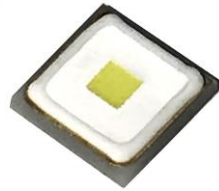




**MATCH
LED**
LED
WATCH



ZA4-3N

Product Code: KFNP-3838C7H1C04-000

Table of Contents

REVISION HISTORY	1
PRODUCT CHARACTERISTICS	2
JEDEC MOISTURE SENSITIVITY.....	2
BRIGHTNESS GROUES	3
PERFORMANCE GROUPS – FORWARD VOLTAGE ($I_F = 1000$ mA).....	3
MAXIMUM RATINGS.....	4
TYPICAL SPATIAL DISTRIBUTION	5
RELATIVE LUMINOUS FLUX VS. CURRENT ($T_S = 25\text{ }^\circ\text{C}$).....	5
RELATIVE LUMINOUS FLUX VS. TEMPERATURE ($I_F = 1000$ mA).....	6
FORWARD VOLTAGE VS.FORWARD CURRENT($T_S=25\text{ }^\circ\text{C}$).....	6
CHROMATICITY COORDINATE SHIFT.....	7
RELATIVE FORWARD VOLTAGE.....	8
GPI'S STANDARD WHITE CHROMATICITY REGINS PLOTTED ON THE 1931 CIE CURVE.....	9
RELIABILITY.....	10
REFLOW SOLDERING CHARACTERISTICS.....	10
MECHANICAL DIMENSIONS.....	11
PACKING.....	12
CAUTIONS.....	13

REVISION HISTORY

Rev.	Date	Charged	Approved	Revision Summary
Beta	2017/11/27	YR	Bruce	<i>First issue</i>

PRODUCT CHARACTERISTICS (T_j = 25 °C; I_F = 1000 mA)

Parameter	Values	Unit
Chromaticity coordinates acc. To CIE 1931 (typ.)	CIE-x : 0.323 CIE-y : 0.333	
Viewing Angle (FWHM)	120	°
Forward voltage	(min.)	3.0 V
	(typ.)	3.3 V
	(max.)	3.6 V
Reversed Current	not designed for reversed operation	
Thermal resistance junction / board (typ.)	6.8	K/W
Radiating surface	1.14	mm ²

JEDEC MOISTURE SENSITIVITY

Level	Floor Life	
	Time	Conditions
1	unlimited	≤ 30°C / 85 % RH

BRIGHTNESS GROPEs

Item	Group	Form Factor	Measured Test Condition
			1000 mA Pulsed Operation Case Temperature $T_c = 25^\circ\text{C}$ Minimum Luminous Flux (lm)
ZA4-3N PKG	Z08	1x1	265
	Z09	1x1	295
	Z10	1x1	325

Notes:

- GPI maintains a tolerance of $\pm 7\%$ on flux
- Calculated flux values are for reference only

PERFORMANCE GROUPS – FORWARD VOLTAGE ($I_F = 1000 \text{ mA}$)

Group code	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
MA	3.0	3.2
MB	3.2	3.4
MC	3.4	3.6

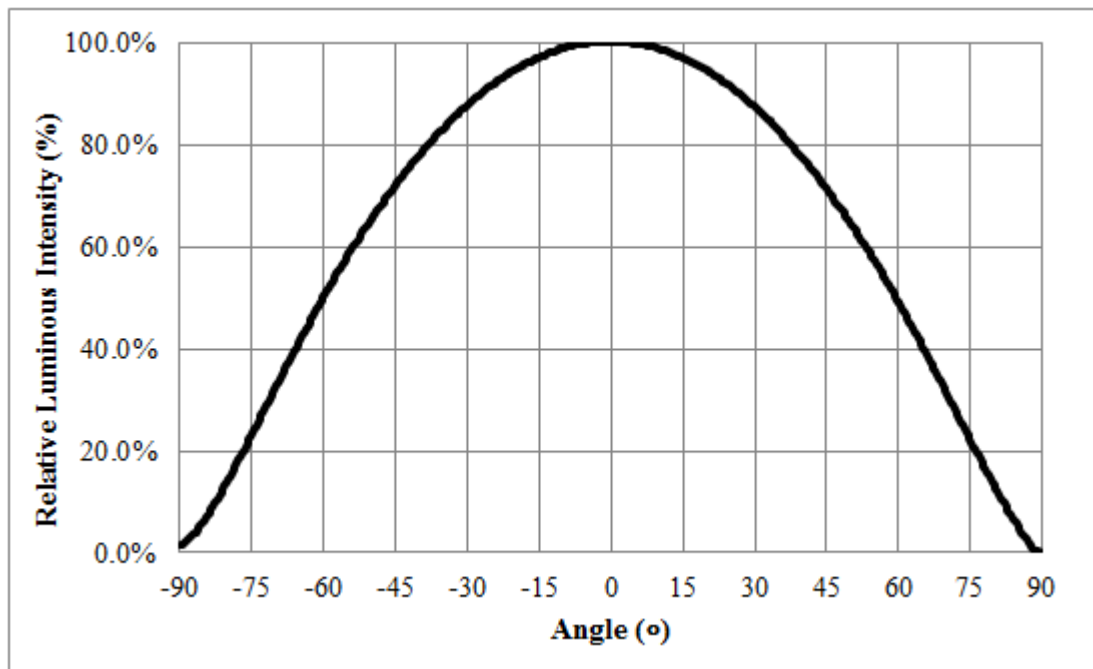
Notes:

- GPI maintains a tolerance $\pm 0.1\text{V}$ on voltage measurements

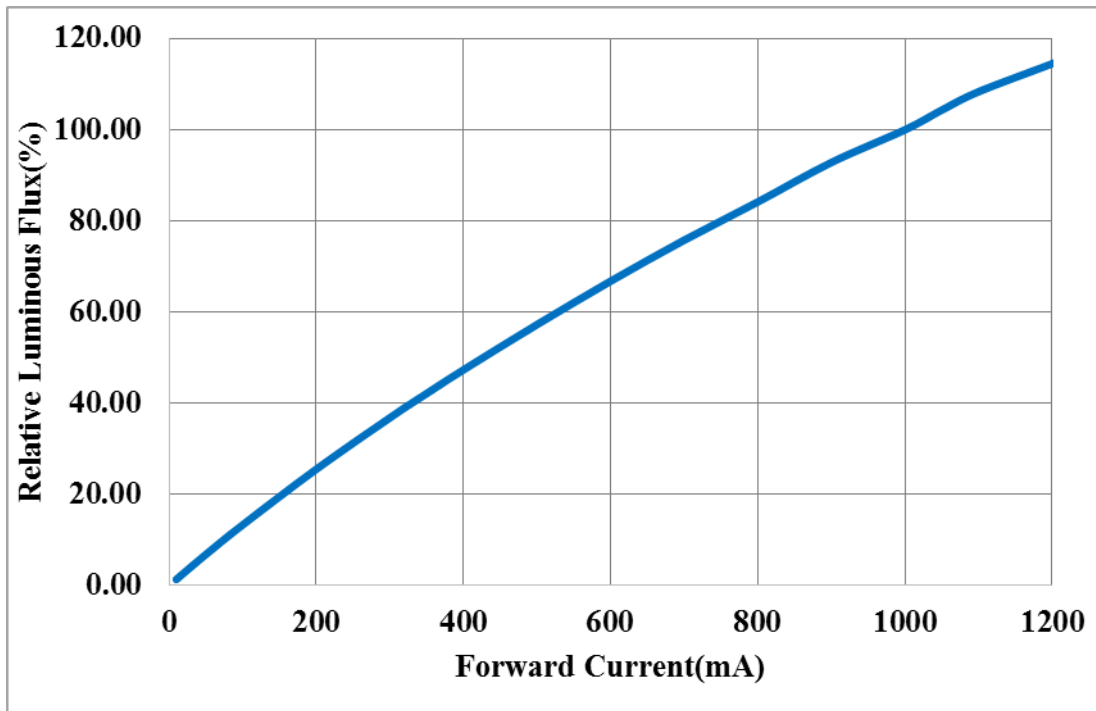
MAXIMUM RATINGS

Parameter	Values	Unit
Operating temperature range	-40 ... 125	°C
Storage temperature range	-40 ... 125	°C
Junction temperature	150	°C
Forward Current	(typ.)	1000
	(max.)	1200
Reversed voltage	not designed for reversed operation	V

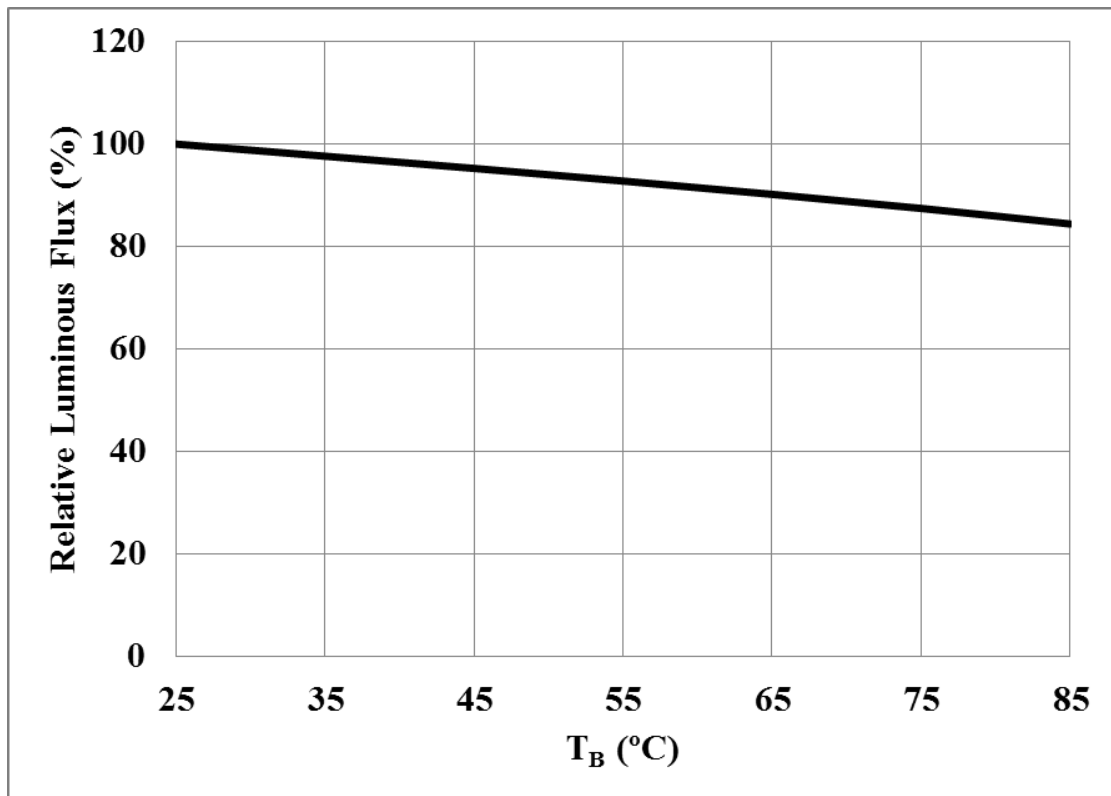
TYPICAL SPATIAL DISTRIBUTION — WHITE



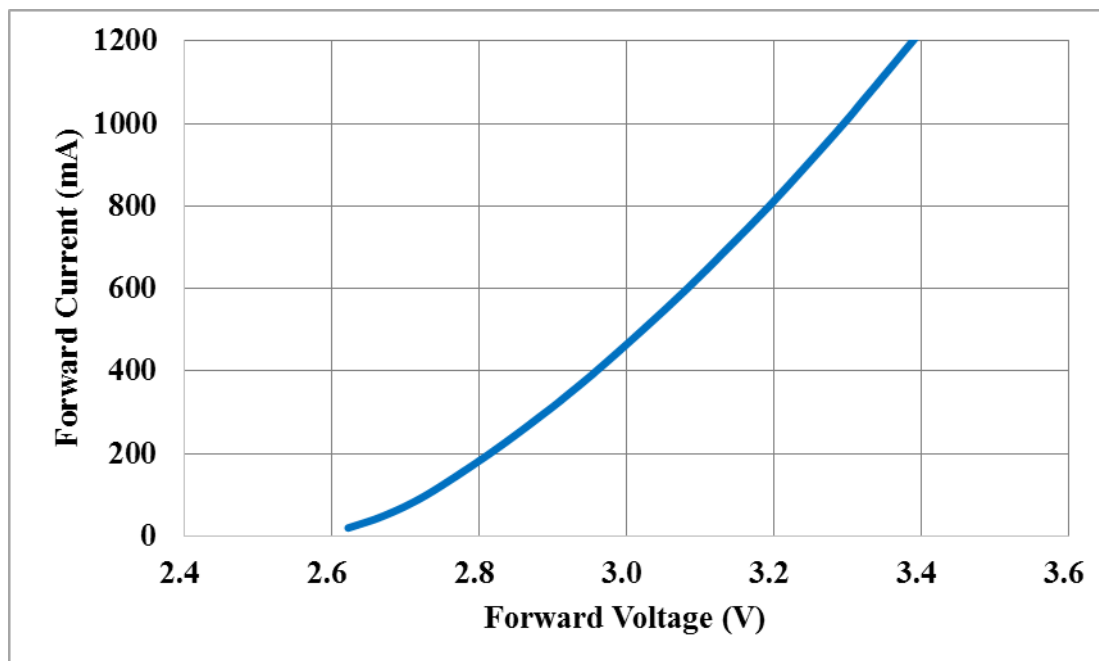
RELATIVE LUMINOUS FLUX VS. CURRENT ($T_s = 25^\circ\text{C}$)



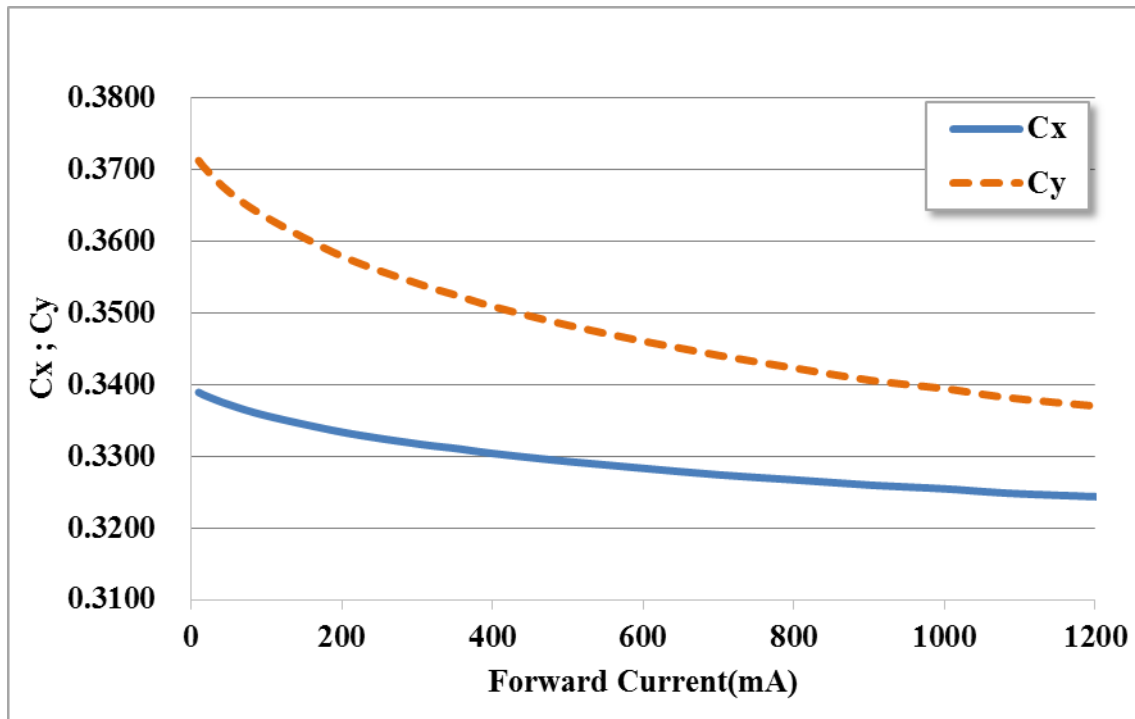
RELATIVE LUMINOUS FLUX VS. TEMPERATURE ($I_F = 1000 \text{ mA}$)



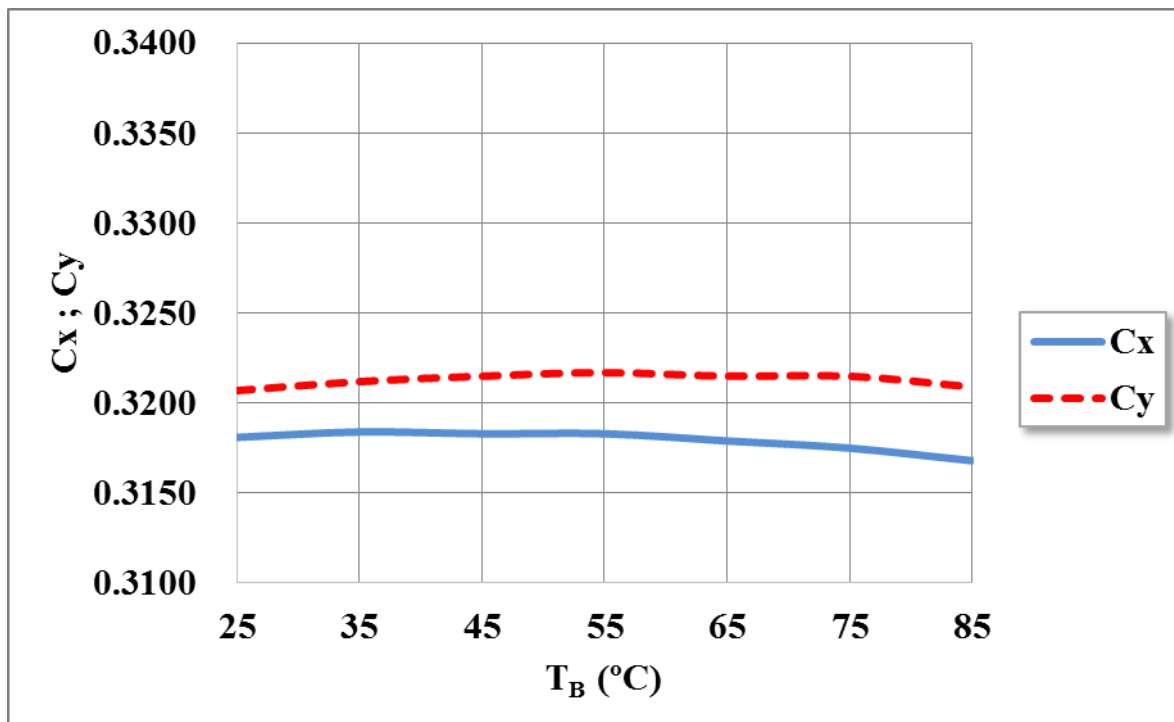
FORWARD VOLTAGE VS. FORWARD CURRENT ($T_s = 25 \text{ °C}$)



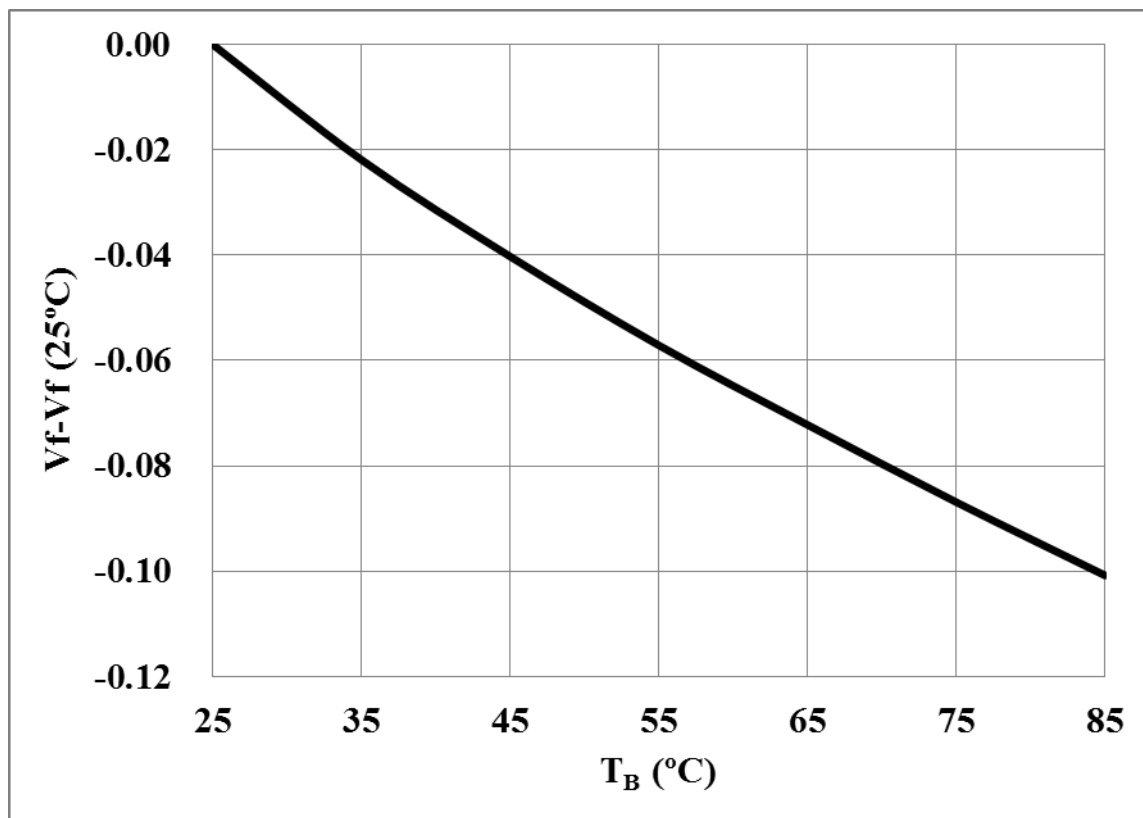
CHROMATICITY COORDINATE SHIFT ($T_s = 25^\circ\text{C}$)



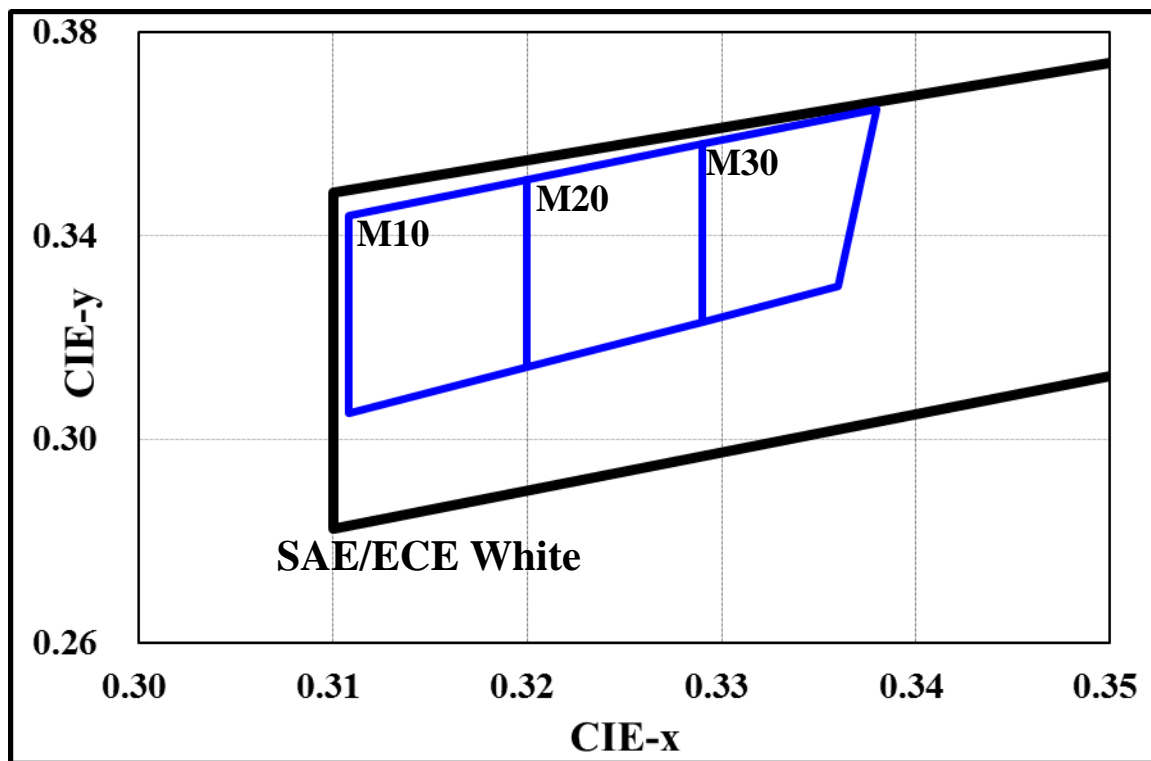
CHROMATICITY COORDINATE SHIFT ($I_F = 1000\text{mA}$)



RELATIVE FORWARD VOLTAGE ($I_F = 1000\text{mA}$)



GPI'S STANDARD WHITE CHROMATICITY REGINS PLOTTED ON THE 1931 CIE CURVE



PERFORMANCE GROUPS – CHROMATICITY

Bin Code	x	y
M10	0.32	0.3511
	0.3108	0.3444
	0.3108	0.3005
	0.32	0.3141

Bin Code	x	y
M20	0.32	0.3511
	0.329	0.3581
	0.329	0.3231
	0.32	0.3141

Bin Code	x	y
M30	0.329	0.3581
	0.338	0.365
	0.336	0.33
	0.329	0.3231

Notes:

•GPI maintains a tolerance of ± 0.005 on chromaticity (CCx, CCy) measurements

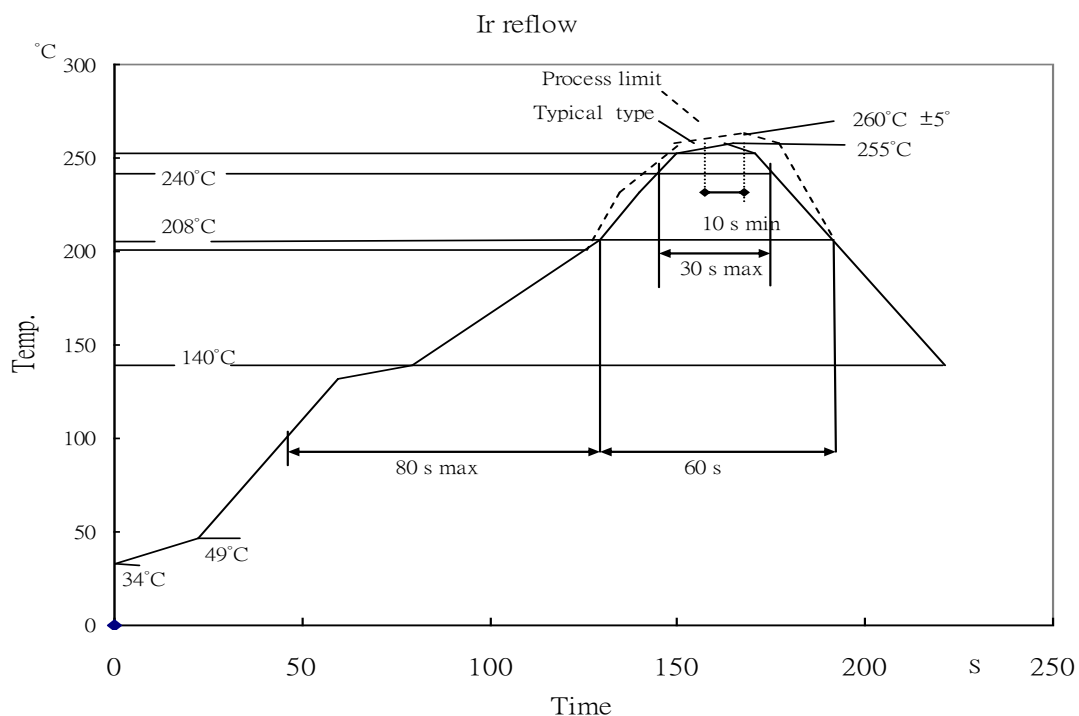
RELIABILITY

Test Item	Test Conditions	Test Period	Ac/Re
High Temperature Forward Bias (HTFB)	TA=85°C ; IF=1000mA DC	1000 hours	0/1
High Temperature High Humidity Bias (HTHHB)	TA=85°C ; 85% humidity IF=1000mA DC	1000 hours	0/1
Temperature Cycle (TC)	-40°C / 125°C 15min dwell, 5min transfer	1000 cycles	0/1
Power and Temperature Cycle (PTC)	-40°C / 125°C 10min dwell, 30min transfer ton/off = 2 min IF=1000mA DC	500 hours	0/1

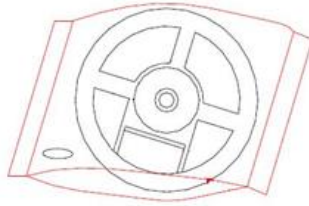
Notes:

- No catastrophic (LED Fail)
- Lumen maintenance > 85%
- Change in Vf < 10%
- Change in white color point $\Delta x \Delta y \pm 0.01$
- No corrosion
- Moisture Sensitivity Level 1 (IPC/JEDEC J-STD-020)

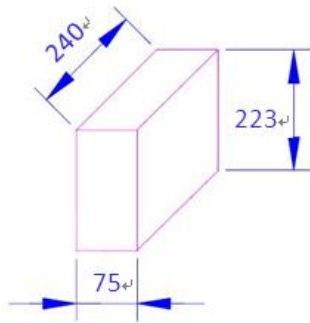
Reflow Soldering Characteristics



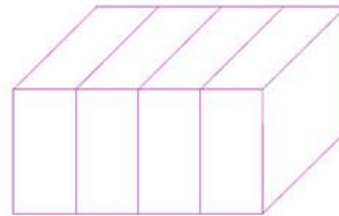
PACKING



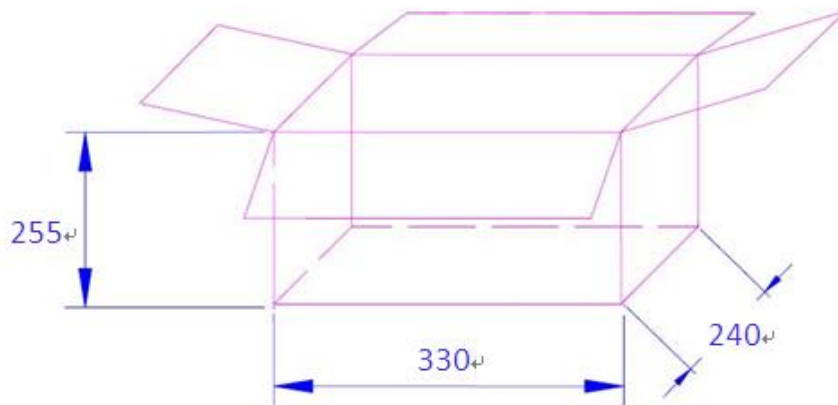
1 Anti-Static Reel in 1 Moistureproof Foil Bag.
(Within Moisture Absorbent Material)



4 Moistureproof Foil Bag in 1 Inner Box.



4 Inner Box in 1 Carton.



CAUTIONS

1. Moisture Sensitivity

In testing, GPI has found ZA4-3N LEDs to have 1 year floor life in condition $\leq 30^{\circ}\text{C}$ / 85% relative humidity (RH). Moisture testing included a 168-hr soak at 85°C / 60% RH followed by 3 times reflow cycles, with visual and electrical inspections at each stage.

GPI recommends keeping ZA4-3N LEDs in their sealed moisture-barrier packaging until immediately prior to use. GPI also recommends returning any unusual LEDs to the re-sealable moisture-barrier bag and closing the bag immediately after use.

2. Handling Precautions

Do not handle LEDs with bare hands, it may contaminate the LED surface and affect optical characteristics. In the worst case, catastrophic failure from excess pressure through wire-bond breaks and package damage may result.

Do not stack assembled PCBs together. Failure to comply can cause the resin portion of the product to be cut, chipped, delaminated and/or deformed. It may cause wire to break, leading to catastrophic failures.

3. Eye safety

Warning: do not look at exposed lamp in operation. Eye injury can result.

4. Static Electricity

Wristbands and anti-electrostatic gloves are strongly recommended and all devices, equipment and machinery must be properly grounded when handling the LEDs, which are sensitive against static electricity and surge.

Precautions are to be taken against surge voltage to the equipment that mounts the LEDs. Unusual characteristics such as significant increase of current leakage, decrease of turn-on voltage or non-operation at a low current can occur when the LED is damaged.