



HCMOS 5.0x3.2mm SMD Oscillator O5HS DATASHEET

(Former F510L, F540L, F530L, F550L Series)

- HCMOS Output
- Stabilities to ± 20 PPM
- Temperature Ranges to -40°C to $+85^{\circ}\text{C}$
- Supply Voltages: 1.8V; 2.5V; 3.3V; 5.0V

1.8V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_o)	1 ~ 160MHz
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})	
1.000 ~ 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 μA
Output Symmetry (50% V_{DD})	40% ~ 60%
Rise/Fall Time (20%/80% V_{DD} Levels) (T_R/T_F)	
1.000 ~ 32.000MHz	5 nS
>32.000 ~ 120.000MHz	3.5 nS
>120.000 ~ 160.000MHz	3 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 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 1.8V

Frequency Stability	Operating Temperature ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}^2$	$-10 \sim +70$	1.000 ~ 160.000
$\pm 100\text{PPM}^2$	$-20 \sim +70$	1.000 ~ 160.000
$\pm 100\text{PPM}^2$	$-40 \sim +85$	1.000 ~ 160.000
$\pm 50\text{PPM}^2$	$-10 \sim +70$	1.000 ~ 160.000
$\pm 50\text{PPM}^2$	$-20 \sim +70$	1.000 ~ 160.000
$\pm 50\text{PPM}^2$	$-40 \sim +85$	1.000 ~ 160.000
$\pm 25\text{PPM}^2$	$-10 \sim +70$	1.000 ~ 160.000
$\pm 25\text{PPM}^2$	$-20 \sim +70$	1.000 ~ 160.000
$\pm 25\text{PPM}^3$	$-40 \sim +85$	1.000 ~ 160.000
$\pm 20\text{PPM}^3$	$-10 \sim +70$	1.000 ~ 160.000
$\pm 20\text{PPM}^3$	$-20 \sim +70$	1.000 ~ 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.



Title / Description: O5HS SERIES STANDARD SPECIFICATIONS	
Drawing Number: O5HS-DOC-1	Revision: F
Part Number:	Cage: 61429
Draftsperson: BEC	Approved: MAJ
Revision Date: 11/12/2020	



2.5V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F _o)	1 ~ 160 MHz
Storage Temperature Range (T _{STG})	-55 ~ +125°C
Supply Voltage (V _{DD})	2.5V±5%
Input Current (I _{DD})	
1.000 ~ 32.000MHz	7 mA
>32.000 ~ 50.000MHz	12 mA
>50.000 ~ 125.000MHz	26 mA
>125.000 ~ 160.000MHz	35 mA
Standby Current	10 µA
Output Symmetry (50% V _{DD})	
1.000 ~ 50.000MHz	45% ~ 55%
> 50.000 ~ 160.000MHz	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 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} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 30%V _{DD}	High Z

• Available Options by Stability & Operating Temp for 2.5V

Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM ²	-10 ~ +70	1.000 ~ 160.000
±100PPM ²	-20 ~ +70	1.000 ~ 160.000
±100PPM ²	-40 ~ +85	1.000 ~ 160.000
±50PPM ²	-10 ~ +70	1.000 ~ 160.000
±50PPM ²	-20 ~ +70	1.000 ~ 160.000
±50PPM ²	-40 ~ +85	1.000 ~ 160.000
±25PPM ²	-10 ~ +70	1.000 ~ 160.000
±25PPM ²	-20 ~ +70	1.000 ~ 160.000
±25PPM ³	-40 ~ +85	1.000 ~ 160.000
±20PPM ³	-10 ~ +70	1.000 ~ 160.000
±20PPM ³	-20 ~ +70	1.000 ~ 160.000

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 Inclusive of 25°C tolerance, operating temperature range.





3.3V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F _o)	1 ~ 170MHz
Storage Temperature Range (T _{STG})	-55 ~ +125°C
Supply Voltage (V _{DD})	3.3V±10%
Input Current (I _{DD})	
1.000 ~ 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})	
1.000 ~ 50.000MHz	45% ~ 55%
>50.000 ~ 170.000MHz	40% ~ 60%
Rise/Fall Time (10%/90% V _{DD} Levels) (T _R /T _F)	
1.000 ~ 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)	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} ≥ 70%V _{DD}	Active
'0' Level V _{IL} ≤ 30%V _{DD}	High Z

• Available Options by Stability & Operating Temp for 3.3V

Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM ²	-10 ~ +70	1.000 ~ 170.000
±100PPM ²	-20 ~ +70	1.000 ~ 170.000
±100PPM ²	-40 ~ +85	1.000 ~ 170.000
±50PPM ²	-10 ~ +70	1.000 ~ 170.000
±50PPM ²	-20 ~ +70	1.000 ~ 170.000
±50PPM ²	-40 ~ +85	1.000 ~ 170.000
±25PPM ²	-10 ~ +70	1.000 ~ 170.000
±25PPM ²	-20 ~ +70	1.000 ~ 170.000
±25PPM ³	-40 ~ +85	1.000 ~ 170.000
±20PPM ³	-10 ~ +70	1.000 ~ 170.000
±20PPM ³	-20 ~ +70	1.000 ~ 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, one-year aging, shock, and vibration.

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



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5.0 V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F _o)	1.544 ~ 50MHz
Storage Temperature Range (T _{STG})	-55 ~ +125°C
Supply Voltage (V _{DD})	5.0V ± 10%
Input Current (I _{DD})	35 mA
Output Symmetry (50% V _{DD})	40% ~ 60%
Rise/Fall Time (10%/90% V _{DD} Levels) (T _R /T _F)	10 nS
Output Voltage (V _{OL}) (V _{OH})	10% V _{DD} 90% V _{DD} Min
Output Load (HCMOS)	15 pF
Start-up Time (T _s)	10 mS
Output Disable Time ¹	100 nS
Output Enable Time ¹	100 nS

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 5.0V

Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM ²	-10 ~ +70	1.544 ~ 50.000
±100PPM ²	-40 ~ +85	1.544 ~ 50.000
±50PPM ²	-10 ~ +70	1.544 ~ 50.000
±50PPM ²	-40 ~ +85	1.544 ~ 50.000
±25PPM ²	-10 ~ +70	1.544 ~ 50.000
±25PPM ³	-40 ~ +85	1.544 ~ 50.000
±20PPM ³	-10 ~ +70	1.544 ~ 50.000

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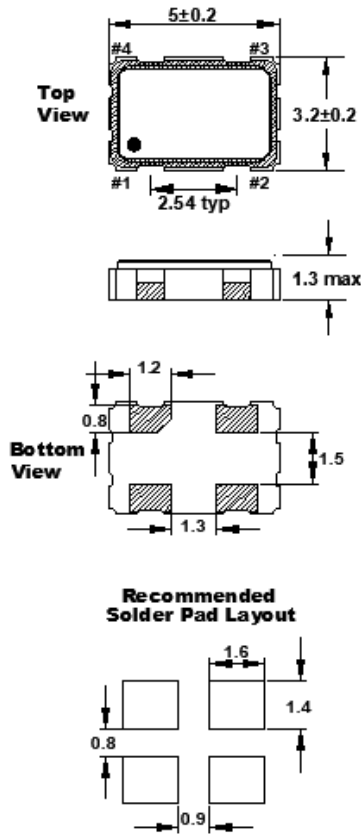
³ Inclusive of 25°C tolerance, operating temperature range.



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DIMENSIONS / MECHANICAL SPECIFICATIONS



Dimensions in millimeters

Pin Connections

#1 E/D #3 Output
#2 GND #4 VDD

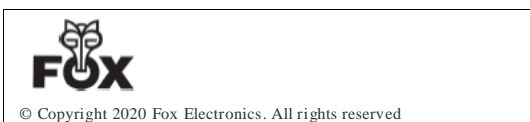
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL) per J-STD-033	N/A
Termination Finish	Au (0.3~1µm) over Ni (1.27~8.89µm)
Seal Method	Seam
Lead (Pb) Free	Yes
ROHS/REACH Compliant	Yes

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

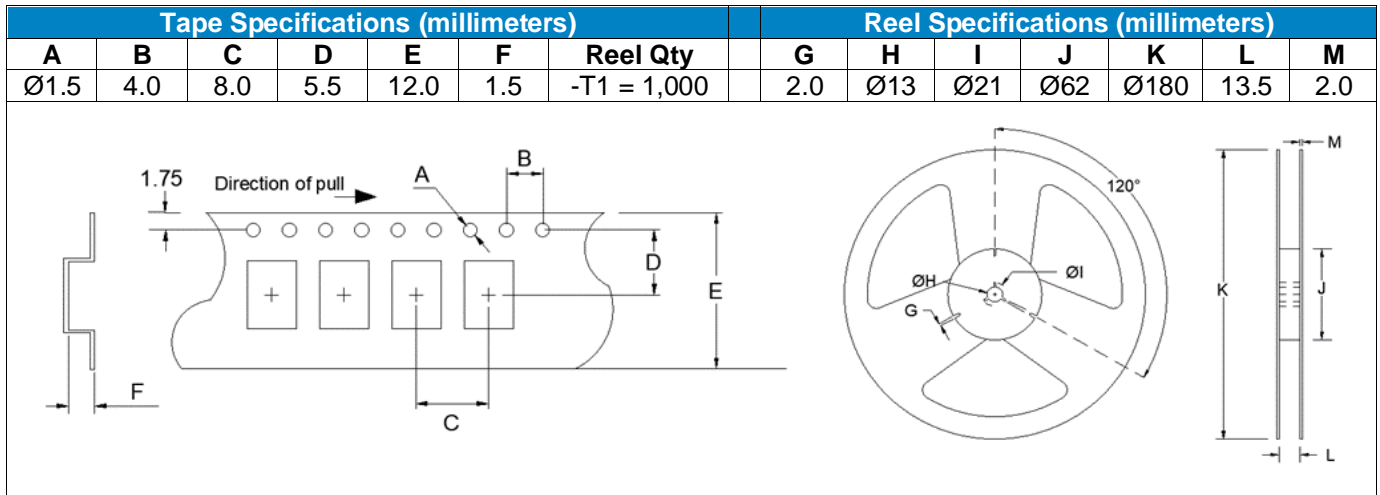


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Available Options & Part Identification*

Example: F O5HS C B M 25.0

F	O5HS	C	B	M	25.0
Fox	Model Number	Voltage K = 1.8V±5% H = 2.5V±5% C = 3.3V±10% A = 5.0V±10%	Stability A = ±100 PPM B = ±50 PPM D = ±25 PPM E = ±20 PPM	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}.



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

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