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 -40ºC to +125ºC
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 ~ +150°C
Supply Voltage (V_{DD})	1.8V±5%
Input Current (I_{DD}) 1.250 ~ <10.000 MHz 10.000 ~ <32.000 MHz 32.000 ~ 60.000 MHz	 3 mA 5 mA 10 mA
Standby Current T_{OPR}= -40 ~ +85°C T_{OPR}= -40 ~ +105°C / -40 ~ +125°C	 10 µA 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}) (V_{OH})	10% V_{DD} 90% V_{DD} Min
Output Current (I_{OL}) (I_{OH})	2 mA Min -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 1.8V[2]

Frequency Stability	Operating Temperature (ºC)	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.

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

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 10.000 ~ <32.000 MHz 32.000 ~ 60.000 MHz	 6 mA 8 mA 20 mA
Standby Current T_{OPR}= -40 ~ +85°C T_{OPR}= -40 ~ +105°C / -40 ~ +125°C	 10 µA 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}) (V_{OH})	10% V_{DD} 90% V_{DD} Min
Output Current (I_{OL}) (I_{OH})	2 mA Min -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 2.5V[2]

Frequency Stability	Operating Temperature (ºC)	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.

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 20.000 ~ <32.000 MHz 32.000 ~ 50.000 MHz >50.000 ~ 60.000 MHz	 7 mA 12 mA 20 mA 25 mA
Standby Current T_{OPR}= -40 ~ +85°C T_{OPR}= -40 ~ +105°C / -40 ~ +125°C	 10 µA 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}) (V_{OH})	10% V_{DD} 90% V_{DD} Min
Output Current (I_{OL}) (I_{OH})	2 mA Min -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

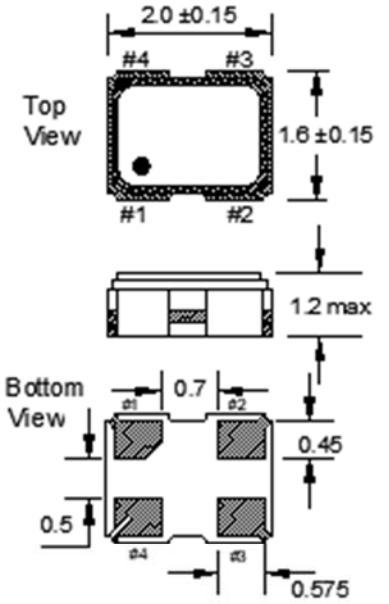
ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN [1]	Active
'1' Level $V_{IH} \geq 70\%V_{DD}$	Active
'0' Level $V_{IL} \leq 30\%V_{DD}$	High Z

• Available Options by Stability & Operating Temp for 3.3V[2]

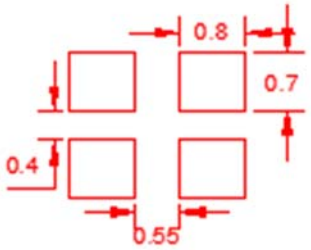
Frequency Stability	Operating Temperature (ºC)	Frequency Range (MHz)
±100PPM	-40 ~ +85	1.250 ~ 60.000
±100PPM	-40 ~ +105	1.250 ~ 60.000
±100PPM	-40 ~ +125	1.250 ~ 60.000
±50PPM	-40 ~ +85	1.250 ~ 60.000
±50PPM	-40 ~ +105	1.250 ~ 60.000
±50PPM	-40 ~ +125	1.250 ~ 60.000
±25PPM	-40 ~ +85	1.250 ~ 60.000

[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.

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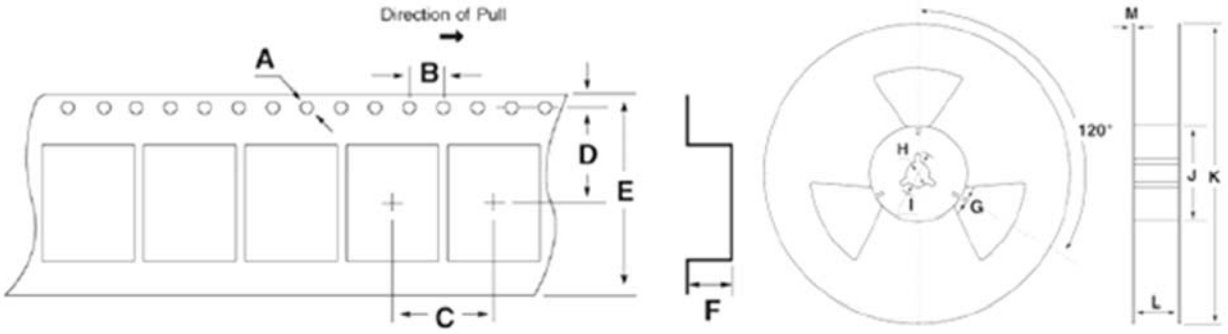
Tape Specifications (millimeters)								Reel Specifications (millimeters)						
A	B	C	D	E	F	Std Reel Qty		G	H	I	J	K	L	M
Ø1.5	4.0	4.0	3.5	8.0	1.15	-T3 = 3,000 -T2 = 2,000 -T1 = 1,000		2.0	Ø13	Ø21	Ø60	Ø180	9.0	1.7



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%	A = ±100PPM	M = -40 to +85ºC	
		H = 2.5V±5%	**B = ±50PPM**	**P = -40 to +105ºC**	
		C = 3.3V±10%	D = ±25PPM	I = -40 to +125ºC	

*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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