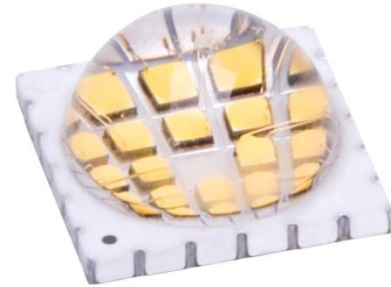## LZP-Series

Highest Lumen Density
Warm White Emitter

LZP-00WW00

Key Features

- Highest luminous flux / area single LED emitter
    - 3200lm Warm White
    - 40mm² light emitting area
- Up to 90 Watt power dissipation on compact 12.0mm x 12.0mm footprint
- Industry lowest thermal resistance per package size (0.6°C/W)
- Industry leading lumen maintenance
- Color Point Stability 7x improvement over Energy Star requirements
- High CRI performance for true color rendering
- Surface mount ceramic package with integrated glass lens
- JEDEC Level 1 for Moisture Sensitivity Level
- Lead (Pb) free and RoHS compliant
- Reflow solderable (up to 6 cycles)
- Copper core MCPCB option with emitter thermal slug directly soldered to the copper core
- Full suite of TIR secondary optics family available

Typical Applications

- General lighting
- Shop lighting
- Stage and Studio lighting
- Architectural lighting

Description

The LZP-00WW00 Warm White LED emitter can dissipate up to 90W of power in an extremely small package. With a small 12.0mm x 12.0mm footprint, this package provides unmatched luminous flux density. LED Engin's patent-pending thermally insulated phosphor layer provides spatial color uniformity across the radiation pattern and a consistent CCT, CRI over time and temperature. The high quality materials used in the package are chosen to optimize light output and minimize stresses which results in superior reliability and lumen maintenance. The robust product design thrives in outdoor applications with high ambient temperatures and high humidity.

Part number options

Base part number

Part number	Description
LZP-00WW00-xxxx	LZP Warm White emitter
LZP-D0WW00-xxxx	LZP Warm White emitter on 5 channel 4x6+1 Star MCPCB
LZP-G0WWT1-xxxx	LZP Warm White emitter on 2 channel 2x12+1 Connectorized MCPCB
LZP-H0WWT1-xxxx	LZP Warm White emitter on 2 channel 4x6+1 Connectorized MCPCB

Bin kit option codes

WW, Warm-White (2700K – 3500K)			
Kit number suffix	Min flux Bin	Color Bin Ranges	Description
0027	D2	8A1, 8A2, 8B1, 8B2, 8A4, 8A3, 8B4, 8B3, 8D1, 8D2, 8C1, 8C2, 8D4, 8D3, 8C4, 8C3	full distribution flux; 2700K ANSI CCT bin
E027	E2	8A1, 8A2, 8B1, 8B2, 8A4, 8A3, 8B4, 8B3, 8D1, 8D2, 8C1, 8C2, 8D4, 8D3, 8C4, 8C3	E2 minimum flux bin; 2700K ANSI CCT bin
0227	D2	8A2, 8B1, 8A3, 8B4, 8D2, 8C1, 8D3, 8C4	full distribution flux; 2700K ANSI CCT half bin
E227	E2	8A2, 8B1, 8A3, 8B4, 8D2, 8C1, 8D3, 8C4	E2 min flux bin; 2700K ANSI CCT half bin
0427	D2	8A3, 8B4, 8D2, 8C1	full distribution flux; 2700K ANSI CCT quarter bin
E427	E2	8A3, 8B4, 8D2, 8C1	E2 min flux bin; 2700K ANSI CCT quarter bin
0030	D2	7A1, 7A2, 7B1, 7B2, 7A4, 7A3, 7B4, 7B3, 7D1, 7D2, 7C1, 7C2, 7D4, 7D3, 7C4, 7C3	full distribution flux; 3000K ANSI CCT bin
E030	E2	7A1, 7A2, 7B1, 7B2, 7A4, 7A3, 7B4, 7B3, 7D1, 7D2, 7C1, 7C2, 7D4, 7D3, 7C4, 7C3	E2 min flux bin; 3000K ANSI CCT bin
0230	D2	7A2, 7B1, 7A3, 7B4, 7D2, 7C1, 7D3, 7C4	full distribution flux; 3000K ANSI CCT half bin
E230	E2	7A2, 7B1, 7A3, 7B4, 7D2, 7C1, 7D3, 7C4	E2 min flux bin; 3000K ANSI CCT half bin
0430	D2	7A3, 7B4, 7D2, 7C1	full distribution flux; 3000K ANSI CCT quarter bin
E430	E2	7A3, 7B4, 7D2, 7C1	E2 min flux bin; 3000K ANSI CCT quarter bin
0035	D2	6A1, 6A2, 6B1, 6B2, 6A4, 6A3, 6B4, 6B3, 6D1, 6D2, 6C1, 6C2, 6D4, 6D3, 6C4, 6C3	full distribution flux; 3500K ANSI CCT bin
E035	E2	6A1, 6A2, 6B1, 6B2, 6A4, 6A3, 6B4, 6B3, 6D1, 6D2, 6C1, 6C2, 6D4, 6D3, 6C4, 6C3	E2 min flux bin; 3500K ANSI CCT bin
0235	D2	6A2, 6B1, 6A3, 6B4, 6D2, 6C1, 6D3, 6C4	full distribution flux; 3500K ANSI CCT half bin
E235	E2	6A2, 6B1, 6A3, 6B4, 6D2, 6C1, 6D3, 6C4	E2 min flux bin; 3500K ANSI CCT half bin
0435	D2	6A3, 6B4, 6D2, 6C1	full distribution flux; 3500K ANSI CCT quarter bin
E435	E2	6A3, 6B4, 6D2, 6C1	E2 min flux bin; 3500K ANSI CCT quarter bin

Warm White Chromaticity Groups
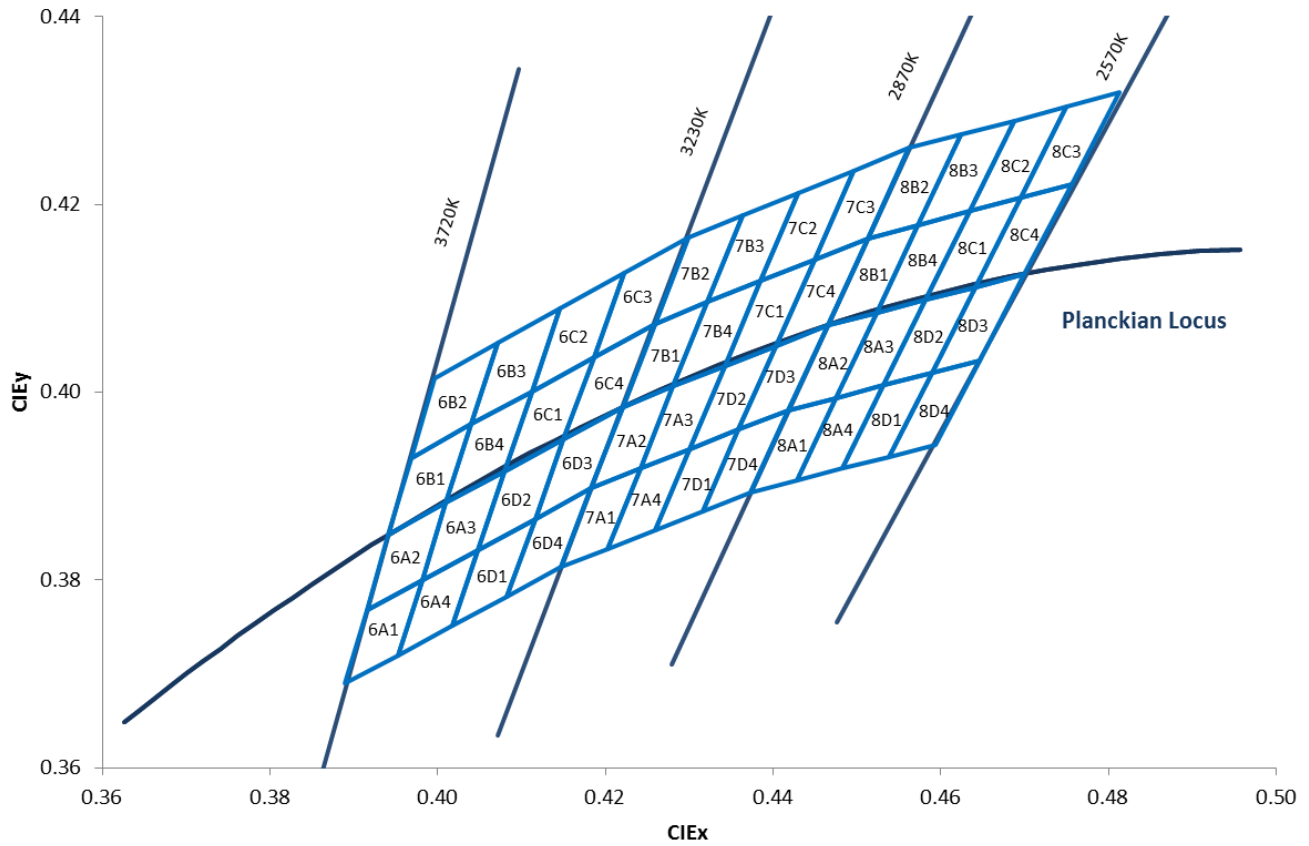
Standard Chromaticity Groups plotted on excerpt from the CIE 1931 (2°) x-y Chromaticity Diagram.
Coordinates are listed below in the table.

Warm White Bin Coordinates

Bin code	CIEx	CIEy	Bin code	CIEx	CIEy	Bin code	CIEx	CIEy	Bin code	CIEx	CIEy
6A1	0.3889	0.369	6A2	0.3915	0.3768	6B1	0.3941	0.3848	6B2	0.3968	0.393
	0.3915	0.3768		0.3941	0.3848		0.3968	0.393		0.3996	0.4015
	0.3981	0.38		0.401	0.3882		0.404	0.3966		0.4071	0.4052
	0.3953	0.372		0.3981	0.38		0.401	0.3882		0.404	0.3966
	0.3889	0.369		0.3915	0.3768		0.3941	0.3848		0.3968	0.393
6A4	0.3953	0.372	6A3	0.3981	0.38	6B4	0.401	0.3882	6B3	0.404	0.3966
	0.3981	0.38		0.401	0.3882		0.404	0.3966		0.4071	0.4052
	0.4048	0.3832		0.408	0.3916		0.4113	0.4001		0.4146	0.4089
	0.4017	0.3751		0.4048	0.3832		0.408	0.3916		0.4113	0.4001
	0.3953	0.372		0.3981	0.38		0.401	0.3882		0.404	0.3966
6D1	0.4017	0.3751	6D2	0.4048	0.3832	6C1	0.408	0.3916	6C2	0.4113	0.4001
	0.4048	0.3832		0.408	0.3916		0.4113	0.4001		0.4146	0.4089
	0.4116	0.3865		0.415	0.395		0.4186	0.4037		0.4222	0.4127
	0.4082	0.3782		0.4116	0.3865		0.415	0.395		0.4186	0.4037
	0.4017	0.3751		0.4048	0.3832		0.408	0.3916		0.4113	0.4001
6D4	0.4082	0.3782	6D3	0.4116	0.3865	6C4	0.415	0.395	6C3	0.4186	0.4037
	0.4116	0.3865		0.415	0.395		0.4186	0.4037		0.4222	0.4127
	0.4183	0.3898		0.4221	0.3984		0.4259	0.4073		0.4299	0.4165
	0.4147	0.3814		0.4183	0.3898		0.4221	0.3984		0.4259	0.4073
	0.4082	0.3782		0.4116	0.3865		0.415	0.395		0.4186	0.4037
7A1	0.4147	0.3814	7A2	0.4183	0.3898	7B1	0.4221	0.3984	7B2	0.4259	0.4073
	0.4183	0.3898		0.4221	0.3984		0.4259	0.4073		0.4299	0.4165
	0.4242	0.3919		0.4281	0.4006		0.4322	0.4096		0.4364	0.4188
	0.4203	0.3833		0.4242	0.3919		0.4281	0.4006		0.4322	0.4096
	0.4147	0.3814		0.4183	0.3898		0.4221	0.3984		0.4259	0.4073
7A4	0.4203	0.3833	7A3	0.4242	0.3919	7B4	0.4281	0.4006	7B3	0.4322	0.4096
	0.4242	0.3919		0.4281	0.4006		0.4322	0.4096		0.4364	0.4188
	0.43	0.3939		0.4342	0.4028		0.4385	0.4119		0.443	0.4212
	0.4259	0.3853		0.43	0.3939		0.4342	0.4028		0.4385	0.4119
	0.4203	0.3833		0.4242	0.3919		0.4281	0.4006		0.4322	0.4096
7D1	0.4259	0.3853	7D2	0.43	0.3939	7C1	0.4342	0.4028	7C2	0.4385	0.4119
	0.43	0.3939		0.4342	0.4028		0.4385	0.4119		0.443	0.4212
	0.4359	0.396		0.4403	0.4049		0.4449	0.4141		0.4496	0.4236
	0.4316	0.3873		0.4359	0.396		0.4403	0.4049		0.4449	0.4141
	0.4259	0.3853		0.43	0.3939		0.4342	0.4028		0.4385	0.4119
7D4	0.4316	0.3873	7D3	0.4359	0.396	7C4	0.4403	0.4049	7C3	0.4449	0.4141
	0.4359	0.396		0.4403	0.4049		0.4449	0.4141		0.4496	0.4236
	0.4418	0.3981		0.4465	0.4071		0.4513	0.4164		0.4562	0.426
	0.4373	0.3893		0.4418	0.3981		0.4465	0.4071		0.4513	0.4164
	0.4316	0.3873		0.4359	0.396		0.4403	0.4049		0.4449	0.4141
8A1	0.4373	0.3893	8A2	0.4418	0.3981	8B1	0.4465	0.4071	8B2	0.4513	0.4164
	0.4418	0.3981		0.4465	0.4071		0.4513	0.4164		0.4562	0.426
	0.4475	0.3994		0.4523	0.4085		0.4573	0.4178		0.4624	0.4274
	0.4428	0.3906		0.4475	0.3994		0.4523	0.4085		0.4573	0.4178
	0.4373	0.3893		0.4418	0.3981		0.4465	0.4071		0.4513	0.4164
8A4	0.4428	0.3906	8A3	0.4475	0.3994	8B4	0.4523	0.4085	8B3	0.4573	0.4178
	0.4475	0.3994		0.4523	0.4085		0.4573	0.4178		0.4624	0.4274
	0.4532	0.4008		0.4582	0.4099		0.4634	0.4193		0.4687	0.4289
	0.4483	0.3919		0.4532	0.4008		0.4582	0.4099		0.4634	0.4193
	0.4428	0.3906		0.4475	0.3994		0.4523	0.4085		0.4573	0.4178
8D1	0.4483	0.3919	8D2	0.4532	0.4008	8C1	0.4582	0.4099	8C2	0.4634	0.4193
	0.4532	0.4008		0.4582	0.4099		0.4634	0.4193		0.4687	0.4289
	0.4589	0.4021		0.4641	0.4112		0.4695	0.4207		0.475	0.4304
	0.4538	0.3931		0.4589	0.4021		0.4641	0.4112		0.4695	0.4207
	0.4483	0.3919		0.4532	0.4008		0.4582	0.4099		0.4634	0.4193
8D4	0.4538	0.3931	8D3	0.4589	0.4021	8C4	0.4641	0.4112	8C3	0.4695	0.4207
	0.4589	0.4021		0.4641	0.4112		0.4695	0.4207		0.475	0.4304
	0.4646	0.4034		0.47	0.4126		0.4756	0.4221		0.4813	0.4319
	0.4593	0.3944		0.4646	0.4034		0.47	0.4126		0.4756	0.4221
	0.4538	0.3931		0.4589	0.4021		0.4641	0.4112		0.4695	0.4207

LZP-00WW00 (5.3-07/01/13)

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Luminous Flux Bins

Bin Code	Minimum Luminous Flux (Φ_V) @ I_F = 700mA /Channel[1,2] (lm)	Maximum Luminous Flux (Φ_V) @ I_F = 700mA /Channel[1,2] (lm)
D2	2,350	2,600
E2	2,600	2,900
F2	2,900	3,200

Notes:
1. Luminous flux performance guaranteed within published operating conditions. LED Engin maintains a tolerance of ± 10% on flux measurements.
2. Luminous Flux typical value is for all 24 LED dies operating at rated current. The LED is configured with 4 Channels of 6 dies in series.

Forward Voltage Bin

Bin Code	Minimum Forward Voltage (V_F) @ I_F = 700mA /Channel[1] (V)	Maximum Forward Voltage (V_F) @ I_F = 700mA /Channel[1] (V)
0	19.20[2,3]	23.52[2,3]

Notes:
1. LED Engin maintains a tolerance of ± 0.24V for forward voltage measurements.
2. All 4 white Channels have matched Vf for parallel operation
3. Forward Voltage is binned with 6 LED dies connected in series. The LED is configured with 4 Channels of 6 dies in series each.

LZP-00WW00 (5.3-07/01/13)

Absolute Maximum Ratings

Table 3:

Parameter	Symbol	Value	Unit
DC Forward Current at T_{jmax}=135°C [1]	I_F	1200	mA
DC Forward Current at T_{jmax}=150°C [1]	I_F	1000	mA
Peak Pulsed Forward Current [2]	I_{FP}	1500 /Channel	mA
Reverse Voltage	V_R	See Note 3	V
Storage Temperature	T_{stg}	-40 ~ +150	°C
Junction Temperature	T_J	150	°C
Soldering Temperature [4]	T_{sol}	260	°C
Allowable Reflow Cycles		6	
ESD Sensitivity [5]		> 8,000 V HBM Class 3B JESD22-A114-D	

Notes:
1. Maximum DC forward current (per die) is determined by the overall thermal resistance and ambient temperature.
   Follow the curves in Figure 10 for current de-rating.
2: Pulse forward current conditions: Pulse Width ≤ 10msec and Duty cycle ≤ 10%.
3. LEDs are not designed to be reverse biased.
4. Solder conditions per JEDEC 020D. See Reflow Soldering Profile Figure 5.
5. LED Engin recommends taking reasonable precautions towards possible ESD damages and handling the LZP-00WW00 in an electrostatic protected area (EPA).
   An EPA may be adequately protected by ESD controls as outlined in ANSI/ESD S6.1.

Optical Characteristics @ T_C = 25°C

Table 4:

Parameter	Symbol	Typical	Unit
Luminous Flux (@ I_F = 700mA) [1]	Φ_V	3050	lm
Luminous Flux (@ I_F = 1000mA) [1]	Φ_V	4000	lm
Luminous Efficacy (@ I_F = 350mA)		70	lm/W
Correlated Color Temperature	CCT	3000	K
Color Rendering Index (CRI)	R_a / R9	83 / 15	
Viewing Angle [2]	$2\Theta_{1/2}$	110	Degrees

Notes:
1. Luminous flux typical value is for all 24 LED dies operating at rated current.
2. Viewing Angle is the off-axis angle from emitter centerline where the luminous intensity is ½ of the peak value.

Electrical Characteristics @ T_C = 25°C

able 5:

Parameter	Symbol	Typical	Unit
Forward Voltage (@ I_F = 700mA) [1]	V_F	21.0 /Channel	V
Forward Voltage (@ I_F = 1000mA) [1]	V_F	21.9 /Channel	V
Temperature Coefficient of Forward Voltage [1]	$\Delta V_F/\Delta T_J$	-16.8	mV/°C
Thermal Resistance (Junction to Case)	$R\Theta_{J-C}$	0.6	°C/W

Notes:
1. Forward Voltage is measured for a single string of 6 dies connected in series. The LED is configured with 4 Channels of 6 dies in series each.

LZP-00WW00 (5.3-07/01/13)

IPC/JEDEC Moisture Sensitivity Level

Table 6 - IPC/JEDEC J-STD-20D.1 MSL Classification:

| | Floor Life | | Soak Requirements | | | |
| | | | Standard | | Accelerated | |
Level	Time	Conditions	Time (hrs)	Conditions	Time (hrs)	Conditions
1	unlimited	≤ 30°C/ 85% RH	168 +5/-0	85°C/ 85% RH	n/a	n/a

Notes:
1. The standard soak time includes a default value of 24 hours for semiconductor manufacturer's exposure time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor's facility.

Average Lumen Maintenance Projections

Lumen maintenance generally describes the ability of a lamp to retain its output over time. The useful lifetime for solid state lighting devices (Power LEDs) is also defined as Lumen Maintenance, with the percentage of the original light output remaining at a defined time period. L70 defines the amount of operating hours at which the light output has reached 70% of its original output.
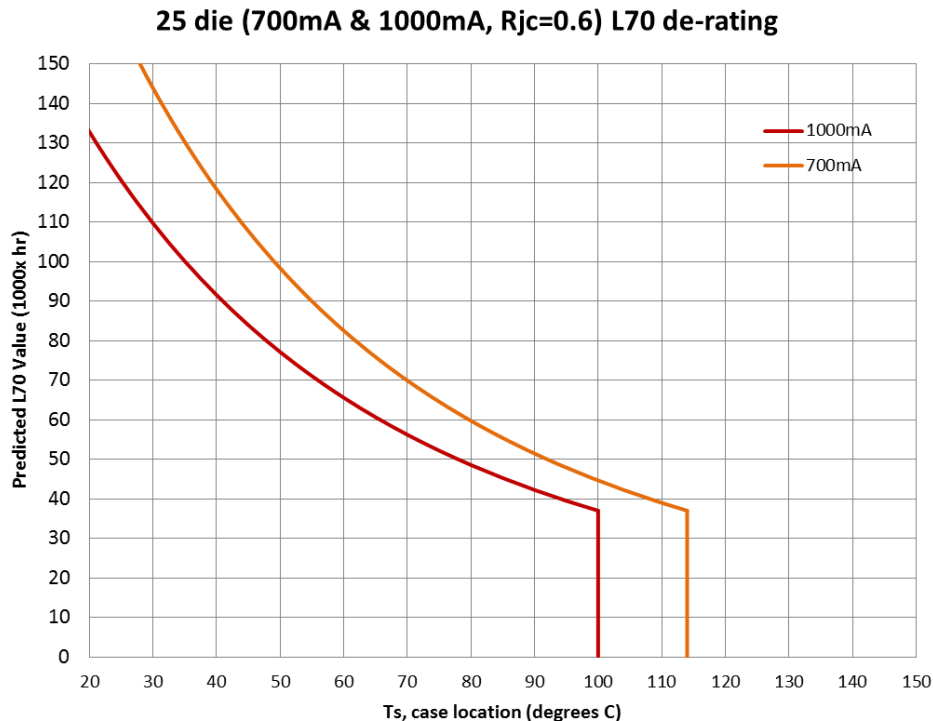
Figure 1: De-rating curve for operation of all dies at 700mA

Notes:
1. Ts is a thermal reference point on the case of the emitter.

Mechanical Dimensions (mm)
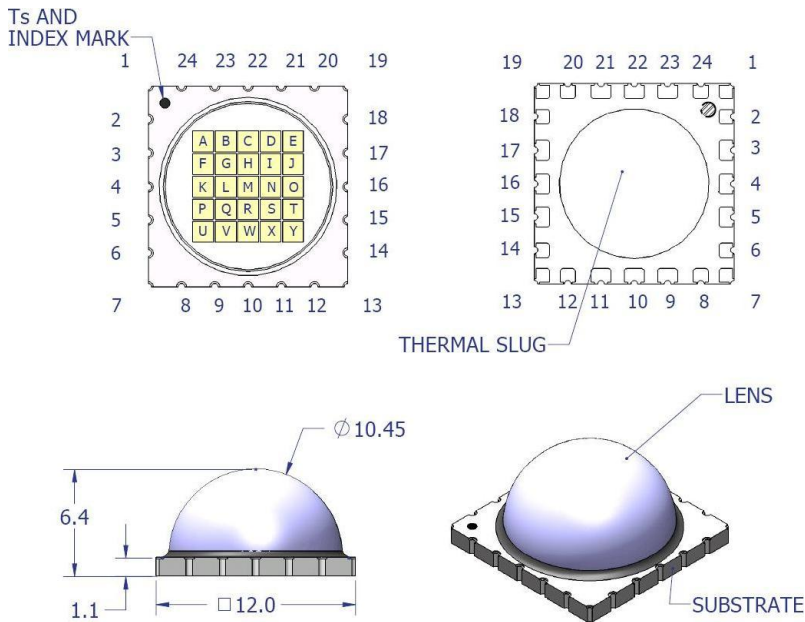
Figure 2: Package outline drawing.

Notes:
1. Unless otherwise noted, the tolerance = ± 0.20 mm.
2. Thermal slug is electrically isolated
3. Ts is a thermal reference point

Pin Out				
Ch.	Pad	Die	Color	Function
1	18	E	WW	Anode
		D	WW	na
		C	WW	na
		B	WW	na
		A	WW	na
	24	F	WW	Cathode
2	17	J	WW	Anode
		I	WW	na
		H	WW	na
		G	WW	na
		L	WW	na
	3	K	WW	Cathode
3	15	O	WW	Anode
		N	WW	na
		S	WW	na
		R	WW	na
		Q	WW	na
	5	P	WW	Cathode
4	14	T	WW	Anode
		Y	WW	na
		X	WW	na
		W	WW	na
		V	WW	na
	8	U	WW	Cathode
5	2	M	-	na
	23	M	-	na

Recommended Solder Pad Layout (mm)
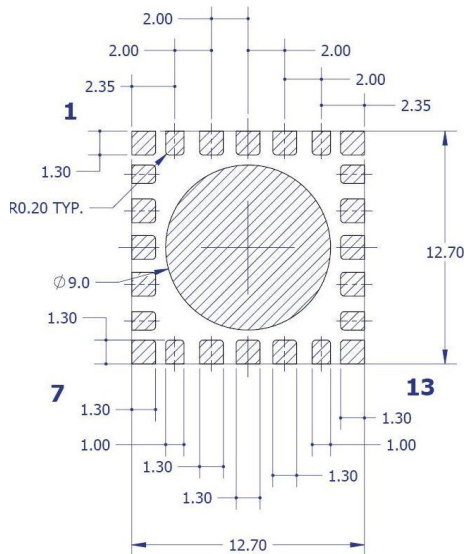
Figure 3: Recommended solder mask opening (hatched area) for anode, cathode, and thermal pad.

Notes:
1. Unless otherwise noted, the tolerance = ± 0.20 mm.
2. LED Engin recommends the use of copper core MCPCB's which allow for the emitter thermal slug to be soldered directly to the copper core (so called pedestal design). Such MCPCB technologies eliminate the high thermal resistance dielectric layer that standard MCPCB technologies use in between the emitter thermal slug and the metal core of the MCPCB, thus lowering the overall system thermal resistance.
3. LED Engin recommends x-ray sample monitoring for solder voids underneath the emitter thermal slug. The total area covered by solder voids should be less than 20% of the total emitter thermal slug area. Excessive solder voids will increase the emitter to MCPCB thermal resistance and may lead to higher failure rates due to thermal over stress.

LZP-00WW00 (5.3-07/01/13)
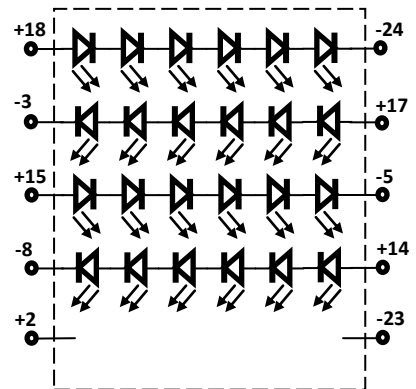
Reflow Soldering Profile
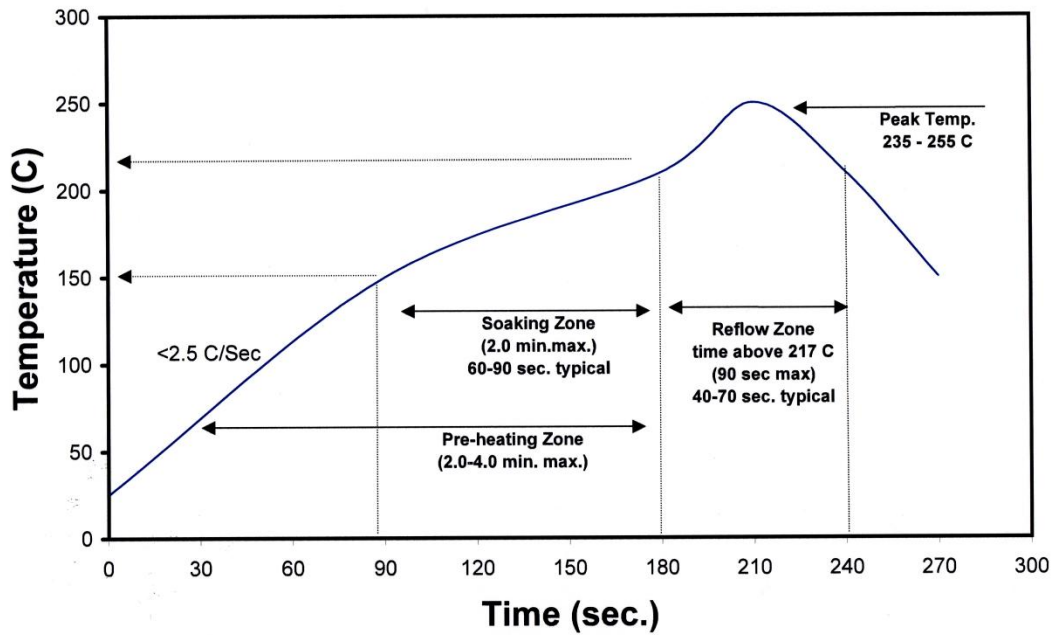

Figure 4: Reflow soldering profile for lead free soldering.

Typical Radiation Pattern
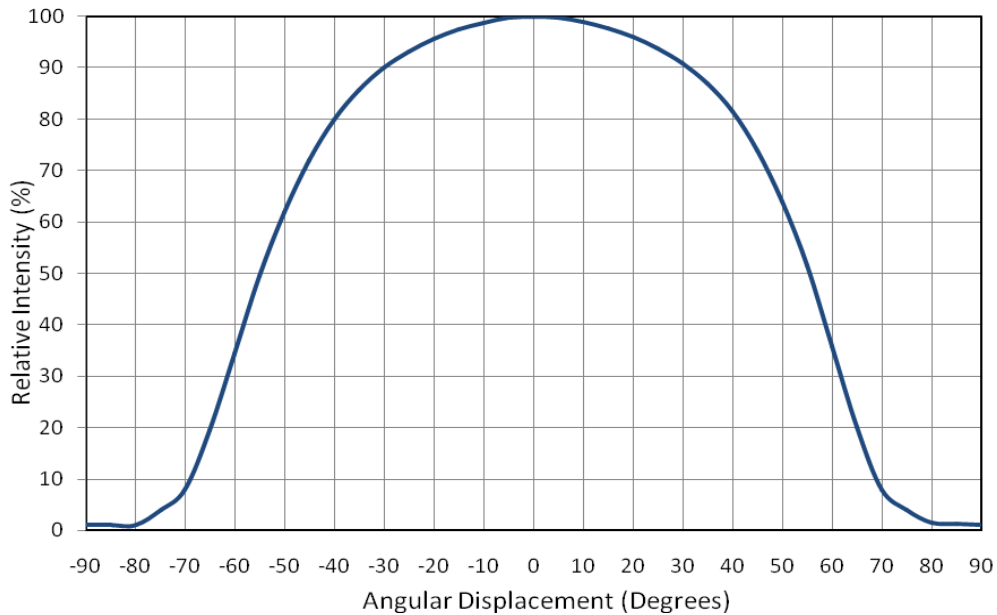
Figure 5: Typical representative spatial radiation pattern.

LZP-00WW00 (5.3-07/01/13)

Typical Relative Spectral Power Distribution
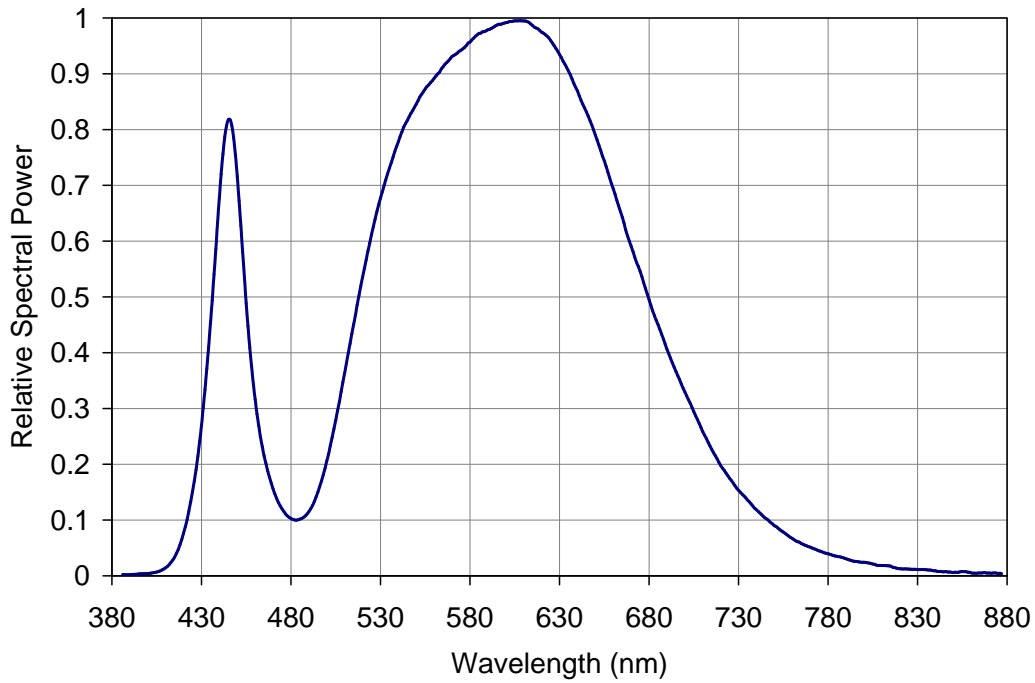

Figure 6: Typical relative spectral power vs. wavelength @ T$_C$ = 25°C.
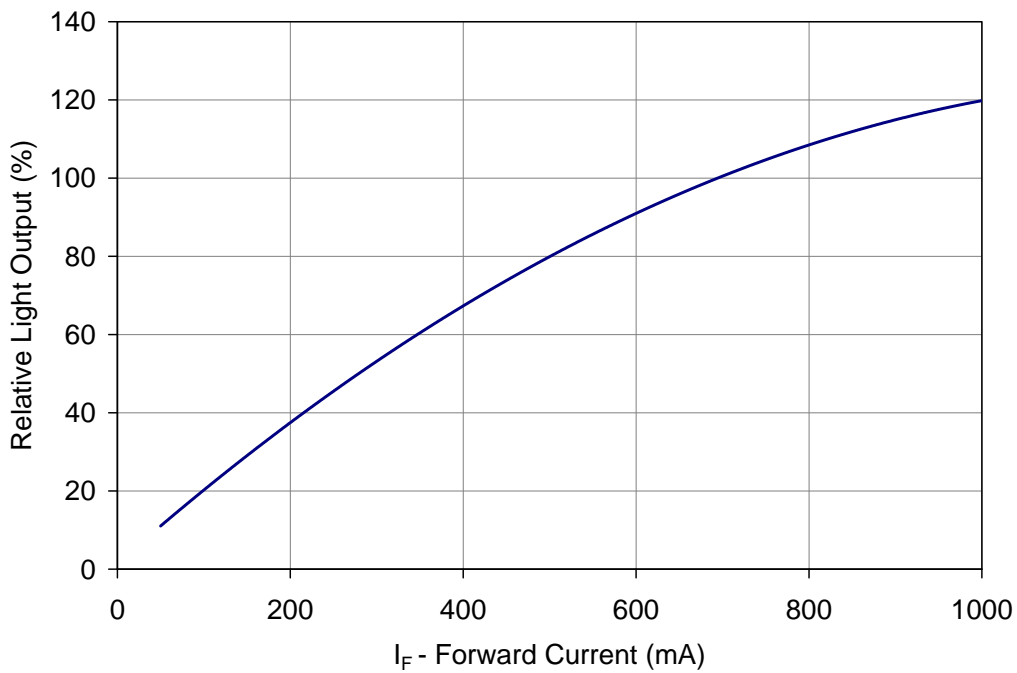
Typical Relative Light Output

Figure 7: Typical relative light output vs. forward current @ T$_C$ = 25°C.

Notes:
1. Luminous Flux typical value is for all 24 LED dies operating concurrently at rated current pro Channel.

LZP-00WW00 (5.3-07/01/13)

Typical Relative Light Output over Temperature
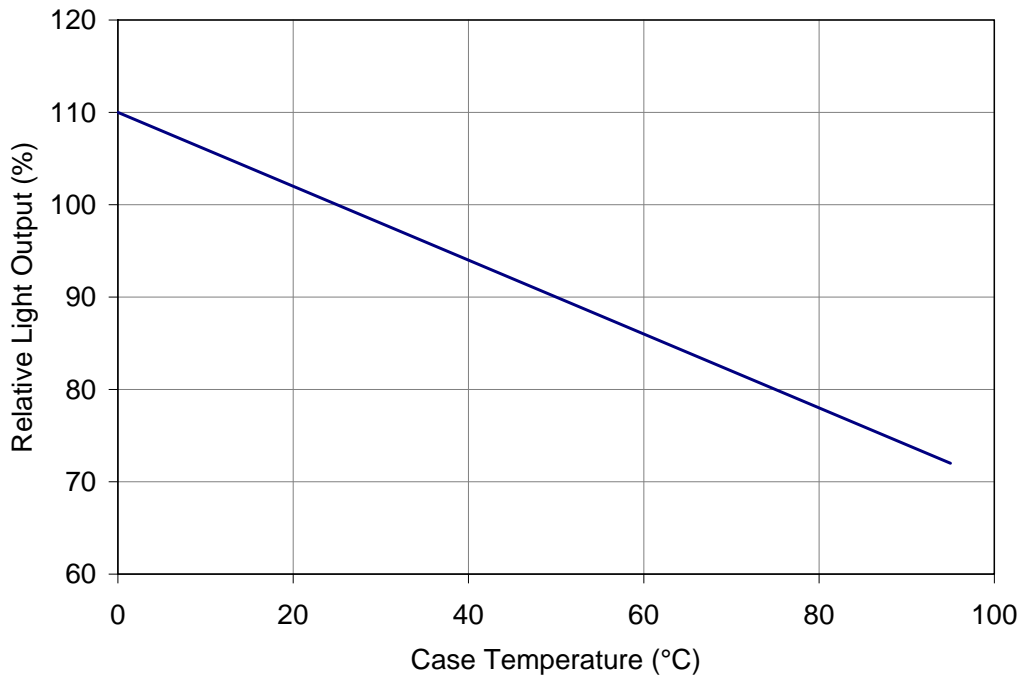
Figure 8: Typical relative light output vs. case temperature.

Notes:
1.   Luminous Flux typical value is for all 24 LED dies operating concurrently at rated current pro Channel.

Typical Forward Current Characteristics
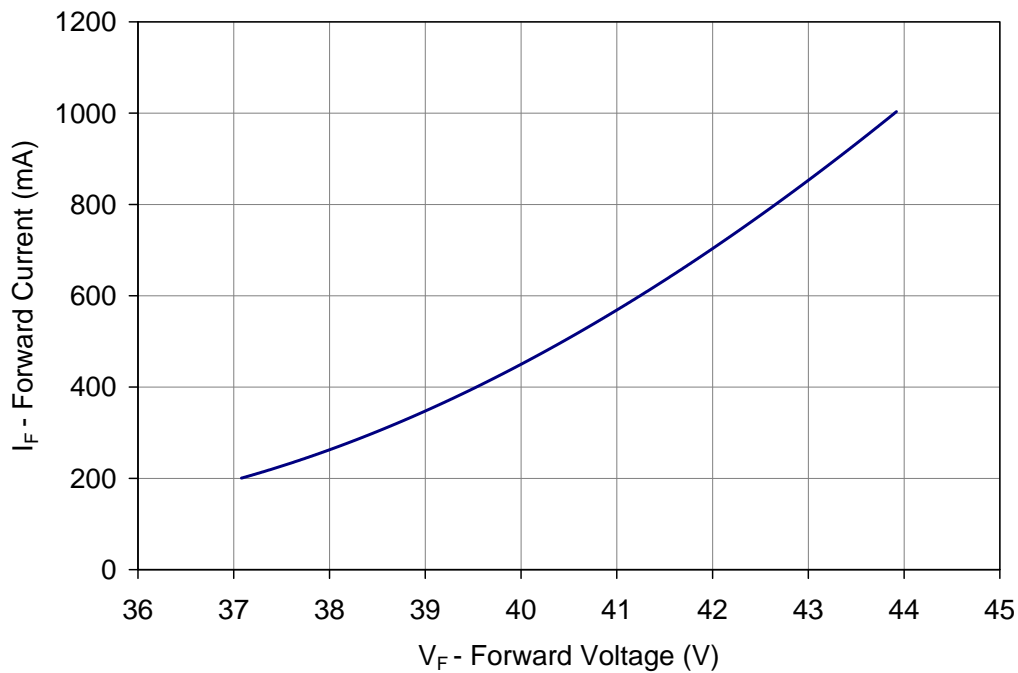
Figure 9: Typical forward current vs. forward voltage @ T_C = at 25°C.

Note:
1.   .Forward Voltage is measured for a single string of 6 dies connected in series. The LED is configured with 4 Channels of 6 dies in series each.

Color over Angle Pattern
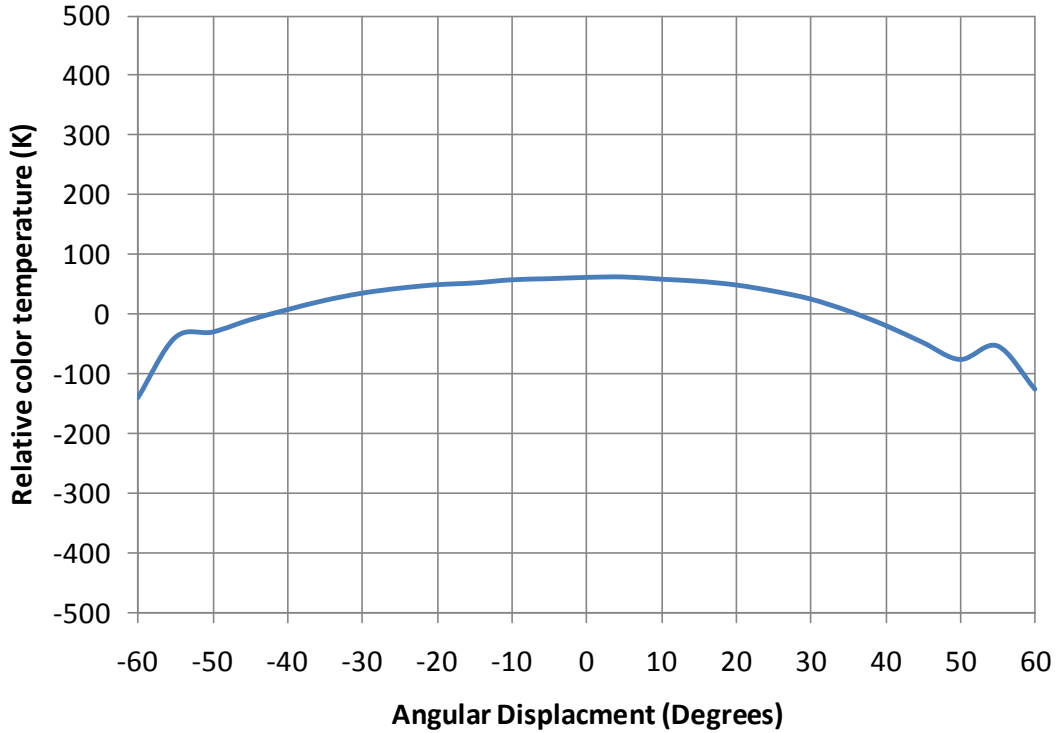
Figure 10: Maximum forward current vs. ambient temperature based on $T_{J(MAX)} = 150°C$.

Current De-rating

$R = \Theta_{J-A} = 1.0°\,C/W$
$R = \Theta_{J-A} = 1.5°\,C/W$
$R = \Theta_{J-A} = 2.0°\,C/W$
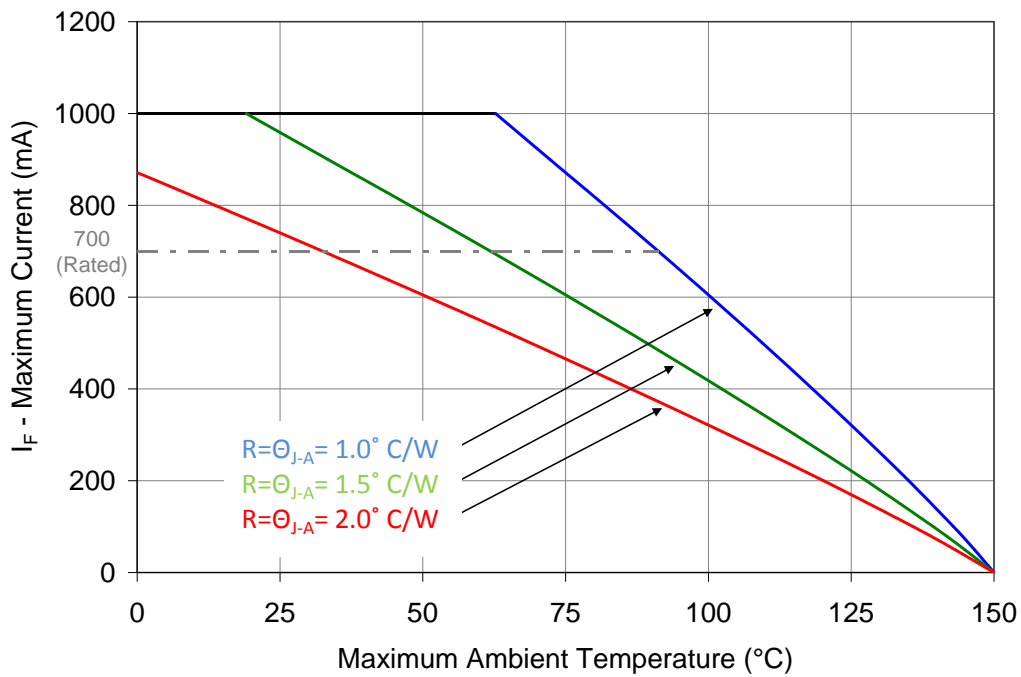
Figure 11: Emitter carrier tape specifications (mm).

Notes:
1. Maximum current assumes that all LED dies are operating at rated current.
2. $R\Theta_{J-C}$ [Junction to Case Thermal Resistance] for the LZP-series is typically 0.6°C/W.
3. $R\Theta_{J-A}$ [Junction to Ambient Thermal Resistance] = $R\Theta_{J-C}$ + $R\Theta_{C-A}$ [Case to Ambient Thermal Resistance].

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Emitter Tape and Reel Specifications (mm)
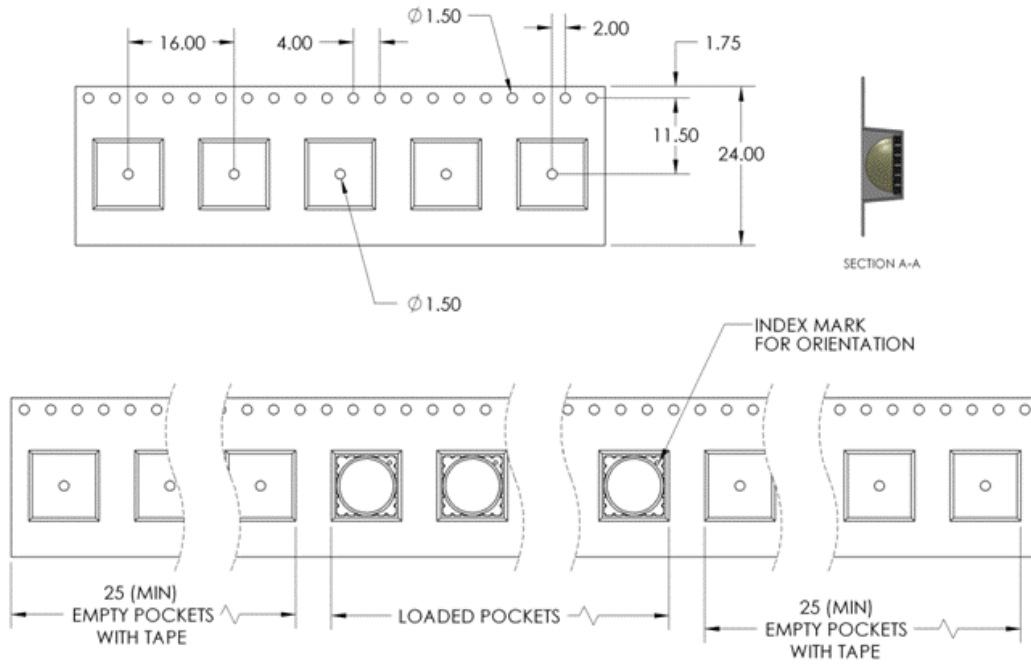
Figure 12: Emitter Reel specifications (mm).
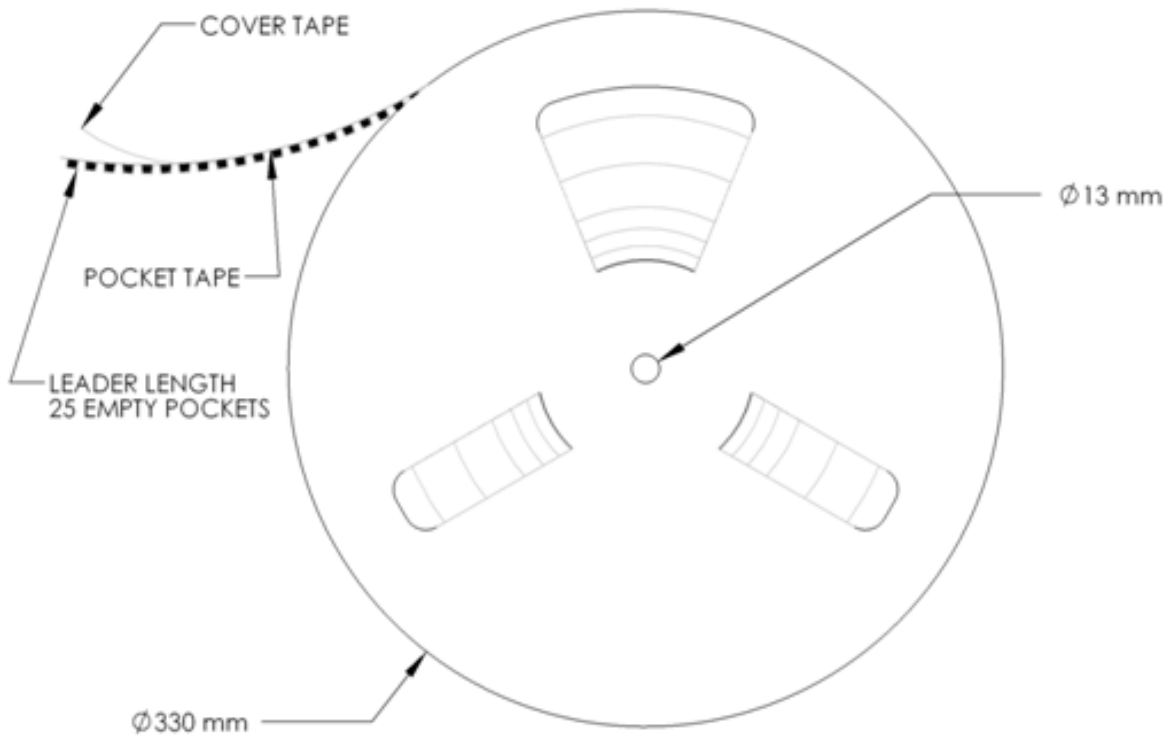
Figure 13: Emitter Reel specifications (mm).

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LZP MCPCB Family

Part number	Type of MCPCB	Diameter (mm)	Emitter + MCPCB Thermal Resistance (^{o}C/W)	Typical V_f (V)	Typical I_f (mA)
LZP-Dxxxxx	5-channel (4x6+1 strings)	28.3	0.6 + 0.1 = 0.7	21.0	4 x 700
LZP-GxxxT1	2-channel (2 x 12 + 1 string)	49.5	0.6 + 0.1 = 0.7	42.0	1400
LZP-HxxxT1	2-channel (4 x 6 + 1 string)	49.5	0.6 + 0.1 = 0.7	21.0	2800

Mechanical Mounting of MCPCB

- MCPCB bending should be avoided as it will cause mechanical stress on the emitter, which could lead to substrate cracking and subsequently LED dies cracking.
- To avoid MCPCB bending:
  - Special attention needs to be paid to the flatness of the heat sink surface and the torque on the screws.
  - Care must be taken when securing the board to the heat sink. This can be done by tightening three M3 screws (or #4-40) in steps and not all the way through at once. Using fewer than three screws will increase the likelihood of board bending.
  - It is recommended to always use plastics washers in combinations with the three screws.
  - If non-taped holes are used with self-tapping screws, it is advised to back out the screws slightly after tightening (with controlled torque) and then re-tighten the screws again.

Thermal interface material

- To properly transfer heat from LED emitter to heat sink, a thermally conductive material is required when mounting the MCPCB on to the heat sink.
- There are several varieties of such material: thermal paste, thermal pads, phase change materials and thermal epoxies. An example of such material is Electrolube EHTC.
- It is critical to verify the material's thermal resistance to be sufficient for the selected emitter and its operating conditions.

Wire soldering

- To ease soldering wire to MCPCB process, it is advised to preheat the MCPCB on a hot plate of 125-150°C. Subsequently, apply the solder and additional heat from the solder iron will initiate a good solder reflow. It is recommended to use a solder iron of more than 60W.
- It is advised to use lead-free, no-clean solder. For example: SN-96.5 AG-3.0 CU 0.5 #58/275 from Kester (pn: 24-7068-7601)

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LZP-Dxxxxx

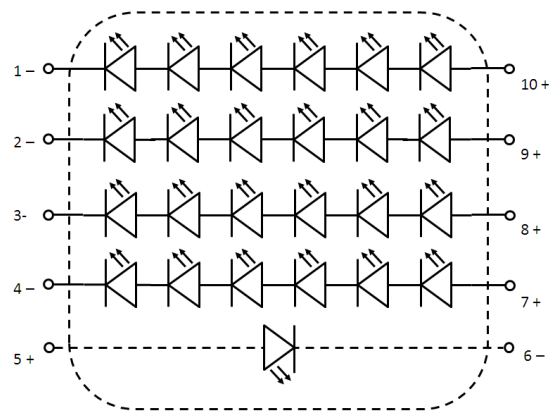## 5-Channel, Standard Star MCPCB (4x6+1) Dimensions (mm)
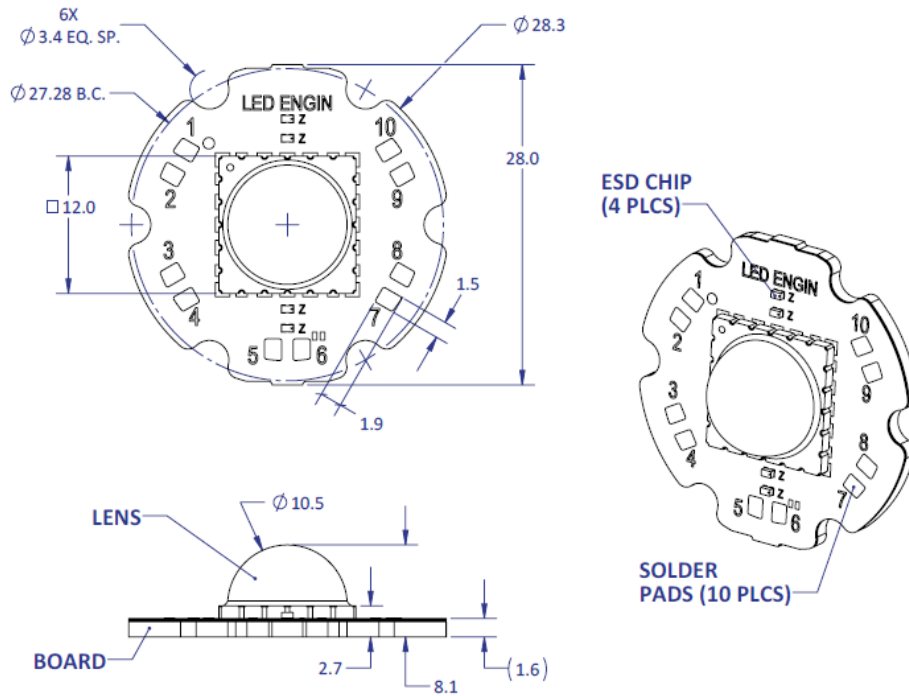
Notes:
- Unless otherwise noted, the tolerance = ± 0.20 mm.
- Slots in MCPCB are for M3 or #4 mounting screws.
- LED Engin recommends using plastic washers to electrically insulate screws from solder pads and electrical traces.
- LED Engin recommends using thermal interface material when attaching the MCPCB to a heat sink.
- LED Engin uses a copper core MCPCB with pedestal design, allowing direct solder connect between the MCPCB copper core and the emitter thermal slug. The thermal resistance of this copper core MCPCB is: RΘC-B 0.1°C/W

Components used
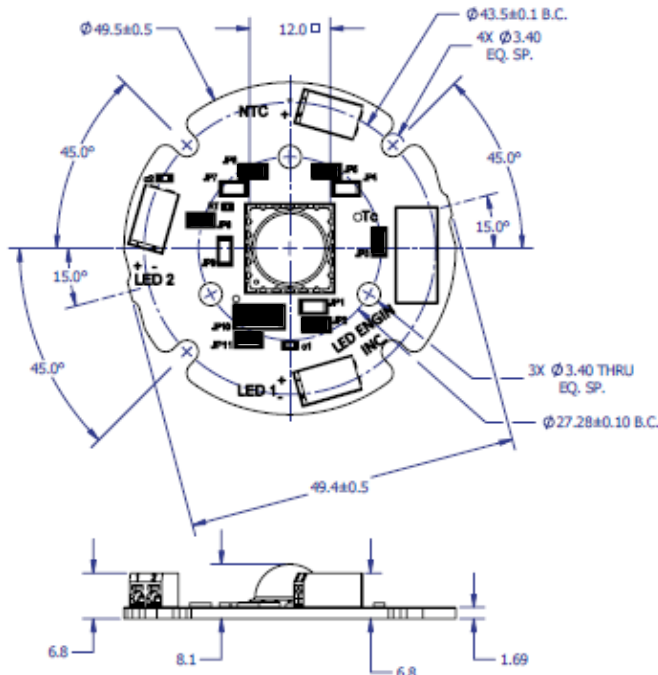
MCPCB: SuperMCPCB   (Bridge Semiconductor, copper core with pedestal design)
ESD chips: BZT52C36LP   (NXP, for 6 LED dies in series)

Pad layout			
Ch.	MCPCB Pad	String/die	Function
1	1	1/EDCBAF	Cathode -
	10		Anode +
2	2	2/JIHGLK	Cathode -
	9		Anode +
3	3	3/ONSRQP	Cathode -
	8		Anode +
4	4	4/TYXWVU	Cathode -
	7		Anode +
5	5	5/M	N/A
	6		N/A

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LZP-GxxxT1

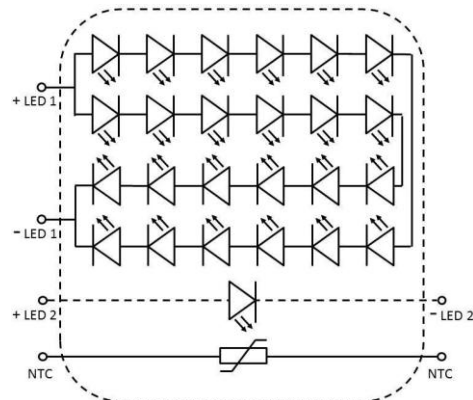## 2-Channel, Connectorized MCPCB with Thermistor (2x12+1) Dimensions (mm)

Notes:
- Unless otherwise noted, the tolerance = ± 0.2 mm. angle = ± 1°
- Slots in MCPCB are for M3 or #4-40 mounting screws. Maximum torque should not exceed 1N-m (8.9 lbf-in)
- LED Engin recommends plastic washers to electrically insulate screws from solder pads and electrical traces.
- LED Engin recommends using thermally interface material when attaching the MCPCB to a heatsink
- For the connectors it is recommended to use solid wires with gauge size, 18, 20 or 22 AWG. It is recommended to strip the insulation of the wires to a length of 4-5mm. When stranded wires are used it is recommended to twists the strands at the end of the wire and use wire extraction toll to insert the wires.
- LED Engin uses a copper core MCPCB with pedestal design, allowing direct solder connect between the MCPCB copper core and the emitter thermal slug. The thermal resistance of this copper core MCPCB is: RΘC-B 0.1°C/W

Components used

MCPCB:	SuperMCPCB	(Bridge Semiconductor, copper core with pedestal design)
ESD chips:	BZX585-C51	(NXP, for 12 LED dies in series)
	BZX585-C9	(NXP, for optional center die)
Thermistor:	NCP15WF104F03RC	(Murata, 100kOhm for the LZx-xxxxT1, please see www.murata.com for details on calculating the thermistor temperature)
Connectors:	00-9276-002-0-21-1-06	(AVX, poke-home)

Ch.	Pad	Emitter pin	Function
1	LED1+	15, 17	Anode
	LED1-	8, 24	Cathode
2	LED2+	2	Anode
	LED2-	23	Cathode
T	NTC	na	Anode
	NTC	na	Cathode

LZP-00WW00 (5.3-07/01/13)

LZP-HxxxT1

2-Channel, Connectorized MCPCB with Thermistor (4x6+1) Dimensions (mm)
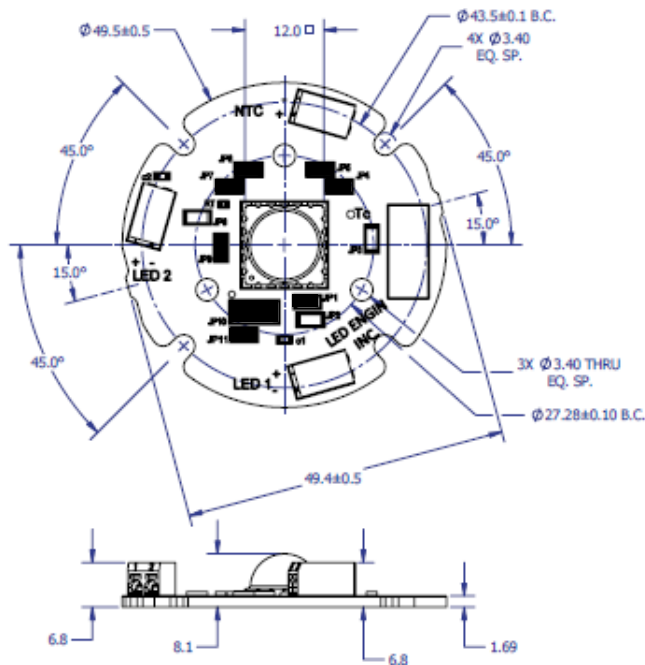
Note for Figure 1:

- Unless otherwise noted, the tolerance = ± 0.2 mm. angle = ± 1°
- Slots in MCPCB are for M3 or #4-40 mounting screws. Maximum torque should not exceed 1N-m (8.9 lbf-in)
- LED Engin recommends plastic washers to electrically insulate screws from solder pads and electrical traces.
- LED Engin recommends using thermally interface material when attaching the MCPCB to a heatsink
- For the connectors it is recommended to use solid wires with gauge size, 18, 20 or 22 AWG. It is recommended to strip the insulation of the wires to a length of 4-5mm. When stranded wires are used it is recommended to twists the strands at the end of the wire and use wire extraction toll to insert the wires.
- LED Engin uses a copper core MCPCB with pedestal design, allowing direct solder connect between the MCPCB copper core and the emitter thermal slug. The thermal resistance of this copper core MCPCB is: RθC-B 0.1°C/W

Components used

|		
MCPCB:	SuperMCPCB	(Bridge Semiconductor, copper core with pedestal design)
ESD chips:	BZX585-C30	(NXP, for 6 LED dies in series)
	BZX585-C9	(NXP, for optional center die)
Thermistor:	NCP15WF104F03RC	(Murata, 100kOhm for the LZx-xxxxT1, please see www.murata.com for details on calculating the thermistor temperature)
Connectors:	00-9276-002-0-21-1-06	(AVX, poke-home)

| Ch.	Pad	Emitter pin	Function
1	LED1+	14, 15, 17, 18	Anode
	LED1-	8, 5, 3, 24	Cathode
2	LED2+	2	Anode
	LED2-	23	Cathode
T	NTC	na	Anode
	NTC	na	Cathode

LZP-00WW00 (5.3-07/01/13)
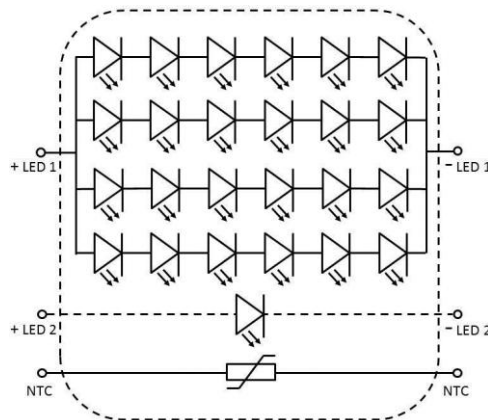
Appendix: Wire Insertion and Extraction Instructions AVX poke-home

For the AVX poke-home it is recommended to use solid wires with gauge size, 18, 20 or 22 AWG, but stranded wire can be used as well. Push the wire in and then give slight tug on the wire to confirm that it is properly engaged.

Wire Insertion Solid conductor
- Strip insulation length 4-5mm
- Insert into appropriate hole to a stop
- Inserted wire will be retained by contact

Insulation Strip length 4mm to 5mm

Push home wire into hole to a stop

Inserted wire will be retained by contact
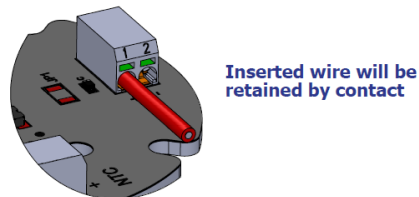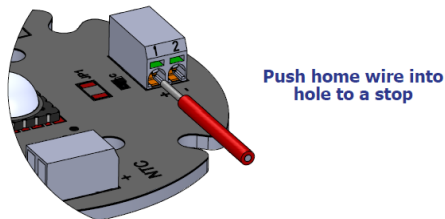
Wire Insertion Stranded wire conductor
- Twist strands together
- Insert tool into contact operation slot
- Insert wire
- Remove tool

Twist strands together

Insulation strip length 4mm to 5mm

Insert tool into contact operation slot
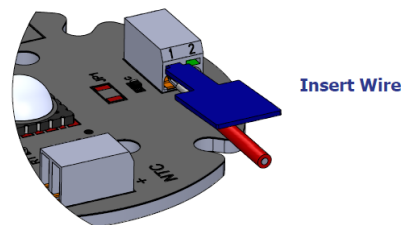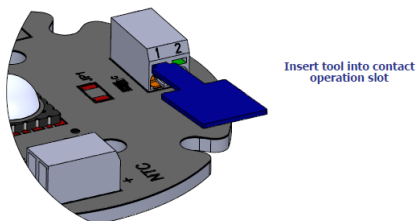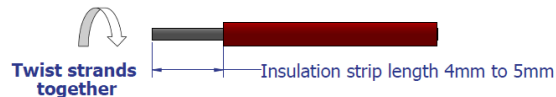
Insert Wire

Wire extraction
- Insert tool into contact
- Extract wire
- Remove tool

After fully inserting Tool into contact operation slot, pull out wire.
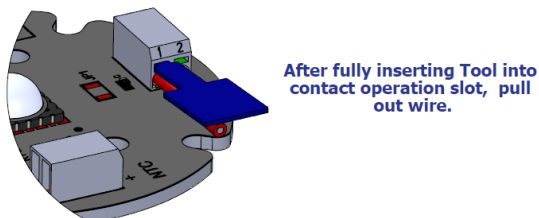
Extraction Tool References:
Thin Blade Wire Extraction Tool: AVX P/N - 0692-7670-0101-000 or
Miniature Precision Screw Driver, 0.047" Tip Width

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Company Information

LED Engin, based in California's Silicon Valley, develops, manufactures, and sells advanced LED emitters, optics and light engines to create uncompromised lighting experiences for a wide range of entertainment, architectural, general lighting and specialty applications. LuxiGen™ multi-die emitter and secondary lens combinations reliably deliver industry-leading flux density, upwards of 5000 quality lumens to a target, in a wide spectrum of colors including whites, tunable whites, multi-color and UV LEDs in a unique patented compact ceramic package. Our LuxiTune™ series of tunable white lighting modules leverage our LuxiGen emitters and lenses to deliver quality, control, freedom and high density tunable white light solutions for a broad range of new recessed and downlighting applications. The small size, yet remarkably powerful beam output and superior in-source color mixing, allows for a previously unobtainable freedom of design wherever high-flux density, directional light is required.

LED Engin is committed to providing products that conserve natural resources and reduce greenhouse emissions.

LED Engin reserves the right to make changes to improve performance without notice.

Please contact sales@ledengin.com or (408) 922-7200 for more information.

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