



2.0x1.6mm Auto Grade Oscillator

O1HA

(Former FA100 Series)

DATASHEET

AEC Q200 Qualified

IATF-16949 QMS

Stabilities to ± 25 PPM

Temperature Ranges as wide as -40°C to $+125^{\circ}\text{C}$

Supply Voltages: 1.8V, 2.5V, 3.3V

1.8V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_o)	1.250 ~ 60.000 MHz
Storage Temperature Range (T_{STG})	$-55 \sim +150^{\circ}\text{C}$
Supply Voltage (V_{DD})	$1.8\text{V} \pm 5\%$
Input Current (I_{DD})	
1.250 ~ <10.000 MHz	3 mA
10.000 ~ <32.000 MHz	5 mA
32.000 ~ 60.000 MHz	10 mA
Standby Current	
$T_{OPR} = -40 \sim +85^{\circ}\text{C}$	10 μA
$T_{OPR} = -40 \sim +105^{\circ}\text{C} / -40 \sim +125^{\circ}\text{C}$	20 μA
Output Symmetry (50% V_{DD})	45% ~ 55%
Rise Time (10%~90% V_{DD})	5 nS
Fall Time (90%~10% V_{DD})	5 nS
Output Voltage (V_{OL})	10% V_{DD}
(V_{OH})	90% V_{DD} Min
Output Current (I_{OL})	2 mA Min
(I_{OH})	-2 mA Min
Output Load (HCMOS)	15 pF
Start-up Time (T_s)	10 mS
Output Disable Time ¹	200 nS
Output Enable Time ¹	10 mS
Aging (per year @ 25C)	± 5 PPM

ENABLE / DISABLE FUNCTION

Pin1	Output (pin 3)
OPEN ¹	Active
'1' Level $V_{IH} \geq 70\%V_{DD}$	Active
'0' Level $V_{IL} \leq 30\%V_{DD}$	High Z

• Available Options by Stability & Operating Temp for 1.8V²

Frequency Stability	Operating Temperature ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}$	$-40 \sim +85$	1.250 ~ 60.000
$\pm 100\text{PPM}$	$-40 \sim +105$	1.250 ~ 60.000
$\pm 100\text{PPM}$	$-40 \sim +125$	1.250 ~ 60.000
$\pm 50\text{PPM}$	$-40 \sim +85$	1.250 ~ 60.000
$\pm 50\text{PPM}$	$-40 \sim +105$	1.250 ~ 60.000
$\pm 50\text{PPM}$	$-40 \sim +125$	1.250 ~ 60.000
$\pm 25\text{PPM}$	$-40 \sim +85$	1.250 ~ 60.000

¹ An internal pull-up resistor from pin 1 to pin 4 allows active output if pin 1 is left open

² Inclusive of 25°C tolerance and operating temperature range.





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2.5V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_O)	1.250 ~ 60.000 MHz
Storage Temperature Range (T_{STG})	-55 ~ +150°C
Supply Voltage (V_{DD})	2.5V±5%
Input Current (I_{DD})	
1.250 ~ <10.000 MHz	6 mA
10.000 ~ <32.000 MHz	8 mA
32.000 ~ 60.000 MHz	20 mA
Standby Current	
$T_{OPR} = -40 \sim +85^\circ\text{C}$	10 μA
$T_{OPR} = -40 \sim +105^\circ\text{C} / -40 \sim +125^\circ\text{C}$	20 μA
Output Symmetry (50% V_{DD})	45% ~ 55%
Rise Time (10%~90% V_{DD})	5 nS
Fall Time (90%~10% V_{DD})	5 nS
Output Voltage (V_{OL})	10% V_{DD}
(V_{OH})	90% V_{DD} Min
Output Current (I_{OL})	2 mA Min
(I_{OH})	-2 mA Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	10 mS
Output Disable Time ¹	200 nS
Output Enable Time ¹	10 mS
Aging (per year @ 25C)	±5 PPM

ENABLE / DISABLE FUNCTION

Pin1	Output (pin 3)
OPEN ¹	Active
'1' Level $V_{IH} \geq 70\%V_{DD}$	Active
'0' Level $V_{IL} \leq 30\%V_{DD}$	High Z

• Available Options by Stability & Operating Temp for 2.5V²

Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-40 ~ +85	1.250 ~ 60.000
±100PPM	-40 ~ +105	1.250 ~ 60.000
±100PPM	-40 ~ +125	1.250 ~ 60.000
±50PPM	-40 ~ +85	1.250 ~ 60.000
±50PPM	-40 ~ +105	1.250 ~ 60.000
±50PPM	-40 ~ +125	1.250 ~ 60.000
±25PPM	-40 ~ +85	1.250 ~ 60.000

¹ An internal pull-up resistor from pin 1 to pin 4 allows active output if pin 1 is left open

² Inclusive of 25°C tolerance and operating temperature range.





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3.3V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_o)	1.250 ~ 60.000 MHz
Storage Temperature Range (T_{STG})	-55 ~ +150°C
Supply Voltage (V_{DD})	3.3V±10%
Input Current (I_{DD})	
1.250 ~ <20.000 MHz	7 mA
20.000 ~ <32.000 MHz	12 mA
32.000 ~ 50.000 MHz	20 mA
>50.000 ~ 60.000 MHz	25 mA
Standby Current	
T_{OPR} = -40 ~ +85°C	10 µA
T_{OPR} = -40 ~ +105°C / -40 ~ +125°C	20 µA
Output Symmetry (50% V_{DD})	45% ~ 55%
Rise Time (10%~90% V_{DD})	5 nS
Fall Time (90%~10% V_{DD})	5 nS
Output Voltage (V_{OL})	10% V_{DD}
(V_{OH})	90% V_{DD} Min
Output Current (I_{OL})	2 mA Min
(I_{OH})	-2 mA Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	10 mS
Output Disable Time ¹	200 nS
Output Enable Time ¹	10 mS
Aging (per year @ 25C)	±5 PPM

ENABLE / DISABLE FUNCTION

Pin1	Output (pin 3)
OPEN ¹	Active
'1' Level $V_{IH} \geq 70\%V_{DD}$	Active
'0' Level $V_{IL} \leq 30\%V_{DD}$	High Z

• Available Options by Stability & Operating Temp for 3.3V²

Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-40 ~ +85	1.250 ~ 60.000
±100PPM	-40 ~ +105	1.250 ~ 60.000
±100PPM	-40 ~ +125	1.250 ~ 60.000
±50PPM	-40 ~ +85	1.250 ~ 60.000
±50PPM	-40 ~ +105	1.250 ~ 60.000
±50PPM	-40 ~ +125	1.250 ~ 60.000
±25PPM	-40 ~ +85	1.250 ~ 60.000

¹ An internal pull-up resistor from pin 1 to pin 4 allows active output if pin 1 is left open

² Inclusive of 25°C tolerance and operating temperature range.

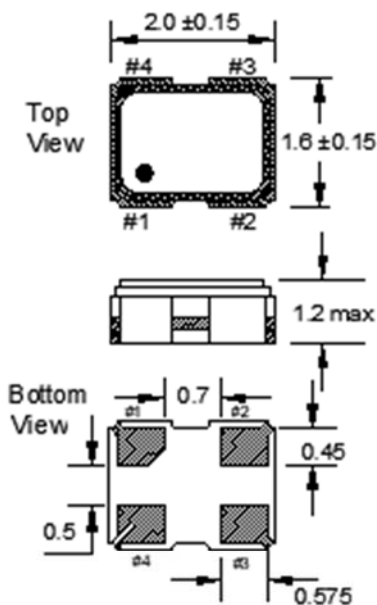




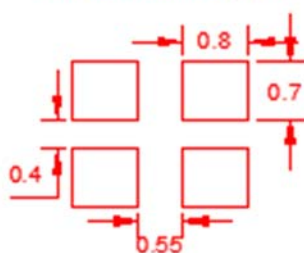
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DIMENSIONS / MECHANICAL SPECIFICATIONS



Recommended Solder Pad Layout



Dimensions are in millimeters.

Pin Connections

#1 E/D #3 Output
#2 GND #4 V_{DD}

Maximum Soldering Temp / Time	260°C / 10 Seconds x2
Moisture Sensitivity Level (MSL)	1
Termination Finish	Au over Ni
Seal Method	Seam
Lead (Pb) Free	Yes
ROHS/REACH Compliant	Yes

Notes:

*A 0.01μF capacitor should be placed between V_{DD} (Pin 4) and GND (Pin2) to minimize power supply line noise.

*Dimensional drawing is for reference to critical specifications defined by size measurements.

Certain non-critical visual attributes, such as side castellations, reference pin shape, etc. may vary



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Title / Description: O1HA SERIES STANDARD SPECIFICATIONS

Drawing Number: O1HA-DOC-1

Size: A

Part Number:

Cage: 61429

Draftsperson: MAJ

Approved: BEC

Revision Date: 06/06/2019



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Tape Specifications (millimeters)							Reel Specifications (millimeters)						
A	B	C	D	E	F	Std Reel Qty	G	H	I	J	K	L	M
Ø1.5	4.0	4.0	3.5	8.0	1.15	-T3 = 3,000 -T2 = 2,000 -T1 = 1,000	2.0	Ø13	Ø21	Ø60	Ø180	9.0	1.7

Available Options & Part Identification*

Example: **F O1HA C B P 25.0**

F	O1HA	C	B	P	25.0
Fox	Model Number	Voltage	Stability	Operating Temperature	Frequency (MHz)
		K = 1.8V±5% H = 2.5V±5% C = 3.3V±10%	A = ±100PPM B = ±50PPM D = ±25PPM	M = -40 to +85°C P = -40 to +105°C I = -40 to +125°C	

*Not all frequencies in the frequency range, nor every combination of stability, temp range, and voltage available. See stabilities and op temps for each V_{DD}.



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