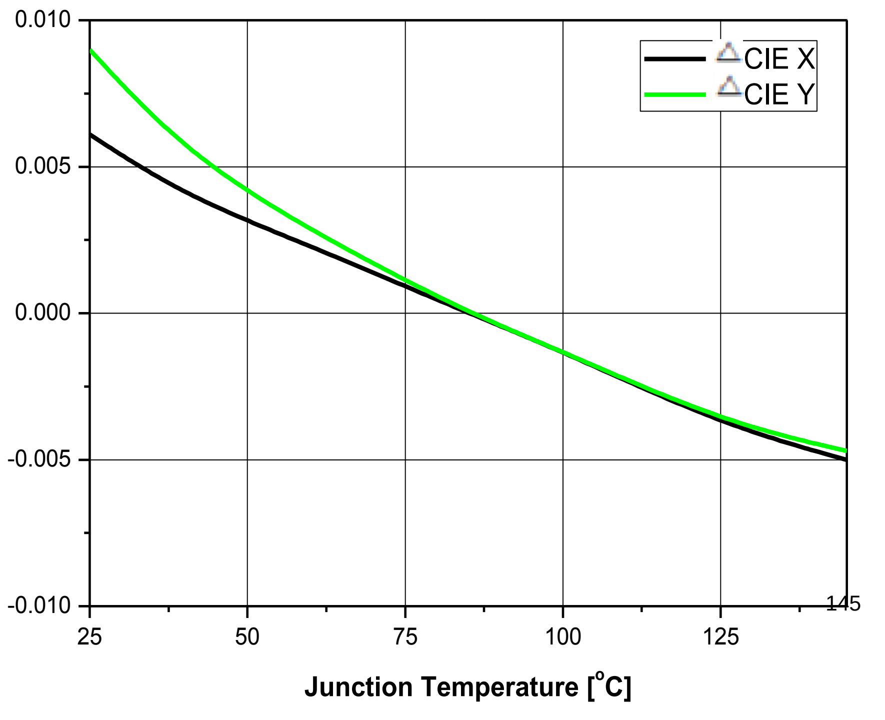
Characteristics Graph

Forward Current vs. CIE X, Y Shift



(Fig 5)

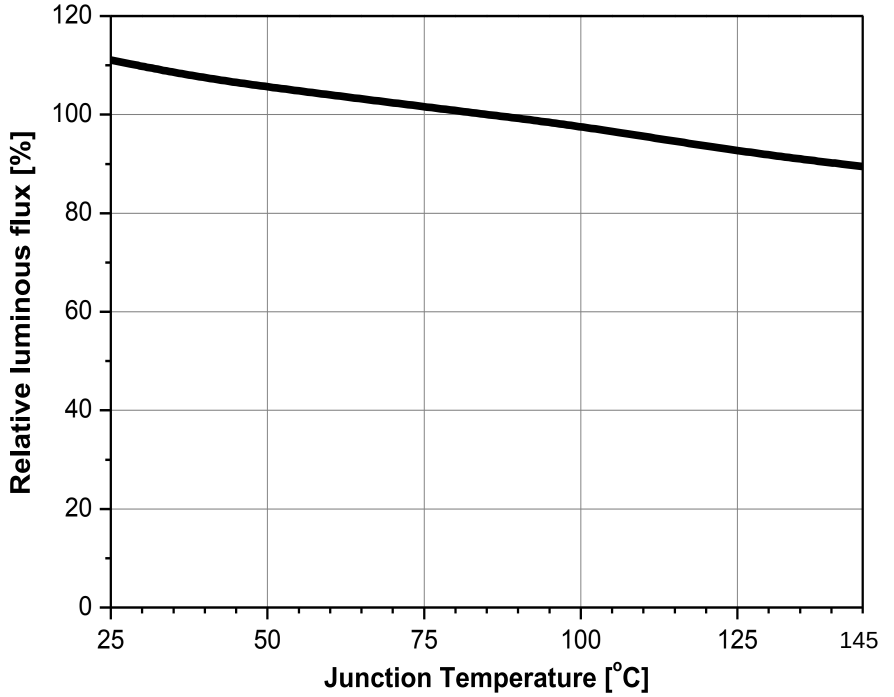
Junction Temp. vs. CIE X, Y Shift



(Fig 6)

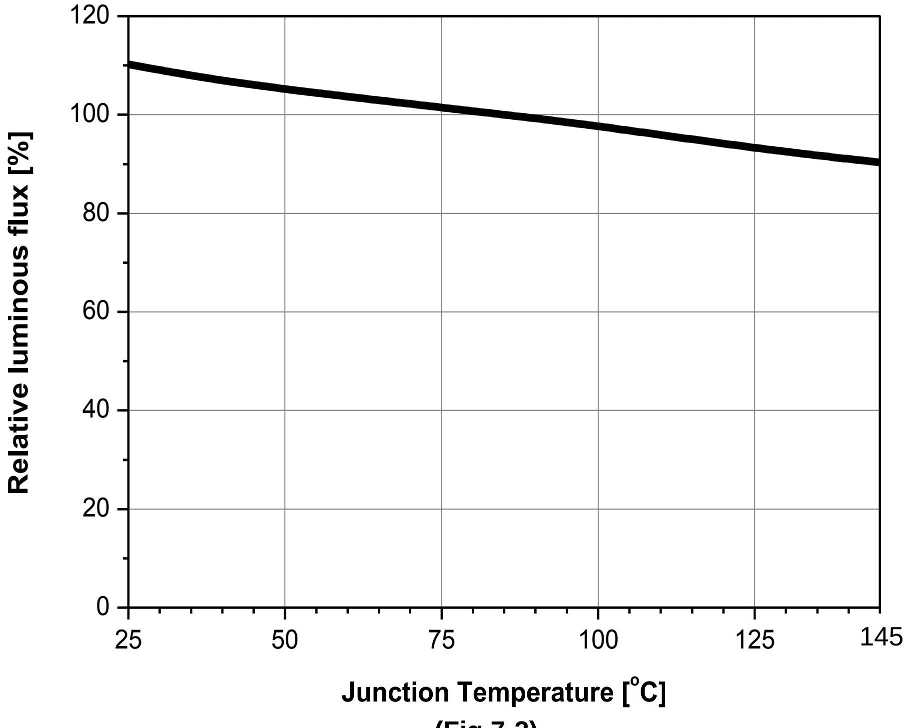
Characteristics Graph

Relative Light Output vs. Junction Temperature, I_F=150mA (3V)



(Fig 7-1)

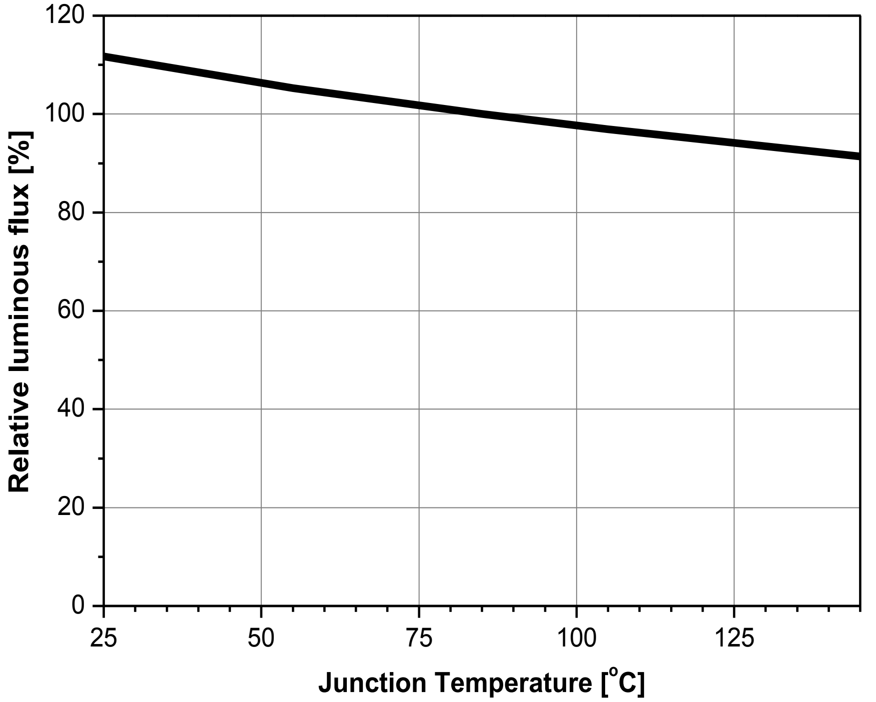
Relative Light Output vs. Junction Temperature, I_F=175mA (6V)



(Fig 7-2)

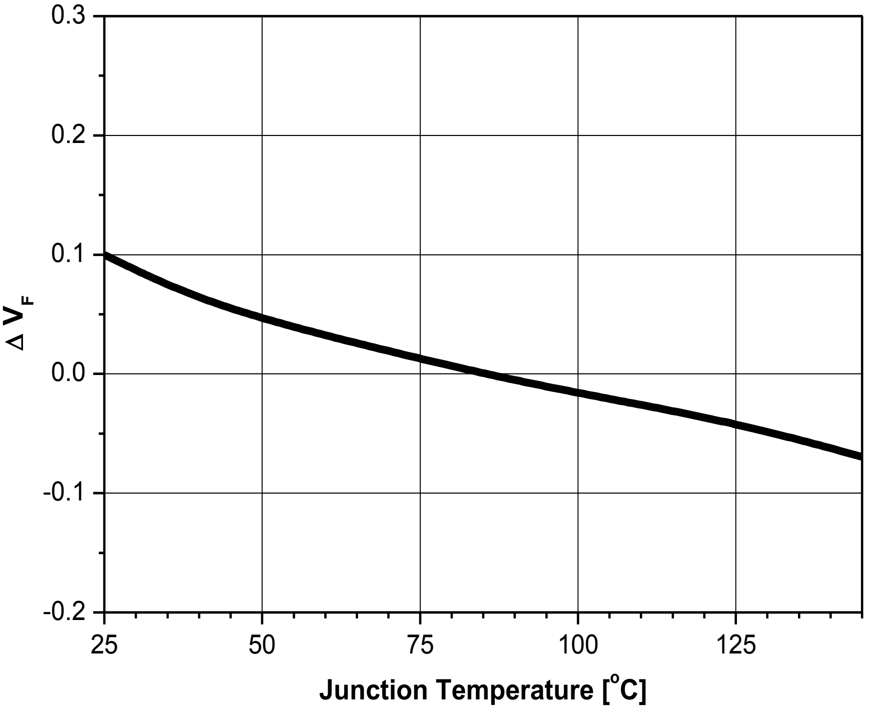
Characteristics Graph

Relative Light Output vs. Junction Temperature, I_F=115mA (9V)



(Fig 7-3)

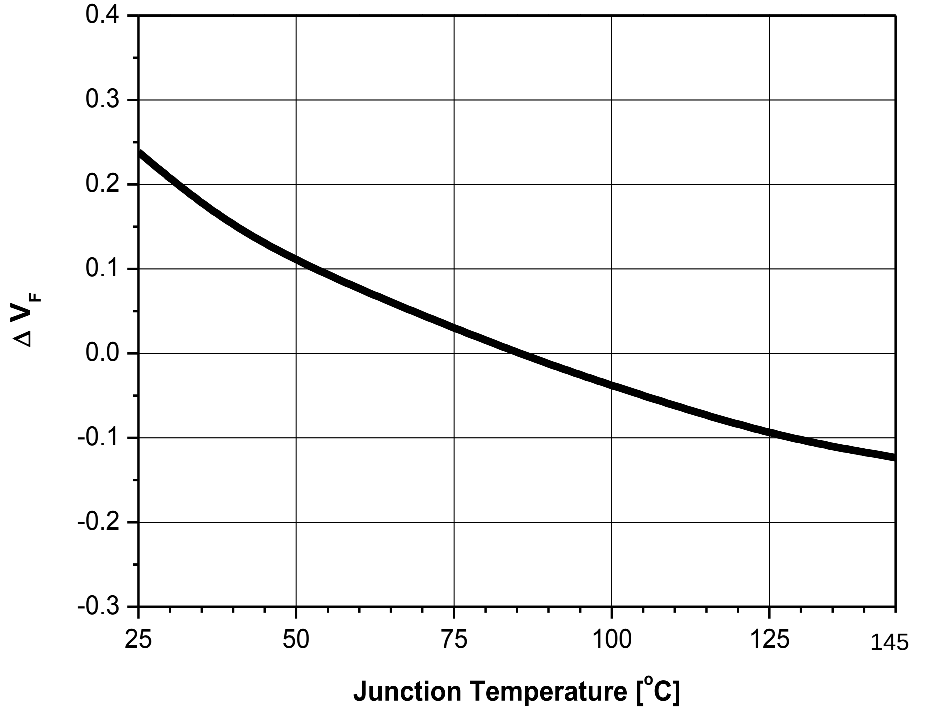
Relative Forward Voltage vs. Junction Temperature, I_F=150mA (3V)



(Fig 8-1)

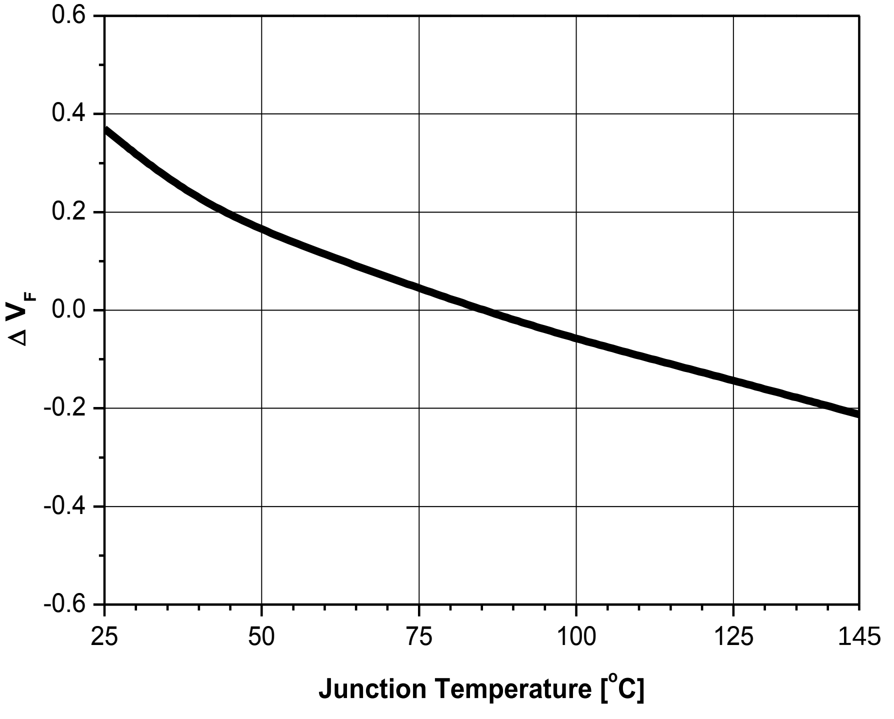
Characteristics Graph

Relative Forward Voltage vs. Junction Temperature, I_F=175mA (6V)



(Fig 8-2)

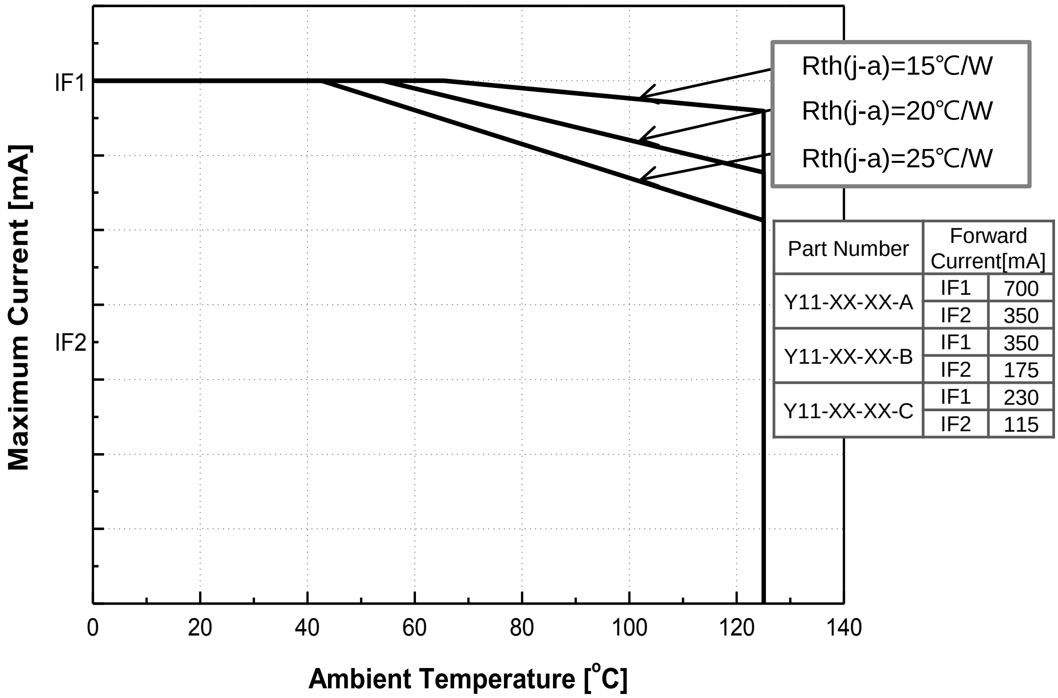
Relative Forward Voltage vs. Junction Temperature, I_F=115mA (9V)



(Fig 8-3)

Characteristics Graph

Maximum Forward Current vs. Ambient Temperature, T_j(max.)=145℃



Part Number	Forward Current[mA]	
Y11-XX-XX-A	IF1	700
	IF2	350
Y11-XX-XX-B	IF1	350
	IF2	175
Y11-XX-XX-C	IF1	230
	IF2	115

(Fig 9)

Performance Characteristics

Table 4-1. Bin Code description, I_F=150mA, T_j=85℃ (3V)

Part Number	Luminous Flux [lm]			Color Chromaticity Coordinate	Typical Forward Voltage [V_F] [1] *		
	Bin Code	Min.	Max.		Bin Code	Min.	Max.
S1W0-1111XXXX03-00000000-00001	W2	68	73	Refer to page. 20~22	G	2.55	2.80
	W1	64	68				
	V3	60	64				
	V2	56	60				
	V1	52	56		H	2.80	3.05
	U3	49	52				
	U2	46	49				
	U1	43	46				

Table 5-1. Luminous Flux rank distribution

Available Rank (shaded)

CRI	CCT	CIE	Luminous Flux Rank								
70	6,000 ~ 7,000K	A	U1	U2	U3	V1	V2	V3	W1	**W2**	**W3**
	5,300 – 6,000K	B	U1	U2	U3	V1	V2	V3	W1	**W2**	**W3**
	4,700 ~ 5,300K	C	U1	U2	U3	V1	V2	V3	W1	**W2**	**W3**
	3,700 ~ 4,200K	E	U1	U2	U3	V1	V2	V3	W1	**W2**	**W3**
80	6,000 ~ 7,000K	A	U1	U2	U3	V1	V2	**V3**	**W1**	W2	W3
	5,300 – 6,000K	B	U1	U2	U3	V1	V2	**V3**	**W1**	W2	W3
	4,700 ~ 5,300K	C	U1	U2	U3	V1	V2	**V3**	**W1**	W2	W3
	3,700 ~ 4,200K	E	U1	U2	U3	V1	V2	**V3**	**W1**	W2	W3
	3,200 ~ 3,700K	F	U1	U2	U3	V1	**V2**	**V3**	W1	W2	W3
	2,900 ~ 3,200K	G	U1	U2	U3	V1	**V2**	**V3**	W1	W2	W3
	2,600 ~ 2,900K	H	U1	U2	U3	V1	**V2**	**V3**	W1	W2	W3
90	6,000 ~ 7,000K	A	U1	U2	U3	V1	**V2**	**V3**	W1	W2	W3
	5,300 – 6,000K	B	U1	U2	U3	V1	**V2**	**V3**	W1	W2	W3
	4,700 ~ 5,300K	C	U1	U2	U3	**V1**	**V2**	V3	W1	W2	W3
	3,700 ~ 4,200K	E	U1	U2	U3	**V1**	**V2**	V3	W1	W2	W3
	3,200 ~ 3,700K	F	U1	U2	**U3**	**V1**	V2	V3	W1	W2	W3
	2,900 ~ 3,200K	G	U1	U2	**U3**	**V1**	V2	V3	W1	W2	W3
	2,600 ~ 2,900K	H	U1	**U2**	**U3**	V1	V2	V3	W1	W2	W3

Notes :

(1) Tolerance is ±0.06V on forward voltage measurements.

(2) All measurements were made under the standardized environment of Seoul Semiconductor
In order to ensure availability, single color rank will not be orderable.

Performance Characteristics

Table 4-2. Bin Code description, I_F=175mA, T_j=85℃ (6V)

Part Number	Luminous Flux [lm]			Color Chromaticity Coordinate	Typical Forward Voltage [V_F] [1] *		
	Bin Code	Min.	Max.		Bin Code	Min.	Max.
S1WM-1111XXXX06-00000000-00001	V3	125	133	Refer to page. 20~22	H	5.60	5.90
	V2	116	125				
	V1	109	116				
	U3	102	109		I	5.90	6.20
	U2	96	102				
	U1	89	96				

Table 5-2. Luminous Flux rank distribution

Available Rank (highlighted)

CRI	CCT	CIE	Luminous Flux Rank						
80	6,000 ~ 7,000K	A	U2	U3	V1	**V2**	**V3**	W1	W2
	5,300 – 6,000K	B	U2	U3	V1	**V2**	**V3**	**W1**	W2
	4,700 ~ 5,300K	C	U2	U3	V1	**V2**	**V3**	**W1**	W2
	3,700 ~ 4,200K	E	U2	U3	V1	V2	**V3**	**W1**	W2
	3,200 ~ 3,700K	F	U2	U3	V1	V2	**V3**	**W1**	W2
	2,900 ~ 3,200K	G	U2	U3	V1	**V2**	**V3**	W1	W2
	2,600 ~ 2,900K	H	U2	U3	V1	**V2**	**V3**	W1	W2
90	3,200 ~ 3,700K	F	U2	**U3**	**V1**	V2	V3	W1	W2
	2,900 ~ 3,200K	G	**U2**	**U3**	V1	V2	V3	W1	W2
	2,600 ~ 2,900K	H	**U2**	**U3**	V1	V2	V3	W1	W2

Notes :

(1) All measurements were made under the standardized environment of Seoul Semiconductor
In order to ensure availability, single color rank will not be orderable.

Performance Characteristics

Table 4-3. Bin Code description, I_F=115mA, T_j=85℃ (9V)

Part Number	Luminous Flux [lm]			Color Chromaticity Coordinate	Typical Forward Voltage [V_F] [1] *		
	Bin Code	Min.	Max.		Bin Code	Min.	Max.
S1WM-1111XXXX09-00000000-00001	V3	125	133	Refer to page. 20~22	H	8.50	8.80
	V2	116	125				
	V1	109	116				
	U3	102	109		I	8.80	9.15
	U2	96	102				
	U1	89	96				

Table 5-3. Luminous Flux rank distribution

Available Rank

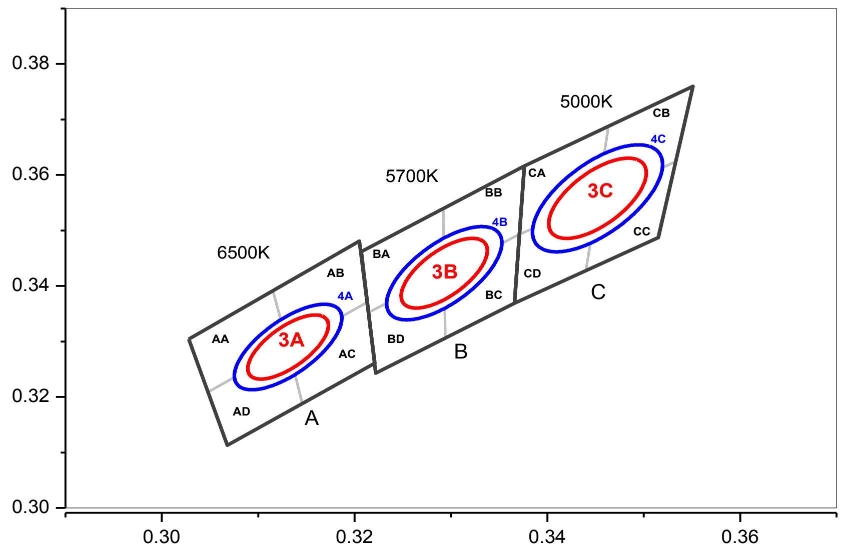
CRI	CCT	CIE	Luminous Flux Rank						
80	6,000 ~ 7,000K	A	U2	U3	V1	V2	V3	W1	W2
	5,300 – 6,000K	B	U2	U3	V1	V2	V3	W1	W2
	4,700 ~ 5,300K	C	U2	U3	V1	V2	V3	W1	W2
	3,700 ~ 4,200K	E	U2	U3	V1	V2	V3	W1	W2
	3,200 ~ 3,700K	F	U2	U3	V1	V2	V3	W1	W2
	2,900 ~ 3,200K	G	U2	U3	V1	V2	V3	W1	W2
	2,600 ~ 2,900K	H	U2	U3	V1	V2	V3	W1	W2
90	3,200 ~ 3,700K	F	U2	U3	V1	V2	V3	W1	W2
	2,900 ~ 3,200K	G	U2	U3	V1	V2	V3	W1	W2
	2,600 ~ 2,900K	H	U2	U3	V1	V2	V3	W1	W2

Notes :

(1) All measurements were made under the standardized environment of Seoul Semiconductor
In order to ensure availability, single color rank will not be orderable.

Color Bin Structure

CIE Chromaticity Diagram (Cool White), T_j=85℃



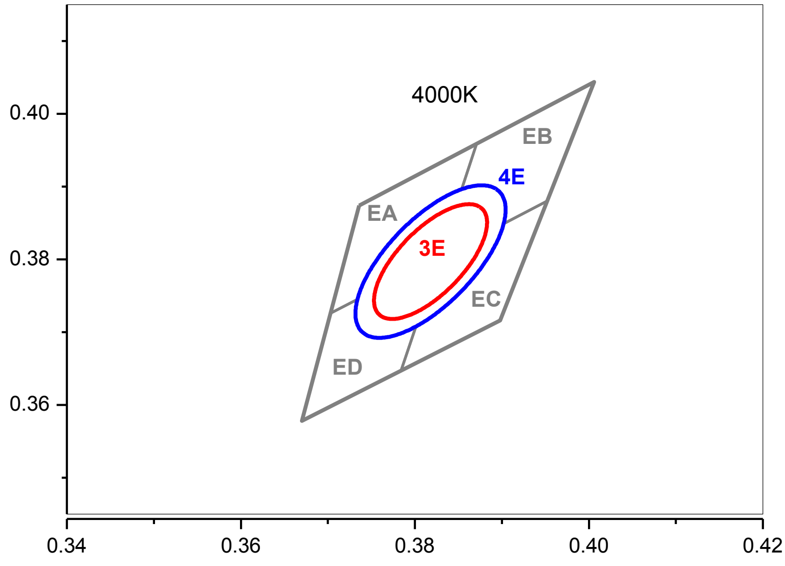
6500K 3Step		5700K 3Step		5000K 3Step	
3A		3B		3C	
Center point	0.3123 : 0.3282	Center point	0.3287 : 0.3417	Center point	0.3447 : 0.3553
Major Axis a	0.0066	Major Axis a	0.0071	Major Axis a	0.0081
Minor Axis b	0.0027	Minor Axis b	0.0030	Minor Axis b	0.0035
Ellipse Rotation Angle	58	Ellipse Rotation Angle	59	Ellipse Rotation Angle	60

6500K 4Step		5700K 4Step		5000K 4Step	
4A		4B		4C	
Center point	0.3123 : 0.3282	Center point	0.3287 : 0.3417	Center point	0.3447 : 0.3553
Major Axis a	0.0088	Major Axis a	0.0095	Major Axis a	0.0108
Minor Axis b	0.0036	Minor Axis b	0.0040	Minor Axis b	0.0047
Ellipse Rotation Angle	58	Ellipse Rotation Angle	59	Ellipse Rotation Angle	60

AA		AB		AC		AD	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3028	0.3304	0.3115	0.3393	0.3131	0.329	0.3048	0.3209
0.3048	0.3209	0.3131	0.329	0.3146	0.3187	0.3068	0.3113
0.3131	0.329	0.3213	0.3371	0.3221	0.3261	0.3146	0.3187
0.3115	0.3393	0.3205	0.3481	0.3213	0.3371	0.3131	0.329
BA		**BB**		**BC**		**BD**	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3207	0.3462	0.3292	0.3539	0.3293	0.3423	0.3215	0.3353
0.3215	0.3353	0.3293	0.3423	0.3294	0.3306	0.3222	0.3243
0.3293	0.3423	0.3371	0.3493	0.3366	0.3369	0.3294	0.3306
0.3292	0.3539	0.3376	0.3616	0.3371	0.3493	0.3293	0.3423
CA		**CB**		**CC**		**CD**	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3376	0.3616	0.3463	0.3687	0.3452	0.3558	0.3371	0.3493
0.3371	0.3493	0.3452	0.3558	0.344	0.3428	0.3366	0.3369
0.3452	0.3558	0.3533	0.3624	0.3514	0.3487	0.344	0.3428
0.3463	0.3687	0.3551	0.376	0.3533	0.3624	0.3452	0.3558

Color Bin Structure

CIE Chromaticity Diagram (Neutral White), T_j=85℃



4000K 3Step

3E	
Center point	0.3818 : 0.3797
Major Axis a	0.0094
Minor Axis b	0.0040
Ellipse Rotation Angle	53

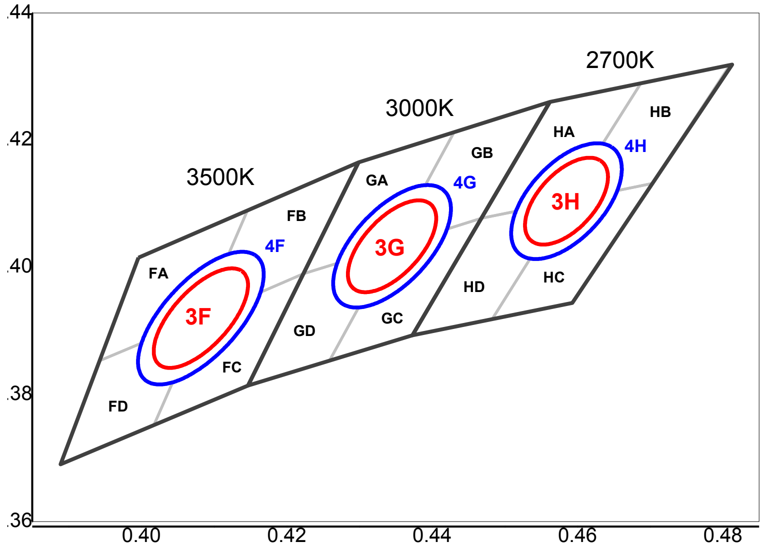
4000K 4Step

4E	
Center point	0.3818 : 0.3797
Major Axis a	0.0125
Minor Axis b	0.0053
Ellipse Rotation Angle	53

EA		EB		EC		ED	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3736	0.3874	0.3871	0.3959	0.3828	0.3803	0.3703	0.3726
0.3703	0.3726	0.3828	0.3803	0.3784	0.3647	0.367	0.3578
0.3828	0.3803	0.3952	0.388	0.3898	0.3716	0.3784	0.3647
0.3871	0.3959	0.4006	0.4044	0.3952	0.388	0.3828	0.3803

Color Bin Structure

CIE Chromaticity Diagram (Warm White), T_j=85℃



3500K 3Step	
3F	
Center point	0.4073 : 0.3917
Major Axis a	0.0093
Minor Axis b	0.0041
Ellipse Rotation Angle	53

3000K 3Step	
3G	
Center point	0.4338 : 0.4030
Major Axis a	0.0085
Minor Axis b	0.0041
Ellipse Rotation Angle	53

2700K 3Step	
3H	
Center point	0.4578 : 0.4101
Major Axis a	0.0079
Minor Axis b	0.0041
Ellipse Rotation Angle	54

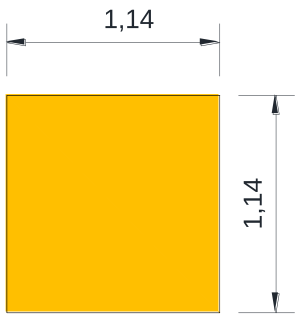
3500K 4Step	
4F	
Center point	0.4073 : 0.3917
Major Axis a	0.0124
Minor Axis b	0.0055
Ellipse Rotation Angle	53

3000K 4Step	
4G	
Center point	0.4338 : 0.4030
Major Axis a	0.0113
Minor Axis b	0.0055
Ellipse Rotation Angle	53

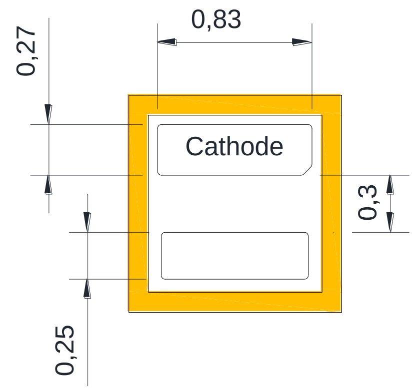
2700K 4Step	
4H	
Center point	0.4578 : 0.4101
Major Axis a	0.0105
Minor Axis b	0.0055
Ellipse Rotation Angle	54

FA		FB		FC		FD	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3996	0.4015	0.4146	0.4089	0.4082	0.392	0.3943	0.3853
0.3943	0.3853	0.4082	0.392	0.4017	0.3751	0.3889	0.369
0.4082	0.392	0.4223	0.399	0.4147	0.3814	0.4017	0.3751
0.4146	0.4089	0.4299	0.4165	0.4223	0.399	0.4082	0.392
GA		**GB**		**GC**		**GD**	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.4299	0.4165	0.443	0.4212	0.4345	0.4033	0.4223	0.399
0.4223	0.399	0.4345	0.4033	0.4259	0.3853	0.4147	0.3814
0.4345	0.4033	0.4468	0.4077	0.4373	0.3893	0.4259	0.3853
0.443	0.4212	0.4562	0.426	0.4468	0.4077	0.4345	0.4033
HA		**HB**		**HC**		**HD**	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.4562	0.426	0.4687	0.4289	0.4585	0.4104	0.4468	0.4077
0.4468	0.4077	0.4585	0.4104	0.4483	0.3919	0.4373	0.3893
0.4585	0.4104	0.4703	0.4132	0.4593	0.3944	0.4483	0.3919
0.4687	0.4289	0.481	0.4319	0.4703	0.4132	0.4585	0.4104

Mechanical Dimensions

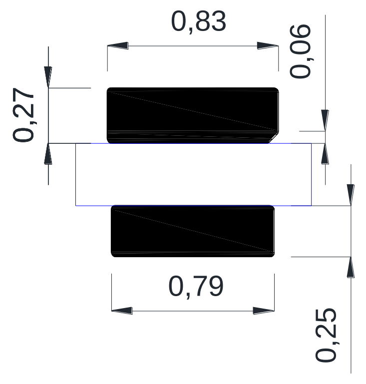


< Top >

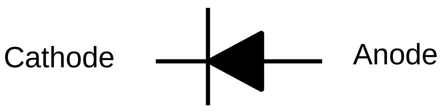


< Bottom >

< Side >



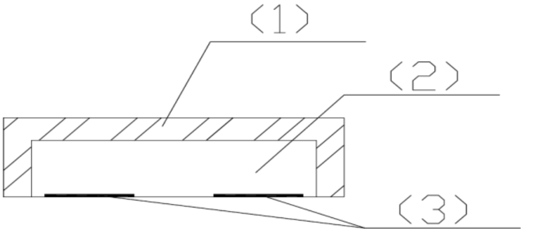
< Recommended Solder Pattern >



< Inner circuit >

(1) All dimensions are in millimeters.
(2) Scale : none
(3) Undefined tolerance is ±0.13mm

Material Structure



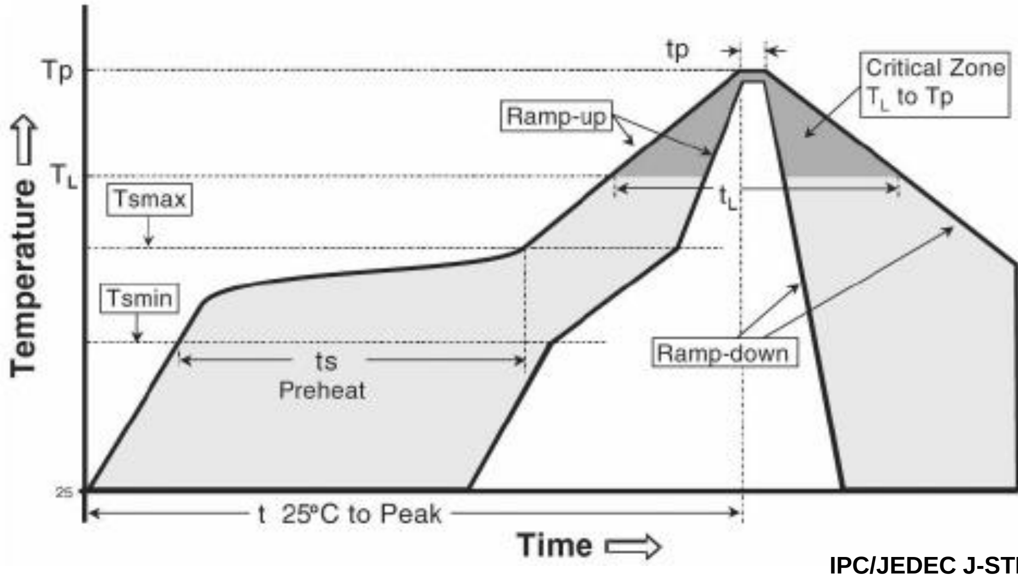
No.	List	Material
①	Encapsulation	Silicone, Phosphor
②	Chip Source	GaN ON SAPPHIRE
③	Solder-PAD	Metal (Au)

Product Nomenclature

Table 6. Part Numbering System : $X_1X_2X_3X_4X_5X_6X_7X_8$-X_9

Part Number Code	Description	Part Number	Value
X_1	Company	S	Seoul Semiconductor
X_2	Level of Integration	1	Discrete LED
X_3X_4	Technology	WX	W0: White General WM: White MJT
$X_5X_6X_7X_8$	Dimension	1111	1.14x1.14mm
X_9X_{10}	CCT	XX	65: 6500K 57: 5700K 50: 5000K 45: 4500K 40: 4000K 35: 3500K 30: 3000K 27: 2700K
$X_{11}X_{12}$	CRI	XX	70: CRI70 80: CRI80 90: CRI90
$X_{13}X_{14}$	Vf	XX	03: 3V 06: 6V 09: 9V
$X_{15}X_{16}X_{17}$	Characteristic code Flux Rank	000	
$X_{18}X_{19}X_{20}$	Characteristic code Vf Rank	000	
$X_{21}X_{22}$	Characteristic code Color Step	00	
$X_{23}X_{24}$	Type	00	
$X_{25}X_{26}X_{27}$	Internal code	001	

Reflow Soldering Characteristics



IPC/JEDEC J-STD-020

Profile Feature	Pb-Free Assembly
Average ramp-up rate (Tsmax to Tp)	3° C/second max.
Preheat - Temperature Min (Tsmin) - Temperature Max (Tsmax) - Time (Tsmin to Tsmax) (ts)	 150 °C 180 °C 80-120 seconds
Time maintained above: - Temperature (TL) - Time (tL)	 217~220°C 80-100 seconds
Peak Temperature (Tp)	250~255℃
Time within 5°C of actual Peak Temperature (tp)2	20-40 seconds
Ramp-down Rate	6 °C/second max.
Time 25°C to Peak Temperature	8 minutes max.
Atmosphere	Nitrogen (O2<1000ppm)

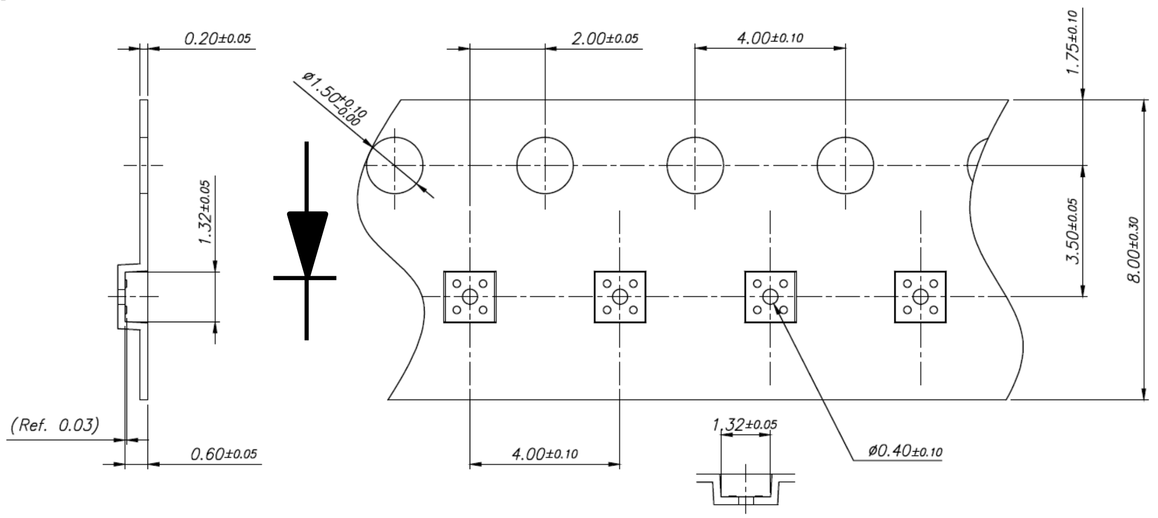
Caution

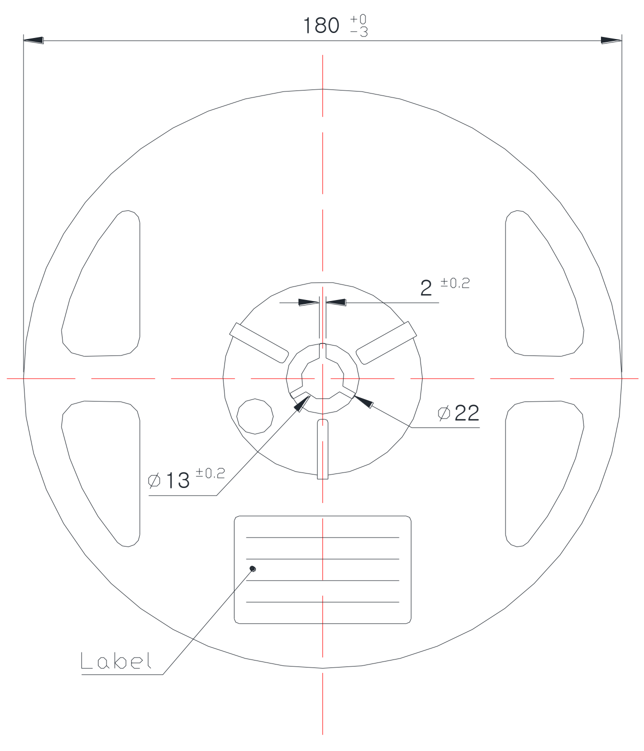
(1) Reflow soldering is recommended not to be done more than two times. When 24 hours passed after first soldering, following reflow soldering will make LED damaged.
(2) Re-soldering should not be done after the LED have been soldered. If re-soldering is unavoidable, LED`s characteristics should be carefully checked on before and after such repair.
(3) Do not put stress on the LED during heating.
(4) After reflow, do not clean PCB with either water or solvent.

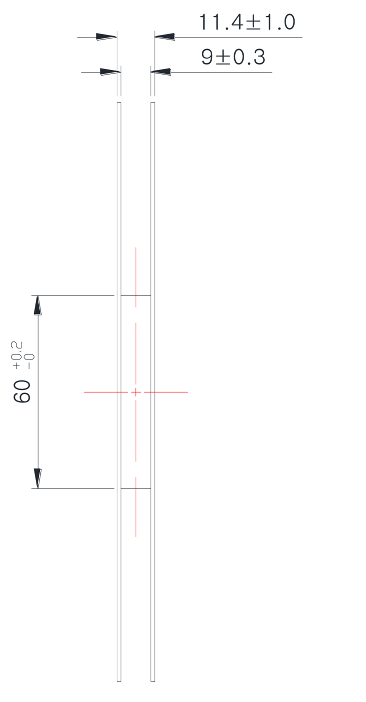
SMT recommendation

(1) After reflow, Over 80% reflectance of PSR is recommended.
(2) Solder paste materials (SAC 305, No Cleaning Paste)
(3) We recommend TOV Test 1.8V~2.8V at 1uA (per LED).
(4) We recommend IR Test 0~1uA at -5V (per LED) for 3V.
We recommend TOV Test 6.6V~8.5V at 30uA (per LED) for 9V.

Emitter Tape & Reel Packaging





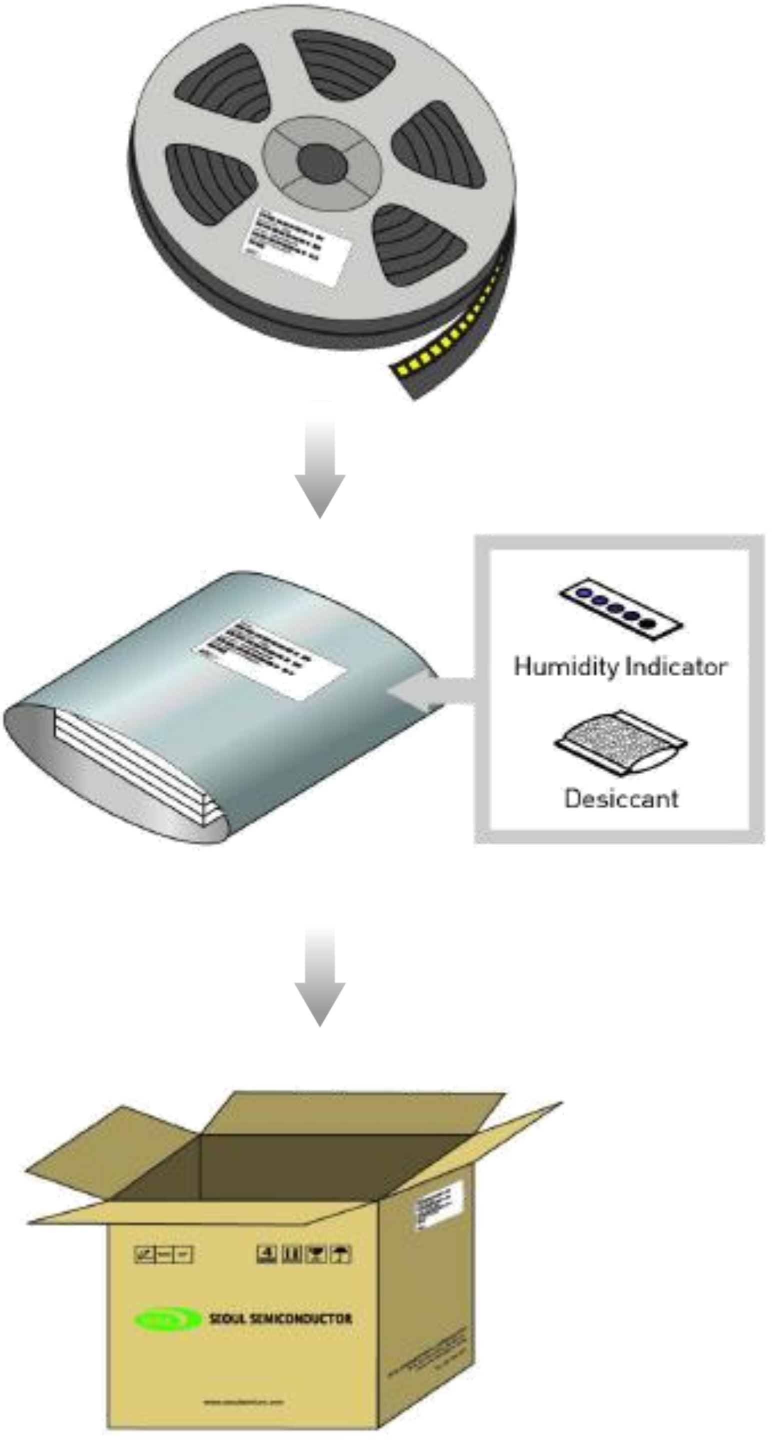


(Tolerance: ±0.2, Unit: mm)

Notes :

(1) Quantity : 3,000pcs/Reel
(empty slot possible in taping reel)
(2) Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ±0.2mm
(3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10º to the carrier tape
(4) Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

Packaging Information



Handling of Silicone Resin for LED

(1) During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.

(2) Do not use tweezers to pick up or handle WICOP2 LED. A vacuum pick up should only be used.

(3) When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented. This is assured by choosing a pick and place nozzle which is smaller than the LED's area.

(4) Silicone differs from materials conventionally used for the manufacturing of LED. These conditions must be considered during the handling of such devices. Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust. As mentioned previously, the increased sensitivity to dust requires special care during processing.

(5) Please do not mold this product into another resin (epoxy, urethane, etc) and do not handle this product with acid or sulfur material in sealed space.

(6) Avoid leaving fingerprints on silicone resin parts.

Precaution for Use

(1) Storage

To avoid the moisture penetration, we recommend storing LED in a dry box with a desiccant . The recommended storage temperature range is 5℃ to 30℃ and a maximum humidity of RH50%.

(2) Use Precaution after Opening the Packaging

Use SMT techniques properly when you solder the LED as separation of the lens may affect the light output efficiency.

Pay attention to the following:

a. Recommend conditions after opening the package

- Sealing / Temperature : 5 ~ 30℃ Humidity : less than RH60%

b. If the package has been opened more than 1 year (MSL 2) or the color of the desiccant changes, components should be dried for 10-24hr at 65±5℃

(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering.

(4) Do not rapidly cool device after soldering.

(5) Components should not be mounted on warped (non coplanar) portion of PCB.

(6) Radioactive exposure is not considered for the products listed here in.

(7) Gallium arsenide is used in some of the products listed in this publication. These products are dangerous if they are burned or shredded in the process of disposal. It is also dangerous to drink the liquid or inhale the gas generated by such products when chemically disposed of.

(8) This device should not be used in any type of fluid such as water, oil, organic solvent and etc.

(9) When the LED are in operation the maximum current should be decided after measuring the package temperature.

(10) The appearance and specifications of the product may be modified for improvement without notice.

(11) Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.

Precaution for Use

(12) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures ca n penetrate silicone encapsulants of LED and discolor when exposed to heat and photonic energy. Th e result can be a significant loss of light output from the fixture. Knowledge of the properties of the mat erials selected to be used in the construction of fixtures can help prevent these issues.

(13) Attaching LED, do not use adhesives that outgas organic vapor.

(14) The driving circuit must be designed to allow forward voltage only when it is ON or OFF. If the rev erse voltage is applied to LED, migration can be generated resulting in LED damage.

(15) LED are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS). Below is a list of suggestions that Seoul Semiconductor purposes to minimize these effects.

a. ESD (Electro Static Discharge)

Electrostatic discharge (ESD) is the defined as the release of static electricity when two objects come into contact. While most ESD events are considered harmless, it can be an expensive problem in many industrial environments during production and storage. The damage from ESD to an LED may c ause the product to demonstrate unusual characteristics such as:

- Increase in reverse leakage current lowered turn-on voltage
- Abnormal emissions from the LED at low current

The following recommendations are suggested to help minimize the potential for an ESD event.
One or more recommended work area suggestions:

- Ionizing fan setup
- ESD table/shelf mat made of conductive materials
- ESD safe storage containers

One or more personnel suggestion options:

- Antistatic wrist-strap
- Antistatic material shoes
- Antistatic clothes

Environmental controls:

- Humidity control (ESD gets worse in a dry environment)

Precaution for Use

b. EOS (Electrical Over Stress)

Electrical Over-Stress (EOS) is defined as damage that may occur when an electronic device is subjected to a current or voltage that is beyond the maximum specification limits of the device. The effects from an EOS event can be noticed through product performance like:

- Changes to the performance of the LED package
  (If the damage is around the bond pad area and since the package is completely encapsulated the package may turn on but flicker show severe performance degradation.)
- Changes to the light output of the luminaire from component failure
- Components on the board not operating at determined drive power

Failure of performance from entire fixture due to changes in circuit voltage and current across total circuit causing trickle down failures. It is impossible to predict the failure mode of every LED exposed to electrical overstress as the failure modes have been investigated to vary, but there are some common signs that will indicate an EOS event has occurred:

- This damage usually appears due to the thermal stress produced during the EOS event.

c. To help minimize the damage from an EOS event Seoul Semiconductor recommends utilizing:

- A surge protection circuit
- An appropriately rated over voltage protection device
- A current limiting device

Company Information

Published by

Company Information

Seoul Semiconductor (www.SeoulSemicon.com) manufacturers and packages a wide selection of light emitting diodes (LED) for the automotive, general illumination/lighting, Home appliance, signage and back lighting markets. The company is the world's fifth largest LED supplier, holding more than 10,000 patents globally, while offering a wide range of LED technology and production capacity in areas such as “nPola”, "Acrich", the world's first commercially produced AC LED, and "Acrich MJT - Multi-Junction Technology" a proprietary family of high-voltage LED.

The company's broad product portfolio includes a wide array of package and device choices such as Acrich and Acirch2, high-brightness LED, mid-power LED, side-view LED, and through-hole type LED as well as custom modules, displays, and sensors.

Legal Disclaimer

Information in this document is provided in connection with Seoul Semiconductor products. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Seoul Semiconductor hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party. The appearance and specifications of the product can be changed to improve the quality and/or performance without notice.