



HCMOS 3.2x2.5mm SMD Oscillator O3HS DATASHEET

(Former F300, F310, F330, F340 Series)

- HCMOS Output
- Stabilities to ± 20 PPM
- Temperature Ranges as wide as -40°C to $+125^{\circ}\text{C}$
- Supply Voltages: 1.0V, 1.8V, 2.5V, 3.3V, Variable (1.6V ~ 3.63V; 2.25V ~ 3.63V)

1.0V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_0)	1.800 ~ 50.000 MHz
Storage Temperature Range (T_{STG})	$-55 \sim +125^{\circ}\text{C}$
Supply Voltage (V_{DD})	1.0V $\pm 5\%$
Input Current (I_{DD})	
1.800 ~ 32.100 MHz	2.5 mA
$>32.100 \sim 50.000$ MHz	3.5 mA
Standby Current	100 μA
Output Symmetry (50% V_{DD})	40% ~ 60%
Rise/Fall Time (20%/80% V_{DD} Levels) (T_R/T_F)	5 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	50 μS
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 1.0V

Frequency Stability ²	Operating Temperature ($^{\circ}\text{C}$)	Frequency Range (MHz)
$\pm 100\text{PPM}$	$-10 \sim +70$	1.800 ~ 50.000
$\pm 100\text{PPM}$	$-40 \sim +85$	1.800 ~ 50.000
$\pm 50\text{PPM}$	$-10 \sim +70$	1.800 ~ 50.000
$\pm 50\text{PPM}$	$-40 \sim +85$	1.800 ~ 50.000
$\pm 25\text{PPM}$	$-10 \sim +70$	1.800 ~ 50.000
$\pm 25\text{PPM}$ ³	$-40 \sim +85$	1.800 ~ 50.000
$\pm 20\text{PPM}$ ³	$-10 \sim +70$	1.800 ~ 50.000

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

³ Inclusive of 25°C tolerance and operating temperature range

7/29/2020 Updated Termination finish and MSL info.
11/11/2020 – Corrected variable voltage
12/17/2020 – Added -40/105 and -40/125 to variable Vdd

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Title / Description: O3HS SERIES STANDARD SPECIFICATIONS

Drawing Number: O3HS-DOC-1

Part Number:

Draftsperson: BEC

Approved: MAJ

Revision: E

Cage: 61429

Revision Date: 12/17/2020



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1.8V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_o)	0.625 ~ 133.000 MHz
Storage Temperature Range (T_{STG})	-55 ~ +125°C
Supply Voltage (V_{DD})	1.8V±5%
Input Current (I_{DD})	
0.625 ~ 32.000 MHz	6 mA
>32.000 ~ 80.000 MHz	15 mA
>80.000 ~ 133.000 MHz	20 mA
Standby Current	10 μ A
Output Symmetry (50% V_{DD})	
0.625 ~ 84.999999MHz	45 % ~ 55 %
85.000 ~ 133MHz	40 % ~ 60 %
Rise/Fall Time (20%/80% V_{DD} Levels) (T_R/T_F)	
0.625 ~ 32.000 MHz	5 nS
>32.000 ~ 133.000 MHz	3.5 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 ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-10 ~ +70	0.625 ~ 133.000
±100PPM	-40 ~ +85	0.625 ~ 133.000
±50PPM	-10 ~ +70	0.625 ~ 133.000
±50PPM	-40 ~ +85	0.625 ~ 133.000
±25PPM	-10 ~ +70	0.625 ~ 133.000
±25PPM ³	-40 ~ +85	0.625 ~ 133.000
±20PPM ³	-10 ~ +70	0.625 ~ 133.000

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PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F _o)	0.625 ~ 170.000 MHz
Storage Temperature Range (T _{STG})	-55 ~ +125°C
Supply Voltage (V _{DD})	2.5V±5%
Input Current (I _{DD})	
0.625 ~ 20.000 MHz	5 mA
>20.000 ~ 40.000 MHz	9 mA
>40.000 ~ 60.000 MHz	11 mA
>60.000 ~ 80.000MHz	20 mA
>80.000 ~ 170.000 MHz	30 mA
Standby Current	10 µA
Output Symmetry (50% V _{DD})	
0.625 ~ 84.99999MHz	45 % ~ 55 %
85.000 ~ 170MHz	40 % ~ 60 %
Rise/Fall Time (10%/90% V _{DD} Levels) (T _R /T _F)	6 nS
Output Voltage (V _{OL})	10 % V _{DD}
(V _{OH})	90 % V _{DD} Min
Output Load (HCMOS)	15 pF
Start-up Time (T _S)	5 mS
Output Disable Time ¹	150 nS
Output Enable Time ¹	5 mS

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

Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-10 ~ +70	0.625 ~ 170.000
±100PPM	-20 ~ +70	0.625 ~ 170.000
±100PPM	-40 ~ +85	0.625 ~ 170.000
±50PPM	-10 ~ +70	0.625 ~ 170.000
±50PPM	-20 ~ +70	0.625 ~ 170.000
±50PPM	-40 ~ +85	0.625 ~ 170.000
±25PPM	-10 ~ +70	0.625 ~ 170.000
±25PPM	-20 ~ +70	0.625 ~ 170.000
±25PPM ³	-40 ~ +85	0.625 ~ 170.000
±20PPM ³	-10 ~ +70	0.625 ~ 170.000
±20PPM ³	-20 ~ +70	0.625 ~ 170.000

³ Inclusive of 25C tolerance and operating temperature range



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3.3V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_o)	0.625 ~ 170 MHz
Storage Temperature Range (T_{STG})	-55 ~ +125°C
Supply Voltage (V_{DD})	3.3V±10%
Input Current (I_{DD})	
0.625 ~ 20.000 MHz	7 mA
>20.000 ~ 40.000 MHz	13 mA
>40.000 ~ 60.000 MHz	19 mA
>60.000 ~ 75.000 MHz	24 mA
>75.000 ~ 80.000 MHz	30 mA
>80.000 ~ 125.000 MHz	40 mA
>125.000 ~ 170.000 MHz	50 mA
Standby Current	10 µA
Output Symmetry (50% V_{DD})	
0.625 ~ 84.999999MHz	45 % ~ 55 %
85.000 ~ 170MHz	40 % ~ 60 %
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	6 nS
Output Voltage (V_{OL})	10 % V_{DD}
(V_{OH})	90 % V_{DD} Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	5 mS
Output Disable Time ¹	150 nS
Output Enable Time ¹	5 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 3.3V

Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-10 ~ +70	0.625 ~ 170.000
±100PPM	-20 ~ +70	0.625 ~ 170.000
±100PPM	-40 ~ +85	0.625 ~ 170.000
±50PPM	-10 ~ +70	0.625 ~ 170.000
±50PPM	-20 ~ +70	0.625 ~ 170.000
±50PPM	-40 ~ +85	0.625 ~ 170.000
±25PPM	-10 ~ +70	0.625 ~ 170.000
±25PPM	-20 ~ +70	0.625 ~ 170.000
±25PPM ³	-40 ~ +85	0.625 ~ 170.000
±20PPM ³	-10 ~ +70	0.625 ~ 170.000
±20PPM ³	-20 ~ +70	0.625 ~ 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, shock, vibration, reflow, and one-year aging.

³ Inclusive of 25°C tolerance and operating temperature range

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VARIABLE VOLTAGE ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_o)	0.75 ~ 156.25 MHz
Storage Temperature Range (T_{STG})	-55 ~ +125°C
Supply Voltage (V_{DD}) 1.25 ~ 135.0 MHz >135.0 ~ 156.25 MHz	1.6V ~ 3.63V 2.25V ~ 3.63V
Input Current (I_{DD}) 0.750 ~ 19.999 MHz 20.000 ~ 39.999 MHz 40.000 ~ 59.999 MHz 60.000 ~ 84.999 MHz 85.000 ~ 135.000 MHz >135.000 ~ 156.250 MHz	4 mA 6 mA 10 mA 15 mA 23 mA 30 mA
Standby Current $T_{OPR} = -40 \sim +85^\circ\text{C}$ $T_{OPR} = -40 \sim +105^\circ\text{C} / -40 \sim +125^\circ\text{C}$	10 μA 20 μA
Output Symmetry (50% V_{DD}) 0.75 ~ 84.999 MHz 85.0 ~ 156.25 MHz	45 % ~ 55 % 40 % ~ 60 %
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	6 nS
Output Voltage (V_{OL}) (V_{OH})	10 % V_{DD} 90 % V_{DD} Min
Output Load (HCMOS)	15 pF
Start-up Time (T_S)	5 mS
Output Disable Time ¹	200 nS
Output Enable Time ¹	5 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

Frequency Stability ²	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM	-20 ~ +70	0.75 ~ 156.25
±100PPM	-40 ~ +85	0.75 ~ 156.25
±100PPM	-40 ~ +105	1.25 ~ 135.0
±100PPM	-40 ~ +125	1.25 ~ 135.0
±50PPM	-20 ~ +70	0.75 ~ 156.25
±50PPM	-40 ~ +85	0.75 ~ 156.25
±50PPM	-40 ~ +105	1.25 ~ 135.0
±50PPM	-40 ~ +125	1.25 ~ 135.0
±25PPM	-20 ~ +70	0.75 ~ 156.25
±25PPM ³	-40 ~ +85	0.75 ~ 156.25
±20PPM ³	-20 ~ +70	0.75 ~ 156.25

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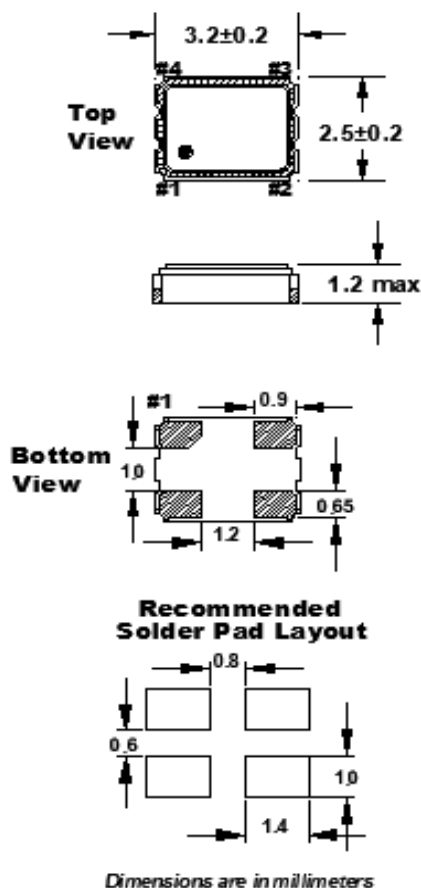
Revision Date: 12/17/2020



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DIMENSIONS / MECHANICAL SPECIFICATIONS



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)	1
Termination Finish	Au over Ni
Seal Method	Seam
Lead (Pb) Free	Yes
RoHS Compliant	Yes, no exemptions
REACH Compliant (latest version)	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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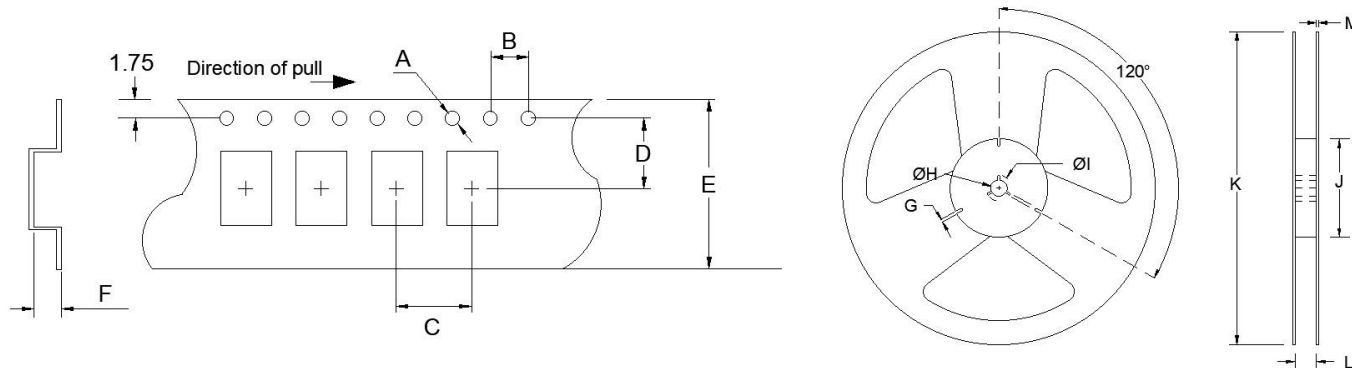
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Tape Specifications (millimeters)							Reel Specifications (millimeters)						
A	B	C	D	E	F	Reel Qty Options	G	H	I	J	K	L	M
Ø1.55	4.0	4.0	3.5	8.0	1.4	-T2 = 2,000 (default) -T1 = 1,000 -T3 = 3,000	2.0	Ø13	Ø21	Ø60	Ø180	9.0	1.2



Available Options & Part Identification*

Example: **F O3HS C B M 25.0**

F	O3HS	C	B	M	25.0
Fox	Model Number	Voltage	Stability	Operating Temperature	Frequency (MHz)
		M = 1.0V±5% K = 1.8V±5% H = 2.5V±5% C = 3.3V±10% V = 1.6V to 3.63V W = 2.25V to 3.63V	A = ±100 PPM B = ±50 PPM D = ±25 PPM E = ±20 PPM	E = -10 to +70°C F = -20 to +70°C M = -40 to +85°C P = -40 to +105°C I = -40 to +125°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}.



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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[FO3HSKDM12.288-BULK](#) [FO3HSKDM30.0-T1](#) [FO3HSKDM48.0-T1](#) [FO3HSKBM25.0-T1](#) [FO3HSKBM25.0-T2](#)
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[BULK](#) [FO3HSCBM45.0-BULK](#) [FO3HSCBM45.0-T1](#) [FO3HSCEE20.0-T1](#) [FO3HSKDM27.0-BULK](#) [FO3HSKDM30.0-](#)
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[FO3HSCBM50.0-T1](#) [FO3HSCBM66.666-T2](#) [FO3HSHAE40.0-T1](#) [FO3HSHBE25.0-BULK](#) [FO3HSHDE22.0-T2](#)
[FO3HSKDE49.152-T2](#) [FO3HSCBE22.4-BULK](#) [FO3HSCBE43.0-T1](#) [FO3HSCBM125.0-T2](#) [FO3HSCBM16.625-BULK](#)
[FO3HSCBM16.625-T2](#) [FO3HSCBM2.0-T1](#) [FO3HSCBM25.0-T1](#) [FO3HSCBM26.0-BULK](#) [FO3HSCBM28.63636-T1](#)
[FO3HSCBM33.333-T1](#) [FO3HSCBM50.0-BULK](#) [FO3HSCBM50.0-T2](#) [FO3HSCBM66.666-T1](#) [FO3HSCDE2.48906-T2](#)
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[FO3HSMEE25.0-T2](#) [FO3HSCBM40.0-T1](#) [FO3HSCBM62.5-BULK](#) [FO3HSCBM62.5-T2](#) [FO3HSCBM70.0-T2](#)
[FO3HSCBM74.25-T1](#) [FO3HSCBM8.192-BULK](#) [FO3HSCBM90.0-BULK](#) [FO3HSCDE45.1584-BULK](#) [FO3HSCDE48.0-](#)
[T2](#) [FO3HSHAE40.0-T2](#) [FO3HSHBM66.0-T2](#) [FO3HSKAM28.63636-T2](#) [FO3HSKBM27.0-T1](#) [FO3HSKDE49.152-T1](#)
[FO3HSKDM24.0-BULK](#) [FO3HSKDM50.0-T1](#) [FO3HSCBE86.4-BULK](#) [FO3HSCBE86.4-T1](#) [FO3HSCBM19.2-T1](#)