

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

APPLICATIONS

- 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 $+85^{\circ}\text{C}$)
- Supply voltage options 3.3V, 2.5V, 1.8V

- 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	$^{\circ}\text{C}$	See options
Storage Temperature		-55		+125	$^{\circ}\text{C}$	
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		
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		
All Inclusive Stability Over 10-Year Product Life (-20°C to $+70^{\circ}\text{C}$)		-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}	$0.9 \cdot V_{dd}$			V	$I_{OH} = -1 \text{ mA}$
	V_{OL}			$0.1 \cdot V_{dd}$		$I_{OL} = +1 \text{ mA}$
Standby Logic Levels	V_{IH}	$0.7 \cdot V_{dd}$				Oscillation
	V_{IL}			$0.3 \cdot V_{dd}$		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}



5101 Hidden Creek Ln Spicewood TX 78669
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REVISED: 08.16.2018

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ISO9001-2015
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Options and Part Identification

ASAKMP - 32.768KHz

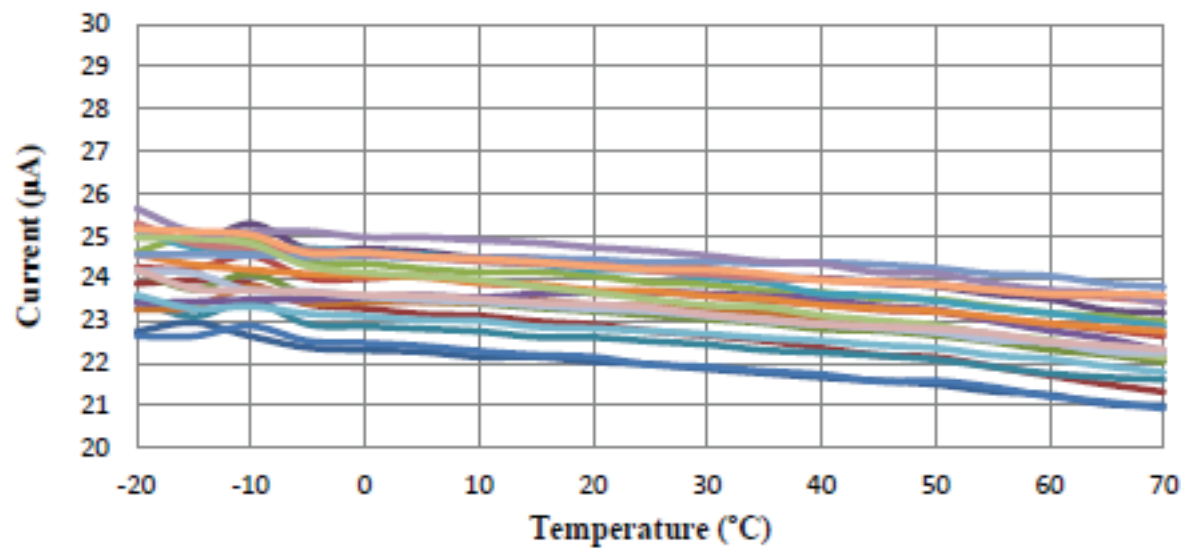
Supply Voltage	Option*	Set Tolerance	Operating Temp.	Stability Over Temperature	All Inclusive Stability Over 10-Year Product Life**	Packaging
A: 3.3V	1	±7 ppm	-20°C to +70°C	±10 ppm	±27 ppm Maximum	Blank: Bulk
B: 2.5V	2	±10 ppm	-20°C to +70°C	±10 ppm	±30 ppm Maximum	T3: 3K pcs/reel
C: 1.8V	3	±7 ppm	-20°C 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 ±3°C



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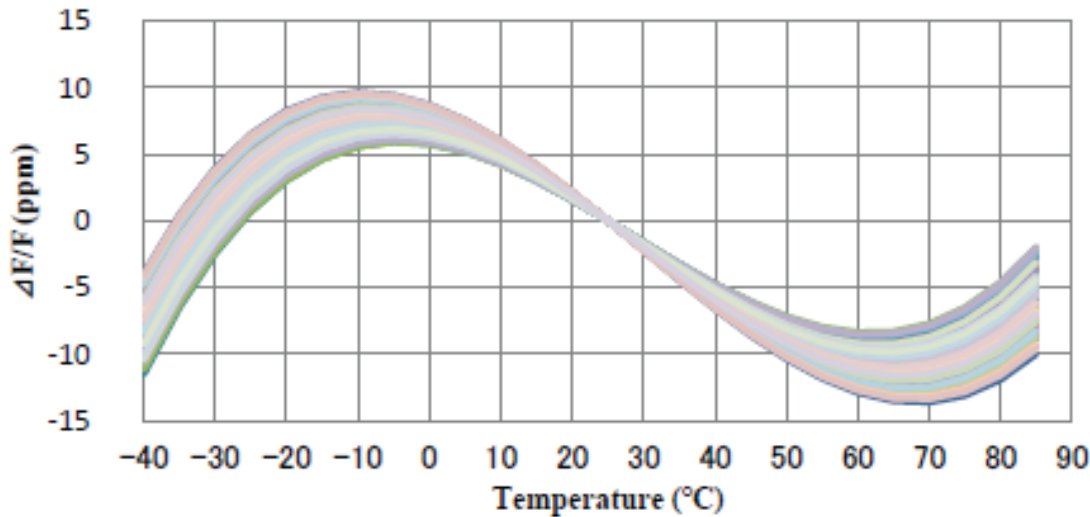
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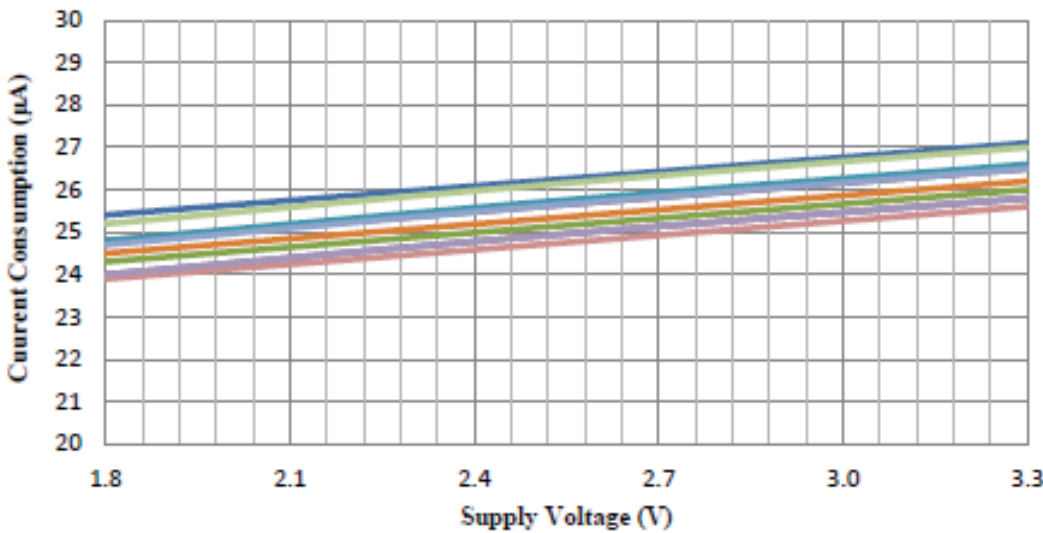
Typical Frequency Stability Over Temperature:

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

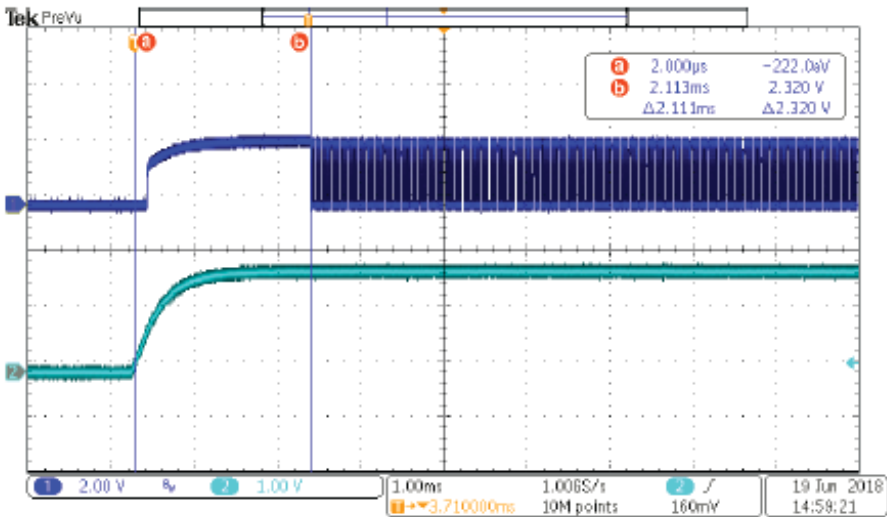


Typical Current Consumption (I_{dd})

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



Typical Start-Up Time @ $V_{dd} = 1.8V$, 25 ±3°C



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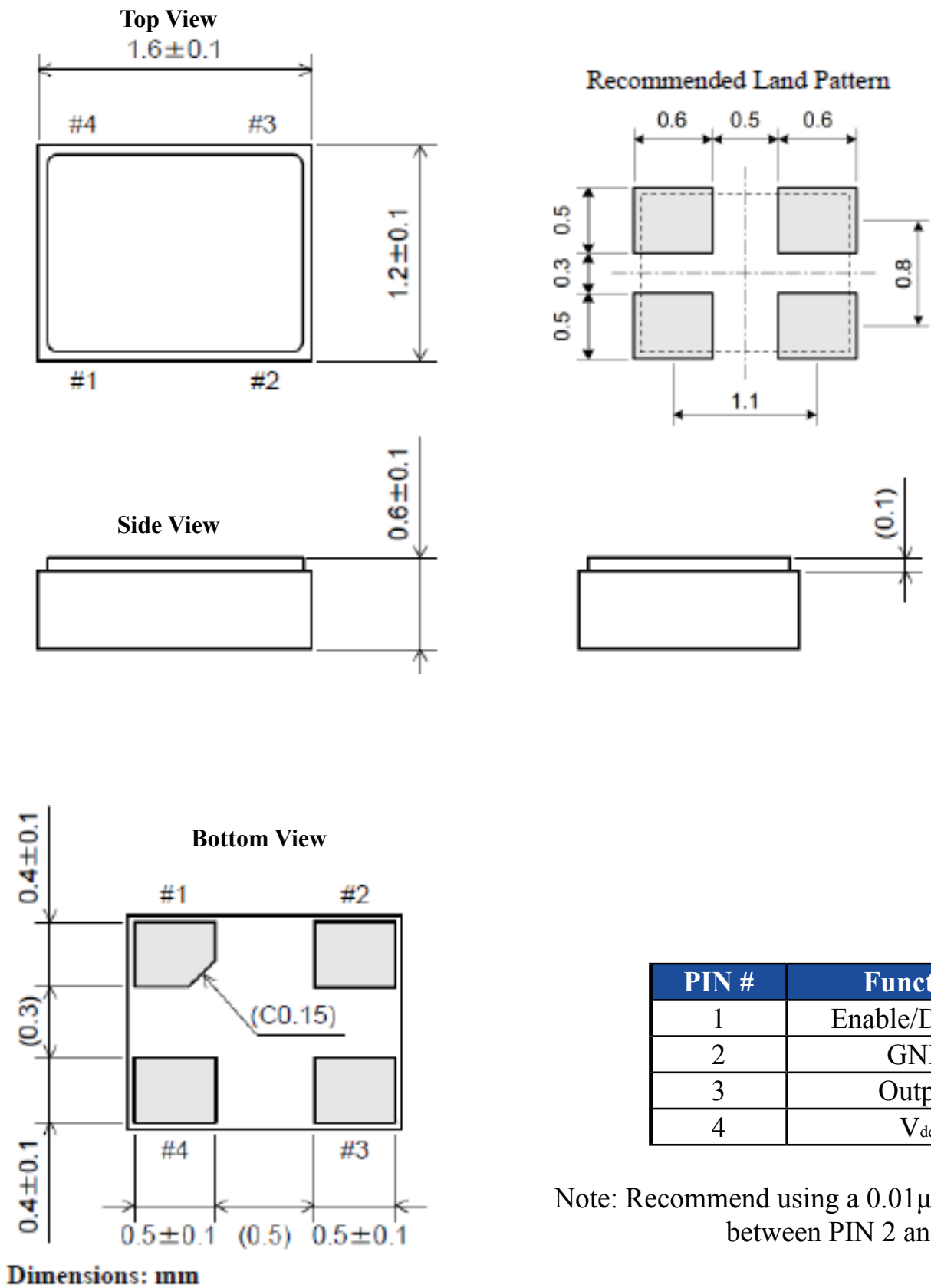


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Mechanical Dimensions



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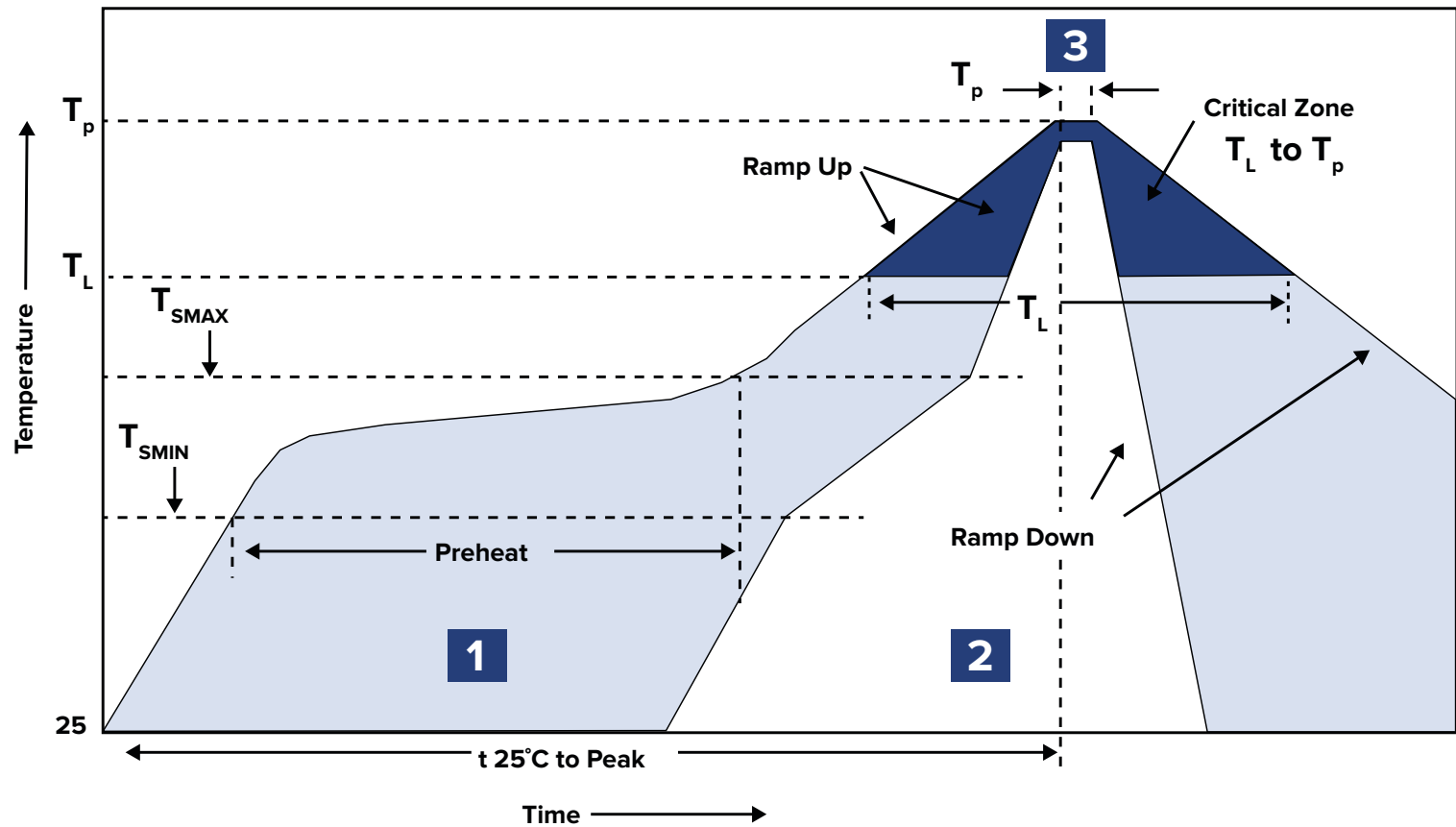


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Reflow Profile



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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Packaging

Technical drawing of a rectangular plate with dimensions and tolerances. The drawing includes a top view and a side view.

Top View Dimensions:

- Overall width: 8.0 ± 0.2
- Overall length: 4.0 ± 0.1
- Distance from top edge to center line: 4.0 ± 0.1
- Distance from center line to bottom edge: 3.5 ± 0.05
- Distance from left edge to center of first hole: 4.0 ± 0.1
- Distance between centers of adjacent holes: 2.0 ± 0.05
- Radius of fillet at corners: $R1.75 \pm 0.1$
- Hole diameter: $\phi 1.5 + 0.1/0$
- Slot width: $(\phi 1.05)$
- Slot depth: (2.75)

Side View Dimensions:

- Overall thickness: 0.80 ± 0.1
- Slot depth: 1.85 ± 0.1

Carrier tape

165 to 180°

 1.45 ± 0.1 0.25 ± 0.05 11.4 ± 1.0 $\phi 60+1/-0$

(1.2)

 9.0 ± 0.3

Dimensions: mm

Technical drawing of a circular mechanical part. The drawing shows a top view of a circular component with a central hole and two trapezoidal features on the left and right sides. The dimensions are as follows:

- Overall diameter: $\phi 180^{+0/-3}$
- Central hole diameter: $\phi 13 \pm 0.2$
- Inner circular feature diameter: $\phi 21 \pm 0.8$
- Distance from central axis to the inner circular feature: 2.0 ± 0.5
- Radius of the trapezoidal features: $R0.5$

Technical drawing of a vertical pipe section. The drawing shows a vertical pipe with a diameter of $\phi 60+1/-0$. The total height of the section is 11.4 ± 1.0 . The bottom section has a height of 9.0 ± 0.3 and a diameter of (1.2) . The top section has a height of 11.4 ± 1.0 .

Mouser Electronics

Authorized Distributor

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ABRACON:

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<u>ASAKMPA3-32.768KHZ-T3</u>	<u>ASAKMPC4-32.768KHZ-T3</u>	<u>ASAKMPA4-32.768KHZ-T3</u>	<u>ASAKMPC3-32.768KHZ-T3</u>
<u>ASAKMPD3-32.768KHZ-T3</u>	<u>ASAKMPC5-32.768KHZ-T3</u>	<u>ASAKMPA6-32.768KHZ-T3</u>	<u>ASAKMPA7-32.768KHZ-T3</u>
<u>ASAKMPB4-32.768KHZ-T3</u>	<u>ASAKMPA2-32.768KHZ-T3</u>	<u>ASAKMPC2-32.768KHZ-T3</u>	<u>ASAKMPA8-32.768KHZ-T3</u>
<u>ASAKMPC6-32.768KHZ-T3</u>	<u>ASAKMPD2-32.768KHZ-T3</u>	<u>ASAKMPD8-32.768KHZ-T3</u>	<u>ASAKMPC7-32.768KHZ-T3</u>
<u>ASAKMPA1-32.768KHZ-T3</u>	<u>ASAKMPC8-32.768KHZ-T3</u>	<u>ASAKMPA5-32.768KHZ-T3</u>	<u>ASAKMPB8-32.768KHZ-T3</u>
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