



# Accusilicon AS318-B Series Professional Audiophile Crystal Oscillator

## Features

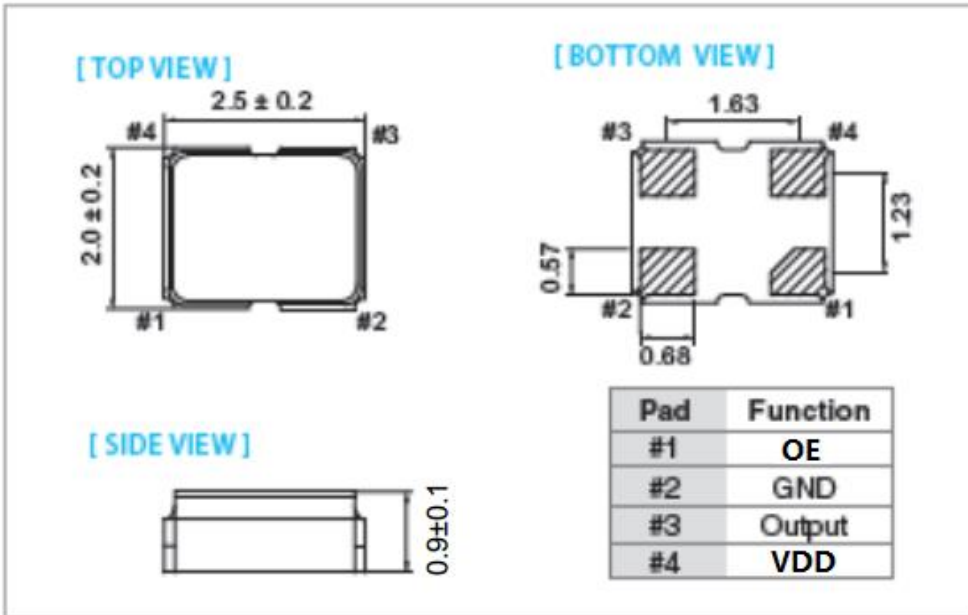
- Extremely low close-in phase noise, designed for professional Audiophile & Recording application.  
 Typical -100dBc @ 10Hz at 45.1584MHz & 49.152MHz;  
 Typical -90dBc @ 10Hz at 90.3168MHz & 98.304MHz;  
 Typical -88dBc @ 10Hz at 100MHz
- 10mA typical current consumption on 15pF load, 3.3V supply voltage @ 45.1584MHz  
 20mA typical current consumption on 15pF load, 3.3V supply voltage @ 100MHz
- Select (-S) version: 100% Phase Noise Test Passed on Typical Phase Noise @10Hz and +/- 1 ppm Frequency accuracy @25°C
- Very low rms phase jitter@ 45.1584MHz:
  - Typical 88fS(0.088pS) @ 10Hz - 1MHz
  - Typical 167fS(0.167pS) @ 12kHz - 80MHz
 Very low rms phase jitter@ 90.3168MHz:
  - Typical 198fS(0.198pS) @ 10Hz - 1MHz
  - Typical 75fS(0.075pS) @ 12kHz - 80MHz
 Very low rms phase jitter@ 100MHz:
  - Typical 200fS(0.2pS) @ 10Hz - 1MHz
  - Typical 71fS(0.071pS) @ 12kHz - 80MHz
- Typical 2520, SMD1409, DIP14 package

## Pin Definition on 2520, SMD1409, DIP14 Package

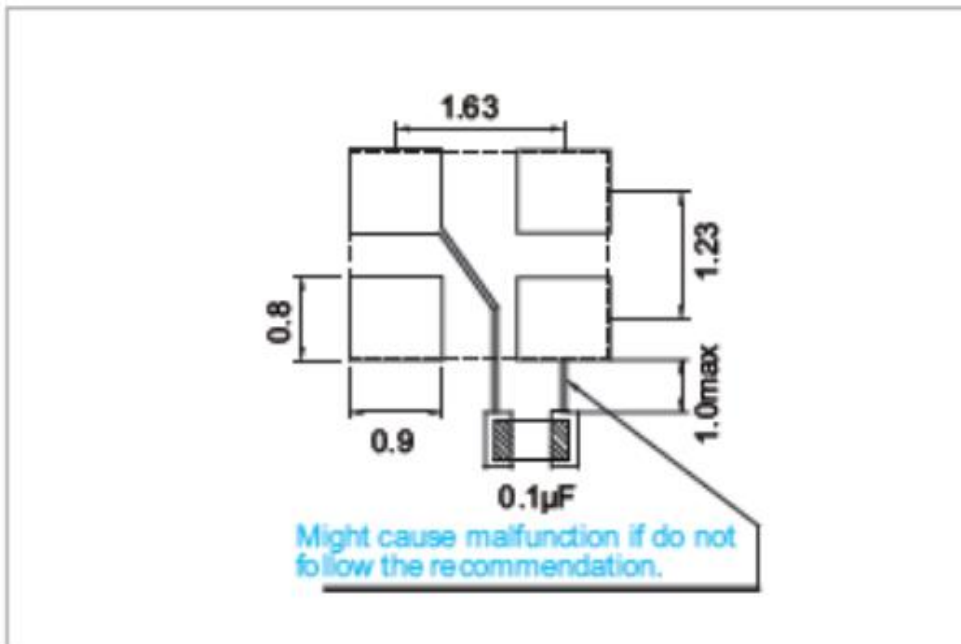
Pin No#	Pin Definition
1	OE
2	GND
3	OUTPUT
4	VDD

\* By default, the OE is pulled up to VDD, Oscillation output ON

### 2520 Package Dimension(mm)

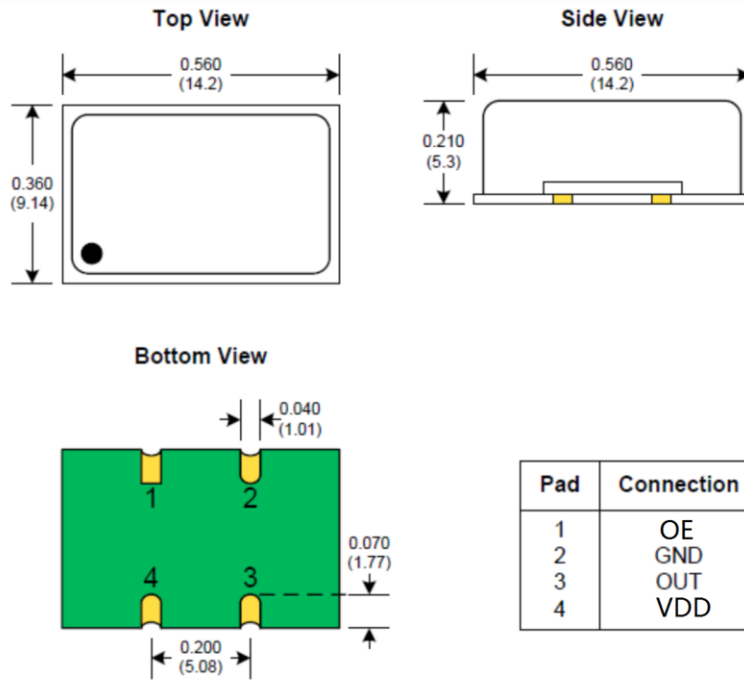


### 2520 Package PCB Pad Layout(mm)

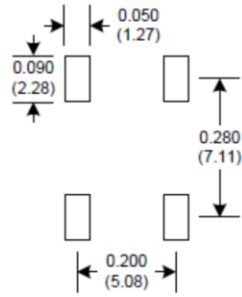




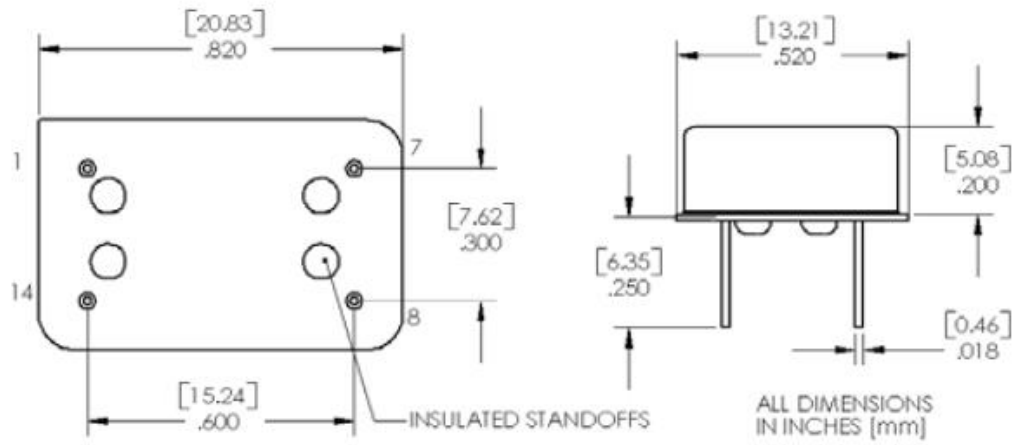
# SMD1409 Package and PCB Pad Layout Dimension(inch/(mm))



## SUGGESTED PAD LAYOUT



### DIP14 Package Dimension(mm)



PIN	Function
1	OE
7	GND
8	OUT
14	Vcc



## Electrical Specifications

### General Electrical Specifications

Symbol	Description	Conditions	Min	Typical	Max	Unit
Vdd	Supply Voltage (3.3V)	AS318-B parts	3.0	3.3	3.6	V
I <sub>osc</sub>	Supply Current (3.3V)	3.3V, 15pF Load, 45.1584MHz		10	12	mA
		3.3V, 15pF Load, 90.3168MHz		20	24	mA
		3.3V, 15pF Load, 100MHz		20	24	mA
	Output Wave Form	CMOS				
	Output Level "0"				10%Vdd	
	Output Level "1"		90%Vdd			
	Rise/Fall time	@20%-80%Vdd			4	ns
	Startup time			0.4	4	ms
	Operating Temperature		-20		85	°C
	Frequency Tolerance		-20		20	ppm
CL	Load				15	pF
	Clock Duty Cycle		45	50	55	%
	Oscillation output ON	OE=Level H ( $0.7 V_{dd} \leq V_{IH} \leq V_{DD}$ ) or OPEN is selected.				
	High impedance	OE=Level L ( $V_{IL} \leq 0.3 V_{dd}$ ) is selected				

Note: It is recommended that the power supply be filtered with a 0.1uF capacitor.



## PhaseNoise

Phase Noise	45.1584MHz, 3.3V	Typical	
	1Hz	-70	dBc/Hz
	10Hz	-103	dBc/Hz
	100Hz	-130	dBc/Hz
	1KHz	-159	dBc/Hz
	10KHz	-165	dBc/Hz
	100KHz	-167	dBc/Hz
	1MHz	-168	dBc/Hz
Phase Noise	49.152MHz, 3.3V		
	1Hz	-70	dBc/Hz
	10Hz	-101	dBc/Hz
	100Hz	-129	dBc/Hz
	1KHz	-158	dBc/Hz
	10KHz	-166	dBc/Hz
	100KHz	-166	dBc/Hz
	1MHz	-166	dBc/Hz
Phase Noise	90.3186MHz, 3.3V		
	1Hz	-59	dBc/Hz
	10Hz	-90	dBc/Hz
	100Hz	-115	dBc/Hz
	1KHz	-144	dBc/Hz
	10KHz	-164	dBc/Hz
	100KHz	-167	dBc/Hz
	1MHz	-168	dBc/Hz
Phase Noise	98.304MHz, 3.3V		
	1Hz	-58	dBc/Hz
	10Hz	-90	dBc/Hz
	100Hz	-115	dBc/Hz
	1KHz	-144	dBc/Hz
	10KHz	-163	dBc/Hz
	100KHz	-165	dBc/Hz
	1MHz	-167	dBc/Hz
Phase Noise	100MHz, 3.3V		
	1Hz	-58	dBc/Hz
	10Hz	-88	dBc/Hz
	100Hz	-118	dBc/Hz
	1KHz	-146	dBc/Hz
	10KHz	-163	dBc/Hz
	100KHz	-168	dBc/Hz
	1MHz	-169	dBc/Hz



## RMS Jitter

RMS Jitter	45.1584MHz, 3.3V Typical	
10Hz - 1MHz	0.088	ps
12KHz – 80MHz	0.167	ps

RMS Jitter	49.1520MHz, 3.3V Typical	
10Hz - 1MHz	0.098	ps
12KHz – 80MHz	0.205	ps

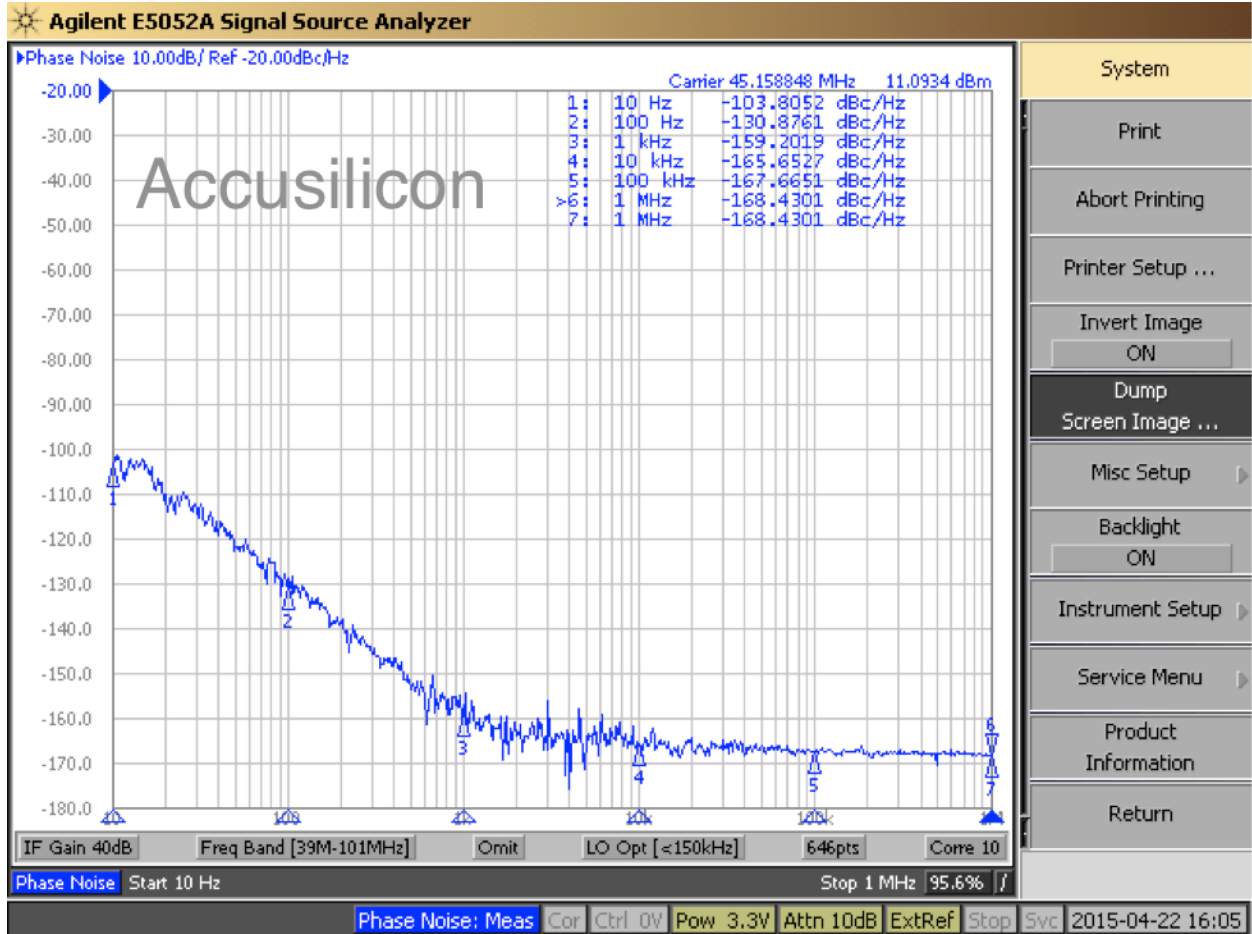
RMS Jitter	90.3186MHz, 3.3V Typical	
10Hz - 1MHz	0.198	ps
12KHz – 80MHz	0.075	ps

RMS Jitter	98.304MHz, 3.3V Typical	
10Hz - 1MHz	0.198	ps
12KHz – 80MHz	0.075	ps

RMS Jitter	100MHz, 3.3V Typical	
10Hz - 1MHz	0.2	ps
12KHz – 80MHz	0.071	ps



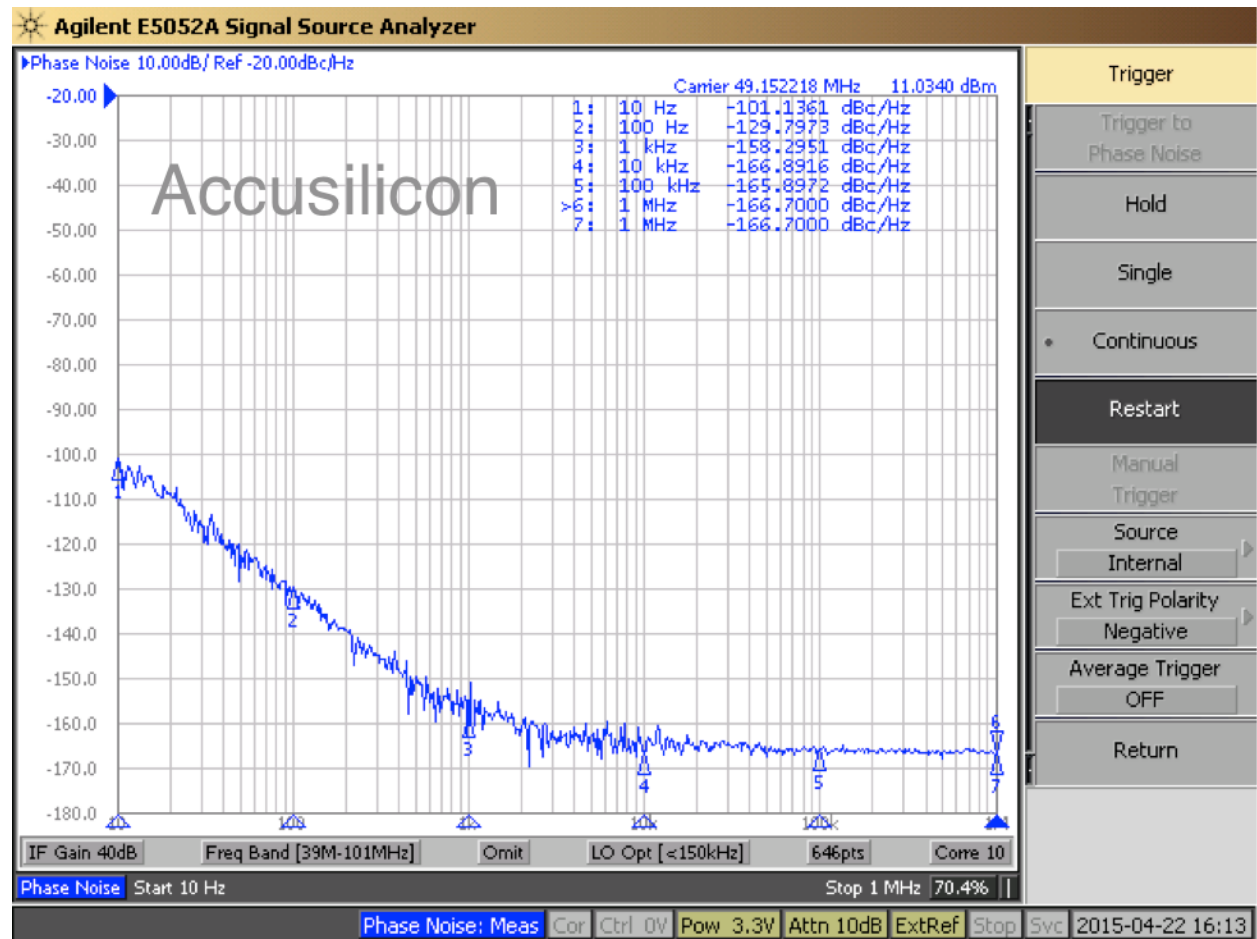
# Accusilicon AS318-B-451584 45.1584MHz





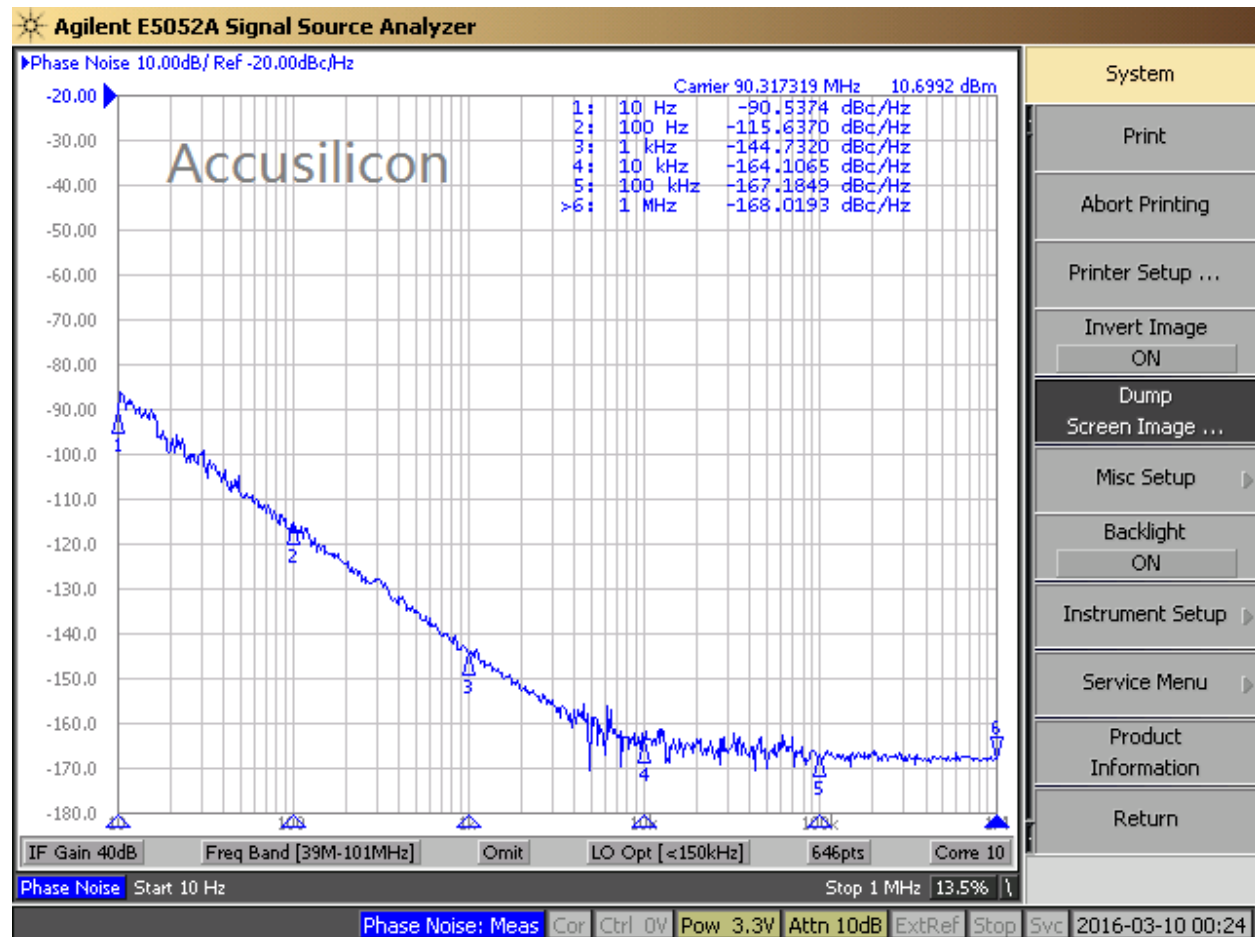


# Accusilicon AS318-B-491520 49.1520MHz



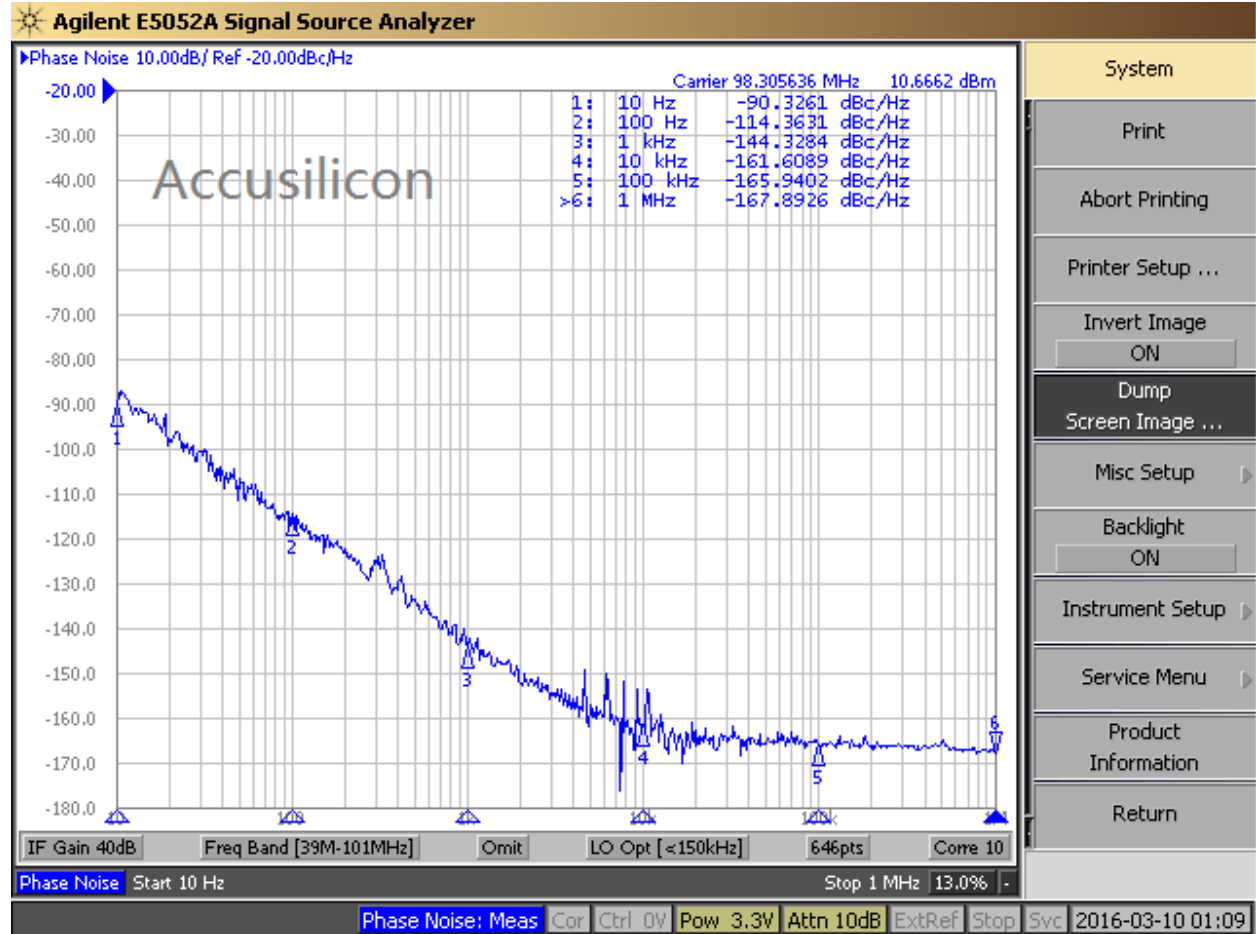


# Accusilicon AS318-B-903186 90.3186MHz



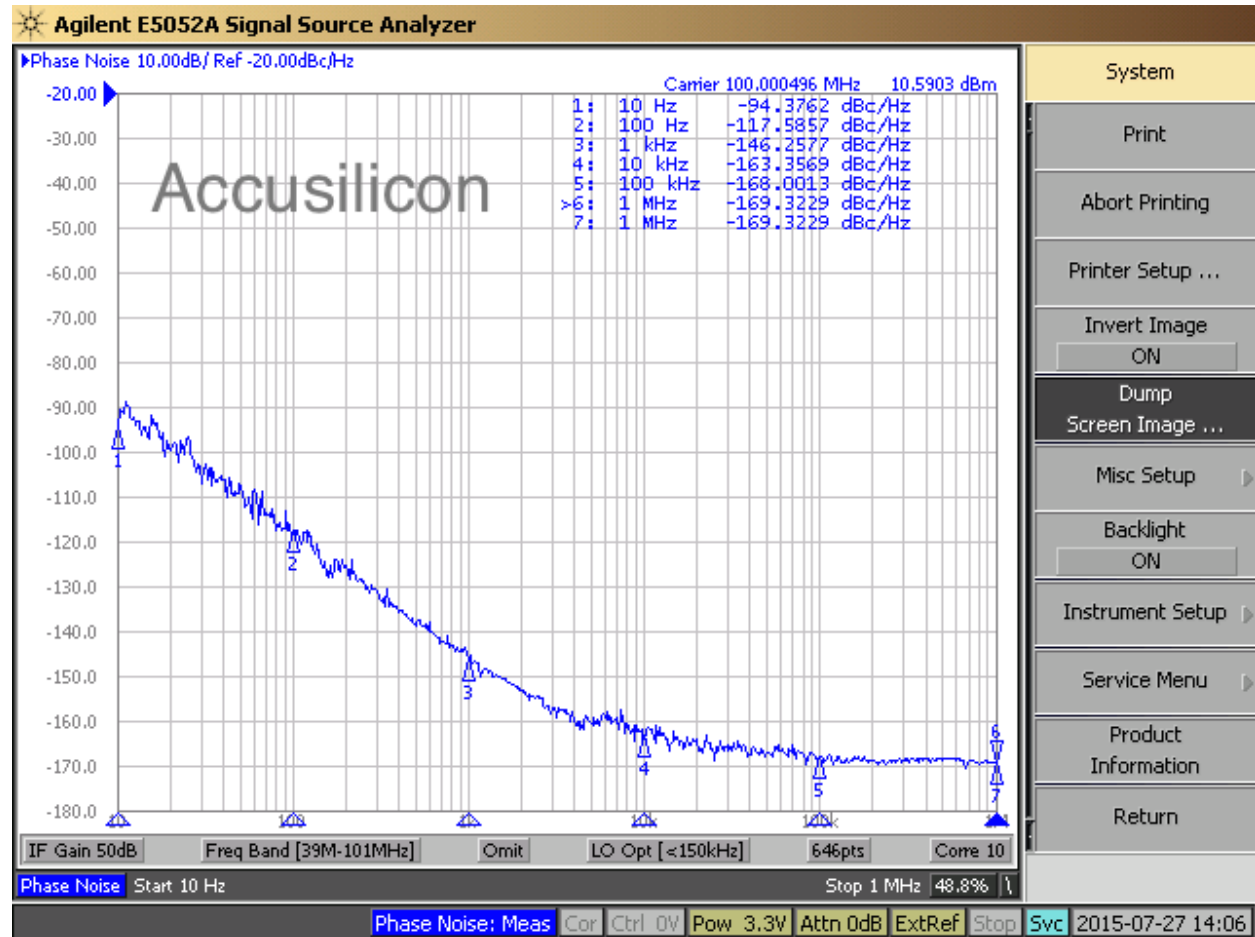


# Accusilicon AS318-B-98304 98.304MHz





# Accusilicon AS318-B-100 100MHz



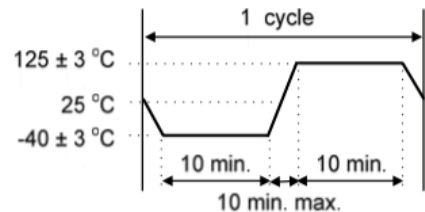
## ■ RELIABILITY SPECIFICATIONS

### 1. Mechanical Endurance

No.	Test Item	Test Methods	Criteria
1.1	Drop Test	Height : 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 <sup>2</sup>	< 1.5 × 10 <sup>-5</sup> Pa m <sup>3</sup> / sec
1.5	Fine Leak	Helium bombing 4.5 kgf/cm <sup>2</sup> for 2 hours	< 1.0 × 10 <sup>-9</sup> Pa m <sup>3</sup> / sec
1.6	Solderability	Preheate temperature : 125°C ± 5°C Preheate time : 120 sec Soldering temperature : 245°C ± 5 °C Duration : 5 ± 1 sec Method : Solder bath method	90% Coated

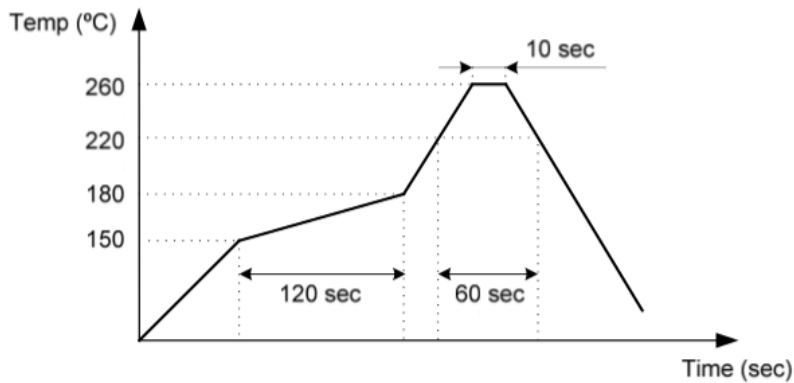
[Note] Criteria mean the maximum frequency change after reliability test, frequency shall be measured at 25°C.

## 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  $25^{\circ}\text{C}$  leaving.

### ■ SUGGESTED REFLOW PROFILE



Note : Total Time: 200 sec. Max., Solder Melting Point:  $220^{\circ}\text{C}$

**List of available part numbers**

Part No#	Frequency	Supply Voltage	Package
AS318-B-451584-1	45.1584MHz	3.3V	2520
AS318-B-491520-1	49.1520MHz	3.3V	2520
AS318-B-903168-1	90.3168MHz	3.3V	2520
AS318-B-983040-1	98.3040MHz	3.3V	2520
AS318-B-100-1	100MHz	3.3V	2520
AS318-B-451584S-1	45.1584MHz	3.3V	2520
AS318-B-491520S-1	49.1520MHz	3.3V	2520
AS318-B-903168S-1	90.3168MHz	3.3V	2520
AS318-B-983040S-1	98.3040MHz	3.3V	2520
AS318-B-100S-1	100MHz	3.3V	2520

Part No#	Frequency	Supply Voltage	Package
AS318-B-451584-2	45.1584MHz	3.3V	SMD1409
AS318-B-491520-2	49.1520MHz	3.3V	SMD1409
AS318-B-903168-2	90.3168MHz	3.3V	SMD1409
AS318-B-983040-2	98.3040MHz	3.3V	SMD1409
AS318-B-100-2	100MHz	3.3V	SMD1409
AS318-B-451584S-2	45.1584MHz	3.3V	SMD1409
AS318-B-491520S-2	49.1520MHz	3.3V	SMD1409
AS318-B-903168S-2	90.3168MHz	3.3V	SMD1409
AS318-B-983040S-2	98.3040MHz	3.3V	SMD1409
AS318-B-100S-2	100MHz	3.3V	SMD1409

Part No#	Frequency	Supply Voltage	Package
AS318-B-451584-3	45.1584MHz	3.3V	DIP14
AS318-B-491520-3	49.1520MHz	3.3V	DIP14
AS318-B-903168-3	90.3168MHz	3.3V	DIP14
AS318-B-983040-3	98.3040MHz	3.3V	DIP14
AS318-B-100-3	100MHz	3.3V	DIP14
AS318-B-451584S-3	45.1584MHz	3.3V	DIP14
AS318-B-491520S-3	49.1520MHz	3.3V	DIP14
AS318-B-903168S-3	90.3168MHz	3.3V	DIP14
AS318-B-983040S-3	98.3040MHz	3.3V	DIP14
AS318-B-100S-3	100MHz	3.3V	DIP14

\*Select (-S) version: 100% Phase Noise Test Passed on Typical Phase Noise @10Hz and +/- 1 ppm  
Frequency accuracy @25°C