

Low Jitter Pin Configurable HCSL-LVPECL Dual Output Ultra Miniature Pure Silicon™ SMD Clock Oscillators



3.2 x 2.5 x 0.85 mm

ASEMDHLP

Moisture Sensitivity Level – MSL 1  **RoHS/RoHS II Compliant**

FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- Pin Configurable Dual HCSL/ LVPECL 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
- PCI Express

STANDARD SPECIFICATIONS:

Key Electrical Specifications

Parameters		Minimum	Typical	Maximum	Units	Notes
Configurable frequency range	HCSL	2.3		460	MHz	Commercial, Industrial temp range
	LVPECL	2.3		460		
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	@25°C
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 @25°C
Supply Current (I _{dd})			76		mA	RL=50Ω, F01=F02=156.25MHz

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

HCSL Output (Fout1)		Minimum	Typical	Maximum	Units	Notes
Output Logic Level	V _{OH}	0.725			V	RL=50 Ω
	V _{OL}			0.1		
Peak to Peak Output Swing			750		mV	Single-Ended
Rise Time	T _r	200		400	ps	RL=50 Ω, CL=2pF; 20%/80%
Fall Time	T _f	200		400	ps	
Duty Cycle		48		52	%	Differential
Period Jitter RMS (J _{PER})			2.8		ps	F01=F02=156.25MHz
Integrated Phase Jitter (J _{PH})			0.25	2	ps	200kHz ~ 20MHz, @156.25MHz
			0.37	2		100kHz ~ 20MHz, @156.25MHz
			1.70	2		12kHz ~ 20MHz, @156.25MHz

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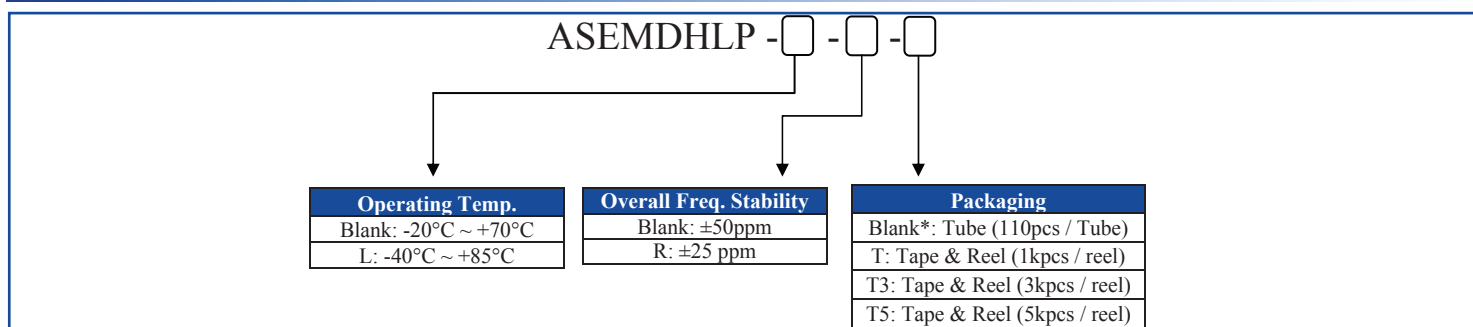
Pb | RoHS/RoHS II Compliant

LVPECL Output (Fout2)		Minimum	Typical	Maximum	Units	Notes
Output Logic Level	V _{OH}	V _{dd} -1.08			V	RL=50 Ω
	V _{OL}			V _{dd} -1.55		
Peak to Peak Output Swing			800		mV	Single-Ended
Rise Time	T _r		250		ps	RL=50 Ω 20%/80%
Fall Time	T _f		250			
Duty Cycle		48		52	%	Differential
Period Jitter RMS (J _{PER})			2.5			
Integrated Phase Jitter (J _{PH})			0.25	2	ps	200kHz ~ 20MHz, @156.25MHz
			0.38	2		100kHz ~ 20MHz, @156.25MHz
			1.7	2		12kHz ~ 20MHz, @156.25MHz

➤ 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		400		
CDM		1,500		

➤ OPTIONS AND PART IDENTIFICATION: (left blank if standard)



* Due to the immediate availability of stock and the qty of the order, the parts may be delivered as BULK: Cut Tape, Loose parts in Antistatic Bag or in Tube(s). The MOQ per the series will still apply for Tube packaging.

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} (HCSL)	156.25							100
	f _{OUT2} (LVPECL)	125							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.

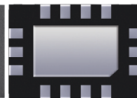
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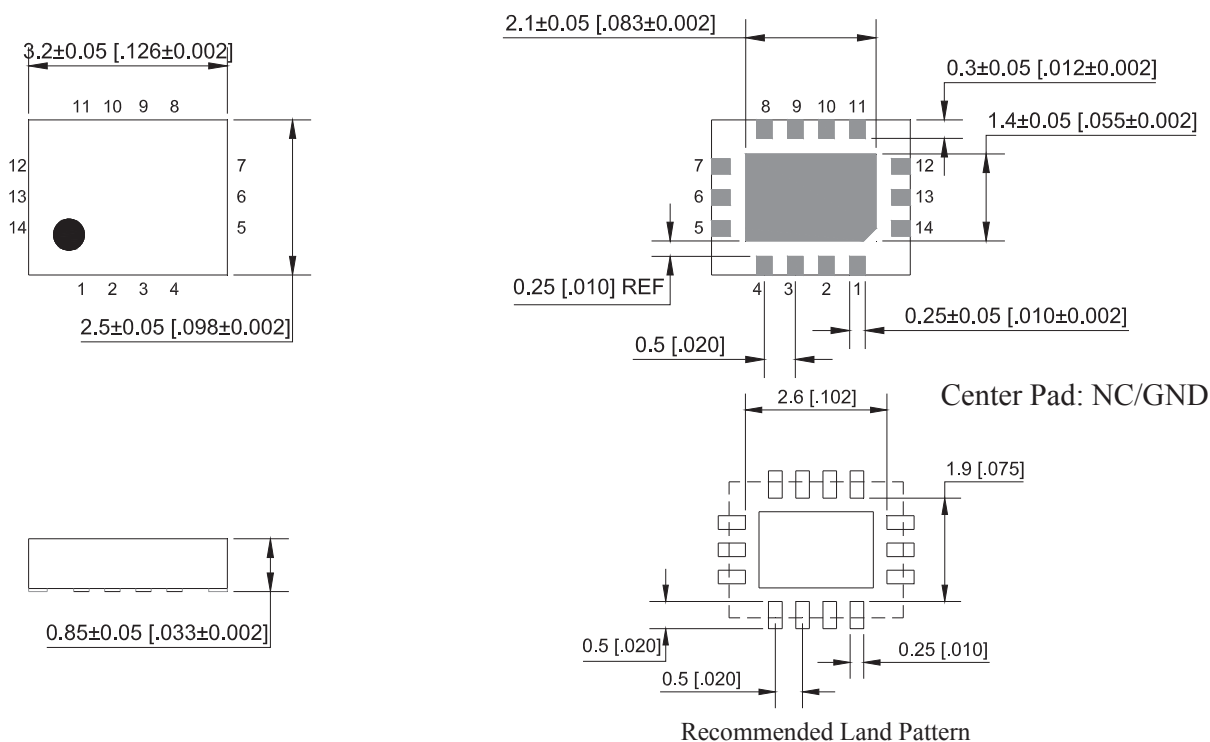


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MECHANICAL DIMENSIONS

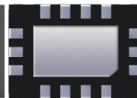


Pin No.	Pin Name	Pin Type	Description
1	Enable	I	Enables outputs when high and disables (tri-state) them when low
2	NC	NA	Leave unconnected or grounded
3	NC	NA	Leave unconnected or grounded
4	GND	Power	Ground
5	FS0	I	Least significant bit for frequency selection
6	FS1	I	Middle bit for frequency selection
7	FS2	I	Most significant bit for frequency selection
8	Output1+	O	Positive HCSL Output 1
9	Output1-	O	Negative HCSL Output 1
10	Output 2-	O	Negative LVPECL Output 2
11	Output 2+	O	Positive LVPECL Output 2
12	VDD2	Power	Power Supply 2 for HCSL Output
13	VDD	Power	Power Supply
14	NC	NA	Leave unconnected or grounded

Dimensions: mm (inches)

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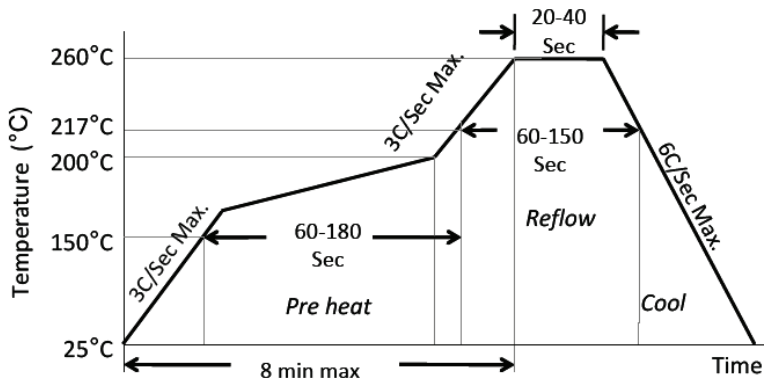


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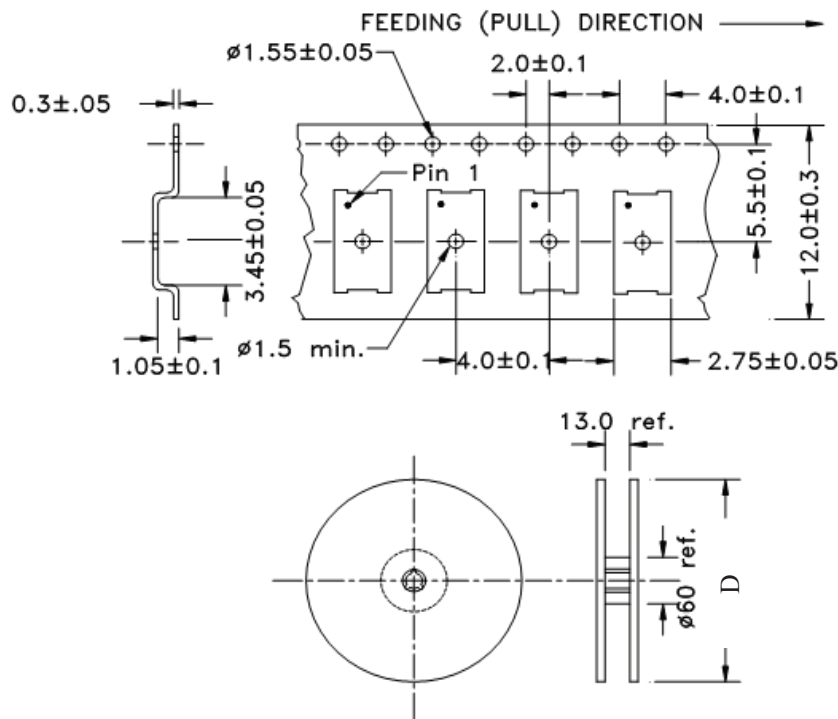
REFLOW PROFILE



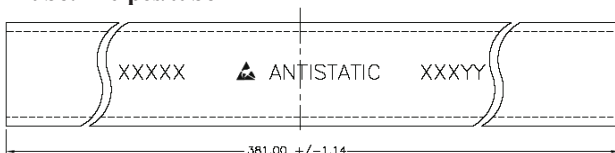
Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.
Preheat Time 150°C to 200°C	60-180 Sec
Time maintained above 217°C	60-150 Sec
Peak Temperature	255-260°C
Time within 5°C of actual Peak	20-40 Sec
Ramp-Down Rate	6°C/Sec Max.
Time 25°C to Peak Temperature	8 min Max.

TAPE & REEL:

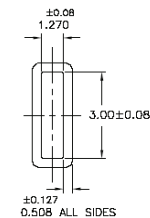
T= 1,000pcs/reel (D=180mm)
 T3= 3,000pcs/reel (D=180mm)
 T5= 5,000pcs/reel (D=330mm)



Tube: 110 pcs/tube



Unit orientation in tube:



Dimensions: mm

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