

# HVA-3528DES



## 3528 PLCC4 / Products Series

High luminous efficiency, consistency, stability and reliability, it is mainly used in automobile applications.

- PPA
- 50% I<sub>v</sub> 120°
- 617nm
- AEC-Q102 & IEC 60810

## Features

- Package Colorless clear silicone in white PPA cup
- Viewing angle at 50% I<sub>v</sub>: 120°
- Color: Amber (617nm)
- Qualifications: Passed reliability test per AEC-Q102 & IEC 60810 requirement

## Applications

- Signaling
- Interior and exterior lighting for automotive

## / Ordering Information

Type	Luminous Intensity I <sub>v</sub> @ I <sub>f</sub> =50mA	Ordering Code
HVA-3528DES- XXXX - XX - XXXX       Brightness Color Forward Voltage	2.24- 4.50 cd	XXXXXX

- |   |                                   |          |
|---|-----------------------------------|----------|
| 4 | HVA-3528DES- <u>BBCB</u> -XX-XXXX | BB CA CB |
|---|-----------------------------------|----------|
- |   |                                   |       |
|---|-----------------------------------|-------|
| 4 | HVA-3528DES-XXXX- <u>24</u> -XXXX | 2 3 4 |
|---|-----------------------------------|-------|
- |   |                                  |             |
|---|----------------------------------|-------------|
| 4 | HVA-3528DES-XXXX-XX- <u>3A4B</u> | 3A 3B 4A 4B |
|---|----------------------------------|-------------|

### Note

■ Brightness Grouping

Only one brightness group will be packed in each reel. Please refer to page #4 for details.  
E.g.: HVA-3528DES-BBCB-XX-XXXX, means only one bin of BB, CA or CB is in each reel.

■ Color Groups

Only one color group will be packed in each reel. Please refer to page #4 for details.  
E.g.: HVA-3528DES-XXXX-24-XXXX, means only one bin of 2, 3 or 4 is in each reel.

■ Forward Voltage Groups

Only one forward voltage group will be packed in each reel. Please refer to page #4 for details.  
E.g.: HVA-3528DES-XXXX-XX-3A4B, means only one bin of 3A, 3B, 4A or 4B is in each reel.

## /Maximum Ratings

Parameters	Symbol	Rating	Unit
/ Junction Temperature	$T_j$	125	
( $T_s=25$ ) / Forward Current	$I_f$	70	mA

/Characteristics ( $T_s = 25$  ;  $I_f = 50$  mA)

Parameters		Symbol	Rating	Unit
/ Wavelength at Peak Emission	typ.	$\lambda_{peak}$	624	nm
/ Dominant Wavelength	min.	$\lambda_{dom}$	612	nm
	typ.	$\lambda_{dom}$	617	nm
	max.	$\lambda_{dom}$	624	nm
/ Spectral Bandwidth at 50% $I_{rel}$ max	typ.		18	nm
50 % $I_v$ / Viewing Angle at 50 % $I_v$	typ.		120	°
/ Forward Voltage	min.	$V_f$	1.90	V
	typ.	$V_f$	2.15	V
	max	$V_f$	2.50	V
/ Reverse Current ( $V_R=12V$ )	typ.	$I_r$	0.2	uA
	max.	$I_r$	10	uA
PN - / Real Thermal Resistance (Junction / Ambient)	max.	$R_{th JA_{real}}$	300	K/W
PN - / Real Thermal Resistance (Junction / Solder Point)	max.	$R_{th JS_{real}}$	130	K/W

/Brightness Grouping ( $T_s = 25$  ;  $I_f = 50$  mA)

Grouping	Luminous Intensity $I_v$ min.	Luminous Intensity $I_v$ max.	Luminous Flux $\Phi_v$ typ.
BB	2.24 cd	2.80 cd	7.60 lm
CA	2.80 cd	3.55 cd	9.50 lm
CB	3.55 cd	4.50 cd	12.10 lm

/Forward Voltage Grouping ( $T_s = 25$  ;  $I_f = 50$  mA)

Grouping	Forward Voltage $V_f$ min.	Forward Voltage $V_f$ max.
3A	1.90 V	2.05 V
3B	2.05 V	2.20 V
4A	2.20 V	2.35 V
4B	2.35 V	2.50 V

/Dominant Wavelength Grouping ( $T_s = 25$  ;  $I_f = 50$  mA)

Grouping	Dominant Wavelength $\lambda_{dom}$ min.	Dominant Wavelength $\lambda_{dom}$ max.
2	612 nm	616 nm
3	616 nm	620 nm
4	620 nm	624 nm

## / Information on Label

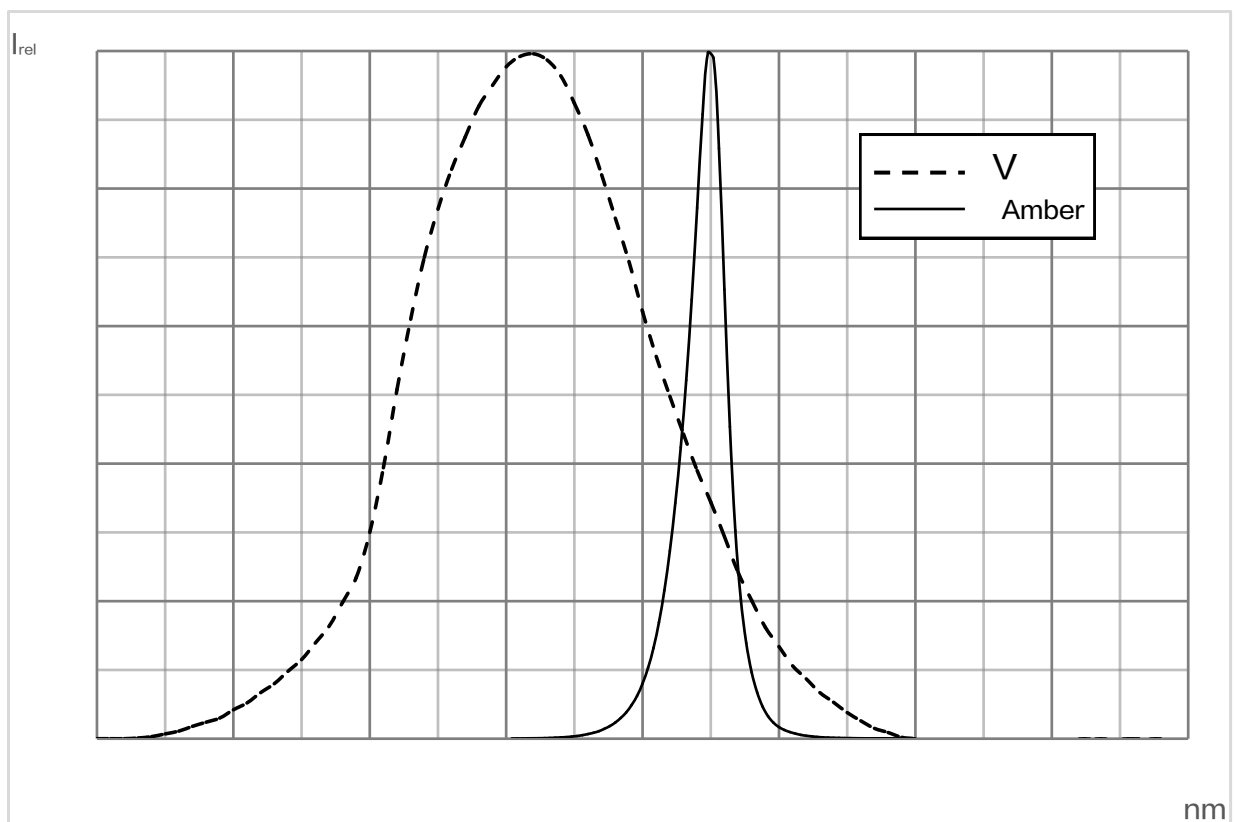
/E.g. BB-2-3A

/Brightness	/Color	/Forward Voltage
BB	2	3A

$$- V(\lambda) =$$

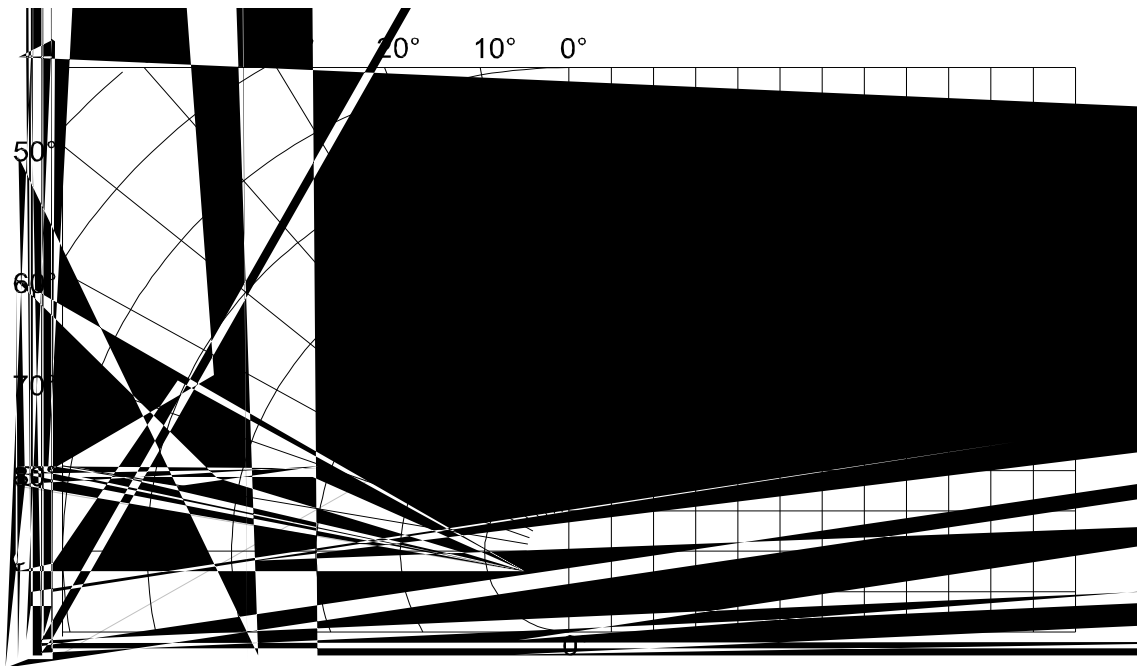
Relative Spectral Emission -  $V(\lambda)$  = Standard Eye Response Curve

$$I_{rel} = f(\lambda); T_s = 25^\circ\text{C}; I_f = 50\text{ mA}$$



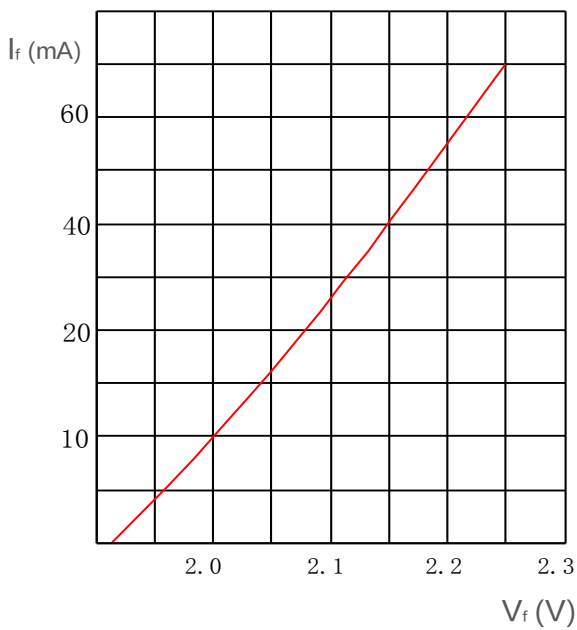
/Radiation Characteristics

$I_{rel} = f(\theta, \phi; T_s = 25)$



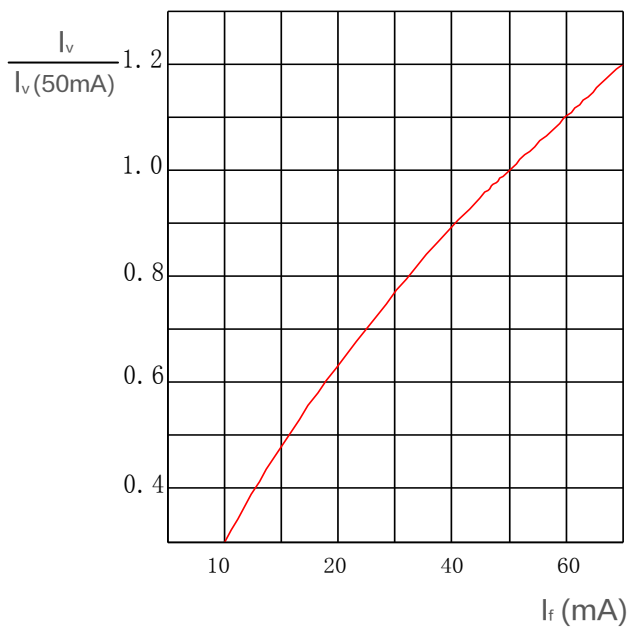
/Forward Current

$I_f = f(V_f; T_a = 25)$



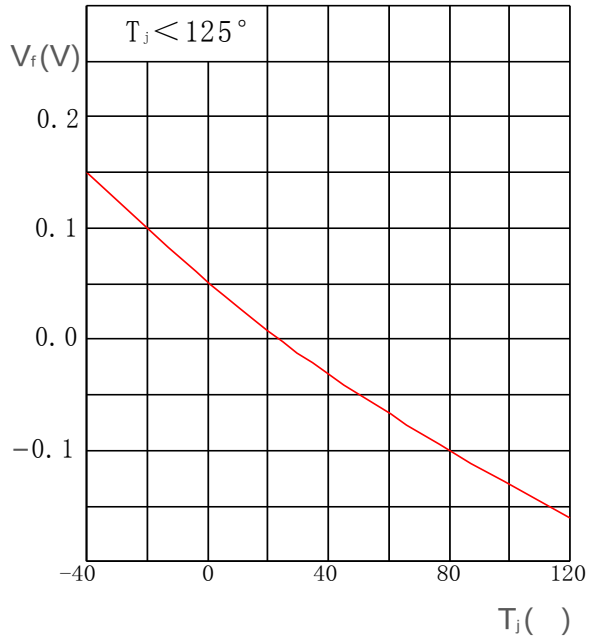
/Relative Luminous Intensity

$I_v/I_v(50\text{mA}) = f(I_f; T_a = 25)$



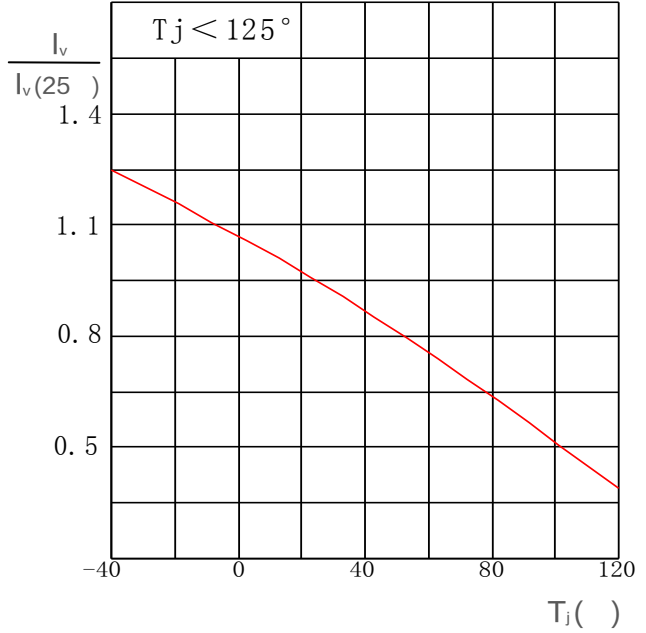
/Relative Forward Voltage

$V_f = V_f - V_f(25^\circ) = f(T_j); I_f = 50 \text{ mA}$

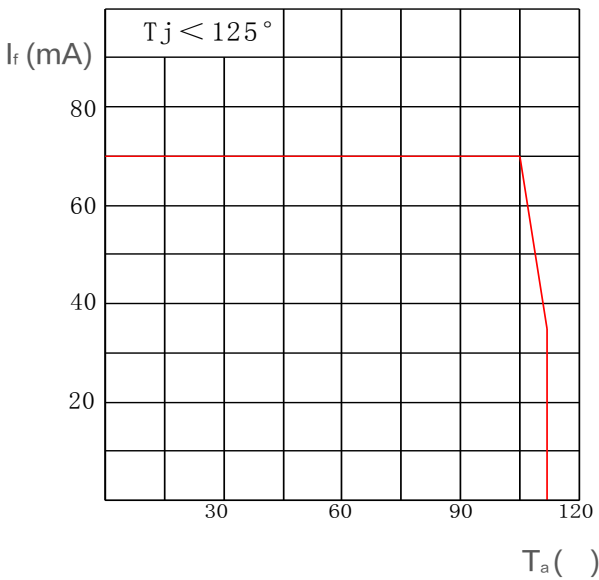


/Relative Luminous Intensity

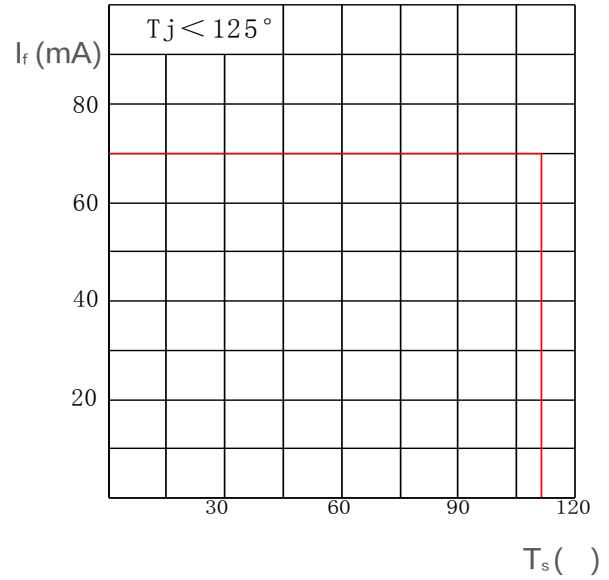
$I_v/I_v(25^\circ) = f(T_j); I_f = 50 \text{ mA}$



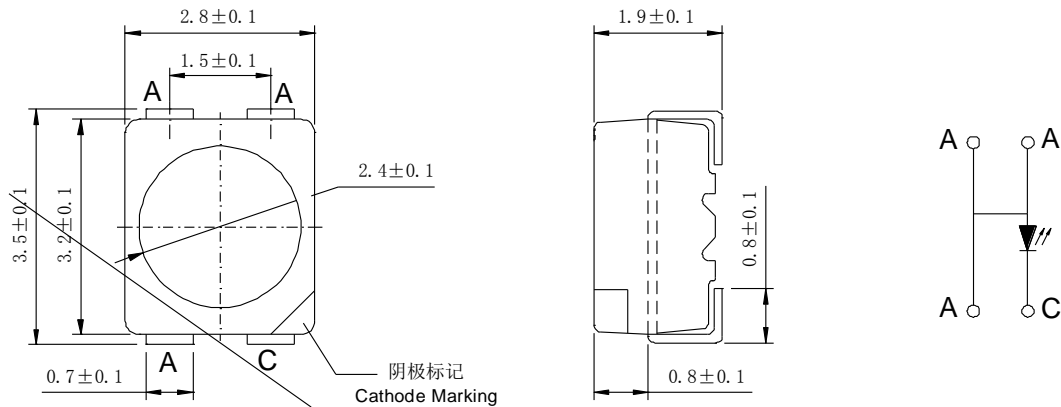
Ambient Temperature vs. Forward Current  
 $I_f = f(T_a)$



/Solder Point Temperature vs. Forward Current  
 $I_f = f(T_s)$



## /Package Outline

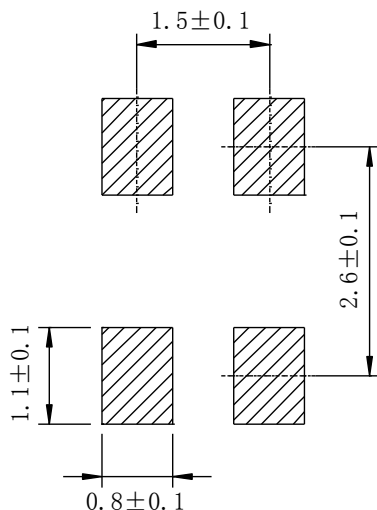


- 30mg
- Class 3B
- : 1) H<sub>2</sub>S 40 /90% R.H, 15ppm, 336 ( IEC 60068-2-43)
- 2) : 25 /75 % R.H, 500
- ( IEC 60068-2-60 4: 10ppb H<sub>2</sub>S, 200ppb SO<sub>2</sub>, 200ppb NO<sub>2</sub>, 10ppb Cl<sub>2</sub>)

### NOTE

- Approximate Weight: 30mg
- Mark: Cathode
- Corrosion test: Class 3B
- Test conditions: 1) H<sub>2</sub>S test 40 /90% R.H, 15ppm, 336hours  
(Standards IEC 60068-2-43)
- 2) Flowing mixed gas test: 25 /75 % R.H, 500hours  
(Standards IEC 60068-2-60 test method 4: 10ppb H<sub>2</sub>S, 200ppb SO<sub>2</sub>, 200ppb NO<sub>2</sub>, 10ppb Cl<sub>2</sub>)

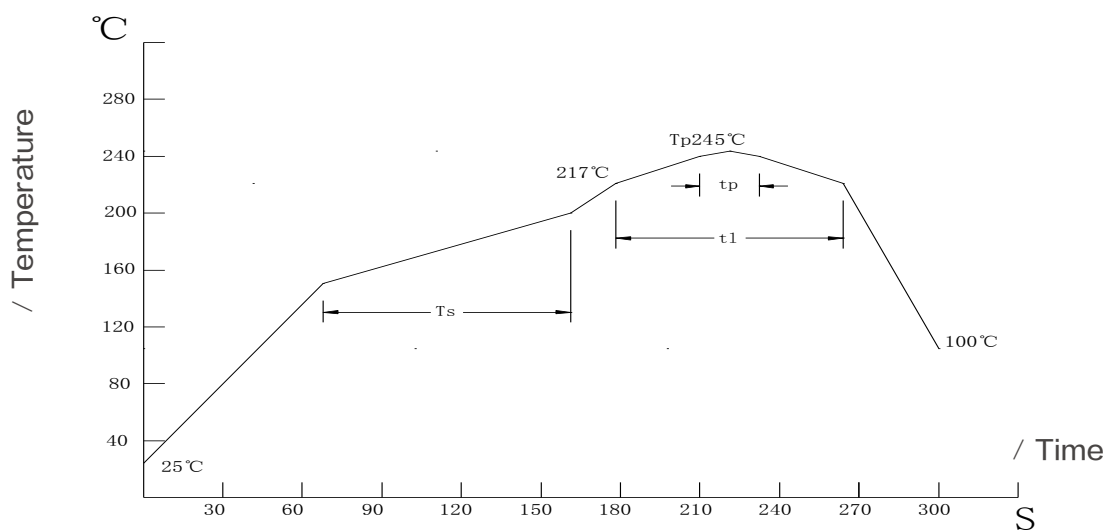
## /Recommended Solder Pad



- NOTE
- Package not suitable for ultrasonic cleaning



## /Reflow Soldering Profile



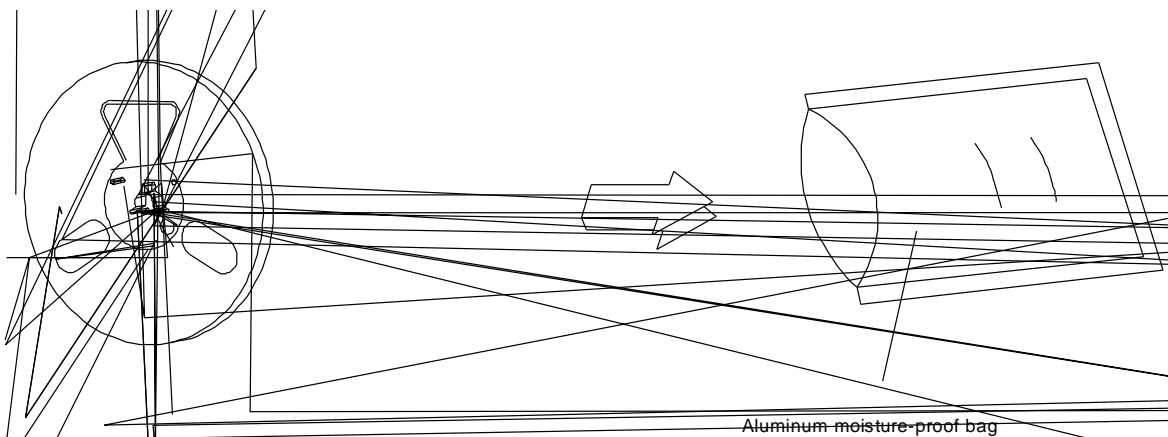
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		min.	rec.	max.	
Ramp-up Rate to Preheat 25 -150	-	-	2	3	/s
/Time $T_{smin}$ to $T_{smax}$	$T_s$	60	100	120	s
Ramp-up Rate to Peak $T_{smax}$ to $T_p$	-	-	2	3	/s
Liquidus Temperature	$T_l$	-	217	-	
Time above Liquidus Temperature	$t_l$	-	80	100	s
/Peak Temperature $\pm 5$	$T_p$	-	245	260	
Time within 5 of the Specified Peak Temperature	$t_p$	10	20	30	s
/Ramp-down Rate $T_p$ to 100	-	-	3	6	/s
/Time 25 to $T_p$	-	-	-	480	s



## /Barcode-Product-Label (BPL)



## /Dry Packing Process and Materials

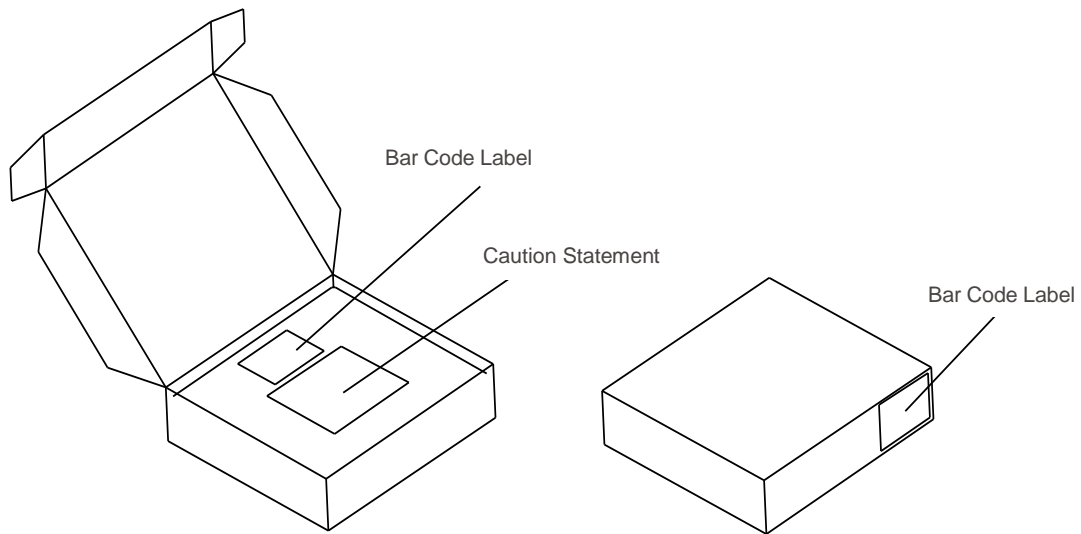


### NOTE

JEDEC

Moisture-sensitive product is packed in a dry bag containing desiccant and HIC (humidity indicator card). Regarding dry pack you may find further information in the internet or JEDEC.

## /Transportation Packing and Materials



## /Dimensions of Transportation Box (mm)

/Width	/Length	/Height
256± 5	223± 5	62± 5
256± 5	223± 5	124± 5

:				
:	,	$\pm 0.1 \text{ mm}$		
	8ms		$\pm 0.05\text{V}$	$\pm 0.1\text{V}$
	GUM K=3			
	25ms		$\pm 0.5\text{nm}$	$\pm 1\text{nm}$
	GUM K=3			
	25ms		$\pm 8\%$	$\pm 11\%$
	GUM K=3			

## Glossary

**Typical Values:** Actual values of each product may differ from these statistical values .

**Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with +/-0.1mm.

**Forward Voltage:** The forward voltage is measured during a current pulse of typically 8 ms, with an internal reproducibility of  $\pm 0.05 \text{ V}$  and an expanded uncertainty of  $\pm 0.1 \text{ V}$  (acc. to GUM with a coverage factor of  $k = 3$ ).

**Wavelength:** The wavelength is measured at a current pulse of typically 25 ms, with an internal reproducibility of  $\pm 0.5 \text{ nm}$  and an expanded uncertainty of  $\pm 1 \text{ nm}$  (acc. to GUM with a coverage factor of  $k = 3$ ).

**Brightness:** Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of  $\pm 8\%$  and an expanded uncertainty of  $\pm 11\%$  (acc. to GUM with a coverage factor of  $k = 3$ ).

**Special Statement:** The final interpretation of this specification shall be vested in Honglitronic, in the case of ambiguity, the Chinese version shall prevail.