

# IoT OPTIMIZED LOW PROFILE QUARTZ CRYSTAL

## ABM11W SERIES



2.0 x 1.6 x 0.5mm



RoHS/RoHS II Compliant

MSL = N/A: NOT APPLICABLE

### FEATURES

- Optimized for energy saving wearables, and IoT applications
- Plated at exceptionally low plating capacitance, as low as 4pF, with optimized ESR
- 0.5 mm max height ideally suited for height constrained designs
- Seam sealed for longterm reliability

### APPLICATIONS

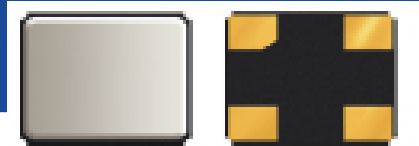
- Wearables
- Internet of Things (IoT)
- Bluetooth/Bluetooth Low Energy (BLE)
- Wireless modules
- Machine-to-machine (M2M) connectivity
- Ultra-low power MCU
- Near Field Communication (NFC)
- ISM Band

### STANDARD SPECIFICATIONS

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	16.000		50.000	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)			200	Ω	16.000 – 17.999MHz
			120		18.000 – 23.999MHz
			100		24.000 – 29.999MHz
			80		30.000 – 37.999MHz
			60		38.000 – 50.000MHz
Shunt capacitance (C0)		< 1.0	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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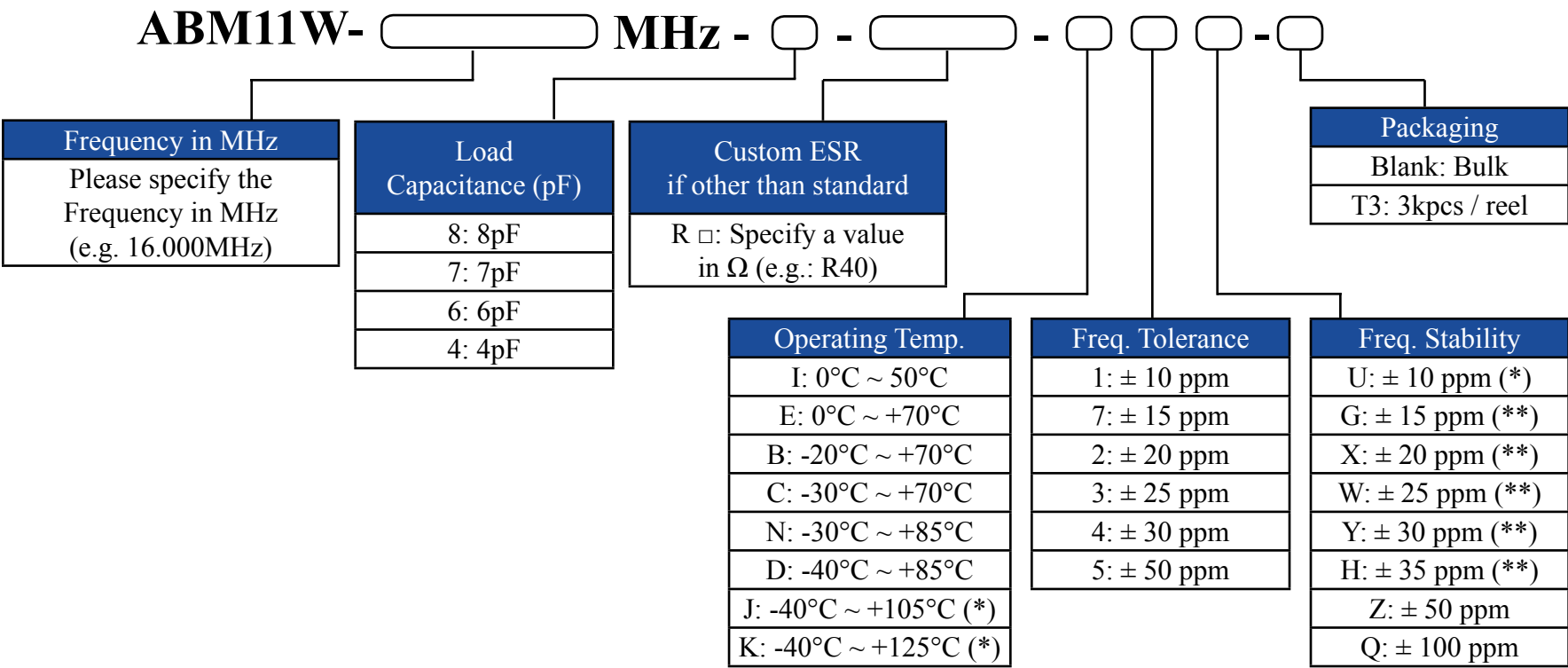
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OPTIONS AND PART IDENTIFICATION



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

Contact ABRACON for tighter Frequency Stability.

(\*) 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.

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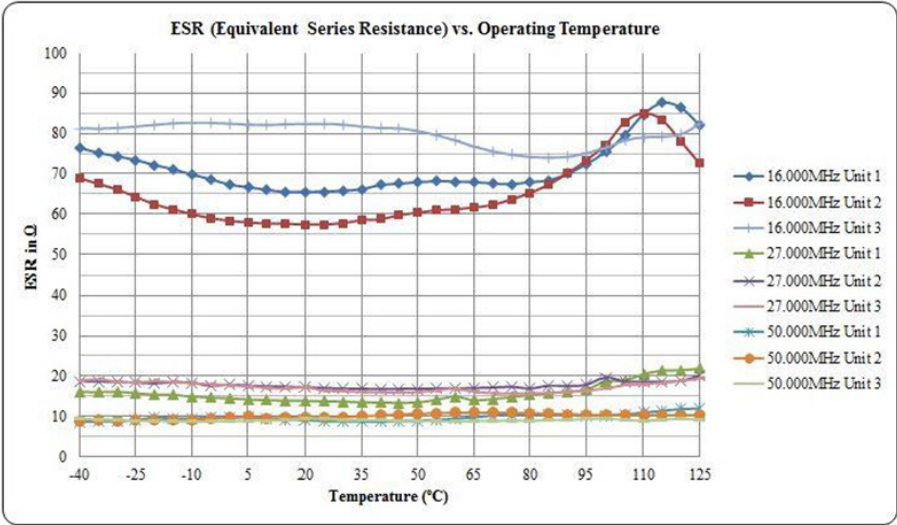
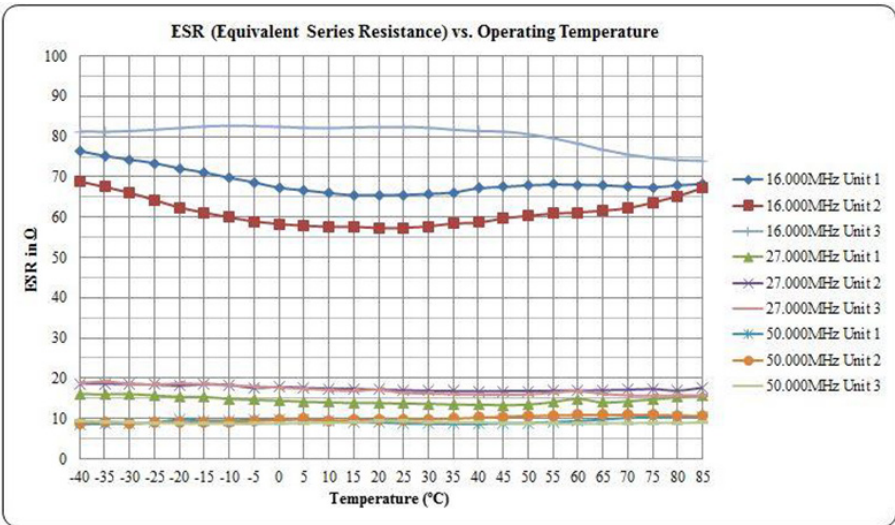
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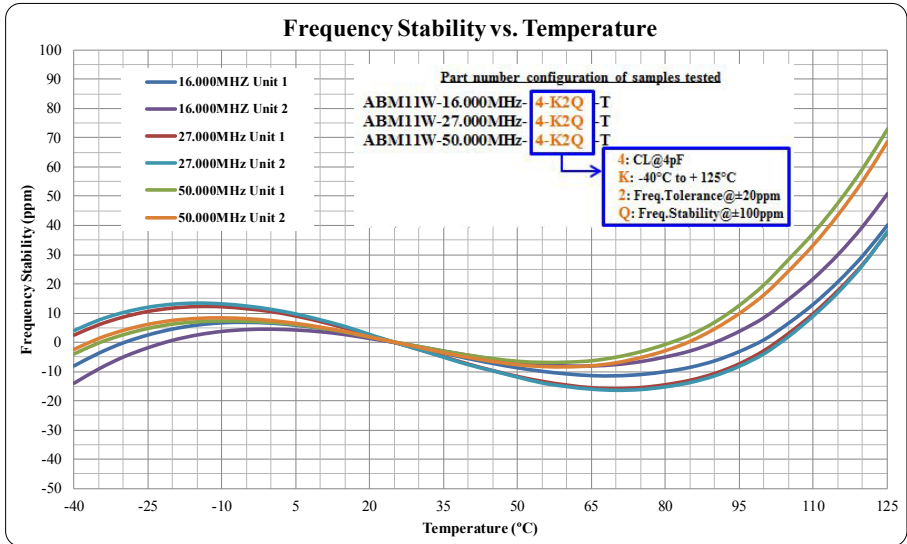
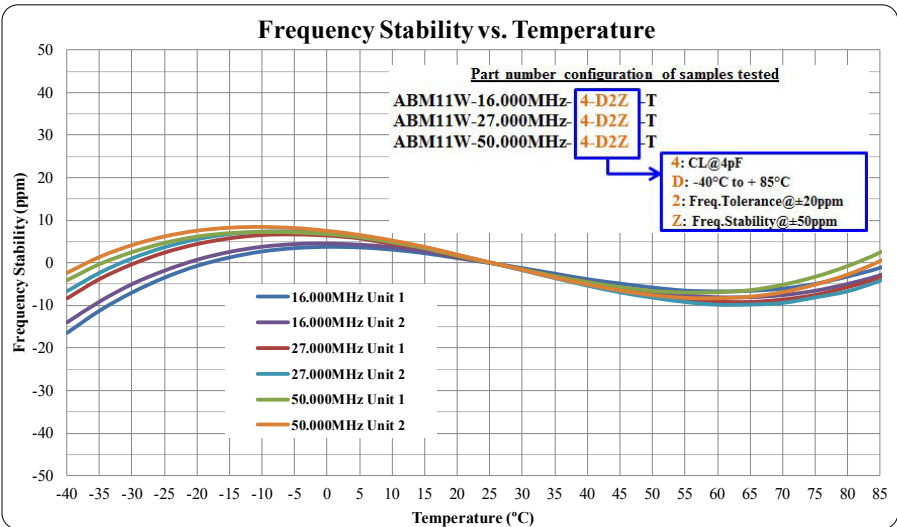
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### TYPICAL ESR (EQUIVALENT SERIES RESISTANCE) Vs. TEMPERATURE CHARACTERISTICS



### TYPICAL FREQUENCY Vs. TEMPERATURE CHARACTERISTICS



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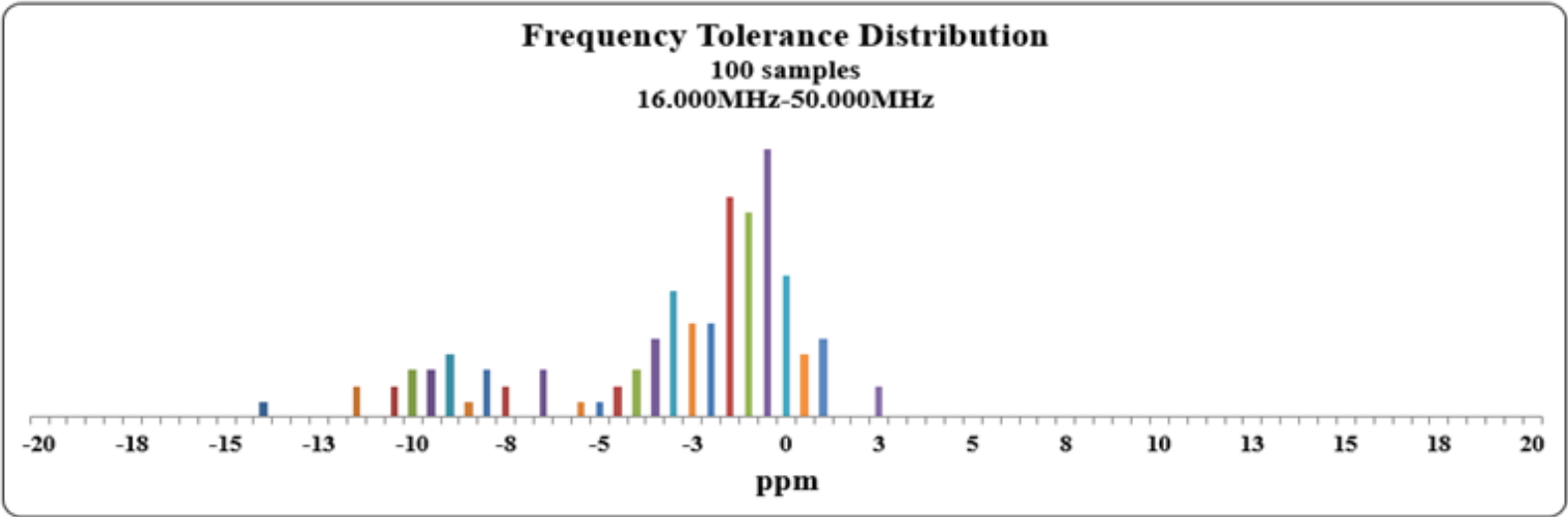
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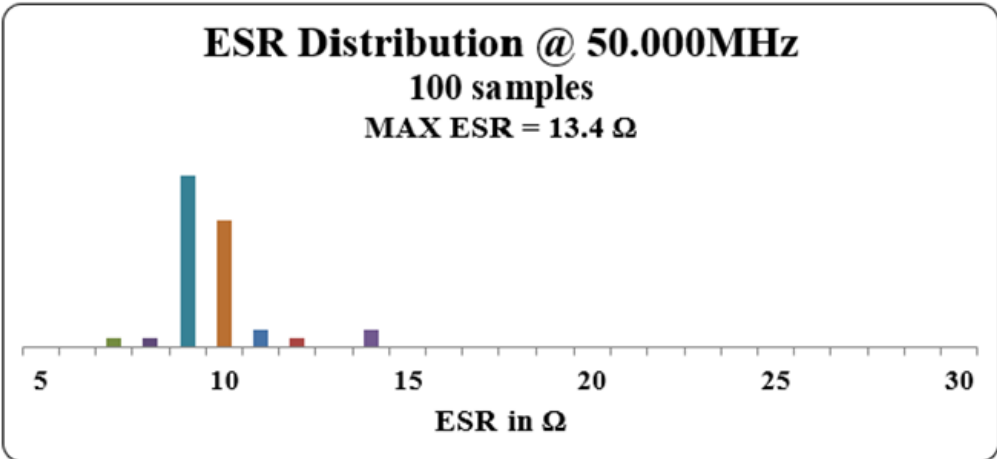
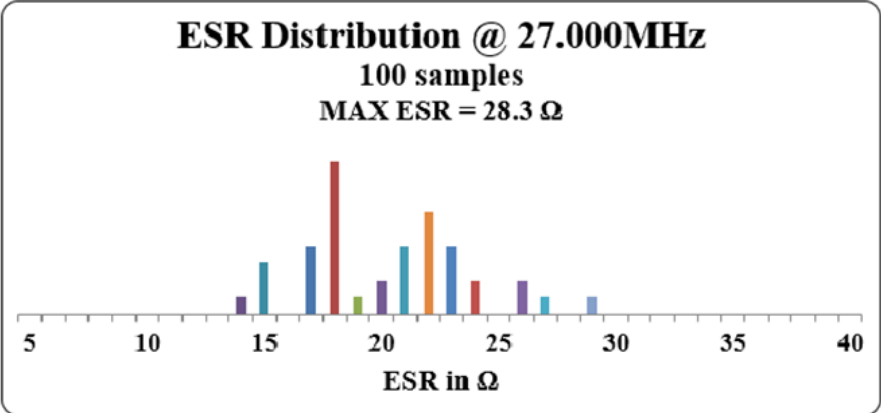
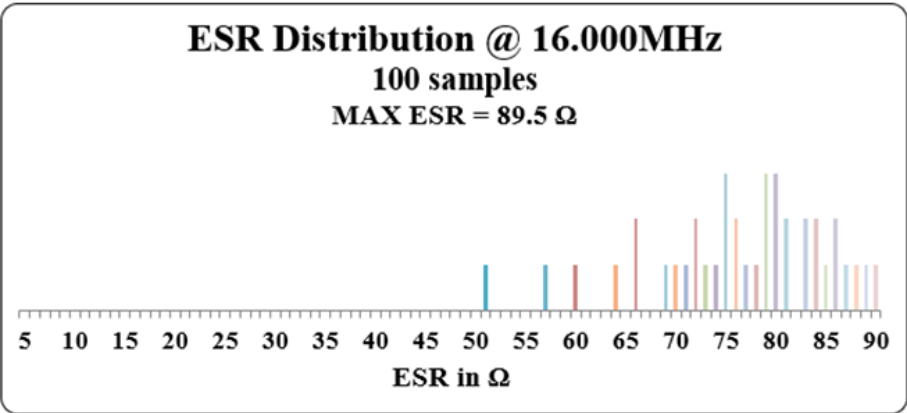
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## TYPICAL FREQUENCY TOLERANCE DISTRIBUTION (AT 25°C ± 3°C)



## TYPICAL ESR DISTRIBUTION (AT 25°C ± 3°C)



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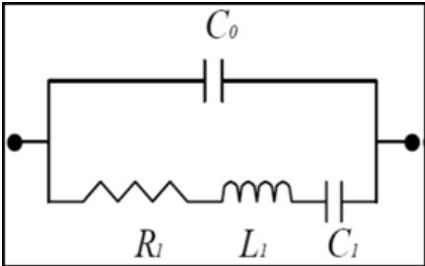
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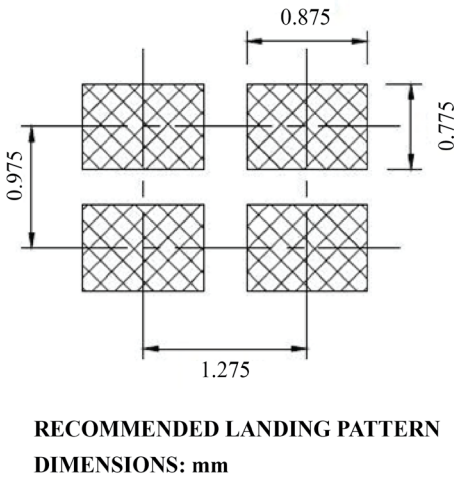
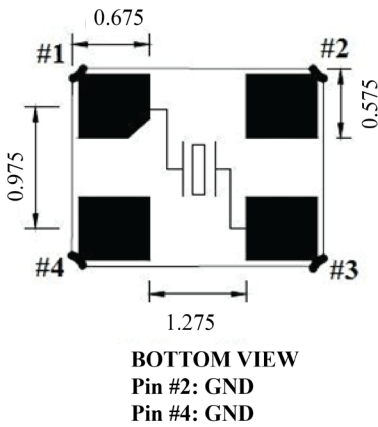
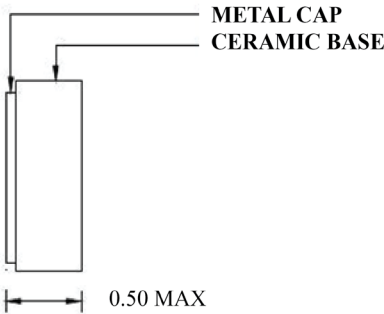
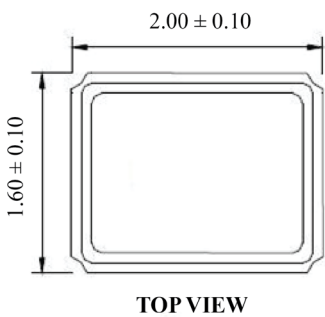
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## SPICE MODELS (BASED ON TYPICAL VALUES AT 25°C ± 3°C)



Frequency: 16.000MHz Plating Load: 4pF				Frequency: 16.000MHz Plating Load: 6pF			
C0	=	0.73	pF	C0	=	0.71	pF
R1	=	73.02	Ω	R1	=	81.42	Ω
L1	=	84.25	mH	L1	=	81.33	mH
C1	=	1.18	fF	C1	=	1.22	fF
Frequency: 27.000MHz Plating Load: 4pF				Frequency: 27.000MHz Plating Load: 6pF			
C0	=	0.78	pF	C0	=	0.76	pF
R1	=	18.71	Ω	R1	=	20.45	Ω
L1	=	18.08	mH	L1	=	18.44	mH
C1	=	1.92	fF	C1	=	1.89	fF
Frequency: 50.000MHz Plating Load: 4pF				Frequency: 50.000MHz Plating Load: 6pF			
C0	=	0.92	pF	C0	=	0.97	pF
R1	=	9.02	Ω	R1	=	8.49	Ω
L1	=	3.53	mH	L1	=	3.21	mH
C1	=	2.88	fF	C1	=	3.15	fF

## 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.

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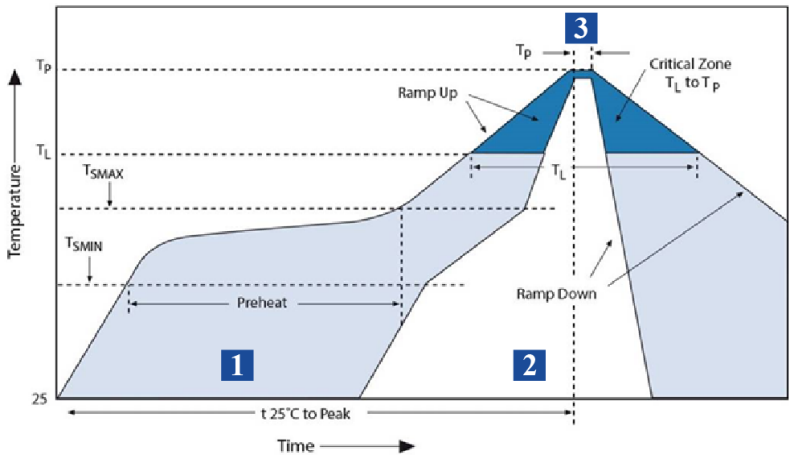
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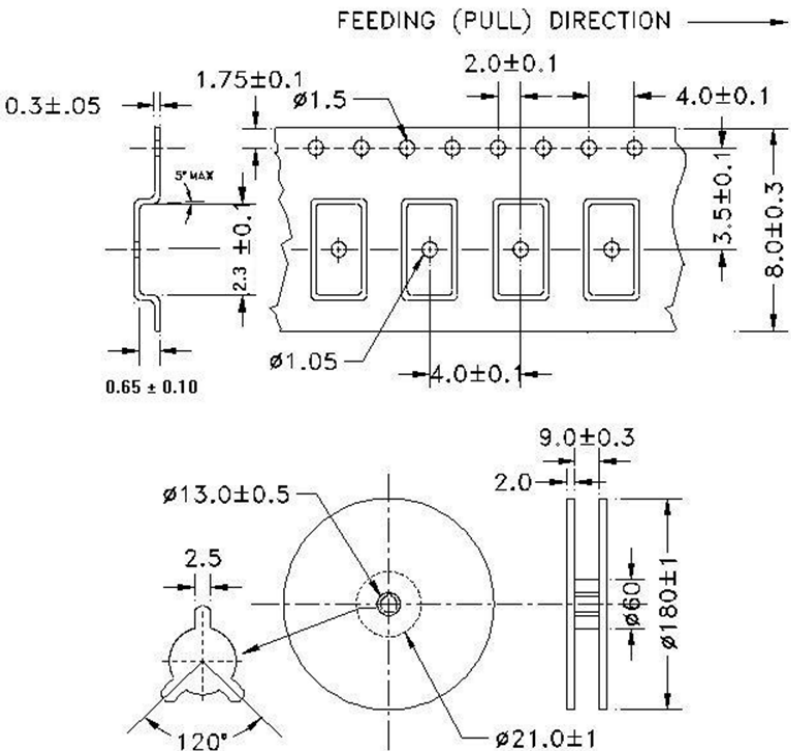
## REFLOW PROFILE



Zone	Description	Temperature	Time
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 150°C ~ 180°C	60 ~ 120 sec.
2	Reflow	$T_L$ 217°C	45 ~ 90 sec.
3	Peak Heat	$T_P$ 260°C MAX	10 sec.

## PACKAGING

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



DIMENSIONS: mm



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## ABRACON:

[ABM11W-31.2500MHZ-7-D2X-T3](#) [ABM11W-28.6364MHZ-4-J2J-T3](#) [ABM11W-38.0000MHZ-6-K1J-T3](#) [ABM11W-26.0410MHZ-6-K2J-T3](#) [ABM11W-24.0000MHZ-4-J1Z-T3](#) [ABM11W-19.4400MHZ-8-D1X-T3](#) [ABM11W-30.0000MHZ-7-K1Z-T3](#) [ABM11W-24.5455MHZ-4-J2Z-T3](#) [ABM11W-28.6364MHZ-4-D2X-T3](#) [ABM11W-27.1200MHZ-4-D1X-T3](#) [ABM11W-24.3050MHZ-4-J2J-T3](#) [ABM11W-31.2500MHZ-6-J2J-T3](#) [ABM11W-31.2500MHZ-4-J1Z-T3](#) [ABM11W-24.5454MHZ-7-J1J-T3](#) [ABM11W-38.0000MHZ-8-D2X-T3](#) [ABM11W-28.6364MHZ-4-J1Z-T3](#) [ABM11W-48.0000MHZ-6-K1Z-T3](#) [ABM11W-35.4160MHZ-6-J2Z-T3](#) [ABM11W-20.0000MHZ-8-D2X-T3](#) [ABM11W-44.0000MHZ-7-K2Z-T3](#) [ABM11W-29.4912MHZ-7-J1Z-T3](#) [ABM11W-50.0000MHZ-4-J2J-T3](#) [ABM11W-33.0000MHZ-7-K1Z-T3](#) [ABM11W-44.0000MHZ-4-J2Z-T3](#) [ABM11W-40.0000MHZ-8-K2J-T3](#) [ABM11W-35.4160MHZ-6-B2U-T3](#) [ABM11W-37.0500MHZ-8-J1J-T3](#) [ABM11W-38.0000MHZ-8-B2U-T3](#) [ABM11W-37.4000MHZ-8-J1Z-T3](#) [ABM11W-37.0500MHZ-6-J2Z-T3](#) [ABM11W-33.0000MHZ-7-K2Z-T3](#) [ABM11W-28.6364MHZ-8-J1Z-T3](#) [ABM11W-36.0000MHZ-7-D2X-T3](#) [ABM11W-40.0000MHZ-8-K1Z-T3](#) [ABM11W-33.0000MHZ-7-D2X-T3](#) [ABM11W-24.3050MHZ-4-D2X-T3](#) [ABM11W-24.9231MHZ-8-K2Z-T3](#) [ABM11W-19.2800MHZ-4-J1Z-T3](#) [ABM11W-26.0000MHZ-7-D1X-T3](#) [ABM11W-36.0000MHZ-8-K2J-T3](#) [ABM11W-33.3300MHZ-4-K1J-T3](#) [ABM11W-49.1520MHZ-8-K2J-T3](#) [ABM11W-33.0000MHZ-4-K2Z-T3](#) [ABM11W-48.0000MHZ-4-D2X-T3](#) [ABM11W-30.0000MHZ-7-K1J-T3](#) [ABM11W-24.5535MHZ-6-K1Z-T3](#) [ABM11W-37.0000MHZ-6-J1Z-T3](#) [ABM11W-24.5535MHZ-4-J1J-T3](#) [ABM11W-24.5535MHZ-7-J1Z-T3](#) [ABM11W-42.0000MHZ-4-J1Z-T3](#) [ABM11W-24.5727MHZ-7-K1Z-T3](#) [ABM11W-33.3330MHZ-4-J2Z-T3](#) [ABM11W-24.5760MHZ-6-J1Z-T3](#) [ABM11W-19.2000MHZ-7-K1Z-T3](#) [ABM11W-24.5535MHZ-7-B2U-T3](#) [ABM11W-27.1200MHZ-7-J1Z-T3](#) [ABM11W-50.0000MHZ-8-K2Z-T3](#) [ABM11W-42.0000MHZ-4-K1Z-T3](#) [ABM11W-49.1520MHZ-8-J1Z-T3](#) [ABM11W-19.9680MHZ-4-J1Z-T3](#) [ABM11W-16.0132MHZ-6-K2Z-T3](#) [ABM11W-24.5727MHZ-8-K2Z-T3](#) [ABM11W-33.3300MHZ-7-J2Z-T3](#) [ABM11W-28.2240MHZ-6-D1X-T3](#) [ABM11W-24.9231MHZ-6-B1U-T3](#) [ABM11W-24.5535MHZ-7-J1J-T3](#) [ABM11W-38.4000MHZ-4-B1U-T3](#) [ABM11W-44.0000MHZ-7-D1X-T3](#) [ABM11W-35.4160MHZ-8-D1X-T3](#) [ABM11W-21.9487MHZ-4-D1X-T3](#) [ABM11W-16.0000MHZ-6-B2U-T3](#) [ABM11W-33.3300MHZ-8-D2X-T3](#) [ABM11W-37.4000MHZ-7-J1Z-T3](#) [ABM11W-16.0000MHZ-4-J1J-T3](#) [ABM11W-24.5454MHZ-7-B2U-T3](#) [ABM11W-35.4160MHZ-7-K1Z-T3](#) [ABM11W-16.0132MHZ-8-J2Z-T3](#) [ABM11W-16.0000MHZ-6-J1J-T3](#) [ABM11W-50.0000MHZ-4-J2Z-T3](#) [ABM11W-28.6364MHZ-4-K2J-T3](#) [ABM11W-36.0000MHZ-8-D2X-T3](#) [ABM11W-35.4160MHZ-7-J1Z-T3](#) [ABM11W-33.3330MHZ-8-K2Z-T3](#) [ABM11W-16.0000MHZ-6-J1Z-T3](#) [ABM11W-29.4912MHZ-8-J1Z-T3](#) [ABM11W-19.2800MHZ-6-J2J-T3](#) [ABM11W-24.5454MHZ-4-J2Z-T3](#) [ABM11W-19.6608MHZ-4-J1J-T3](#) [ABM11W-26.0410MHZ-7-B1U-T3](#) [ABM11W-20.0000MHZ-8-K1Z-T3](#) [ABM11W-40.0000MHZ-8-J1J-T3](#) [ABM11W-44.0000MHZ-8-K1Z-T3](#) [ABM11W-28.3220MHZ-4-J1Z-T3](#) [ABM11W-16.0132MHZ-8-B2U-T3](#) [ABM11W-32.0000MHZ-6-D1X-T3](#) [ABM11W-33.0000MHZ-6-J1Z-T3](#) [ABM11W-33.3300MHZ-8-](#)

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