
DTL5053DW57A3

Features

- High power LED
- Long life, up to 100k hours
- Instant light (less than 100 ns)
- Low voltage DC operated
- Typical color temperature: 5700 K.
- Typical view angle: 120°
- Soldering methods: SMT.
- Typical optical efficiency: 80 lm/W.
- Thermal resistance (junction to case): 12 °C/W.
- RoHS Compliant

Applications

- Reading Lamps (bus, car, aircraft)
- Signal and symbol luminaries for orientation marker lights (e.g. steps, exit ways, etc.)
- Portable (bicycle, flashlight)
- Decorative and entertainment illumination
- Indoor and outdoor commercial and residential architectural lighting

Rating and Characteristics

1. Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Power Dissipation	P_d	0.8	W
Forward Current ^{*1}	I_F	80	mA
Peak Forward Current ^{*1, *2}	I_{FP}	100	mA
Reverse Voltage ^{*1}	V_r	5	V
Junction Temperature	T_j	115	°C
Thermal Resistance, Junction-Case	$R_{th, j-c}$	12	°C/W
Operating Temperature	T_{opr}	-40 ~ 85	°C
Storage Temperature	T_{stg}	-40 ~ 100	°C

Notes

1. The values are based on one die performance.
2. I_{FP} Conditions: 0.1 ms Pulse Width and 1/10 Duty Cycle.

2. Electrical / Optical Characterizes (Ta = 25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage * ¹	V _F	I _F =60mA ¹	2.7	3.3	3.8	V
Luminous Flux * ²	Φ	I _F =60mA ¹	31.7	47.5	69.8	lm
Efficacy * ²	η	I _F =60mA ¹	-	80	-	lm/W
Reverse Current * ¹	I _R	V _R =5V ¹	-	-	100	μA
Color Rendering Index * ²	Ra	I _F =60mA ¹	-	70	-	-
View Angle * ²	2θ _{1/2}	I _F =60mA ¹	-	120	-	°C
Chromaticity Coordinates * ²	CCx	I _F =60mA ¹	-	0.330	-	-
	CCy	I _F =60mA ¹	-	0.342	-	-

Notes

1. For each die.
2. When all LED dies are operated simultaneously.
3. Luminous flux is the total luminous flux output as measured with an integrating sphere.
4. The chromaticity coordinates (x, y) is derived from the CIE 1931 chromaticity diagram.
5. IS CAS140B is for the luminous flux (lm) and the CIE1931 chromaticity coordinates (x, y) testing. The chromaticity coordinates (x, y) guarantee should be added ± 0.01 tolerance.

3. Typical Electrical / Optical Characteristics Curves

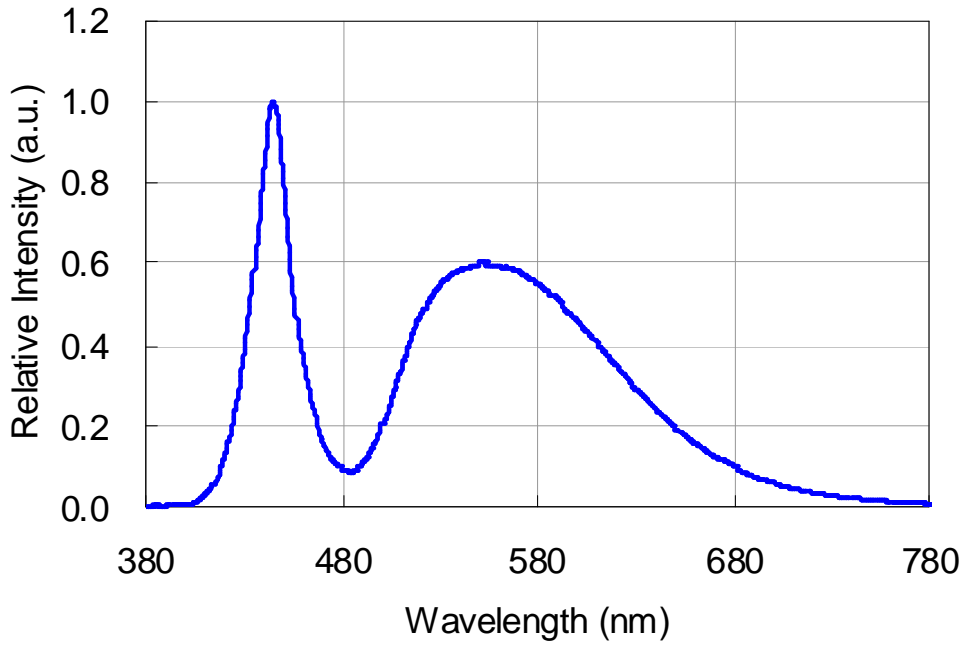


Fig.1 Relative Spectrum of Emission

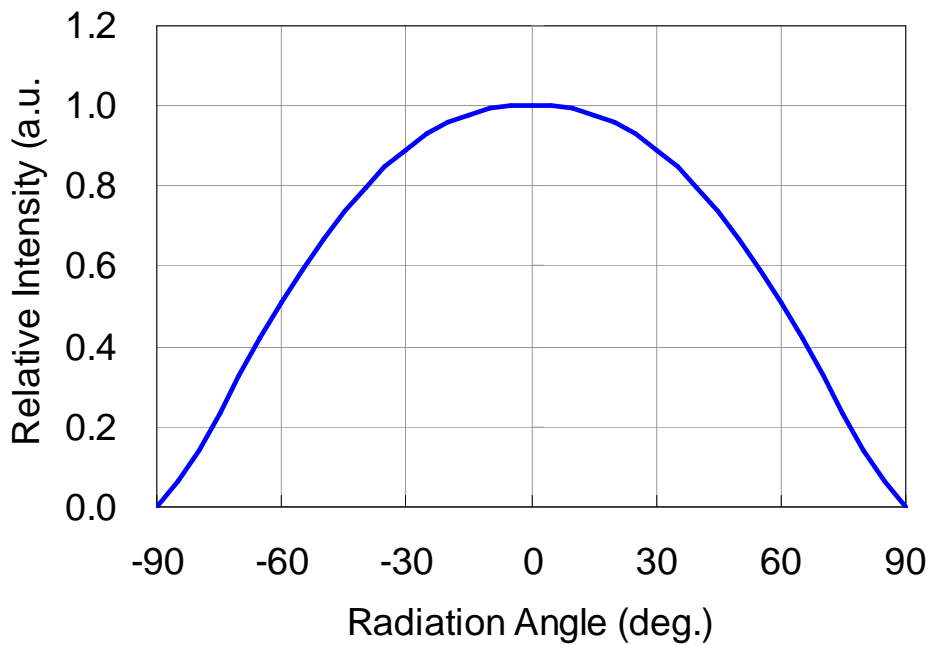


Fig.2 Radiation Characteristic

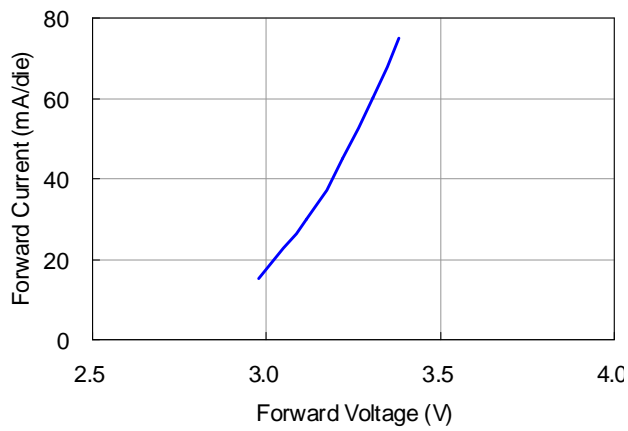


Fig.3 Forward Current

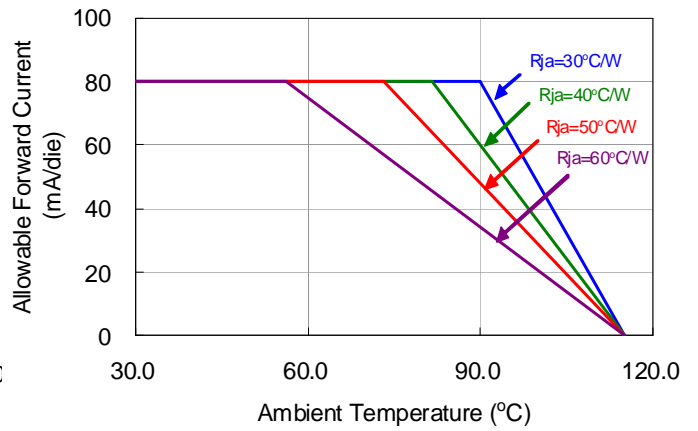


Fig.4 Forward Current Derating curve

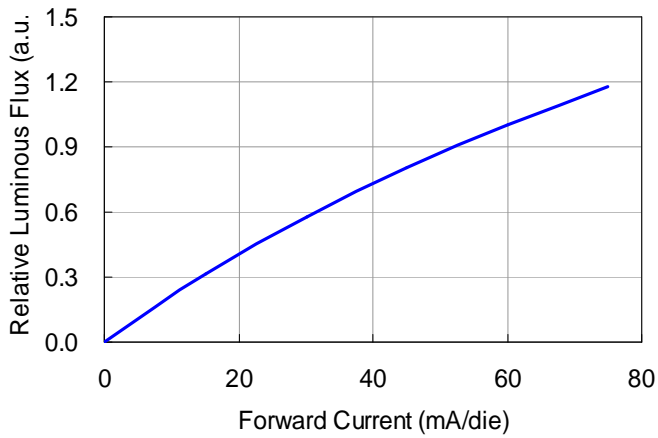


Fig.5 Relative Luminous Flux

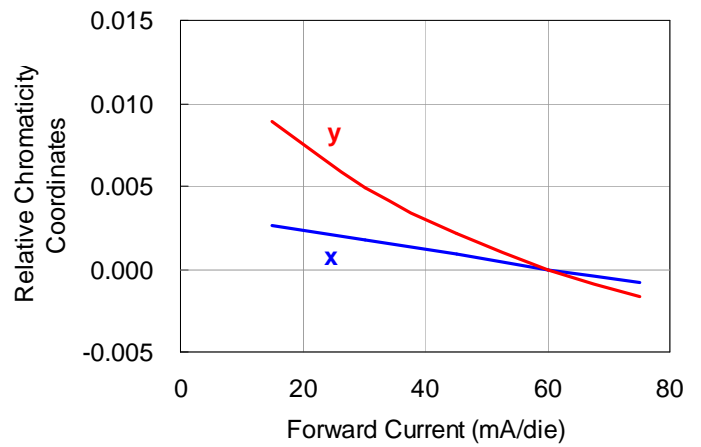


Fig.6 Chromaticity Coordinate Shift

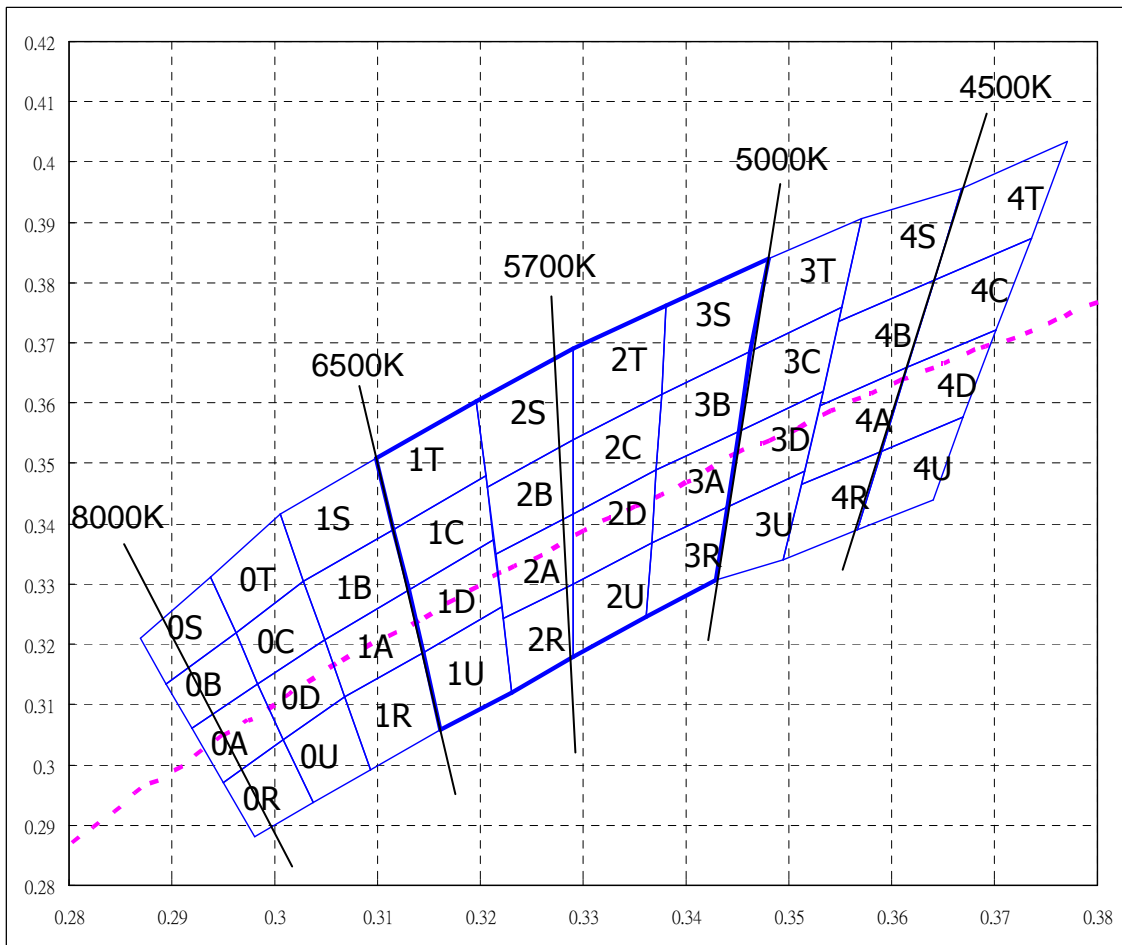
4. Luminous Flux Bin (Ta=25°C)

Rank Code	Symbol	Condition	Min	Max	Unit
P0	Φ	I _F =60mA/Die	31.7	41.3	lm
Q0			41.3	53.7	
R0			53.7	69.8	

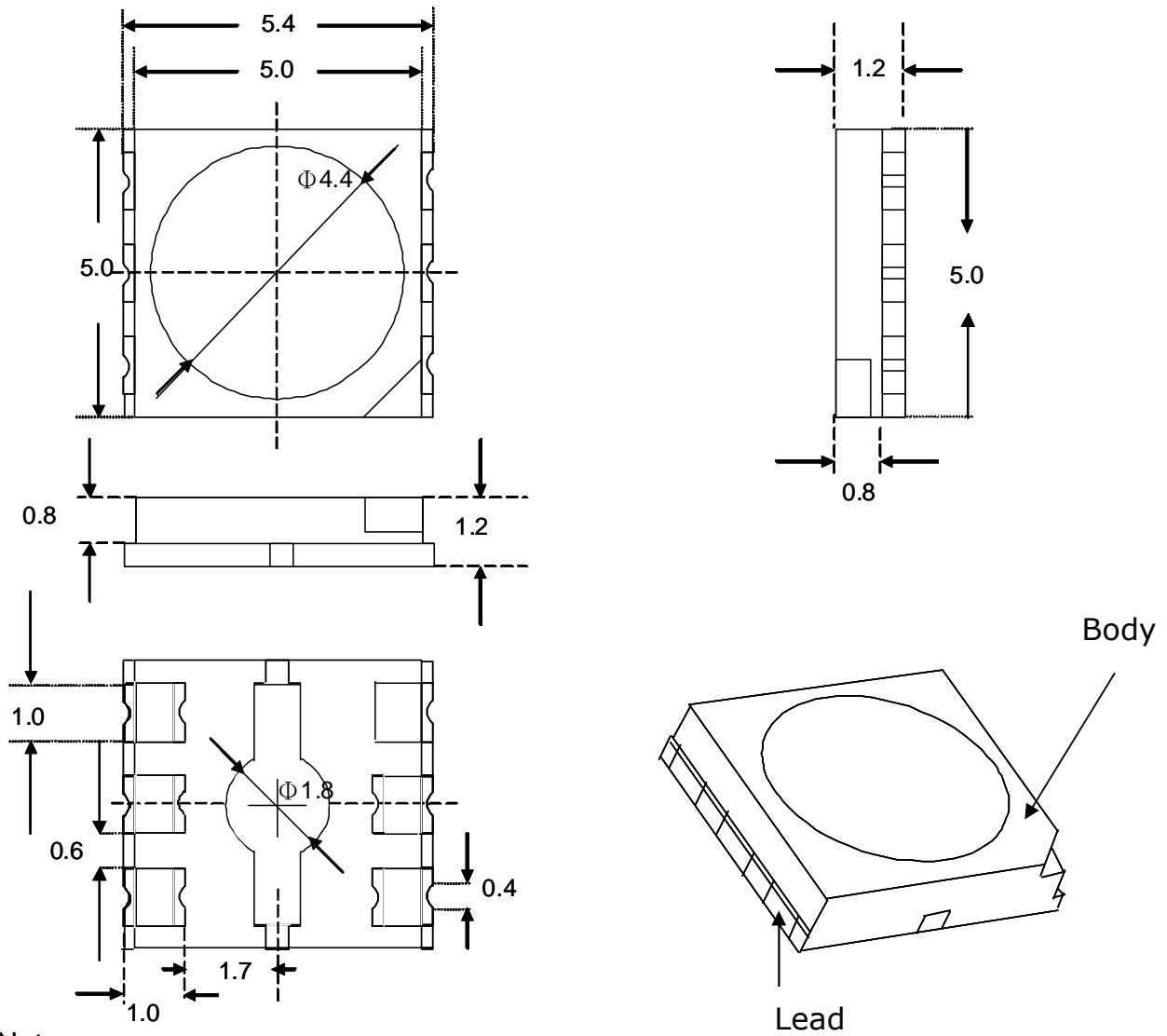
5. Color Ranks

Code	x	y	Code	x	y	Code	x	y	Code	x	y
0A	0.2950	0.2970	0B	0.2920	0.3060	0C	0.2984	0.3133	0D	0.2984	0.3133
	0.2920	0.3060		0.2895	0.3135		0.2962	0.3220		0.3048	0.3207
	0.2984	0.3133		0.2962	0.3220		0.3028	0.3304		0.3068	0.3113
	0.3009	0.3042		0.2984	0.3133		0.3048	0.3207		0.3009	0.3042
0R	0.2980	0.2880	0S	0.2895	0.3135	0T	0.2962	0.3220	0U	0.3037	0.2937
	0.2950	0.2970		0.2870	0.3210		0.2937	0.3312		0.3009	0.3042
	0.3009	0.3042		0.2937	0.3312		0.3005	0.3415		0.3068	0.3113
	0.3037	0.2937		0.2962	0.3220		0.3028	0.3304		0.3093	0.2993
1A	0.3048	0.3207	1B	0.3028	0.3304	1C	0.3115	0.3391	1D	0.3130	0.3290
	0.3130	0.3290		0.3115	0.3391		0.3205	0.3481		0.3213	0.3373
	0.3144	0.3186		0.3130	0.3290		0.3213	0.3373		0.3221	0.3261
	0.3068	0.3113		0.3048	0.3207		0.3130	0.3290		0.3144	0.3186
1R	0.3068	0.3113	1S	0.3005	0.3415	1T	0.3099	0.3509	1U	0.3144	0.3186
	0.3144	0.3186		0.3099	0.3509		0.3196	0.3602		0.3221	0.3261
	0.3161	0.3059		0.3115	0.3391		0.3205	0.3481		0.3231	0.3120
	0.3093	0.2993		0.3028	0.3304		0.3115	0.3391		0.3161	0.3059
2A	0.3215	0.3350	2B	0.3207	0.3462	2C	0.3290	0.3538	2D	0.3290	0.3417
	0.3290	0.3417		0.3290	0.3538		0.3376	0.3616		0.3371	0.3490
	0.3290	0.3300		0.3290	0.3417		0.3371	0.3490		0.3366	0.3369
	0.3222	0.3243		0.3215	0.3350		0.3290	0.3417		0.3290	0.3300
2R	0.3222	0.3243	2S	0.3196	0.3602	2T	0.3290	0.3690	2U	0.3290	0.3300
	0.3290	0.3300		0.3290	0.3690		0.3381	0.3762		0.3366	0.3369
	0.3290	0.3180		0.3290	0.3538		0.3376	0.3616		0.3361	0.3245
	0.3231	0.3120		0.3207	0.3462		0.3290	0.3538		0.3290	0.3180

3A	0.3371	0.3490	3B	0.3376	0.3616	3C	0.3463	0.3687	3D	0.3451	0.3554
	0.3451	0.3554		0.3463	0.3687		0.3551	0.3760		0.3533	0.3620
	0.3440	0.3427		0.3451	0.3554		0.3533	0.3620		0.3440	0.3427
	0.3366	0.3369		0.3371	0.3490		0.3451	0.3554		0.3440	0.3427
3R	0.3366	0.3369	3S	0.3381	0.3762	3T	0.3480	0.3840	3U	0.3440	0.3428
	0.3440	0.3428		0.3480	0.3840		0.3571	0.3907		0.3515	0.3487
	0.3429	0.3307		0.3463	0.3687		0.3551	0.3760		0.3495	0.3339
	0.3361	0.3245		0.3376	0.3616		0.3463	0.3687		0.3429	0.3307
4A	0.3530	0.3597	4B	0.3548	0.3736	4C	0.3641	0.3804	4D	0.3615	0.3659
	0.3615	0.3659		0.3641	0.3804		0.3736	0.3874		0.3702	0.3722
	0.3590	0.3521		0.3615	0.3659		0.3702	0.3722		0.3670	0.3578
	0.3512	0.3465		0.3530	0.3597		0.3615	0.3659		0.3590	0.3521
4R	0.3512	0.3465	4S	0.3571	0.3907	4T	0.3668	0.3957	4U	0.3590	0.3521
	0.3590	0.3521		0.3668	0.3957		0.3771	0.4034		0.3670	0.3578
	0.3567	0.3389		0.3641	0.3804		0.3736	0.3874		0.3640	0.3440
	0.3495	0.3339		0.3548	0.3736		0.3641	0.3804		0.3567	0.3389



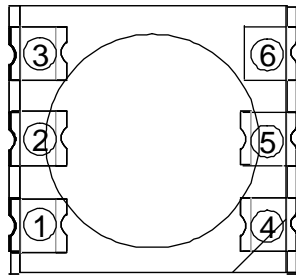
Physical Dimensions:



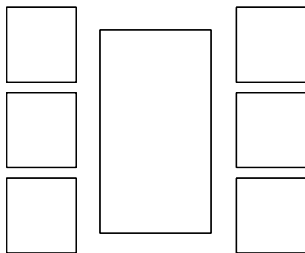
Notes :

1. All dimensions are in millimeters
2. Tolerance is ± 0.25 mm unless otherwise noted.

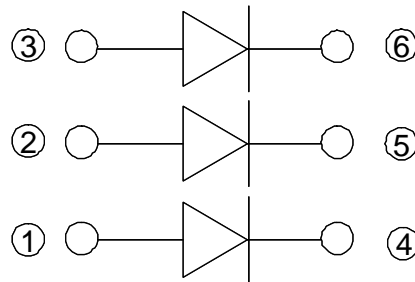
Pad Configuration



TOP VIEW



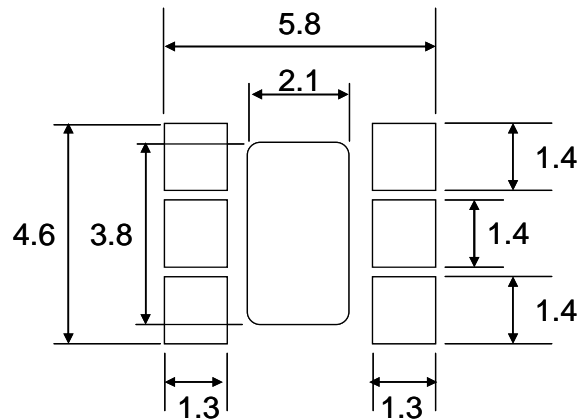
BOTTOM VIEW



① ② ③ Anode

④ ⑤ ⑥ Cathode

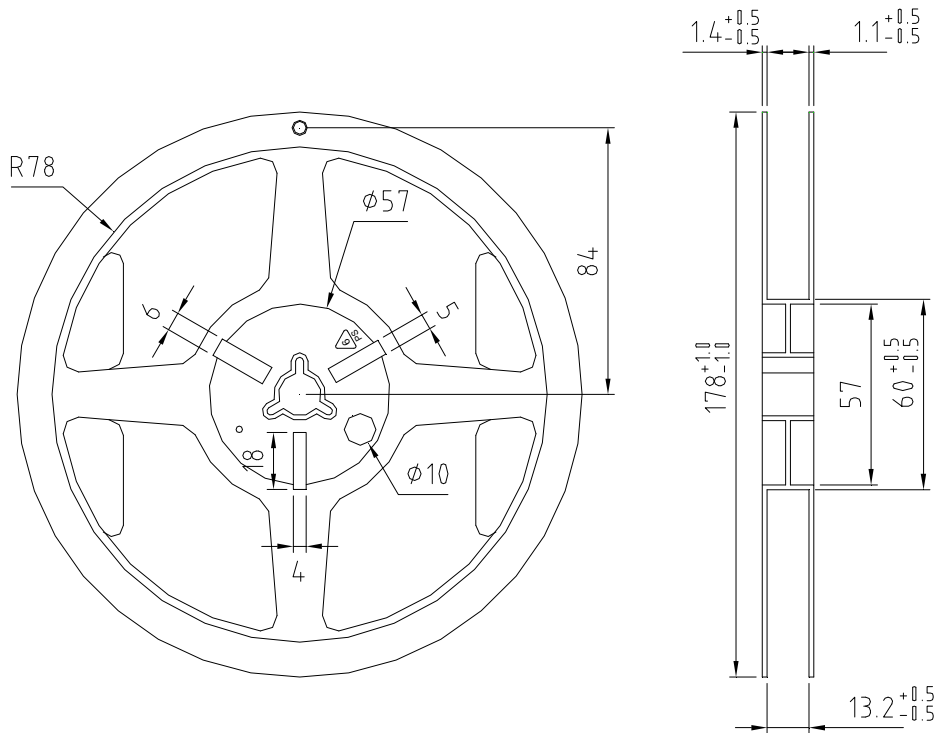
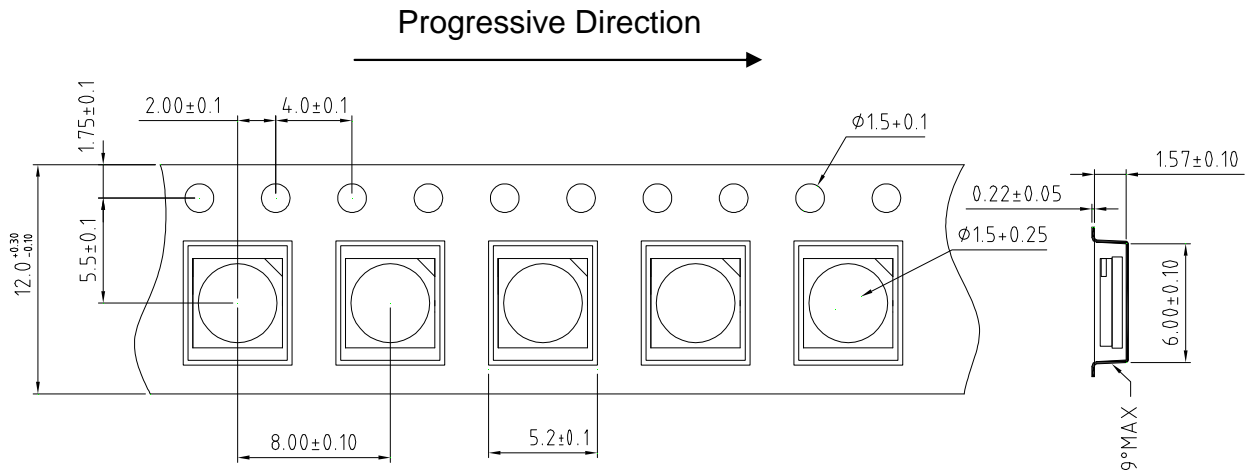
Solder Pad Design



Notes:

1. All dimensions are in millimeters
2. The circle metallization board and lead contact pad is electrically isolated.

Package Dimensions of Tape and Reel



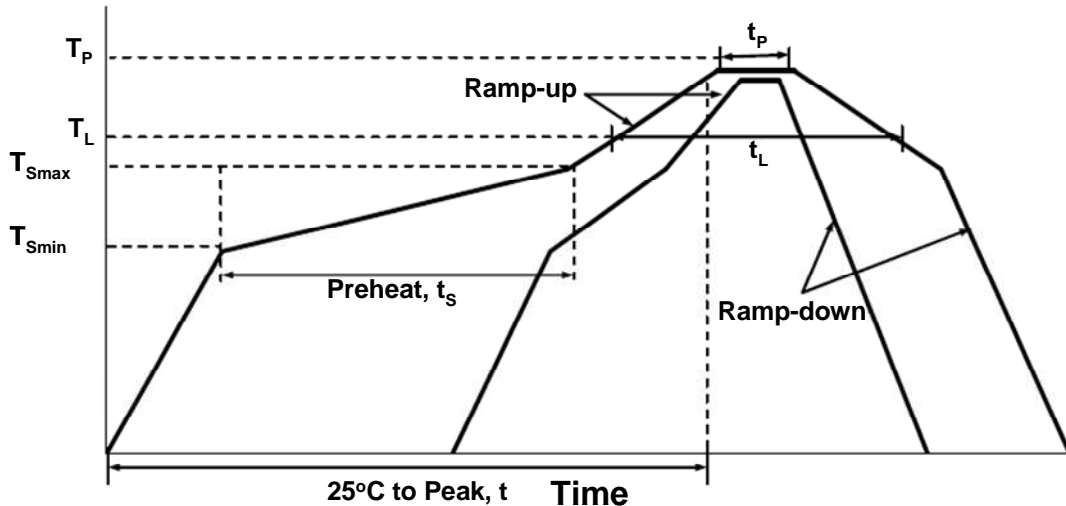
Notes:

1. Empty component pockets sealed with top cover tape.
2. 1400 pieces per one 7-inch reel.
3. The maximum number of consecutive missing LED is two.
4. In accordance with EIA-481-1-L23 specifications.

Reflow Soldering Characteristics

In testing, we have found LEDs to be compatible with JEDEC J-STD-020C, using the parameters listed below. As a general guideline, we recommend that users follow the recommended soldering profile provided by the manufacturer of solder paste used.

Note that this general guideline may not apply to all PCB designs and configurations of reflow soldering equipment.



Profile Feature	Lead-Based Solder	Lead-Free Solder
Average Ramp-Up Rate (T_{smax} to T_p)	3°C/second max.	3°C/second max.
Preheat: Temperature Min (T_{smin})	100°C	150°C
Preheat: Temperature Max (T_{smax})	150°C	200°C
Preheat: Time (t_{smin} to t_{smax})	60-120 seconds	60-180 seconds
Time Maintained Above: Temperature (T_L)	183°C	217°C
Time Maintained Above: Time (t_L)	60-150 seconds	60-150 seconds
Peak/Classification Temperature (T_p)	215°C	260°C
Time Within 5°C of Actual Peak Temperature (t_p)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

Note:

All temperatures refer to topside of the package, measured on the package body surface.

Reliability Test

No.	Test Item	Test Condition	Duration	Test Q'ty
1	Solder Resistance	Tsld=260°C, 10sec	3 Times	0/30
2	Solderability	Tsld=245±5°C, 3sec	3 Times	0/30
3	Room Temperature Operating Life	25°C, If=60mA/die	1000 Hours	0/30
4	High Temp. High Humidity Operation Life	85°C/85%RH, If=25mA/die	1000 Hours	0/30
5	Temperature Cycle	-40°C~25°C~100°C~25°C (30min-5min-30min-5min)	500 Cycles	0/30
6	Thermal Shock	-55~105°C, 15min dwell, <10sec transfer	500 Cycles	0/30
7	Moisture Resistance Cyclic	25°C~65°C~-10°C 90%RH, 24hrs/1cycle	10 cycles	0/30
8	High Temperature Storage (100°C)	Ta=100°C	1000 Hours	0/30
9	Low Temperature Storage (-40°C)	Ta=-40°C	1000 Hours	0/30
10	Electrostatic Discharges	R=1.5kΩ, C=100pF Test Voltage=2kV	3 Times	0/30

Criteria for Judging the Damage

Item	Symbol	Test Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	Vf	I _F = 60mA/Die	-	U.S.L. x 1.1
Luminous Intensity	Im	I _F = 60mA/Die	L.S.L. x 0.7	-