



## Features

- HCMOS Output
- Stabilities to  $\pm 20$  PPM
- Temperature Ranges to  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Supply Voltage: 1.8V, 2.5V, 3.3V

1.8V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range ( $F_0$ )	0.012 ~ 160.000MHz
Storage Temperature Range ( $T_{STG}$ )	$-55 \sim +125^{\circ}\text{C}$
Supply Voltage ( $V_{DD}$ )	$1.8\text{V} \pm 5\%$
Input Current ( $I_{DD}$ )	
0.012 ~ 32.000MHz	5 mA
>32.000 ~ 70.000MHz	10 mA
>70.000 ~ 120.000MHz	15 mA
>120.000 ~ 160.000MHz	30 mA
Standby Current	10 $\mu\text{A}$
Output Symmetry (50% $V_{DD}$ )	40% ~ 60%
Rise/Fall Time (20%/80% $V_{DD}$ Levels) ( $T_R/T_F$ )	
0.012 ~ 32.000MHz	5.0 nS
>32.000 ~ 120.000MHz	3.5 nS
>120.000 ~ 160.000MHz	3.0 nS
Output Voltage ( $V_{OL}$ )	20% $V_{DD}$
( $V_{OH}$ )	80% $V_{DD}$ Min
Output Load (HCMOS)	15pF
Start-up Time ( $T_S$ )	10 mS
Output Disable Time 1	300 nS
Output Enable Time 1	10 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

Available Options by Stability & Operating Temp for 1.8V		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 160.000
±100PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 160.000
±100PPM <sup>2</sup>	-40 ~ +85	0.012 ~ 160.000
±50PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 160.000
±50PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 160.000
±50PPM <sup>2</sup>	-40 ~ +85	0.012 ~ 160.000
±25PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 160.000
±25PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 160.000
±25PPM <sup>3</sup>	-40 ~ +85	0.012 ~ 160.000
±20PPM <sup>3</sup>	-10 ~ +70	0.012 ~ 160.000
±20PPM <sup>3</sup>	-20 ~ +70	0.012 ~ 160.000

<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, and one-year aging.

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

2.5V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F <sub>0</sub> )	0.012 ~ 170.000MHz
Storage Temperature Range (T <sub>STG</sub> )	-55 ~ +125°C
Supply Voltage (V <sub>DD</sub> )	2.5V±5%
Input Current (I <sub>DD</sub> )	
0.012 ~ 32.000MHz	7 mA
>32.000 ~ 50.000MHz	12 mA
>50.000 ~ 125.000MHz	26 mA
>125.000 ~ 160.000MHz	35 mA
>160.000 ~ 170.000MHz	40 mA
Standby Current	10 µA
Output Symmetry (50% V <sub>DD</sub> )	
0.012 ~ 50.000MHz	45% ~ 55%
>50.000 ~ 200.000MHz	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)	15pF
Start-up Time (T <sub>S</sub> )	10 mS
Output Disable Time 1	150 nS
Output Enable Time 1	10 mS

ENABLE / DISABLE FUNCTION	
Pin <sup>1</sup>	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>	-10 ~ +70	0.012 ~ 170.000
±100PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 170.000
±100PPM <sup>2</sup>	-40 ~ +85	0.012 ~ 170.000
±50PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 170.000
±50PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 170.000
±50PPM <sup>2</sup>	-40 ~ +85	0.012 ~ 170.000
±25PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 170.000
±25PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 170.000
±25PPM <sup>3</sup>	-40 ~ +85	0.012 ~ 170.000
±20PPM <sup>3</sup>	-10 ~ +70	0.012 ~ 170.000
±20PPM <sup>3</sup>	-20 ~ +70	0.012 ~ 170.000

<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, and one-year aging.

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

3.3V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F <sub>0</sub> )	0.012 ~ 170.000MHz
Storage Temperature Range (T <sub>STG</sub> )	-55 ~ +125°C
Supply Voltage (V <sub>DD</sub> )	3.3V±10%
Input Current (I <sub>DD</sub> )	
0.012 ~ 0.040MHz	3 mA
>0.040 ~ 1.500MHz	6 mA
>1.500 ~ 32.000MHz	15 mA
>32.000 ~ 50.000MHz	20 mA
>50.000 ~ 67.000MHz	25 mA
>67.000 ~ 170.000MHz	40 mA
Standby Current	10 µA
Output Symmetry (50% V <sub>DD</sub> )	
0.012 ~ 50.000MHz	45% ~ 55%
>50.000 ~ 170.000MHz	40% ~ 60%
Rise/Fall Time (10%/90% V <sub>DD</sub> Levels) (T <sub>R</sub> /T <sub>F</sub> )	
0.012 ~ 80.000MHz	6 nS
>80.000 ~ 125.000MHz	4 nS
>125.000 ~ 170.000MHz	3 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)	15pF
Start-up Time (T <sub>S</sub> )	10 mS
Output Disable Time 1	150 nS
Output Enable Time 1	10 mS

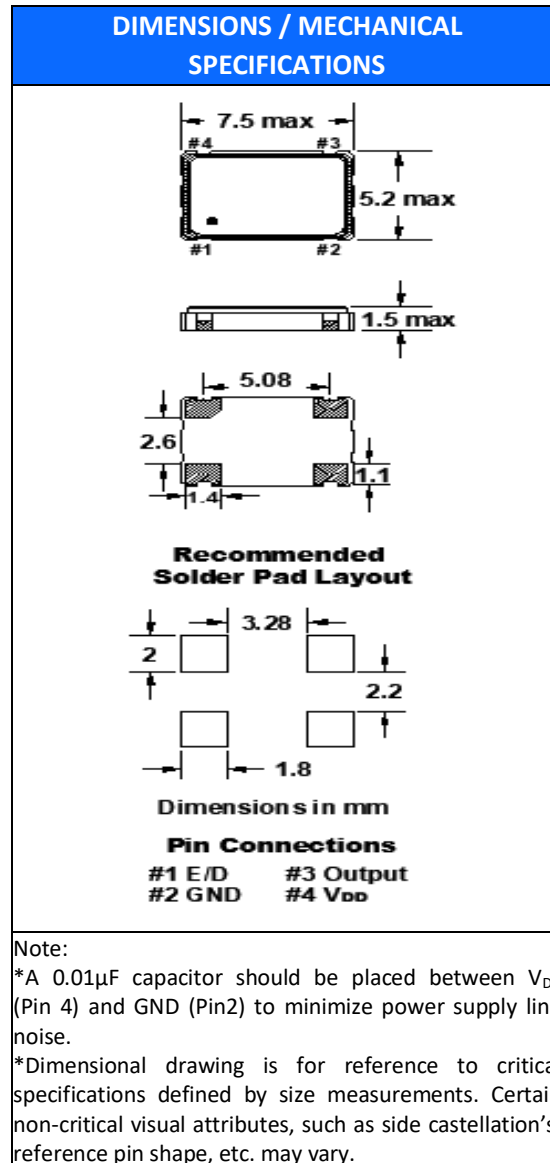
ENABLE / DISABLE FUNCTION	
Pin <sup>1</sup>	Output (pin 3)
OPEN <sup>1</sup>	Active
'1' Level V <sub>IH</sub> ≥ 70%V <sub>DD</sub>	Active
'0' Level V <sub>IL</sub> ≤ 30%V <sub>DD</sub>	High Z

Available Options by Stability & Operating Temp for 3.3V		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 170.000
±100PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 170.000
±100PPM <sup>2</sup>	-40 ~ +85	0.012 ~ 170.000
±50PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 170.000
±50PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 170.000
±50PPM <sup>2</sup>	-40 ~ +85	0.012 ~ 170.000
±25PPM <sup>2</sup>	-10 ~ +70	0.012 ~ 170.000
±25PPM <sup>2</sup>	-20 ~ +70	0.012 ~ 170.000
±25PPM <sup>3</sup>	-40 ~ +85	0.012 ~ 170.000
±20PPM <sup>3</sup>	-10 ~ +70	0.012 ~ 170.000
±20PPM <sup>3</sup>	-20 ~ +70	0.012 ~ 170.000

<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, and one-year aging.

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



<b>STANDARD SPECIFICATIONS</b>	
PARAMETERS	MAX (Unless otherwise noted)
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL) per J-STD-033	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
RERACH Compliant (latest version)	Yes

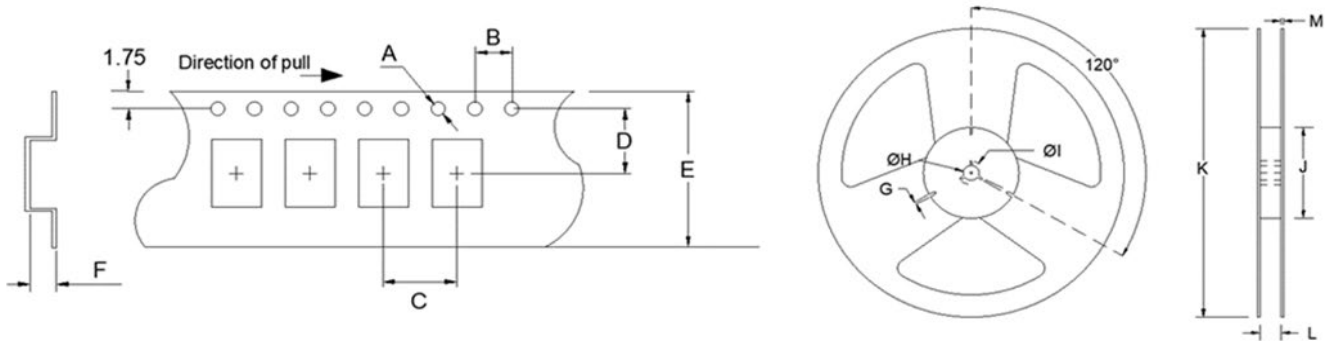
# FO7HS

(Former F4500, F4400, F4100 Series)

7mm x 5mm  
**HCMOS SMD Oscillator**



TAPE SPECIFICATIONS (mm)							REEL SPECIFICATIONS (mm)						
A	B	C	D	E	F	REEL QTY	G	H	I	J	K	L	M
ø1.5	4.0	8.0	7.5	16.0	2.15	-T1 = 1,000	2.0	ø13	ø21	ø80	ø255	17.5	2.0



\* 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<sub>DD</sub>.

Available Options & Part Identification for HCMOS SMD Oscillator FO7HS*						
Sample PN: <u>FO7HSCBM25.0-T1</u>						
F	O7HS	C	B	M	25.0	-T1
<u>Fox</u>	<u>Model Number</u>	<u>Voltage</u> B = 3.3V±5% <b>C = 3.3V±10%</b> H = 2.5V±5% K = 1.8V±5%	<u>Stability</u> A = ±100PPM <b>B = ±50PPM</b> D = ±25PPM E = ±20PPM	<u>Operating Temperature</u> E = -10 to +70°C F = -20 to +70°C <b>M = -40 to +85°C</b>	<u>Frequency (MHz)</u>	<u>Values Added Options</u> Blank = Bulk T1 = 1,000 pcs

Reliability Test Conditions
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