

SiT3800, High performance Voltage Controlled Oscillator:

- 1 MHz to 200 MHz
 - Linear pull range +/-240ppm or +/-60ppm
 - Small form factor
 - Excellent frequency accuracy/jitter
- These highly reliable oscillators are completely Quartz free.



Features

- Frequency range
 - o 1 MHz to 200 MHz
- RMS phase jitter (random)
 - o 0.7ps (typical)
- Linear pull range
 - o +/-240ppm or +/-60ppm
- VCMO tuning voltage
 - o 0V to 1.6V for all Vdds
- Operating voltage
 - o 1.8 V / 2.5 V to 3.3 V
- Total frequency stability
 - o +/- 50 ppm or +/-100 ppm
- World's Smallest Footprints:
 - o 2.5 x 2.0 x 0.85 mm
 - o 3.2 x 2.5 x 0.85 mm
 - o 5.0 x 3.2 x 0.85 mm
- Operating Temperature Range
 - o -40C to +85C
 - o -10C to +70C
- Ultra-Reliable start up and greater immunity from interference

Benefits

- No crystal or capacitors required
 - o Eliminates crystal qualification time
 - o 50%+ board space saving

Applications

- Data communication
- ADSL
- DSL

Description

The SiT3800 is a high performance Voltage Controlled MEMS Oscillator, VCMO (VCXO equivalent), suitable for most communication applications. The pull range can be set to +/-240ppm (480ppm total) or +/-60ppm (120ppm total). The SiT3800 offers unparalleled flexibility in terms of frequency range, frequency accuracy tolerance, supply voltage, and operating temperature range while simultaneously offering outstanding performance in terms of linearity of the VCMO pull range.

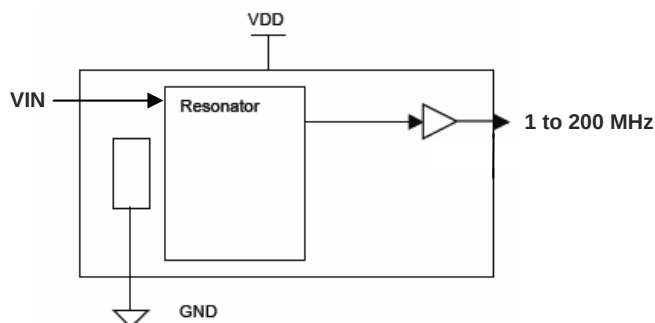
The SiT3800 is a factory programmable device that enables user to pull the frequency by applying 0V to

1.6V to the VCMO control pin (pin1).

The SiT3800, by eliminating the external quartz crystal, has improved immunity to the environmental effects of vibration, shock, strain, and humidity.

To order samples, go to www.sitime.com and click on "Request sample" link.

Block Diagram



Package Thermal Characteristics

Theta JA = 30°C/W with copper plane on VDD and GND

Theta JA = 120°C/W with PCB traces of 0.010" to all pins

Pin Description

Pin Number	Pin Name	Pin Type	Pin Description
1	VIN	Input	0 to 1.6V for pulling the output frequency
2	GND	Power	Connect to Ground
3	CLK	Output	1 to 1250 programmed MHz Clock output
4	VDD	Power	Connect to 1.8V or 2.5V to 3.3V

Pull Range

The SiT3800 can be factory programmed to provide a completely linear profile. As it's shown in figure1 and 2, regardless of the Vdd voltage (1.8V/2.5V/3.3V) the output frequency can be pulled by applying 0V to 1.6V to the VIN pin. This feature enables a tight control over the pull range by guarantying zero ppm frequency shift at VIN= 0.8V for all the Vdds.

Figure1- +/-60 ppm pull range, VIN=0V to 1.6V, Vdd=1.8V/2.5V/3.3V

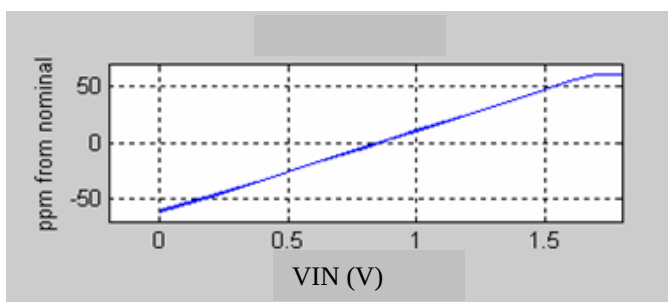
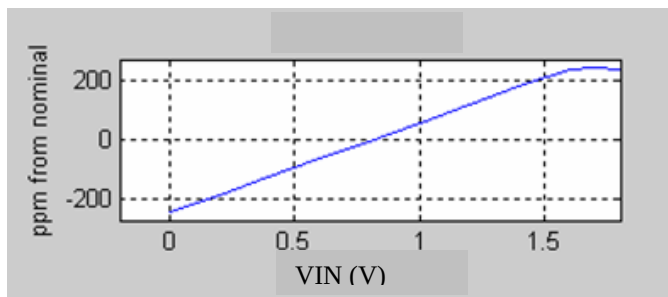


Figure1- +/-240 ppm pull range, VIN=0V to 1.6V, Vdd=1.8V/2.5V/3.3V



Absolute Maximum Ratings

Attempted operation outside the absolute maximum ratings of the part may cause permanent damage to the part. Actual performance of the IC is only guaranteed within the operational specifications not absolute maximum ratings.

Parameter	Min	Max	Unit
Storage Temperature	-65	150	°C
Commercial Operation Temperature	-10	70	°C
Industrial Operation Temperature	-40	85	°C
VDD	-0.5	+3.6	V
Electrostatic Discharge		2000	V
Soldering Temperature (follow standard Pb free soldering guidelines)		260	°C
# of Program Writes		1	NA
Program Retention over -40 to 125C, Process, VDD (0 to 3.6V)		1,000+	years

DC Electrical Specifications

The following specification apply at 1.8V +/- 5%, -10 to 70 °C

Parameter	Condition	Min	Typical	Max	Unit
Operating VDD	1.8V operation	1.71	1.8	1.89	V
VIN Voltage Range		0	-	1.6	V
Pull Range	Option 1	-60	-	+60	ppm
	Option 2	-240	-	+240	ppm
Voltage Output High	20 mA load current	80% of Vdd	-	-	V
Voltage Output Low	10 mA source current	-	-	20% of Vdd	V
Operating Current	Output frequency = 30 MHz, 15 pF load	-	21	-	mA
Operating Current	Output frequency = 125 MHz, 15 pF load	-	25	-	mA
Power Up Time		-	10	-	ms

The following specification apply at 3.3V +/-5% or 2.5V +/-5%, -10 to 70 °C

Parameter	Condition	Min	Typical	Max	Unit
Operating VDD		3.15	3.3	3.45	V
VIN Voltage Range		0	-	1.6	V
Pull Range	Option 1	-60	-	+60	ppm
	Option 2	-240	-	+240	ppm
Operating VDD	2.5V operation	2.37	2.5	2.63	V
Voltage Output High	20 mA load current	80% of Vdd	-	-	V
Voltage Output Low	10 mA source current	-	-	20% of Vdd	V
Operating Current	Output frequency = 30 MHz, 15	-	22	-	mA

	pF load				
Operating Current	Output frequency = 125 MHz, 15 pF load	-	29	-	mA
Power Up Time		-	10	-	ms

AC Electrical Specifications

The following specification apply at 1.8V +/- 5%, -10 to 70°C

Parameter	Condition	Min	Typical	Max	Unit
Clock Output Frequency		1	-	200	MHz
Clock Output Duty Cycle	Output frequency= 1MHz to 66MHz	45	50	55	%
	Output frequency= 66MHz to 125MHz	40	-	60	%
Clock Output Rise Time	15 pF Load	-	1.0	1.5	ns
Clock Output Fall Time	15 pF Load	-	1.0	1.5	ns
Pk-pk Period Jitter	Output frequency = 125 MHz		+/-20		ps
rms period jitter	Output frequency = 125 MHz	-	5	-	ps
rms Phase Jitter (Random)	Output frequency = 75MHz 900KHz to 7.5MHz	-	0.73	-	ps

The following specification apply at 3.3V +/- 5% or 2.5V +/-5%, -10 to 70°C

Parameter	Condition	Min	Typical	Max	Unit
Clock Output Frequency		1	-	200	MHz
Clock Output Duty Cycle		45	50	55	%
Clock Output Rise Time	15 pF Load	-	1.0	1.5	ns
Clock Output Fall Time	15 pF Load	-	1.0	1.5	ns
Pk-pk Period Jitter	Output frequency = 125 MHz, VDD=3.3V	-	+/-12	-	ps
	Output frequency = 125 MHz, VDD=2.5V	-	+/-15	-	ps
rms period jitter	Output frequency = 125 MHz	-	4	-	ps
rms Phase Jitter (Random)	Output frequency = 75MHz 900KHz to 7.5MHz	-	0.73	-	ps

Ordering Information

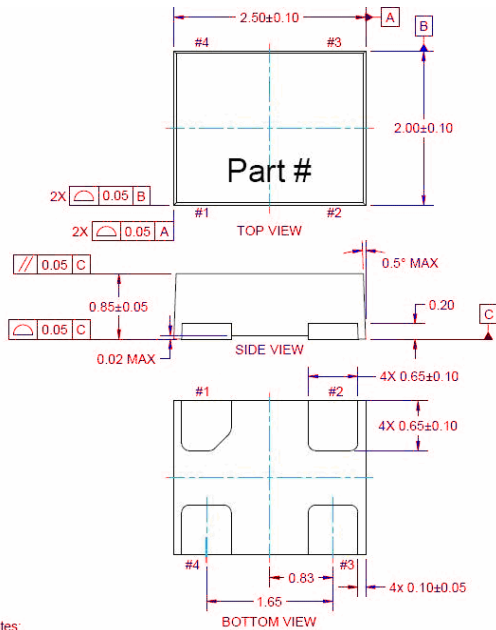
SiT3800AC-14-332-123.12345T

Part Family:	Temperature	Package Size:	Frequency	Supply	Pull Range	Frequency:	Package:
SiT3800	Range:	"1" 2.5 x 2.0 mm	Tolerance:	Voltage:	Option:	1.000000 MHz	"T" is
	"C" -10 to 70°C	"2" 3.2 x 2.5 mm	"3" +/- 50 ppm	"18" 1.8V	"1" +/-60ppm	to	Tape
Revision	"I" -40 to 85°C	"3" 5.0 x 3.2 mm	"4" +/- 100 ppm	"25" 2.5V	"2" +/-240ppm	200.00000 MHz	& Reel
Letter:				"33" 3.3V			

"A" is the revision

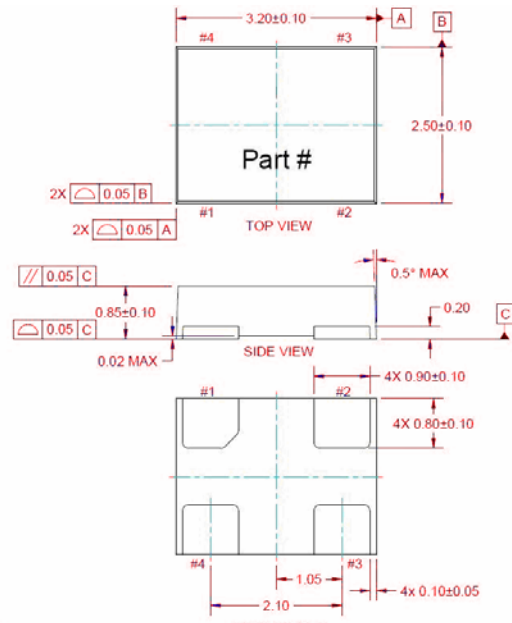
Package Information

2.0 mm x 2.5 mm x 0.85 mm QFN type package



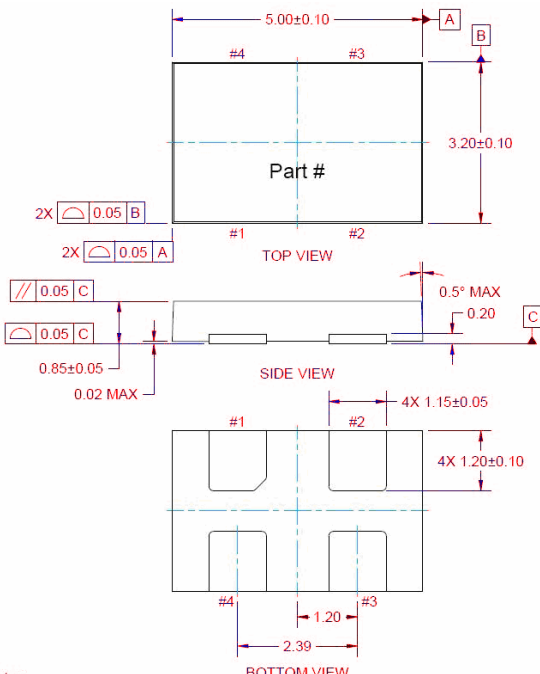
- Notes:
- 1) Lead Finish: Ni/Pd/Au
 - 2) Body: Transfer Molded Plastic
 - 3) Must Meet MSL #1
 - 4) Leads Cu

2.5 mm x 3.2 mm x 0.85 mm QFN type package



- Notes:
- 1) Lead Finish: Ni/Pd/Au
 - 2) Body: Transfer Molded Plastic
 - 3) Must Meet MSL #1
 - 4) Leads Cu

3.2 mm x 5.0 mm x 0.85 mm QFN type package



- Notes:
- 1) Lead Finish: Ni/Pd/Au
 - 2) Body: Transfer Molded Plastic
 - 3) Must Meet MSL #1
 - 4) Leads Cu