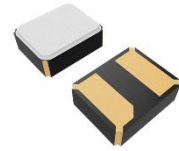


## Commercial Grade Ceramic Base SMD 2-pad Crystal

### Description

The ABM11A series is an AT-Cut fundamental mode MHz quartz crystal offered in a 2.0mm x 1.6mm x 0.8mm two-pad SMD package. Tight frequency accuracy of  $\pm 15\text{ppm}$  at room temperature ( $+25^\circ\text{C}$ ) with frequency stability as low as  $\pm 50\text{ppm}$  over operating temperature range of  $-40^\circ\text{C}$  to  $+125^\circ\text{C}$  is achieved in industry-standard carrier frequencies common for high-density, modem, communication, test equipment, PCMCIA, and wireless end applications.



### Features

- 2.0 x 1.6 x 0.8mm two-pad package
- Suitable for RoHS compliant reflow
- Seam sealed ceramic package with metal lid assures high precision and reliability
- [REACH/RoHS II Compliant](#) | MSL Level = 1

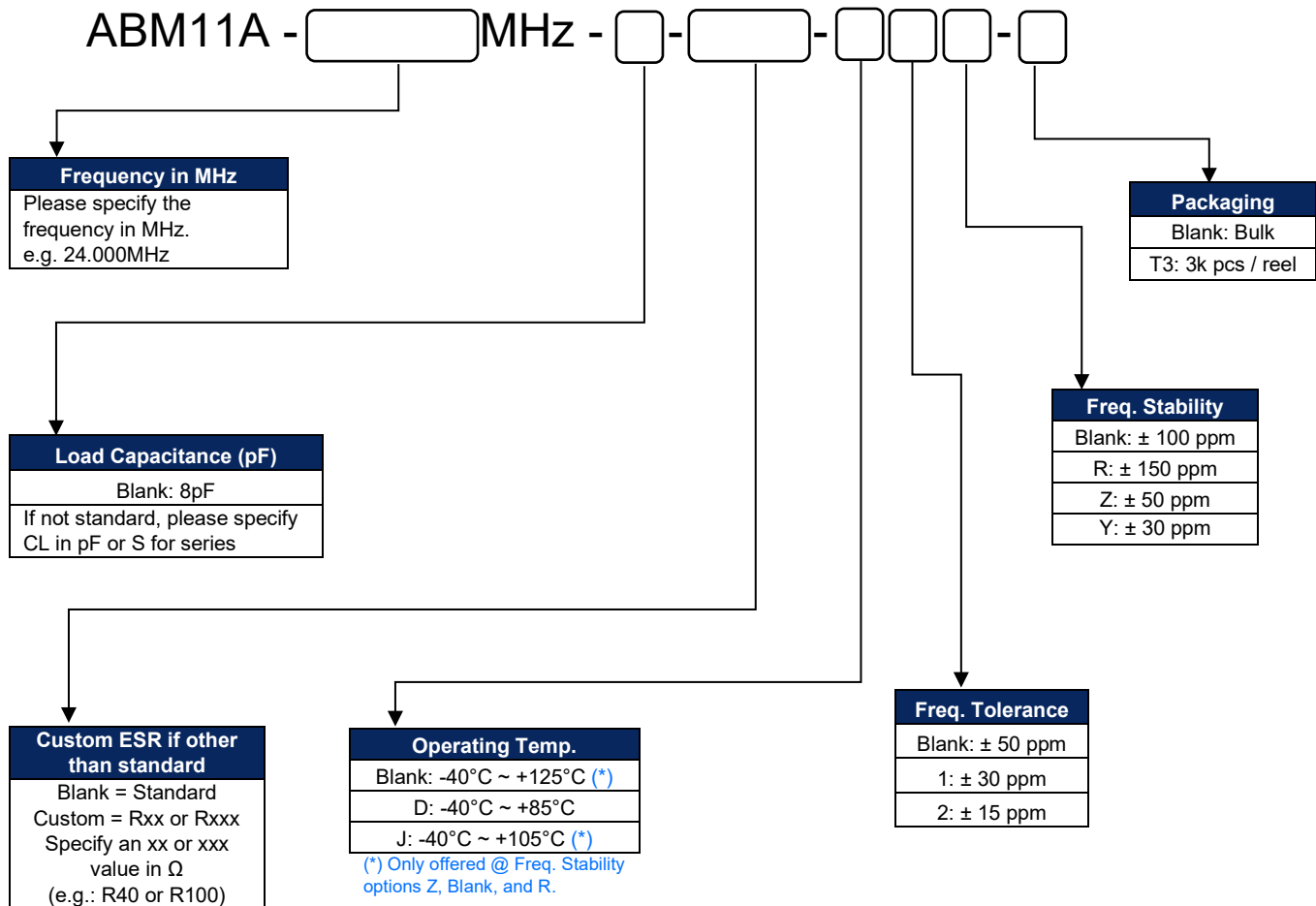
### Typical Applications

- High-density applications
- Modems, communication, and test equipment
- PCMCIA and wireless applications

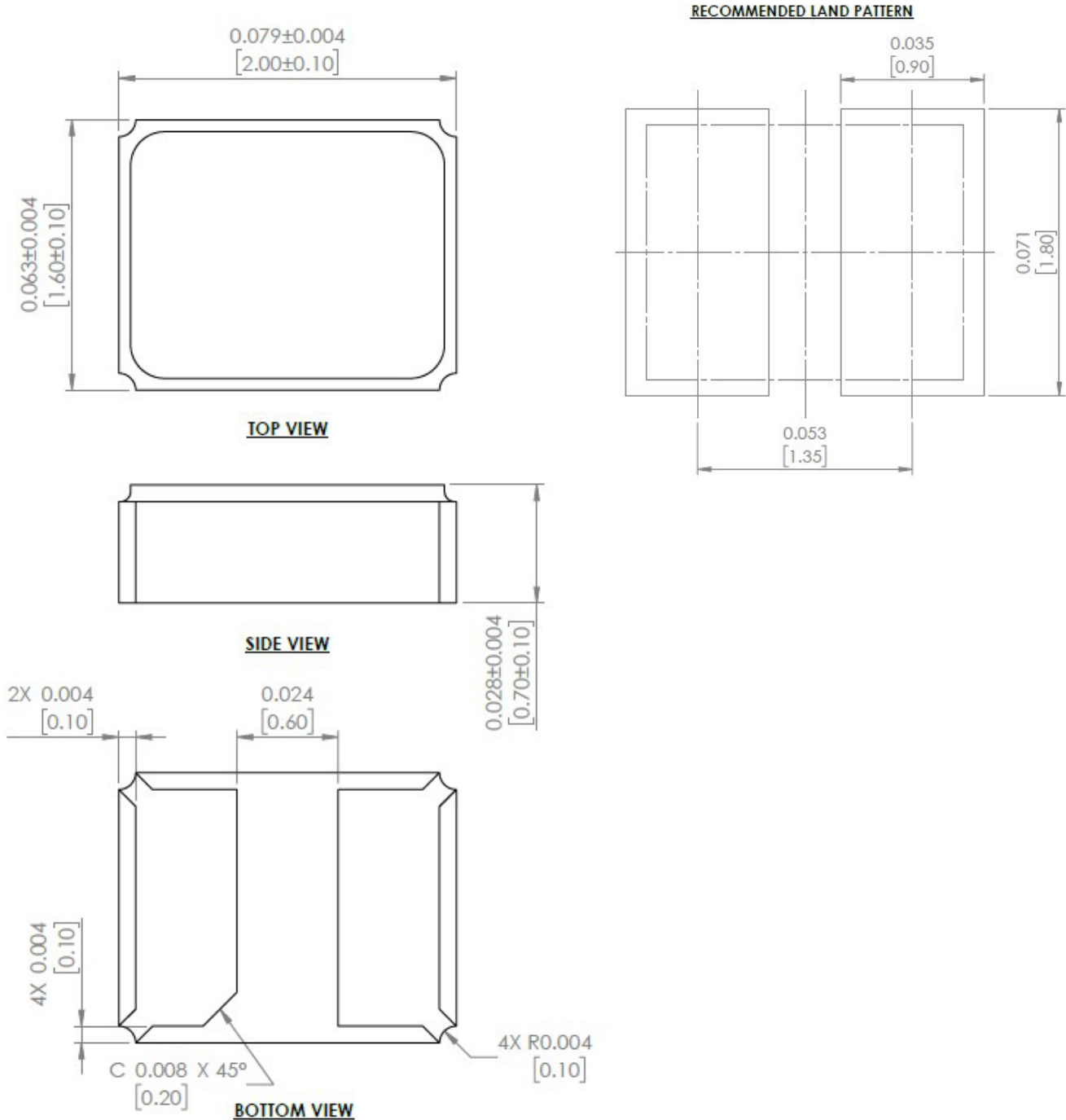
### Electrical Specifications

| Parameters                                                                        | Min.                 | Typ. | Max.   | Units            | Notes                                               |
|-----------------------------------------------------------------------------------|----------------------|------|--------|------------------|-----------------------------------------------------|
| Frequency Range                                                                   | 16.000               |      | 54.000 | MHz              |                                                     |
| Operation Mode                                                                    | Fundamental (AT-cut) |      |        |                  |                                                     |
| Operating Temperature                                                             | -40                  |      | +125   | $^\circ\text{C}$ | Option "blank"; See options                         |
| Storage Temperature                                                               | -40                  |      | +150   | $^\circ\text{C}$ |                                                     |
| Frequency Tolerance @ $+25^\circ\text{C}$                                         | -50                  |      | +50    | ppm              | Option "blank"; See options                         |
| Frequency Stability over the Operating Temperature (ref. to $+25^\circ\text{C}$ ) | -100                 |      | +100   | ppm              | Option "blank"; See options                         |
| Equivalent series resistance (R1)                                                 |                      |      | 200    | $\Omega$         | 16.000 - 23.999MHz                                  |
|                                                                                   |                      |      | 60     |                  | 24.000 - 47.999MHz                                  |
|                                                                                   |                      |      | 40     |                  | 48.000 - 53.999MHz                                  |
|                                                                                   |                      |      | 30     |                  | 54.000MHz                                           |
| Shunt capacitance (C0)                                                            |                      |      | 3.0    | pF               |                                                     |
| Load capacitance (CL)                                                             |                      | 8    |        | pF               | Option "blank"; See options                         |
| Drive Level                                                                       |                      | 10   | 100    | $\mu\text{W}$    |                                                     |
| Aging                                                                             | -3                   |      | +3     | ppm              | @ $25^\circ\text{C} \pm 3^\circ\text{C}$ First year |
| Spurious Ratio                                                                    |                      |      | -3     | dB               | F0 $\pm 500\text{kHz}$                              |
| Insulation Resistance                                                             | 500                  |      |        | M $\Omega$       | @100Vdc $\pm 15\text{V}$                            |

Part Identification (left blank if standard)



## Mechanical Dimensions



Dimensions: inches [mm]

## Reflow Profile [JEDEC J-STD-020]

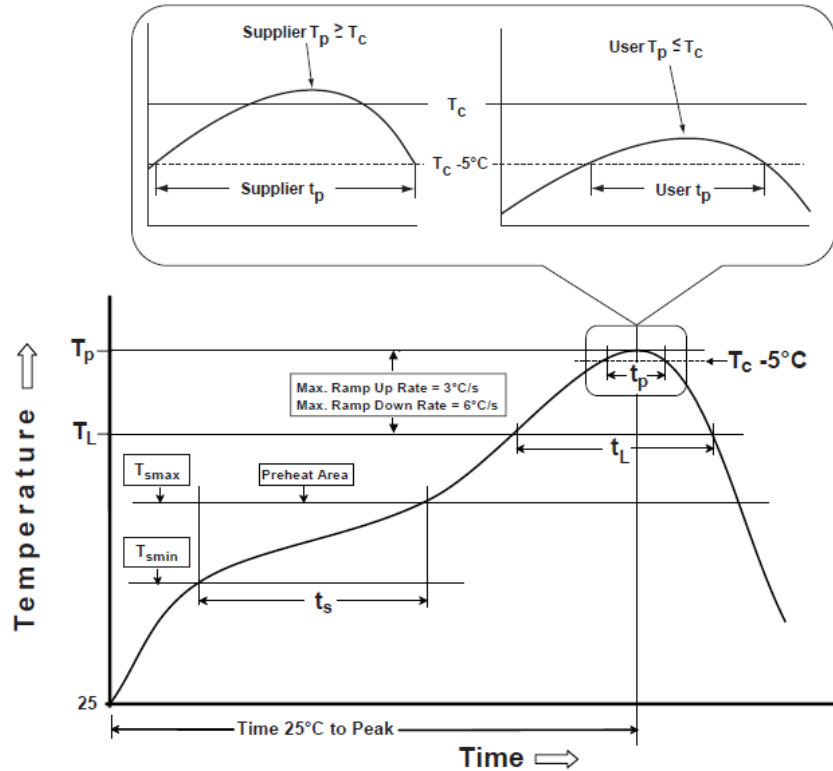


Table 1

**SnPb Eutectic Process**  
**Classification Temperatures ( $T_c$ )**

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5 mm           | 235 °C                      | 220 °C                      |
| ≥2.5 mm           | 220 °C                      | 220 °C                      |

Table 2

**Pb-Free Process**  
**Classification Temperatures ( $T_c$ )**

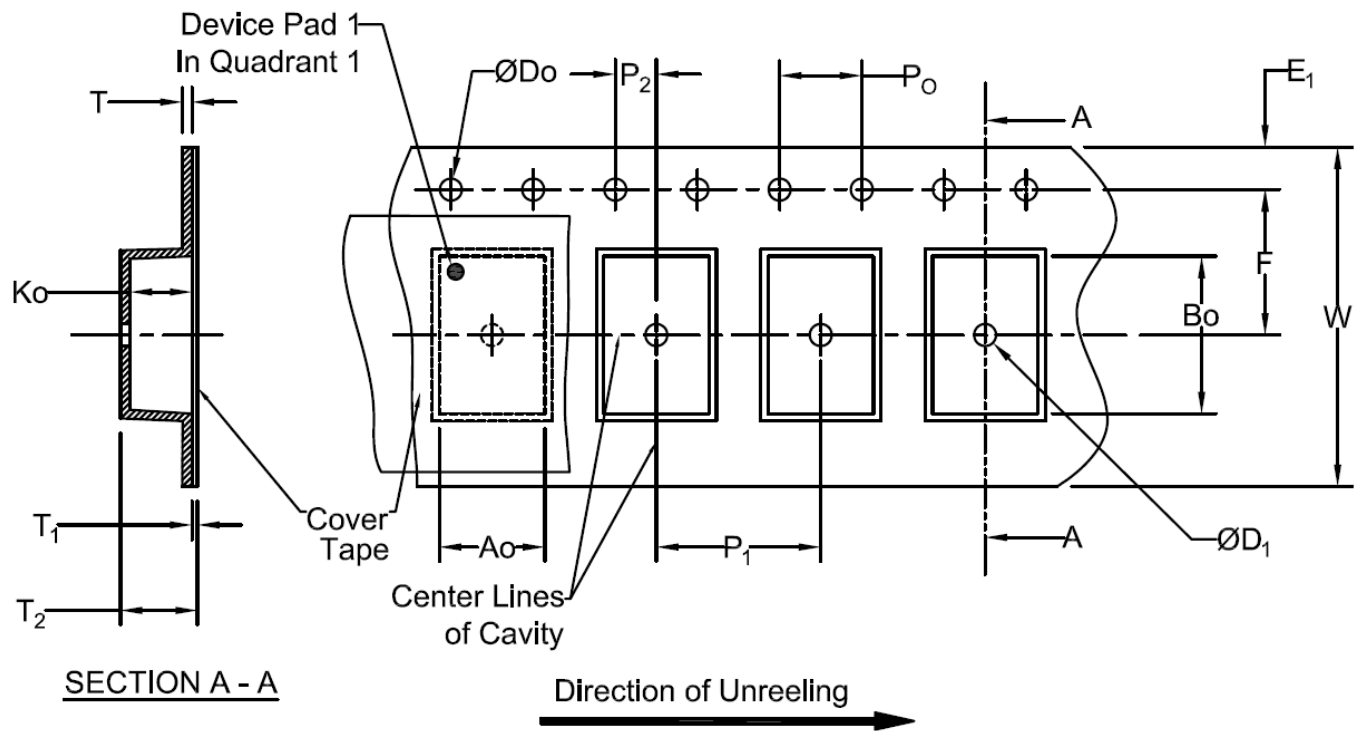
| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350-2000 | Volume mm <sup>3</sup> >2000 |
|-------------------|-----------------------------|---------------------------------|------------------------------|
| <1.6 mm           | 260 °C                      | 260 °C                          | 260 °C                       |
| 1.6 mm - 2.5 mm   | 260 °C                      | 250 °C                          | 245 °C                       |
| >2.5 mm           | 250 °C                      | 245 °C                          | 245 °C                       |

| Profile Feature                                                                   | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|-----------------------------------------------------------------------------------|-------------------------|------------------|
| Preheat / soak                                                                    |                         |                  |
| Temperature minimum ( $T_{smin}$ )                                                | 100°C                   | 150°C            |
| Temperature maximum ( $T_{smax}$ )                                                | 150°C                   | 200°C            |
| Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )                                       | 60 - 120 sec.           | 60 - 120 sec.    |
| Average ramp-up rate ( $T_{smax}$ to $T_p$ )                                      | 3°C/sec. max            | 3°C/sec. max     |
| Liquidous temperature ( $T_L$ )                                                   | 183°C                   | 217°C            |
| Time at liquidous ( $t_L$ )                                                       | 60 - 150 sec.           | 60 - 150 sec.    |
| Peak package body temperature ( $T_p$ )*                                          | see Table 1             | see Table 2      |
| Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_c$ ) | 20 sec.                 | 30 sec.          |
| Ramp-down rate ( $T_p$ to $T_{smax}$ )                                            | 6°C/sec. max            | 6°C/sec. max     |
| Time 25°C to peak temperature                                                     | 6 min. max              | 8 min. max       |
| Reflow cycles                                                                     | 2 max                   | 2 max            |

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

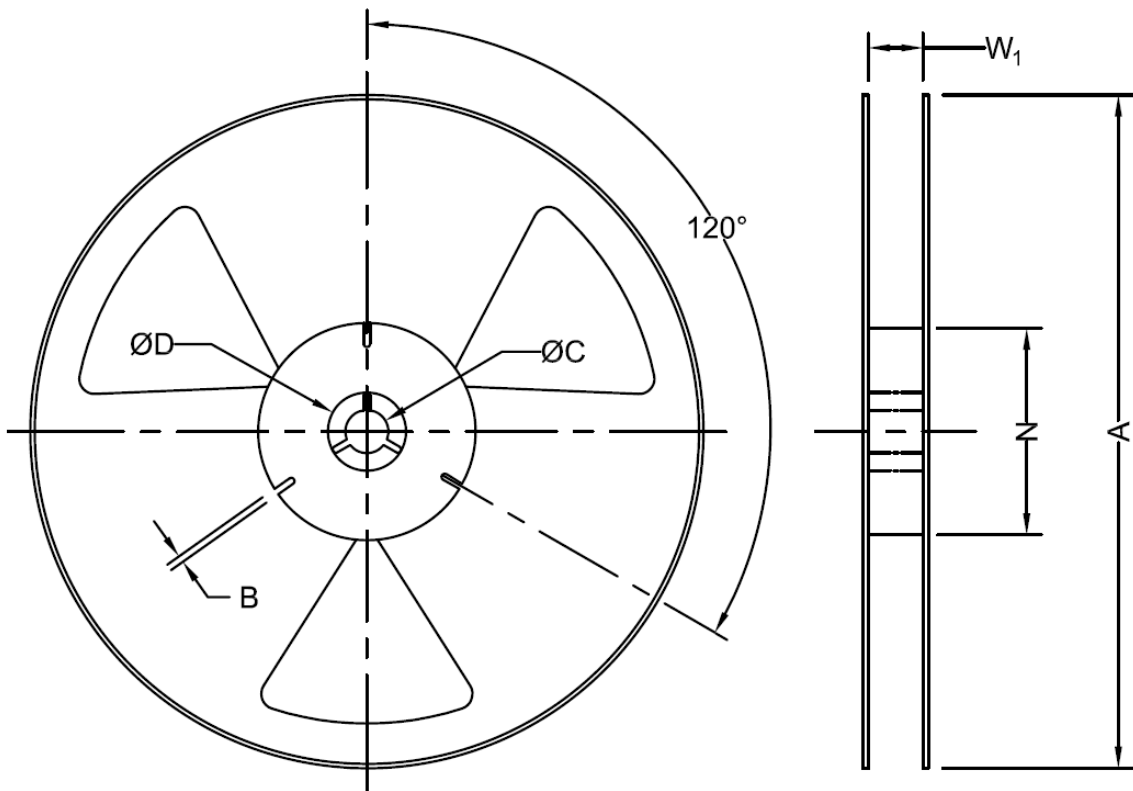
\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

Packaging



| Tape Specifications (mm) |                |                |                |                      |                      |                      |         |
|--------------------------|----------------|----------------|----------------|----------------------|----------------------|----------------------|---------|
| Width                    | Ao             | Bo             | Do             | D <sub>1</sub> (Min) | E <sub>1</sub>       | F                    | Ko      |
| 8mm                      | *              | *              | 1.5+0.1/-0.0   | 1.0                  | 1.75±0.1             | 3.5±0.05             | *       |
| Width                    | P <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | T (Max)              | T <sub>1</sub> (Max) | T <sub>2</sub> (Max) | W (Max) |
| 8mm                      | 4.0±0.1        | 2.0±0.05       | 4.0±0.1        | 0.6                  | 0.1                  | 2.5                  | 8.3     |

**\*Note: Compliant to EIA-481**



| Reel Specifications (mm) |          |         |         |               |         |         |                 |
|--------------------------|----------|---------|---------|---------------|---------|---------|-----------------|
| Width                    | Qty/Reel | A (Nom) | B (Min) | C (Min)       | D (Min) | N (Min) | *W <sub>1</sub> |
| 8mm                      | 3000     | 178     | 1.5     | 13.0+0.5/-0.2 | 20.2    | 50      | 8.4+1.5/-0.0    |

**\*Note: Measured at Hub**

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