

Features

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

1.8V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F_o)	1.25 ~ 133.0 MHz
Temperature Range	
Storage (T_{STG})	$-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$
Supply Voltage (V_{DD})	1.8V $\pm 5\%$
Input Current (I_{DD})	
1.25 ~ 10.0MHz	2.5 mA
>10.0 ~ 20.0MHz	3.5 mA
>20.0 ~ 30.0MHz	4.0 mA
>30.0 ~ 40.0MHz	4.5 mA
>40.0 ~ 60.0MHz	6.0 mA
>60.0 ~ 100.0MHz	10.0 mA
>100.0 ~ 133.0MHz	20.0 mA
Standby Current	10 μA
Output Symmetry (50% V_{DD})	
1.25 ~ 50.0 MHz	45 % ~ 55 %
>50.0 MHz	40% ~ 60%
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	10 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	10 μS
Output Enable Time ¹	10 mS

ENABLE / DISABLE FUNCTION ¹	
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)
$\pm 100\text{PPM}^2$	-20 ~ +70	1.25 ~ 133.0
$\pm 100\text{PPM}^2$	-40 ~ +85	1.25 ~ 133.0
$\pm 50\text{PPM}^2$	-20 ~ +70	1.25 ~ 133.0
$\pm 50\text{PPM}^2$	-40 ~ +85	1.25 ~ 133.0
$\pm 25\text{PPM}^2$	-20 ~ +70	1.25 ~ 133.0
$\pm 25\text{PPM}^3$	-40 ~ +85	1.25 ~ 133.0

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 and operating temperature range.

2.5V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F_0)	1.25 ~ 170.0 MHz
Temperature Range	
Storage (T_{STG})	-55°C ~ +150°C
Supply Voltage (V_{DD})	2.5V±10%
Input Current (I_{DD})	
1.25 ~ 19.999999MHz	5 mA
20.0 ~ 39.999999MHz	9 mA
40.0 ~ 50.0MHz	11 mA
>50.0 ~ 170MHz	30 mA
Standby Current	10µA
Output Symmetry (50% V_{DD})	
1.25 ~ 50.0 MHz	45 % ~ 55 %
>50.0 MHz	40 % ~ 60 %
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	10nS
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	200 nS
Output Enable Time ¹	10 mS

ENABLE / DISABLE FUNCTION ¹	
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 ²	-20 ~ +70	1.25 ~ 170.0
±100PPM ²	-40 ~ +85	1.25 ~ 170.0
±50PPM ²	-20 ~ +70	1.25 ~ 170.0
±50PPM ²	-40 ~ +85	1.25 ~ 170.0
±25PPM ²	-20 ~ +70	1.25 ~ 170.0
±25PPM ³	-40 ~ +85	1.25 ~ 170.0

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 and operating temperature range.

3.3V ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F_o)	1.25 ~ 170.0MHz
Temperature Range	
Storage (T_{STG})	-55°C ~ +125°C
Supply Voltage (V_{DD})	3.3V±5%
Input Current (I_{DD})	
1.25 ~ 19.99999MHz	7 mA
20.0 ~ 39.99999MHz	13 mA
40.0 ~ 50.0 MHz	19 mA
>50.0 ~ 170.0 MHz	40 mA
Standby Current	10µA
Output Symmetry (50% V_{DD})	
1.25 ~ 50.0 MHz	45% ~ 55%
>50.0 MHz	40% ~ 60%
Rise/Fall Time (10%/90% V_{DD} Levels) (T_R/T_F)	10 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	200 nS
Output Enable Time ¹	10 mS
Aging (per year @ 25°C)	±5 PPM

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	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM ²	-20 ~ +70	1.25 ~ 170.0
±100PPM ²	-40 ~ +85	1.25 ~ 170.0
±50PPM ²	-20 ~ +70	1.25 ~ 170.0
±50PPM ²	-40 ~ +85	1.25 ~ 170.0
±25PPM ²	-20 ~ +70	1.25 ~ 170.0
±25PPM ³	-40 ~ +85	1.25 ~ 170.0

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 and operating temperature range.

VARIABLE VOLTAGE ELECTRICAL CHARACTERISTICS	
PARAMETERS	MAX (Unless otherwise noted)
Frequency Range (F_0)	0.75 ~ 156.25 MHz
Temperature Range	
Storage (T_{STG})	-55°C ~ +125°C
Supply Voltage (V_{DD})	
0.75 ~ 135. MHz	1.6V ~ 3.63V
>135.0 ~ 156.25MHz	2.25V ~ 3.63V
Input Current (I_{DD})	
0.75 ~ 19.999MHz	4 mA
20.0 ~ 39.999MHz	6 mA
40.0 ~ 59.999MHz	10 mA
60.0 ~ 84.999MHz	15 mA
85.0 ~ 135.0MHz	30 mA
>135.0 ~ 156.250MHz	40 mA
Standby Current	
$T_{OPR} = -40 \sim +85^\circ\text{C}$	10 μA
$T_{OPR} = -40 \sim +105^\circ\text{C} / -40 \sim +125^\circ\text{C}$	20 μA
Output Symmetry (50% V_{DD})	
0.75 ~ 80MHz	45 % ~ 55 %
80.0 ~ 135 MHz	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	200nS
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

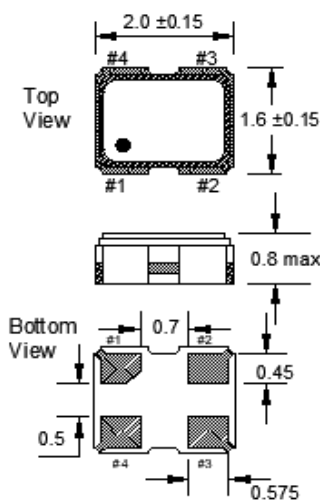
Available Options by Stability & Operating Temp For Variable Voltage		
Frequency Stability	Operating Temperature (°C)	Frequency Range (MHz)
±100PPM ²	-20 ~ +70	0.75 ~ 156.25
±100PPM ²	-40 ~ +85	0.75 ~ 156.25
±100PPM ²	-40 ~ +105	1.25 ~ 135.0
±100PPM ²	-40 ~ +125	1.25 ~ 135.0
±50PPM ²	-20 ~ +70	0.75 ~ 156.25
±50PPM ²	-40 ~ +85	0.75 ~ 156.25
±50PPM ²	-40 ~ +105	1.25 ~ 135.0
±50PPM ²	-40 ~ +125	1.25 ~ 135.0
±25PPM ²	-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

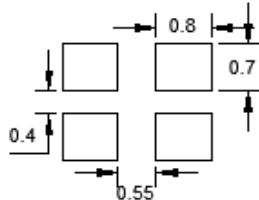
² Inclusive of 25°C tolerance, operating temperature range, input voltage change, load change, Reflow, one year aging, shock, and vibration.

² Inclusive of 25°C tolerance and operating temperature range.

DIMENSIONS / MECHANICAL SPECIFICATIONS



Recommended Solder Pad Layout



Dimensions are in millimeters.

Pin Connections

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

Note:

1, A 0.01μF capacitor should be placed between V_{DD} (Pin 4) and G_{ND} (Pin2) to minimize power supply line noise.

2, Dimensional drawing is for reference to critical specifications defined by size measurements. Certain non-critical visual attributes, such as side castellations, etc. may vary.

STANDARD SPECIFICATIONS

PARAMETERS	MAX (Unless otherwise noted)
Maximum Soldering Temp / Time	260°C / 10 Seconds x 2
Moisture Sensitivity Level (MSL)	N/A
Termination Finish	Au (0.3~1μm) over Ni (1.27~8.89μm)
Seal Method	Seam
Lead (Pb) Free	Yes
RoHS Compliant	Yes, no exemptions
REACH Compliant (latest version)	Yes

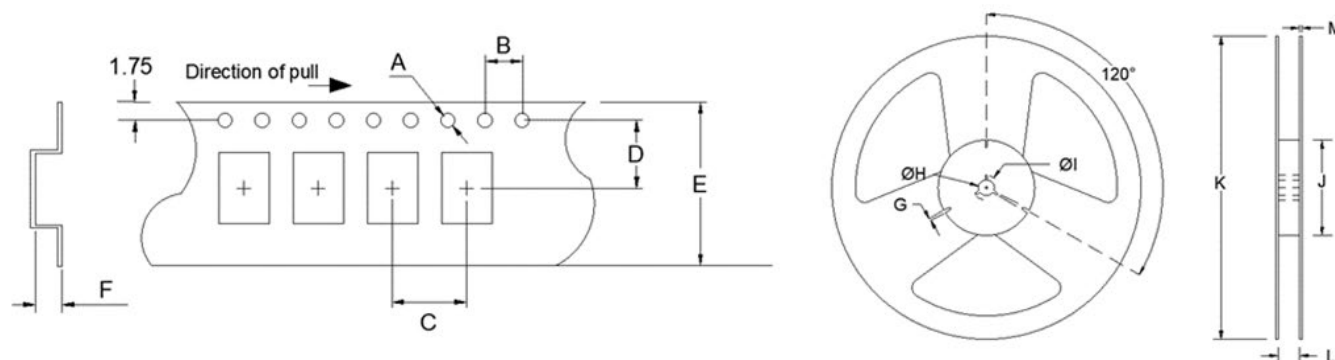
FO1HS

(Former F110, F130, F140)

2.0mm x 1.6mm
HCMOS SMD Oscillator



TAPE SPECIFICATIONS (mm)						REEL SPECIFICATIONS (mm)							
A	B	C	D	E	F	REEL QTY	G	H	I	J	K	L	M
ø1.55	4.0	4.0	3.5	8.0	1.15	-T3 = 3,000 -T2 = 2,000 -T1 = 1,000	2.0	ø13	ø21	ø60	ø180	9.0	1.7



Available Options & Part Identification*

Sample PN: **FO1HSCBM25.0-T3**

F	O1HS	C	B	M	25.0	-T3
Fox	Model Number	Voltage L = 1.8V±10% J = 2.5V±10% C = 3.3V±10% V = 1.6V to 3.63V W = 2.25V to 3.63V	Stability A = ±100 PPM B = ±50 PPM D = ±25 PPM E = ±20 PPM	Operating Temperature F = -20 to +70°C M = -40 to +85°C I = -40 to +125°C P = -40 to +105°C	Frequency (MHz)	Values Added Options Blank = Bulk T1 = 1,000 pcs T2 = 2,000 pcs T3 = 3,000 pcs

* 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}.

Reliability Test Conditions

Please contact Abracon Quality Assurance department

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ABRACON:

[FO1HSCBM20.0-T3](#) [FO1HSLAF20.0-T3](#) [FO1HSCAF50.0-T1](#) [FO1HSCBM26.0-T1](#) [FO1HSCBM48.0-T3](#)
[FO1HSLBM20.0-T1](#) [FO1HSCAM18.0-T3](#) [FO1HSCBM24.0-T3](#) [FO1HSCBM25.0-T3](#) [FO1HSLAF20.0-T1](#)
[FO1HSLBM20.0-T3](#) [FO1HSLAM31.25-T3](#) [FO1HSLBF20.0-T1](#) [FO1HSCAF50.0-T3](#) [FO1HSCAF20.0-T1](#)
[FO1HSCAF20.0-T3](#) [FO1HSCBM20.0-T1](#) [FO1HSLAM31.25-T1](#) [FO1HSCAM20.0-T1](#) [FO1HSCAM50.0-T3](#)
[FO1HSCAM20.0-T3](#) [FO1HSCAM50.0-T1](#) [FO1HSCBM26.0-T3](#) [FO1HSCAM18.0-T1](#) [FO1HSCBM24.0-T1](#)
[FO1HSCBM25.0-T1](#) [FO1HSLBF20.0-T3](#) [FO1HSCBM48.0-T1](#) [FO1HSLDF16.0-T1](#) [FO1HSCDF70.0-T1](#)
[FO1HSCDF70.0-T3](#) [FO1HSLDF16.0-T3](#) [FO1HSLDF20.0-T1](#) [FO1HSLDF20.0-T3](#) [FO1HSLBM16.368-T3](#)
[FO1HSLBM22.1184-T1](#) [FO1HSLBM22.1184-T3](#) [FO1HSLBM16.368-T1](#) [FO1HSCBM33.333-T1](#) [FO1HSCBM33.333-T3](#)
[FO1HSCBM16.368-T3](#) [FO1HSCBM22.1184-T3](#) [FO1HSCBM16.368-T1](#) [FO1HSCBF48.0-T1](#) [FO1HSCBF50.0-T1](#)
[FO1HSCBF40.0-T1](#) [FO1HSCBF25.0-T1](#) [FO1HSCBF24.0-T1](#) [FO1HSCBF16.0-T1](#) [FO1HSCBF12.0-T1](#)
[FO1HSCBM27.12-T3](#) [FO1HSCBM30.0-T3](#) [FO1HSLBM10.0-T3](#) [FO1HSLBM25.0-T3](#) [FO1HSLBM26.0-T3](#)
[FO1HSLBM27.12-T3](#) [FO1HSLBM30.0-T1](#) [FO1HSLBM33.333-T1](#) [FO1HSLBM33.333-T3](#) [FO1HSLBM37.4-T3](#)
[FO1HSLBM38.4-T3](#) [FO1HSLBM50.0-T3](#) [FO1HSCBF16.0-T3](#) [FO1HSCBM10.0-T1](#) [FO1HSCBM12.0-T1](#)
[FO1HSCBM16.0-T3](#) [FO1HSCDM25.0-T1](#) [FO1HSCDM25.0-T3](#) [FO1HSCBF12.0-T3](#) [FO1HSCBF24.0-T3](#)
[FO1HSCBF25.0-T3](#) [FO1HSCBF40.0-T3](#) [FO1HSCBF48.0-T3](#) [FO1HSCBF50.0-T3](#) [FO1HSLBM40.0-T3](#)
[FO1HSLBM48.0-T1](#) [FO1HSLBM48.0-T3](#) [FO1HSLBM50.0-T1](#) [FO1HSLBM8.0-T1](#) [FO1HSLBM8.0-T3](#)
[FO1HSLBM30.0-T3](#) [FO1HSLBM37.4-T1](#) [FO1HSLBM38.4-T1](#) [FO1HSLBM4.0-T1](#) [FO1HSLBM4.0-T3](#)
[FO1HSLBM40.0-T1](#) [FO1HSLBM22.0-T3](#) [FO1HSLBM24.0-T1](#) [FO1HSLBM24.0-T3](#) [FO1HSLBM25.0-T1](#)
[FO1HSLBM26.0-T1](#) [FO1HSLBM27.12-T1](#) [FO1HSLBM12.0-T3](#) [FO1HSLBM14.31818-T1](#) [FO1HSLBM14.31818-T3](#)
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