



HCMOS 7x5mm SMD Oscillator

O7HS

(former F4500, F4400, F4100 Series)

DATASHEET

- HCMOS Output
- Stabilities to ± 20 PPM
- Temperature Ranges as wide as -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_0)	0.012 ~ 160.000 MHz
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 ~ 32.000 MHz	5 mA
>32.000 ~ 70.000 MHz	10 mA
>70.000 ~ 120.000 MHz	15 mA
>120.000 ~ 160.000 MHz	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 ~ 32.000 MHz	5.0 nS
>32.000 ~ 120.000 MHz	3.5 nS
>120.000 ~ 160.000 MHz	3.0 nS
Output Voltage (V_{OL})	20% V_{DD}
(V_{OH})	80% V_{DD} Min
Output Current (I_{OL})	2 mA Min
(I_{OH})	-2 mA Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	10 mS
Output Disable Time ¹	300 nS
Output Enable Time ¹	10 mS

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 1.8V²

Frequency Stability ²	Operating Temperature ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 100\text{PPM}$	$-20 \sim +70$	0.012 ~ 160.000
$\pm 100\text{PPM}$	$-40 \sim +85$	0.012 ~ 160.000
$\pm 50\text{PPM}$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 50\text{PPM}$	$-20 \sim +70$	0.012 ~ 160.000
$\pm 50\text{PPM}$	$-40 \sim +85$	0.012 ~ 160.000
$\pm 25\text{PPM}$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 25\text{PPM}$	$-20 \sim +70$	0.012 ~ 160.000
$\pm 25\text{PPM}$	$-40 \sim +85$	0.012 ~ 160.000
$\pm 20\text{PPM}^*$	$-10 \sim +70$	0.012 ~ 160.000
$\pm 20\text{PPM}^*$	$-20 \sim +70$	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, and one year aging. *Excludes Shock/Vibration.





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2.5V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_0)	0.012 ~ 170.000 MHz
Storage Temperature Range (T_{STG})	$-55 \sim +125^{\circ}\text{C}$
Supply Voltage (V_{DD})	$2.5V \pm 5\%$
Input Current (I_{DD})	
0.012 ~ 32.000 MHz	7 mA
$>32.000 \sim 50.000$ MHz	12 mA
$>50.000 \sim 125.000$ MHz	26 mA
$>125.000 \sim 160.000$ MHz	35 mA
$>160.000 \sim 170.000$ MHz	40 mA
Standby Current	10 μA
Output Symmetry (50% V_{DD})	
0.012 ~ 50.000 MHz	45 % ~ 55 %
$>50.000 \sim 200.000$ MHz	40 % ~ 60 %
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	5 nS
Output Voltage (V_{OL})	10% V_{DD}
(V_{OH})	90% V_{DD} Min
Output Current (I_{OL})	4 mA Min
(I_{OH})	-4 mA Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	10 mS
Output Disable Time ¹	150 nS
Output Enable Time ¹	10 mS

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 2.5V²

Frequency Stability ²	Operating Temperature ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 100\text{PPM}$	$-20 \sim +70$	0.012 ~ 170.000
$\pm 100\text{PPM}$	$-40 \sim +85$	0.012 ~ 170.000
$\pm 50\text{PPM}$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 50\text{PPM}$	$-20 \sim +70$	0.012 ~ 170.000
$\pm 50\text{PPM}$	$-40 \sim +85$	0.012 ~ 170.000
$\pm 25\text{PPM}$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 25\text{PPM}$	$-20 \sim +70$	0.012 ~ 170.000
$\pm 25\text{PPM}$	$-40 \sim +85$	0.012 ~ 170.000
$\pm 20\text{PPM}^*$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 20\text{PPM}^*$	$-20 \sim +70$	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. *Excludes Shock/Vibration.



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Title / Description: O7HS SERIES STANDARD SPECIFICATIONS

Drawing Number: 101147

Size: A

Part Number:

Cage: 61429

Draftsperson: CMR

Approved: BEC

Revision Date: 10/10/2017



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- HCMOS Output
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- Supply Voltages: 1.8V, 2.5V, 3.3V

3.3V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_0)	0.012 ~ 170.000 MHz
Storage Temperature Range (T_{STG})	$-55 \sim +125^{\circ}\text{C}$
Supply Voltage (V_{DD})	$3.3\text{V} \pm 10\%$
Input Current (I_{DD})	
0.012 ~ 0.040 MHz	3 mA
$>0.040 \sim 1.500$ MHz	6 mA
$>1.500 \sim 32.000$ MHz	15 mA
$>32.000 \sim 50.000$ MHz	20 mA
$>50.000 \sim 67.000$ MHz	25 mA
$>67.000 \sim 170.000$ MHz	40 mA
Standby Current	10 μA
Output Symmetry (50% V_{DD})	
0.012 ~ 50.000 MHz	45% ~ 55%
$>50.000 \sim 170.000$ MHz	40% ~ 60%
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	
0.012 ~ 80.000 MHz	6 nS
$>80.000 \sim 125.000$ MHz	4 nS
$>125.000 \sim 170.000$ MHz	3 nS
Output Voltage (V_{OL}) (V_{OH})	10% V_{DD} 90% V_{DD} Min
Output Current (I_{OL}) (I_{OH})	2 mA Min -2 mA Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	10 mS
Output Disable Time ¹	150 nS
Output Enable Time ¹	10 mS
Jitter ($F_0 \geq 100$ MHz, 12 kHz ~ 20 MHz)	0.3 pS Typ.

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 3.3V²

Frequency Stability ²	Operating Temperature ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 100\text{PPM}$	$-20 \sim +70$	0.012 ~ 170.000
$\pm 100\text{PPM}$	$-40 \sim +85$	0.012 ~ 170.000
$\pm 50\text{PPM}$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 50\text{PPM}$	$-20 \sim +70$	0.012 ~ 170.000
$\pm 50\text{PPM}$	$-40 \sim +85$	0.012 ~ 170.000
$\pm 25\text{PPM}$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 25\text{PPM}$	$-20 \sim +70$	0.012 ~ 170.000
$\pm 25\text{PPM}$	$-40 \sim +85$	0.012 ~ 170.000
$\pm 20\text{PPM}^*$	$-10 \sim +70$	0.012 ~ 170.000
$\pm 20\text{PPM}^*$	$-20 \sim +70$	0.012 ~ 170.000

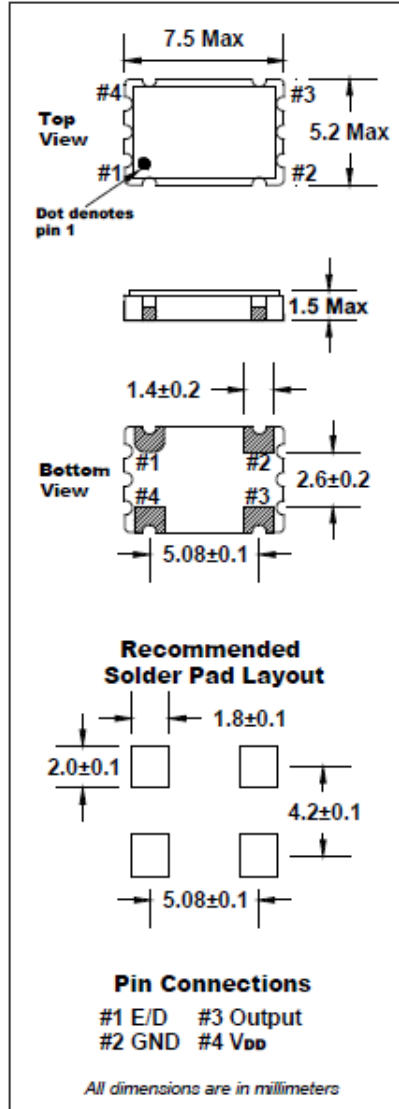
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DIMENSIONS / MECHANICAL SPECIFICATIONS



Maximum Soldering Temp / Time	260°C / 10 Seconds
Moisture Sensitivity Level (MSL)	1
Termination Finish	Au over Ni
Seal Method	Seam Seal
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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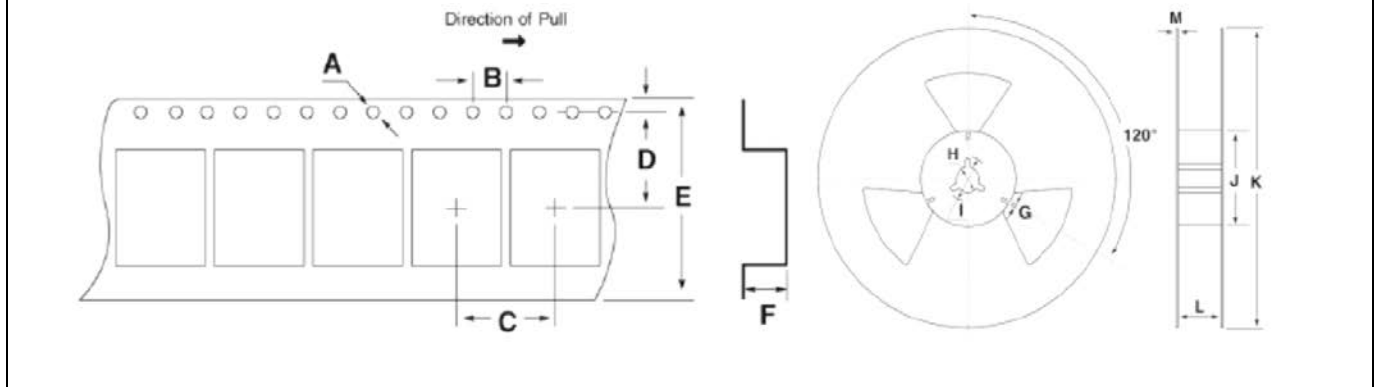
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Tape Specifications (millimeters)							Reel Specifications (millimeters)							
A	B	C	D	E	F	Std Reel Qty	G	H	I	J	K	L	M	
Φ1.5	4.0	8.0	7.5	16.0	2.15	2,000	2.0	Φ13	Φ21	Φ80	Φ255	17.5	2.0	



Available Options & Part Identification*

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

F	O7HS	C	B	M	25.0
Fox	Model Number	Voltage 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

*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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