ASFLM series

Plastic SMD MEMS Clock Oscillator

Description

The Abracon ASFLM series is a programmable MEMS oscillator, offered in various supply voltages. This series features low power consumption, a wide frequency range, excellent phase noise, tight stabilities, and short lead times for industrial, consumer, and other applications. The ASFLM series comes in a 5.0 x 3.2 mm compact package with a CMOS output.



Features

- Low Power Consumption
- Exceptional Stability Over Temp. at -40 to +85°C
- Low Cost-Compact QFN Plastic Packaging
- Supply Voltage options: 1.8V, 2.5V, 2.8V, 3.0V, 3.3V
- Stand-by function
- REACH/RoHS II Compliant | MSL Level 1

Typical 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

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	
Overall Frequency Stability [Note 1]		-50		+50	ppm	See options
Supply Voltage (Vdd)		+1.8V, 2.5V, 2.8V, 3.0V, or 3.3V			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_{OH}	$0.8*V_{dd}$			V	15pF
	V_{OL}			$0.2*V_{dd}$		
Rise Time: Fall Time:	Tr		1.3	3.0	ns	15pF; T=25°C 20%/80%*VDD
	Tf		1.3	3.0		
Output Load:		15pF max / 10kΩ min.			pF	
Symmetry:		45		55	%	@1/2Vdd
Startup Time :			1.5	3.0	ms	

Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Disable Time:		20	100	ns	
Disable Stand-by Current:			15	uA	
Tri-state Function (Stand-by) :	"1" (VIH≥0.75*Vdd) or Open: Oscillation			V	
	"0" (VIL<0.25*Vdd) : Hi Z				
Cycle to cycle jitter:		60		ps	F=100MHz
Aging:	-5.0		+5.0	ppm	First year @25℃

Note 1: Includes post reflow frequency accuracy, temperature stability, load pulling and power supply variation.

Absolute Maximum Ratings

Item	Min.	Max.	Units
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
ESD HBM MM CDM		 2,000 200 500	V

Options and Part Identification

ASFLM □ - □ MHz - □ □ - □

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

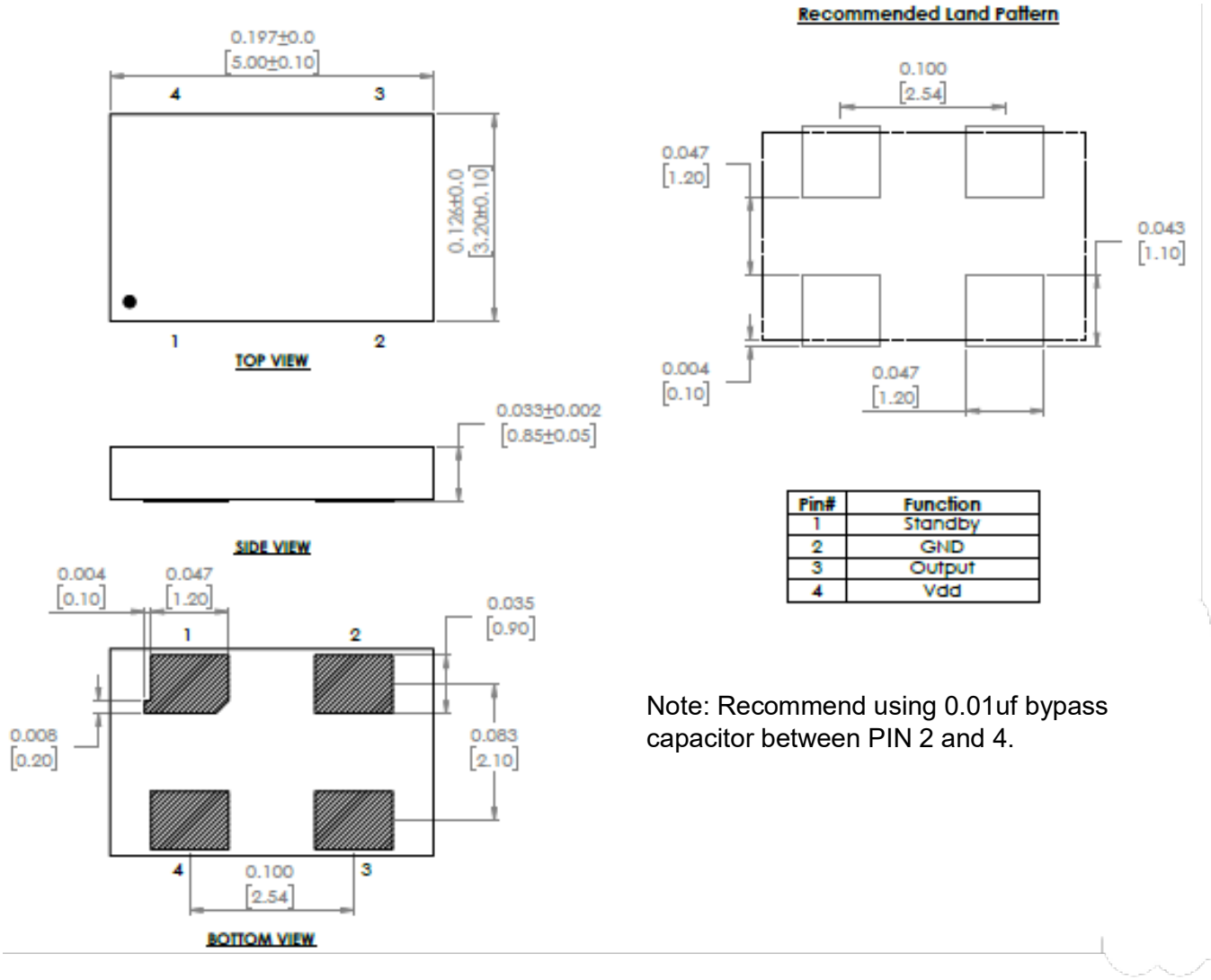
Frequency in MHz
e.g. 14.3181 MHz (Maximum 4 digits after decimal)

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

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

Packaging
Blank: Bulk
T: 1,000pcs / reel

Mechanical Dimensions



Pin#	Function
1	Standby
2	GND
3	Output
4	Vdd

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

Dimensions: Inches[mm]

Reflow Profile [JEDEC J-STD-020]

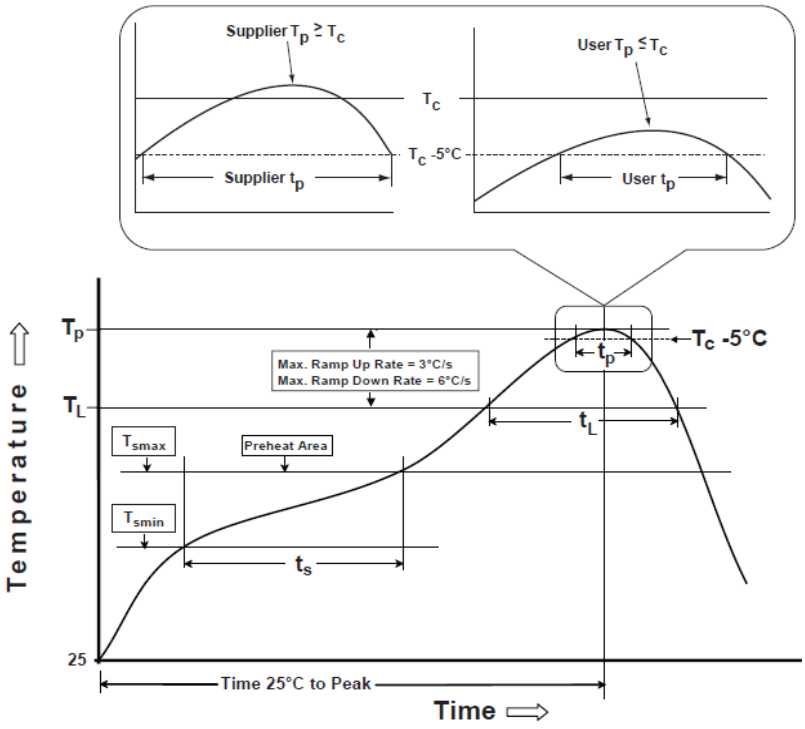


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≥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 mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >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

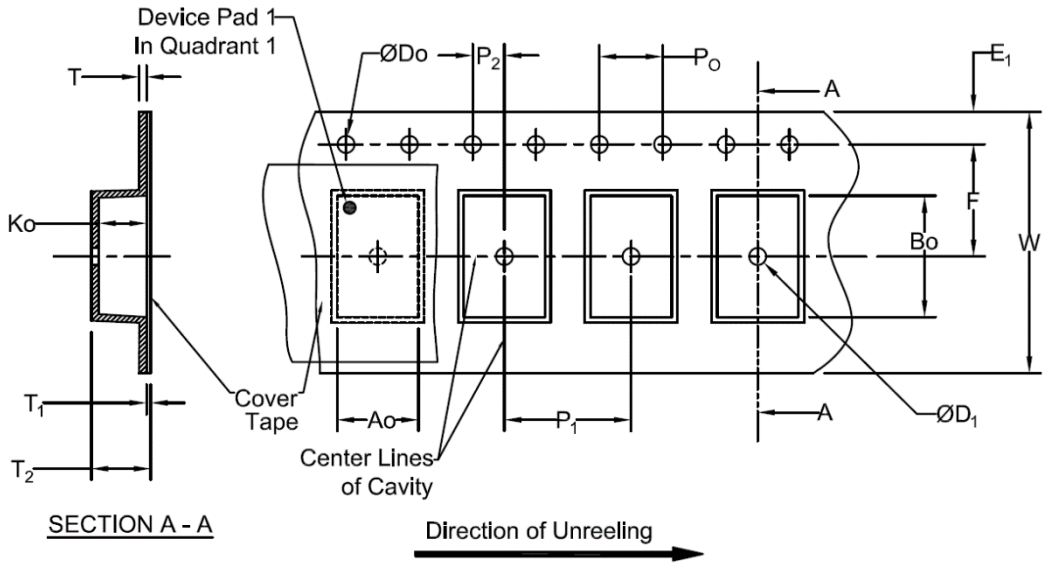
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_P)	3°C/sec. max	3°C/sec. max
Liquidous temperature (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.

Packaging

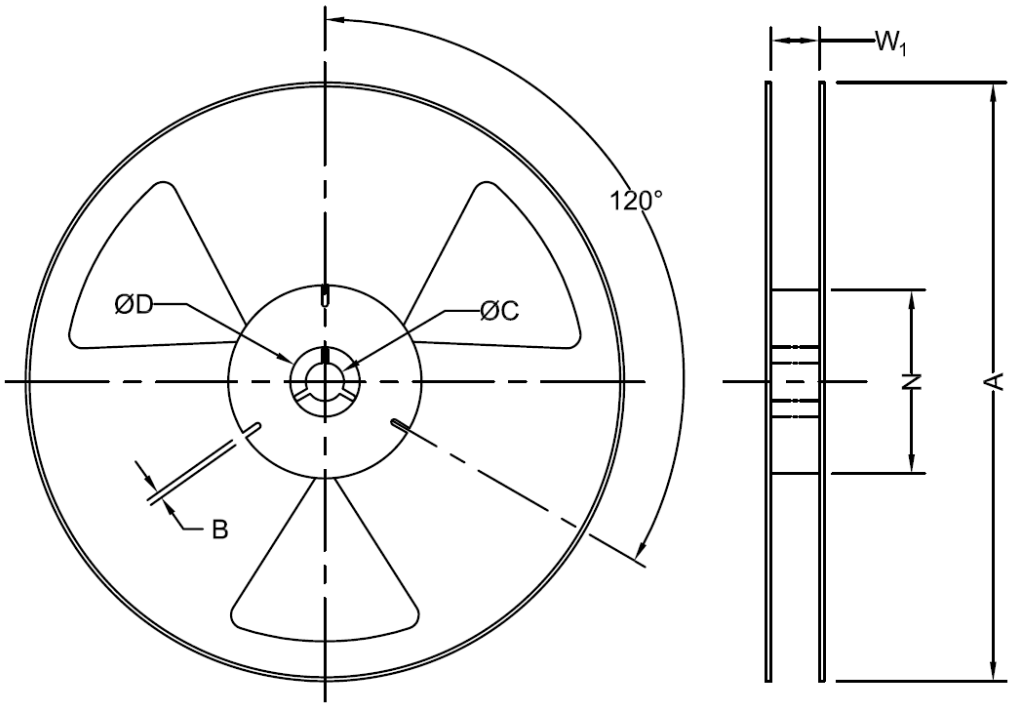
T= 1,000pcs/reel (D=180mm)



Tape Specifications (mm)							
Width	Ao	Bo	Do	D_1 (Min)	E_1	F	Ko
12mm	*	*	1.5+0.1/-0.0	1.0	1.75±0.1	5.5±0.05	*
Width	P1	P2	P0	T (Max)	T1 (Max)	T2 (Max)	W (Max)
12mm	8.0±0.1	2.0±0.05	4.0±0.1	0.6	0.1	6.5	12.3

***Note: Compliant to EIA-481**

Dimensions: mm



Reel Specifications (mm)							
Width	Qty/Reel	A (Nom)	B (Min)	C (Min)	D (Min)	N (Min)	*W_1
12mm	1000	178	1.5	13.0+0.5/-0.2	20.2	50	12.4+2.0/-0.0

***Note: Measured at Hub**

Dimensions: mm