

Ultra Miniature 1.6 x 1.2mm 32.768 kHz Crystal Oscillator



ASAKMP



ESD Sensitive

1.6 x 1.2 x 0.6mm
RoHS/RoHS II Compliant
MSL - N/A

FEATURES

- 32.768 kHz crystal oscillator
- Excellent ± 10 ppm stability over temperature
- Excellent ± 27 ppm all inclusive stability
- Compact form factor 1.6 x 1.2 mm
- Output enable/disable function
- Available over industrial operating temperature range (-40°C to +85°C)
- Supply voltage options 3.3V, 2.5V, 1.8V

APPLICATIONS

- Enhanced accuracy timekeeping
- RTC reference clock
- Medical devices
- Utility metering
- Wearables
- IoT
- Industrial timing
- Industrial wearables
- ULP input device

Electrical Specifications

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	32.768			kHz	
Operating Temperature Range (OTR)	-40		+85	°C	See options
Storage Temperature	-55		+125	°C	
Frequency Accuracy $\Delta f/f_0$ vs Tolerance (@+25 $\pm 3^\circ\text{C}$)	-7		+7	ppm	See options
vs Post Reflow (@+25 $\pm 3^\circ\text{C}$)	-2		+2		See options
vs Temperature (ref. to +25 $\pm 3^\circ\text{C}$)	-15		+15		See options
vs Aging (Over 10 Years @+25 $\pm 3^\circ\text{C}$)	-7		+7		See options
All Inclusive Stability Over 10-Year Product Life (-20°C to +70°C)	-27		+27		See options
Power Supply Voltage (V_{dd})	2.97	3.3	3.63	V	Option 1
	2.25	2.5	2.75		Option 2
	1.62	1.8	1.98		Option 3
		1.60 ~ 3.63			Option 4
Supply Current (I_{DD})		< 27.0	30.0	μA	$V_{dd} = 3.0\text{V}$, No Load
Stand Current Consumption (I_{STBY})			3.0	μA	
Output Load			15.0	pF	CMOS
Output Logic Levels	V_{OH}	$0.9 * V_{dd}$		V	$I_{OH} = -1 \text{ mA}$
	V_{OL}		$0.1 * V_{dd}$		$I_{OL} = +1 \text{ mA}$
Standby Logic Levels	V_{IH}	$0.7 * V_{dd}$			Oscillation
	V_{IL}		$0.3 * V_{dd}$		Hi Z
Symmetry @1/2 V_{dd}	45.0	50.0	55.0	%	$V_{TH} = 0.5 V_{dd}$
Start-up Time		< 2.25	7.0	ms	$V_{dd} = 3.3\text{V}$
		< 3.00	10.0		$V_{dd} = 1.8\text{V}$
Rise/Fall Time (T_r/T_f)			200.0	ns	10% V_{dd} to 90% V_{dd}



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Phone: 512-371-6159 | Fax: 512-351-8858
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REVISED: 08.16.2018

ABRACON IS
ISO9001-2015
CERTIFIED

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Options and Part Identification

ASAKMP [] [] - 32.768KHz []

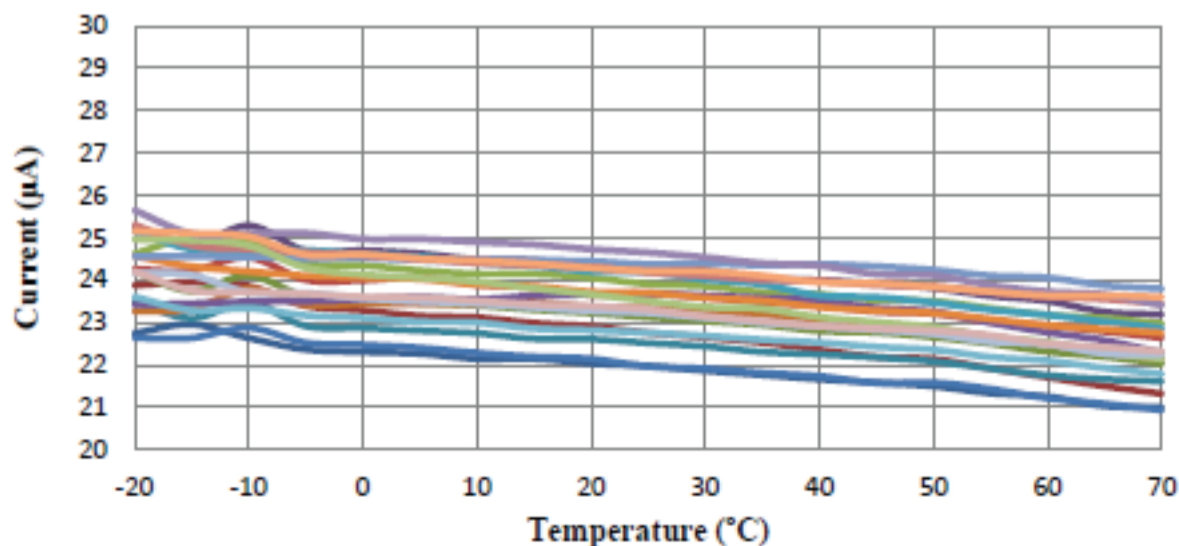
Supply Voltage	Option*	Set Tolerance	Operating Temp.	Stability Over Temperature	All Inclusive Stability Over 10-Year Product Life**	Packaging
A: 3.3V	1	±7 ppm	-20°C to +70°C	±10 ppm	±27 ppm Maximum	Blank: Bulk
B: 2.5V	2	±10 ppm	-20°C to +70°C	±10 ppm	±30 ppm Maximum	T3: 3K pcs/reel
C: 1.8V	3	±7 ppm	-20°C to +70°C	±15 ppm	±32 ppm Maximum	
D: 1.60 ~ 3.63V	4	±10 ppm	-20°C to +70°C	±15 ppm	±35 ppm Maximum	
	5	±7 ppm	-40°C to +85°C	±15 ppm	±32 ppm Maximum	
	6	±10 ppm	-40°C to +85°C	±15 ppm	±35 ppm Maximum	
	7	±7 ppm	-40°C to +85°C	±20 ppm	±37 ppm Maximum	
	8	±10 ppm	-40°C to +85°C	±20 ppm	±40 ppm Maximum	

* For custom tolerance, operating temperature and stability, please contact Abracon.

** All-Inclusive Stability: Set-tolerance, shift through reflow, stability over temperature and aging over 10-year product life.

Typical Current Consumption

Current Consumption Over Temperature @ $V_{dd} = 3.3V, 25 \pm 3^\circ C$



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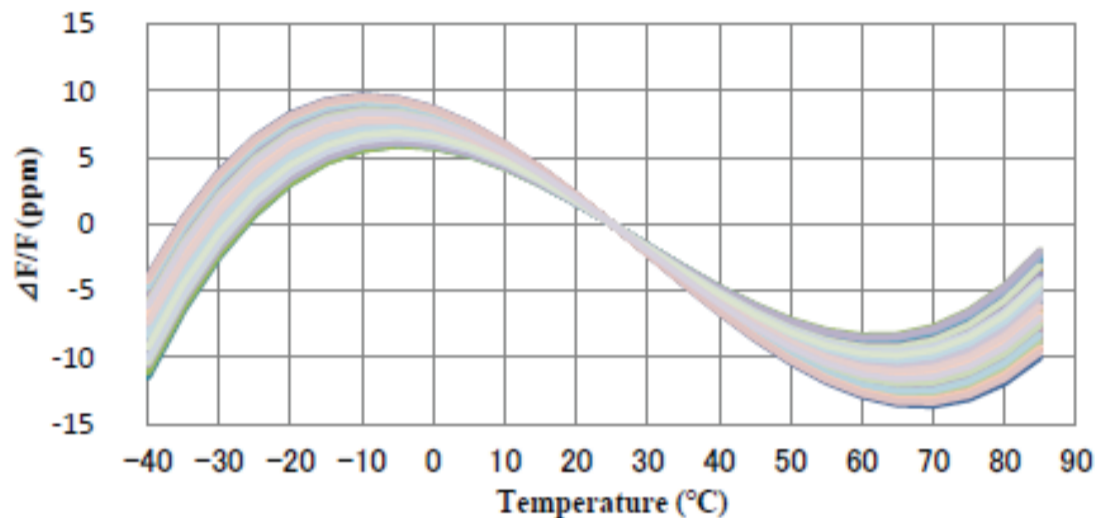
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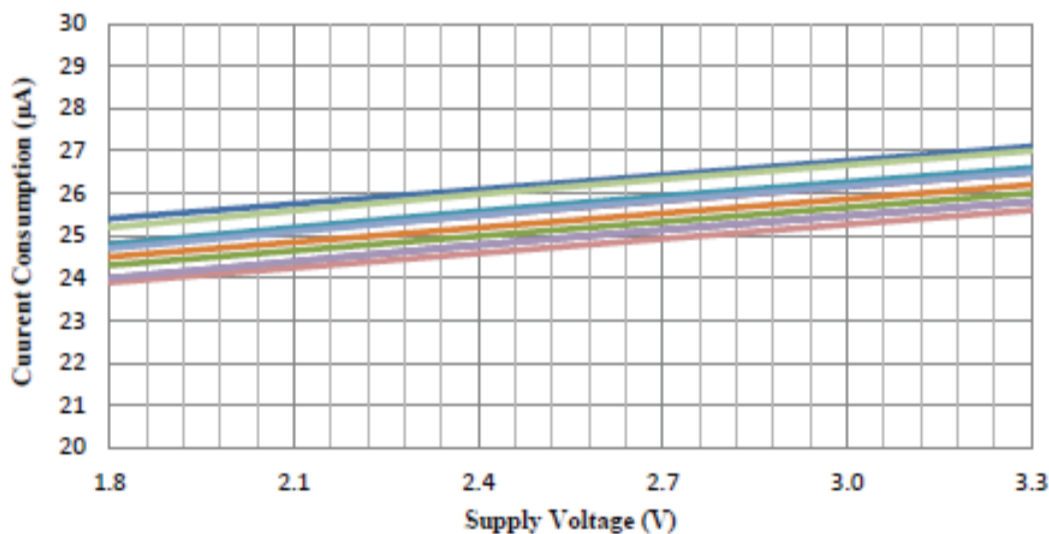
Typical Frequency Stability Over Temperature:

Frequency Stability Over Operating Temperature
Normalized to measured frequency @ 25°C

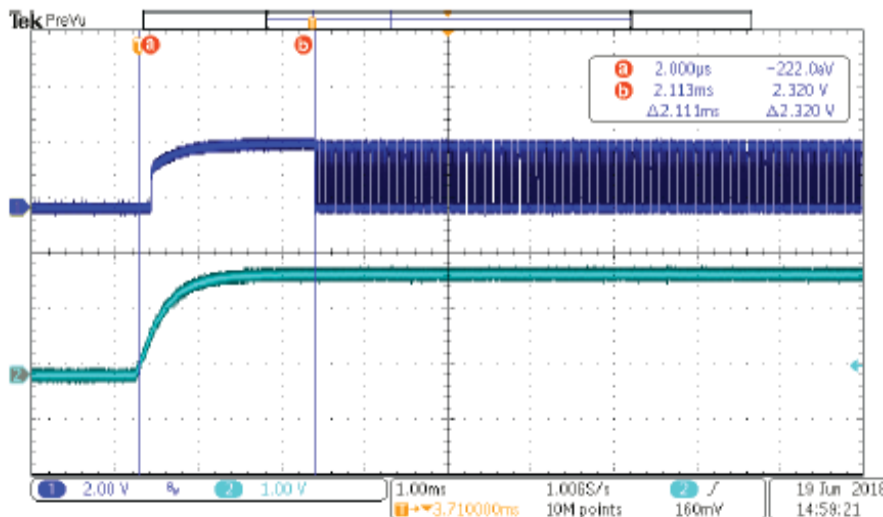


Typical Current Consumption (I_{dd})

Current Consumption vs. Supply Voltage @ 25 ±3°C



Typical Start-Up Time @ $V_{dd} = 1.8V, 25 \pm 3^\circ C$



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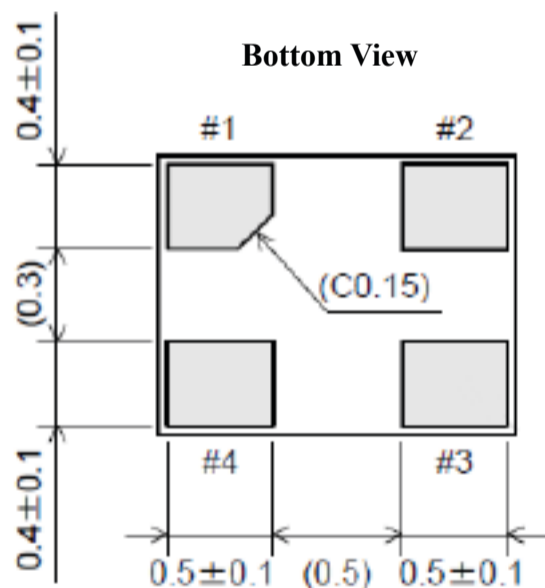
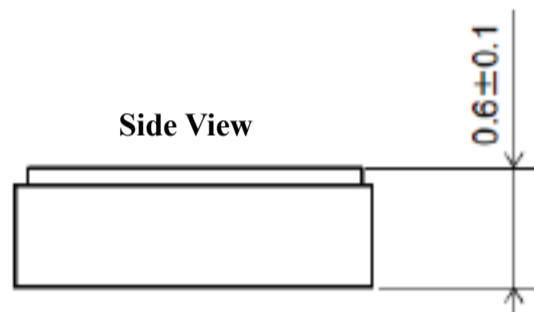
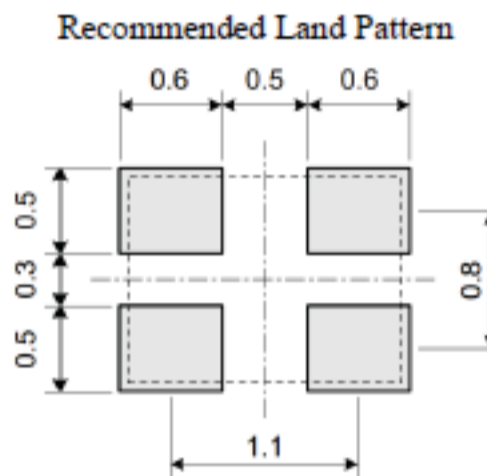
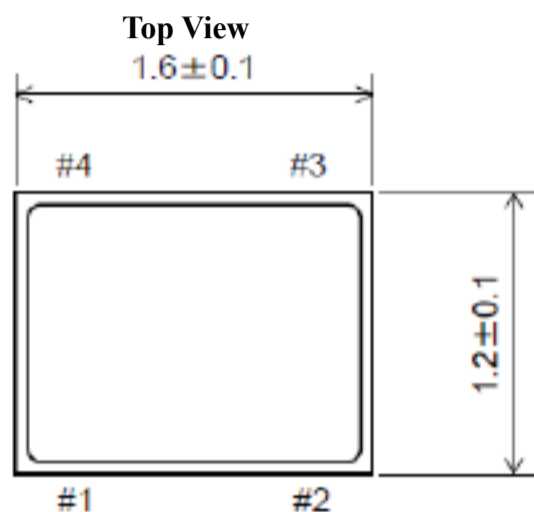


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MSL - N/A

Mechanical Dimensions



Dimensions: mm

PIN #	Function
1	Enable/Disable
2	GND
3	Output
4	V _{dd}

Note: Recommend using a 0.01μF bypass capacitor between PIN 2 and 4.



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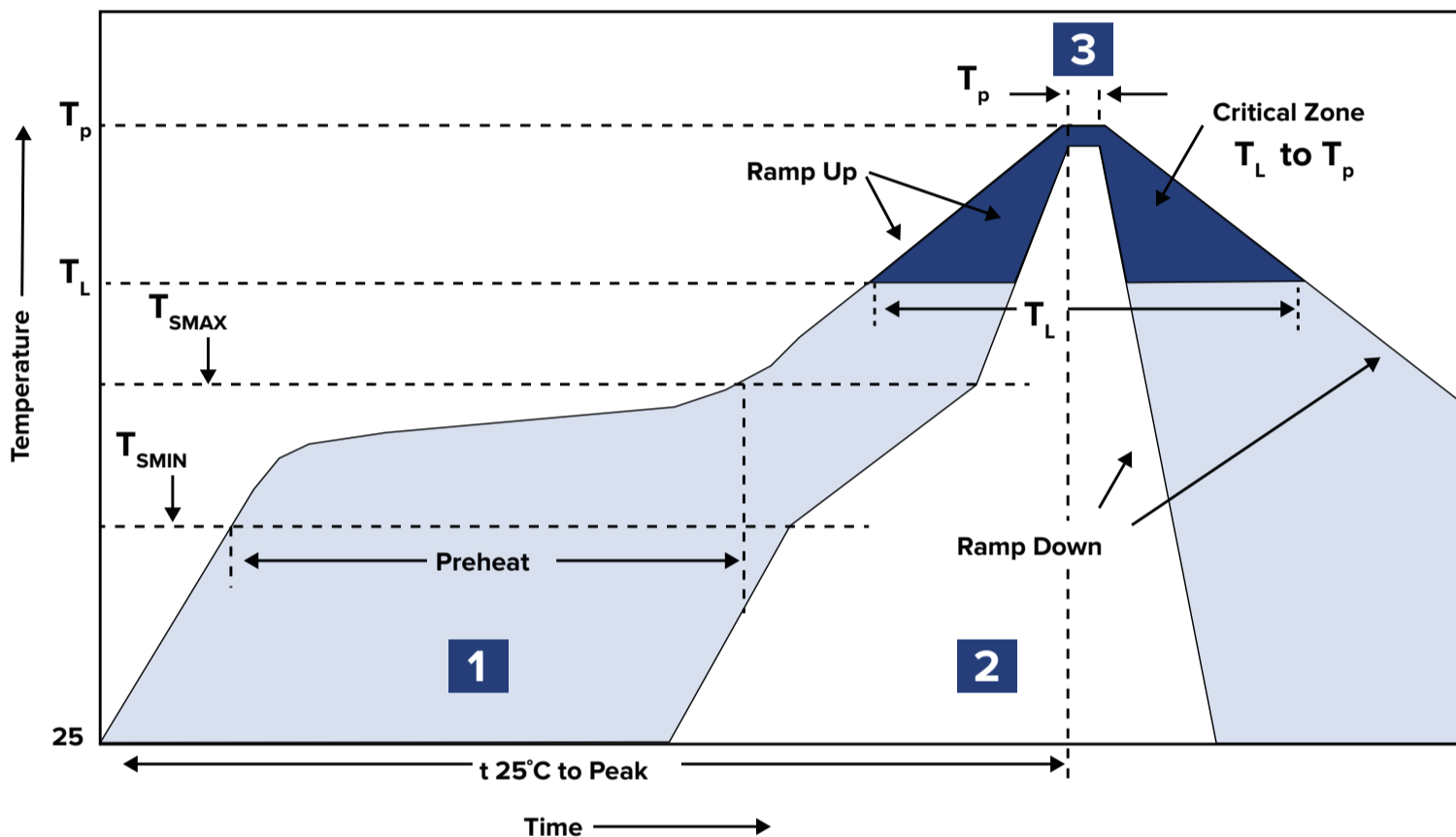


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Reflow Profile



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

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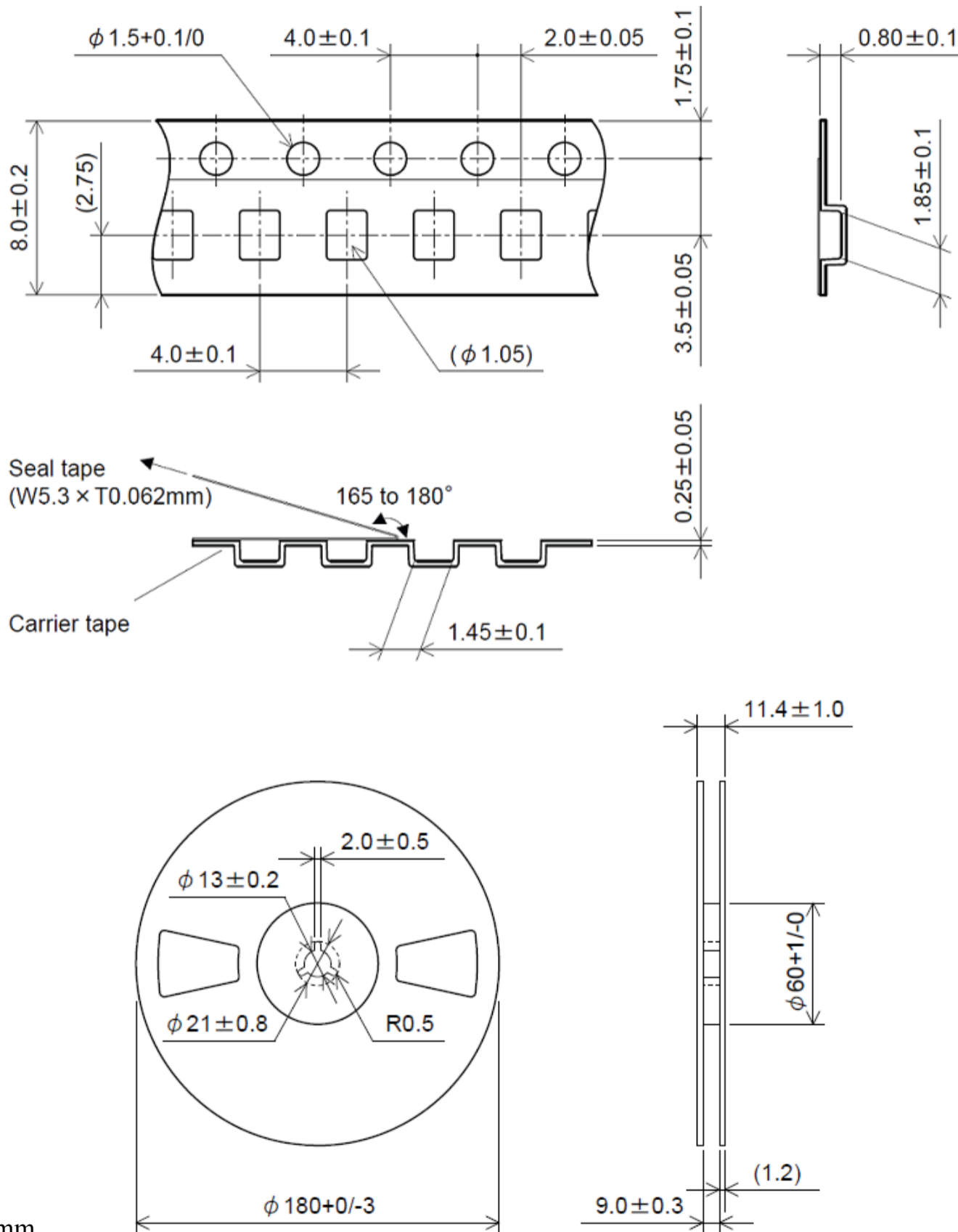
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Packaging

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



Dimensions: mm



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