

HVS-3528DER



3528 PLCC4

Products Series

压

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

- PPA
- 50% I_v 120T
- 633nm
- AEC-Q102 & IEC 60810压

Features



- Package Colorless clear resin in white PPA cup
- Viewing angle at 50% I_v: 120T
- Color: Super Red (633nm)
- Qualifications: Passed reliability test per AEC-Q102 & IEC 60810 requirement

Applications

- Signaling
- Interior and exterior lighting for automotive

Ordering Information

Type	Luminous Intensity I _v @ I _f =50mA	Ordering Code
HVS-3528DER - XXXX - X - XXXX Brightness Color Forward Voltage	1.40 - 2.80 cd	XXXXXX

<p>■ HVS-3528DER-<u>ABBB</u>-1-XXXX</p> <p>■ 4</p> <p>■  4</p> <p>■  HVS-3528DER-XXXX-1-<u>3A4B</u></p>	<p>4</p> <p>AB BA BB</p> <p>4</p> <p>3A 3B 4A 4B</p>
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Note

■ Brightness Grouping

Only one brightness group will be packed in each reel. Please refer to page #4 for details.
E.g.: HVS-3528DER-ABBB-1-XXXX, means only one bin of AB, BA or BB is in each reel.

■ Color Grouping




Please refer to page #4 for details.

■ Forward Voltage Groups



Only one forward voltage group will be packed in each reel. Please refer to page #4 for details.

E.g.: HVS-3528DER-XXXX-1-3A4B, 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	
 Forward Current ($T_s=25$)	I_f	70	mA
 Peak Forward Current ($t \leq 10\mu s$ $D=0.005$ $T_s=25$)	I_{fp}	100	mA
 Reverse Voltage ($T_s=25$)	V_r	12	V
Electrostatic Discharge (HBM)	V_{ESD}	2000	V
Operating Temperature	T_{opr}	-40 ~ +100	
Storage Temperature	T_{stg}	-40 ~ +100	

Characteristics ($T_s = 25^\circ C$, $I_f = 50$ mA)

Parameters	Symbol	Rating	Unit
Wavelength at Peak Emission	typ. λ_{peak}	645	nm
Dominant Wavelength	min. λ_{dom}	627	nm
	typ. λ_{dom}	633	nm
	max. λ_{dom}	639	nm
Spectral Bandwidth at 50% I_{rel} max	typ.	16	nm
50 % I_v Viewing Angle at 50 % I_v	typ.	120	T
 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	μA
	max. I_r	10	μA
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 $f = 50$ mA)

Grouping	Luminous Intensity I_v min.	Luminous Intensity I_v max.	Luminous Flux Φ_v typ.
AB	1.40 cd	1.80 cd	4.80 lm
BA	1.80 cd	2.24 cd	6.10 lm
BB	2.24 cd	2.80 cd	7.60 lm



Forward Voltage Grouping (T_s $f = 50$ 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 $f = 50$ mA)

Grouping	Dominant Wavelength λ_{dom} min.	Dominant Wavelength λ_{dom} max.
1	627 nm	639 nm

Information on Label

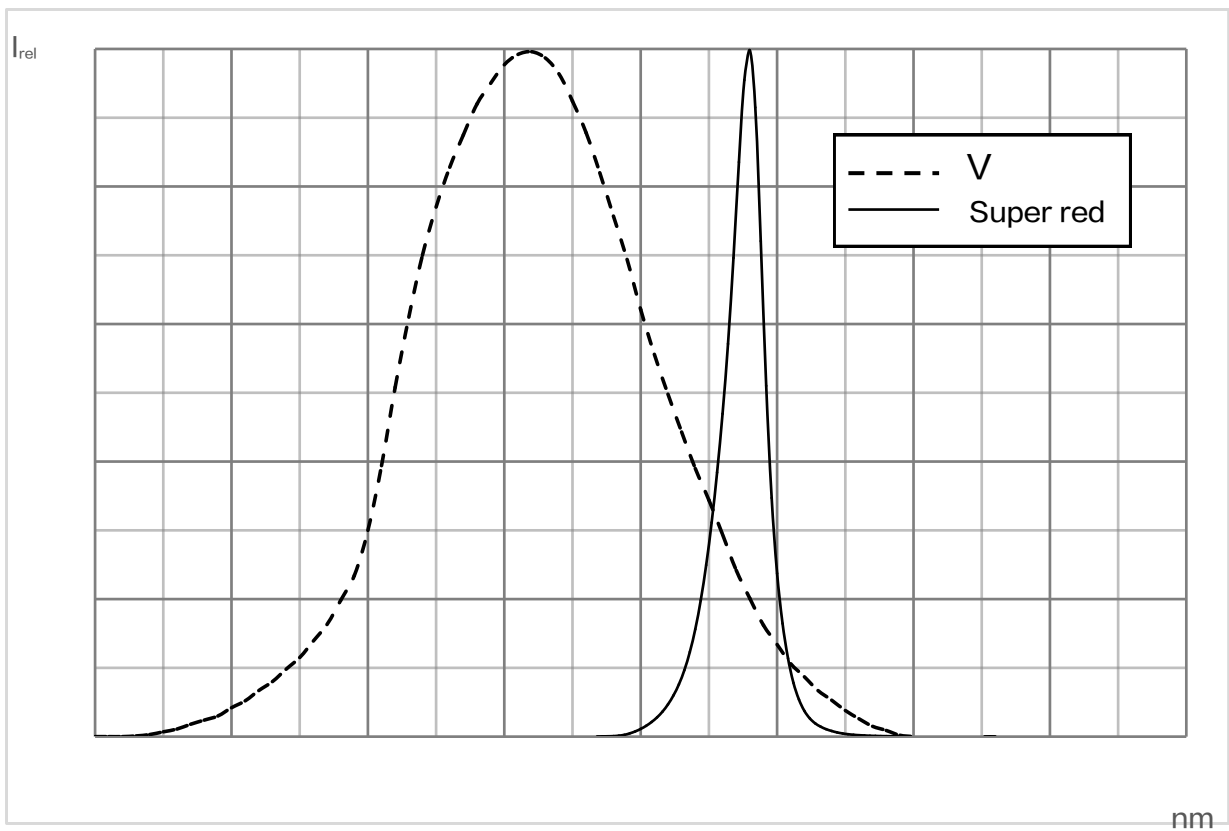
E.g. BA-1-3A

Brightness	Color	 Forward Voltage
BA	1	3A

$$- V(\lambda) =$$

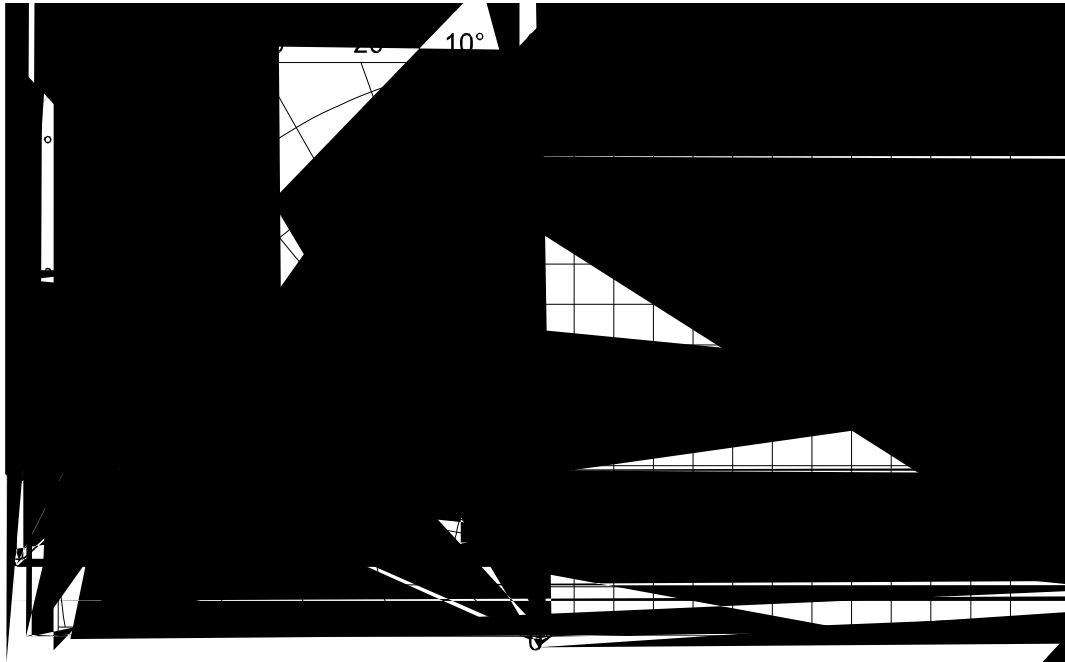
Relative Spectral Emission - $V(\lambda)$ = Standard Eye Response Curve

$$I_{rel} = f(\lambda); T_s \quad I_f = 50 \text{ mA}$$



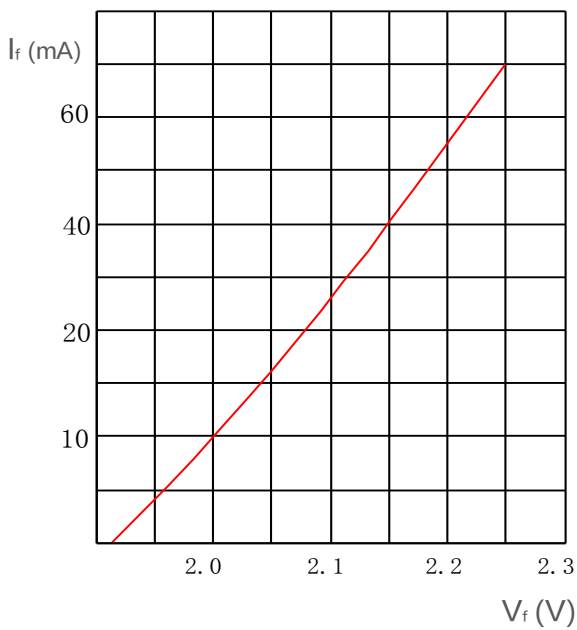
Radiation Characteristics

$I_{rel} = f(\theta) \quad T_s = 25$



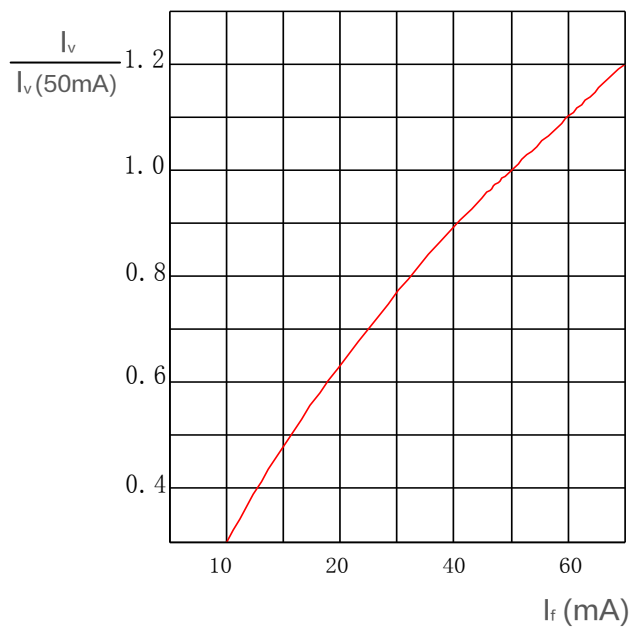
Forward Current

$I_f = f(V_f); T_a$



Relative Luminous Intensity

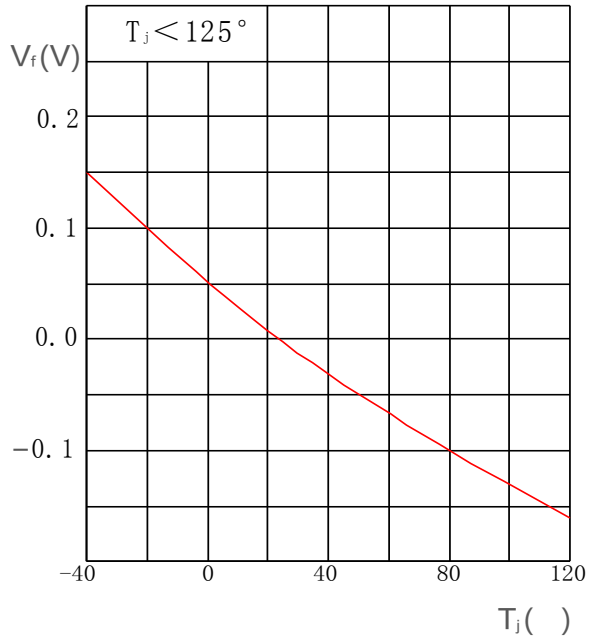
$I_v/I_v(50\text{ mA}) = f(I_f); T_a$





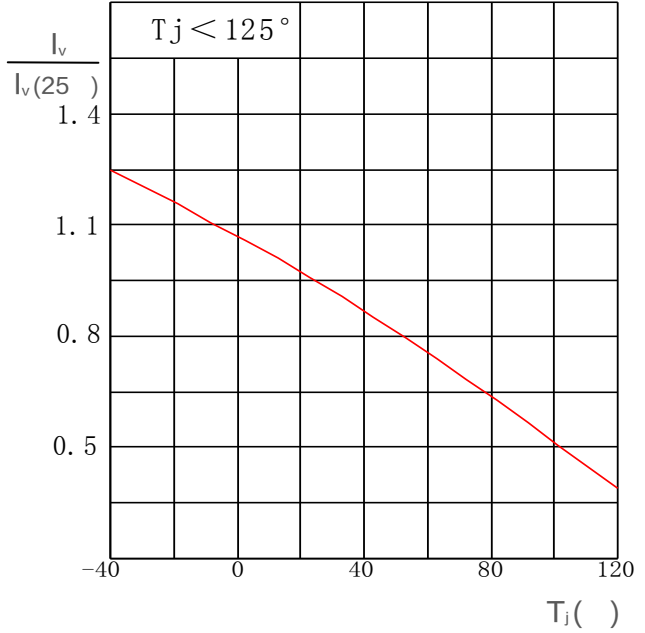
Relative Forward Voltage

$V_f = V_f - V_f$ $8 \text{ } \mu\text{s}; I_f = 50 \text{ mA}$



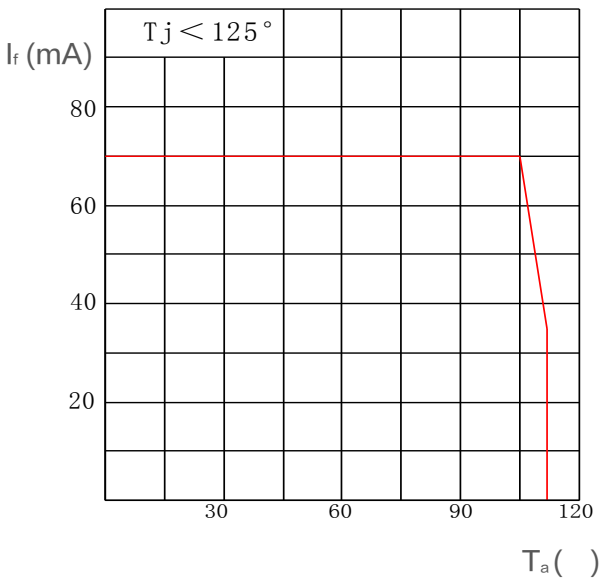
Relative Luminous Intensity

I_v/I_v $8 \text{ } \mu\text{s}; I_f = 50 \text{ mA}$



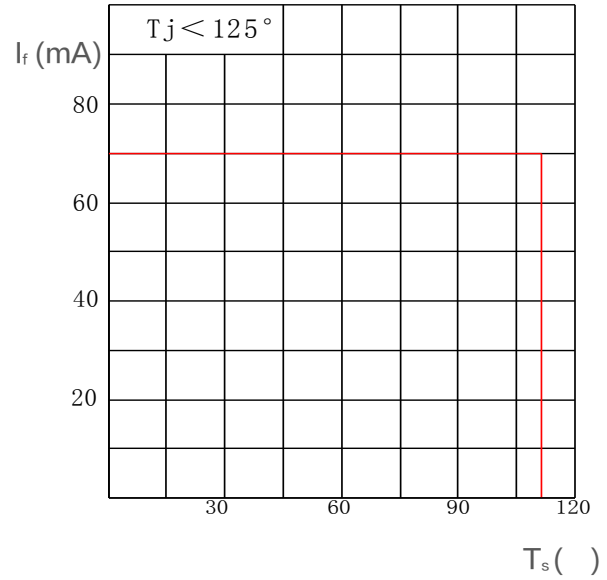
Ambient Temperature vs. Forward Current

$I_f = f(T_a)$

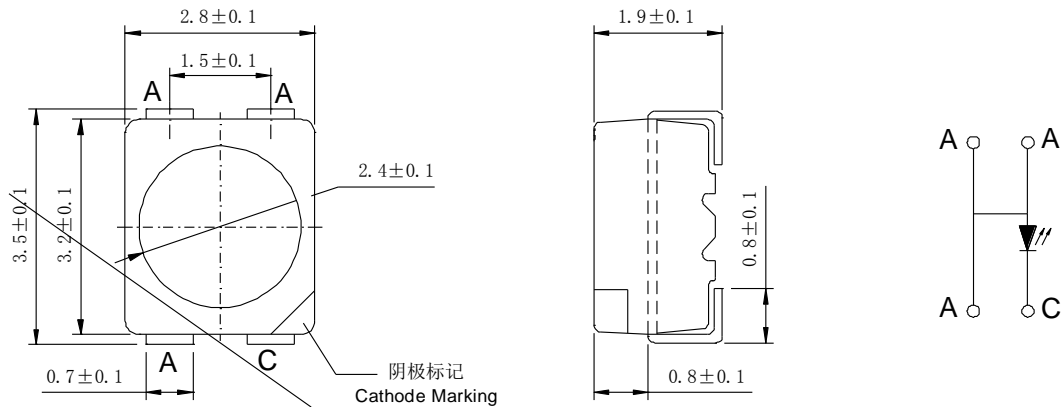


Solder Point Temperature vs. Forward Current

$I_f = f(T_s)$



Package Outline

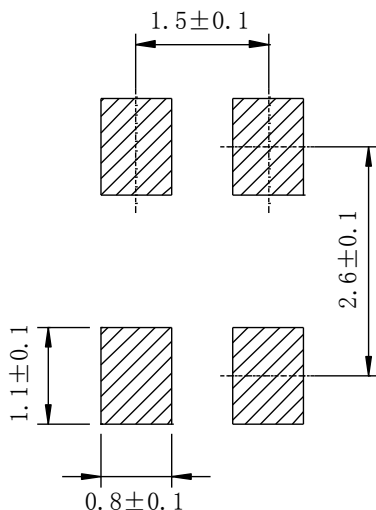


- 30mg
- Class 3B
- : 1) H₂S , 336 IEC 60068-2-43)
- 2) IEC 60068-2-60 4: 10ppb H₂S, 200ppb SO₂, 200ppb NO₂, 10ppb Cl₂)

NOTE

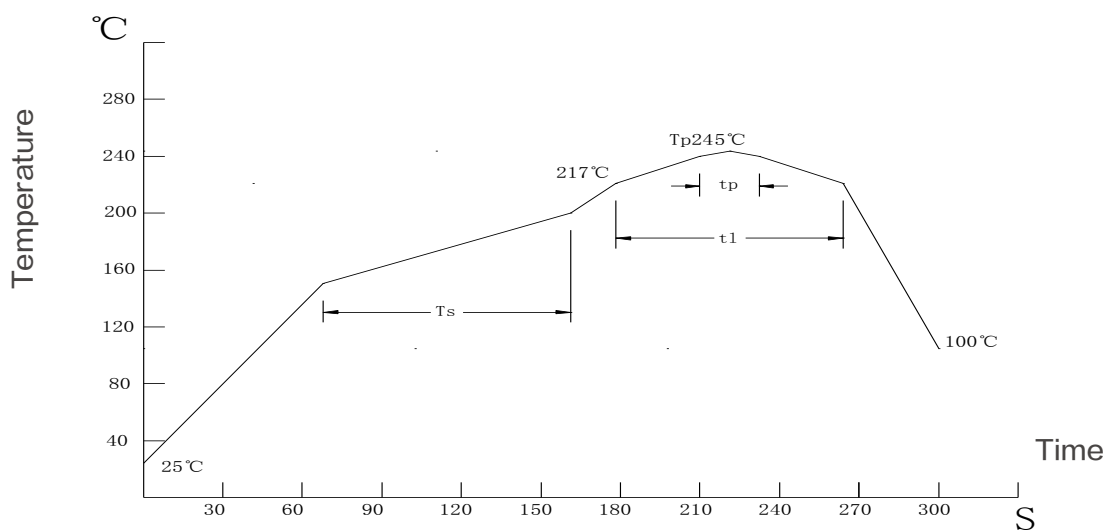
- Approximate Weight: 30mg
- Mark: Cathode
- Corrosion test: Class 3B
- Test conditions: 1) H₂S test , 15ppm, 336hours (Standards IEC 60068-2-43)
- 2) Flowing ; 7 9 7 : G (Standards IEC 60068-2-60 test method 4: 10ppb H₂S, 200ppb SO₂, 200ppb NO₂, 10ppb Cl₂)

Recommended Solder Pad



- NOTE
- Package not suitable for ultrasonic cleaning

Reflow Soldering Profile

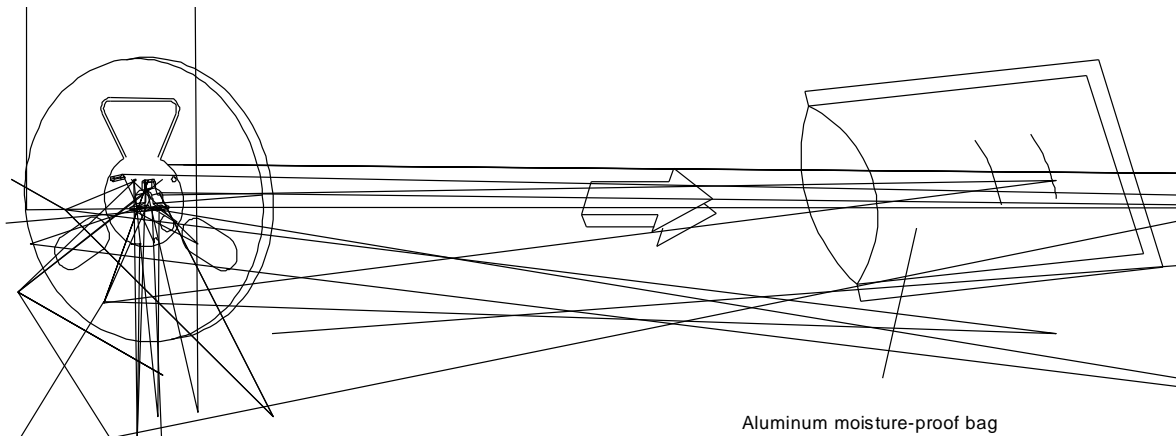


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		min.	rec.	max.	
Ramp-up Rate to Preheat 25 -150	-	-	2	3	/s
Time T_{smin} to T_{smax}	T_s	60	100	120	s
Ramp-up Rate to Peak T_{smax} to T_p	-	-	2	3	s
Liquidus Temperature	T_l	-	217	-	-
Time above Liquidus Temperature	t_l	-	80	100	s
Peak Temperature	T_p	-	245	260	-
U5 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)



卡 Dry Packing Process and Materials

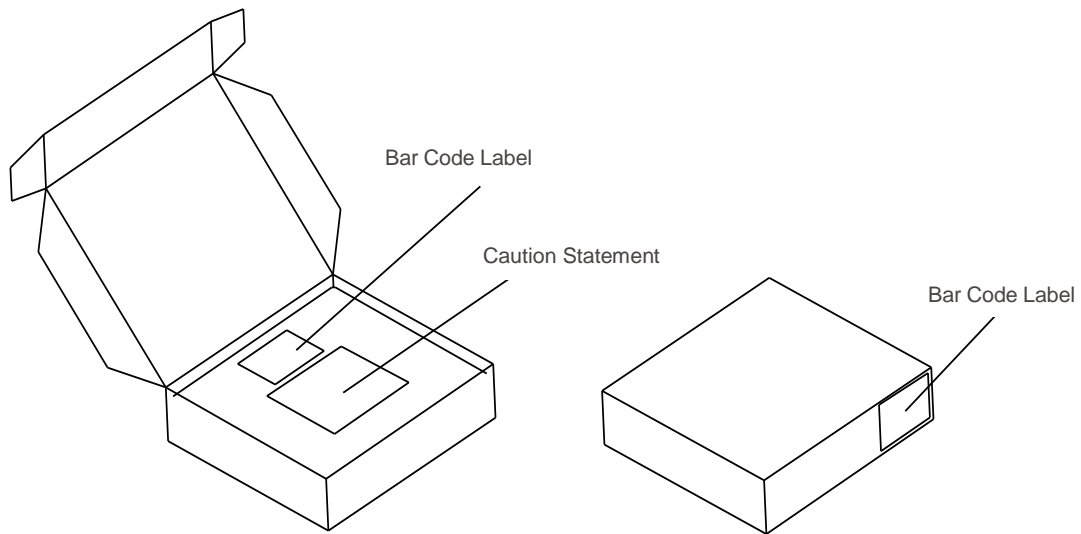


NOTE

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.

压 JEDEC

✦ Transportation Packing and Materials



Dimensions of Transportation Box (mm)

Width	Length	Height
256 U5	223 U5	62 U5
256 U5	223 U5	124 U5

: 压
: , U
8ms U0.05V U0.1V
GUM K=3
25ms U0.5nm U1nm
GUM K=3
25ms U8% U11%
GUM K=3

Glossary

Typical Values