Engineering/Process Change Notice

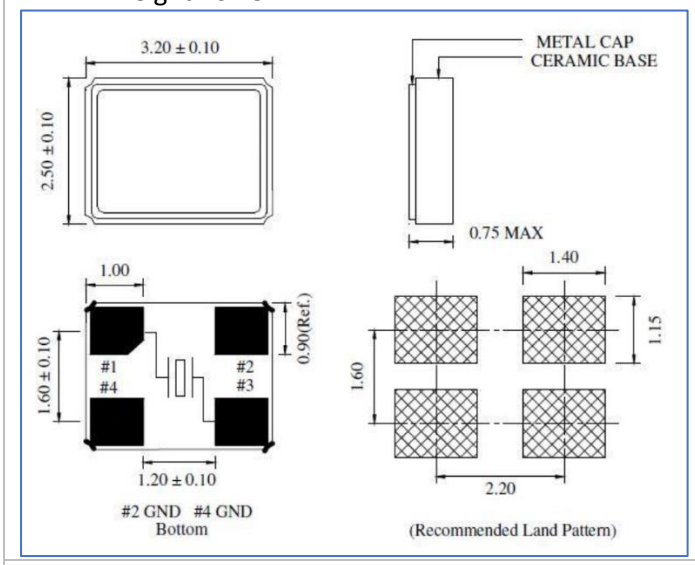
ECN/PCN No.: 4330

For Manufacturer			
Product Description: LOW ESR, LOW CL CERAMIC SMD CRYSTAL	**Abracon Part Number / Part Series:** ABM8W	☐ Documentation only ☒ ECN ☐ EOL	☒ Series ☐ Part Number
Affected Revision: B	**New Revision:** C	**Application:**	☐ Safety ☒ Non-Safety

Prior to Change:

Mechanical dimensions:

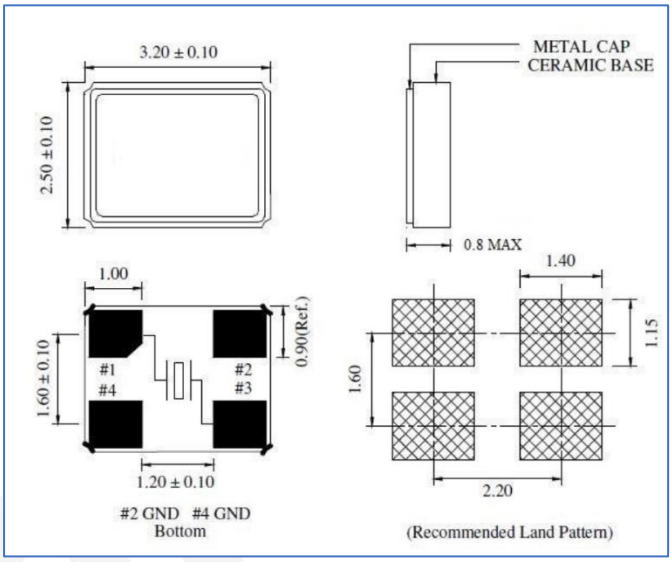
- Height= 0.75mm MAX



After Change:

Mechanical dimensions:

- Height= 0.80mm MAX



Cause/Reason for Change:

Abracon introduced additional manufacturing sources to ensure product availability and to be in a better position to meet long term customer demand. Updated mechanical dimensions to reflect the product produced by all manufacturing sources.

Engineering/Process Change Notice

Change Plan		
Effective Date: 12/01/2022	**Additional Remarks:** N/A	
Change Declaration: The package mechanical dimension revision do not impact the recommended landing pattern nor the electrical performance of the device.		
Issued Date: 12/01/2022	**Issued By:** *Brooke Cushman* Product Engineer	**Issued Department:** Engineering
Approval: *Thomas Culhane* Engineering Director	**Approval:** *Reuben Quintanilla* Quality Director	**Approval:** *Ying Huang* Purchasing Director

For Abracon EOL only		
Last Time Buy (if applicable): N/A	**Alternate Part Number / Part Series:** N/A	
Additional Approval: *N/A*	**Additional Approval:** *N/A*	**Additional Approval:** *N/A*

Customer Approval (If Applicable)		
Qualification Status: ☐ Approved ☐ Not accepted *Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.*		
Customer Part Number:	**Customer Project:**	
Company Name:	**Company Representative:**	**Representative Signature:**
Customer Remarks:		

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	ºC	See options
Storage Temperature	-55		+125	ºC	
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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RoHS/RoHS II Compliant
MSL Level = N/A

Options and Part Identification [Note 1]

ABM8W - [ ] MHz - [ ] - [ ] - [ ] [ ] [ ] - [ ]

Frequency in MHz
Please specify the Frequency in MHz out to **4 digit** accuracy after the decimal. (e.g. 16.0000MHz)

Load Capacitance (pF)
8: 8pF
7: 7pF
6: 6pF
4: 4pF

Custom ESR if other than standard
R □: Specify a value in Ω (e.g.: R40)

Operating Temp.
I: 0°C ~ 50°C
E: 0°C ~ +70°C
B: -20°C ~ +70°C
C: -30°C ~ +70°C
N: -30°C ~ +85°C
D: -40°C ~ +85°C
J: -40°C ~ +105°C (*)
K: -40°C ~ +125°C (*)

(*) Only offered @ Freq. Stability Options: Z & Q.

Contact ABRACON for tighter Frequency Stability.

Freq. Tolerance
1: ± 10 ppm
7: ± 15 ppm
2: ± 20 ppm
3: ± 25 ppm
4: ± 30 ppm
5: ± 50 ppm

Freq. Stability
U: ± 10 ppm (*)
G: ± 15 ppm (**)
X: ± 20 ppm (**)
W: ± 25 ppm (**)
Y: ± 30 ppm (**)
H: ± 35 ppm (**)
Z: ± 50 ppm
Q: ± 100 ppm

(*) Only offered @ Operating Temp. Range options: I, E, & B
(**) Only offered @ Operating Temp. Range options: I, E, B, C, N, & D

Contact ABRACON for wider Operating Temp. Range.

Packaging
Blank: Bulk
T3: 3kpcs / reel

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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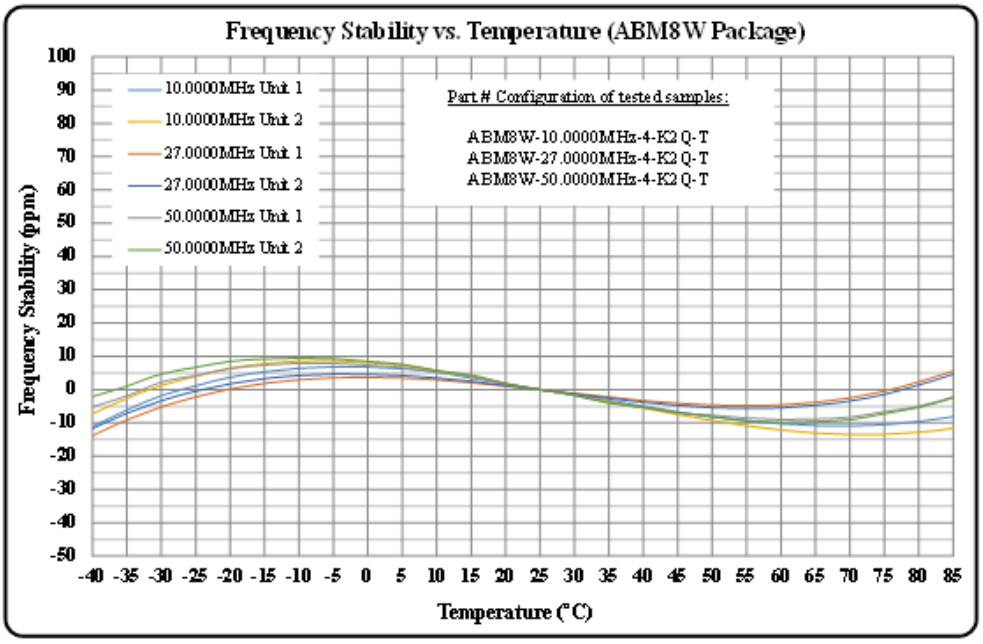
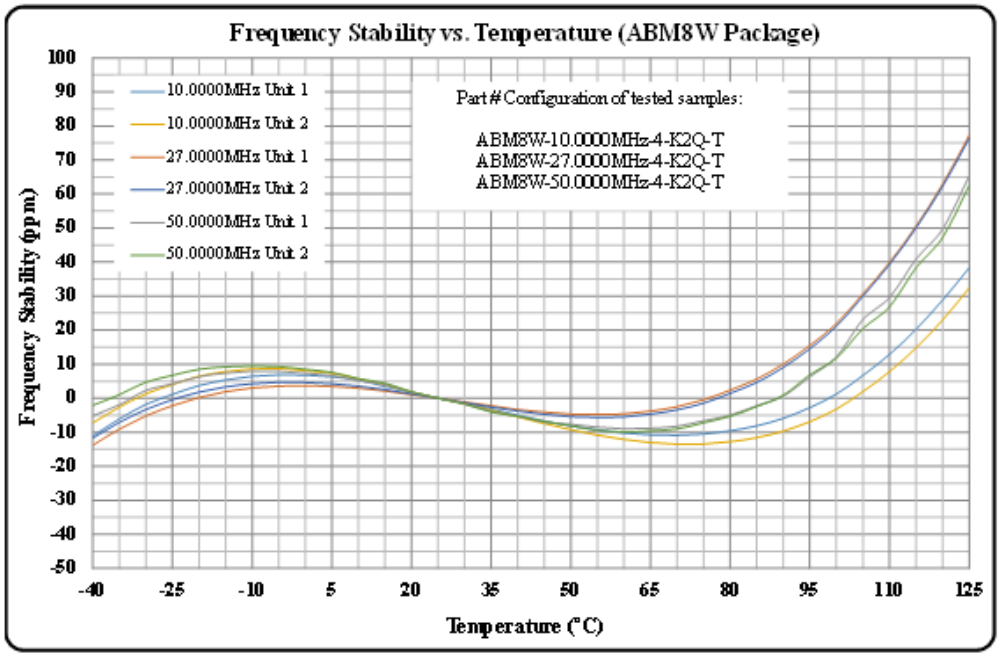
Typical Frequency vs. Temperature Characteristics:





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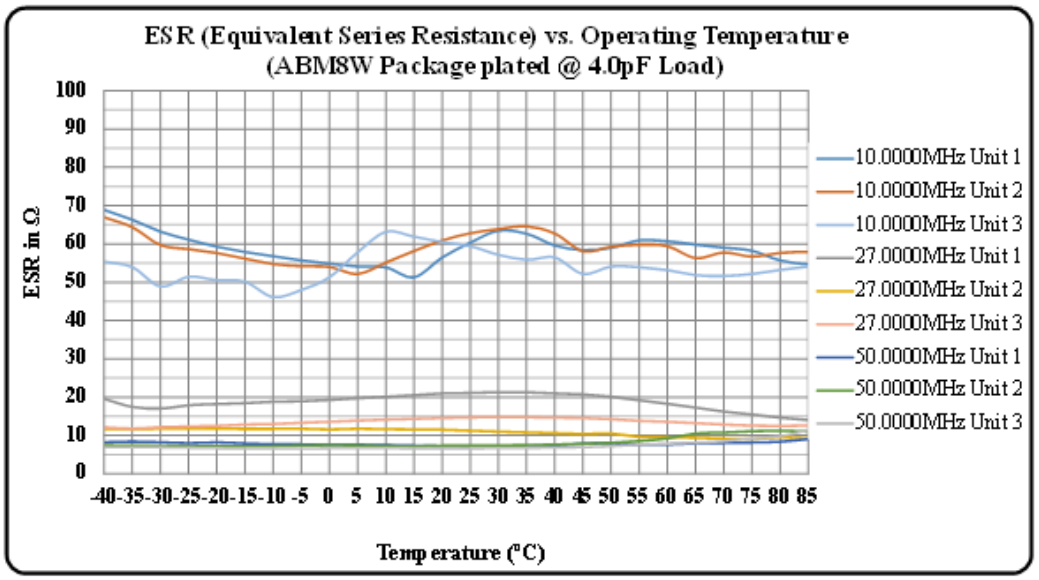
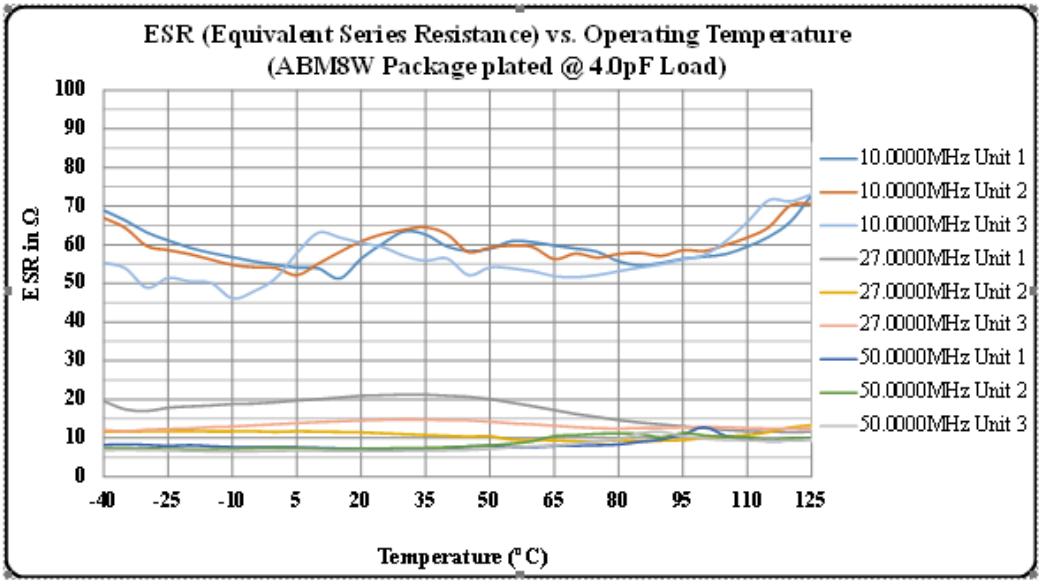
RoHS/RoHS II Compliant
MSL Level = N/A

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





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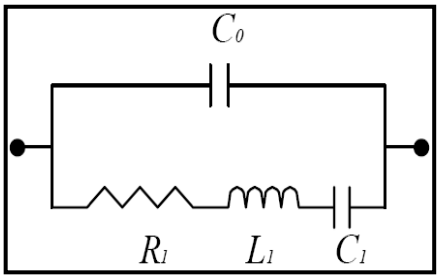
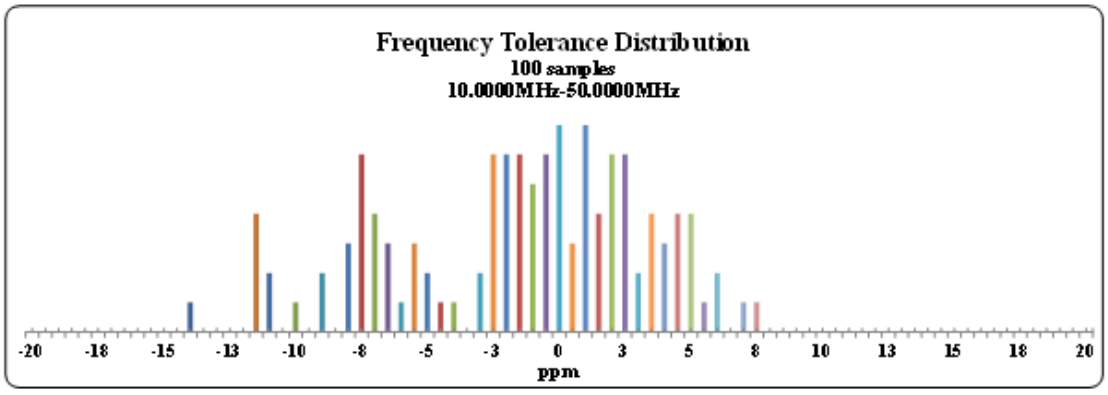
RoHS/RoHS II Compliant
MSL Level = N/A

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



Frequency: 10.0000MHz Plating Load: 4pF				Frequency: 10.0000MHz Plating Load: 6pF			
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
Frequency: 27.0000MHz **Plating Load: 4pF**				**Frequency: 27.0000MHz** **Plating Load: 6pF**			
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
Frequency: 50.0000MHz **Plating Load: 4pF**				**Frequency: 50.0000MHz** **Plating Load: 6pF**			
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 25ºC ± 3ºC):



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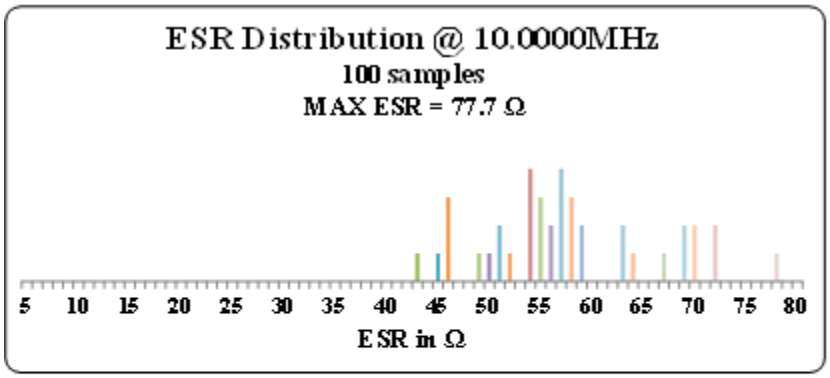
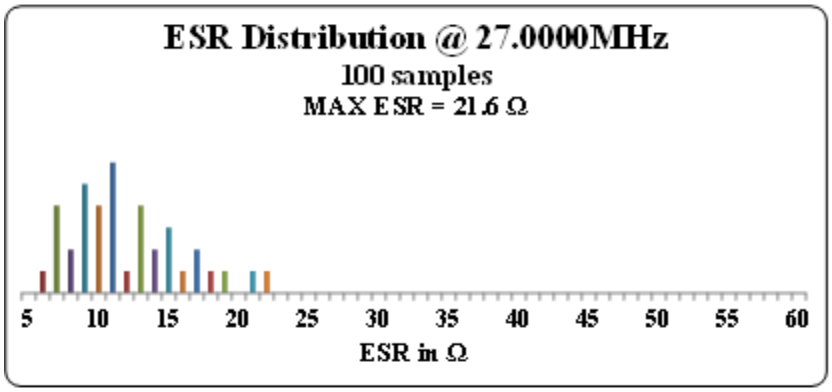
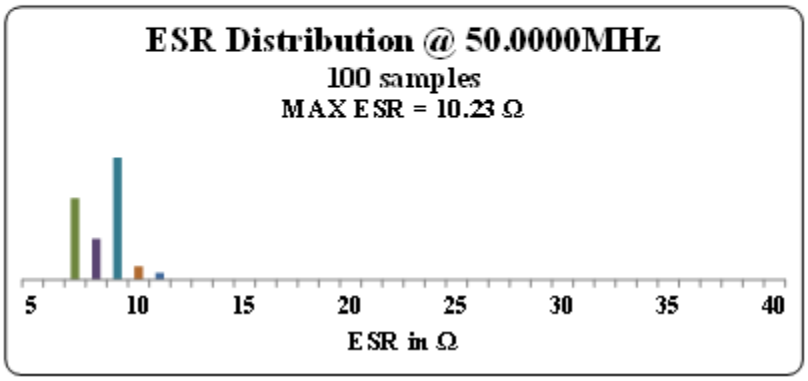
3.2 x 2.5 x 0.8 mm
RoHS/RoHS II Compliant
MSL Level = N/A

Typical ESR Distribution (at 25ºC ± 3ºC):







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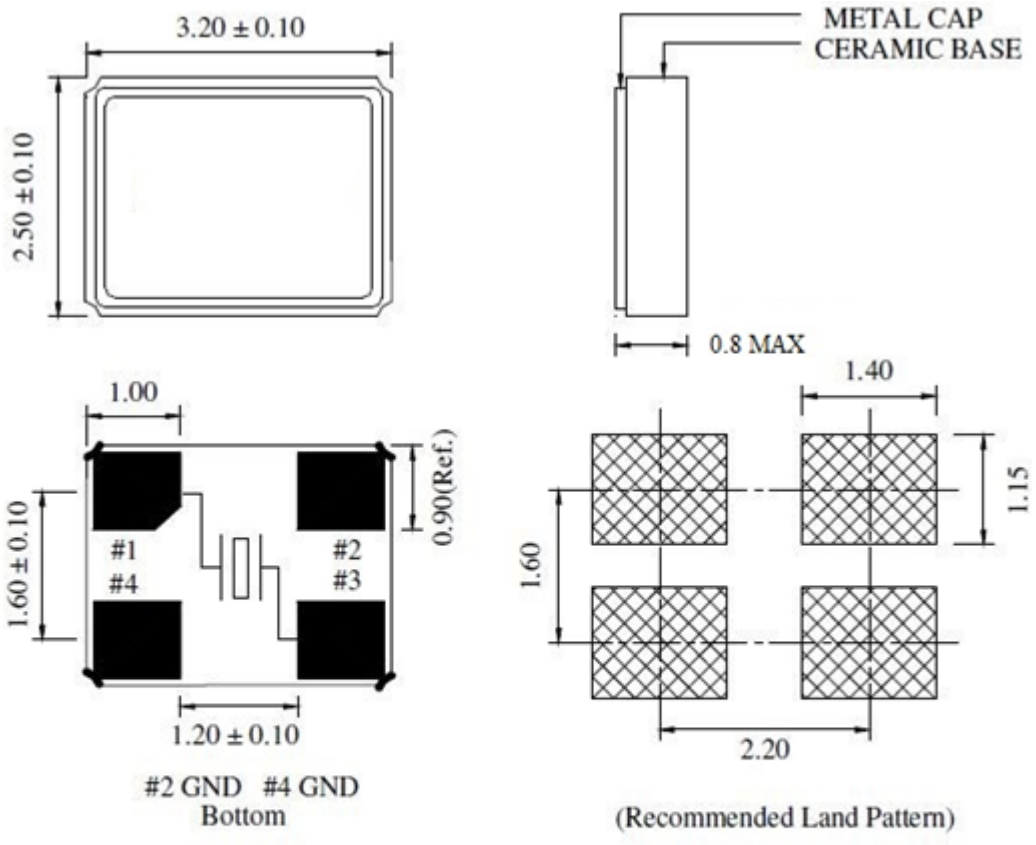
3.2 x 2.5 x 0.8 mm
RoHS/RoHS II Compliant
MSL Level = N/A

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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MSL Level = N/A

Reflow Profile [JEDEC J-STD-020]

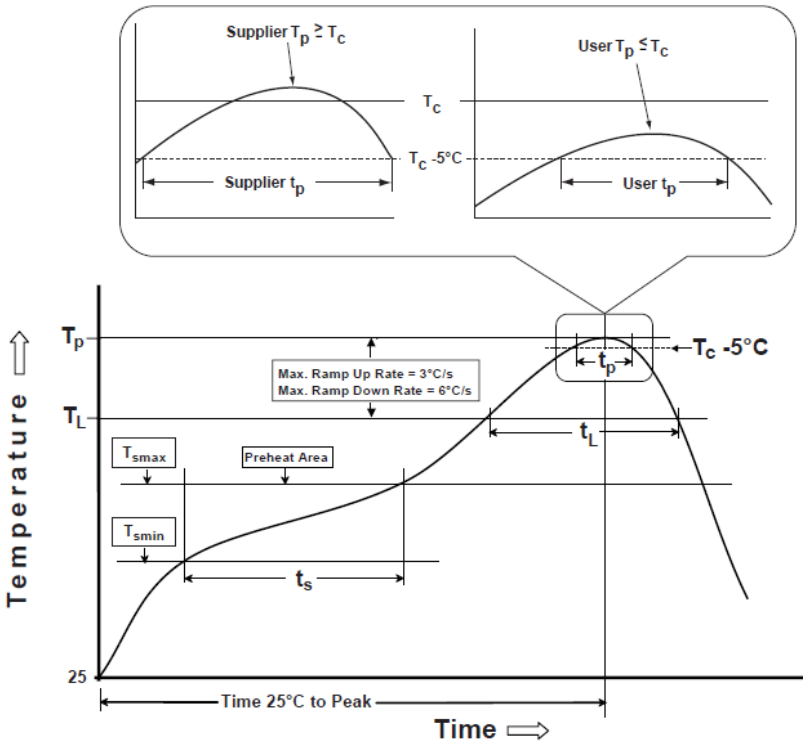

Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≥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 mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >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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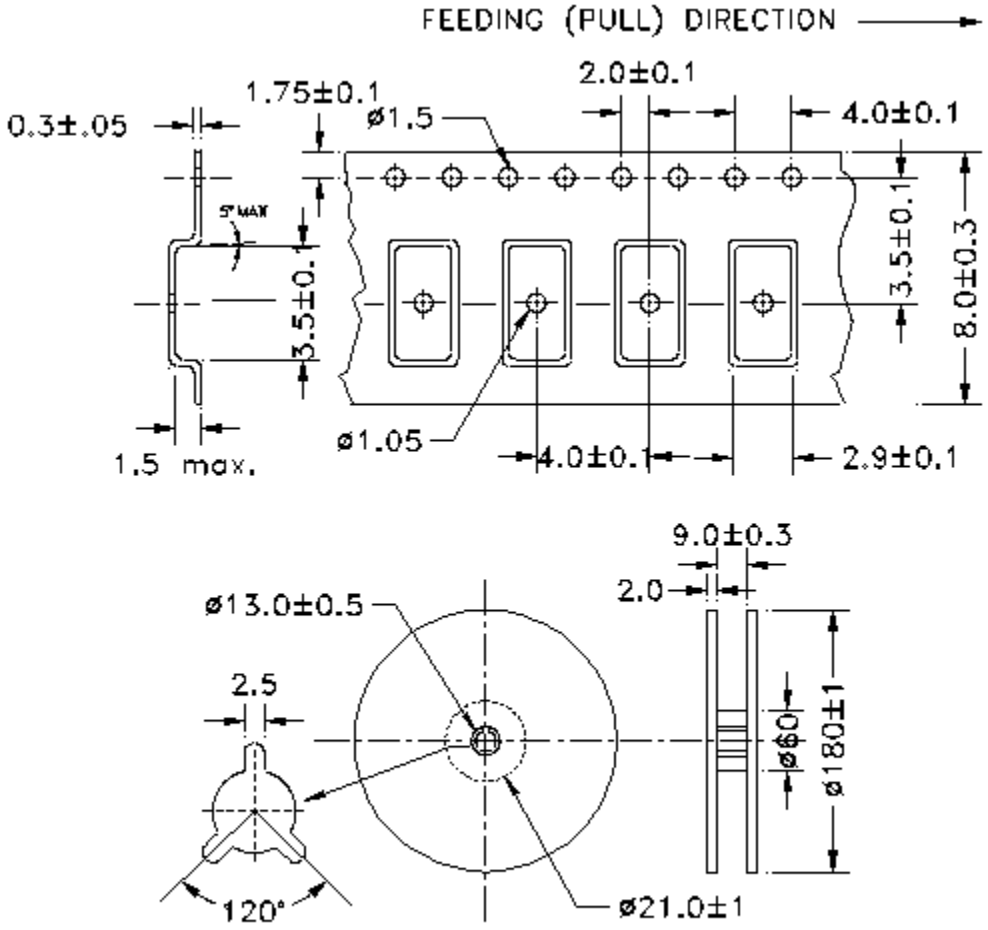
MSL Level = N/A

Packaging:

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



Dimensions: mm

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AFFECTED PART NUMBERS
ABM8W-10.0000MHZ-8-D4X
ABM8W-10.0000MHZ-8-K2Z
ABM8W-10.0000MHZ-8-K7Z
ABM8W-10.0000MHZ-8-K7Z-T3
ABM8W-10.77938MHZ-8-B2X
ABM8W-10.78125MHZ-8-B2X
ABM8W-12.0000MHZ-4-B1U-T3
ABM8W-12.0000MHZ-4-D1X-T3
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