

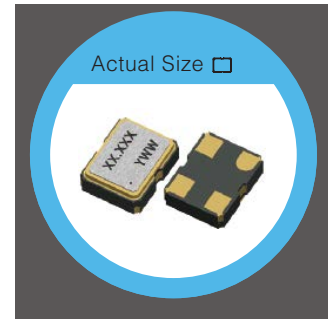
OC Type 2.5 x 2.0 mm SMD Crystal Oscillator

FEATURE

- Typical 2.5 x 2.0 x 0.81mm Ceramic SMD Package
- Tight Symmetry (45 to 55%) Available
- Operation Voltage: 1.8V, 2.5V, 3.3V
- Tri-State Enable/Disable

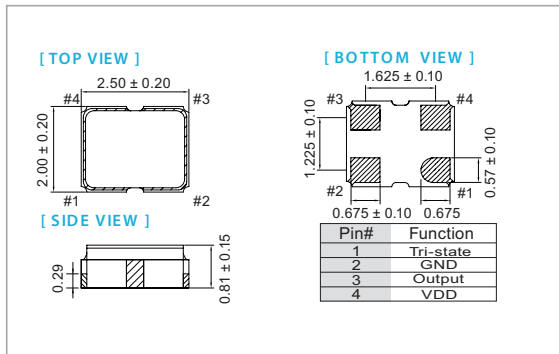
TYPICAL APPLICATION

- WLAN/WiMAX
- Mobile Phone
- DSC, Set-Top Box, HDTV

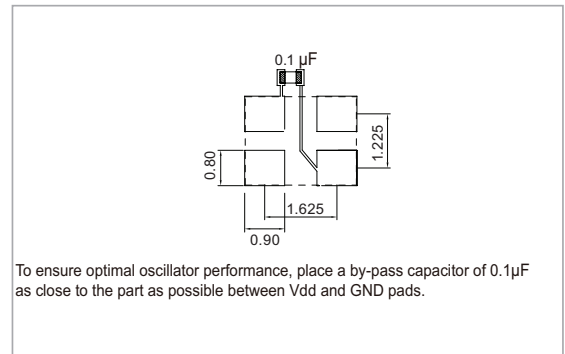


RoHS Compliant

DIMENSION (mm)



SOLDER PAD LAYOUT (mm)



ELECTRICAL SPECIFICATION

Parameter	3.3V		2.5V		1.8V		Unit		
	Min.	Max.	Min.	Max.	Min.	Max.			
Supply Voltage Variation (V _{DD})	V _{DD} -5%	V _{DD} +5%	V _{DD} -5%	V _{DD} +5%	V _{DD} -5%	V _{DD} +5%	V		
Frequency Range	1.25	125	1.25	125	1.25	125	MHz		
Standard Frequency	24, 26, 30, 40						MHz		
Supply Current	At 15pF Load		-	15	-	10	-	7	mA
	No Load Condition, 1.25MHz ≤ Fo < 10MHz		-	1.5	-	1.5	-	1.2	mA
	No Load Condition, 10MHz ≤ Fo < 20MHz		-	2	-	2	-	1.5	mA
	No Load Condition, 20MHz ≤ Fo < 80MHz		-	3	-	2.5	-	1.5	mA
	No Load Condition, 80MHz ≤ Fo < 125MHz		-	8	-	7	-	5	mA
Duty Cycle	45	55	45	55	45	55	%		
Output Level	Output High		2.97	-	2.25	-	1.62	-	V
	Output Low		-	0.33	-	0.25	-	0.18	V
Transition Time: Rise / Fall Time*	1.25MHz ≤ Fo < 10MHz		-	3	-	4	-	5	nSec
	10MHz ≤ Fo < 20MHz		-	3	-	3	-	4	nSec
	20MHz ≤ Fo < 80MHz		-	3	-	3	-	4	nSec
	80MHz ≤ Fo < 125MHz		-	3	-	3	-	4	nSec
Startup Time	-	2	-	2	-	2	-	2	mSec
Tri-State (Input to Pin 1)	Enable (High Voltage or Floating)		2.31	-	1.75	-	1.26	-	V
	Disable (Low Voltage or GND)		-	0.99	-	0.75	-	0.54	V
Output Loading	15		15		15			pF	
Stand by Current (@-40°C to 85°C)	-	10	-	10	-	10	-	10	µA
Stand by Current (@-40°C to 125°C)	-	20	-	20	-	20	-	20	µA
Period Jitter (Pk-Pk)	-	40	-	40	-	40	-	40	pSec
RMS Phase Jitter (12kHz to 20MHz)	-	1	-	1	-	1	-	1	pSec
Aging (@ 25°C, 1 st Year)	-	±3	-	±3	-	±3	-	±3	ppm
Storage Temp. Range	-55	+125	-55	+125	-55	+125	-	+125	°C

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position
 +Transition times are measured between 10% and 90% of V_{DD} with an output load of 15pF

FREQ. STABILITY vs. TEMP. RANGE

Temp. (°C)	ppm		
	±20	±25	±50
-10~+60	○	○	○
-20~+70	△	○	○
-40~+85	×	○	○
-40~+125	×	×	○

* ○: Available △: Conditional X: Not available

*Inclusive of calibration @ 25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration load variation

Note: not all combination of options are available. Other specifications may be available upon request.

32.768kHz Series

OE / OC Type

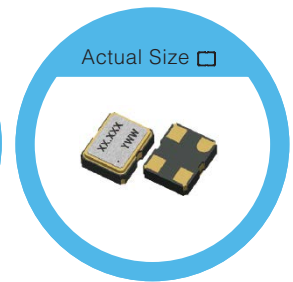
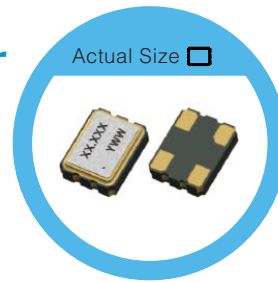
3.2 x 2.5 / 2.5 x 2.0 mm SMD Oscillator

FEATURE

- Tight symmetry (45 to 55%) available.
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable
- Built-in ASIC enables reduction of current consumption.

TYPICAL APPLICATION

- Typically used for real time clock application.
- Mobile Phone
- DSC, Set-top Box, HDTV
- Car navigation systems.



RoHS Compliant

DIMENSION (mm)

SOLDER PAD LAYOUT (mm)

<p>[TOP VIEW]</p> <p>[SIDE VIEW]</p>	<p>[BOTTOM VIEW]</p> <table border="1"> <thead> <tr> <th>Pin#</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Tri-state</td> </tr> <tr> <td>2</td> <td>GND</td> </tr> <tr> <td>3</td> <td>Output</td> </tr> <tr> <td>4</td> <td>VDD</td> </tr> </tbody> </table>	Pin#	Function	1	Tri-state	2	GND	3	Output	4	VDD	<p>To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.</p>
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1	Tri-state											
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1	Tri-state											
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4	VDD											

ELECTRICAL SPECIFICATION

Parameter	3.3V		2.5V		1.8V		Unit
	Min.	Max.	Min.	Max.	Min.	Max.	
Supply Voltage Variation (VDD)	VDD-10%	VDD+10%	VDD-10%	VDD+10%	VDD-10%	VDD+10%	V
Supply Current (@ 15pF load)	-	120	-	120	-	120	uA
Supply Current (@ no load)	-	80	-	80	-	80	uA
Duty Cycle	45	55	45	55	45	55	%
Output Level (CMOS)	2.97	-	2.25	-	1.62	-	V
Output High (Logic "1")	-	0.33	-	0.25	-	0.18	
Output Low (Logic "0")	-	0.33	-	0.25	-	0.18	
Transition Time: Rise/Fall Time+	-	50	-	50	-	50	nSec
Start Time	-	2	-	2	-	2	mSec
Tri-State (Input to Pin 1)	2.31	-	1.75	-	1.26	-	V
Enable (High voltage or floating)	-	0.99	-	0.75	-	0.54	
Disable (Low voltage or GND)	-	0.99	-	0.75	-	0.54	
Aging (@ 25°C 1 st year)	-	±3	-	±3	-	±3	ppm
Storage Temp. Range	-55	125	-55	125	-55	125	°C

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position
 +Transition times are measured between 10% and 90% of VDD, with an output load of 15pF

FREQ. STABILITY vs. TEMP. RANGE

Temp. (°C)	ppm			
	±20	±25	±40	±50
-10~+60	○	○	○	○
-20~+70	△	○	○	○
-40~+85	×	△	○	○
-40~+105	×	×	○	○
-40~+125	×	×	△	○

* O: Available △: Conditional X: Not available

* Inclusive of calibration @ 25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration load variation

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