DOMINANT™
Opto Technologies
*Innovating Illumination*

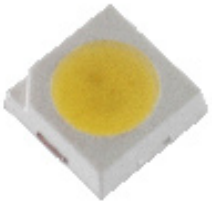
DATA SHEET :

# Primax

## 250 InGaN Yellow : NAZY-HHG

### Primax

Synonymous with function and performance, enter the Primax, the new era of high intensity illumination in LED. With its high flux output and high luminous intensity, Primax transcends today LED lightings technology and how we perceive it. The small package outline (3.5 x 3.5 x 1.2 mm) and high intensity make it an ideal choice for backlighting, signage, exterior automotive lighting and decorative lighting.



### Features:

> Super high brightness surface mount LED
> 120° viewing angle.
> Compact package outline (LxW) of 3.5 x 3.5 mm.
> Ultra low height profile - 1.2mm.
> Low thermal resistance.
> Compatible to IR reflow soldering.
> Environmental friendly; RoHS compliance.
> Superior corrosion resistance.
> Excellent reliability with new state-of-the-art phosphor system.
> Qualified based on AEC-Q101 Standard.

### Applications:

> Automotive: exterior applications, eg: Turn Signal, Strobe Light, etc.
> Industrial: eg: Warning Lamp.

## Optical Characteristics at Tj=25°C

| Part Ordering Number | Color | Viewing Angle° | Luminous Flux @ 250mA (lm) Appx. 1.2 | | |
|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. |
| NAZY-HHG-QR-1 | InGaN Yellow | 120 | 30.6 | 39.8 | 51.7 |
| ● NAZY-HHG-PQ-1 | InGaN Yellow | 120 | 23.5 | 30.0 | 39.8 |

● Not for new design

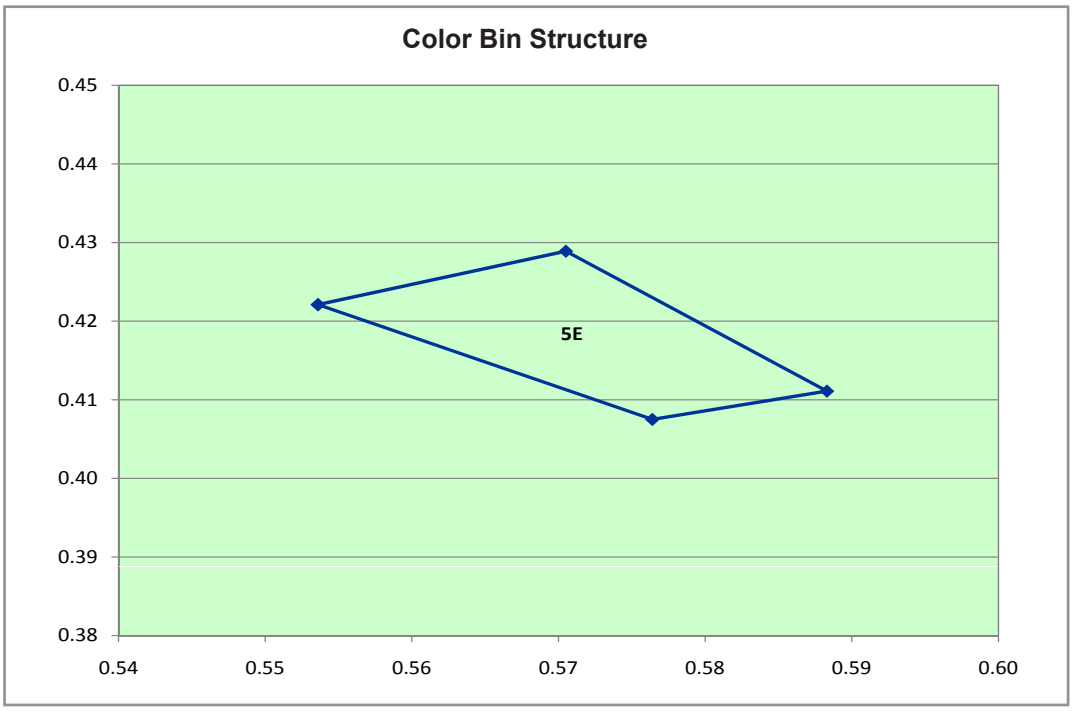
## Electrical Characteristics at Tj=25°C

| Part Number | Vf @ If = 250 mA Appx. 3.1 | | | Vr @ Ir = 10uA |
|---|---|---|---|---|
| | Min. (V) | Typ. (V) | Max. (V) | Min. (V) |
| NAZY-HHG | 2.7 | 3.1 | 3.3 | 5 |

## Absolute Maximum Ratings

| | Maximum Value | Unit |
|---|---|---|
| DC forward current | 300 | mA |
| Peak pulse current | 350 | mA |
| Reverse voltage | 5 | V |
| ESD threshold (HBM) | 2000 | V |
| LED junction temperature | 150 | ˚C |
| Operating temperature | -40 … +125 | ˚C |
| Storage temperature | -40 … +125 | ˚C |
| Thermal resistance | | |
| - Real Thermal Resistance | | |
| Junction / ambient, $R_{th\ JA\ real}$ | 90 | K/W |
| Junction / solder point, $R_{th\ JS\ real}$ | 35 | K/W |
| - Electrical Thermal Resistance | | |
| Junction / ambient, $R_{th\ JA\ el}$ | 65 | K/W |
| Junction / solder point, $R_{th\ JS\ el}$ | 25 | K/W |
| (Mounted on dual-sided FR4 in-house PCB ; total Cu area > 900 mm²) | | |

## NAZY-HHG, Color Grouping *Appx. 2.1*




| Bin | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 5E | Cx | 0.5536 | 0.5705 | 0.5883 | 0.5764 |
| | Cy | 0.4221 | 0.4289 | 0.4111 | 0.4075 |

## Luminous Intensity Group at Tj=25$^0$C

| Brightness Group | Luminous Flux (lm) *Appx. 1.2* |
|---|---|
| P2 | 23.5 ... 26.8 |
| P3 | 26.8 ... 30.6 |
| Q2 | 30.6 ... 34.8 |
| Q3 | 34.8 ... 39.8 |
| R2 | 39.8 ... 45.2 |
| R3 | 45.2 ... 51.7 |

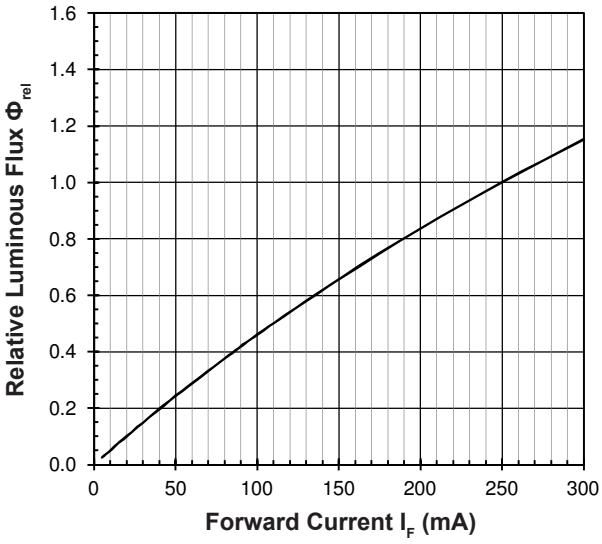
## Vf Binning (Optional)

| Vf Bin @ 250mA | Forward Voltage (V) *Appx. 3.1* |
|---|---|
| V0 | 2.70 ... 3.00 |
| V1 | 3.00 ... 3.30 |

Please consult sales and marketing for special part number to incorporate Vf binning.

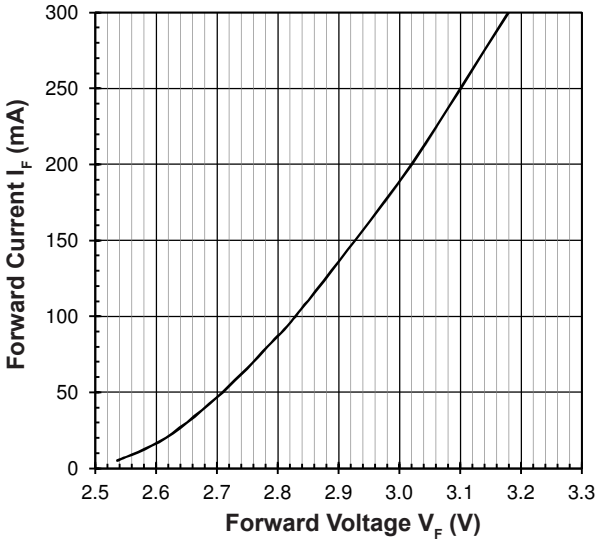
## Relative Luminous Flux Vs Forward Current

$\Phi_V/\Phi_V(250mA) = f(I_F)$; $T_j = 25°C$



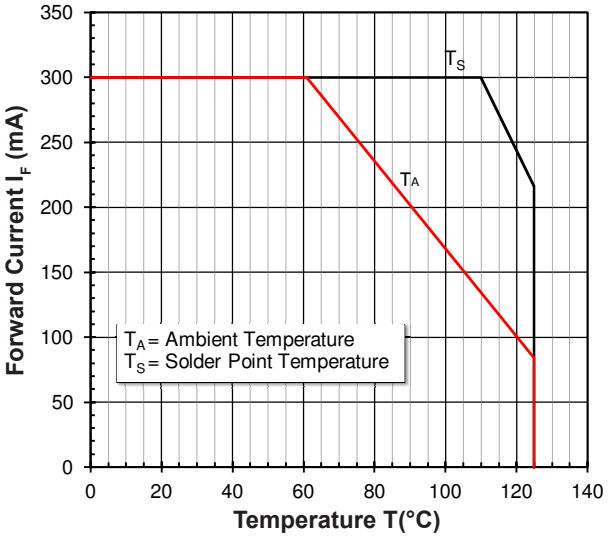

## Forward Current Vs Forward Voltage

$I_F = f(V_F)$; $T_j = 25°C$



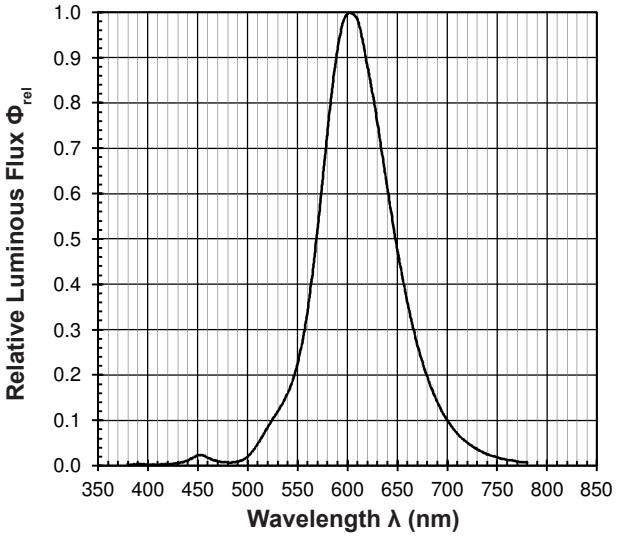

## Maximum Current Vs Temperature

$I_F = f(T)$



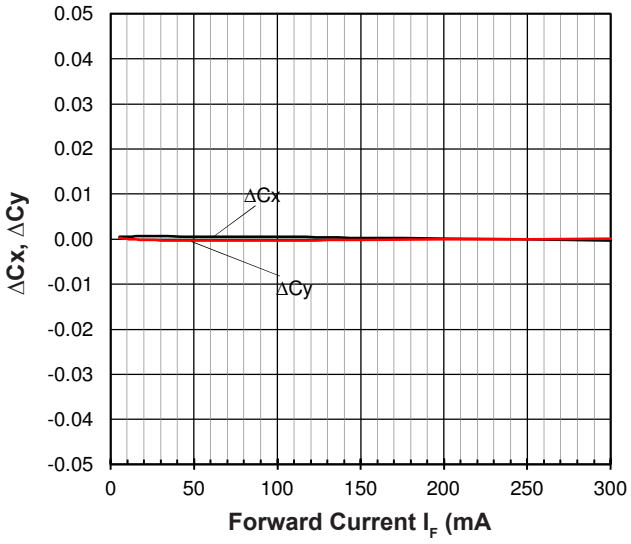

## Relative Spectral Emission

$\Phi_{rel} = f(\lambda)$; $T_j = 25°C$; $I_F = 250mA$



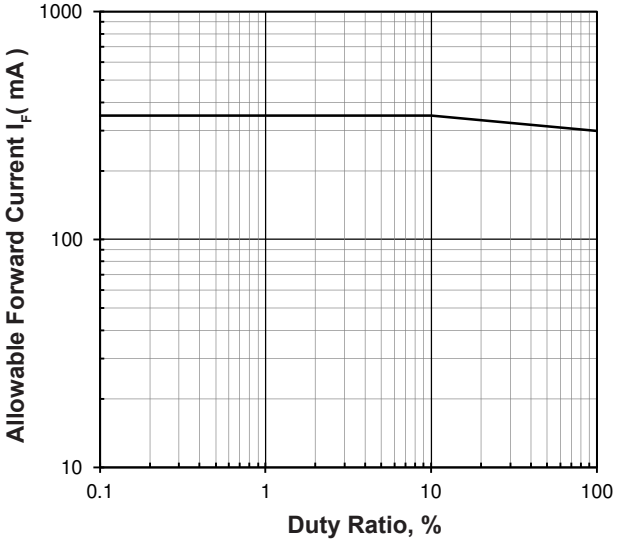

## Chromaticity Coordinate Shift Vs Forward Current

$\Delta Cx, \Delta Cy = f(I_F); T_j = 25°C$

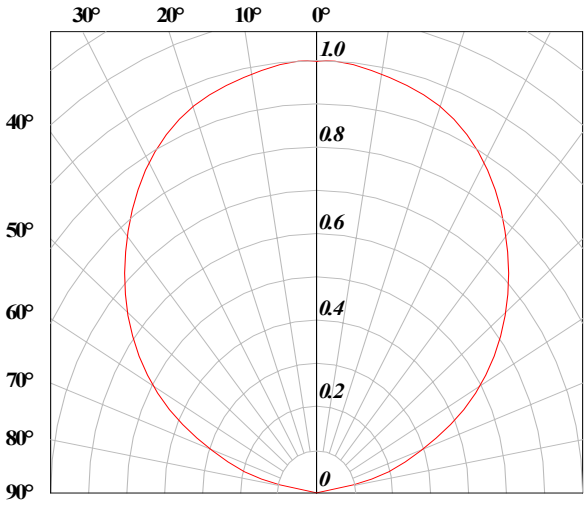



## Allowable Forward Current Vs Duty Ratio

( $T_j = 25°C$; $t_p \leq 10\mu s$ )

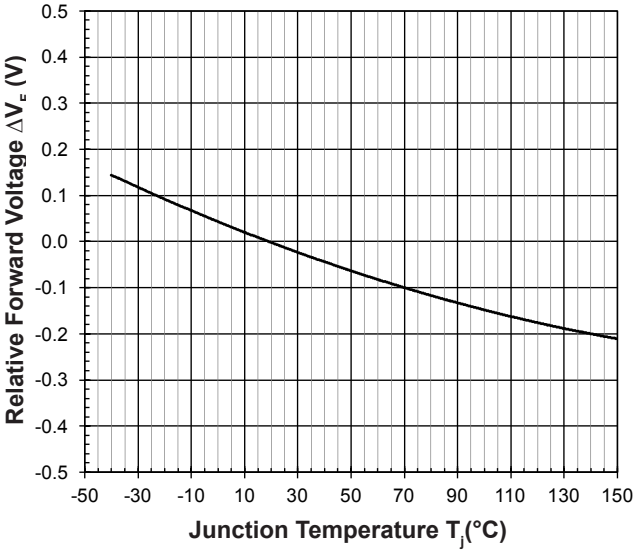


## Radiation Pattern



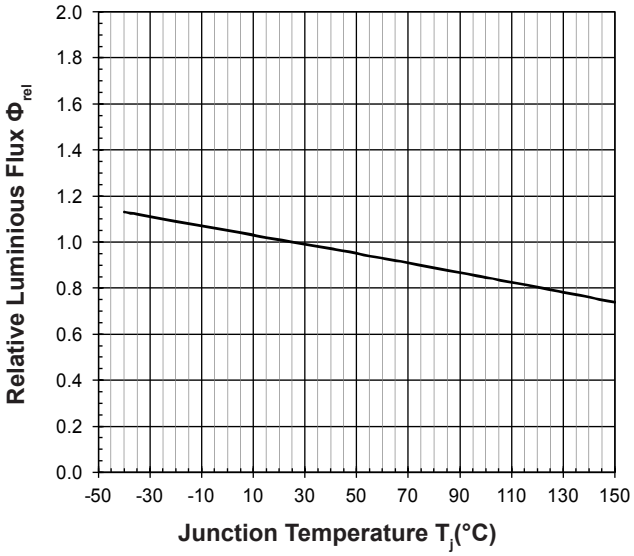

## Relative Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; $I_F$ =250mA



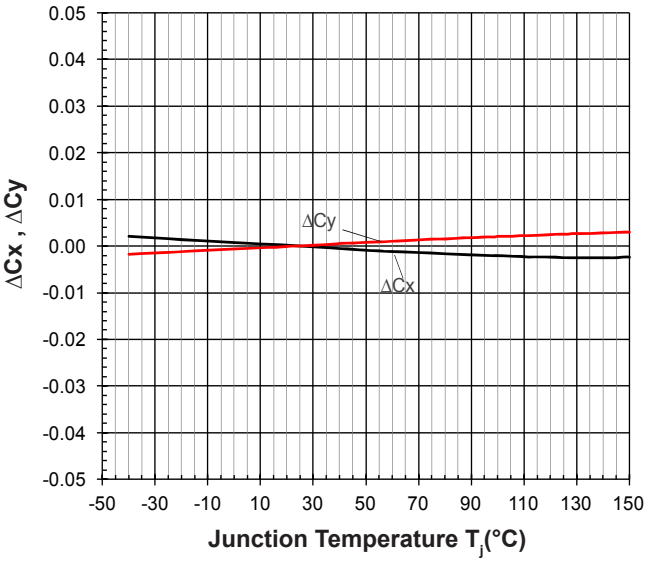

## Relative Luminious Flux Vs Junction Temperature

$\Phi V/\Phi V(25°C) = f(T_j)$; $I_F$ = 250mA

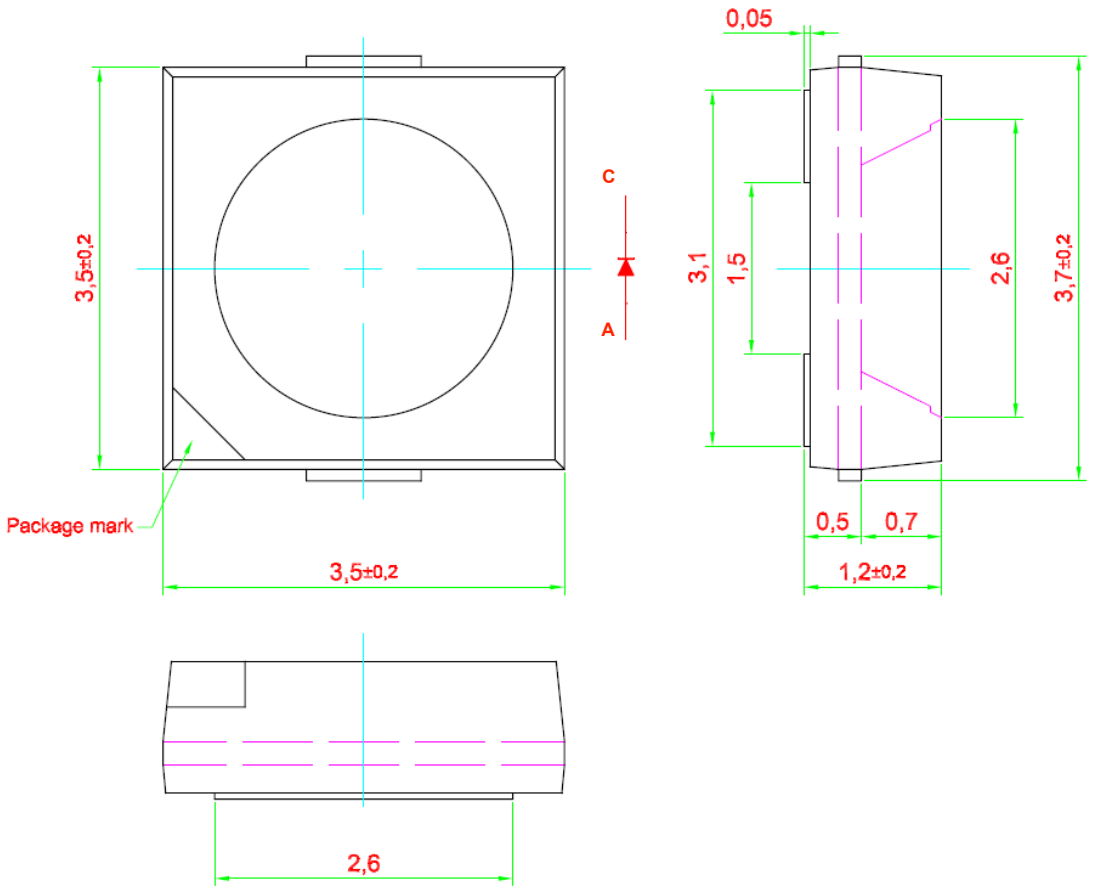



## Chromaticity Coordinate Shift Vs Junction Temperature

$\Delta Cx, \Delta Cy = f(T_j)$; $I_F$ = 250mA



## Primax • 250 InGaN Yellow: NAZY-HHG Package Outlines

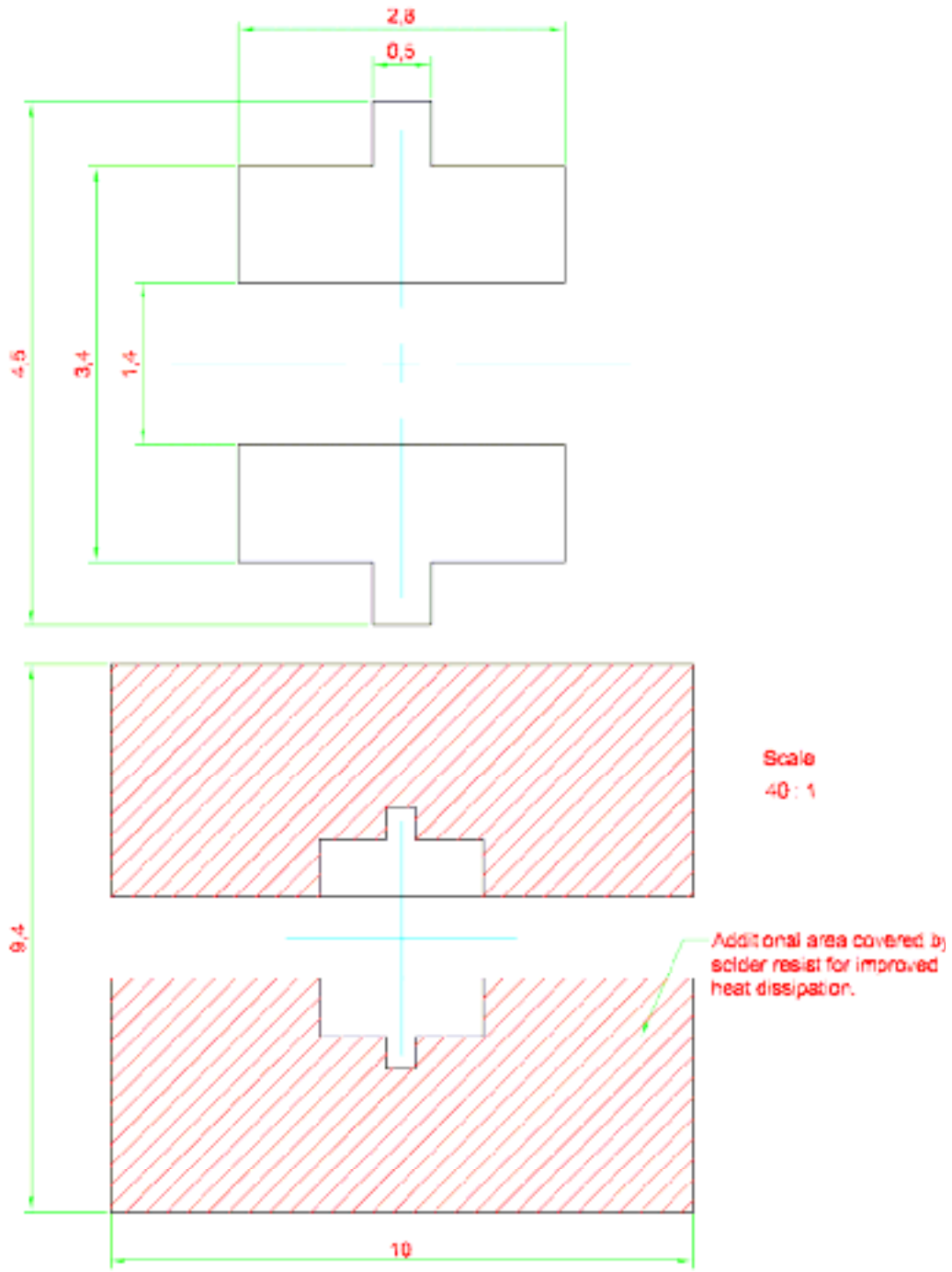



**Note : Primary thermal path is through Anode lead of LED package.**

## Material

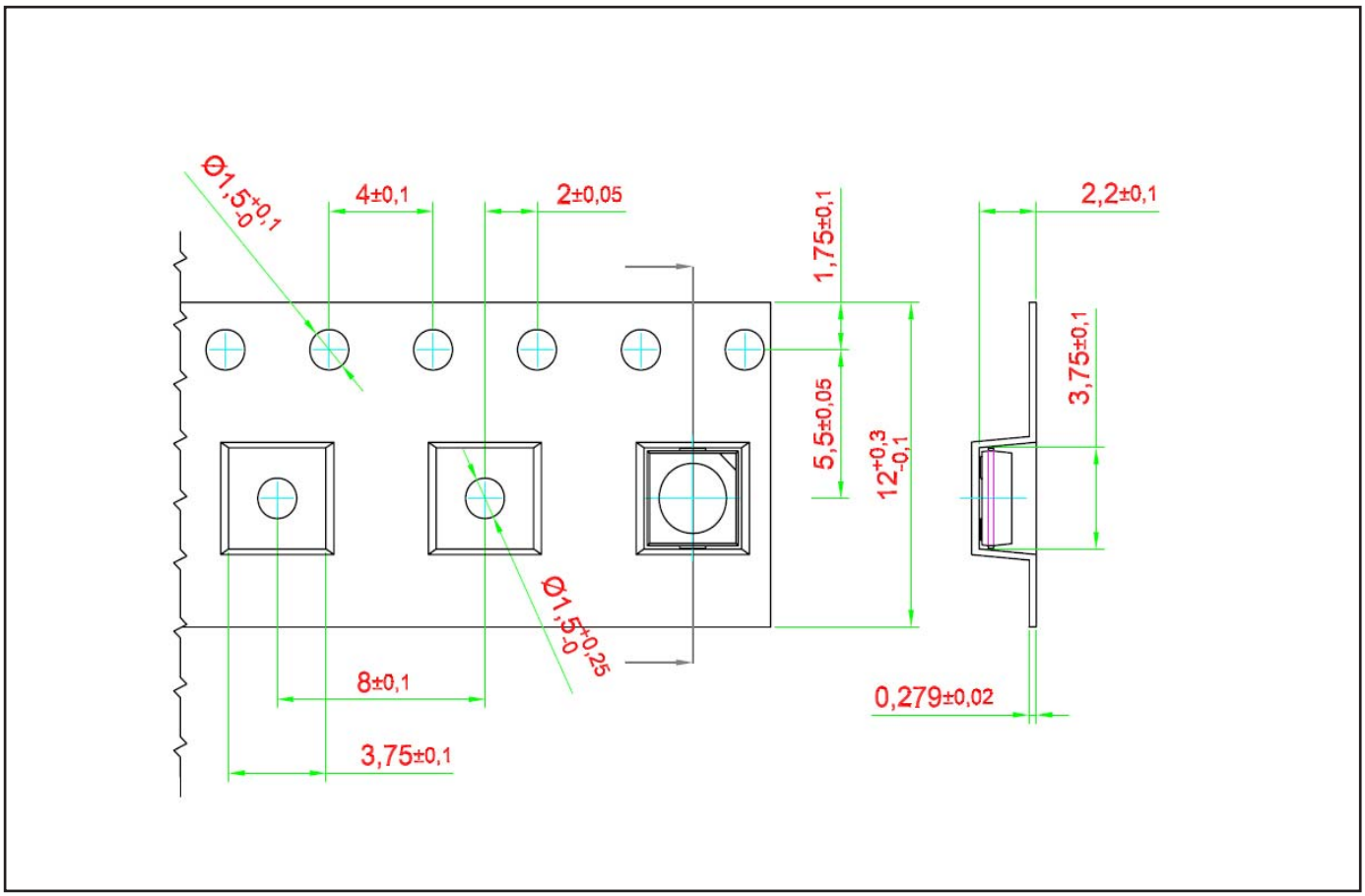
| | Material |
|---|---|
| Lead-frame | Cu Alloy With Au Plating |
| Package | High Temperature Resistant Plastic, PPA |
| Encapsulant | Silicone |
| Soldering Leads | Au Plating |

## Recommended Solder Pad

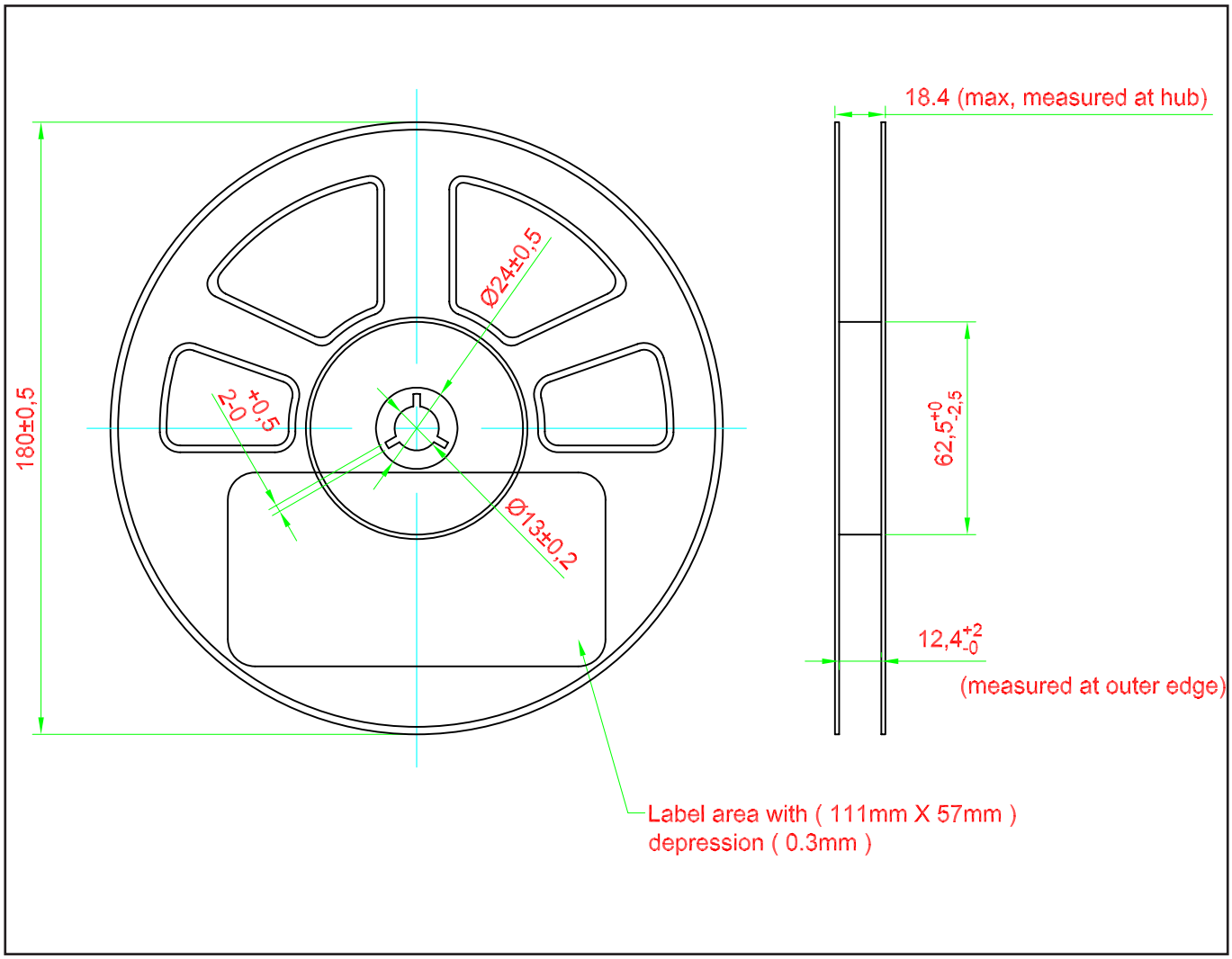


## Taping and orientation

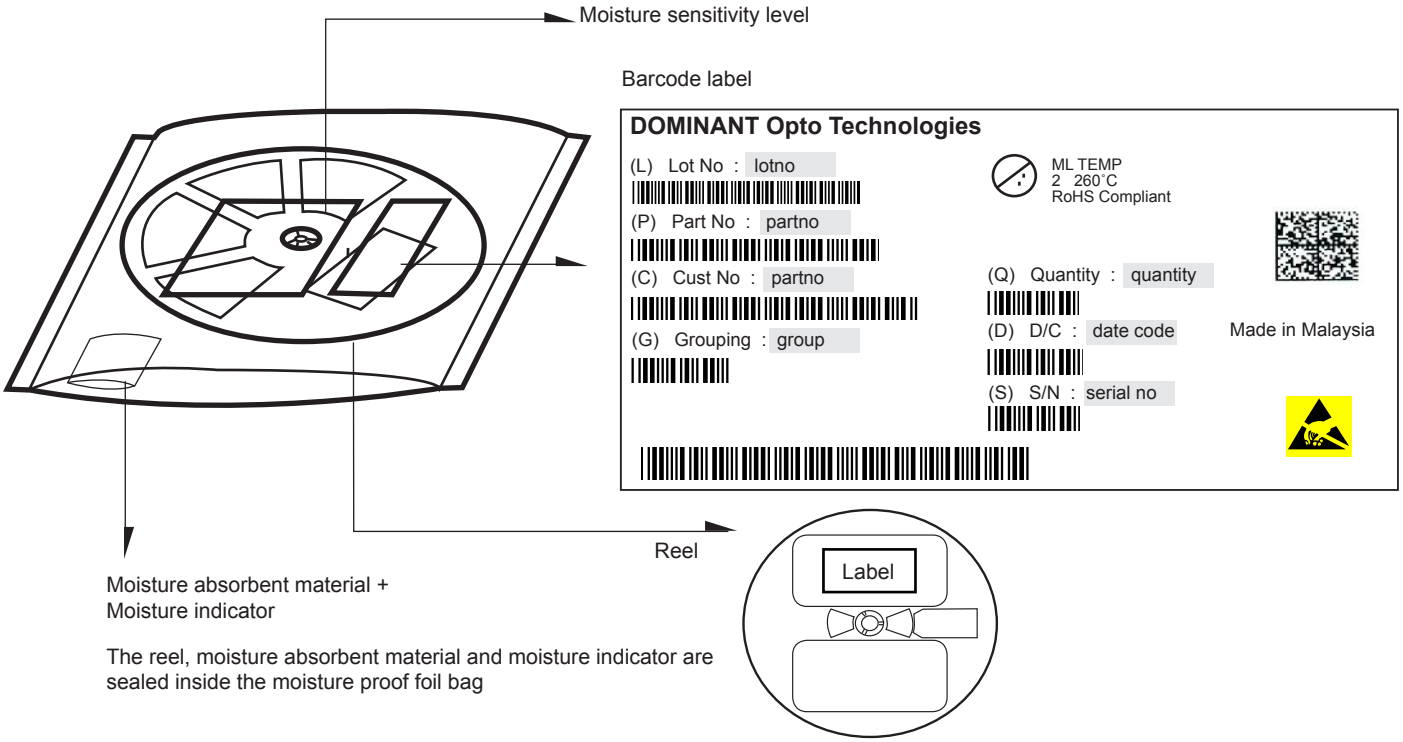
- Reels come in quantity of 1000 units.
- Reel diameter is 180 mm.



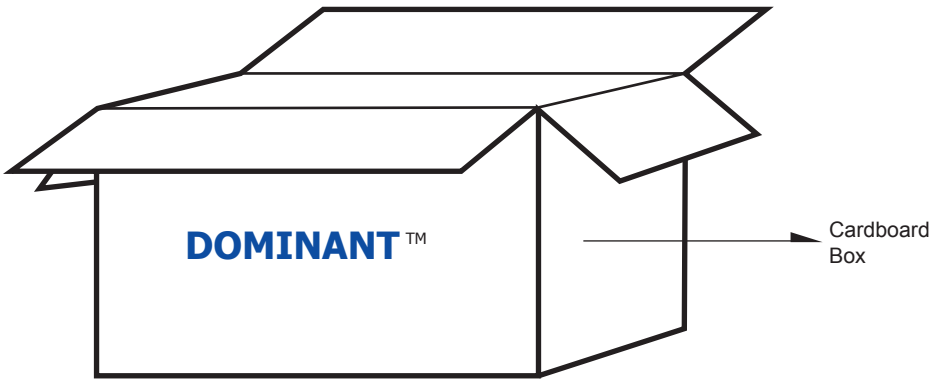
## Packaging Specification



## Packaging Specification



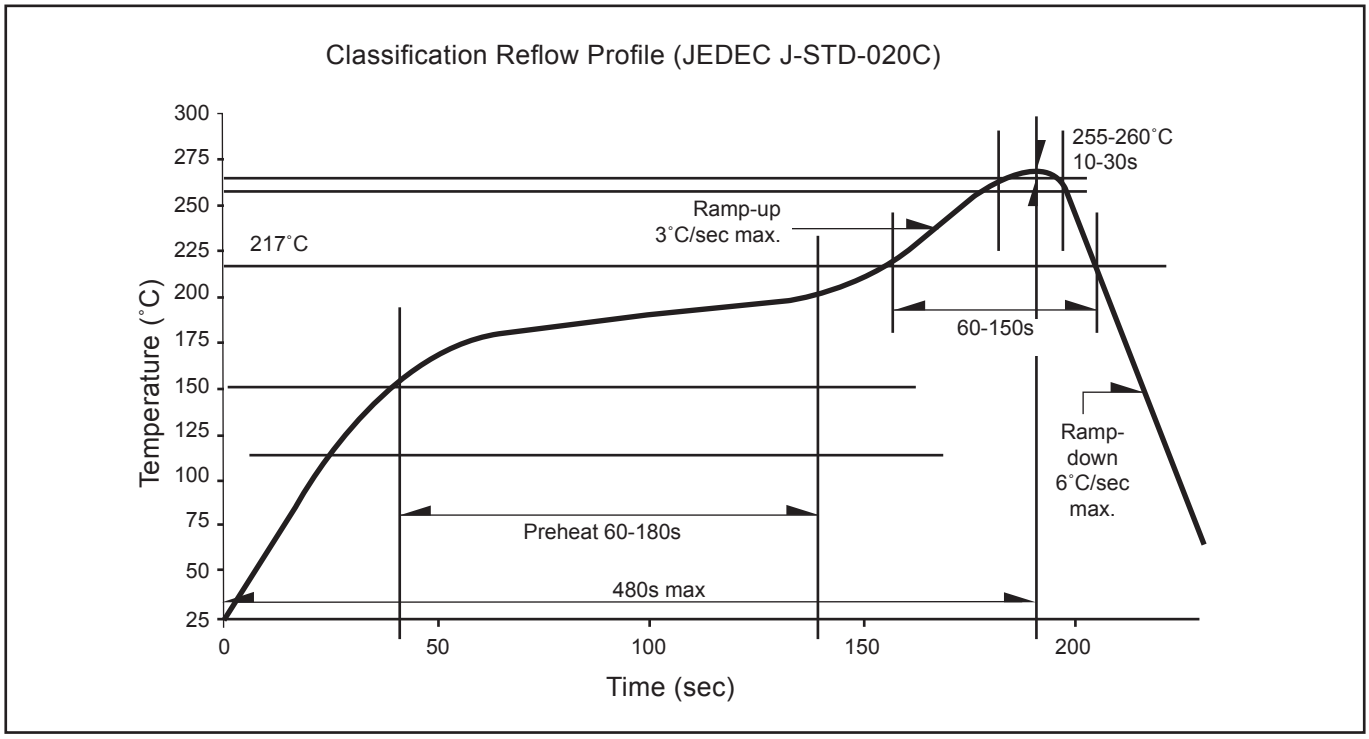

| | Average 1pc Primax | 1 completed bag (1000pcs) |
|---|---|---|
| **Weight (gram)** | **0.040** | **240 ± 10** |




## For Primax

| Cardboard Box Size | Dimensions (mm) | Empty Box Weight (kg) | Reel / Box |
|---|---|---|---|
| Super Small | 325 x 225 x 190 | 0.38 | 7 reels MAX |
| Small | 325 x 225 x 280 | 0.54 | 11 reels MAX |
| Medium | 570 x 440 x 230 | 1.46 | 48 reels MAX |
| Large | 570 x 440 x 460 | 1.92 | 96 reels MAX |

## Recommended Pb-free Soldering Profile



## Appendix

**1) Brightness:**

1.1 Luminous intensity is measured with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

1.2 Luminous flux is measured with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

**2) Color:**

2.1 Chromaticity coordinate groups are measured with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (accordingly to GUM with a coverage factor of k=3).

2.2 DOMINANT wavelength is measured with an internal reproducibility of ± 0.5nm and an expanded uncertainty of ± 1nm (accordingly to GUM with a coverage factor of k=3).

**3) Voltage:**

3.1 Forward Voltage, Vf is measured with an internal reproducibility of ± 0.05V and an expanded uncertainty of ± 0.1V (accordingly to GUM with a coverage factor of k=3).

## Revision History

| Page | Subjects | Date of Modification |
|---|---|---|
| - | Initial release | 14 Mar 2013 |
| 6 | Update Graph: Max Current Vs Ambient Temperature | 06 Feb 2014 |
| 1, 2, 5 | Add Features<br>Update Vf and Vf Binning | 16 Apr 2015 |
| 1, 5, 11 | Update Application<br>Remove Vf Binning (V2 & V3)<br>Update Packaging Specification | 19 Aug 2015 |
| 2, 13 | Add new partno: NAZY-HHG-QR-1<br>Not for new design: NAZY-HHG-PQ-1<br>Add Appendix | 05 Aug 2016 |
| 2, 5, 6, 7 | Typo error in Electrical Characteristics & Reverse Voltage<br>Add Electrical Thermal Resistance<br>Update Graph<br>Add Notes & Typo Error in Package Outline | 22 Aug 2016 |
| 6, 7 | Update Graph: Relative Forward Voltage Vs Junction Temperature<br>Update Graph: Chromaticity Coordinate Shift Vs Junction Temperature<br>Typo Error on Material | 13 Oct 2016 |
| | | |

## About Us

DOMINANT Opto Technologies is a dynamic Malaysian Corporation that is among the world's leading SMT LED Manufacturers. An excellence – driven organization, it offers a comprehensive product range for diverse industries and applications. Featuring an internationally certified quality assurance acclaim, DOMINANT's extra bright LEDs are perfectly suited for various lighting applications in the automotive, consumer and communications as well as industrial sectors. With extensive industry experience and relentless pursuit of innovation, DOMINANT's state-of-art manufacturing, research and testing capabilities have become a trusted and reliable brand across the globe. More information about DOMINANT Opto Technologies can be found on the Internet at http://www.dominant-semi.com.

**Please contact us for more information:**

DOMINANT Opto Technologies Sdn. Bhd
Lot 6, Batu Berendam, FTZ Phase III, 75350 Melaka, Malaysia.
Tel: +606 283 3566  Fax: +606 283 0566
E-mail: sales@dominant-semi.com