

IoT OPTIMIZED LOW PROFILE QUARTZ CRYSTAL

ABM8W SERIES



3.2 x 2.5 x 0.75mm



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
- 0.75 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	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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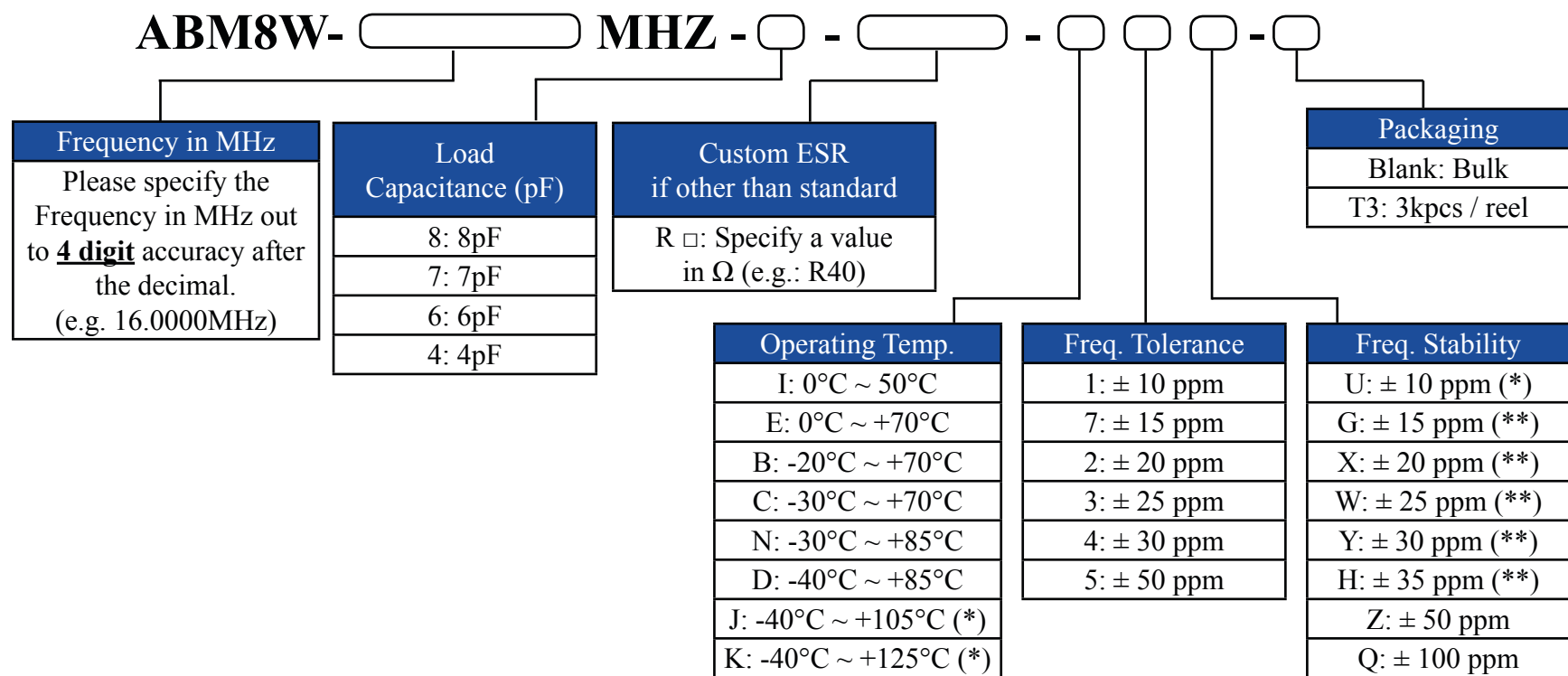


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OPTIONS AND PART IDENTIFICATION (NOTE 1)

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



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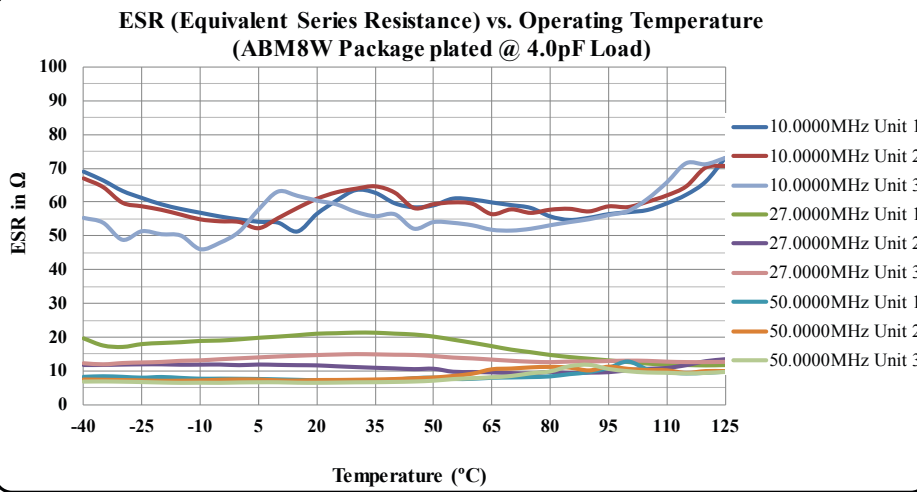
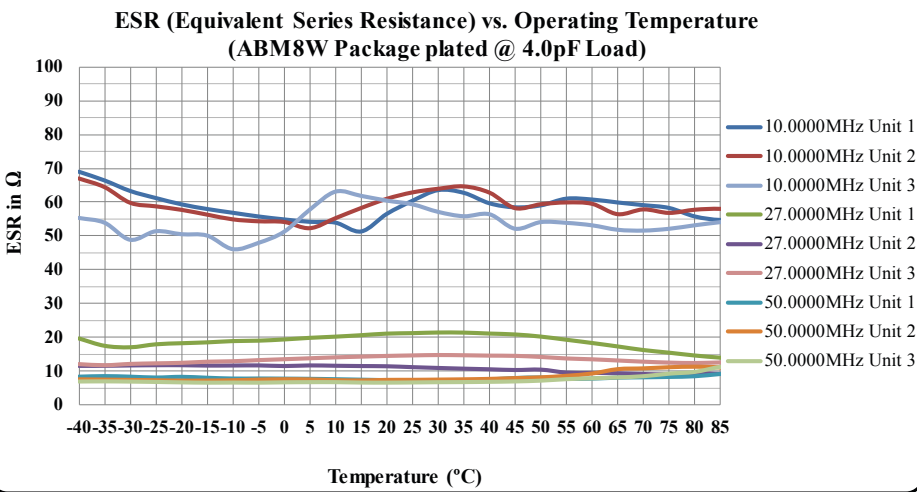
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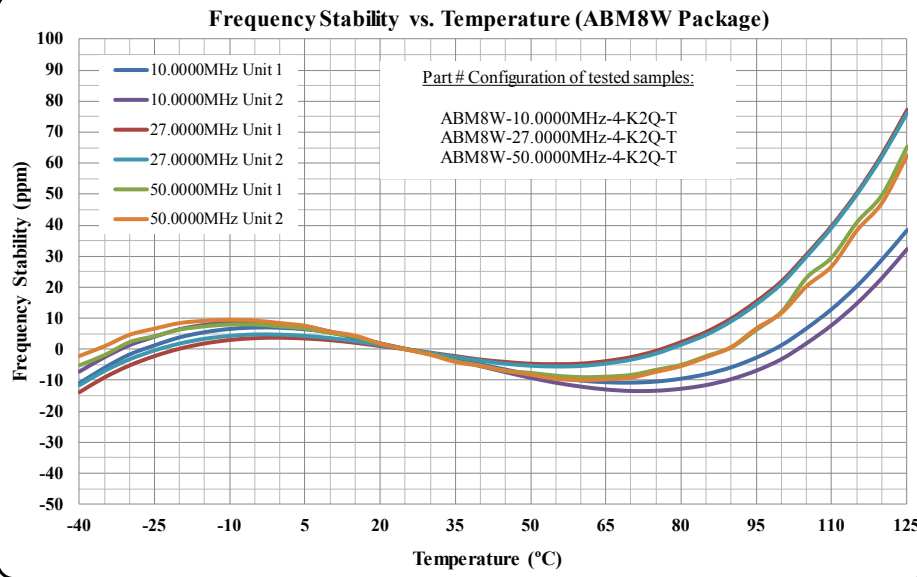
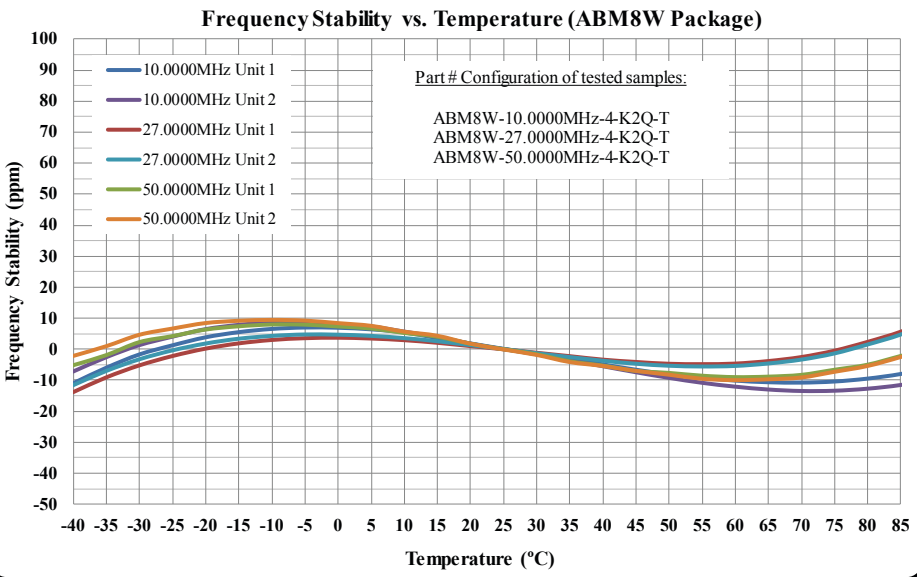
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TYPICAL ESR (EQUIVALENT SERIES RESISTANCE) Vs. TEMPERATURE CHARACTERISTICS



TYPICAL FREQUENCY Vs. TEMPERATURE CHARACTERISTICS



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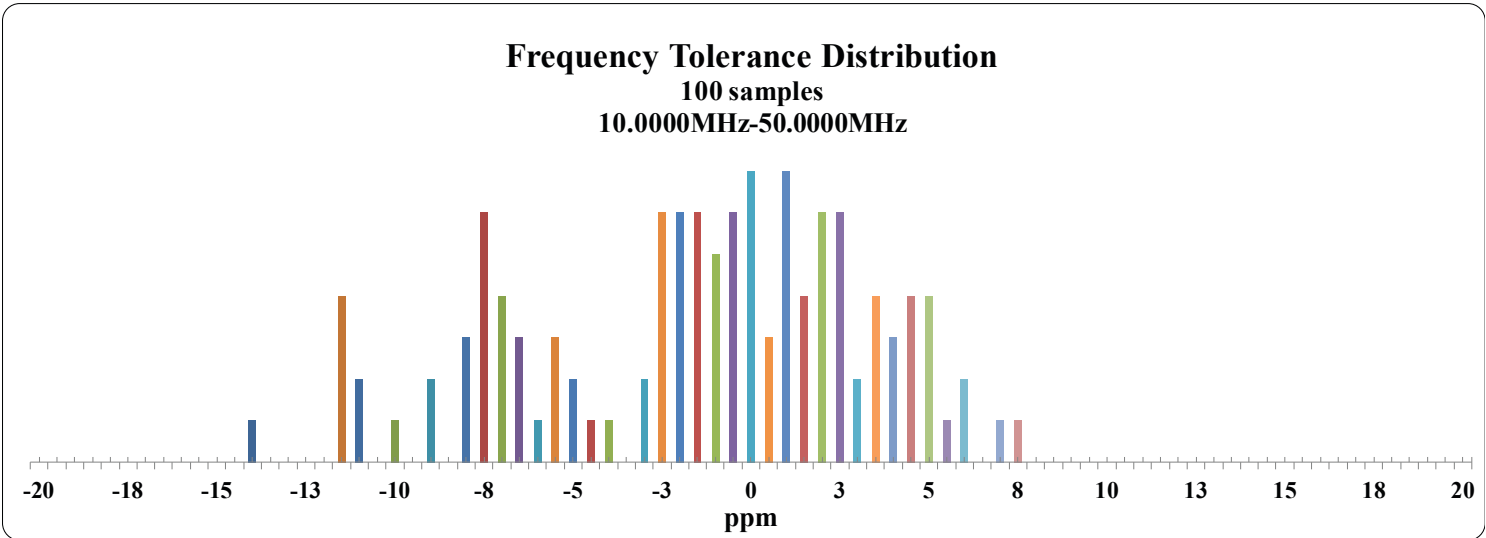
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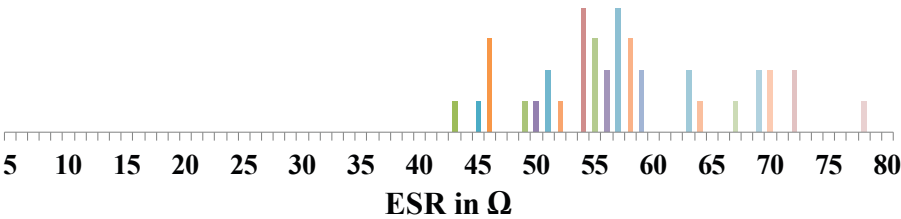
TYPICAL FREQUENCY TOLERANCE DISTRIBUTION (AT 25°C ± 3°C)



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

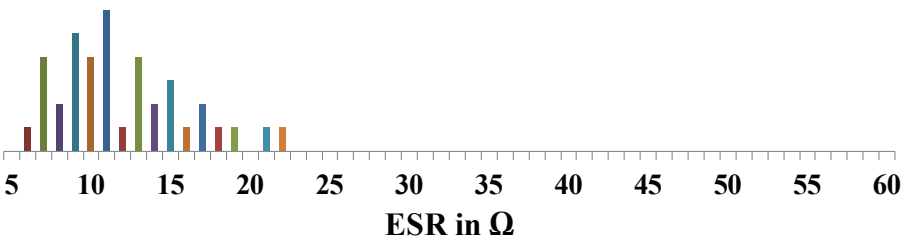
ESR Distribution @ 10.0000MHz

100 samples
MAX ESR = 77.7 Ω



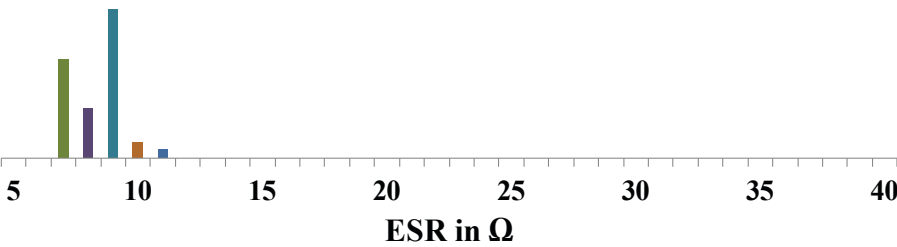
ESR Distribution @ 27.0000MHz

100 samples
MAX ESR = 21.6 Ω



ESR Distribution @ 50.0000MHz

100 samples
MAX ESR = 10.23 Ω



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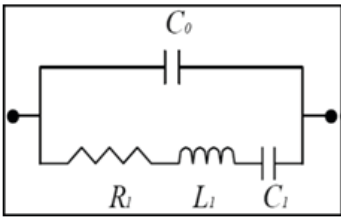
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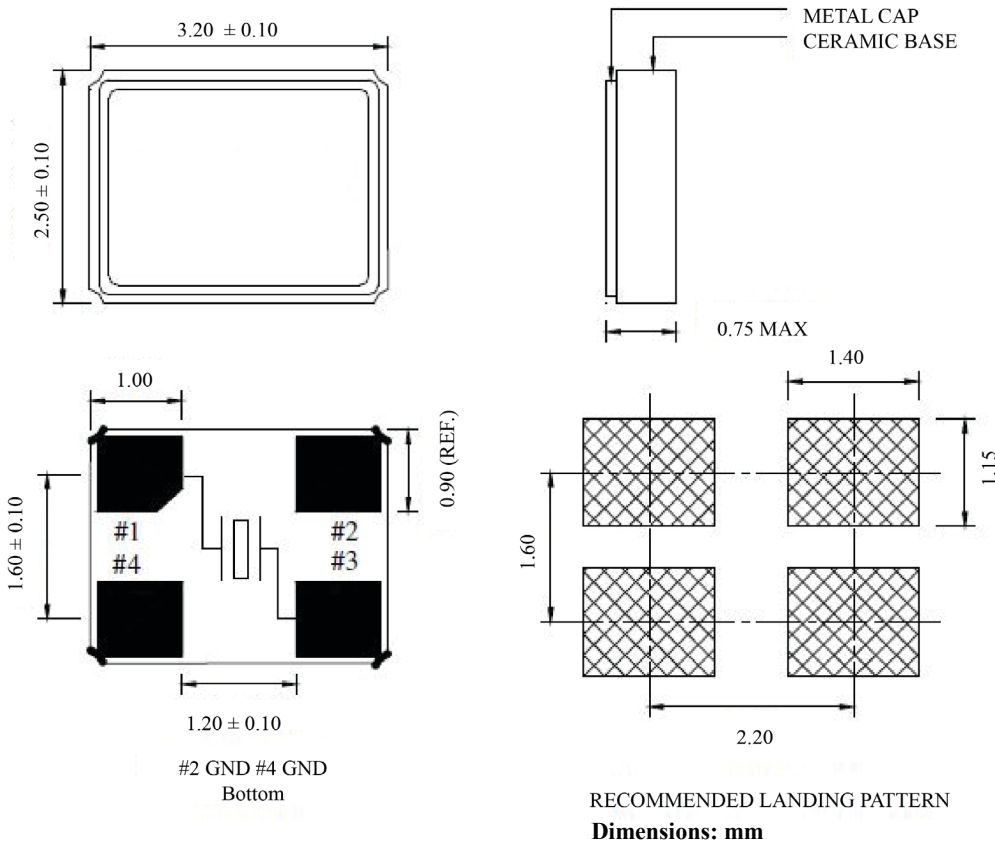
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SPICE MODELS (BASED ON TYPICAL VALUES AT 25°C ± 3°C)



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

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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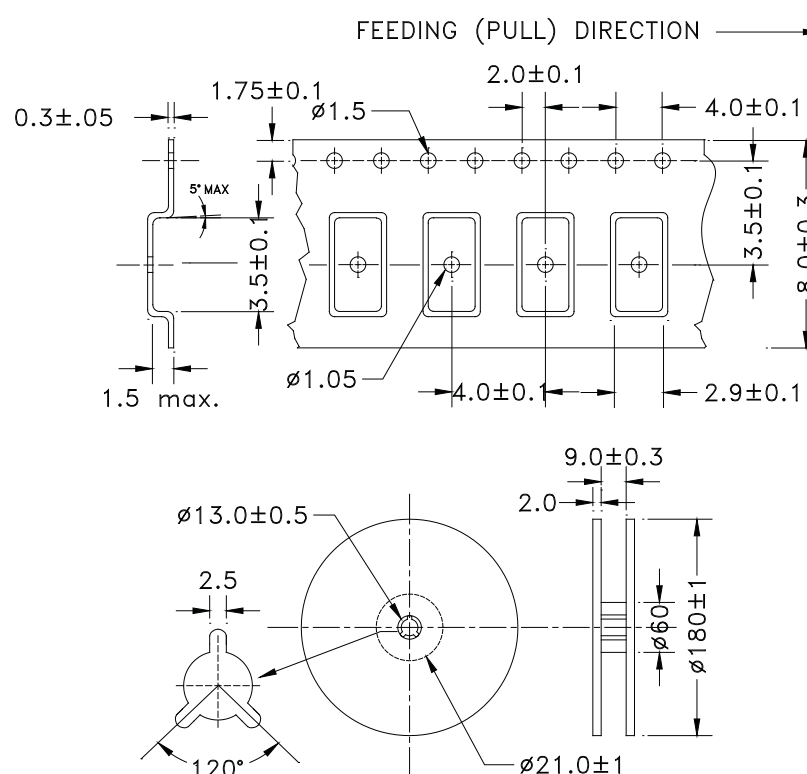
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The graph illustrates a heat treatment cycle with the following components:

- Y-axis:** Temperature
- X-axis:** Time
- Starting Point:** 25
- Preheat (1):** The initial heating phase from 25 to T_{SMIN} .
- Ramp Up (2):** The heating phase from T_{SMIN} to T_P .
- Peak (3):** The peak temperature T_P .
- Critical Zone:** The temperature range between T_P and T_L .
- Ramp Down:** The cooling phase from T_P to T_L .
- Soak Temperature Range:** Indicated by T_{SMIN} and T_{SMAX} .
- Time to Peak:** Labeled as $t_{25^\circ\text{C to Peak}}$.

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

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



DIMENSIONS: mm