

## Features

- AEC-Q200 Qualified
- IATF-16949 Certified
- Temperature Ranges from -40°C to +125°C
- Supply Voltages: 1.8V, 2.5V, 3.3V

1.8V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F <sub>0</sub> )	1.000 ~ 50.000 MHz
Temperature Range	
Storage (T <sub>STG</sub> )	-55°C ~ +150°C
Supply Voltage (V <sub>DD</sub> )	1.8V±5%
Input Current (I <sub>DD</sub> )	
1.000 ~ 9.999999 MHz	5 mA
10.000 ~ 31.999999 MHz	6 mA
32.000 ~ 50.000 MHz	15 mA
Standby Current (I <sub>ST</sub> )	
T <sub>a</sub> = -40 ~ +85°C	10µA
T <sub>a</sub> = -40 ~ +105°C/125°C	20µA
Output Symmetry (50% V <sub>DD</sub> )	40 % ~ 60 %
Rise/Fall Time (10%~90%V <sub>DD</sub> Levels) (T <sub>R</sub> /T <sub>F</sub> )	5 nS
Output Voltage (V <sub>OL</sub> )	10 % V <sub>DD</sub>
(V <sub>OH</sub> )	90 % V <sub>DD</sub> Min
Output Load (HCMOS)	15 pF
Start-up Time (T <sub>S</sub> )	10 mS
Output Disable Time <sup>1</sup>	100 nS
Output Enable Time <sup>1</sup>	10 mS

ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN <sup>1</sup>	Active
'1' Level V <sub>IH</sub> ≥ 70%V <sub>DD</sub>	Active
'0' Level V <sub>IL</sub> ≤ 30%V <sub>DD</sub>	High Z

Available Options by Stability & Operating Temp for 1.8V		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM <sup>2</sup>	-40 ~ +85	1.000 ~ 50.000
±100PPM <sup>2</sup>	-40 ~ +105	1.000 ~ 50.000
±100PPM <sup>2</sup>	-40 ~ +125	1.000 ~ 50.000
±50PPM <sup>2</sup>	-40 ~ +85	1.000 ~ 50.000
±50PPM <sup>2</sup>	-40 ~ +105	1.000 ~ 50.000
±50PPM <sup>2</sup>	-40 ~ +125	1.000 ~ 50.000
±25PPM <sup>3</sup>	-40 ~ +85	1.000 ~ 50.000

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

<sup>2</sup> Inclusive of 25°C tolerance, operating temperature range, input voltage change, load change, Reflow, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of 25°C tolerance and operating temperature range.

2.5V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F <sub>0</sub> )	32.768 kHz
Temperature Range	
Storage (T <sub>STG</sub> )	-55°C ~ +125°C
Supply Voltage (V <sub>DD</sub> )	2.5V±10%
Input Current (I <sub>DD</sub> )	
1.000 ~ 9.999999 MHz	6 mA
10.000 ~ 31.999999 MHz	8 mA
32.000 ~ 75.000 MHz	20 mA
Standby Current (I <sub>ST</sub> )	
T <sub>a</sub> = -40 ~ +85°C	10µA
T <sub>a</sub> = -40 ~ +105°C/125°C	20µA
Output Symmetry (50% V <sub>DD</sub> )	40 % ~ 60 % <sup>4</sup>
Rise/Fall Time (10%~90%V <sub>DD</sub> Levels) (T <sub>R</sub> /T <sub>F</sub> )	
1.000 ~ 49.999999 MHz	5 nS
50.000 ~ 75.000 MHz	4 nS
Output Voltage (V <sub>OL</sub> )	10 % V <sub>DD</sub>
(V <sub>OH</sub> )	90 % V <sub>DD</sub> Min
Output Load (HCMOS)	15 pF
Start-up Time (T <sub>S</sub> )	10 mS
Output Disable Time <sup>1</sup>	100 nS
Output Enable Time <sup>1</sup>	10 mS

ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN <sup>1</sup>	Active
'1' Level V <sub>IH</sub> ≥ 70%V <sub>DD</sub>	Active
'0' Level V <sub>IL</sub> ≤ 30%V <sub>DD</sub>	High Z

Available Options by Stability & Operating Temp for 2.5V		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM <sup>2</sup>	-40 ~ +85	1.000 ~ 75.000
±100PPM <sup>2</sup>	-40 ~ +105	1.000 ~ 75.000
±100PPM <sup>2</sup>	-40 ~ +125	1.000 ~ 75.000
±50PPM <sup>2</sup>	-40 ~ +85	1.000 ~ 75.000
±50PPM <sup>2</sup>	-40 ~ +105	1.000 ~ 75.000
±50PPM <sup>2</sup>	-40 ~ +125	1.000 ~ 75.000
±25PPM <sup>3</sup>	-40 ~ +85	1.000 ~ 75.000

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

<sup>2</sup> Inclusive of 25°C tolerance, operating temperature range, input voltage change, load change, Reflow, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of 25°C tolerance and operating temperature range.

<sup>4</sup> 45/55 Symmetry available on an inquiry basis

3.3V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F <sub>0</sub> )	1.000 ~ 135.000 MHz
Temperature Range Storage (T <sub>STG</sub> )	-55°C ~ +150°C
Supply Voltage (V <sub>DD</sub> )	3.3V±10%
Input Current (I <sub>DD</sub> )	
1.000 ~ 19.999999 MHz	7 mA
20.000 ~ 31.999999 MHz	12 mA
32.000 ~ 49.999999 MHz	20 mA
50.000 ~ 79.999999 MHz	25 mA
80.000 ~ 99.999999 MHz	30 mA
100.000 ~ 135.000 MHz	40 mA
Standby Current (I <sub>ST</sub> )	
T <sub>a</sub> = -40 ~ +85°C	10µA
T <sub>a</sub> = -40 ~ +105°C/125°C	20µA
Output Symmetry (50% V <sub>DD</sub> )	40 % ~ 60 % <sup>4</sup>
Rise/Fall Time (10%~90%V <sub>DD</sub> Levels) (T <sub>R</sub> /T <sub>F</sub> )	
1.000 ~ 49.999999 MHz	10 nS
50.000 ~ 79.999999 MHz	8 nS
80.000 ~ 99.999999 MHz	5 nS
100.000 ~ 135.000 MHz	4 nS
Output Voltage (V <sub>OL</sub> ) (V <sub>OH</sub> )	10 % V <sub>DD</sub> 90 % V <sub>DD</sub> Min
Output Load (HCMOS)	15 pF
Start-up Time (T <sub>S</sub> )	10 mS
Output Disable Time <sup>1</sup>	100 nS
Output Enable Time <sup>1</sup>	10 mS

ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN <sup>1</sup>	Active
'1' Level V <sub>IH</sub> ≥ 70%V <sub>DD</sub>	Active
'0' Level V <sub>IL</sub> ≤ 30%V <sub>DD</sub>	High Z

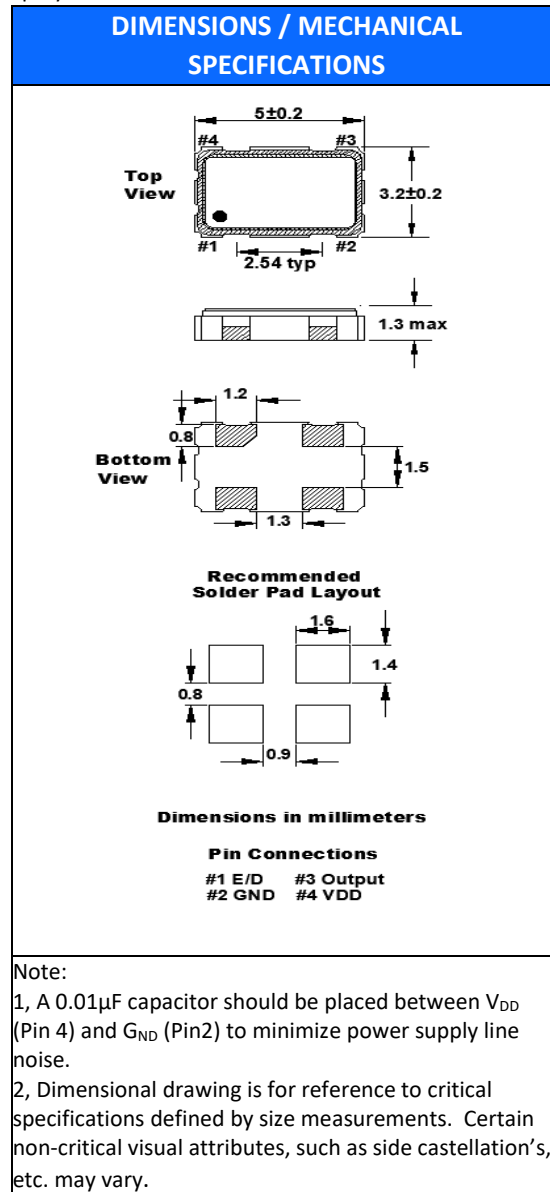
Available Options by Stability & Operating Temp for 3.3V		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM <sup>2</sup>	-40 ~ +85	1.000 ~ 135.000
±100PPM <sup>2</sup>	-40 ~ +105	1.000 ~ 135.000
±100PPM <sup>2</sup>	-40 ~ +125	1.000 ~ 135.000
±50PPM <sup>2</sup>	-40 ~ +85	1.000 ~ 135.000
±50PPM <sup>2</sup>	-40 ~ +105	1.000 ~ 135.000
±50PPM <sup>2</sup>	-40 ~ +125	1.000 ~ 135.000
±25PPM <sup>3</sup>	-40 ~ +85	1.000 ~ 135.000

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

<sup>2</sup> Inclusive of 25°C tolerance, operating temperature range, input voltage change, load change, Reflow, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of 25°C tolerance and operating temperature range.

<sup>4</sup> 45/55 Symmetry available on an inquiry basis



STANDARD SPECIFICATIONS	
PARAMETERS	MAX (Unless otherwise noted)
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL)	N/A
Termination Finish	Au (0.3~1μm) over Ni (1.27~8.89μm)
Seal Method	Seam
Lead (Pb) Free	Yes
ROHS Compliant	Yes, no exemptions
ROHS/REACH Compliant (latest version)	Yes

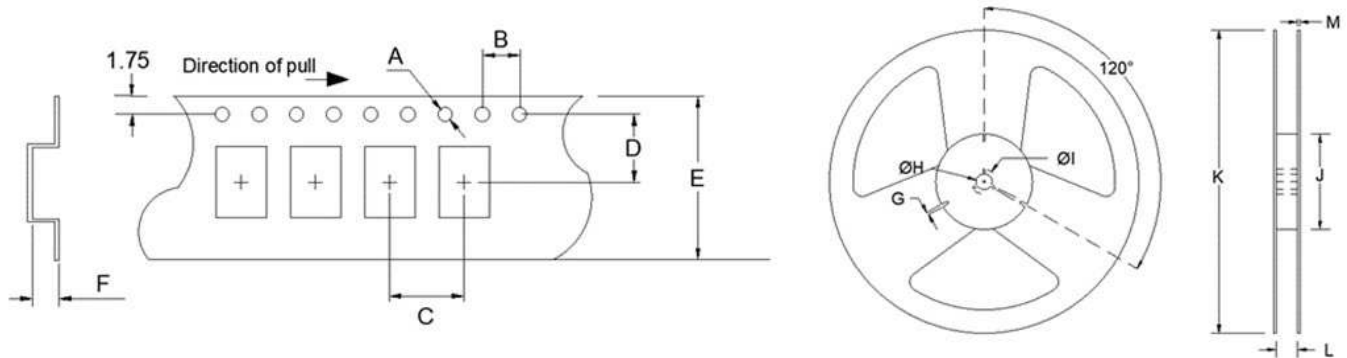
# FO5HA

(Former FA510, FA530, FA540)

5mm x 3.2mm  
HCMOS SMD Oscillator



TAPE SPECIFICATIONS (mm)							REEL SPECIFICATIONS (mm)						
A	B	C	D	E	F	REEL QTY	G	H	I	J	K	L	M
ø1.55	4.0	8.0	5.5	12.0	1.5	-T1 = 1,000	2.0	ø13	ø21	ø62	ø180	13.5	2.0



### Available Options & Part Identification\*

Sample PN: **FO5HACBM25.0**

F	O5HA	C	B	M	25.0	-T1
<b>Fox</b>	<b>Model Number</b>	<b>Voltage</b> C = 3.3V±10% H = 2.5V±5% K = 1.8V±5%	<b>Stability</b> A = ±100 PPM B = ±50 PPM D = ±25 PPM	<b>Operating Temperature</b> M = -40 to +85°C P = -40 to +105°C I = -40 to +125°C	<b>Frequency (MHz)</b>	<b>Values Added Options</b> Blank = Bulk T1 = 1,000 pcs

\*Not all frequencies in the frequency range, or every combination of stability, temp range, and voltage available

### Reliability Test Conditions

Please contact Abracon Quality Assurance department