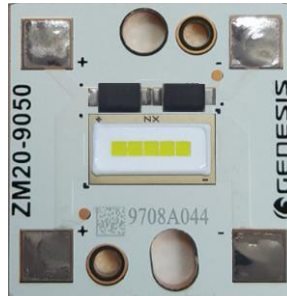


# MATCH LED



## ZM20-5NX

**C2-CR00-510-D00-11**

**Product Code: C7C2-CR405011D0A-001**

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## REVISION HISTORY

Rev.	Date	Charged	Approved	Revision Summary
Beta	2019/08/06	YR	Bruce	<i>First issue</i>

## 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.)	15.8 V
	(typ.)	16.8 V
	(max.)	17.8 V
Reversed Current	not designed for reversed operation	
Thermal resistance junction / board (typ.)	1.5	K/W
Radiating surface	5.9	mm <sup>2</sup>

## JEDEC MOISTURE SENSITIVITY

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

## BRIGHTNESS GROPPES

Item	Group	Form Factor	Measured Test Condition 1100 mA Pulsed Operation Case Temperature $T_c = 25^\circ\text{C}$ Minimum Luminous Flux (lm)
ZM20-5NX	Z24	1x5	1500
	Z25	1x5	1670
	Z26	1x5	1860

### Notes:

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

## PERFORMANCE GROUPS – FORWARD VOLTAGE ( $I_F = 1100 \text{ mA}$ )

Group code	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
CN	15	16
CO	16	17
CP	17	18

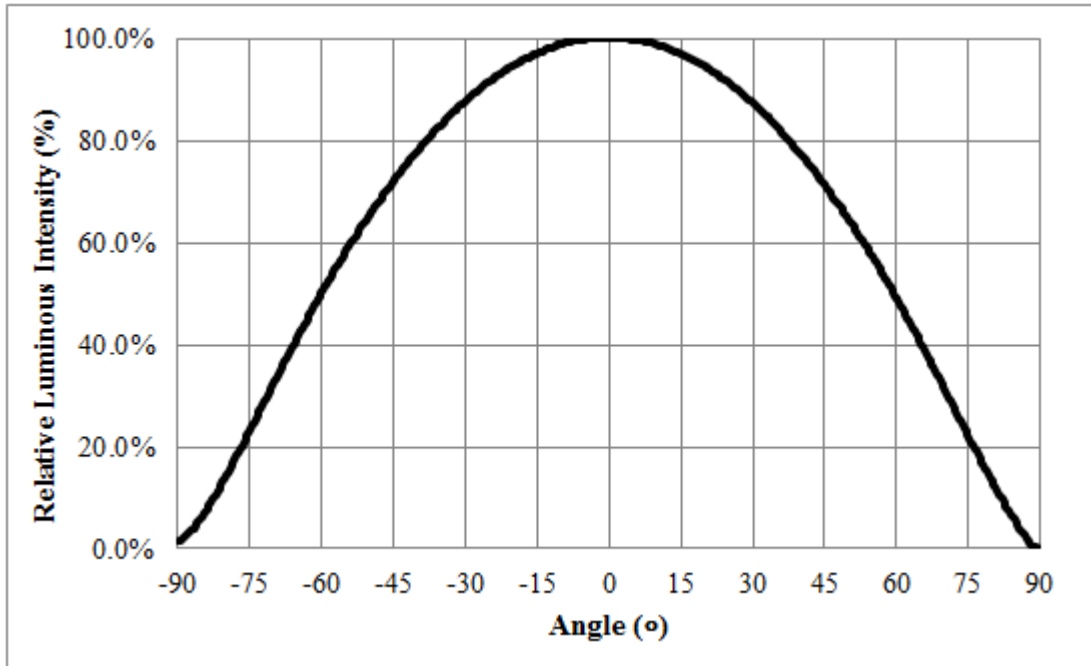
Notes:

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

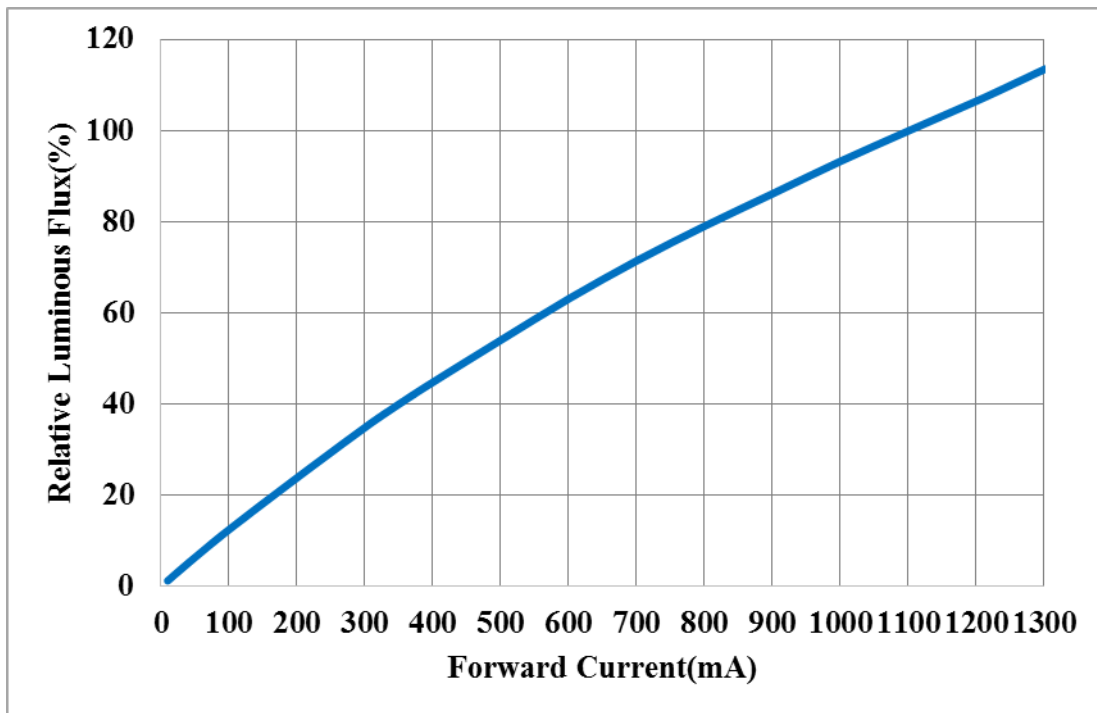
## MAXIMUM RATINGS

Parameter	Values	Unit
<b>Operating temperature range</b>	-40 ... 125	$^{\circ}\text{C}$
<b>Storage temperature range</b>	-40 ... 125	$^{\circ}\text{C}$
<b>Junction temperature</b>	150	$^{\circ}\text{C}$
<b>Forward Current</b>	(typ.) (max.)	mA mA
<b>Reversed voltage</b>	not designed for reversed operation	V
<b>ESD Sensitivity</b>	Up to 8	kV

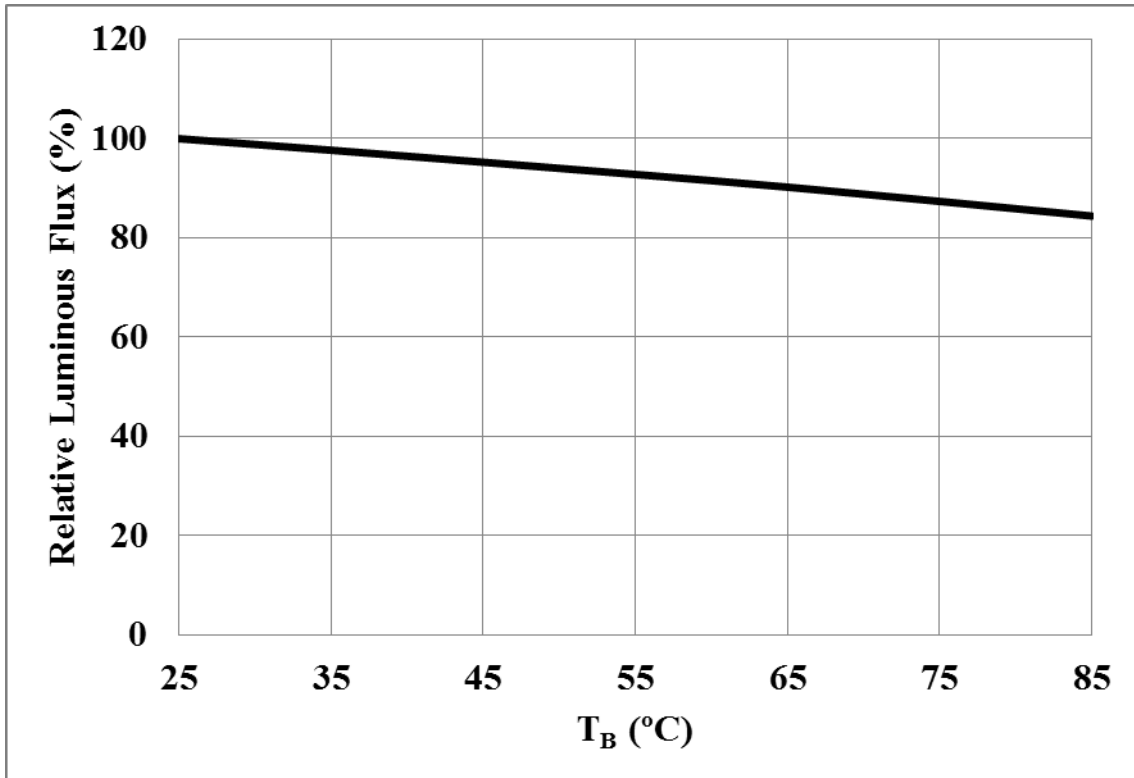
## TYPICAL SPATIAL DISTRIBUTION – WHITE



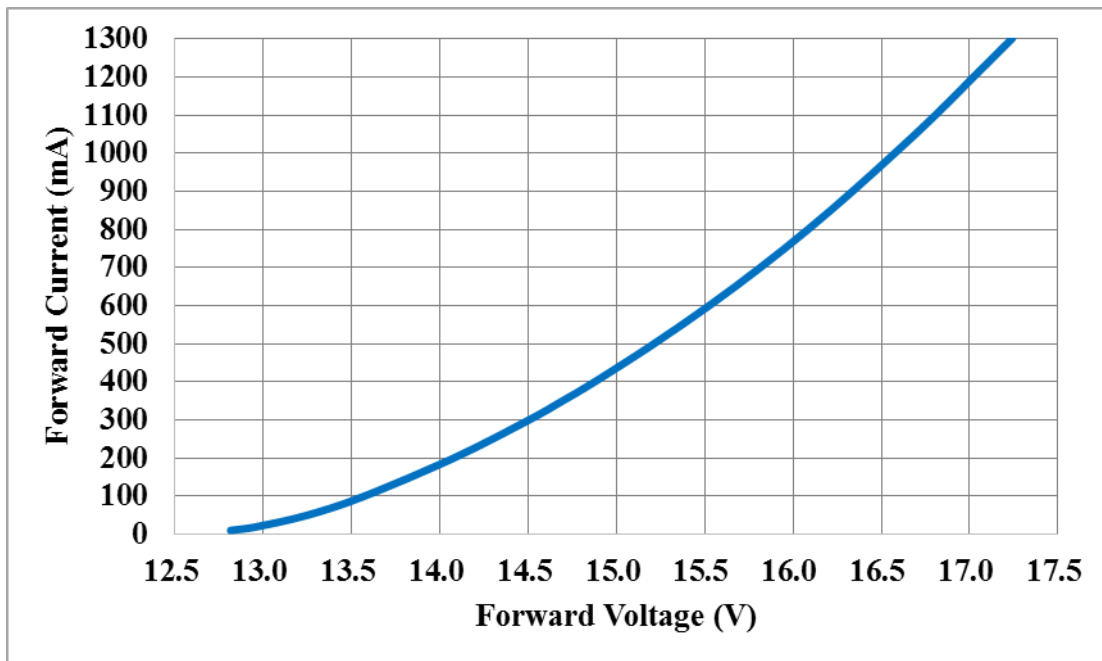
## RELATIVE LUMINOUS FLUX VS. CURRENT ( $T_B = 25\text{ }^\circ\text{C}$ )



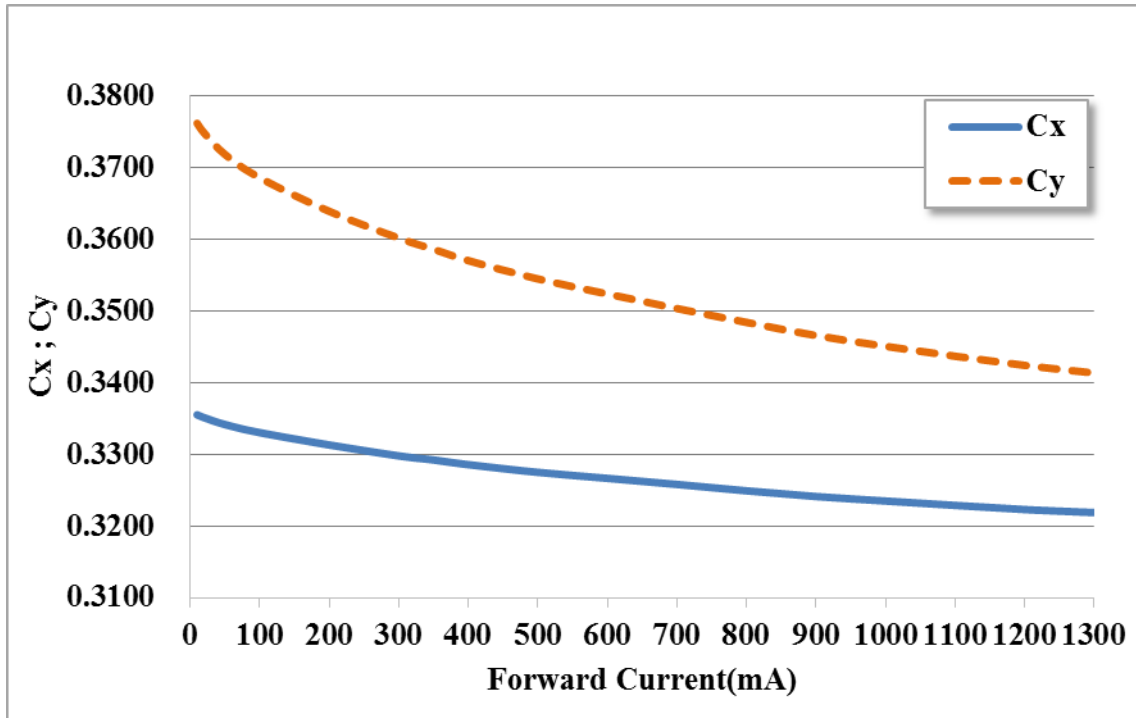
**RELATIVE LUMINOUS FLUX VS. JUNCTION TEMPERATURE ( $I_F = 1100 \text{ mA}$ )**



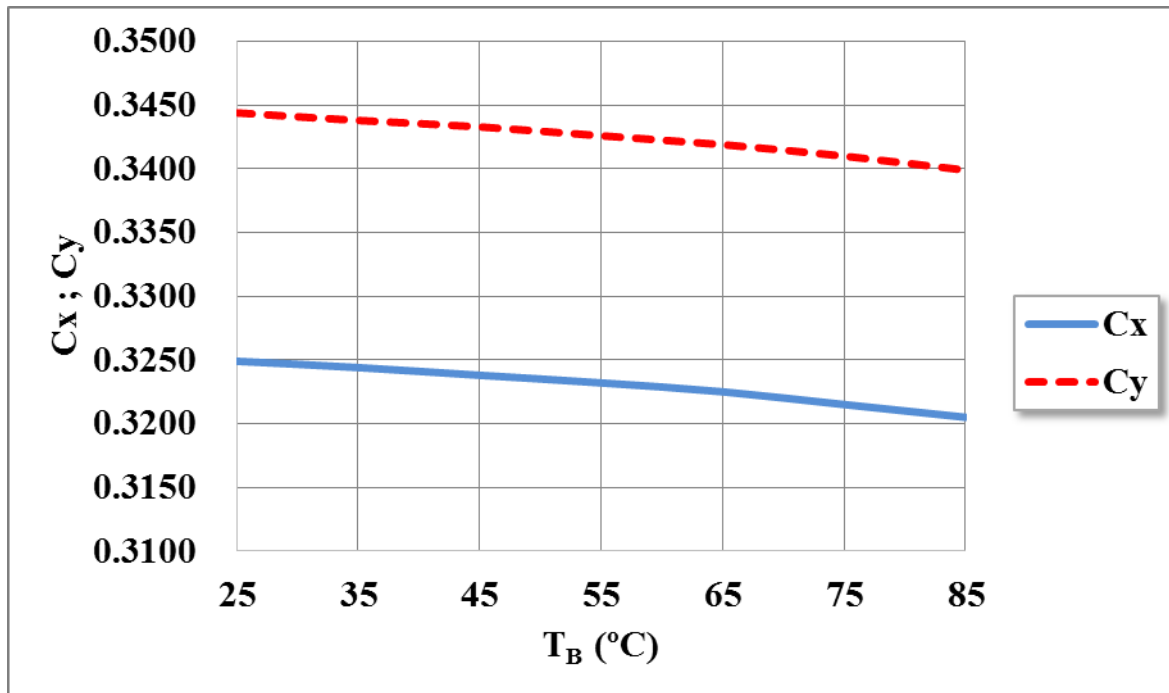
**FORWARD VOLTAGE VS. FORWARD CURRENT ( $T_B = 25 \text{ °C}$ )**



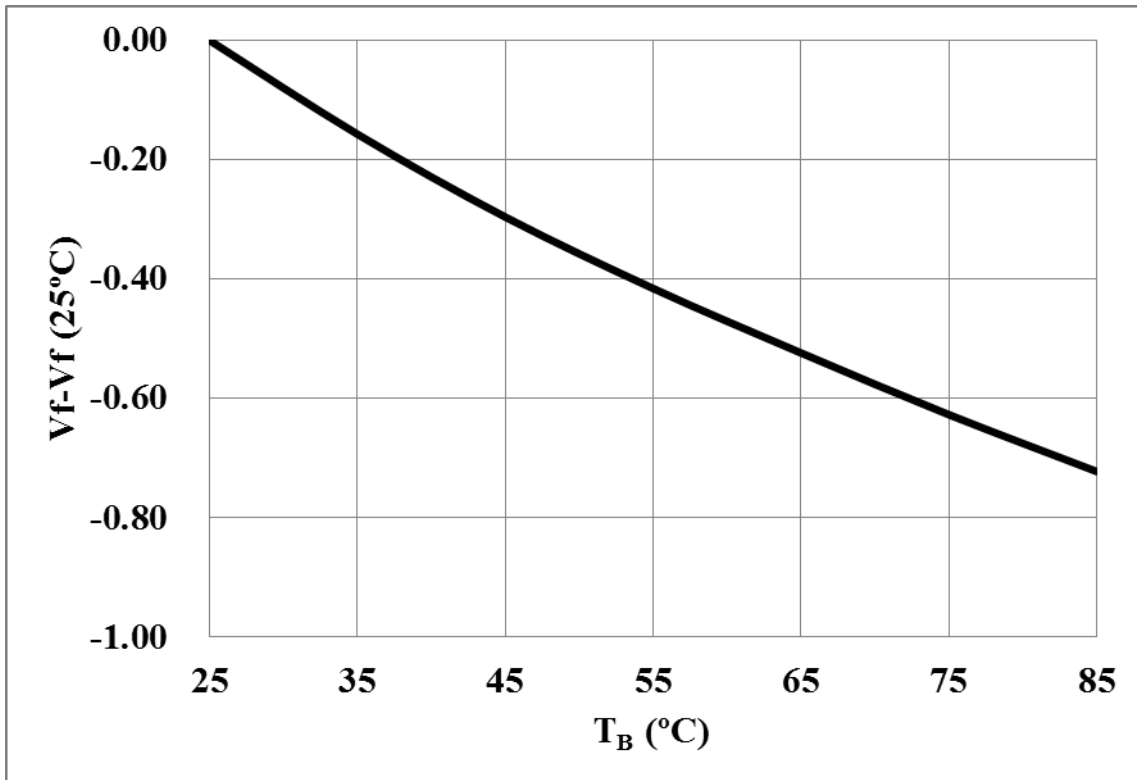
### CHROMATICITY COORDINATE SHIFT ( $T_B = 25\text{ }^\circ\text{C}$ )



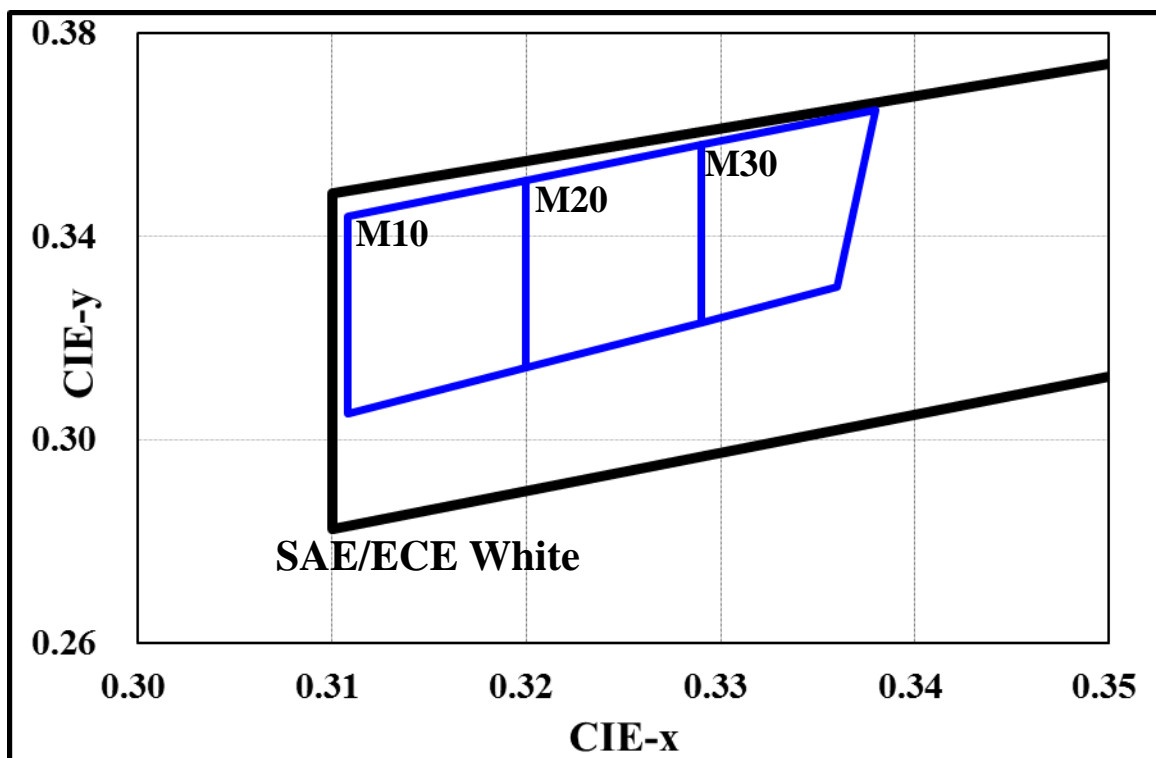
### CHROMATICITY COORDINATE SHIFT ( $I_F = 1100\text{ mA}$ )



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



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



MOD-DS-025 Rev. Beta



## PERFORMANCE GROUPS – CHROMATICITY

Bin Code	x	y
<b>M10</b>	0.3200	0.3511
	0.3108	0.344
	0.3108	0.305
	0.3200	0.3141

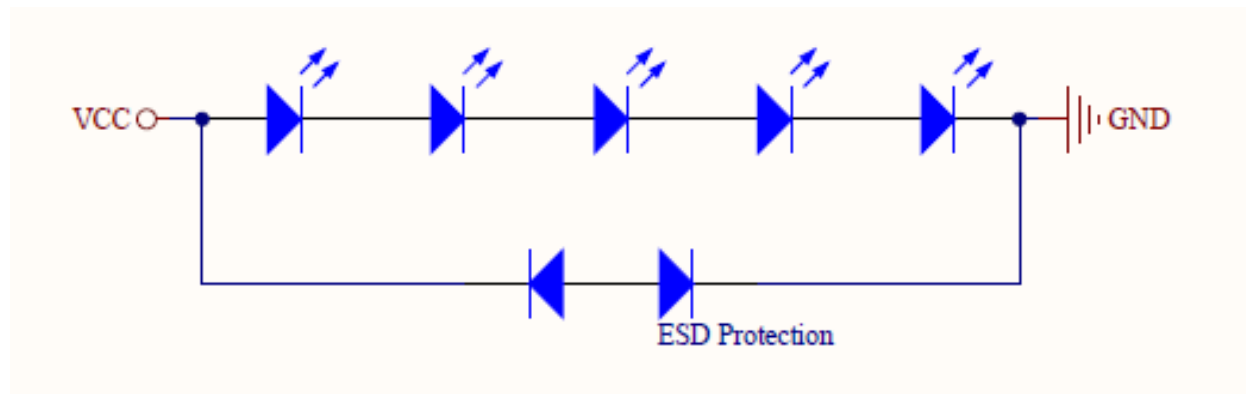
Bin Code	x	y
<b>M20</b>	0.3200	0.3511
	0.3290	0.3581
	0.3290	0.3231
	0.3200	0.3141

Bin Code	x	y
<b>M30</b>	0.3290	0.3581
	0.3380	0.365
	0.3360	0.3300
	0.3290	0.3231

Notes:

- GPI maintains a tolerance of  $\pm 0.005$  on chromaticity (CCx, CCy) measurements.

## INTERNAL ELECTRICAL CIRCUITE



## 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)	$I_R$ ( $\mu A$ )	$I_{PPM}$ (A)	$V_C \text{ MAX}$ (V)
20	1	18	0.1	6.8	29.2

## RELIABILITY

Test Item	Test Conditions	Test Period	Ac/Re
<b>High Temperature Forward Bias (HTFB)</b>	TA=85°C ; IF=1300mA DC	1000 hours	0/1
<b>High Temperature High Humidity Bias (HTHHB)</b>	TA=85°C : 85% humidity IF=1300mA DC	1000 hours	0/1
<b>Temperature Cycle (TC)</b>	-40°C / 125°C 15min dwell, 5min transfer	1000 cycles	0/1

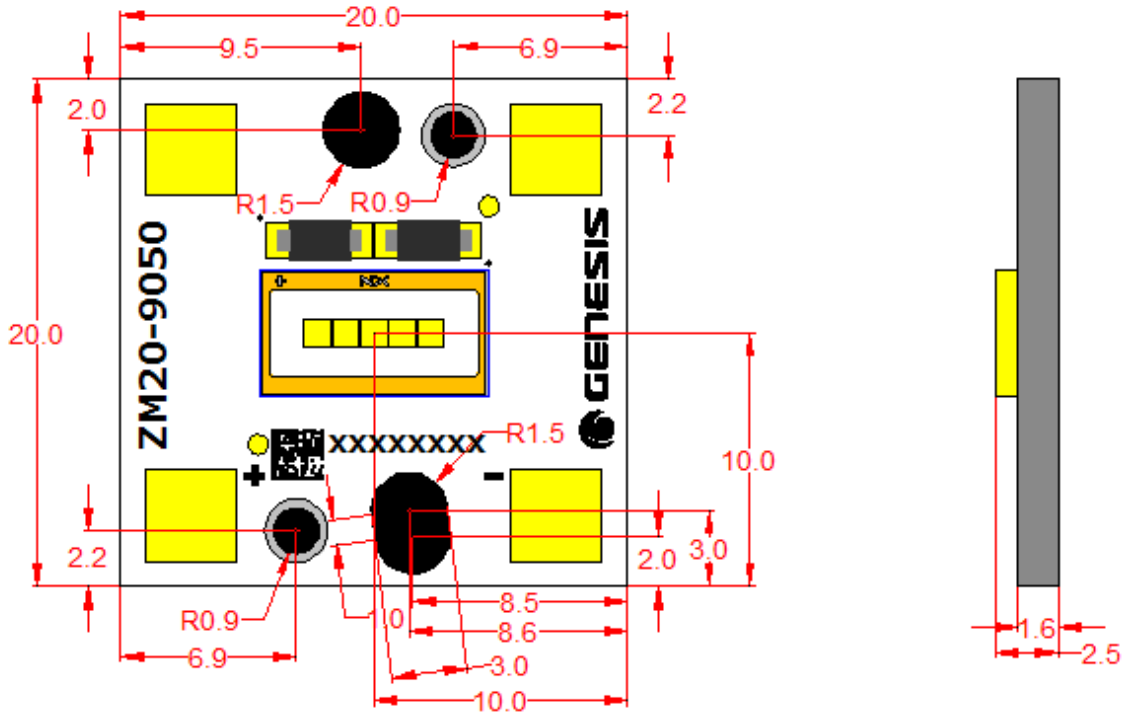
Notes:

- 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)

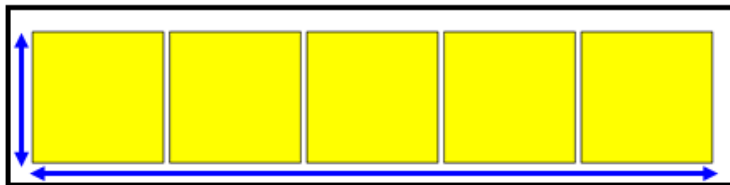
## MECHANICAL DIMENSIONS

Dimensions are in millimeters.

All measurements are  $\pm 0.20$  mm unless otherwise indicated.



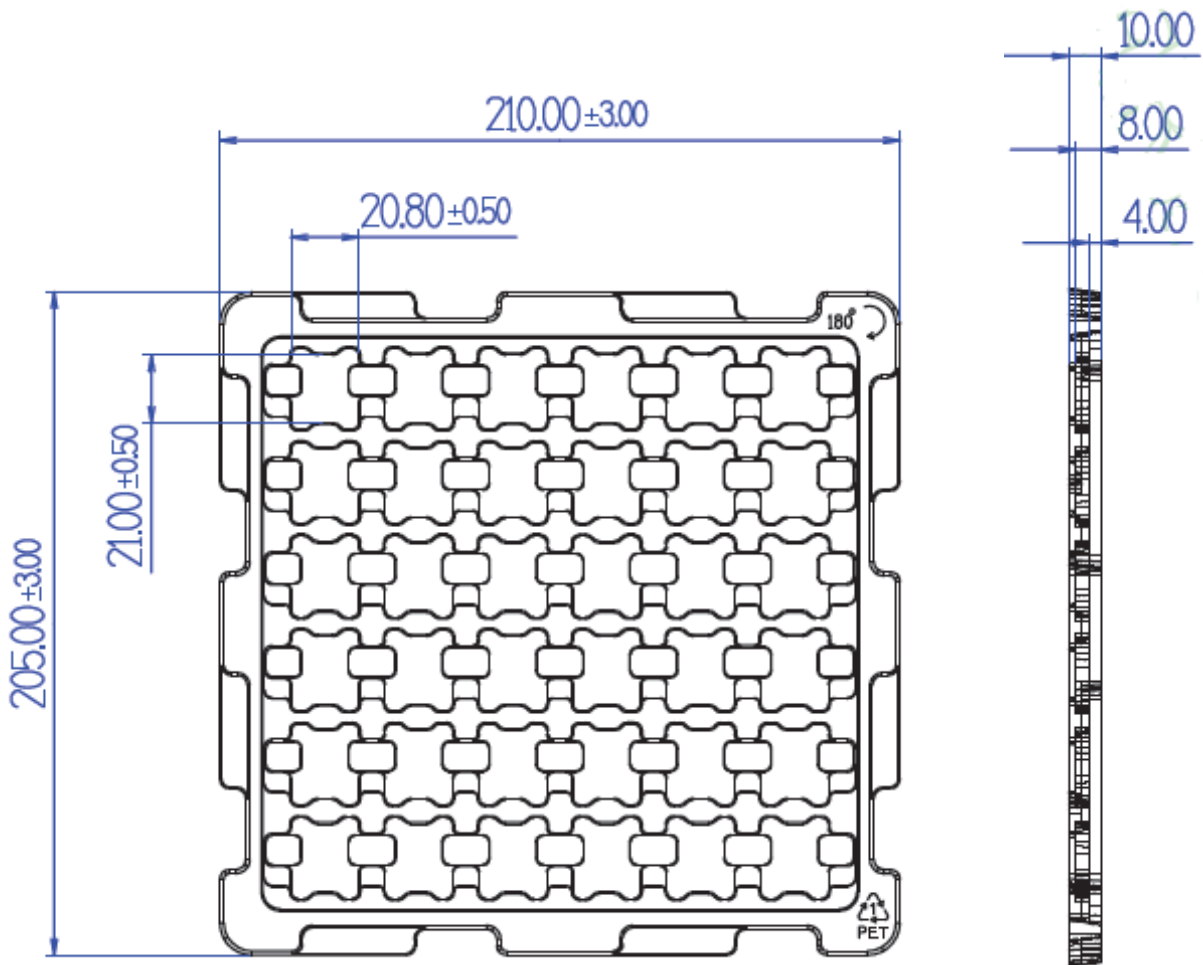
Unit: mm



**Emitting Area:**  
5.55mm X 1.07mm

## Tray

36 pcs. per tray



## CAUTIONS

### 1. Moisture Sensitivity

In testing, GPI has found ZM20-5NX to have 1 year floor life in condition  $\leq 30\text{C}$ / 85% relative humidity (RH). Moisture testing included a 168-hr soak at 85C/60% RH followed by 3 times reflow cycles, with visual and electrical inspections at each stage.

GPI recommends keeping ZM20-5NX 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.