

# LOW ESR, LOW CL CERAMIC SMD CRYSTAL

**ABM8W Series**

Request Samples



Check Inventory



3.2 x 2.5 x 0.8 mm  
**RoHS/RoHS II Compliant**  
 MSL Level = N/A



## Features

- Optimized for energy saving wearables and IoT applications
- Plated at exceptionally low plating capacitance, as low as 4pF, with optimized ESR
- Seam sealed for long term reliability

## Applications

- Wearables
- Internet of Things (IoT)
- Bluetooth/Bluetooth Low Energy (BLE)
- Wireless modules
- Machine-to-machine (M2M) connectivity
- Ultra-low power MCU
- Near Field Communication (NFC)
- ISM Band

## Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	10.0000		54.0000	MHz	
Operation Mode	Fundamental				
Operating Temperature Range	-40		+125	°C	See options
Storage Temperature	-55		+125	°C	
Frequency Tolerance @ +25°C	-10		+10	ppm	See options
Frequency Stability over the Operating Temperature (ref. to +25°C)	-10		+10	ppm	See options
Equivalent series resistance (R1) (over -40°C to +125°C)		< 100	200	Ω	10.0000 – 11.9999MHz
		< 60	100		12.0000 – 15.9999MHz
		< 40	70		16.0000 – 19.9999MHz
		< 25	50		20.0000 – 29.9999MHz
		< 20	40		30.0000 – 39.9999MHz
		< 18	30		40.0000 – 54.0000MHz
Shunt capacitance (C0)		< 1.2	2.0	pF	
Load capacitance (CL)		4.0		pF	See options
Drive Level		10	100	μW	
Aging (1 year)	-2		+2	ppm	@ 25°C±3°C
Insulation Resistance	500			MΩ	@ 100Vdc ± 15V



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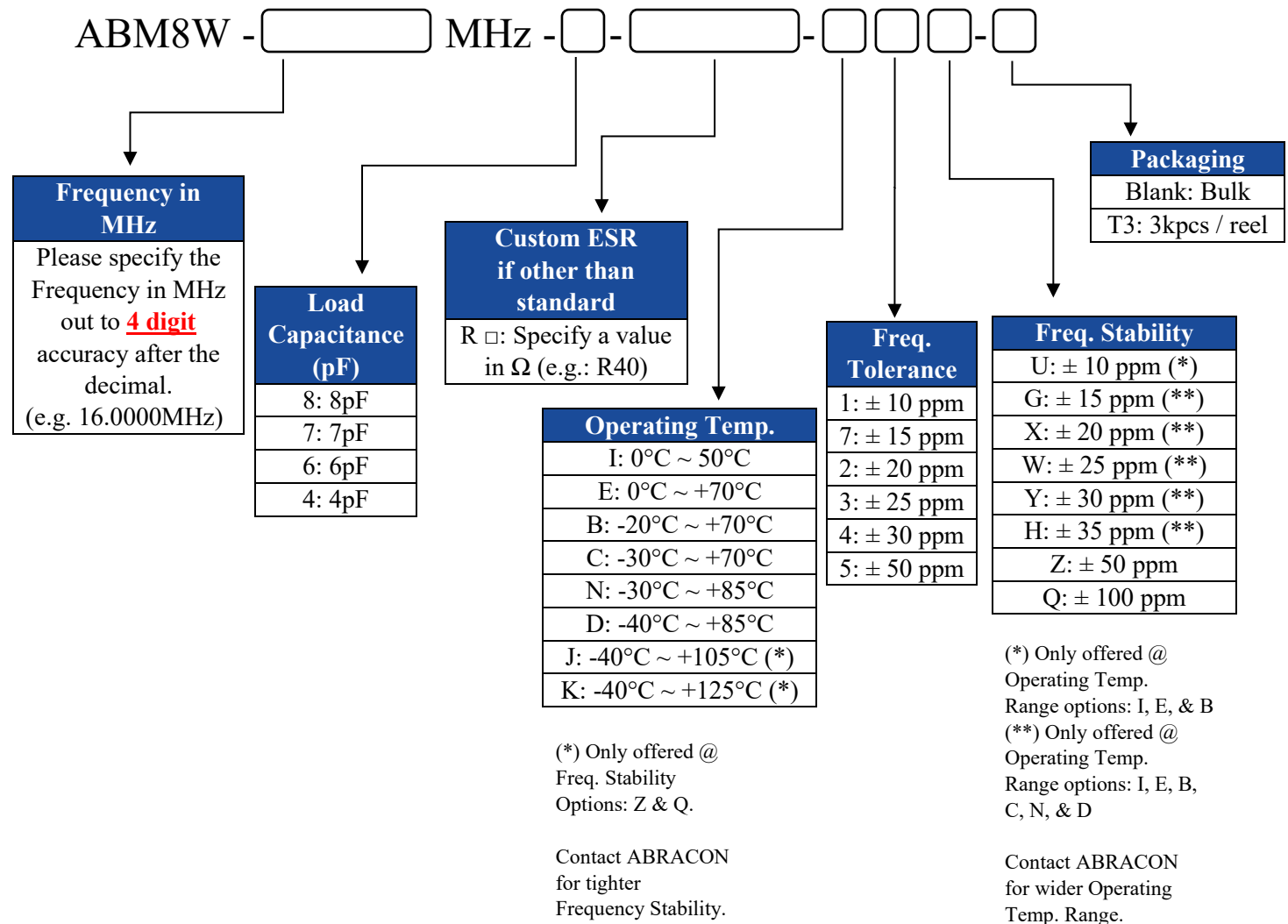
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## Options and Part Identification [Note 1]



Note 1: Contact Abracon for part number requests with carrier frequency callouts up to 5 & 6 digit accuracy after the decimal.



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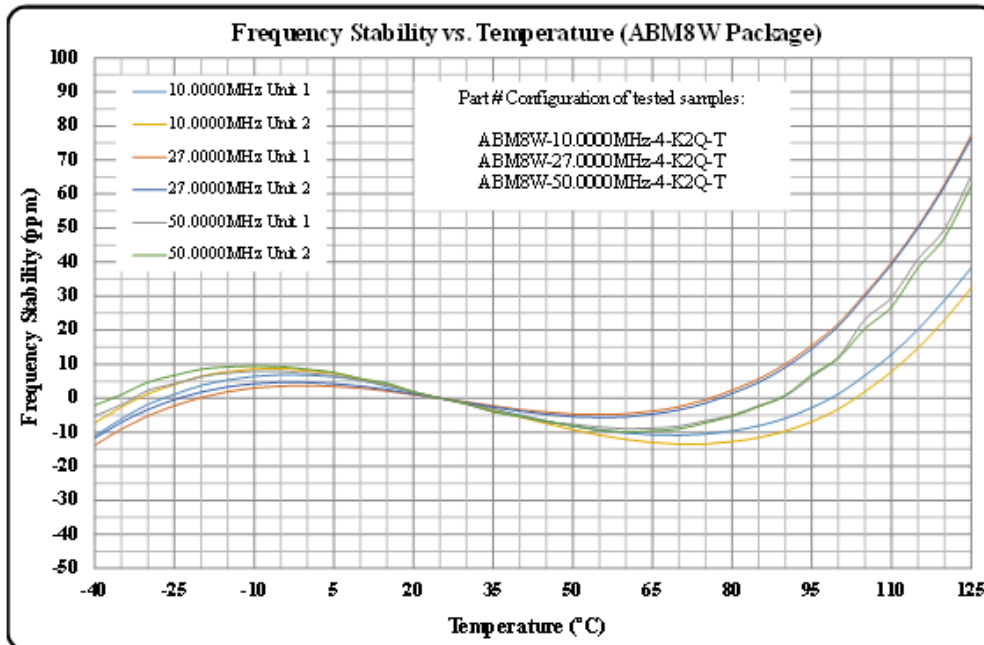
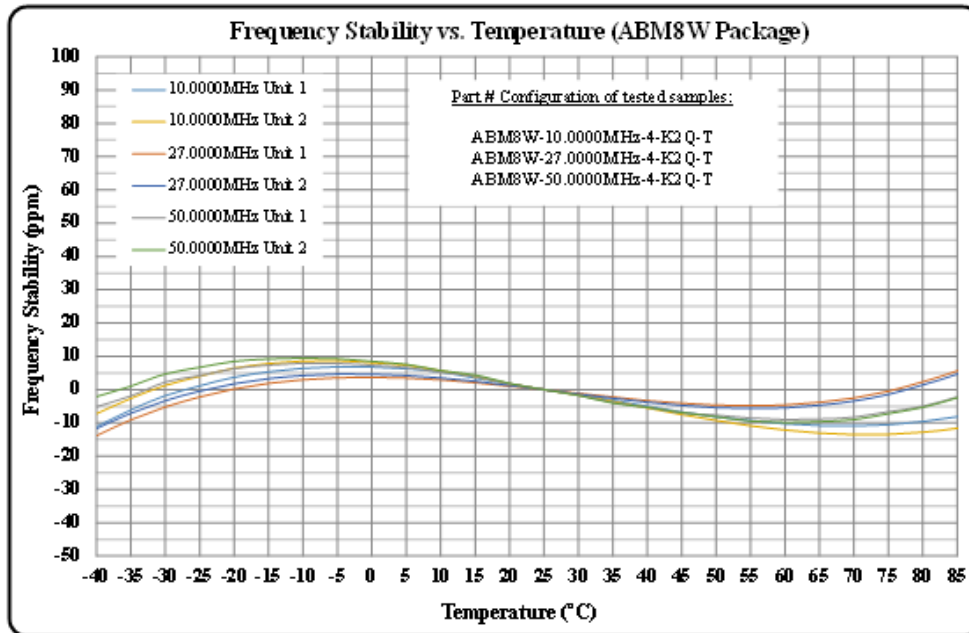
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## Typical Frequency vs. Temperature Characteristics:



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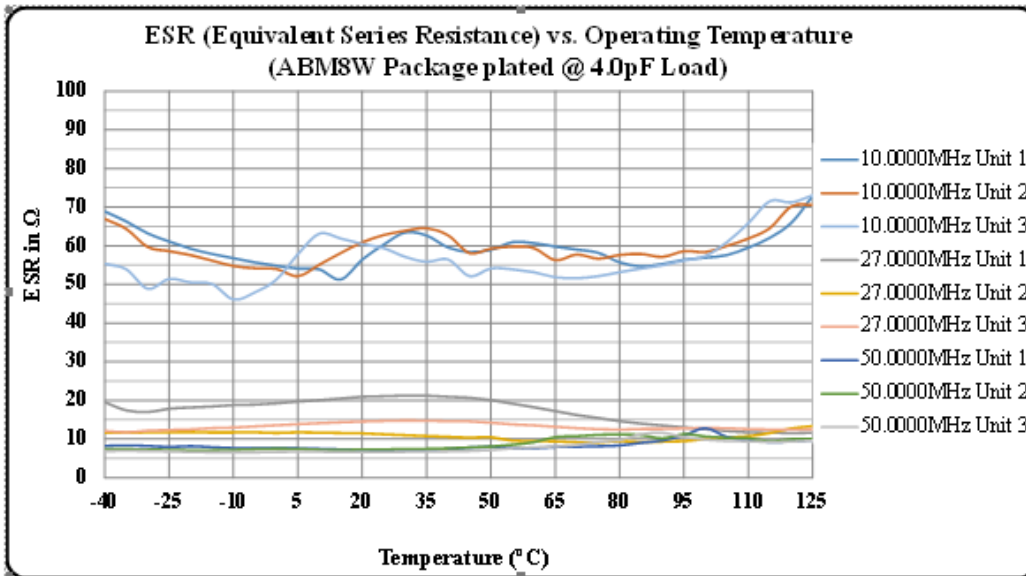
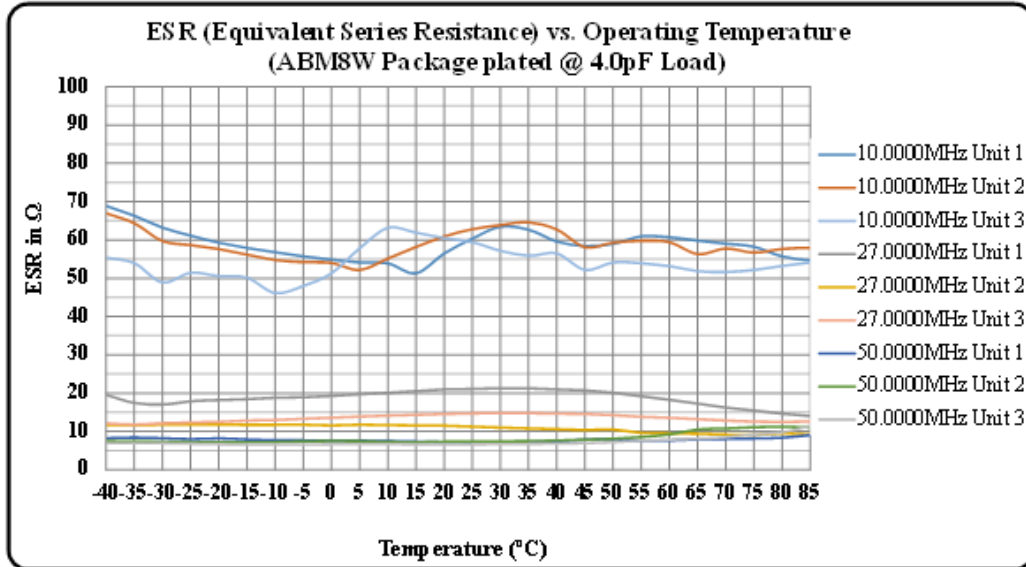


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## Typical ESR (Equivalent Series Resistance) vs. Temperature Characteristics:



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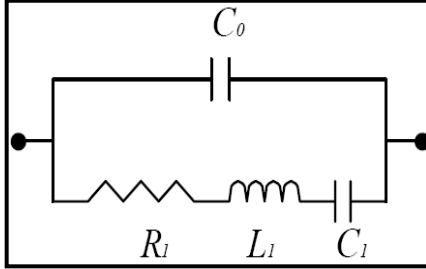
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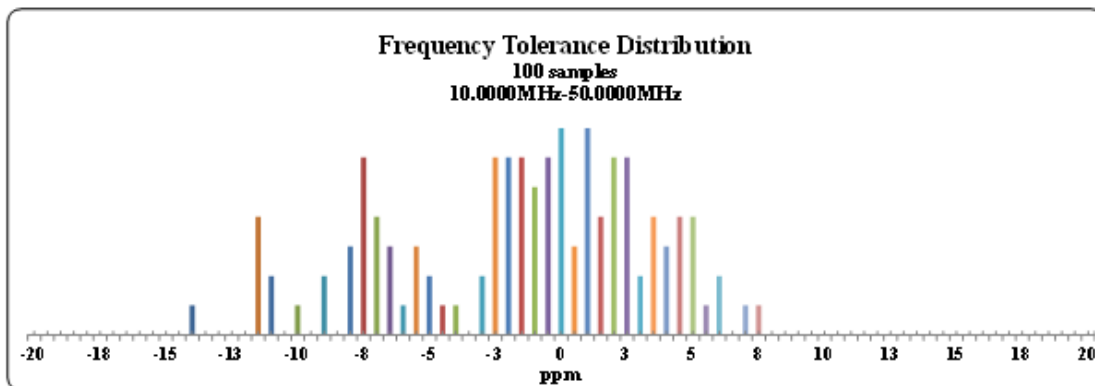


SPICE Models (based on typical values at 25°C ± 3°C):



<b>Frequency: 10.0000MHz</b> <b>Plating Load: 4pF</b>		<b>Frequency: 10.0000MHz</b> <b>Plating Load: 6pF</b>	
C0	= 0.88 pF	C0	= 0.86 pF
R1	= 53.82 Ω	R1	= 60.62 Ω
L1	= 162.02 mH	L1	= 164.96 mH
C1	= 1.56 fF	C1	= 1.54 fF
<b>Frequency: 27.0000MHz</b> <b>Plating Load: 4pF</b>		<b>Frequency: 27.0000MHz</b> <b>Plating Load: 6pF</b>	
C0	= 1.16 pF	C0	= 1.16 pF
R1	= 11.83 Ω	R1	= 11.06 Ω
L1	= 9.16 mH	L1	= 9.10 mH
C1	= 3.80 fF	C1	= 3.82 fF
<b>Frequency: 50.0000MHz</b> <b>Plating Load: 4pF</b>		<b>Frequency: 50.0000MHz</b> <b>Plating Load: 6pF</b>	
C0	= 1.16 pF	C0	= 1.15 pF
R1	= 7.61 Ω	R1	= 8.06 Ω
L1	= 2.45 mH	L1	= 2.49 mH
C1	= 4.14 fF	C1	= 4.07 fF

Typical Frequency Tolerance Distribution (at 25°C ± 3°C):



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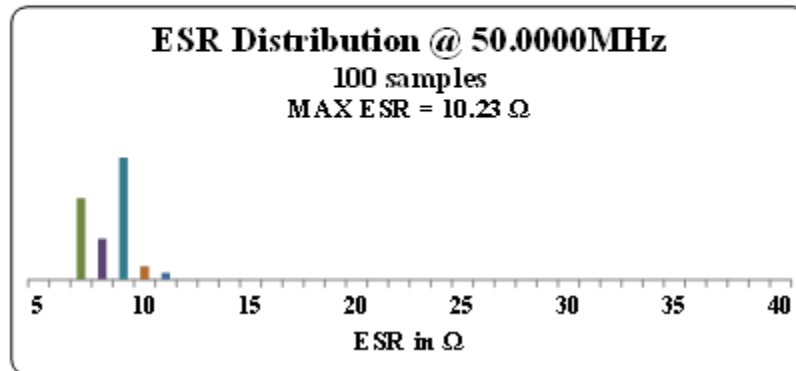
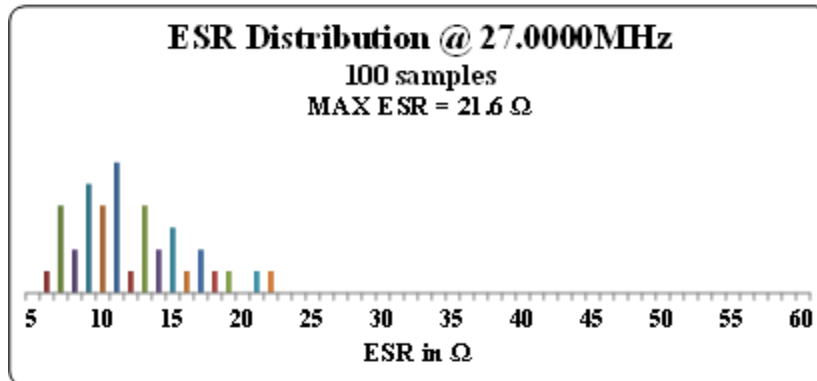
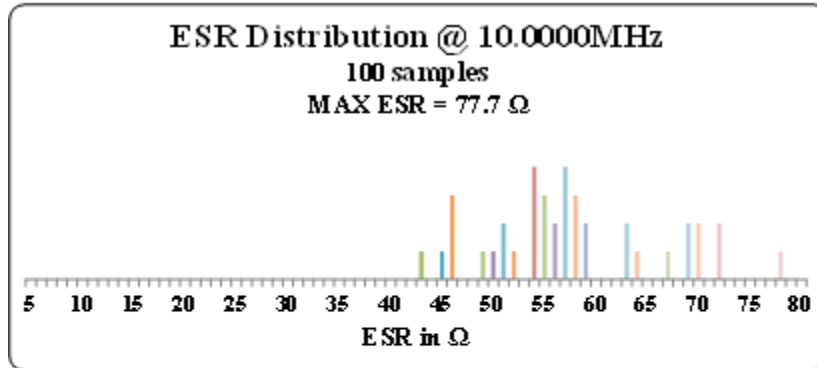
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Typical ESR Distribution (at 25°C ± 3°C):



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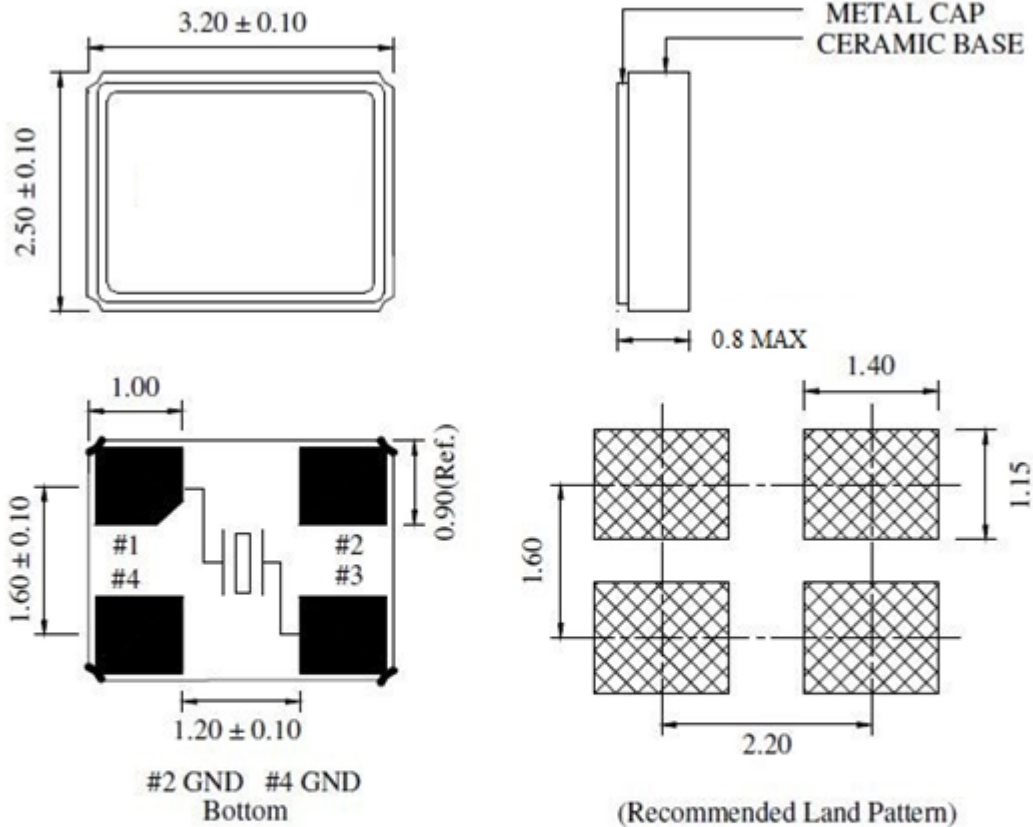
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## Mechanical Dimensions



### Note:

Due to material availability the Chamfer could be located on pin #1, 2 or 4. Be advised that the Chamfer location has no impact on the electrical performance of the device.

Dimensions: mm

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

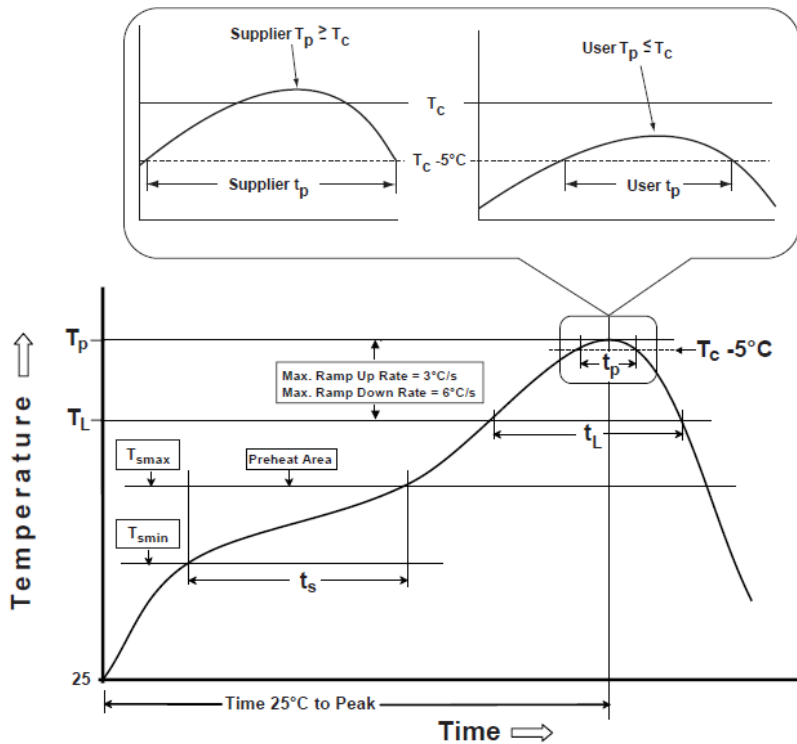


Table 1

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 supplier minimum and a user maximum.



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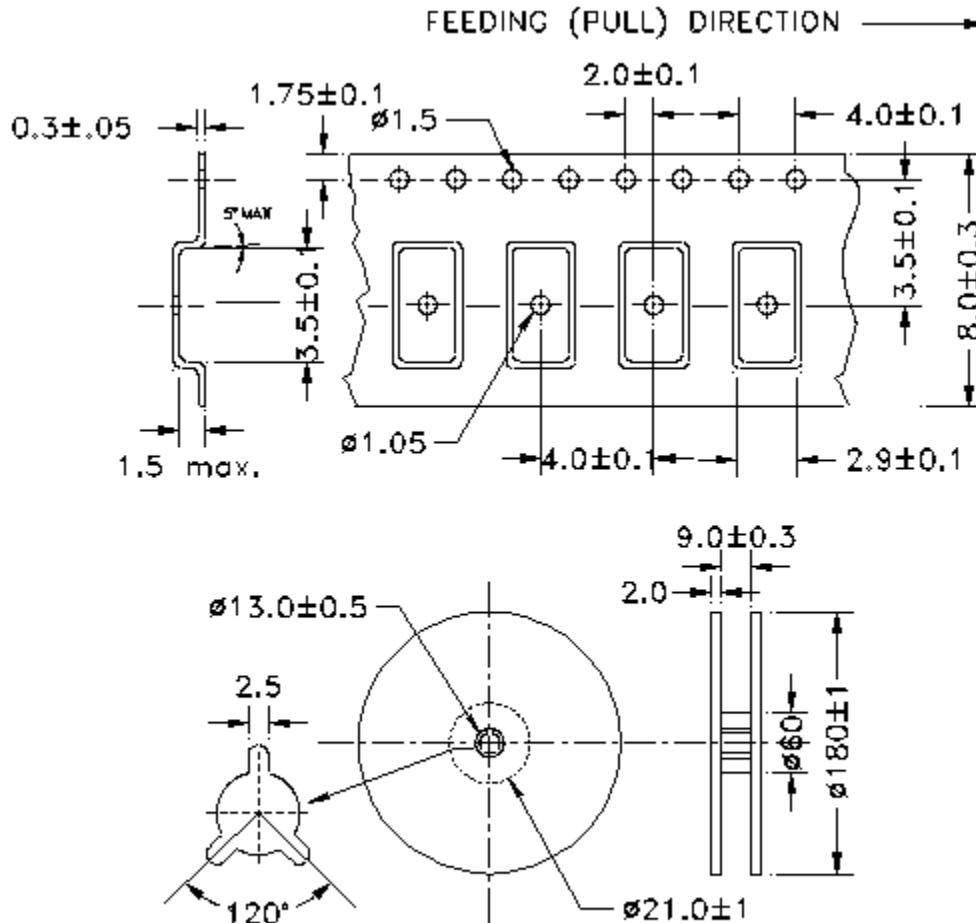


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MSL Level = N/A



## Packaging:

T3: Tape and reel (3,000pcs/reel)



Dimensions: mm

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