



HCMOS 7x5mm SMD Oscillator

O7HS

(former F4500, F4400, F4100 Series)

DATASHEET

- HCMOS Output
- Stabilities to ± 20 PPM
- Temperature Ranges to -40°C to $+85^{\circ}\text{C}$
- Supply Voltages: 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})	$-55 \sim +125^{\circ}\text{C}$
Supply Voltage (V_{DD})	1.8V $\pm 5\%$
Input Current (I_{DD})	
0.012 ~ 32.000MHz	5mA
>32.000 ~ 70.000MHz	10mA
>70.000 ~ 120.000MHz	15mA
>120.000 ~ 160.000MHz	30mA
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	5.0nS
>32.000 ~ 120.000MHz	3.5nS
>120.000 ~ 160.000MHz	3.0nS
Output Voltage (V_{OL})	20% V_{DD}
(V_{OH})	80% V_{DD} Min
Output Current (I_{OL})	2mA Min
(I_{OH})	-2mA Min
Output Load (HCMOS)	15pF
Start-up Time (T_s)	10mS
Output Disable Time ¹	300nS
Output Enable Time ¹	10mS

ENABLE / DISABLE FUNCTION

Pin1	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 ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}^2$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 100\text{PPM}^2$	$-20 \sim +70$	0.012 ~ 160.000
$\pm 100\text{PPM}^2$	$-40 \sim +85$	0.012 ~ 160.000
$\pm 50\text{PPM}^2$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 50\text{PPM}^2$	$-20 \sim +70$	0.012 ~ 160.000
$\pm 50\text{PPM}^2$	$-40 \sim +85$	0.012 ~ 160.000
$\pm 25\text{PPM}^2$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 25\text{PPM}^2$	$-20 \sim +70$	0.012 ~ 160.000
$\pm 25\text{PPM}^3$	$-40 \sim +85$	0.012 ~ 160.000
$\pm 20\text{PPM}^3$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 20\text{PPM}^3$	$-20 \sim +70$	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, one-year aging, shock, and vibration.

³ Inclusive of 25°C tolerance, operating temperature range.



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Title / Description: O7HS SERIES STANDARD SPECIFICATIONS	
Drawing Number: O7HS-DOC-1	Size: A
Part Number:	Cage: 61429
Draftsperson: BEC	Approved: MAJ
Revision Date: 10/02/2019	



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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	7mA
>32.000 ~ 50.000MHz	12mA
>50.000 ~ 125.000MHz	26mA
>125.000 ~ 160.000MHz	35mA
>160.000 ~ 170.000MHz	40mA
Standby Current	10µA
Output Symmetry (50% V _{DD})	
0.012 ~ 50.000MHz	45% ~ 55%
>50.000 ~ 200.000MHz	40% ~ 60%
Rise/Fall Time (10%/90% V _{DD} Levels) (T _R /T _F)	5nS
Output Voltage (V _{OL})	10%V _{DD}
(V _{OH})	90%V _{DD} Min
Output Current (I _{OL})	4mA Min
(I _{OH})	-4mA Min
Output Load (HCMOS)	15pF
Start-up Time (T _S)	10mS
Output Disable Time ¹	150nS
Output Enable Time ¹	10mS

ENABLE / DISABLE FUNCTION

Pin1	Output (pin 3)
OPEN ¹	Active
'1' Level V _{IH} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 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

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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	3mA
>0.040 ~ 1.500MHz	6mA
>1.500 ~ 32.000MHz	15mA
>32.000 ~ 50.000MHz	20mA
>50.000 ~ 67.000MHz	25mA
>67.000 ~ 170.000MHz	40mA
Standby Current	10µA
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	6nS
>80.000 ~ 125.000MHz	4nS
>125.000 ~ 170.000MHz	3nS
Output Voltage (V _{OL})	10% V _{DD}
(V _{OH})	90% V _{DD} Min
Output Current (I _{OL})	2mA Min
(I _{OH})	-2mA Min
Output Load (HCMOS)	15pF
Start-up Time (T _S)	10mS
Output Disable Time ¹	150nS
Output Enable Time ¹	10mS

ENABLE / DISABLE FUNCTION

Pin1	Output (pin 3)
OPEN ¹	Active
'1' Level V _{IH} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 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

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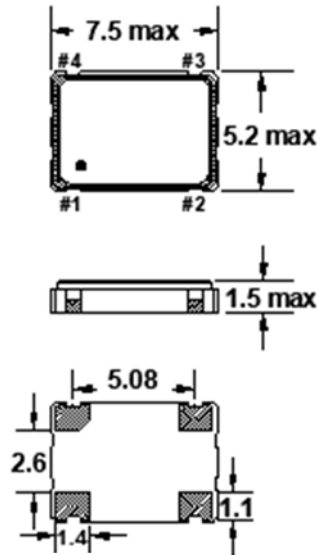
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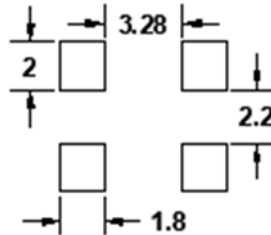
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DIMENSIONS / MECHANICAL SPECIFICATIONS



Recommended Solder Pad Layout



Dimensions in mm

Pin Connections

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

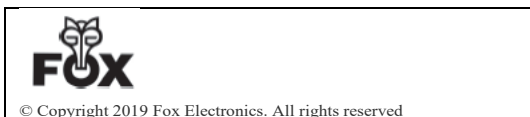
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL)	1
Termination Finish	Au over Ni
Seal Method	Seam
Lead (Pb) Free	Yes
ROHS/REACH Compliant	Yes

Notes:

*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 castellations, reference pin shape, etc. may vary



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Tape Specifications (millimeters)						Reel Specifications (millimeters)							
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*

Example: **F O7HS C B M 25.0**

F	O7HS	C	B	M	25.0
Fox	Model Number	Voltage	Stability	Operating Temperature	Frequency(MHz)
		K = 1.8V±5% H = 2.5V±5% C = 3.3V±10%	A = ±100PPM B = ±50PPM D = ±25PPM E = ±20PPM	E = -10 to +70°C F = -20 to +70°C M = -40 to +85°C	

*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}.



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