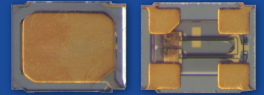


32.768kHz IoT Optimized SMD Crystal



ABS04W SERIES



1.20 x 1.00 x 0.35mm
 RoHS/RoHS II Complaint
 MSL = N/A: Not Applicable

Note #1: With an effective loop capacitance of 4.0pF, the oscillator circuit will be within set-tolerance specification; less any frequency shift due to the reflow process.

Note #2: The oscillator loop needs to present an effective loop capacitance of 4.0 pF to track the stand-alone crystal frequency. This loop capacitance is essential to ensure highest possible Closed-Loop Safety Factor for the entire population of crystals.

Note #3: $T_s = - (C1) / [2*(C0 + CL)^2]$ Where CL = 4pF

Options and Part Identification

ABS04W-32.768 kHz - [] - [] [] - []

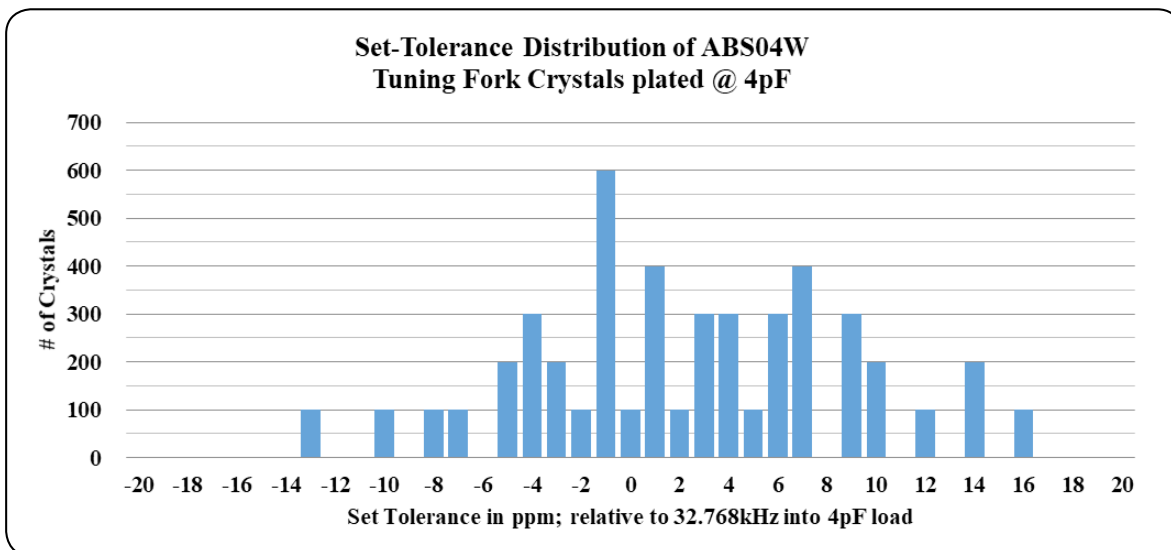
Load Capacitance (pF)
V: 12.5pF
9: 9pF
7: 7pF
6: 6pF
5: 5pF
4: 4pF

Operating Temp. Range
B: -20°C ~ +70°C
D: -40°C ~ +85°C
J: -40°C ~ +105°C

Freq. Tolerance
2: ±20ppm
3: ±30ppm
5: ±50ppm

Packaging
Blank: Bulk
T5: Tape & Reel (5000pcs/reel)

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

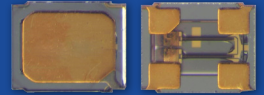


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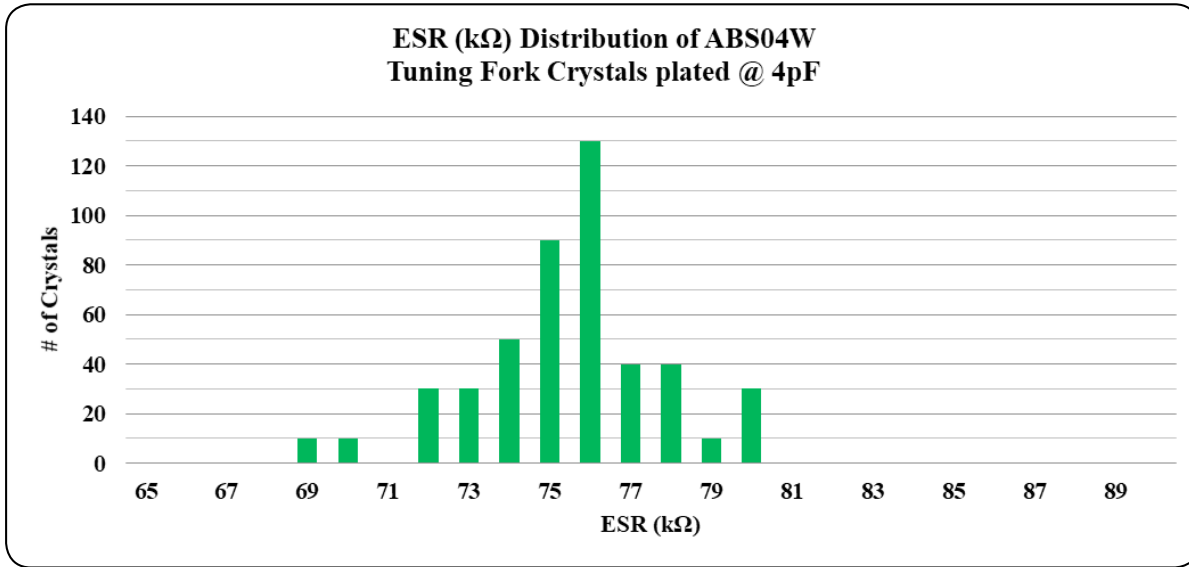


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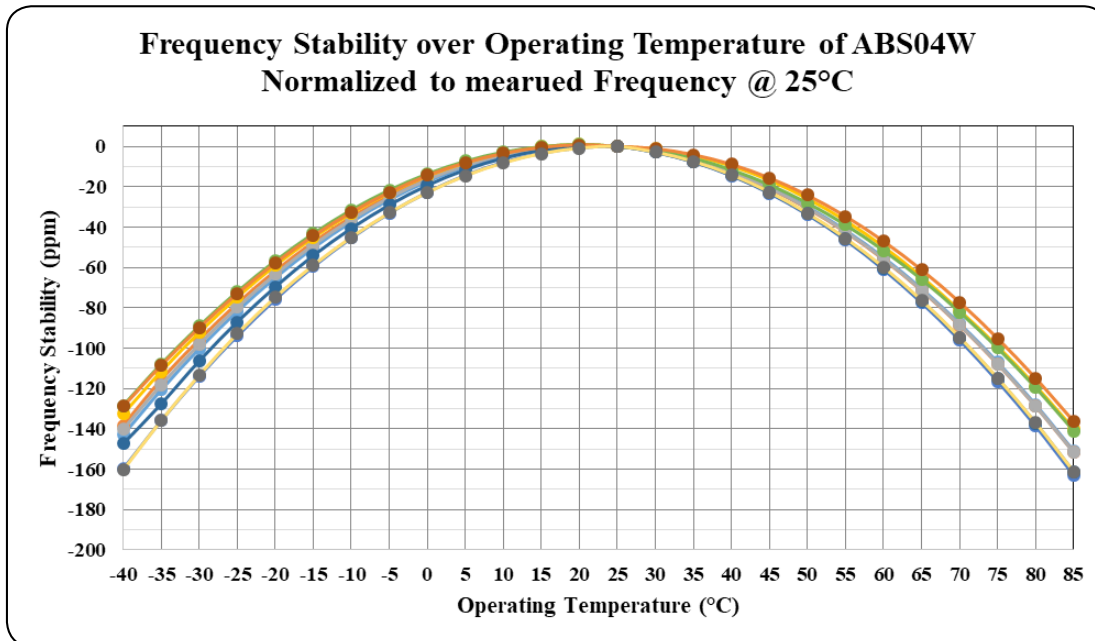
1.20 x 1.00 x 0.35mm
RoHS/RoHS II Complaint
MSL = N/A: Not Applicable

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



The data above reflects typical distribution, lot-to-lot variation applies

Typical Frequency vs. Temperature Characteristics:

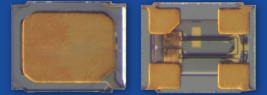


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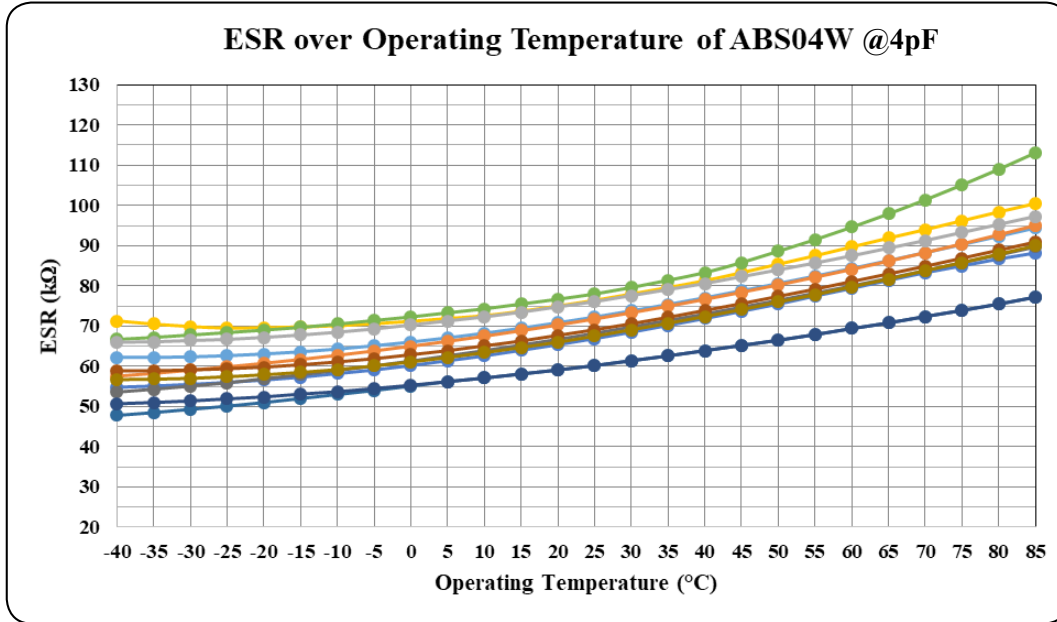


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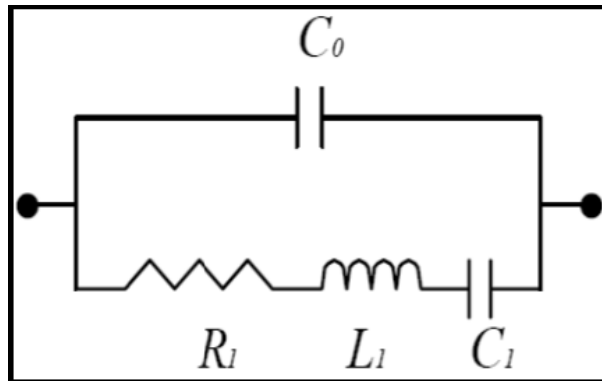
1.20 x 1.00 x 0.35mm
 RoHS/RoHS II Complaint
 MSL = N/A: Not Applicable

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



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

Quartz Crystal Equivalent Circuit



Plating Load (CL) = 4pF

C0	=	1.54	pF
R1	=	72,895	Ω
L1	=	3,702,326	mH
C1	=	6.47	fF

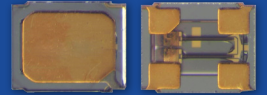
Plating Load (CL) = 6pF

C0	=	1.50	pF
R1	=	72,615	Ω
L1	=	3,750,717	mH
C1	=	6.38	fF

Plating Load (CL) = 12.5pF

C0	=	1.48	pF
R1	=	75,455	Ω
L1	=	3,660,470	mH
C1	=	6.55	fF

32.768kHz IoT Optimized SMD Crystal



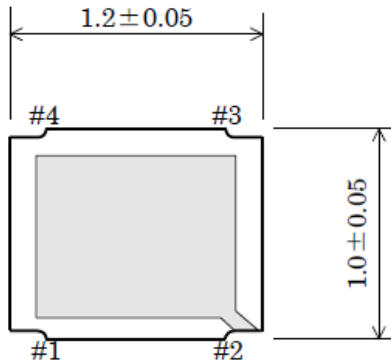
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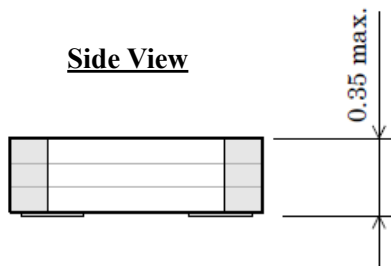
1.20 x 1.00 x 0.35mm
RoHS/RoHS II Complaint
MSL = N/A: Not Applicable

Mechanical Dimensions

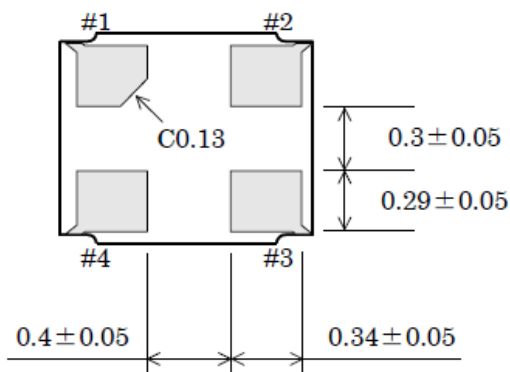
Top View



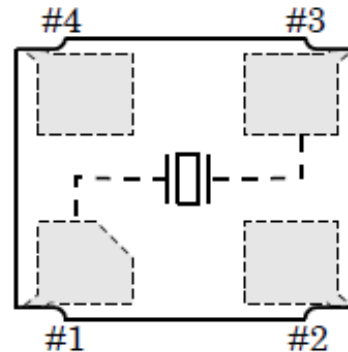
Side View



Bottom View



Crystal Internal Connections

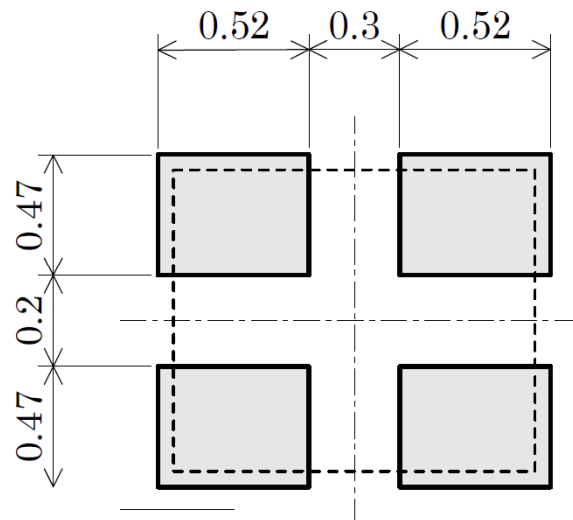


Pin #2: GND*

Pin #4: NC

*Pin #2 is connected to lid of the crystal package.

Recommended Land Pattern



Dimensions: mm

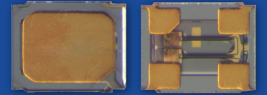


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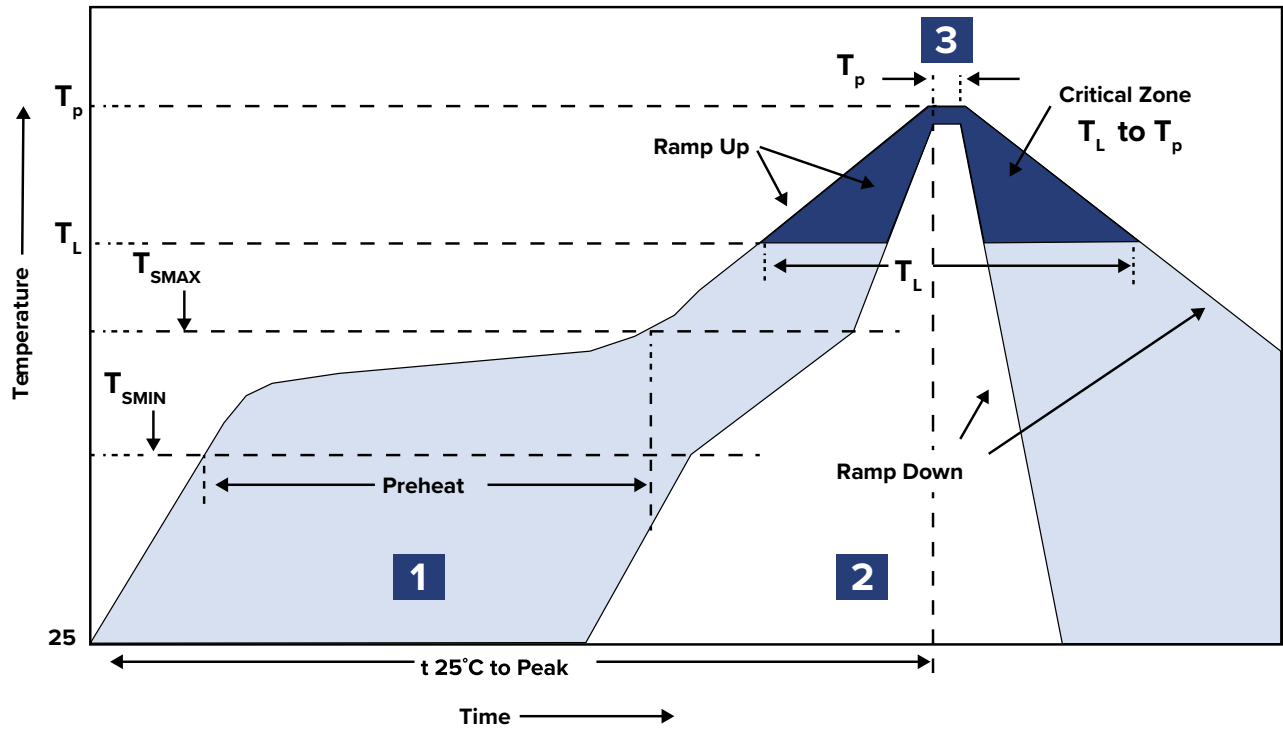


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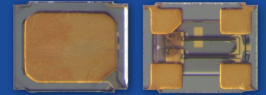
1.20 x 1.00 x 0.35mm
 RoHS/RoHS II Complaint
 MSL = N/A: Not Applicable

Recommended Reflow Profile



Zone	Description	Temperature	Time
1	Preheat / Soak	$T_{SMIN} \sim T_{SMAX}$ 150~170°C	80 ~ 100 sec.
2	Reflow	T_L 220°C	50 ~ 70 sec.
3	Peak heat	T_P 260±5°C	5 sec. MAX.

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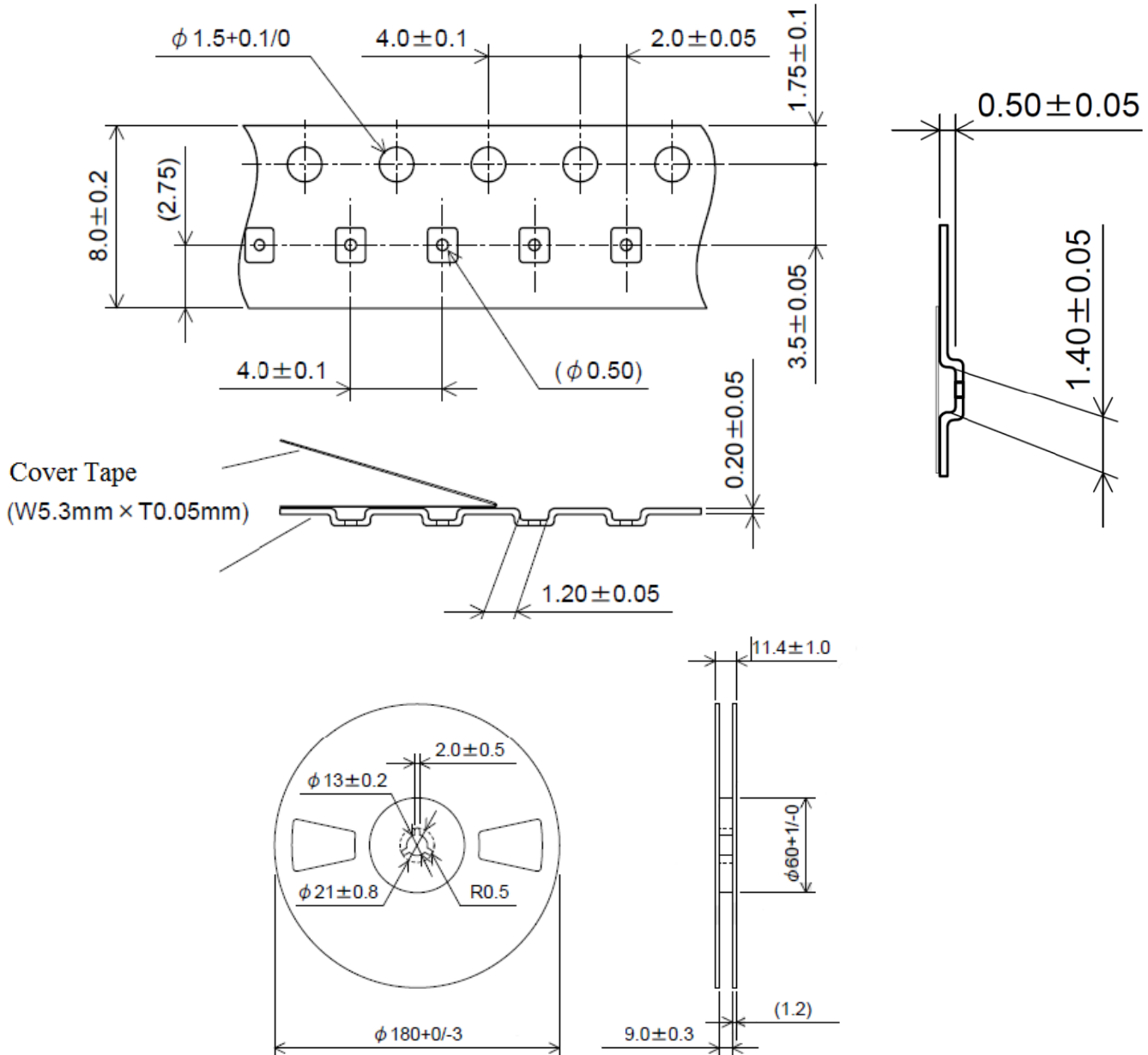
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1.20 x 1.00 x 0.35mm
RoHS/RoHS II Complaint
MSL = N/A: Not Applicable

Packaging:

T5: Tape and reel (5,000pcs/reel)



Dimensions: mm

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