

Features

- AEC Q200 Qualified
- IATF-16949 QMS
- Temperature Ranges to -40°C to +125°C
- Supply Voltages: 1.8V; 2.5V; 3.3V; 1.6V~3.63V

1.8V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency (Fo)	1.25 ~ 60.000 MHz
Storage Temperature Range (T _{STG})	-55°C ~ +150°C
Supply Voltage (V _{DD})	1.8V±10%
Input Current (I _{DD})	
1.250 ~ 9.999999MHz	3mA
10.000 ~ 31.999999MHz	5mA
32.000 ~ 60.000MHz	10mA
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 Load (HCMOS)	15 pF
Start-up Time (T _S)	10 mS
Output Disable Time ¹	200nS
Output Enable Time ¹	10 mS
Aging (per year @ 25C)	±5PPM

ENABLE / DISABLE FUNCTION	
Pin ¹	Output (pin 3)
OPEN ¹	Active
'1' Level V _{IH} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 30%V _{DD}	High Z

Available Options by Stability & Operating Temp		
Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-40 ~ +85	1.25 ~ 60.000
±100PPM	-40 ~ +105	1.25 ~ 60.000
±100PPM	-40 ~ +125	1.25 ~ 60.000
±50PPM	-40 ~ +85	1.25 ~ 60.000
±50PPM	-40 ~ +105	1.25 ~ 60.000
±50PPM ³	-40 ~ +125	1.25 ~ 60.000
±25PPM ³	-40 ~ +85	1.25 ~ 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, operating temperature range, input voltage change, load change, Vibration, reflow, and one-year aging, shock, and vibration.

³ Inclusive of 25°C tolerance and operating temperature range.

2.5V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F ₀)	1.25 ~ 60.000MHz
Storage Temperature Range (T _{STG})	-55°C ~ +150°C
Supply Voltage (V _{DD})	2.5V±5%
Input Current (I _{DD})	
1.250 ~ 9.999999MHz	6mA
10.000 ~ 31.999999MHz	8mA
32.000 ~ 60.000MHz	20mA
Standby Current	
T _{OPR} = -40 ~ +85°C	10μA
T _{OPR} = -40 ~ +105°C / -40 ~ +125°C	20μA
Output Symmetry (50% V _{DD})	45 % ~ 55 %
Rise Time (10%~90% V _{DD})	5nS
Fall Time (90%~10% V _{DD})	5nS
Output Voltage (V _{OL})	10 % V _{DD}
(V _{OH})	90 % V _{DD} Min
Output Load (HCMOS)	15pF
Start-up Time (T _S)	10mS
Output Disable Time ¹	200nS
Output Enable Time ¹	10mS
Aging (per year @ 25°C)	±5PPM

ENABLE / DISABLE FUNCTION	
Pin ¹	Output (pin 3)
OPEN ¹	Active
'1' Level V _{IH} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 30%V _{DD}	High Z

Available Options by Stability & Operating Temp		
Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-40 ~ +85	1.25 ~ 60.000
±100PPM	-40 ~ +105	1.25 ~ 60.000
±100PPM	-40 ~ +125	1.25 ~ 60.000
±50PPM	-40 ~ +85	1.25 ~ 60.000
±50PPM	-40 ~ +105	1.25 ~ 60.000
±50PPM ³	-40 ~ +125	1.25 ~ 60.000
±25PPM ³	-40 ~ +85	1.25 ~ 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, operating temperature range, input voltage change, load change, Shock, vibration, reflow, and one-year aging.

³ Inclusive of 25°C tolerance and operating temperature range.

3.3V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F ₀)	1.25 ~ 160.000 MHz
Storage Temperature Range (T _{STG})	-55°C ~ +150°C
Supply Voltage (V _{DD})	3.3V±10%
Input Current (I _{DD})	
1.25 ~ 19.999999MHz	7mA
20.000 ~ 31.999999MHz	12mA
32.000 ~ 50.000MHz	20mA
50.000001 ~ 60.000MHz	25mA
60.000001 ~ 160.000MHz	35mA
Standby Current	
T _{OPR} = -40 ~ +85°C	10 µA
T _{OPR} = -40 ~ +105°C / -40 ~ +125°C	
1.25~134.999999 MHz	20µA
135 ~160 MHz	100µA
Output Symmetry (50% V _{DD})	45 % ~ 55 %
Rise Time (10%~90% V _{DD})	5nS
Fall Time (90%~10% V _{DD})	5nS
Output Voltage (V _{OL})	10 % V _{DD}
(V _{OH})	90 % V _{DD} Min
Output Load (HCMOS)	15pF
Start-up Time (T _S)	10mS
Output Disable Time ¹	200nS
Output Enable Time ¹	10mS
Aging (per year @ 25°C)	±5 PPM

ENABLE / DISABLE FUNCTION	
Pin ¹	Output (pin 3)
OPEN ¹	Active
'1' Level V _{IH} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 30%V _{DD}	High Z

Available Options by Stability & Operating Temp		
Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-40 ~ +85	1.25 ~ 160.000
±100PPM	-40 ~ +105	1.25 ~ 160.000
±100PPM	-40 ~ +125	1.25 ~ 160.000
±100PPM	-40 ~ +85	1.25 ~ 160.000
±50PPM	-40 ~ +105	1.25 ~ 160.000
±50PPM ³	-40 ~ +125	1.25 ~ 133.333
±25PPM ³	-40 ~ +85	1.25 ~ 160.000

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, operating temperature range, input voltage change, load change, reflow, One-year aging, shock, and vibration.

³ Inclusive of 25°C tolerance, operating temperature rang

1.6V~3.63V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F ₀)	1.25 ~ 135MHz
Storage Temperature Range (T _{STG})	-55°C ~ +150°C
Supply Voltage (V _{DD})	1.6V±3.63V
Input Current (I _{DD})	
2.000 ~ 19.999999MHz	4mA
20.000 ~ 39.999999MHz	6mA
40.000 ~ 59.999999MHz	10mA
60.000 ~ 80.000MHz	15mA
80.000001 ~ 135MHz	30mA
Standby Current	
T _{OPR} = -40 ~ +85°C	10 µA
T _{OPR} = -40 ~ +105°C / -40 ~ +125°C	20µA
Output Symmetry (50% V _{DD})	45 % ~ 55 %
Rise Time (10%~90% V _{DD})	5nS
Fall Time (90%~10% V _{DD})	5nS
Output Voltage (V _{OL})	10 % V _{DD}
(V _{OH})	90 % V _{DD} Min
Output Load (HCMOS)	15pF
Start-up Time (T _S)	10mS
Output Disable Time ¹	200nS
Output Enable Time ¹	10mS
Aging (per year @ 25°C)	±5 PPM

ENABLE / DISABLE FUNCTION	
Pin ¹	Output (pin 3)
OPEN ¹	Active
'1' Level V _{IH} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 30%V _{DD}	High Z

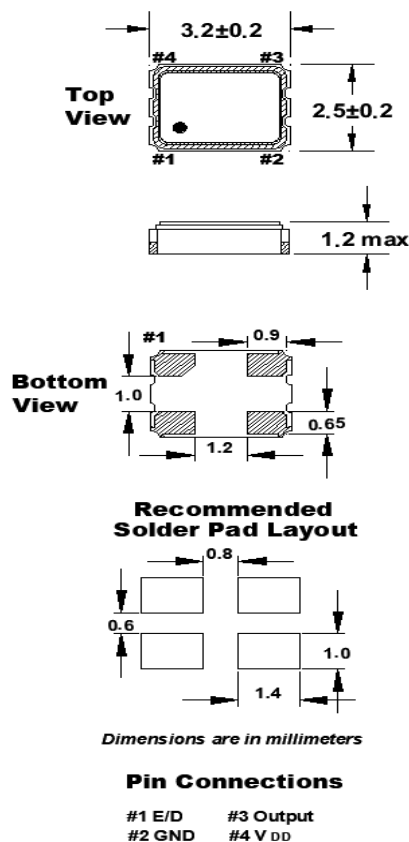
Available Options by Stability & Operating Temp		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM ²	-40 ~ +85	1.25 ~ 135.000
±100PPM ²	-40 ~ +105	1.25 ~ 135.000
±100PPM ²	-40 ~ +125	1.25 ~ 135.000
±100PPM ²	-40 ~ +85	1.25 ~ 135.000
±50PPM ²	-40 ~ +105	1.25 ~ 135.000
±50PPM ³	-40 ~ +125	1.25 ~ 135.000
±25PPM ³	-40 ~ +85	1.25 ~ 135.000

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, operating temperature range, input voltage change, load change, Reflow, one-year aging, shock, and vibration.

³ Inclusive of 25°C tolerance, operating temperature range.

DIMENSIONS / MECHANICAL SPECIFICATIONS



Note:

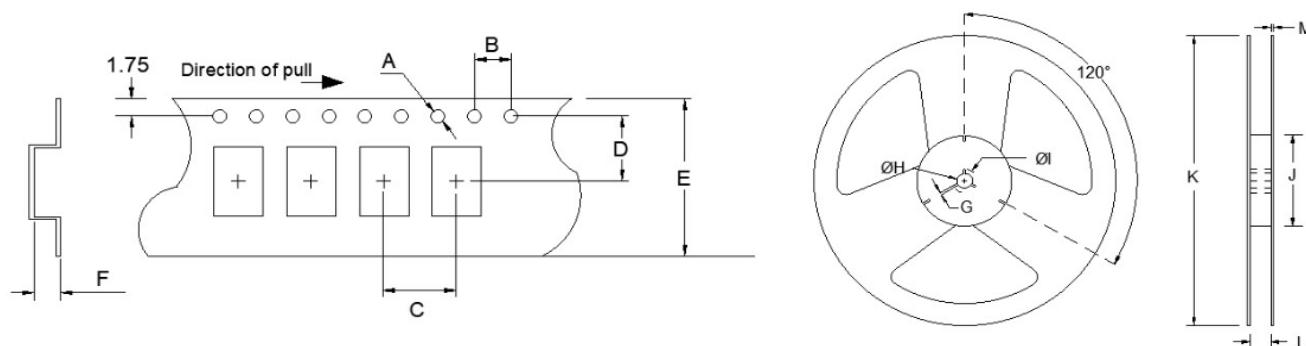
*A 0.01μF capacitor should be placed between VDD (Pin 4) and GND (Pin2) to minimize power supply line noise.

*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

STANDARD SPECIFICATIONS

PARAMETERS	MAX (Unless otherwise noted)
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL) per J-STD-033	1
Termination Finish	Au (0.3~1μm) over Ni (1.27~8.89μm)
Seal Method	Seam
Lead (Pb) Free	Yes
RoHS Compliant	Yes, no exemptions
REACH Compliant	Yes

TAPE SPECIFICATIONS (mm)							REEL SPECIFICATIONS (mm)						
A	B	C	D	E	F	REEL QTY	G	H	I	J	K	L	M
ø1.5	4.0	4.0	3.5	8.0	1.4	-T1 = 1,000 -T2 = 2,000 -T3 = 3,000	2.0	ø13	ø21	ø60	ø180	9.0	1.2



Available Options & Part Identification for Auto Grade Oscillator O3HA*

Sample PN: **FO3HACBP25.0-T3**

F	O3HA	C	B	P	25.0	-T3
Fox	Model Number	Voltage K = 1.8V±5% H = 2.5V±5% C = 3.3V±10% V = 1.6V ~ 3.63V	Stability A = ±100PPM B = ±50PPM D = ±25PPM	Operating Temperature M = -40 to +85°C P = -40 to +105°C I = -40 to +125°C	Frequency (MHz)	Values Added Options Blank = Bulk T1 = 1,000 pcs T2 = 2,000 pcs T3 = 3,000 pcs

* Not all frequencies in the frequency range, or every combination of stability, temp range, and voltage available. See stabilities and op temps for each V_{DD}.

Reliability Test Conditions

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