LOW JITTER PIN CONFIGURABLE DUAL CMOS OUTPUT ULTRA MINIATURE PURE SILICON™ CLOCK OSCILLATOR

ASEMDC

Moisture Sensitivity Level – MSL 1

RoHS Compliant

3.2 x 2.5 x 0.85 mm

FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- Pin Configurable Dual CMOS output
- Low Jitter (Period Jitter RMS 3ps typical)
- Low Integrated Phase Jitter 2ps max
- Tight Stability +/-10ppm -40 to +85C
- Excellent Shock & Vibration Immunity

APPLICATIONS:

- Consumer Electronics
- Storage Area Networks
- SATA, SAS, Fibre Channel
- Passive Optical Networks
- EPON, 10G-EPON, GPON, 10G-PON
- Ethernet
- 1G, 10GBASE-T/KR/LR/SR, and FCoE
- HD/SD/SDI Video & Surveillance
- PCI Express

Low Jitter Pin Configurable Dual CMOS Output 3G MEMS

STANDARD SPECIFICATIONS:

Pre-programmed Output Frequency Configuration

Ordering Info	Freq (MHz)	Freq Select Bits [FS2, FS1, FS0] – Default is [111]							
		000	001	010	011	100	101	110	**111**
Frequency Configuration 1	f_{OUT1}	27	25	50	54	48	24	24	**24**
	f_{OUT2}	24	125	125	27	24	50	54	**27**
Frequency Configuration 2	f_{OUT1}	106.25	100	125	100	156.25	156.25	125	**156.25**
	f_{OUT2}	25	100	50	50	25	125	25	**156.25**
Custom Configuration	f_{OUT1}	Contact Abracon for customized configurations							
	f_{OUT2}								

Frequency select bits [FS2, FS1, FS0] are weakly tied high so if left floated, the default setting will be [111] and the device will output the associated frequency highlighted in Bold. If other frequency combinations are required, please contact Abracon for customized configuration. Please see the configurable frequency range in the section 2.0

Key Electrical Specifications

Parameters		Minimum	Typical	Maximum	Units	Notes
Configurable frequency range		10	-----	170	MHz	Commercial, Industrial temp range
		10	-----	100		Automotive temp range
Operating Temperature		-20	-----	+70	°C	See options
Storage Temperature		-55	-----	+150	°C	
Overall Frequency Stability[*1]		-50	-----	+50	ppm	See options
Supply Voltage (Vdd)		+2.25	-----	+3.6	V	
Startup Time		-----	-----	5	ms	
Enable Time		-----	-----	20	ns	
Disable Time		-----	-----	5	ns	
Disable Current		-----	21	23	mA	
Tri-state Function (Standby/Disable)		"1" (VIH≥0.75*Vdd) or Open: Oscillation "0" (VIL<0.25*Vdd) : Hi Z			V	40kΩ pull-up resistor embedded
Aging		-5.0	-----	+5.0	ppm	First year
Supply Current (I_{dd})		-----	32	-----	mA	CL=15pF, 125MHz
Output Logic Level	V_{OH}	0.9*V_{dd}	-----		V	I=±6mA
	V_{OL}	-----	-----	0.1*V_{dd}		
Rise Time	Tr	-----	1.1	2.0	ns	CL=15pF
Fall Time	Tf	-----	1.4	2.0	ns	20%/80%*VDD
Duty Cycle		45	-----	55	%	

*1. Frequency stability includes frequency variations due to initial tolerance, temp. and power supply voltage

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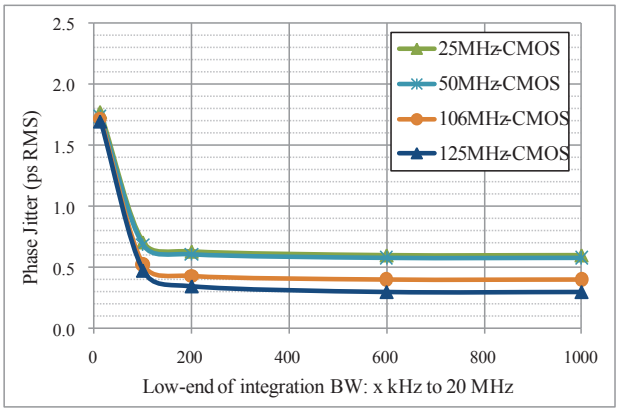
Key Electrical Specifications (continued)

Parameters	Minimum	Typical	Maximum	Units	Notes
Period Jitter RMS (J_{PER})	-----	3.0	-----	ps	F01=F02= 125MHz
Integrated Phase Jitter (J_{PH})	-----	0.30	2	ps	200kHz ~ 20MHz, 125MHz
	-----	0.38	2		100kHz ~ 20MHz, 125MHz
	-----	1.70	2		12kHz ~ 20MHz, 125MHz

PHASE JITTER



ABSOLUTE MAXIMUM RATINGS:

Item	Minimum	Maximum	Unit	Condition
Supply Voltage	-0.3	+4.0	V	
Input Voltage	-0.3	V_{dd}+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)

ASEMDC□-□-□-□

Frequency Combination (See table below)
1: Cfg. 1
2: Cfg. 2

Operating Temp.
Blank: -20°C ~ +70°C
L: -40°C ~ +85°C
X: -40°C ~ +105°C
Z: -55°C ~ +125°C

Overall Freq. Stability
Blank: ±50ppm
Y: ±10ppm*
R: ±25 ppm

Packaging
Blank: Tube (110pcs / Tube)
T: Tape & Reel(1kpcs / reel)
T3: Tape & Reel(3kpcs / reel)
T5: Tape & Reel(5kpcs / reel)

*-20°C ~ +70°C, option L, or X only

Frequency Combination	Freq (MHz)	Freq Select Bits [FS2, FS1, FS0] – **Default is [111]**							
		000	001	010	011	100	101	110	**111**
Configuration 1	f_{OUT1}	27	25	50	40	27	24	24	**24**
	f_{OUT2}	24	125	125	25	48	50	54	**27**
Configuration 2	f_{OUT1}	106.25	100	125	100	156.25	156.25	125	**156.25**
	f_{OUT2}	25	100	50	50	25	125	25	**156.25**
Custom Configuration	f_{OUT1}	Contact Abracon for customized configurations							
	f_{OUT2}								

Default condition: Frequency select bits [FS2, FS1, FS0] are all left floated. FS2, FS1, FS0 are pulled high [111]
Frequency combination and default frequency is customized upon request. Please contact Abracon for the frequency combinations.

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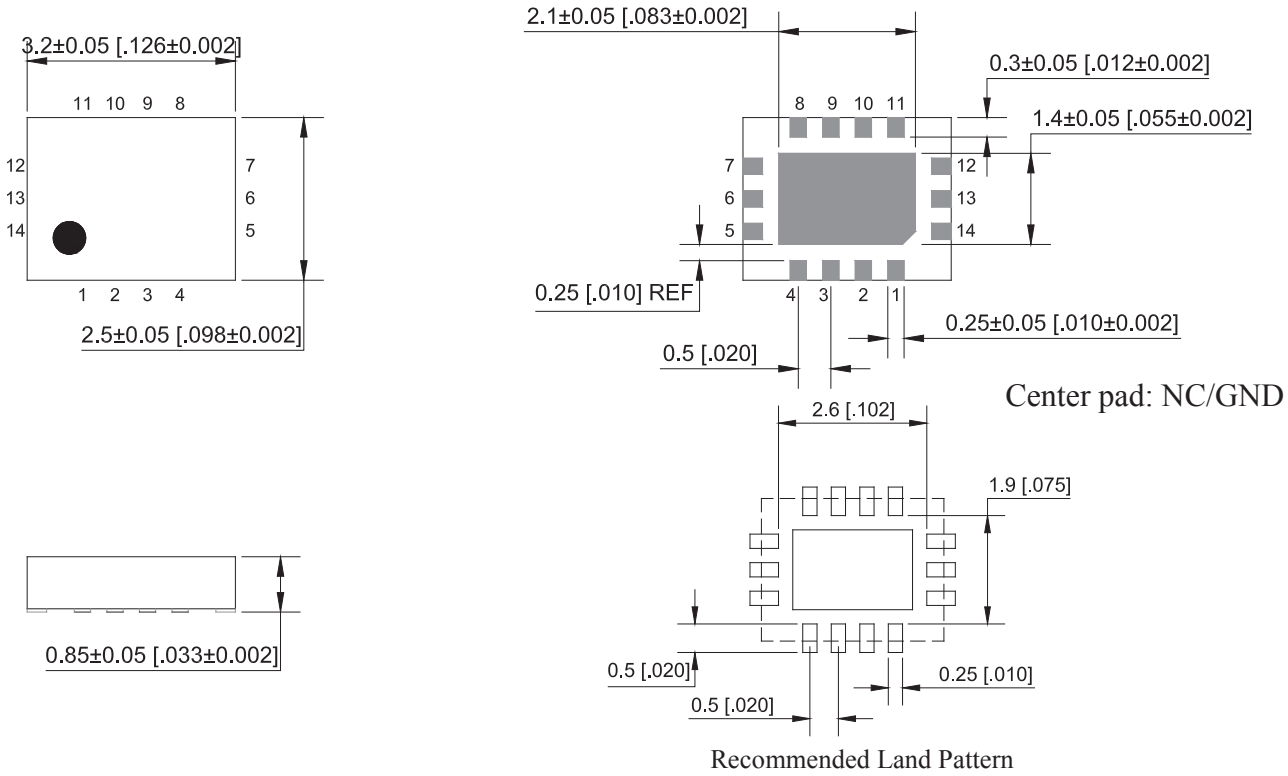
CONFIGURABLE OUTPUT STRENGTH (Tr/Tf)

Output (Tr/Tf) are configurable by the control pins OxS1 and OxS0. The combinations are described in the table below. (O1S1 and O1S0 are for output 1. O2S1 and O2S0 are for output 2)

	Output Drive Strength Bits [O1S1, O1S0], [O2S1, O2S0] - Default [11]			
	00	01	10	**11**
Tr (ns)	1.6	1.4	1.2	**1.1**
Tf (ns)	2.4	2.2	1.5	**1.4**

MECHANICAL DIMENSIONS



Recommended Land Pattern

Pin No.	Pin Name	Pin Type	Description
1	Enable	I	Enables outputs when high and disables (tri-state) them when low
2	NC	NA	Leave unconnected or grounded
3	O2S0	I	Least significant bit for output drive strength selection for Output 2
4	GND	Power	Ground
5	FS0	I	Least significant bit for frequency selection
6	FS1	I	Middle bit for frequency selection
7	FS2	I	Most significant bit for frequency selection
8	Fout1	O	CMOS output 1
9	O1S0	I	Least significant bit for output drive strength selection for output 1
10	O1S1	I	Most significant bit for output drive strength selection for output 1
11	Fout2	O	CMOS output 2
12	VDD2	Power	Power Supply for Output 2
13	VDD	Power	Power Supply
14	O2S1	I	Most significant bit for output drive strength selection for output 2

Dimensions: mm (inches)

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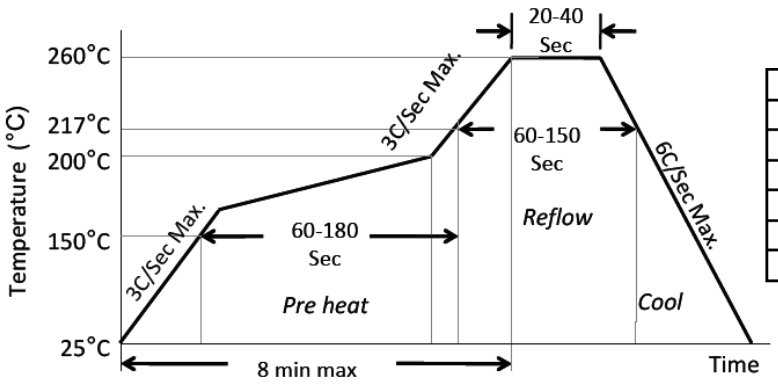
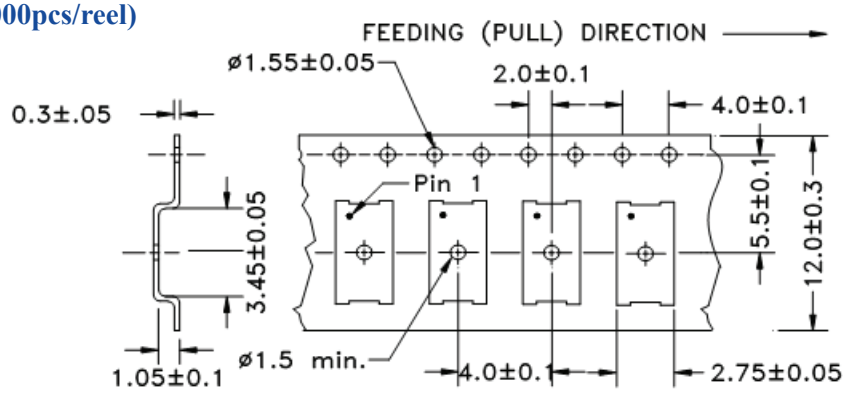
REFLOW PROFILE

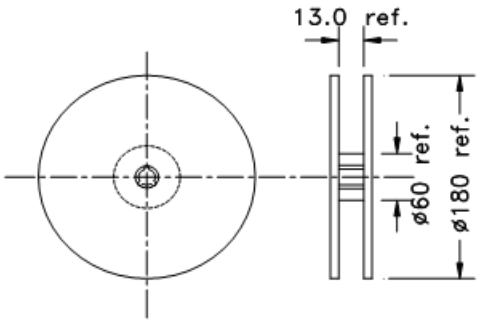


Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.
Preheat Time 150°C to 200°C	60-180 Sec
Time maintained above 217°C	60-150 Sec
Peak Temperature	255-260°C
Time within 5°C of actual Peak	20-40 Sec
Ramp-Down Rate	6°C/Sec Max.
Time 25°C to Peak Temperature	8 min Max.

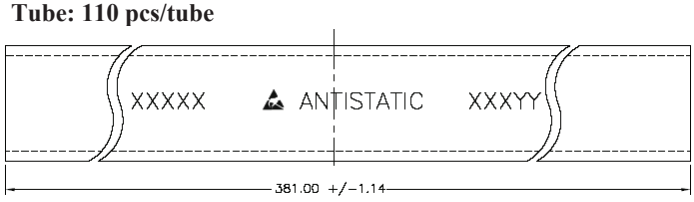
REFLOW PROFILE

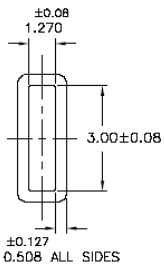
T= Tape and reel (1,000pcs/reel)





Tube: 110 pcs/tube





Unit orientation in tube:

Dimensions: mm

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