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	16.0000		50.0000	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 Operating Temperature Range) (CL=4pF)		< 150	200	Ω	16.0000 – 17.9999MHz
		< 80	120		18.0000 – 20.9999MHz
		< 60	100		21.0000 – 29.9999MHz
		< 50	80		30.0000 – 37.9999MHz
		< 30	60		38.0000 – 50.0000MHz
Equivalent series resistance "R1" (over Operating Temperature Range) (CL=6pF, 7pF, 8pF)		< 120	150	Ω	16.0000 – 17.9999MHz
		< 80	120		18.0000 – 20.9999MHz
		< 60	100		21.0000 – 23.9999MHz
		< 30	50		24.0000 – 29.9999MHz
		< 30	50		30.0000 – 37.9999MHz
		< 30	40		38.0000 – 50.0000MHz
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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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.

ABM11W- ( ) 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 ABRACONfor 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

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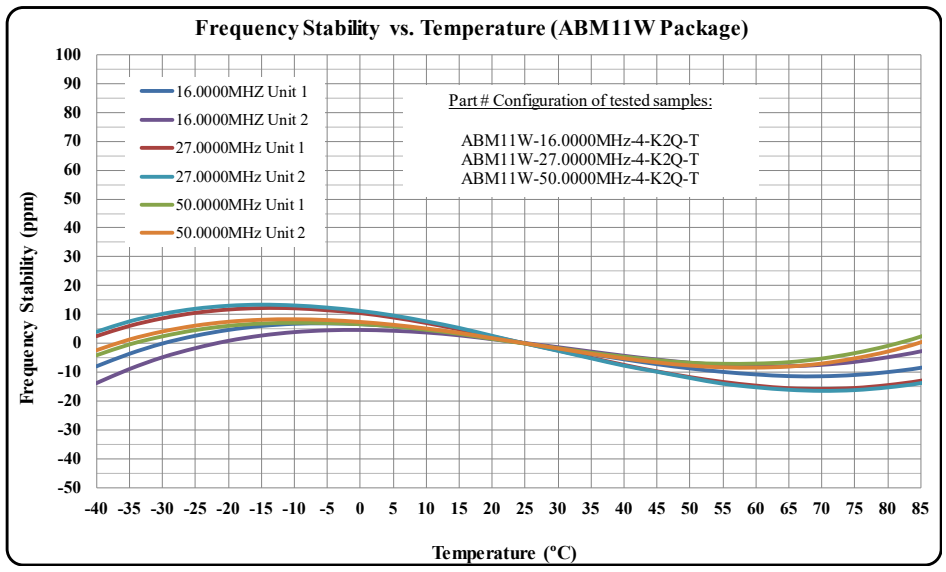
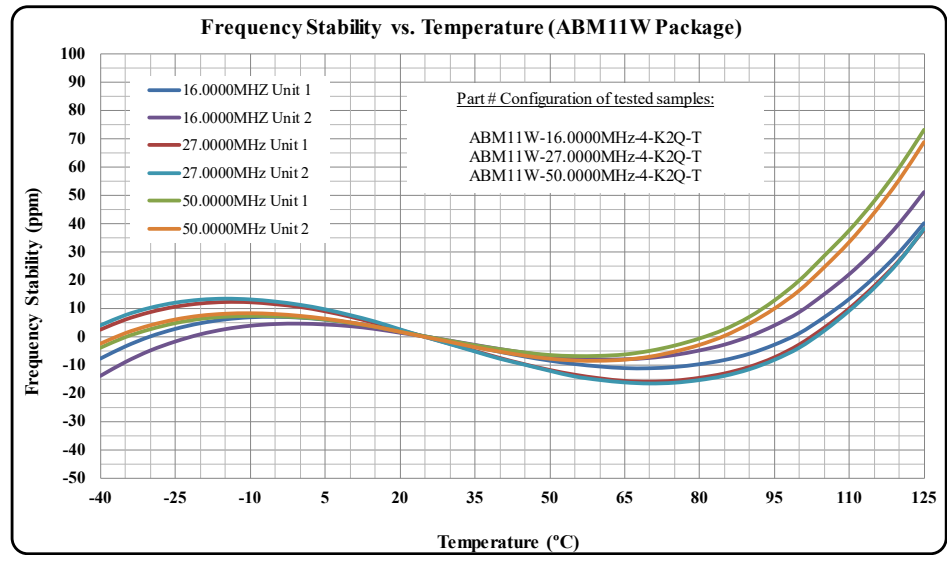
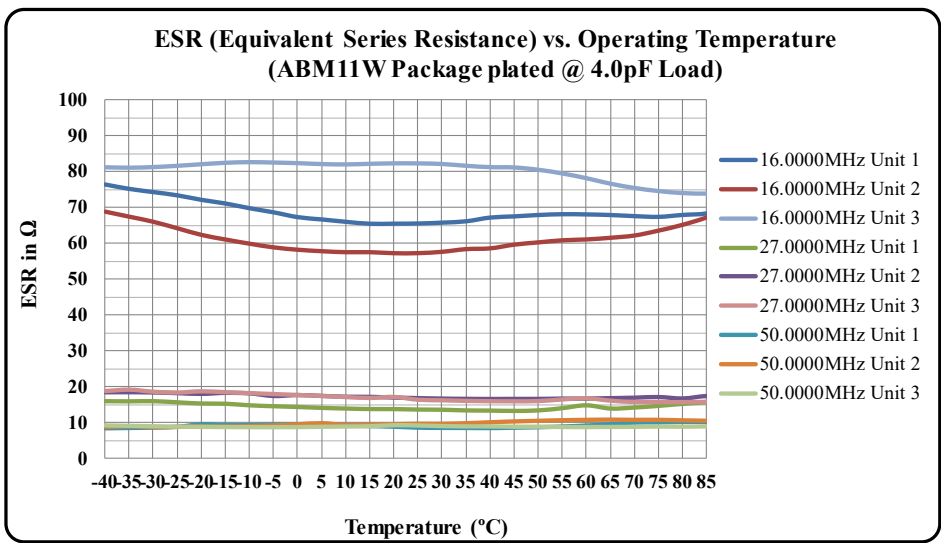
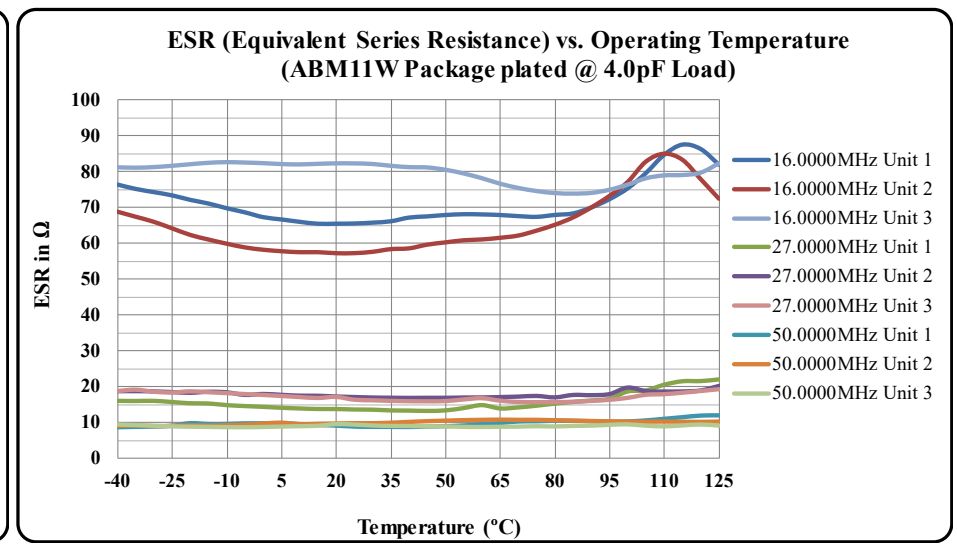
TYPICAL FREQUENCY Vs. TEMPERATURE CHARACTERISTICS





TYPICAL ESR (EQUIVALENT SERIES RESISTANCE) Vs. TEMPERATURE CHARACTERISTICS





(*) Plating Load = Load Capacitance (CL)

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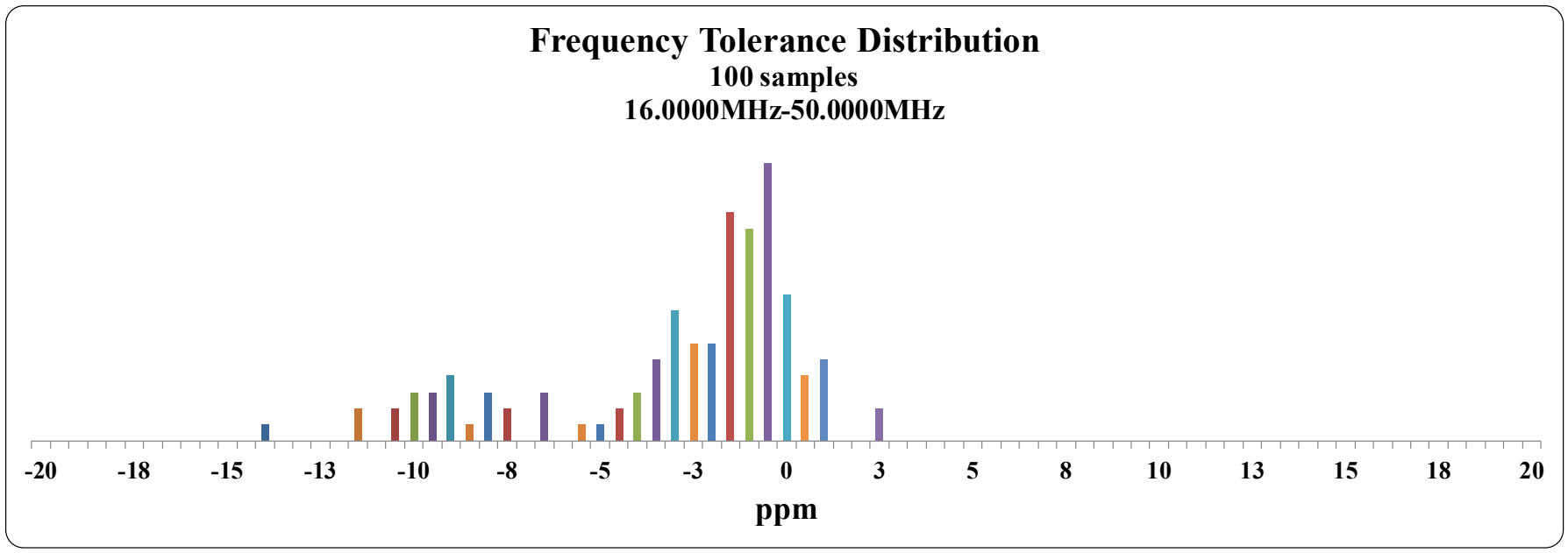
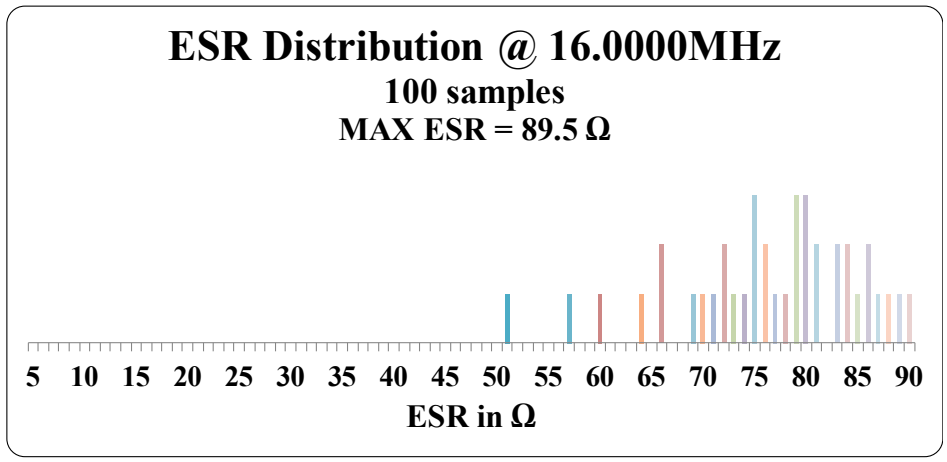
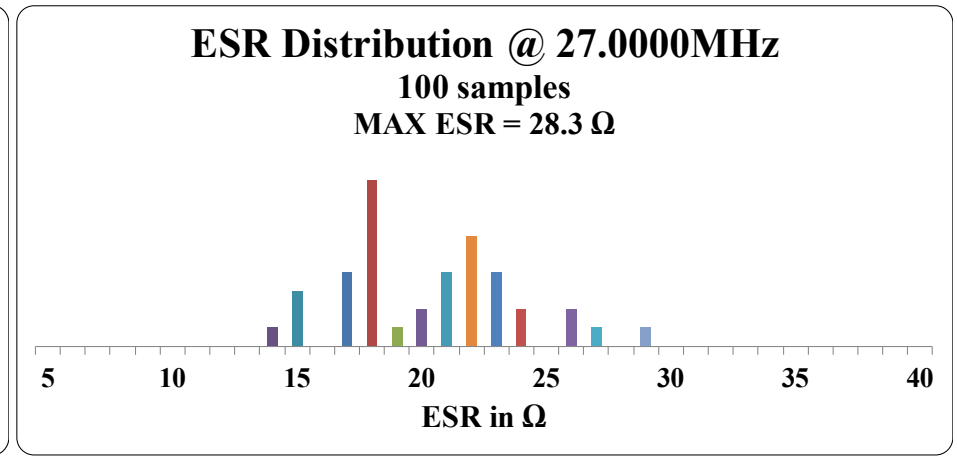
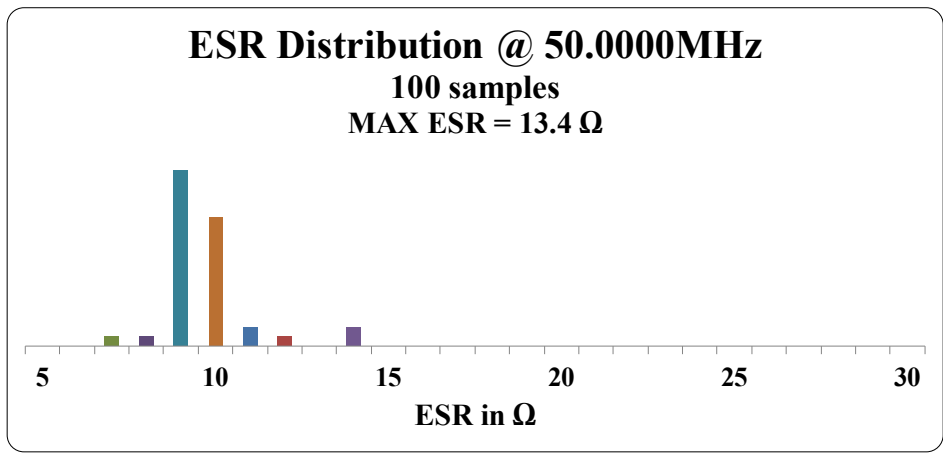
TYPICAL FREQUENCY TOLERANCE DISTRIBUTION (AT 25°C ± 3°C)



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







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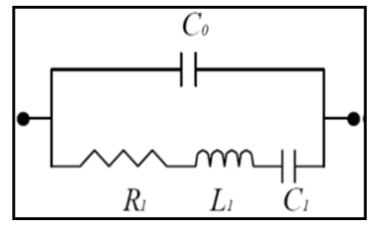
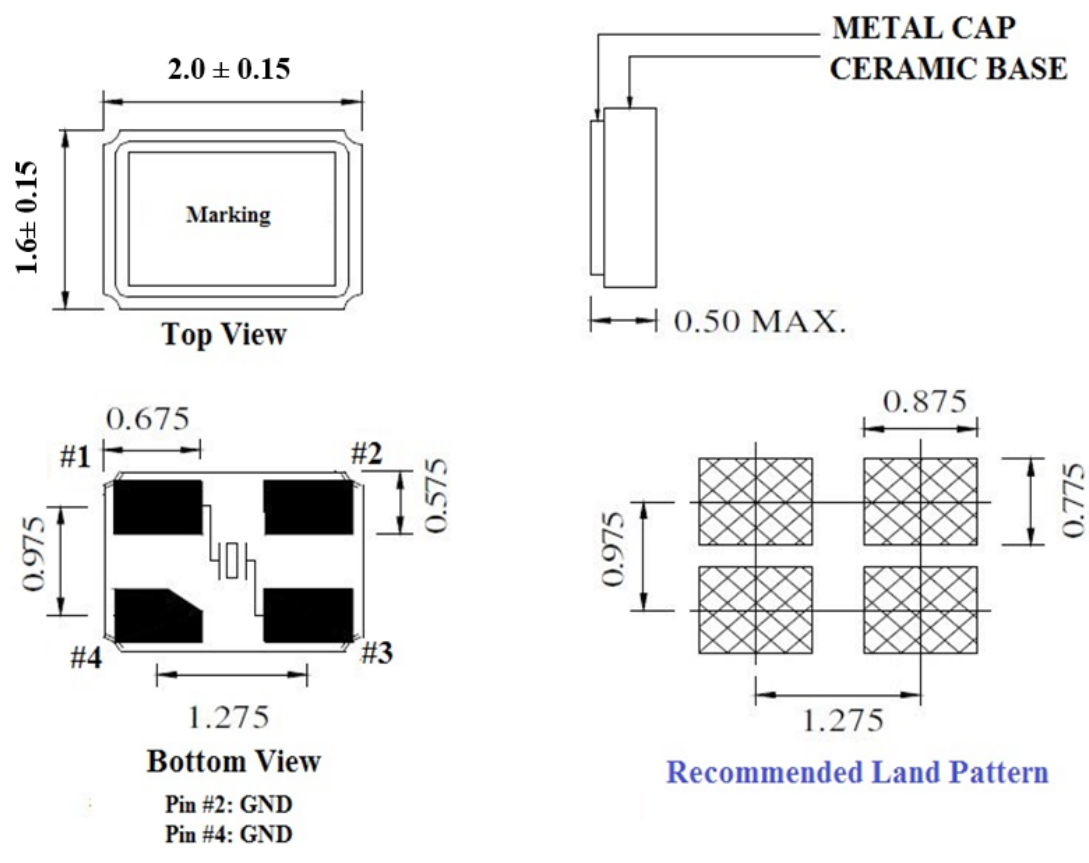
SPICE MODELS (BASED ON TYPICAL VALUES AT 25°C ± 3°C)



Frequency: 16.0000MHz Plating Load: 4pF				Frequency: 16.0000MHz 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: 27.0000MHz Plating Load: 4pF				**Frequency: 27.0000MHz 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: 50.0000MHz Plating Load: 4pF				**Frequency: 50.0000MHz 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.

DIMENSIONS: MM

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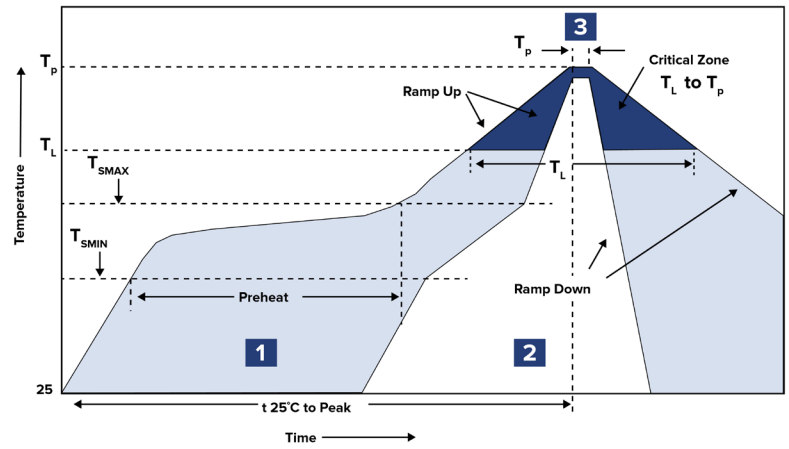
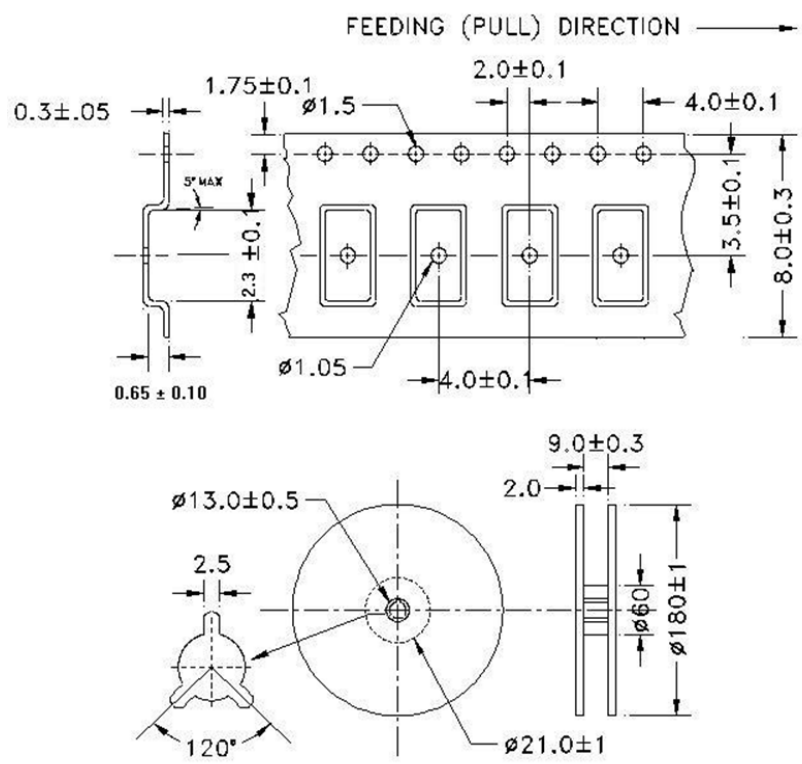
REFLOW PROFILE



Zone	Description	Temperature	Time
1	Preheat	T_{SMIN} ~ 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

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