



**MATCH
LED**
LED
MATCH



ZM20-3NX

Product Code: C7C2-CR40301PD0A-001

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REVISION HISTORY

Rev.	Date	Charged	Approved	Revision Summary
Beta	2018/10/23	James	Bruce	First issue
A	2018/12/26	James	Bruce	1. Change MECHANICAL DIMENSIONS

PRODUCT CHARACTERISTICS ($T_j = 25\text{ }^\circ\text{C}$; $I_F = 1100\text{ mA}$)

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.)	9.4 V
	(typ.)	10.0 V
	(max.)	10.6 V
Reversed Current	not designed for reversed operation	
Thermal resistance junction / board (typ.)	2.5	K/W
Radiating surface	3.54	mm ²

JEDEC MOISTURE SENSITIVITY

Level	Floor Life	
	Time	Conditions
1	unlimited	$\leq 30^\circ\text{C} / 85\% \text{ RH}$

BRIGHTNESS GROPEs

Item	Group	Form Factor	Measured Test Condition
			1100 mA Pulsed Operation Case Temperature $T_c = 25^\circ\text{C}$ Minimum Luminous Flux (lm)
ZM20-3NX	Z18	1x3	780
	Z19	1x3	870
	Z20	1x3	970
	Z21	1x3	1080

Notes:

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

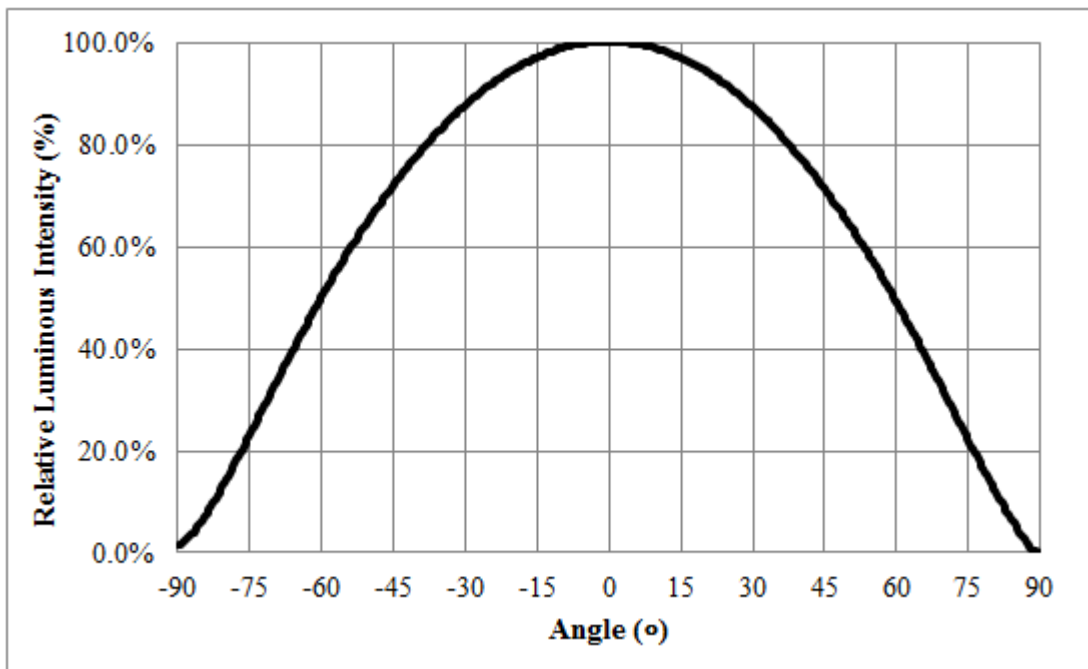
PERFORMANCE GROUPS – FORWARD VOLTAGE (IF = 1100 mA)

Group code	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
KF	9.0	9.6
KG	9.6	10.2
KH	10.2	10.8

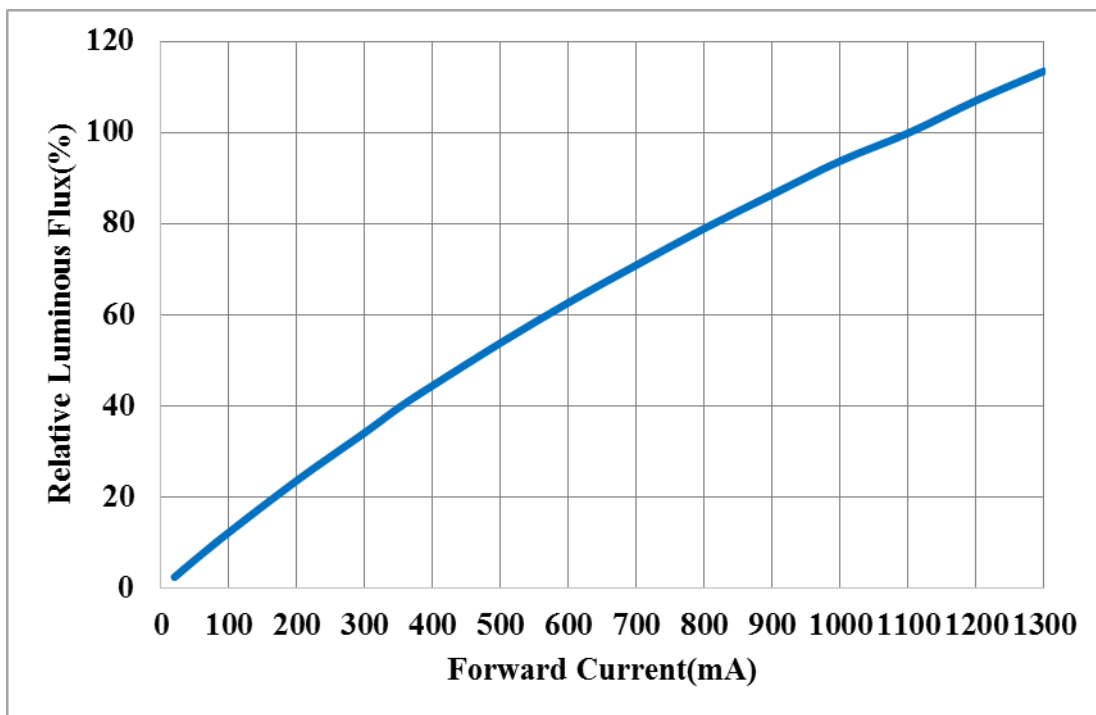
MAXIMUM RATINGS

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

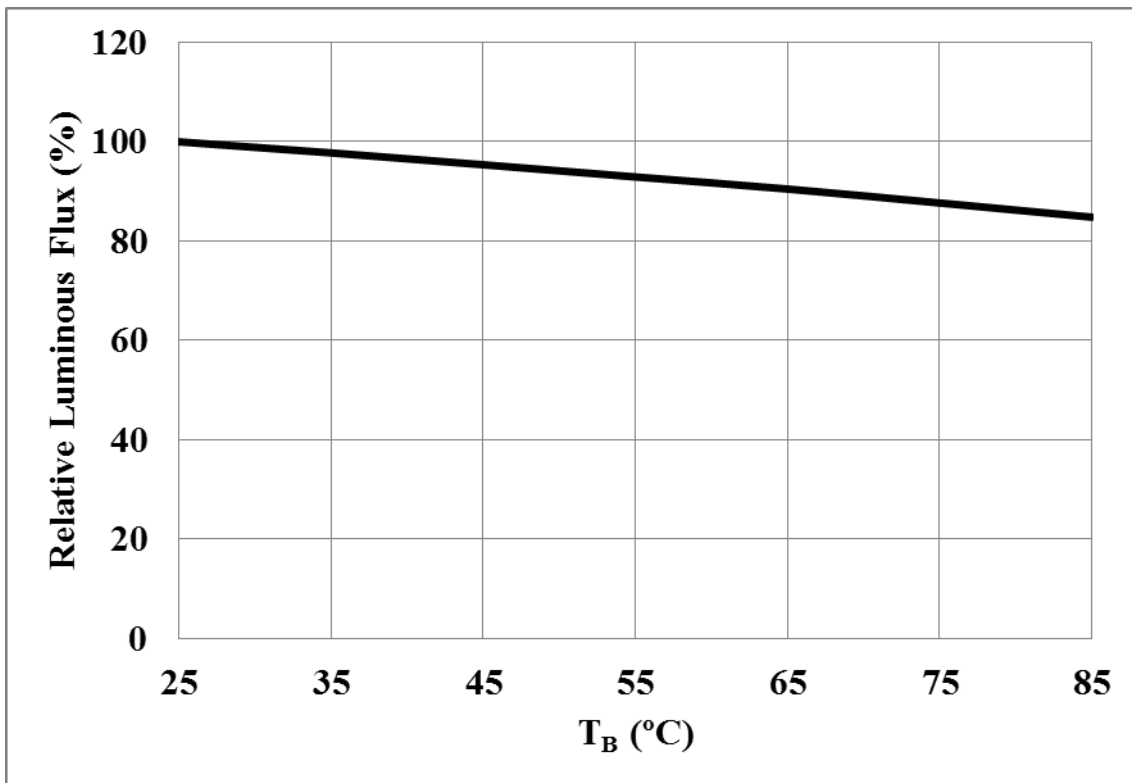
TYPICAL SPATIAL DISTRIBUTION – WHITE



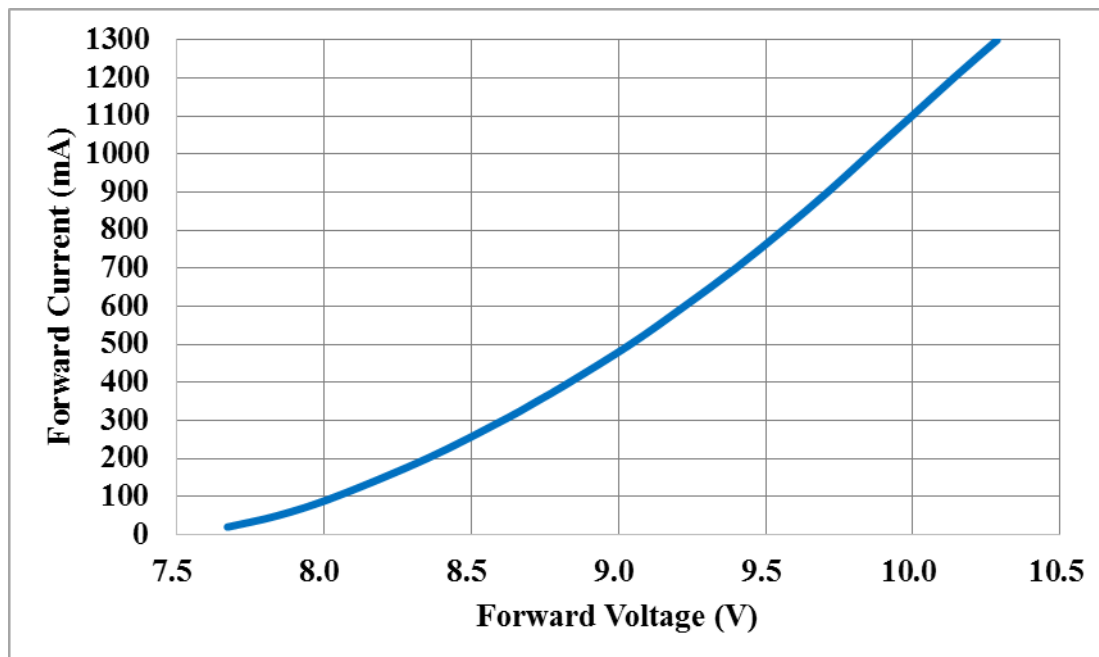
RELATIVE LUMINOUS FLUX VS. CURRENT ($T_B = 25\text{ }^\circ\text{C}$)



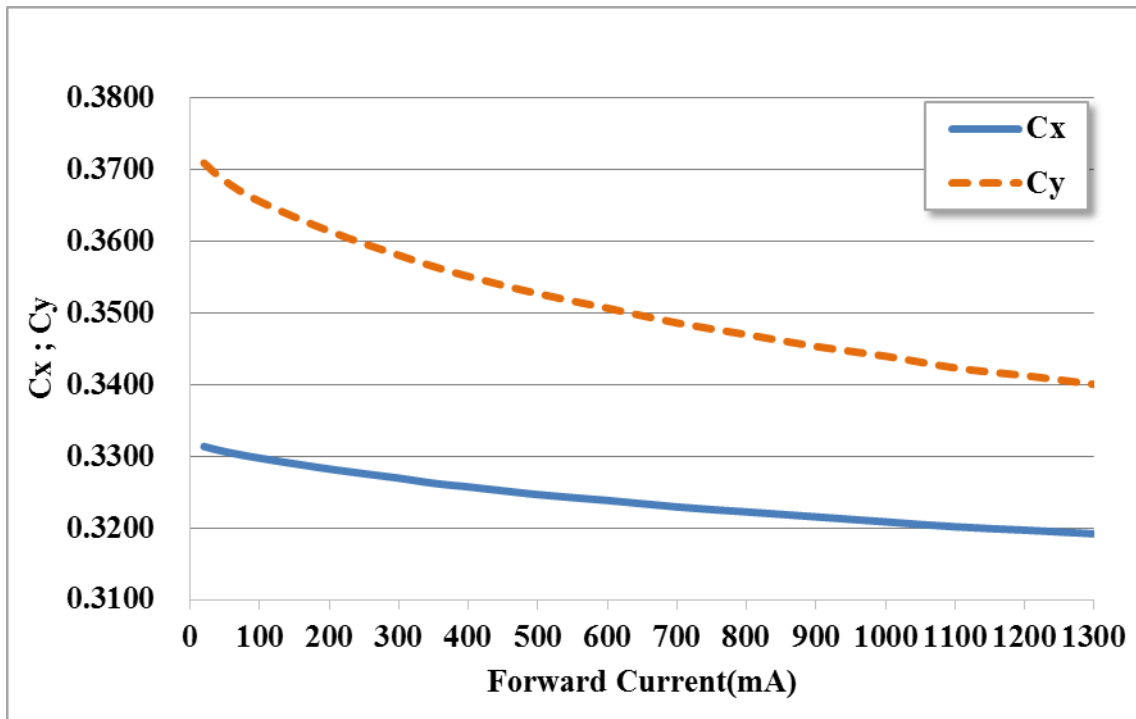
RELATIVE LUMINOUS FLUX VS. TEMPERATURE ($I_F = 1100 \text{ mA}$)



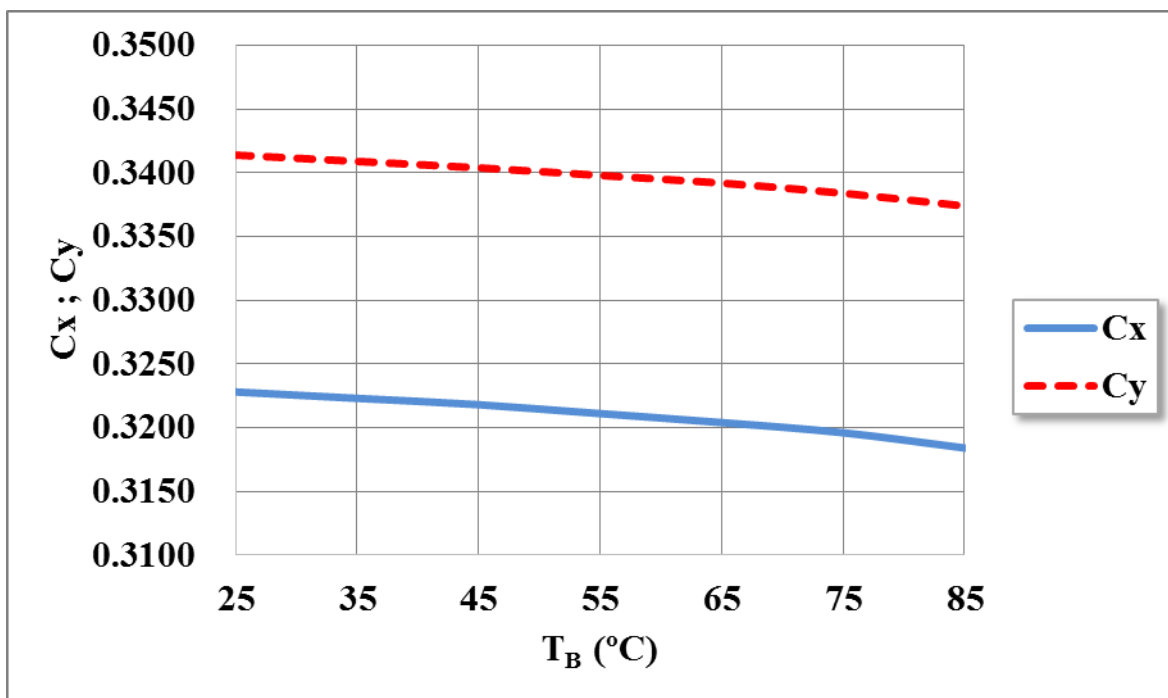
FORWARD VOLTAGE VS. FORWARD CURRENT ($T_B = 25 \text{ °C}$)



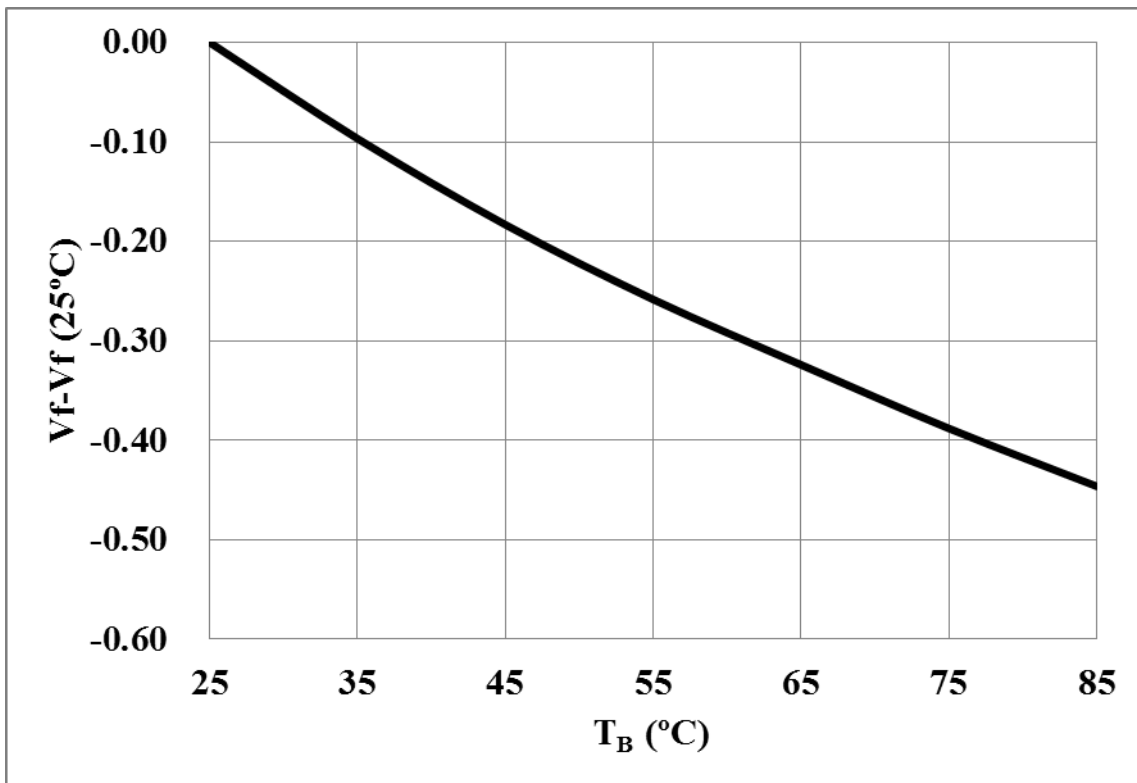
CHROMATICITY COORDINATE SHIFT ($T_B = 25\text{ }^\circ\text{C}$)



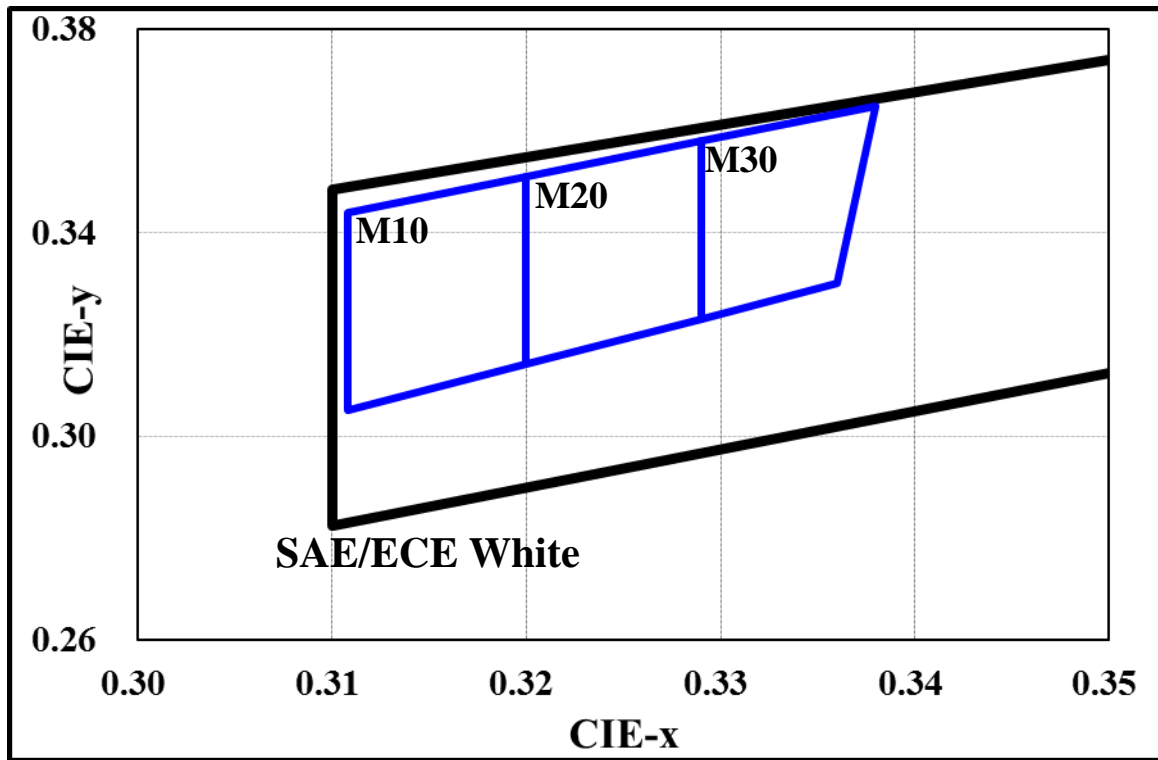
CHROMATICITY COORDINATE SHIFT ($I_F = 1100\text{ mA}$)



RELATIVE FORWARD VOLTAGE ($I_F = 1100 \text{ mA}$)



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	0.344
	0.3108	0.305
	0.32	0.3141

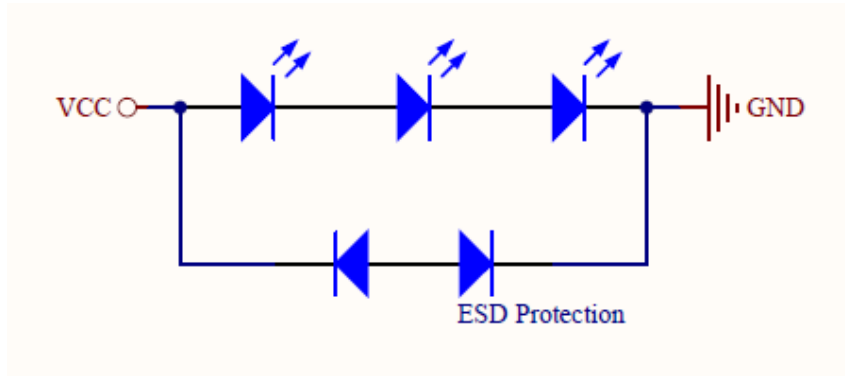
Bin Code	x	y
M20	0.32	0.3511
	0.329	0.3581
	0.329	0.3231
	0.32	0.3141

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

Electrical Internal Circuit



ESD Protection Diode

ELECTRICAL CHARACTERISTICS

Reverse breakdown voltage at I_T , $T_p = 5ms$	Test current	Reverse working voltage	Reverse current at V_{RWM}	Peak pulse current $T_p = 10/1000 \mu s$	Reverse clamping voltage at I_{PPM}
$V_{BR} \text{ MIN}$ (V)	I_T (mA)	$V_{RWM} \text{ MIN}$ (V)	I_R (μA)	I_{PPM} (A)	$V_c \text{ MAX}$ (V)
15.6	1	14	0.1	8.6	23.2

RELIABILITY

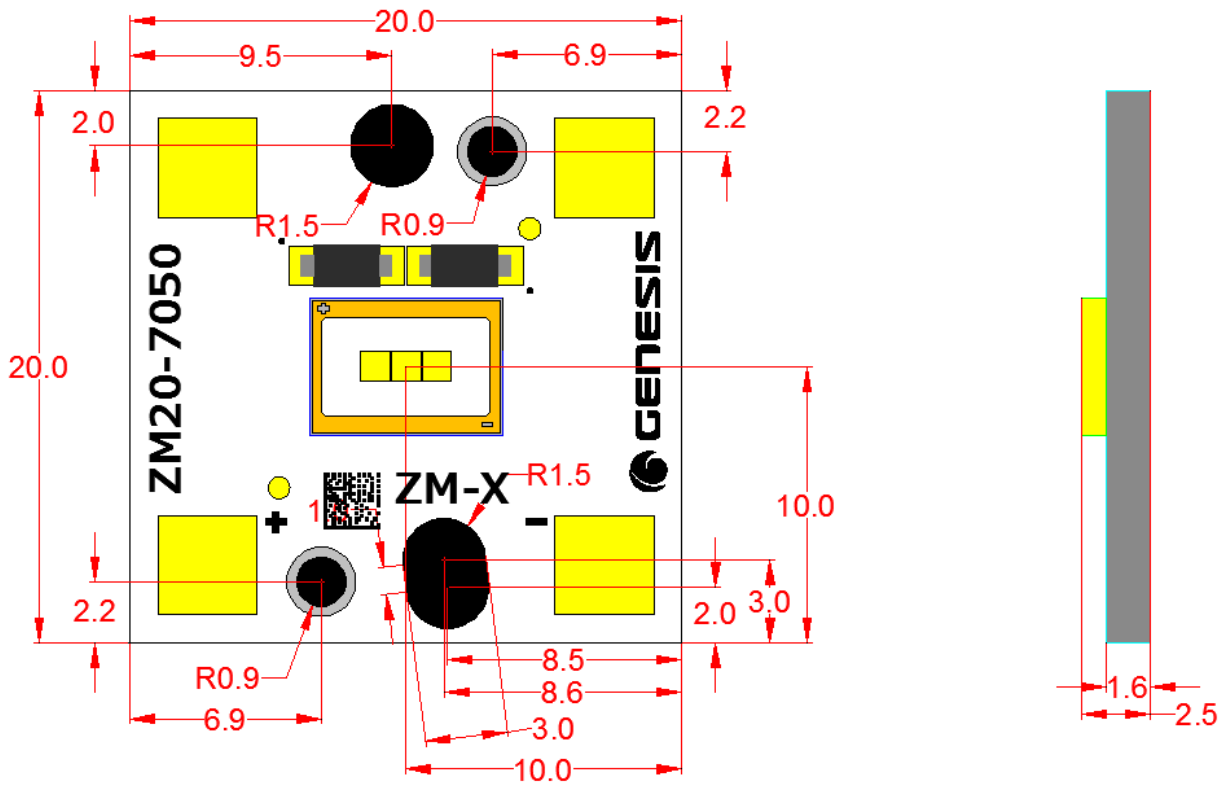
Test Item	Test Conditions	Test Period	Ac/Re
High Temperature Forward Bias (HTFB)	$T_A=85^\circ C$; $I_F=1200mA$ DC	1000 hours	0/1
High Temperature High Humidity Bias (HTHHB)	$T_A=85^\circ C$; 85% humidity $I_F=1200mA$ DC	1000 hours	0/1
Temperature Cycle (TC)	$-40^\circ C / 125^\circ C$ 15min dwell, 5min transfer	1000 cycles	0/1
Power and Temperature Cycle (PTC)	$-40^\circ C / 125^\circ C$ 10min dwell, 30min transfer ton/off = 2 min $I_F=1200mA$ DC	500 hours	0/1

Notes:

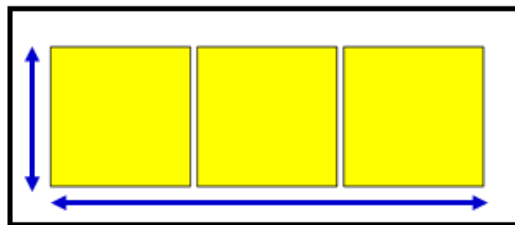
- No catastrophic (LED Fail)
- Lumen maintenance > 85%
- Change in $V_f < 10\%$
- Change in white color point $\Delta x \Delta y \pm 0.01$
- No corrosion
- Moisture Sensitivity Level 1 (IPC/JEDEC J-STD-020)

MECHANICAL DIMENSIONS

All measurements are ± 0.20 mm unless otherwise indicated.



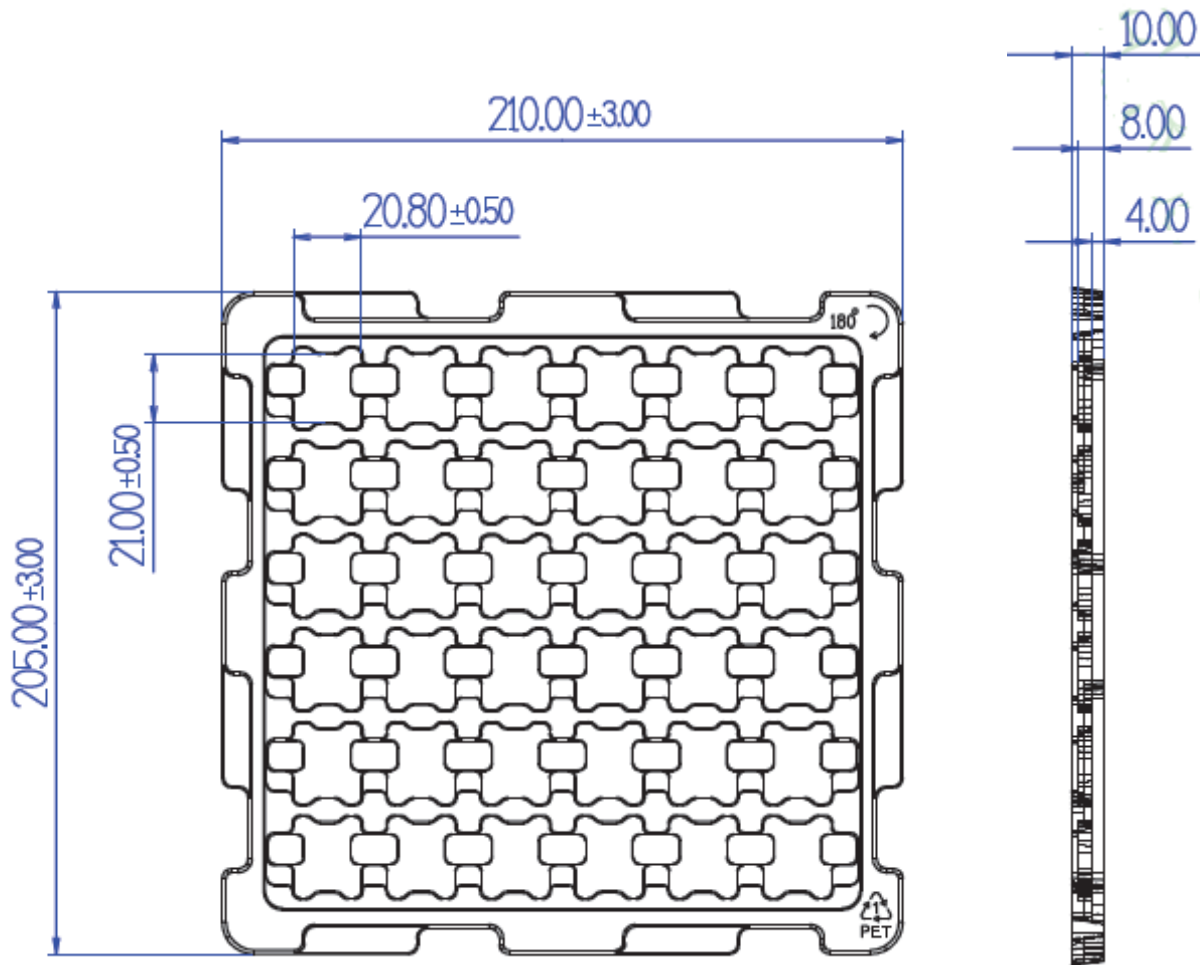
Unit: mm



Emitting Area:
3.31mm X 1.07mm

TRAY

36 pcs. per tray



CAUTIONS

1. Moisture Sensitivity

In testing, GPI has found ZA20-3NX LEDs to have 1 year floor life in condition $\leq 30\text{C}/85\%$ relative humidity (RH). Moisture testing included a 168-hr soak at $85\text{C}/60\%$ RH followed by 3 times reflow cycles, with visual and electrical inspections at each stage.

GPI recommends keeping ZA20-3NX 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.