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 -40ºC to +85ºC
- Supply Voltages: 1.0V, 1.8V, 2.5V, 3.3V, Variable (1.7 ~ 3.63V)

1.0V ELECTRICAL CHARACTERISTICS

PARAMETERS	MAX (unless otherwise noted)
Frequency Range (F_O)	1.800 ~ 50.000 MHz
Storage Temperature Range (T_{STG})	-55 ~ +125°C
Supply Voltage (V_{DD})	1.0V±5%
Input Current (I_{DD}) 1.800 ~ 32.100 MHz >32.100 ~ 50.000 MHz	 2.5 mA 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}) (V_{OH})	20 % V_{DD} 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 (ºC)	Frequency Range (MHz)
±100PPM	-10 ~ +70	1.800 ~ 50.000
±100PPM	-40 ~ +85	1.800 ~ 50.000
±50PPM	-10 ~ +70	1.800 ~ 50.000
±50PPM	-40 ~ +85	1.800 ~ 50.000
±25PPM	-10 ~ +70	1.800 ~ 50.000
±25PPM[3]	-40 ~ +85	1.800 ~ 50.000
±20PPM[3]	-10 ~ +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 25C tolerance and operating temperature range

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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 >32.000 ~ 80.000 MHz >80.000 ~ 133.000 MHz	 6 mA 15 mA 20 mA
Standby Current	10 µA
Output Symmetry (50% V_{DD}) 0.625 ~ 84.999999MHz 85.000 ~ 133MHz	 45 % ~ 55 % 40 % ~ 60 %
Rise/Fall Time (20%/80% V_{DD} Levels) (T_R/T_F) 0.625 ~ 32.000 MHz >32.000 ~ 133.000 MHz	 5 nS 3.5 nS
Output Voltage (V_{OL}) (V_{OH})	20 % V_{DD} 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

[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 25C tolerance and operating temperature range

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Title / Description: O3HS SERIES STANDARD SPECIFICATIONS		
Drawing Number: O3HS-DOC-1		**Revision:** C
Part Number:		**Cage:** 61429
Draftsperson: BEC	**Approved:** MAJ	**Revision Date:** 07/29/2020

2.5V ELECTRICAL CHARACTERISTICS

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

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 2.5V

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 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 25C 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	 1.7 ~ 3.63V 2.25 ~ 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	10 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 for 3.3V

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

[1] An internal pull-up resistor from pin 1 to pin 4 allows active output if pin 1 is left open

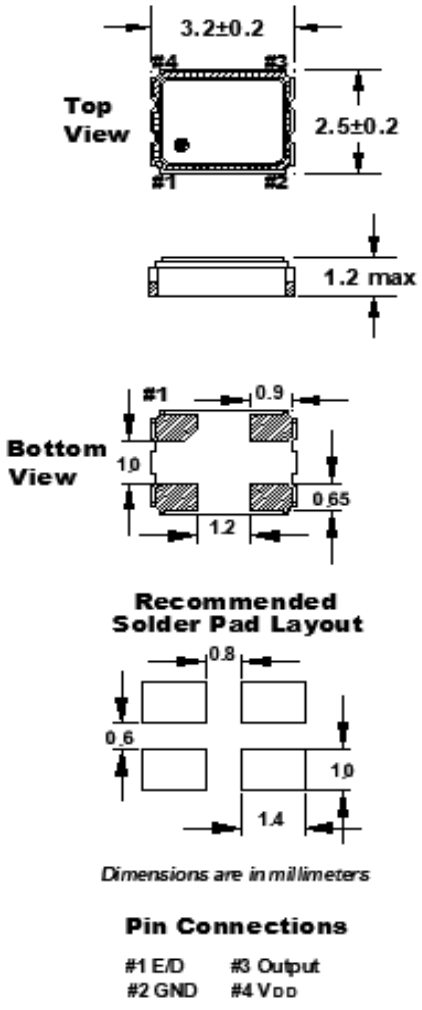
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[3] Inclusive of 25C tolerance and operating temperature range

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DIMENSIONS / MECHANICAL SPECIFICATIONS



Dimensions are in millimeters

Pin Connections

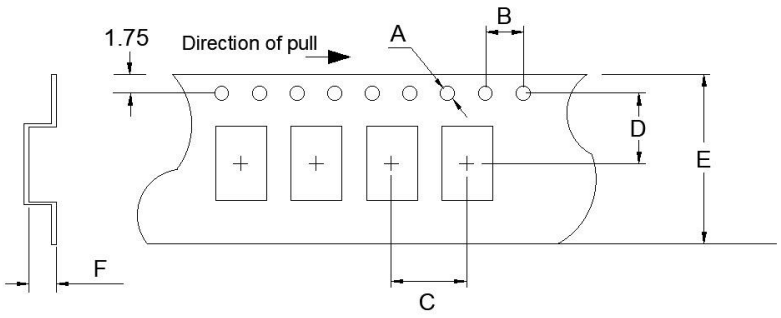
#1 E/D	#3 Output
#2 GND	#4 V_{DD}

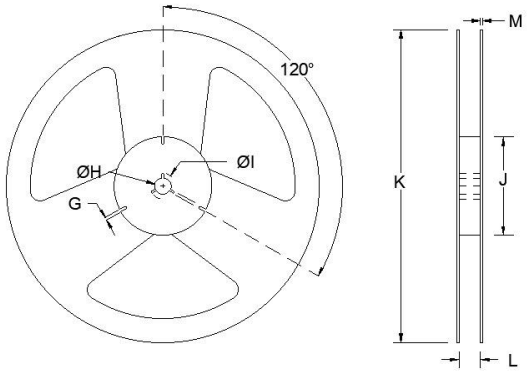
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL)	1
Termination Finish	Au over Ni
Seal Method	Seam
Lead (Pb) Free	Yes
RoHS Compliant	Yes, no exemptions
REACH Compliant (latest version)	Yes

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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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%	A= ±100 PPM	E = -10 to +70ºC	
		K = 1.8V±5%	**B = ±50 PPM**	F = -20 to +70ºC	
		H = 2.5V±5%	D = ±25 PPM	**M = -40 to +85ºC**	
		C = 3.3V±10%	E = ±20 PPM		
		V = 1.7 to 3.63V			
		W = 2.25 to 3.63V			

*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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7/29/2020 Updated Termination finish and MSL info.	**Title / Description:** O3HS SERIES STANDARD SPECIFICATIONS		
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