


# PLASTIC PACKAGE INDUSTRIAL GRADE ULTRA MINIATURE PURE SILICON™ CLOCK OSCILLATOR

ASFLMB

Life Size   
5.0 x 3.2 x 0.85 mm

ASFLMB



**MEMS  
Technology!**

## FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- 2nd Generation MEMS Technology by Discera
- Low Power Consumption <10mA
- Exceptional Stability Over Temp. at 40 to +85°C
- Available in 30kG Shock Resistance Configuration
- Low Cost-Compact QFN Plastic Packaging
- Compact Package design
- Available over Extended Operating Temperature
- Available tight stability +/- 5ppm over -40 to +85C
- Low jitter

## APPLICATIONS:

- CCD Clock for VTR Camera
- Equipment Connected to PCs
- Low Profile Equipment
- Computers and Peripherals
- Lower Cost Crystal Oscillator Replacement
- Portable Electronics (MP3 Players, Games)
- Consumer Electronics such as TV's, DVR's, etc.
- Vibrant, Shock-Prone & Humid Environments for Industrial Equipment
- Demanding Military & Automotive Electronics

## STANDARD SPECIFICATIONS:

### Common Key Electrical Specifications

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range:	1.0	-----	150	MHz	
Operating Temperature:	0	-----	+70	°C	See options
Storage Temperature:	-55	-----	+150	°C	
Overall Frequency Stability*:	-50	-----	+50	ppm	See options
Supply Voltage (Vdd):	+1.7 ~ +3.6			V	
Output Load:	10		15, 25, or 40	pF kΩ	See options
Symmetry:	45		55	%	@1/2Vdd
Startup Time:		3	10	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" (VIL<0.25*Vdd) : Hi Z			V	
Aging:	-5.0	-----	+5.0	ppm	First year

### Key Electrical Specifications – Vdd = 1.8V

Parameters	Minimum	Typical	Maximum	Units	Notes	
Supply Current (no load):	1.0 to 39.9999MHz	-----	5	15	mA	CL=0p RL=∞ T=25°C (Standard CL: 15pF)
	40.0 to 79.9999MHz	-----	6	15	mA	
	80.0 to 124.9999MHz	-----	7	15	mA	
	125.0 to 150MHz	-----	8	15	mA	
	1.0 to 39.9999MHz	-----	6	15	mA	CL=0p RL=∞ T=25°C (CL option: 25pF)
	40.0 to 79.9999MHz	-----	7	15	mA	
	80.0 to 124.9999MHz	-----	8	15	mA	
	125.0 to 150MHz	-----	9	15	mA	
1.0 to 39.9999MHz	-----	7	15	mA	CL=0p RL=∞ T=25°C (CL option: 40pF)	
40.0 to 79.9999MHz	-----	8	15	mA		
80.0 to 124.9999MHz	-----	9	15	mA		
125.0 to 150MHz	-----	10	15	mA		
Output Voltage:	V <sub>OH</sub>	0.8*V <sub>dd</sub>	-----	-----	V	CL=15, 25, 40pF
	V <sub>OL</sub>	-----	-----	0.2*V <sub>dd</sub>	V	
Rise Time: Fall Time:	Tr	-----	1.8	3.0	ns	CL=15pF; T=25°C 20%/80%*VDD
	Tf	-----	1.0	3.0	ns	
	Tr	-----	1.5	3.0	ns	CL=25pF; T=25°C 20%/80%*VDD
	Tf	-----	1.2	3.0	ns	
Cycle to Cycle Jitter:		-----	100	-----	ps	F=100MHz CL=15pF
		-----	55	-----	ps	F=100MHz CL=25pF
		-----	55	-----	ps	F=100MHz CL=40pF
Period Jitter RMS:		-----	12	-----	ps	F=100MHz CL=15pF
		-----	10	-----	ps	F=100MHz CL=25pF
		-----	10	-----	ps	F=100MHz CL=40pF

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ISO9001:2008  
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RoHS  
Compliant

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## Key Electrical Specifications – $V_{dd} = 2.5V$

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (no load):	1.0 to 39.9999MHz	-----	6	15	mA	CL=0p
	40.0 to 79.9999MHz	-----	7	15	mA	RL=∞
	80.0 to 124.9999MHz	-----	8	15	mA	T=25°C
	125.0 to 150MHz	-----	9	15	mA	(Standard CL: 15pF)
	1.0 to 39.9999MHz	-----	7	15	mA	CL=0p
	40.0 to 79.9999MHz	-----	8	15	mA	RL=∞
	80.0 to 124.9999MHz	-----	9	15	mA	T=25°C
	125.0 to 150MHz	-----	10	15	mA	(CL option: 25pF)
	1.0 to 39.9999MHz	-----	8	16	mA	CL=0p
	40.0 to 79.9999MHz	-----	9	16	mA	RL=∞
	80.0 to 124.9999MHz	-----	10	16	mA	T=25°C
	125.0 to 150MHz	-----	11	16	mA	(CL option: 40pF)
Output Voltage:	$V_{OH}$	$0.8 * V_{dd}$	-----	-----	V	CL=15, 25pF
	$V_{OL}$	-----	-----	$0.2 * V_{dd}$	V	
	$V_{OH}$	$0.9 * V_{dd}$	-----	-----	V	CL=40pF
	$V_{OL}$	-----	-----	$0.1 * V_{dd}$	V	
Rise Time: Fall Time:	$T_r$	-----	1.0	2.0	ns	CL=15pF; T=25°C
	$T_f$	-----	0.9	2.0	ns	20%/80%*VDD
	$T_r$	-----	1.1	2.0	ns	CL=25pF; T=25°C
	$T_f$	-----	0.9	2.0	ns	20%/80%*VDD
	$T_r$	-----	1.0	2.0	ns	CL=40pF; T=25°C
	$T_f$	-----	0.9	2.0	ns	20%/80%*VDD
Period Jitter RMS:		-----	6.5	-----	ps	F=100MHz CL=15pF
		-----	5	-----		F=100MHz CL=25pF
		-----	5	-----		F=100MHz CL=40pF
Cycle to Cycle Jitter:		-----	80	-----	ps	F=100MHz CL=15pF
		-----	40	-----		F=100MHz CL=25pF
		-----	40	-----		F=100MHz CL=40pF

## Key Electrical Specifications – $V_{dd} = 3.3V$

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (no load):	1.0 to 39.9999MHz	-----	7	15	mA	CL=0p
	40.0 to 79.9999MHz	-----	8	15	mA	RL=∞
	80.0 to 124.9999MHz	-----	9	15	mA	T=25°C
	125.0 to 150MHz	-----	10	15	mA	(Standard CL: 15pF)
	1.0 to 39.9999MHz	-----	8	16	mA	CL=0p
	40.0 to 79.9999MHz	-----	9	16	mA	RL=∞
	80.0 to 124.9999MHz	-----	10	16	mA	T=25°C
	125.0 to 150MHz	-----	11	16	mA	(CL option: 25pF)
	1.0 to 39.9999MHz	-----	8	16	mA	CL=0p
	40.0 to 79.9999MHz	-----	9	16	mA	RL=∞
	80.0 to 124.9999MHz	-----	10	16	mA	T=25°C
	125.0 to 150MHz	-----	11	16	mA	(CL option: 40pF)
Output Voltage:	$V_{OH}$	$0.8 * V_{dd}$	-----	-----	V	CL=15pF
	$V_{OL}$	-----	-----	$0.2 * V_{dd}$	V	
	$V_{OH}$	$0.9 * V_{dd}$	-----	-----	V	CL=25, 40pF
	$V_{OL}$	-----	-----	$0.1 * V_{dd}$	V	
Rise Time: Fall Time:	$T_r$	-----	1.0	2.0	ns	CL=15pF; T=25°C
	$T_f$	-----	0.9	2.0	ns	20%/80%*VDD
	$T_r$	-----	0.1	2.0	ns	CL=25pF; T=25°C
	$T_f$	-----	0.9	2.0	ns	20%/80%*VDD
	$T_r$	-----	0.8	2.0	ns	CL=40pF; T=25°C
	$T_f$	-----	0.8	2.0	ns	20%/80%*VDD
Period Jitter RMS:		-----	6	-----	ps	F=100MHz CL=15pF
		-----	5	-----		F=100MHz CL=25pF
		-----	5	-----		F=100MHz CL=40pF
Cycle to Cycle Jitter:		-----	80	-----	ps	F=100MHz CL=15pF
		-----	40	-----		F=100MHz CL=25pF
		-----	40	-----		F=100MHz CL=40pF

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## Absolute Maximum Ratings

Item	Minimum	Maximum	Unit	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		4,000		
MM		200		
CDM		1,500		

## OPTIONS AND PART IDENTIFICATION: (Left Blank if Standard)

### Programmed Orders (Quantity > 1,000pcs)

ASFLMB -  MHz -  -  -

Frequency in MHz	Operating Temp.	Overall Freq. Stability	Output Load	Packaging
e.g. 14.3181 MHz (Maximum 4 digits after decimal)	Blank: 0°C ~ +70°C E: -20°C ~ +70°C L: -40°C ~ +85°C X: -40°C ~ +105°C	Blank: ±50ppm R5*: ±5ppm Y: ±10ppm R: ±25 ppm	Blank: 15pF 25: 25pF 40: 40pF	Blank: Tube (72pcs / Tube) T: Tape & Reel (1kpcs / reel)

\*R5: ±5ppm stability is available by request. Please contact Abracon for more information.

### Un-Programmed Orders

Blank un-programmed oscillators and our low cost portable programmer are available for quick turn engineering requirements. Please call ABRACON or visit MEMSpeed Pro site <http://www.abracon.com/memspeedpro/memspeedpro.html> for more information.

ASFLMB - BLANK -  -

Operating Temp.	Overall Freq. Stability	Packaging
Blank: 0°C ~ +70°C E: -20°C ~ +70°C L: -40°C ~ +85°C X: -40°C ~ +105°C	Blank: ±50ppm Y: ±10ppm R: ±25 ppm	Blank: Tube (72pcs / Tube) T: Tape & Reel (1kpcs / reel)

**Note: Available 15pF output load only for ASFLMB blank MEMS oscillator**

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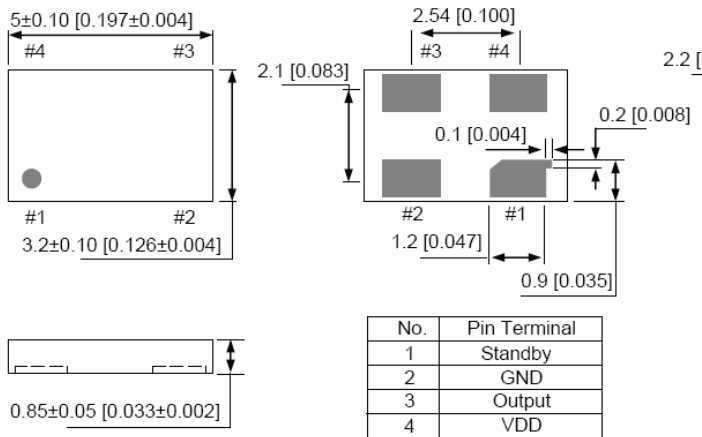
5.0 x 3.2 x 0.85 mm

ASFLMB

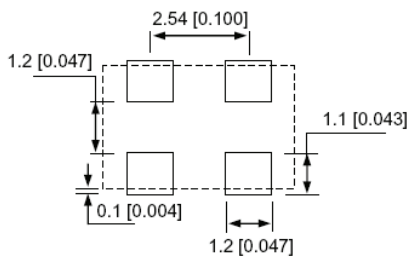


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Compliant

## OUTLINE DIMENSIONS:



### Recommended Land Pattern

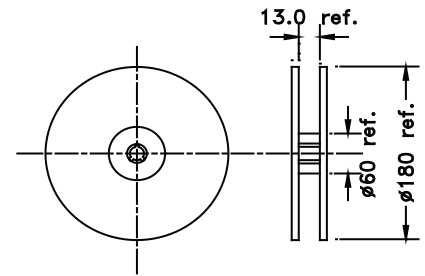
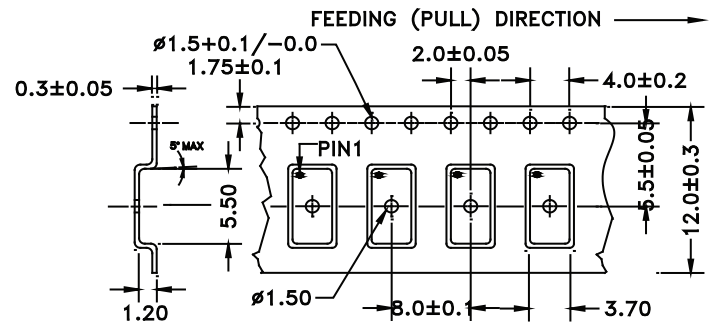
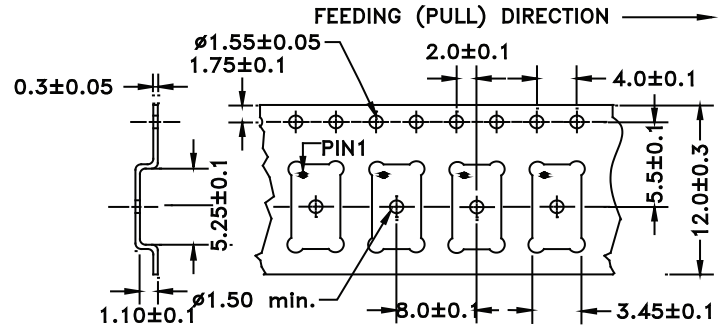


Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and 4.

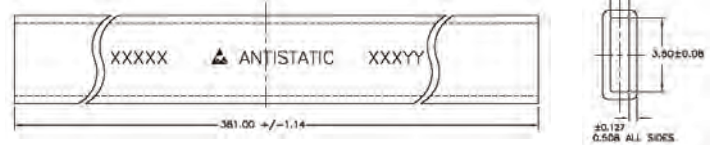
Dimensions: mm (inches)

## TAPE AND REEL:

T= Tape and reel (1,000pcs/reel)



Tube: 72 pcs/tube

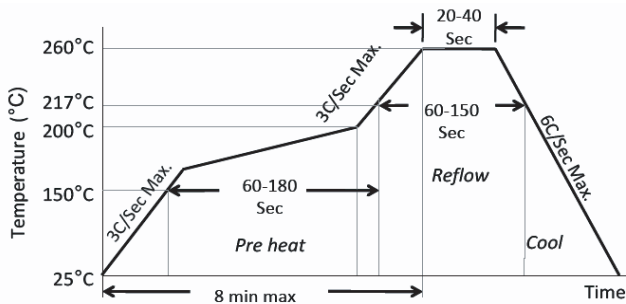


Unit orientation in tube:



Dimensions: mm

## REFLOW PROFILE:



Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.
Preheat Time 150°C to 200°C	60-180 Sec
Time maintained above 217°C	60-150 Sec
Peak Temperature	255-260°C
Time within 5°C of actual Peak	20-40 Sec
Ramp-Down Rate	6°C/Sec Max.
Time 25°C to Peak Temperature	8 min Max.



Need a test socket for the ASFLMB Series? To view compatible **PRECISION TEST SOCKETS** for these parts, [click here](#): PN: **AXS-5032-04-07**.

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