

# HDSM-531x/533x

## 0.56" (14.22mm) Single digit surface mount LED display



### Data Sheet

#### Description

This is 0.56" (14.22mm) height single digit display. This device utilizes AlInGaP / GaAs chip. This device is with top surface gray and white segments.

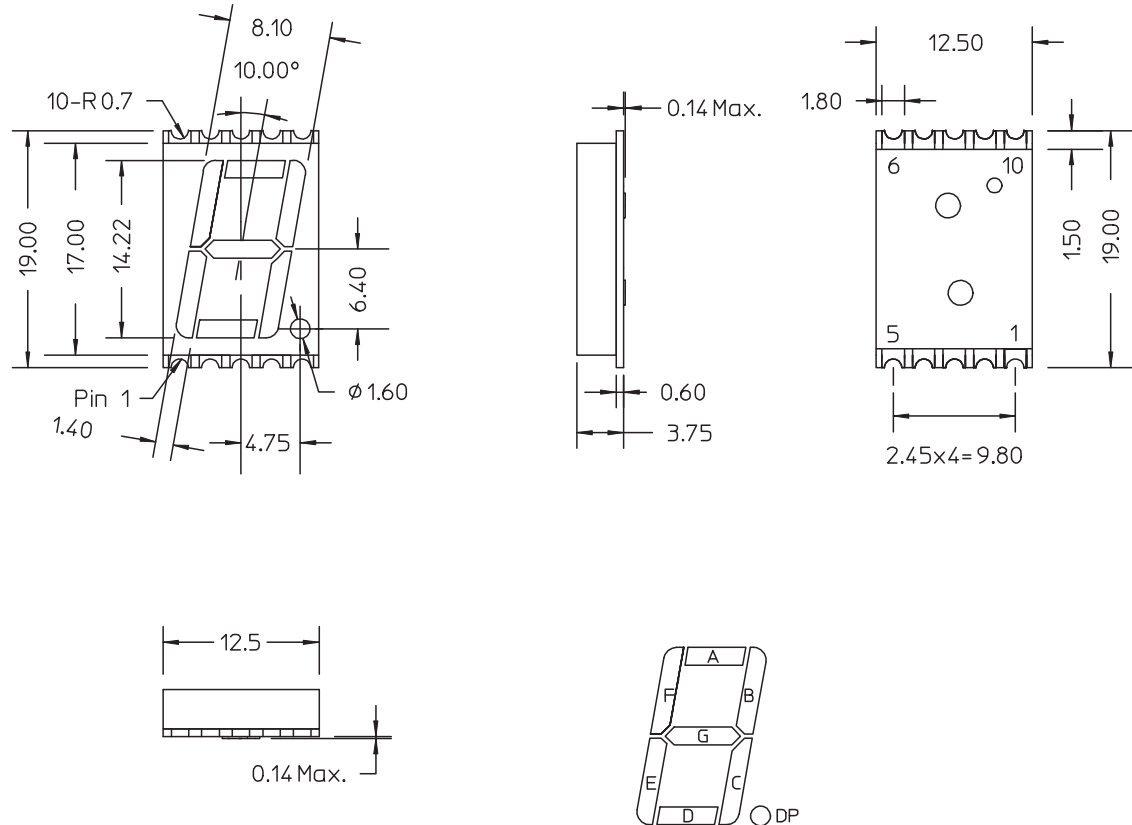
#### Features

- 0.56" digit height
- Low current operation
- Excellent characters appearance
- Available in CA and CC
- 1000 pieces per reel
- Moisture Sensitivity Level: Level 3
- RoHS compliant

#### Ordering Information

Red	Green	Yellow	Orange	Description
HDSM-531C	HDSM-531H	HDSM-531F	HDSM-531L	Common Anode, Right Hand Decimal
HDSM-533C	HDSM-533H	HDSM-533F	HDSM-533L	Common Cathode, Right Hand Decimal

#### Package Dimensions



Notes:  
 All dimensions are in millimeters (inches).  
 Tolerance:  $\pm 0.25\text{mm}$  (0.01") unless otherwise noted.

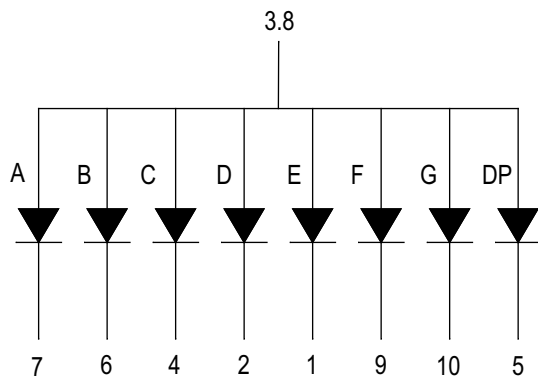
### Pin Connection (Common Anode)

PIN No	Connection
1	Cathode E
2	Cathode D
3	Common Anode
4	Cathode C
5	Cathode DP
6	Cathode B
7	Cathode A
8	Common Anode
9	Cathode F
10	Cathode G

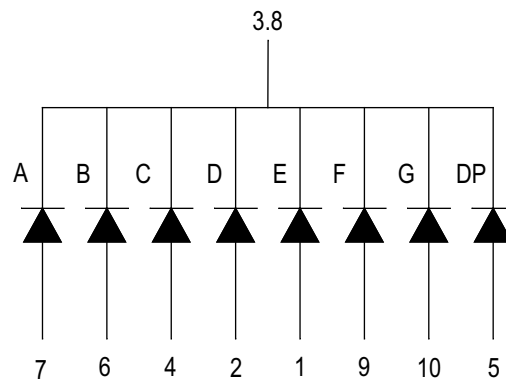
### Pin Connection (Common Cathode)

PIN No	Connection
1	Anode E
2	Anode D
3	Common Cathode
4	Anode C
5	Anode DP
6	Anode B
7	Anode A
8	Common Cathode
9	Anode F
10	Anode G

### Internal Circuit Diagram (Common Anode)



### Internal Circuit Diagram (Common Cathode)



### Absolute Maximum Ratings @ $T_A=25^\circ$

Parameter	Green/Yellow/Red/Orange	Unit
Power Dissipation Per Segment	65	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, .01ms pulse width)	100	mA
Continuous Forward Current Per Segment Derating Linearly From 25°C Per Segment	25 0.25	mA mA/°C
Reverse Voltage Per Segment	5	V
Operating Temperature Range	-40°C to +105°C	
Storage Temperature Range	-40°C to +105°C	

## Electrical / Optical Characteristics @ T<sub>A</sub>=25°C

### Green

Parameters	Symbol	Min	Typ	Max	Unit	Test Condition
Average Luminous Intensity	I <sub>V</sub>	5.4	10.5	-	Mcd	I <sub>F</sub> = 10mA
Emissions Wavelength	λ <sub>p</sub> /λ <sub>d</sub>	-	572/571	-	Nm	I <sub>F</sub> = 20mA
Spectral Line Half-Width	Δλ	-	20	-	Nm	I <sub>F</sub> = 20mA
Forward Voltage, Per Segment	V <sub>F</sub>	-	2.1	2.6	V	I <sub>F</sub> = 20mA
Reverse Current, Per Segment	I <sub>R</sub>	-	-	100	μA	V <sub>R</sub> = 5V
Luminous Intensity Matching Ratio	I <sub>V-M</sub>	-	-	2:1	-	I <sub>F</sub> = 10mA

### Yellow

Parameters	Symbol	Min	Typ	Max	Unit	Test Condition
Average Luminous Intensity	I <sub>V</sub>	8.6	20	-	Mcd	I <sub>F</sub> = 10mA
Emissions Wavelength	λ <sub>p</sub> /λ <sub>d</sub>	-	591/589	-	Nm	I <sub>F</sub> = 20mA
Spectral Line Half-Width	Δλ	-	15	-	Nm	I <sub>F</sub> = 20mA
Forward Voltage, Per Segment	V <sub>F</sub>	-	2.1	2.6	V	I <sub>F</sub> = 20mA
Reverse Current, Per Segment	I <sub>R</sub>	-	-	100	μA	V <sub>R</sub> = 5V
Luminous Intensity Matching Ratio	I <sub>V-M</sub>	-	-	2:1	-	I <sub>F</sub> = 10mA

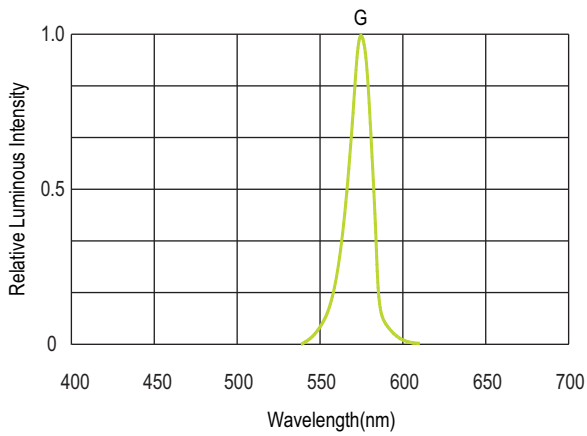
### Red

Parameters	Symbol	Min	Typ	Max	Unit	Test Condition
Average Luminous Intensity	I <sub>V</sub>	8.6	16	-	Mcd	I <sub>F</sub> = 10mA
Emissions Wavelength	λ <sub>p</sub> /λ <sub>d</sub>	-	632/624	-	Nm	I <sub>F</sub> = 20mA
Spectral Line Half-Width	Δλ	-	20	-	Nm	I <sub>F</sub> = 20mA
Forward Voltage, Per Segment	V <sub>F</sub>	-	2.0	2.6	V	I <sub>F</sub> = 20mA
Reverse Current, Per Segment	I <sub>R</sub>	-	-	100	μA	V <sub>R</sub> = 5V
Luminous Intensity Matching Ratio	I <sub>V-M</sub>	-	-	2:1	-	I <sub>F</sub> = 10mA

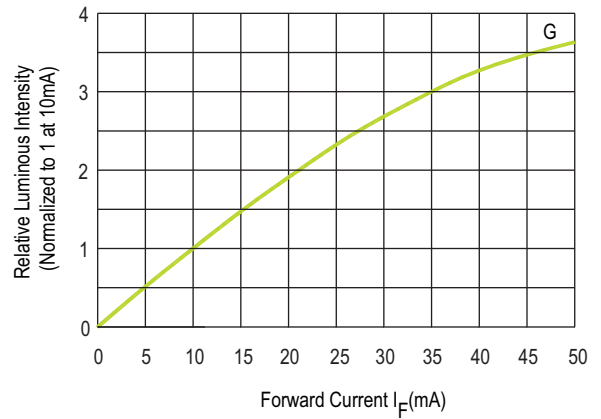
### Orange

Parameters	Symbol	Min	Typ	Max	Unit	Test Condition
Average Luminous Intensity	I <sub>V</sub>	8.6	19.5	-	Mcd	I <sub>F</sub> = 10mA
Emissions Wavelength	λ <sub>p</sub> /λ <sub>d</sub>	-	611/605	-	Nm	I <sub>F</sub> = 20mA
Spectral Line Half-Width	Δλ	-	17	-	Nm	I <sub>F</sub> = 20mA
Forward Voltage, Per Segment	V <sub>F</sub>	-	2.1	2.6	V	I <sub>F</sub> = 20mA
Reverse Current, Per Segment	I <sub>R</sub>	-	-	100	μA	V <sub>R</sub> = 5V
Luminous Intensity Matching Ratio	I <sub>V-M</sub>	-	-	2:1	-	I <sub>F</sub> = 10mA

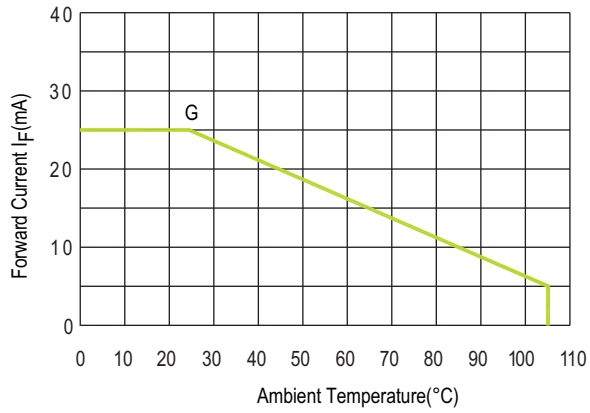
**Typical Electrical / Optical characteristic curves @  $T_A=25^\circ\text{C}$**   
**Green**



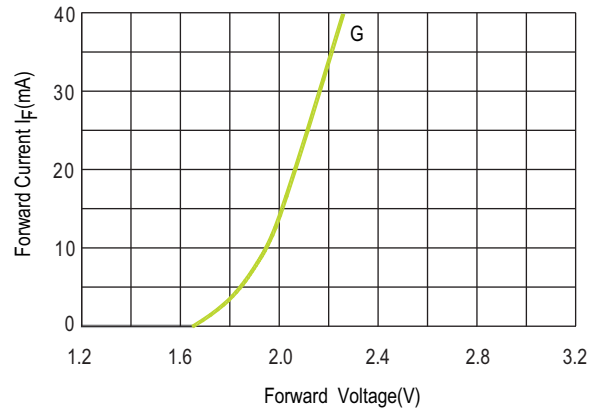
**Figure 1. Relative Luminous Intensity vs. Wavelength**



**Figure 2. Relative Luminous Intensity vs. Forward Current**



**Figure 3. Allowable DC Current vs. Ambient Temperature**



**Figure 4. Forward Current vs. Forward Voltage**

## Yellow

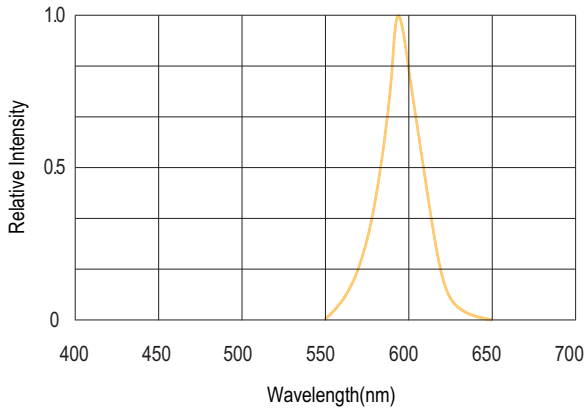


Figure 1. Relative Intensity vs. Wavelength

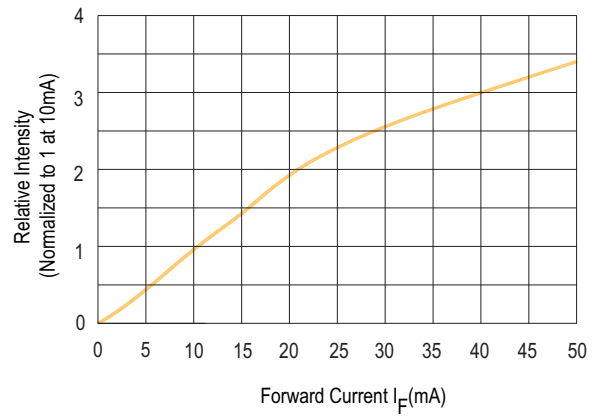


Figure 2. Relative Intensity vs. Forward Current

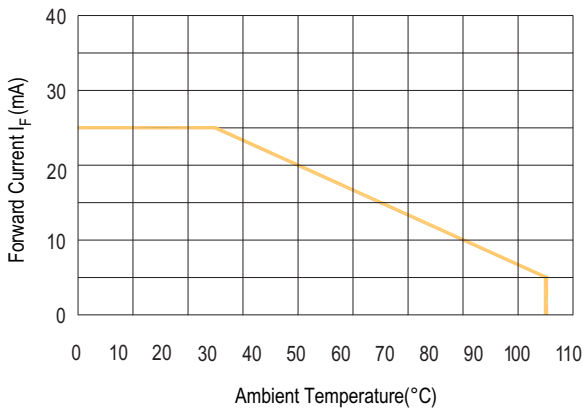


Figure 3. Allowable DC Current vs. Ambient Temperature

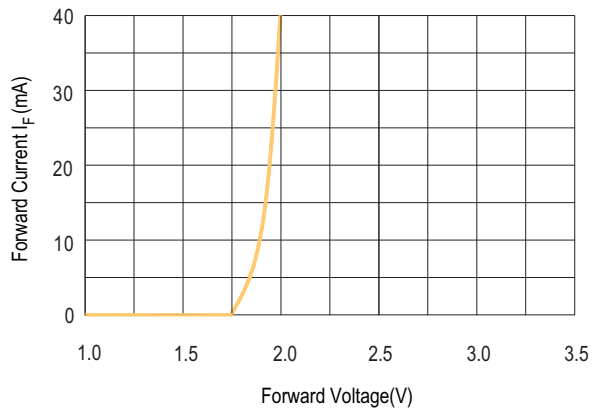


Figure 4. Forward Current vs. Forward Voltage

### Red

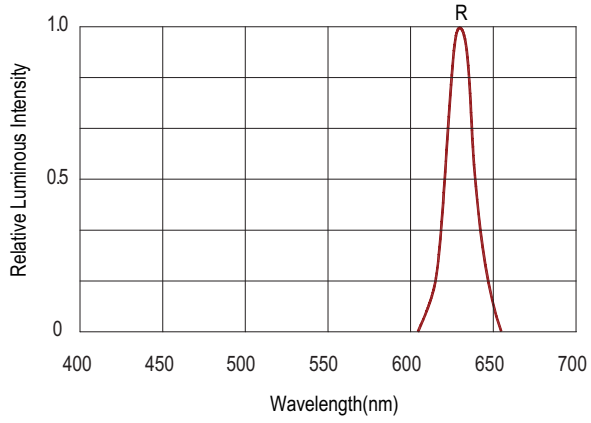


Figure 1. Relative Luminous Intensity vs. Wavelength

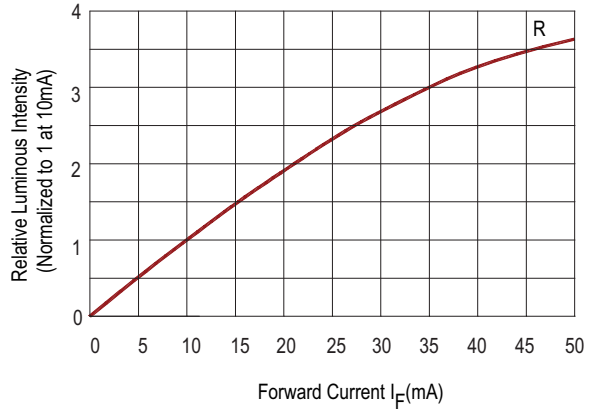


Figure 2. Relative Luminous Intensity vs. Forward Current

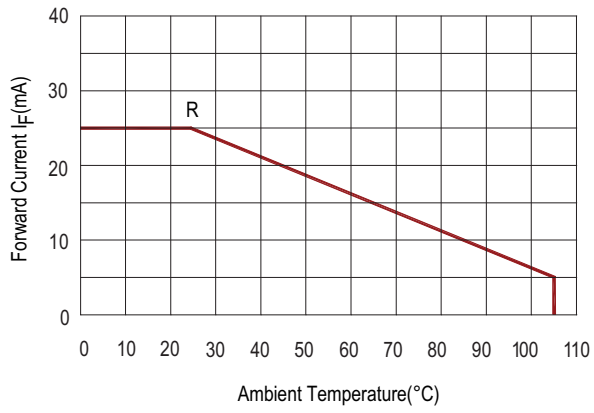


Figure 3. Allowable DC Current vs. Ambient Temperature

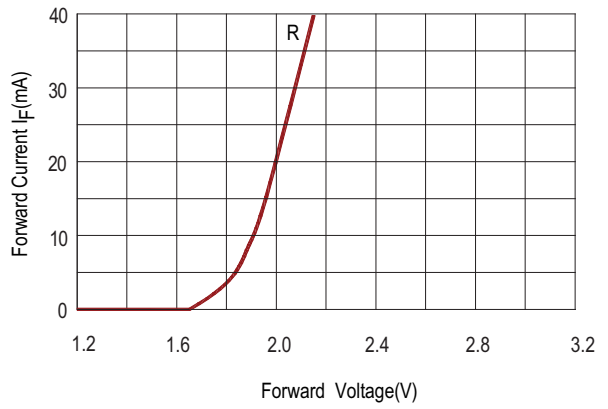


Figure 4. Forward Current vs. Forward Voltage

## Orange

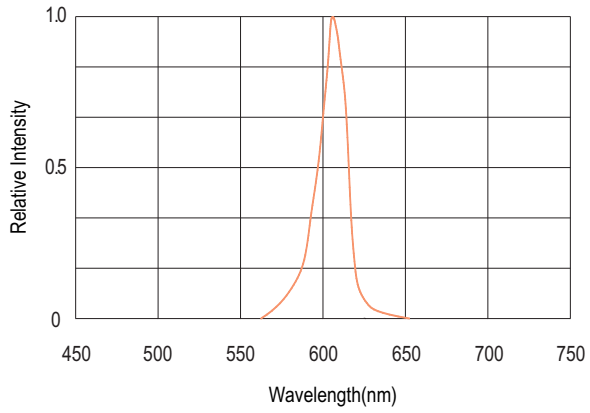


Figure 1. Relative Intensity vs. Wavelength

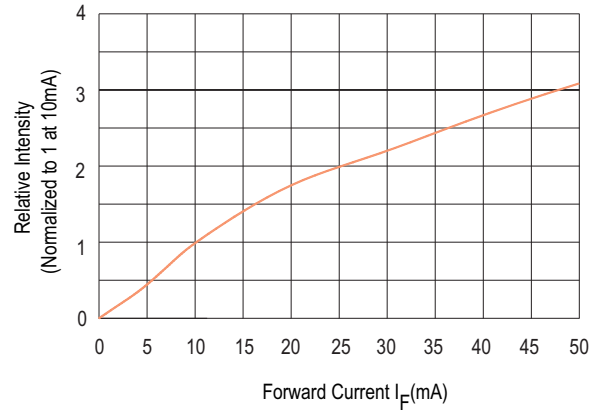


Figure 2. Relative Intensity vs. Forward Current

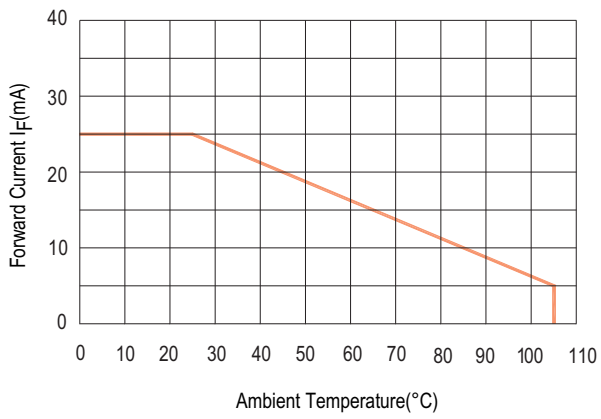


Figure 3. Allowable DC Current vs. Ambient Temperature

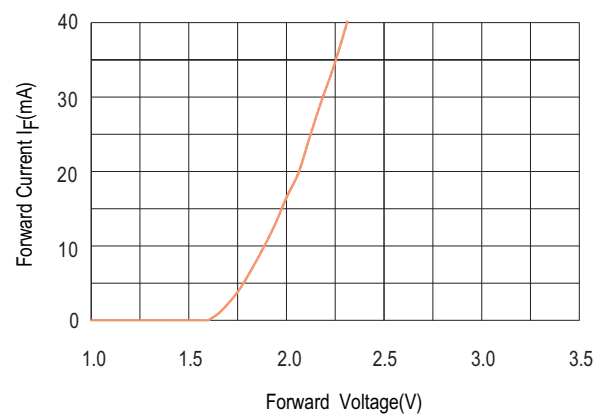


Figure 4. Forward Current vs. Forward Voltage

## Intensity Bin Limits (mcd)

### Green

IV Bin Category	Min.	Max
M	5.401	8.600
N	8.601	13.700
P	13.701	21.800
Q	21.801	34.700

Tolerance: ±15%

### Yellow / Red / Orange

IV Bin Category	Min.	Max
N	8.601	13.700
P	13.701	21.800
Q	21.801	34.700
R	34.701	55.200

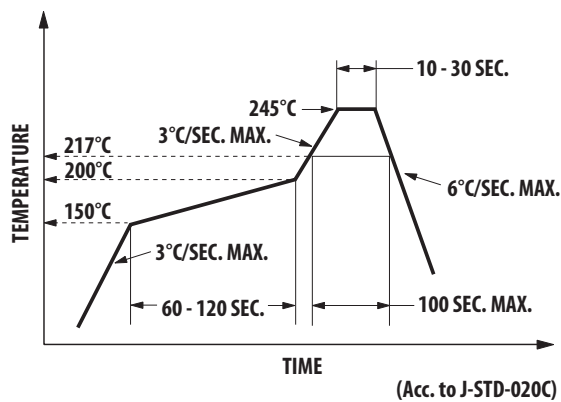
Tolerance: ±15%

Note:

- Bin categories are established for classification of products. Products may not be available in all categories. Please contact your Avago representative for information on currently available bins.

## SMT Soldering Profile

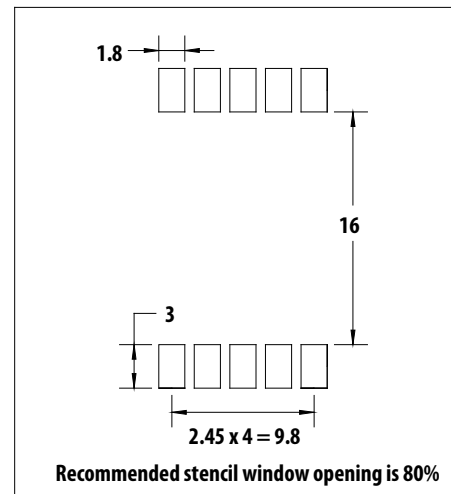
### Pb free reflow soldering Profile



Notes:

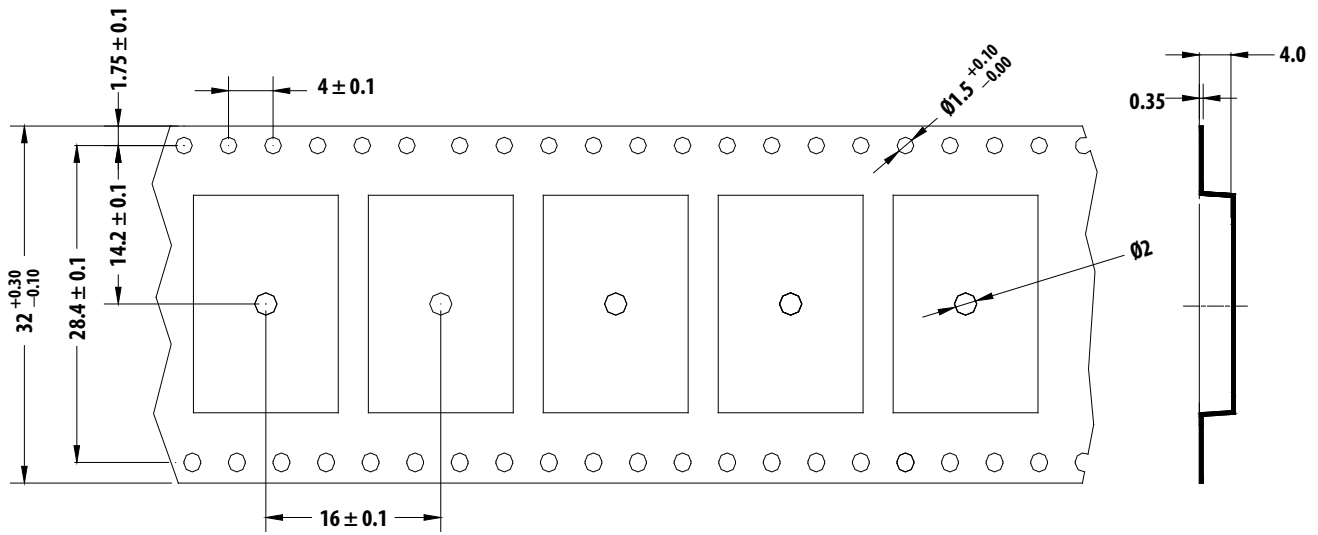
- The peak temperature refers to the peak package body temperature.
- Number of reflow process shall be limited to maximum 2 times only. Cooling process to normal temperature is required between first and second soldering process.

## Recommended soldering pattern (unit: mm)





### Tape specification (unit: mm)



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