

## Features

- HCMOS Output
- Stabilities to  $\pm 20$  PPM
- Temperature Ranges as wide as  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Supply Voltages: 1.8V, 2.5V, 3.3V; Variable (1.6V ~ 3.63V)

1.8V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range ( $F_0$ )	32.768 kHz
Temperature Range	
Storage ( $T_{STG}$ )	$-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$
Supply Voltage ( $V_{DD}$ )	$1.8\text{V} \pm 10\%$
Input Current ( $I_{DD}$ )	120 $\mu\text{A}$
Standby Current	10 $\mu\text{A}$
Output Symmetry (50% $V_{DD}$ )	45 % ~ 55 %
Rise/Fall Time (10%~90% $V_{DD}$ Levels) ( $T_R/T_F$ )	50 nS
Output Voltage ( $V_{OL}$ )	10 % $V_{DD}$
( $V_{OH}$ )	90 % $V_{DD}$ Min
Output Load (HCMOS)	15 pF
Start-up Time ( $T_S$ )	3 mS
Output Disable Time <sup>1</sup>	1 $\mu\text{S}$
Output Enable Time <sup>1</sup>	3 mS

ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN <sup>1</sup>	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	
Frequency Stability	Operating Temperature ( $^{\circ}\text{C}$ )
$\pm 50\text{PPM}^2$	$-20 \sim +70$
$\pm 50\text{PPM}^2$	$-40 \sim +85$
$\pm 25\text{PPM}^2$	$-20 \sim +70$
$\pm 25\text{PPM}^3$	$-40 \sim +85$
$\pm 20\text{PPM}^3$	$-10 \sim +60$

<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  $25^{\circ}\text{C}$  tolerance, operating temperature range, input voltage change, load change, Reflow, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of  $25^{\circ}\text{C}$  tolerance and operating temperature range.

2.5V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F <sub>0</sub> )	32.768kHz
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> )	126 μA
Standby Current	10μA
Output Symmetry (50% V <sub>DD</sub> )	45 % ~ 55 %
Rise/Fall Time (10%~90%V <sub>DD</sub> Levels) (TR/TF)	50 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> )	3 mS
Output Disable Time <sup>1</sup>	1 μS
Output Enable Time <sup>1</sup>	3 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)
±50PPM	-20 ~ +70
±50PPM	-40 ~ +85
±50PPM	-20 ~ +70
±25PPM	-40 ~ +85
±25PPM	-10 ~ +60

<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.

3.3V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range ( $F_0$ )	32.768 kHz
Temperature Range	
Storage ( $T_{STG}$ )	-55°C ~ +125°C
Supply Voltage ( $V_{DD}$ )	3.3V±5%
Input Current ( $I_{DD}$ )	130µA
Standby Current	10µA
Output Symmetry (50% $V_{DD}$ )	45 % ~ 55 %
Rise/Fall Time (10%~90% $V_{DD}$ Levels) (TR/TF)	50 nS
Output Voltage ( $V_{OL}$ )	10 % $V_{DD}$
( $V_{OH}$ )	90 % $V_{DD}$ Min
Output Load (HCMOS)	15 pF
Start-up Time ( $T_s$ )	3 mS
Output Disable Time <sup>1</sup>	1 µS
Output Enable Time <sup>1</sup>	3 mS

ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN <sup>1</sup>	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	
Frequency Stability	Operating Temperature (°C)
±50PPM	-20 ~ +70
±50PPM	-40 ~ +85
±25PPM	-20 ~ +70
±25PPM	-40 ~ +85
±20PPM	-10 ~ +60

<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>2</sup> Inclusive of 25°C tolerance and operating temperature range.

VARIABLE VOLTAGE ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range ( $F_0$ )	32.768 kHz
Temperature Range	
Storage ( $T_{STG}$ )	-55°C ~ +125°C
Supply Voltage ( $V_{DD}$ )	1.6V ~ 3.63V
Input Current ( $I_{DD}$ )	130 $\mu$ A
Standby Current	10 $\mu$ A
Output Symmetry (50% $V_{DD}$ )	45 % ~ 55 %
Rise/Fall Time (10%/90% $V_{DD}$ Levels) ( $T_R/T_F$ )	50 nS
Output Voltage ( $V_{OL}$ )	10 % $V_{DD}$
( $V_{OH}$ )	90 % $V_{DD}$ Min
Output Load (HCMOS)	15 pF
Start-up Time ( $T_s$ )	3 mS
Output Disable Time <sup>1</sup>	1 $\mu$ S
Output Enable Time <sup>1</sup>	3 mS

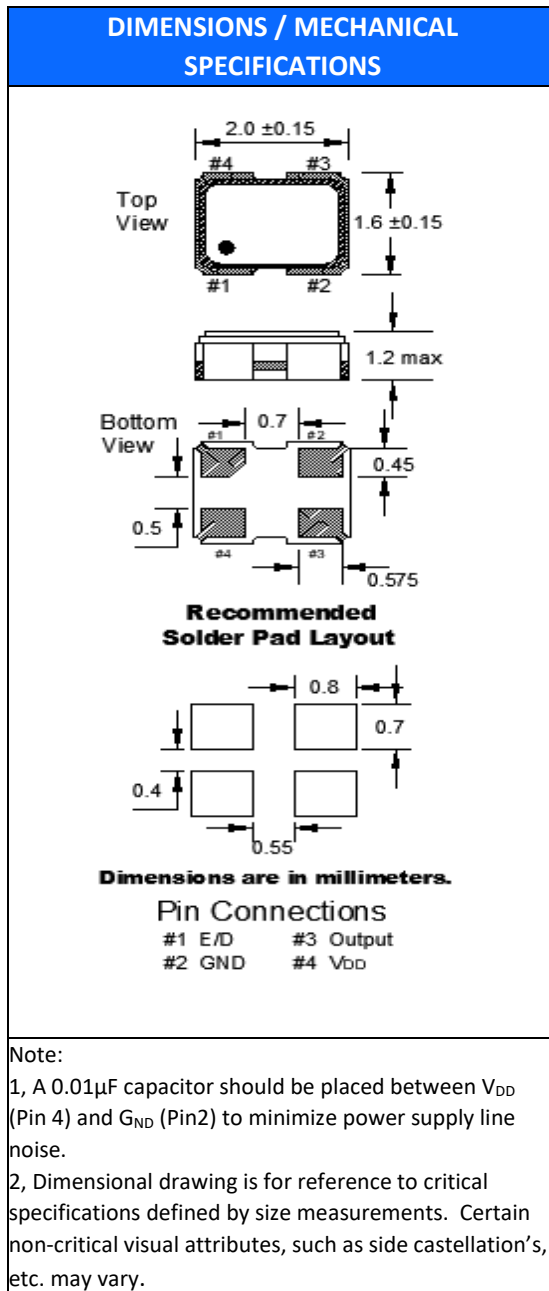
ENABLE / DISABLE FUNCTION	
Pin1	Output (pin 3)
OPEN <sup>1</sup>	Active
'1' Level $V_{IH} \geq 70\%V_{DD}$	Active
'0' Level $V_{IL} \leq 30\%V_{DD}$	High Z

Available Options by Stability & Operating Temp	
Frequency Stability	Operating Temperature (°C)
$\pm 50$ PPM	-20 ~ +70
$\pm 50$ PPM	-40 ~ +85
$\pm 25$ PPM	-20 ~ +70
$\pm 25$ PPM	-40 ~ +85
$\pm 20$ PPM	-10 ~ +60

<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.



STANDARD SPECIFICATIONS	
PARAMETERS	MAX (Unless otherwise noted)
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL)	1
Termination Finish	Au over Ni
Seal Method	Seam
Lead (Pb) Free	Yes
REACH Compliant (latest version)	Yes

# FO1HK

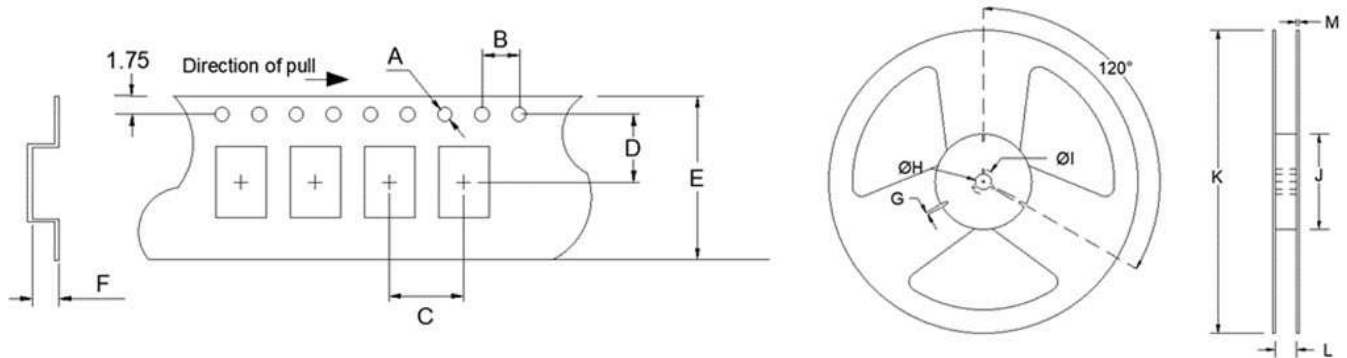
(Former FX 100)

2.0mm x 1.6mm

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	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

Sample PN: **FO1HKLBM0.032768-T3**

F	O1HK	L	B	M	0.032768	-T3
<u>Fox</u>	<u>Model Number</u>	<u>Voltage</u> L = 1.8V±10% J = 2.5V±10% C = 3.3V±10% V = 1.6V ~ 3.63V	<u>Stability</u> B = ±50 PPM D = ±25 PPM E = ±20 PPM	<u>Operating Temperature</u> D = -10 ~ +60°C F = -20 ~ +70°C M = -40 ~ +85°C	<u>Frequency (MHz)</u>	<u>Values Added Options</u> Blank = Bulk T1 = 1,000 pcs T2 = 2,000 pcs T3 = 3,000 pcs

### Reliability Test Conditions

Please contact Abracon Quality Assurance department