



**THE DATASHEET OF  
ASEM1-60.000MHZ-LC-T**



# PLASTIC PACKAGE ULTRA MINIATURE PURE SILICON™ CLOCK OSCILLATORS

ASEM

Request Samples



Check Inventory



ESD Sensitive



3.2 x 2.5 x 0.85 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Features

- Low Power Consumption
- Exceptional Stability Over Temp. at -40°C to +85°C
- Low Cost-Compact QFN Plastic Packaging
- Compact Package design

## Applications

- CCD Clock for VTR Camera
- Equipment Connected to PCs
- Low Profile Equipment
- Computers and Peripherals
- Portable Electronics
- Consumer Electronics
- Vibrant, Shock-Prone & Humid Environments for Industrial Equipment
- Demanding Military & Automotive Electronics

## Common Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range:	1.0		150	MHz	
Operating Temperature:	0		+70	°C	See options
Storage Temperature:	-55		+150	°C	
Supply Voltage (Vdd):	+1.8 ~ +3.3			V	See options
Supply Current (no load):	1.0 to 39.9999MHz	7	15	mA	Vdd=3.3V No load RL=∞ T=25°C
	40.0 to 79.9999MHz	8	15		
	80.0 to 124.9999MHz	9	15		
	125.0 to 150MHz	10	15		
Output Voltage:	V <sub>OH</sub>	0.8*V <sub>dd</sub>		V	15pF
	V <sub>OL</sub>		0.2*V <sub>dd</sub>		
Rise Time:		1.3	3.0	ns	15pF; T=25°C 20%/80%*VDD
Fall Time:		1.3	3.0		
Output Load:	15pF max / 10kΩ min.			pF	
Symmetry:	45		55	%	@1/2Vdd
Startup Time:		1.5	3.0	ms	
Disable Time:		20	100	ns	
Disable Stand-by Current:			15	uA	
Tri-state Function (Stand-by) :	"1" (VIH≥0.75*Vdd) or Open: Oscillation "0" (VIH<0.25*Vdd) : Hi Z			V	
Cycle to cycle jitter:		60		ps	F=100MHz
Aging:	-5.0		+5.0	ppm	First year



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## Absolute Maximum Ratings

Item	Min.	Max.	Units	condition
Supply Voltage	-0.3	+4.0	V	
Input Voltage	-0.3	Vdd+0.3	V	
Junction Temp.		+150	°C	
Storage Temp.	-55	+150	°C	
Soldering Temp.		+260	°C	40sec max
ESD			V	
HBM		2,000		
MM		200		
CDM		500		

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## Options and Part Identification (left blank if standard)

ASEM [ ] - [ ] MHz - [ ] [ ] - [ ]

Supply Voltage
1: 3.3 ± 0.3V
2: 3.0 ± 0.3V
3: 2.5 ± 0.2V
4: 1.8 ± 0.15V
5: 2.8 ± 0.2V

Frequency in MHz
e.g. 14.3181 MHz (Maximum 4 digits after decimal)

Operating Temp.
Blank: 0°C ~ +70°C
E: -20°C ~ +70°C
L: -40°C ~ +85°C

Overall Freq. Stability
Blank: ±100ppm
R: ±25ppm
C: ±50ppm

Packaging
Blank: 110pcs / Tube
T: 1,000pcs / reel

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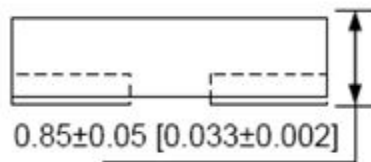
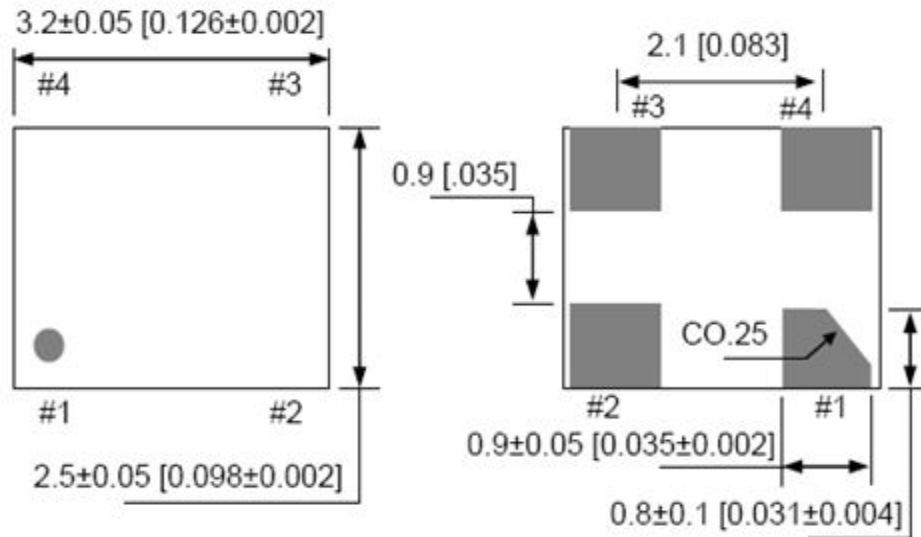


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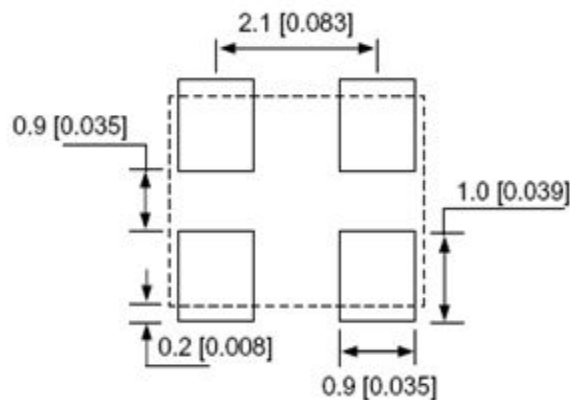
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MSL Level = 1

## Mechanical Dimensions



No.	Pin Terminal
1	Standby
2	GND
3	Output
4	VDD

## Recommended Land Pattern



Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and 4.

Dimensions: mm (inches)



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## Reflow Profile [JEDEC J-STD-020]

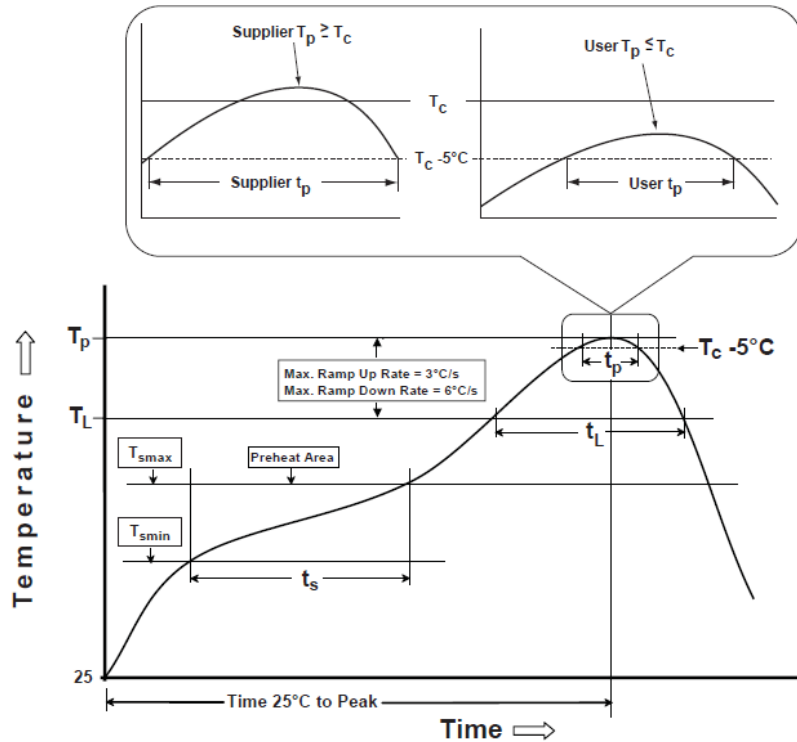


Table 1

SnPb Eutectic Process Classification Temperatures ( $T_c$ )		
Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures ( $T_c$ )			
Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec. max
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature ( $T_p$ )*	see Table 1	see Table 2
Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_c$ )	20 sec.	30 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as supplier minimum and a user maximum.



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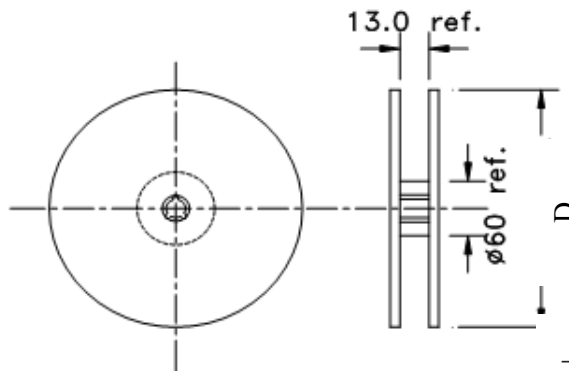
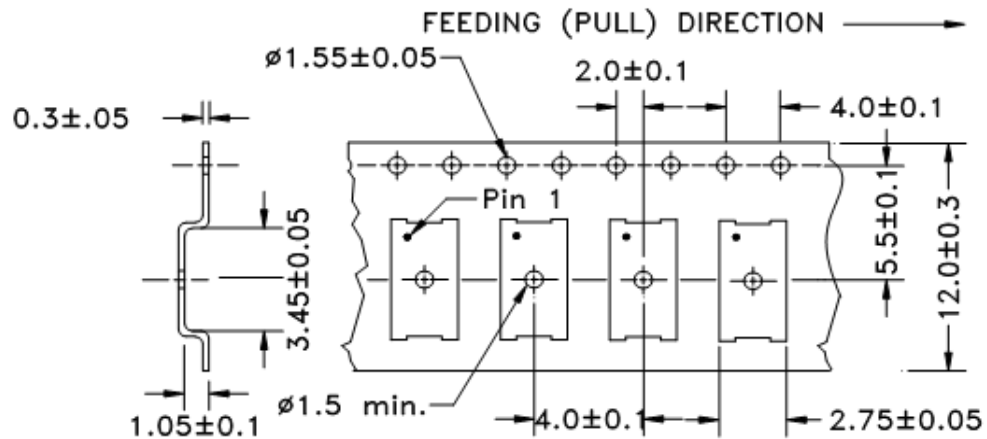
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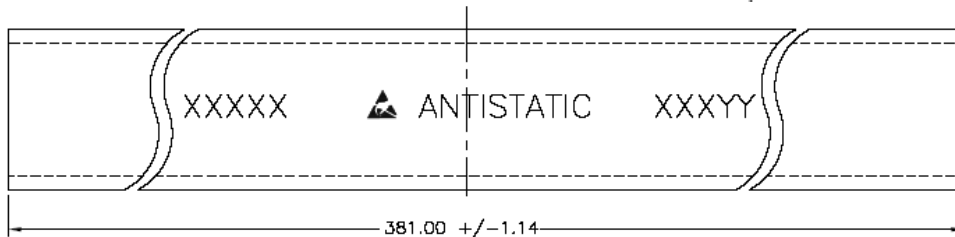
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## Packaging

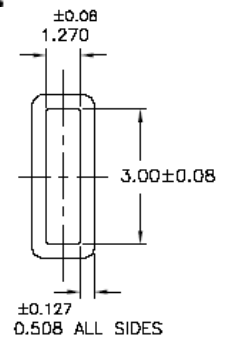
T= 1,000pcs/reel (D=180mm)



Tube: 110 pcs/tube



Unit orientation in tube:



Dimensions: mm

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