FO7HS

(Former F4500, F4400, F4100 Series)

7mm x 5mm

HCMOS SMD Oscillator

Features

- HCMOS Output
- Stabilities to ±20 PPM
- Temperature Ranges to -40°C to +85°C
- Supply Voltage: 1.8V, 2.5V, 3.3V

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

ENABLE / DISABLE FUNCTION	
Pin[1]	Output (pin 3)
OPEN [1]	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[2]	-10 ~ +70	0.012 ~ 160.000
±100PPM[2]	-20 ~ +70	0.012 ~ 160.000
±100PPM[2]	-40 ~ +85	0.012 ~ 160.000
±50PPM[2]	-10 ~ +70	0.012 ~ 160.000
±50PPM[2]	-20 ~ +70	0.012 ~ 160.000
±50PPM[2]	-40 ~ +85	0.012 ~ 160.000
±25PPM[2]	-10 ~ +70	0.012 ~ 160.000
±25PPM[2]	-20 ~ +70	0.012 ~ 160.000
±25PPM[3]	-40 ~ +85	0.012 ~ 160.000
±20PPM[3]	-10 ~ +70	0.012 ~ 160.000
±20PPM[3]	-20 ~ +70	0.012 ~ 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, and one-year aging.
[3] Inclusive of 25°C tolerance and operating temperature rang.

2.5V ELECTRICAL CHARACTERISTICS	
PARAMETERS	**MAX (Unless otherwise noted)**
Frequency Range (F_O)	0.012 ~ 170.000MHz
Storage Temperature Range (T_{STG})	-55 ~ +125°C
Supply Voltage (V_{DD})	2.5V±5%
Input Current (I_{DD}) 0.012 ~ 32.000MHz >32.000 ~ 50.000MHz >50.000 ~ 125.000MHz >125.000 ~ 160.000MHz >160.000 ~ 170.000MHz	 7 mA 12 mA 26 mA 35 mA 40 mA
Standby Current	10 µA
Output Symmetry (50% V_{DD}) 0.012 ~ 50.000MHz >50.000 ~ 200.000MHz	 45% ~ 55% 40% ~ 60%
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	5 nS
Output Voltage (V_{OL}) (V_{OH})	10% V_{DD} 90% V_{DD} Min
Output Load (HCMOS)	15pF
Start-up Time (TS)	10 mS
Output Disable Time 1	150 nS
Output Enable Time 1	10 mS

ENABLE / DISABLE FUNCTION	
Pin[1]	Output (pin 3)
OPEN [1]	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 2.5V		
Frequency Stability	**Operating Temperature (°C)**	**Frequency Range (MHz)**
±100PPM[2]	-10 ~ +70	0.012 ~ 170.000
±100PPM[2]	-20 ~ +70	0.012 ~ 170.000
±100PPM[2]	-40 ~ +85	0.012 ~ 170.000
±50PPM[2]	-10 ~ +70	0.012 ~ 170.000
±50PPM[2]	-20 ~ +70	0.012 ~ 170.000
±50PPM[2]	-40 ~ +85	0.012 ~ 170.000
±25PPM[2]	-10 ~ +70	0.012 ~ 170.000
±25PPM[2]	-20 ~ +70	0.012 ~ 170.000
±25PPM[3]	-40 ~ +85	0.012 ~ 170.000
±20PPM[3]	-10 ~ +70	0.012 ~ 170.000
±20PPM[3]	-20 ~ +70	0.012 ~ 170.000

[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, and one-year aging.
[3] Inclusive of 25°C tolerance and operating temperature rang.

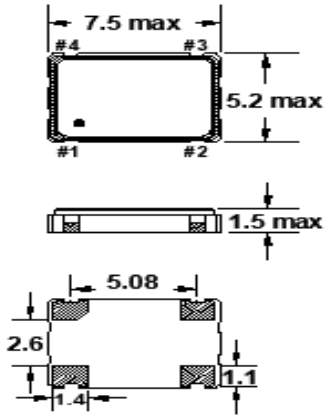
3.3V ELECTRICAL CHARACTERISTICS	
PARAMETERS	**MAX (Unless otherwise noted)**
Frequency Range (F_O)	0.012 ~ 170.000MHz
Storage Temperature Range (T_{STG})	-55 ~ +125°C
Supply Voltage (V_{DD})	3.3V±10%
Input Current (I_{DD})	
0.012 ~ 0.040MHz	3 mA
>0.040 ~ 1.500MHz	6 mA
>1.500 ~ 32.000MHz	15 mA
>32.000 ~ 50.000MHz	20 mA
>50.000 ~ 67.000MHz	25 mA
>67.000 ~ 170.000MHz	40 mA
Standby Current	10 µA
Output Symmetry (50% V_{DD})	
0.012 ~ 50.000MHz	45% ~ 55%
>50.000 ~ 170.000MHz	40% ~ 60%
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	
0.012 ~ 80.000MHz	6 nS
>80.000 ~ 125.000MHz	4 nS
>125.000 ~ 170.000MHz	3 nS
Output Voltage (V_{OL})	10% V_{DD}
(V_{OH})	90% V_{DD} Min
Output Load (HCMOS)	15pF
Start-up Time (TS)	10 mS
Output Disable Time 1	150 nS
Output Enable Time 1	10 mS

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

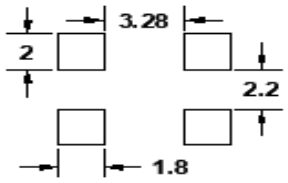
Available Options by Stability & Operating Temp for 3.3V		
Frequency Stability	**Operating Temperature (°C)**	**Frequency Range (MHz)**
±100PPM[2]	-10 ~ +70	0.012 ~ 170.000
±100PPM[2]	-20 ~ +70	0.012 ~ 170.000
±100PPM[2]	-40 ~ +85	0.012 ~ 170.000
±50PPM[2]	-10 ~ +70	0.012 ~ 170.000
±50PPM[2]	-20 ~ +70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

[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, and one-year aging.
[3] Inclusive of 25°C tolerance and operating temperature rang.

DIMENSIONS / MECHANICAL SPECIFICATIONS



Recommended Solder Pad Layout



Dimensions in mm

Pin Connections

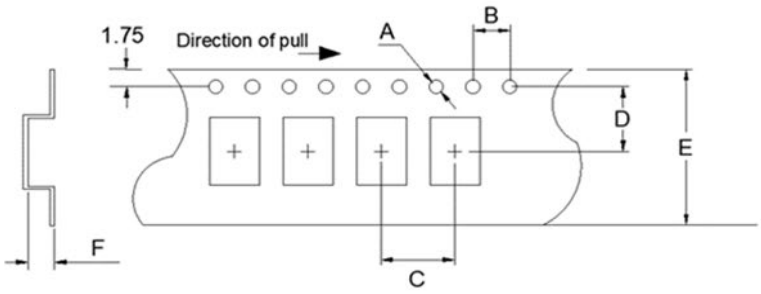
#1 E/D	#3 Output
#2 GND	#4 V_{DD}

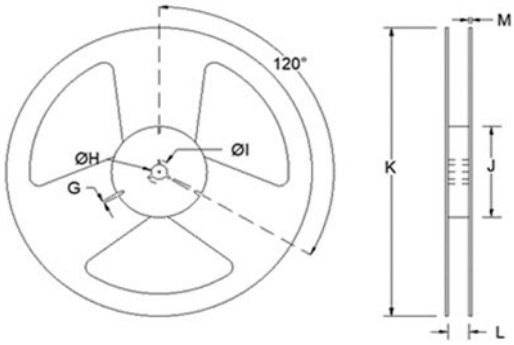
Note:
*A 0.01µF capacitor should be placed between V_{DD} (Pin 4) and GND (Pin2) to minimize power supply line noise.
*Dimensional drawing is for reference to critical specifications defined by size measurements. Certain non-critical visual attributes, such as side castellation's, reference pin shape, 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	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

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 -T2 = 2,000	2.0	Ø13	Ø21	Ø80	Ø255	17.5	2.0





Available Options & Part Identification for HCMOS SMD Oscillator O7HS*

Sample PN: FO7HSCBM25.0-T2

F	O7HS	C	B	M	25.0	-T2
Fox	**Model Number**	**Voltage** K = 1.8V±5% H = 2.5V±5% **C = 3.3V±10%**	**Stability** A = ±100PPM **B = ±50PPM** D = ±25PPM E = ±20PPM	**Operating Temperature** E = -10 to +70°C F = -20 to +70°C **M = -40 to +85°C**	**Frequency (MHz)**	**Values Added Options** Blank = Bulk T1 = 1,000 pcs **T2 = 2,000 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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