



Accusilicon AS338 Series Hi-End Audiophile Metal Hermetic Sealed Crystal Oscillator

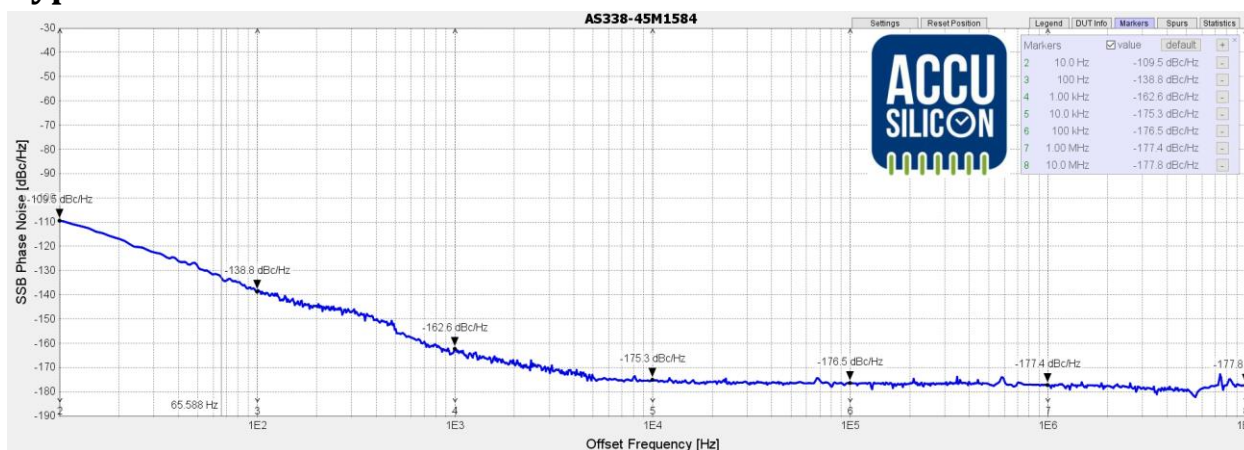
Features

- High-End inverted-mesa AT-Cut crystal with precision Plasma etching process
- Initial Frequency Tolerance $< \pm 2 \text{ ppm}$ @ $+20^\circ\text{C}$ ---- $+30^\circ\text{C}$
 $< \pm 20 \text{ ppm}$ @ -40°C ---- $+85^\circ\text{C}$
- Extremely Low Phase Noise, Typical -108 dBc @ 10 Hz Offset
Typical -176 dBc @ Noise Floor
- Extremely Low Jitter, Typical 38 fs @ $10 \text{ Hz} - 1 \text{ MHz}$
Typical 31 fs @ $12 \text{ kHz} - 20 \text{ MHz}$
- Extremely Short-term Stability, Typical $2 \text{ E}-11$ @ $0.01 \text{ s} - 1 \text{ s}$
- Tri-State Enable / Disable
- Metal Hermetic Sealed DIP-14 Package
- Available in 45.1584 MHz and 49.1520 MHz

Application

- Hi-End Audiophile Equipment
- Professional Audio Equipment
- Audio Test & Measurement Instrument

Typical Phase Noise





Electrical Specifications

General Electrical Specifications

Symbol	Description	Conditions	Min	Typical	Max	Unit
VDD	Supply Voltage (3.3V)		3.0	3.3	3.6	V
I _{off}	Disable Mode Current			1	10	uA
	Tri-State(Input to Pin 1)					
	Enable	High voltage or floating	0.7VDD			
	Disable	Low voltage or GND			0.3VDD	
I _{osc}	Supply Current(3.3V)	3.3V, 15pF Load		10	18	mA
	Output Wave Form	CMOS				
	Output Level "0"				10%VDD	
	Output Level "1"		90%VDD			
	Rise/Fall time	@20% - %80 VDD			1	ns
	Startup time			5	20	ms
	Operating Temperature		-40		85	°C
	Frequency Tolerance		-20		20	ppm
CL	Load				15	pF
	Clock Duty Cycle		45	50	55	%

Phase Noise

Phase Noise	45.1584MHz / 49.1520MHz	Typical	
	10Hz	-108	dBc/Hz
	100Hz	-138	dBc/Hz
	1KHz	-160	dBc/Hz
	10KHz	-168	dBc/Hz
	100KHz	-176	dBc/Hz
	1MHz	-176	dBc/Hz
	20MHz	-178	dBc/Hz

Short-term Stability (ADEV)

ADEV	45.1584MHz / 49.1520MHz	Typical	
		2E-11	0.01s
		2E-11	0.1s
		2E-11	1S

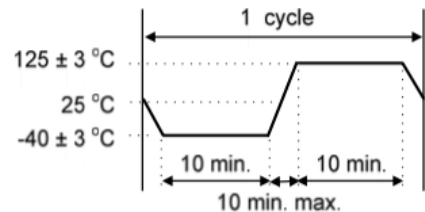
■ RELIABILITY SPECIFICATIONS

1. Mechanical Endurance

No.	Test Item	Test Methods	Criteria
1.1	Drop Test	Hegiht : 100 cm height Direction : X,Y,Z 6 directions Test cycles : 3 cycles Fall freely on to concrete floor Mounting on test fixture (total weight=100 g)	+/- 2.0 ppm
1.2	Mechanical Shock	Acceleration : 1000 g Duration : 0.5 ms Test cycles : 3 times for all 3 directions	+/- 2.0 ppm
1.3	Vibration	Acceleration : 20 g Duration : 4 hours/each direction Frequency range : 10 ~ 2000 Hz Amplitude : 1.52 mm Direction : X,Y,Z 3 directions Sweep speed : 20 minutes/cycle	+/- 2.0 ppm
1.4	Gross Leak	Standard sample for automatic gross leak detector. Test Pressure : 2 kg/cm ²	$< 1.5 \times 10^{-5}$ Pa m ³ / sec
1.5	Fine Leak	Helium bomging 4.5 kgf/cm ² for 2 hours	$< 1.0 \times 10^{-9}$ Pa m ³ / sec
1.6	Solderability	Preheate temperature : 125°C ± 5°C Preheate time : 120 sec Solding temperature : 245°C ± 5 °C Duration : 5 ± 1 sec Method : Solder bath method	90% Coated

[Note] Criteria mean the maximum frequency change after reliability test, frequency shell be measured at 25°C.

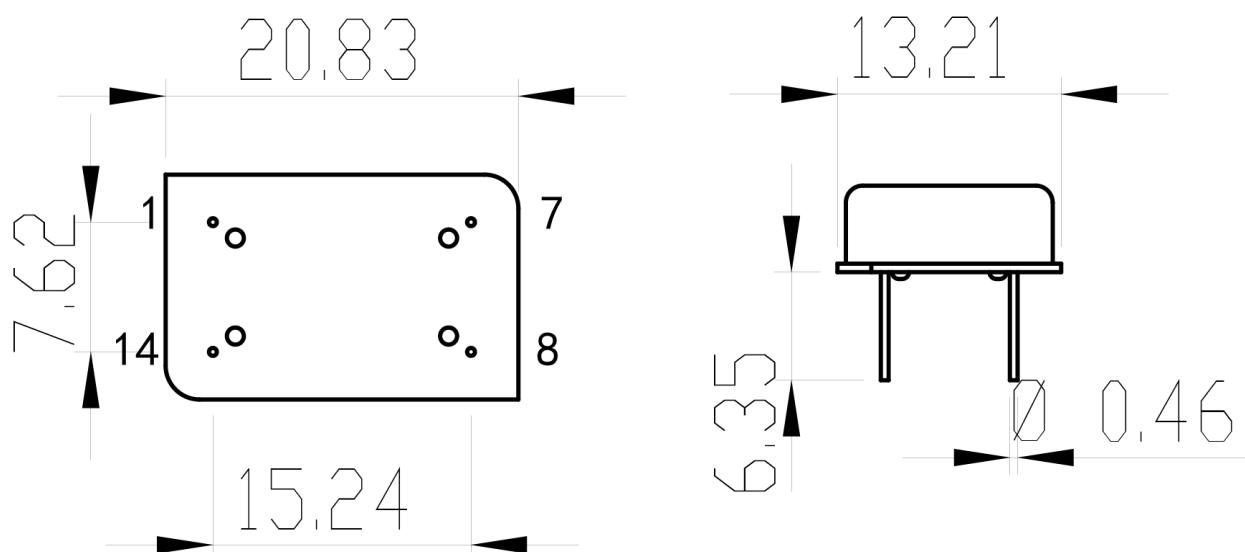
2. Environmental Endurance

No.	Test Item	Test Methods	Criteria
2.1	High Temp. Storage	Temperature : $+125^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Duration : 168 hours	± 2.0 ppm
2.2	Low Temp. Storage	Temperature : $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Duration : 500 hours	± 2.0 ppm
2.3	Thermal Shock (Air to Air)	Total 100 cycles of the following temperature cycle : 	± 2.0 ppm
2.4	High Temp & Humidity	Temperature : $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Humidity: RH 85% Duration : 168 hours	± 2.0 ppm
2.5	Aging	Temperature : $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Duration : 500 hours Voltage input by specification	± 2.0 ppm

[Note] Criteria mean the maximum frequency change after reliability test, frequency shall be measured after 2 hours at 25°C leaving.



Rev.C

Package Dimension(mm)

PIN	Function
1	OE
7	GND
8	OUT
14	VDD

List of available part numbers

Part No#	Frequency	Supply Voltage
AS338-451584	45.1584MHz	3.3V
AS338-491520	49.1520MHz	3.3V