

**Features**

- HCMOS Output
- Stabilities to  $\pm 20$  PPM
- Temperature Ranges as wide as  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- Supply Voltages: 1.8V; 2.5V; 3.3V

| 1.8V ELECTRICAL CHARACTERISTICS                        |                                                 |
|--------------------------------------------------------|-------------------------------------------------|
| PARAMETERS                                             | MAX (Unless otherwise noted)                    |
| Frequency ( $F_o$ )                                    | 32.768 kHz                                      |
| Storage Temperature Range ( $T_{STG}$ )                | $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$ |
| 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 % $\sim$ 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 ( $T_S$ )                                | 2 mS                                            |
| Output Disable Time <sup>1</sup>                       | 1 $\mu\text{S}$                                 |
| Output Enable Time <sup>1</sup>                        | 2 mS                                            |

| ENABLE / DISABLE FUNCTION          |                |
|------------------------------------|----------------|
| Pin <sup>1</sup>                   | 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         |

| Frequency Stability  | Operating Temperature ( $^{\circ}\text{C}$ ) |
|----------------------|----------------------------------------------|
| $\pm 50\text{PPM}^2$ | $-20 \sim +70$                               |
| $\pm 50\text{PPM}^2$ | $-40 \sim +85$                               |
| $\pm 25\text{PPM}^2$ | $-20 \sim +70$                               |
| $\pm 25\text{PPM}^3$ | $-40 \sim +70$                               |
| $\pm 20\text{PPM}^3$ | $-10 \sim +60$                               |

<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, Vibration, reflow, and one-year aging, shock, and vibration.

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

**Features**

- HCMOS Output
- Stabilities to  $\pm 20$  PPM
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- Supply Voltages:  
1.8V; 2.5V; 3.3V

| 2.5V ELECTRICAL CHARACTERISTICS                        |                                                 |
|--------------------------------------------------------|-------------------------------------------------|
| PARAMETERS                                             | MAX (Unless otherwise noted)                    |
| Frequency ( $F_o$ )                                    | 32.768 KHz                                      |
| Storage Temperature Range ( $T_{STG}$ )                | $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$ |
| Supply Voltage ( $V_{DD}$ )                            | $2.5\text{V} \pm 10\%$                          |
| Input Current ( $I_{DD}$ )                             | 126 $\mu\text{A}$                               |
| Standby Current                                        | 10 $\mu\text{A}$                                |
| Output Symmetry (50% $V_{DD}$ )                        | 45 % $\sim$ 55 %                                |
| Rise/Fall Time (10%/90% $V_{DD}$ Levels) ( $T_R/T_F$ ) | 50 nS                                           |
| Output Voltage ( $V_{OL}$ )                            | 90 % $V_{DD}$                                   |
| ( $V_{OH}$ )                                           | 10 % $V_{DD}$ Min                               |
| Output Load (HCMOS)                                    | 15 pF                                           |
| Start-up Time ( $T_S$ )                                | 2 mS                                            |
| Output Disable Time <sup>1</sup>                       | 1 $\mu\text{S}$                                 |
| Output Enable Time <sup>1</sup>                        | 2 mS                                            |

| ENABLE / DISABLE FUNCTION          |                |
|------------------------------------|----------------|
| Pin <sup>1</sup>                   | 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         |

| Frequency Stability  | Operating Temperature ( $^{\circ}\text{C}$ ) |
|----------------------|----------------------------------------------|
| $\pm 50\text{PPM}^2$ | $-20 \sim +70$                               |
| $\pm 50\text{PPM}^2$ | $-40 \sim +85$                               |
| $\pm 25\text{PPM}^2$ | $-20 \sim +70$                               |
| $\pm 25\text{PPM}^3$ | $-40 \sim +70$                               |
| $\pm 20\text{PPM}^3$ | $-10 \sim +60$                               |

<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.

**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

| 3.3V ELECTRICAL CHARACTERISTICS                        |                                                 |
|--------------------------------------------------------|-------------------------------------------------|
| PARAMETERS                                             | MAX (Unless otherwise noted)                    |
| Frequency ( $F_o$ )                                    | 32.768 KHz                                      |
| Storage Temperature Range ( $T_{STG}$ )                | $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$ |
| Supply Voltage ( $V_{DD}$ )                            | $3.3\text{V} \pm 10\%$                          |
| Input Current ( $I_{DD}$ )                             | 130 $\mu\text{A}$                               |
| Standby Current                                        | 10 $\mu\text{A}$                                |
| Output Symmetry (50% $V_{DD}$ )                        | 45 % $\sim$ 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 ( $T_S$ )                                | 2 mS                                            |
| Output Disable Time <sup>1</sup>                       | 1 $\mu\text{S}$                                 |
| Output Enable Time <sup>1</sup>                        | 2 mS                                            |

| ENABLE / DISABLE FUNCTION          |                |
|------------------------------------|----------------|
| Pin <sup>1</sup>                   | 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         |

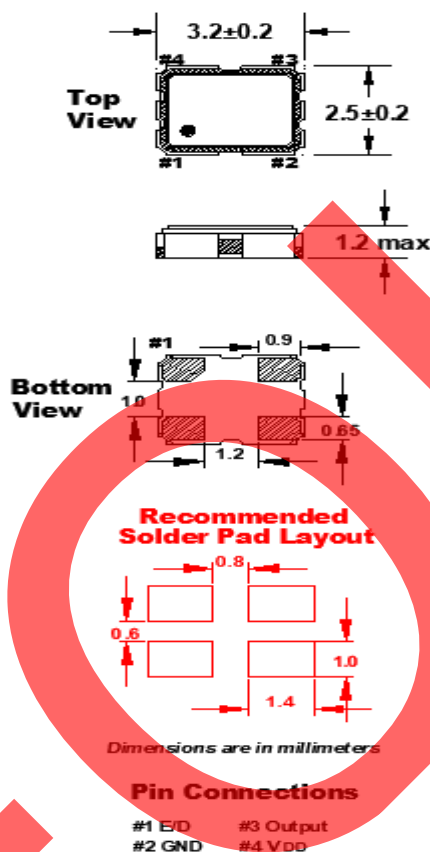
| Frequency Stability  | Operating Temperature ( $^{\circ}\text{C}$ ) |
|----------------------|----------------------------------------------|
| $\pm 50\text{PPM}^2$ | $-20 \sim +70$                               |
| $\pm 50\text{PPM}^2$ | $-40 \sim +85$                               |
| $\pm 25\text{PPM}^2$ | $-20 \sim +70$                               |
| $\pm 25\text{PPM}^3$ | $-40 \sim +70$                               |
| $\pm 20\text{PPM}^3$ | $-10 \sim +60$                               |

<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, 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

### 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 (0.3~1μm) over Ni (1.27~8.89μm) |
| Seal Method                      | Seam                               |
| Lead (Pb) Free                   | Yes                                |
| ROHS/REACH Compliant             | Yes                                |

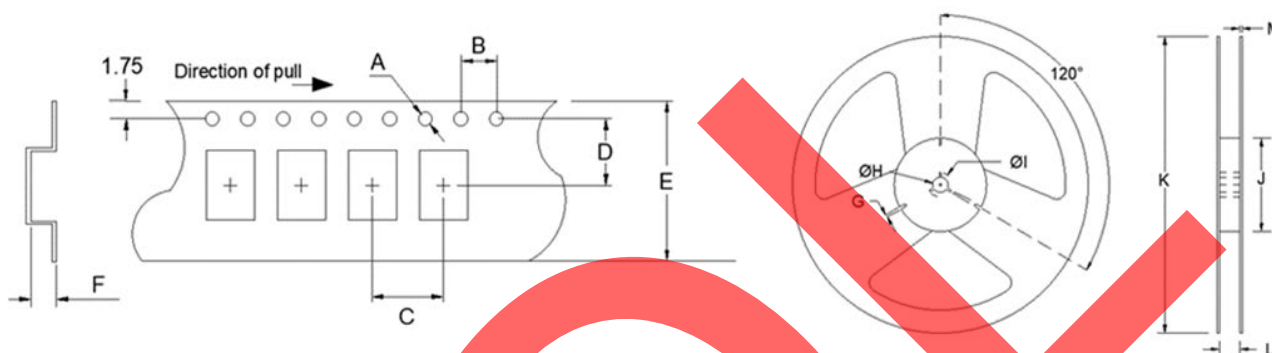
# FO3HK

(Former FK315, FK345, FK335 Series)

3.2mm x 2.5mm  
HCMOS Oscillator



| 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<br>-T2 = 2,000<br>-T3 = 3,000 | 2.5                      | ø13 | ø22 | ø60 | ø178 | 8.0 | 1.2 |



| Available Options & Part Identification for HCMOS Oscillator O3HK |                     |                                                                      |                                                               |                                                                                          |                        |                                                                                                   |
|-------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------|
| Sample PN: <b>FO3HKCBM0.032768-T3</b>                             |                     |                                                                      |                                                               |                                                                                          |                        |                                                                                                   |
| F                                                                 | O3HK                | C                                                                    | B                                                             | M                                                                                        | 0.032768               | -T3                                                                                               |
| <b>Fox</b>                                                        | <b>Model Number</b> | <b>Voltage</b><br>C = 3.3V±10%<br>V = 2.5V to 10%<br>W = 1.8V to 10% | <b>Stability</b><br>B = ±50 PPM<br>D = ±25 PPM<br>E = ±20 PPM | <b>Operating Temperature</b><br>D = -10 to +60°C<br>F = -20 to +70°C<br>M = -40 to +85°C | <b>Frequency (MHz)</b> | <b>Values Added Options</b><br>Blank = Bulk<br>T1 = 1,000 pcs<br>T2 = 2,000 pcs<br>T3 = 3,000 pcs |

| Reliability Test Conditions                         |
|-----------------------------------------------------|
| Please contact Abracon Quality Assurance department |