



# HCMOS 7x5mm SMD Oscillator

## O7HS

(former F4500, F4400, F4100 Series)

### DATASHEET

- HCMOS Output
- Stabilities to  $\pm 20$  PPM
- Temperature Ranges to  $-40^{\circ}\text{C}$  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 ~ 160.000MHz
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	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)	15 pF
Start-up Time ( $T_s$ )	10 mS
Output Disable Time <sup>1</sup>	300 nS
Output Enable Time <sup>1</sup>	10 mS

## ENABLE / DISABLE FUNCTION

Pin1	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 ( $^{\circ}\text{C}$ )	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

<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.



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<b>Title / Description:</b> O7HS SERIES STANDARD SPECIFICATIONS		
<b>Drawing Number:</b> O7HS-DOC-1		<b>Size:</b> A
<b>Part Number:</b>		<b>Cage:</b> 61429
<b>Draftsperson:</b> BEC	<b>Approved:</b> MAJ	<b>Revision Date:</b> 01/13/2020



# HCMOS 7x5mm SMD Oscillator

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### DATASHEET

#### 2.5V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F <sub>o</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	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 <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> )	5nS
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> )	10mS
Output Disable Time <sup>1</sup>	150nS
Output Enable Time <sup>1</sup>	10mS

#### ENABLE / DISABLE FUNCTION

Pin1	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>2</sup>	-40 ~ +85	0.012 ~ 170.000
±25PPM <sup>3</sup>	-10 ~ +70	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, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of 25°C tolerance, operating temperature range.



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# HCMOS 7x5mm SMD Oscillator

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### DATASHEET

### 3.3V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F <sub>o</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)	15 pF
Start-up Time (T <sub>s</sub> )	10 mS
Output Disable Time <sup>1</sup>	150 nS
Output Enable Time <sup>1</sup>	10 mS

### ENABLE / DISABLE FUNCTION

Pin1	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, one-year aging, shock, and vibration.

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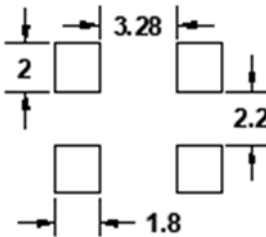
(former F4500, F4400, F4100 Series)

### DATASHEET

## DIMENSIONS / MECHANICAL SPECIFICATIONS



### Recommended Solder Pad Layout



Dimensions in mm

### Pin Connections

#1 E/D    #3 Output  
 #2 GND   #4 V<sub>DD</sub>

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<sub>DD</sub> (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



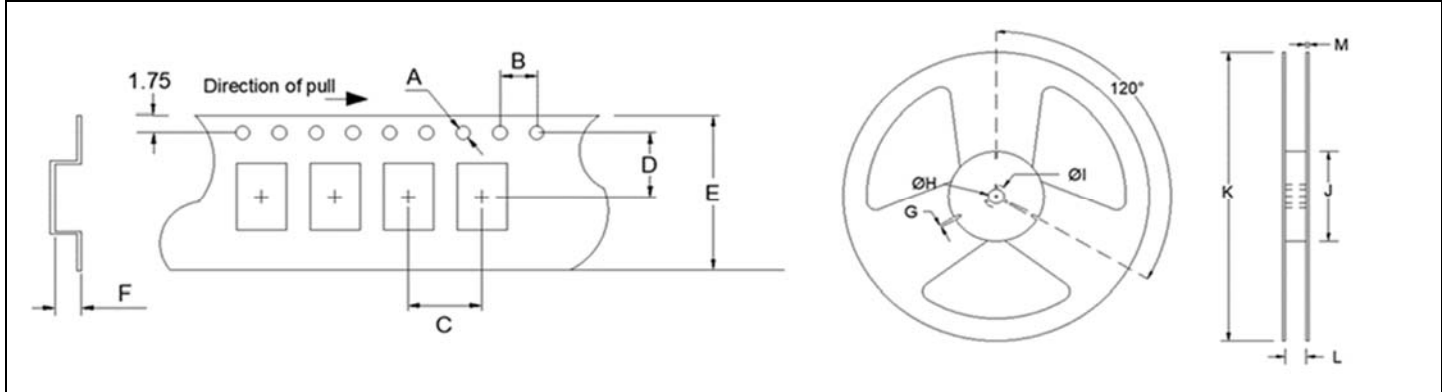
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Tape Specifications (millimeters)						Reel Specifications (millimeters)								
A	B	C	D	E	F	Reel Qty		G	H	I	J	K	L	M
Ø1.5	4.0	8.0	7.5	16.0	2.15	-T1 = 1,000	-T2 = 2,000	2.0	Ø13	Ø21	Ø80	Ø255	17.5	2.0



### 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% <b>C = 3.3V±10%</b>	A = ±100PPM <b>B = ±50PPM</b> D = ±25PPM E = ±20PPM	E = -10 to +70°C F = -20 to +70°C <b>M = -40 to +85°C</b>	

\*Not all frequencies in the frequency range, or every combination of stability, temp range, and voltage available. See stabilities and op temps for each VDD.



Corporate Headquarters  
5570 Enterprise Parkway  
Fort Myers, FL 33905  
<http://www.FOXONLINE.com>

Sales  
1-888-GET-2-FOX (1-888-438-2369)  
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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.