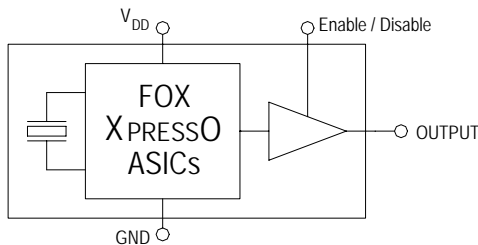


## Features

- XTREMELY Low Jitter
- Low Cost
- XPRESS Delivery
- Frequency Resolution to six decimal places
- Stabilities to  $\pm 20$  PPM
- -20 to +70°C or -40 to +85°C operating temperatures
- Tri-State Enable / Disable Feature
- Industry Standard Package, Footprint & Pin-Out
- Fully RoHS compliant
- Gold over Nickel Termination Finish
- Serial ID with Comprehensive Traceability



For more information -- Click on the drawing

## Description

The Fox XPRESSO Crystal Oscillator is a breakthrough in configurable Frequency Control Solutions. XPRESSO utilizes a family of proprietary ASICs, designed and developed by Fox, with a key focus on noise reduction technologies.

The 3<sup>rd</sup> order Delta Sigma Modulator reduces noise to the levels that are comparable to traditional Bulk Quartz and SAW oscillators. The ASICs family has ability to select the output type, input voltages, and temperature performance features.

With the XPRESS lead-time, low cost, low noise, wide frequency range, excellent ambient performance, XpressO is an excellent choice over the conventional technologies.

Finished XPRESSO parts are 100% final tested.



## Applications

- ANY application requiring an oscillator
- SONET
- Ethernet
- Storage Area Network
- Broadband Access
- Microprocessors / DSP / FPGA
- Industrial Controllers
- Test and Measurement Equipment
- Fiber Channel

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## Model Selection Guide & Fox Part Number

**STEP #1:** Customer selects the Model Description and provides to Fox Customer Service

### Model Description

**FXO - HC736R - 106.25**      Frequency (in MHz)  
*Resolutions to 6 places past the decimal point*

<b>H = HCMOS</b>	<b>C = Ceramic</b>	5 = 5 x 3.2mm	3 = 3.3 V	0 = ± 100 PPM	blank = -20°C to +70°C
L = LVDS	Q = Quartz	7 = 7 x 5mm	2 = 2.5 V	5 = ± 50 PPM	R = -40°C to +85°C
P = LVPECL				6 = ± 25 PPM	
M = LVDS (pin 2 E/D)				8 = ± 20 PPM	
Q = LVPECL (pin 2 E/D)				(-20 ~ +70°C)	
X = HCMOS (comp 2 <sup>nd</sup> Output)					

**STEP #2:** The Fox Customer Service team provides a customer specific Part Number for use on their Bill Of Materials (BOM).

**Fox Part Number** (The assigned Fox Part Number must be on the BOM – not the above Model Description)  
 (This will ensure receipt of the proper part)

**The 1<sup>st</sup> Field**

Product Code #

767 = FXO-HC5

**768 = FXO-HC7**

770 = FXO-LC5

771 = FXO-LC7

773 = FXO-PC5

774 = FXO-PC7

**768 - 106.25 - 20**

**The 2<sup>nd</sup> Field**

The Customer's Frequency

**The 3<sup>rd</sup> Field**

Fox Internally Generated Number

(If any specification changes, the last digits change)

(The same specs for a different customer also changes the last digits)

*This example, **FXO-HC736R-106.25** = HCMOS Output, Ceramic 7 x 5mm Package, 3.3V, ±25 PPM Stability, -40 to +85°C Temperature Range, at 106.25 MHz*

## Electrical Characteristics

Parameters	Symbol	Condition	Maximum Value (unless otherwise noted)
Frequency Range	F <sub>O</sub>		0.750 to 250.000 MHz
Frequency Stability <sup>1</sup>			100, 50, 25, & 20 ppm
Temperature Range	T <sub>O</sub>	Standard operating	-20°C to +70°C
	T <sub>STG</sub>	Optional operating Storage	-40°C to +85°C -55°C to +125°C
Supply Voltage	V <sub>DD</sub>	Standard	3.3 V ± 5%
Input Current (@ 15pF LOAD)	I <sub>DD</sub>	0.75 ~ 20 MHz	32 mA
		20+ ~ 50 MHz	35 mA
		50+ ~ 130 MHz	47 mA
		130+ ~ 200 MHz	55 mA
		200+ ~ 250 MHz	60 mA
Output Load	HCMOS	Standard	15 pF
		Operational To 125MHz	30 pF
Start-Up Time	T <sub>S</sub>		10 mS
Output Enable / Disable Time			100 nS
Moisture Sensitivity Level	MSL	JEDEC J-STD-20	1
Termination Finish			Au

Note 1 – Stability is inclusive of 25°C tolerance, operating temperature range, input voltage change, load change, aging, shock and vibration.

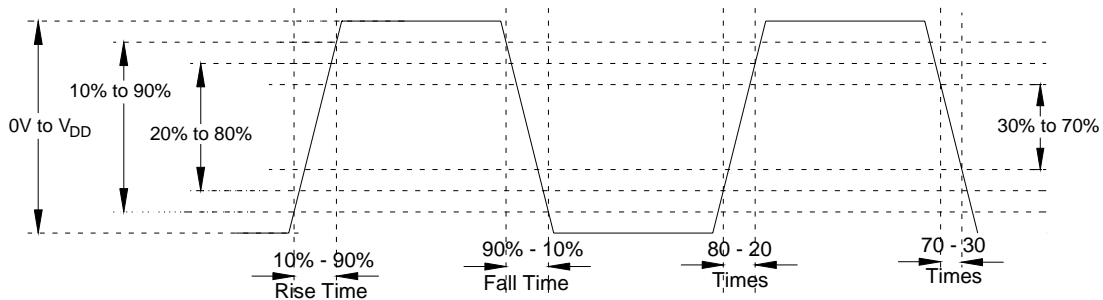
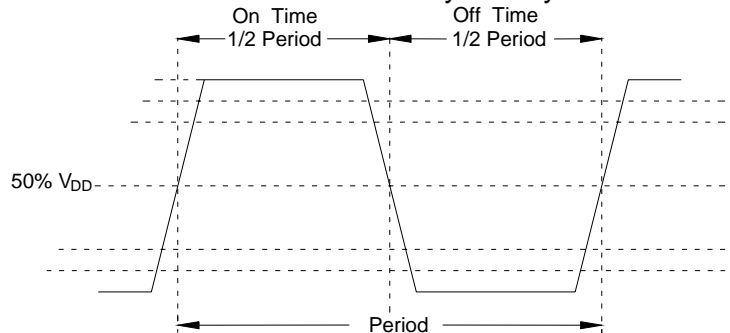
**Absolute Maximum Ratings** *(Useful life may be impaired. For user guidelines only, not tested)*

Parameters	Symbol	Condition	Maximum Value (unless otherwise noted)
Input Voltage	$V_{DD}$		-0.5V to +5.0V
Operating Temperature	$T_{AMAX}$		-55°C to +105°C
Storage Temperature	$T_{STG}$		-55°C to +125°C
Junction Temperature			150°C
ESD Sensitivity	HBM	Human Body Model	1 kV

**Output Wave Characteristics**

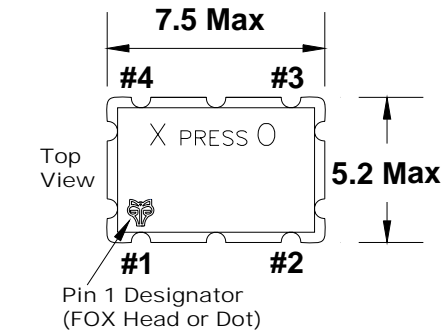
Parameters	Symbol	Condition	Maximum Value (unless otherwise noted)
Output LOW Voltage	$V_{OL}$	0.75 to 150 MHz 150+ to 250 MHz	10% $V_{DD}$ 20% $V_{DD}$
Output HIGH Voltage	$V_{OH}$	0.75 to 150 MHz 150+ to 250 MHz	90% $V_{DD}$ MIN 80% $V_{DD}$ MIN
Output Symmetry (See Drawing Below)		@ 50% $V_{DD}$ Level	45% ~ 55%
Output Enable (PIN # 1) Voltage	$V_{IH}$		> 70% $V_{DD}$
Output Disable (PIN # 1) Voltage	$V_{IL}$		< 30% $V_{DD}$
Cycle Rise Time (See Drawing Below)	$T_R$	0.75 to 150 MHz 150+ to 250 MHz	3 nS (10%~90%) 3 nS (20%~80%)
Cycle Fall Time (See Drawing Below)	$T_F$	0.75 to 150 MHz 150+ to 250 MHz	3 nS (90%~10%) 3 nS (80%~20%)

If 30% to 70% times are used, Rise and Fall times change to 1.5 nS from 0.75 to 250MHz  
 If 20% to 80% times are used, Rise and Fall times change to 2 nS from 0.75 to 150MHz

**Rise Time / Fall Time Measurements**

**Oscillator Symmetry**


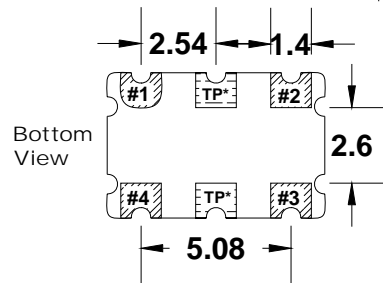
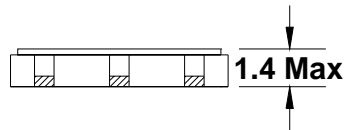
Ideally, Symmetry should be 50/50 -- Other expressions are 45/55 or 55/45

**Mechanical Dimensional Drawing & Pad Layout**

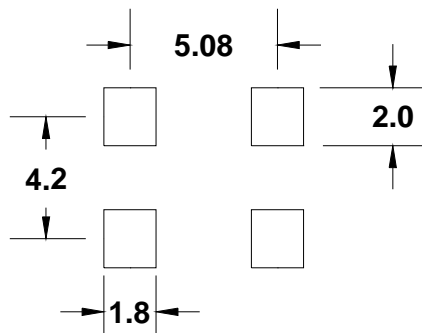


**Actual part marking is depicted.**

See **Traceability** (pg. 8) for more information



**Recommended Solder Pad Layout**



**Note:** XPRESSO HCMOS XO's are designed to fit or industry standard, 4 pad, layouts.

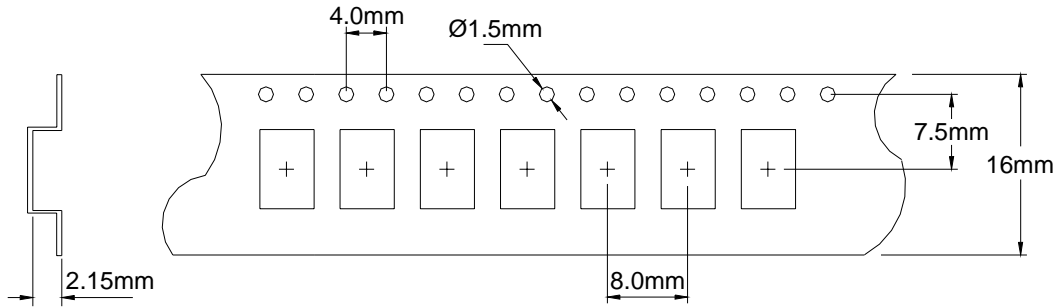
**Pin Connections**

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

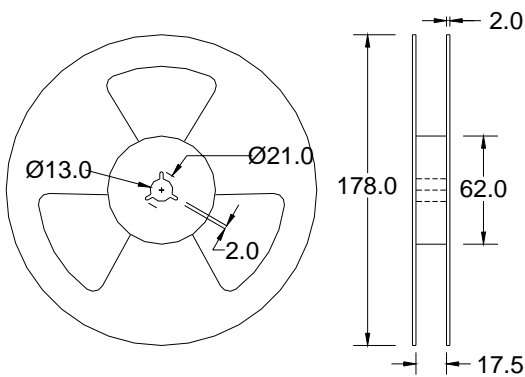
\*TP are test points and are NC

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

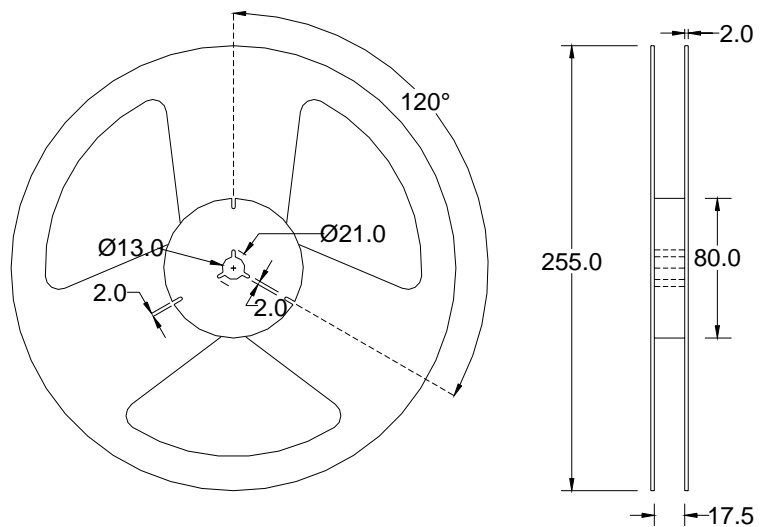
**Tape and Reel Dimensions**



**1k Reel Dimensions in mm**



**2k Reel Dimensions in mm**



**Labeling** (Reels and smaller packaging are labeled with the below)

- Fox Part Number: **768-106.25-20** →
- Quantity: **2000 pieces** →
- Description: **FXO-HC736R-106.25** →
- Date Code: **0745** →  
(YYWW 2007 45<sup>th</sup> wk)
- LOT #: **24435** →  
*If traceability should become necessary*

**SKU 768-106.25-20**  
**QTY: 2000**  
**DESC FXO-HC736R-106.25**  
**DATE CODE: 0745**  
**LOT 24435**

**Pb-Free RoHS Compliant Category (e4)**

**FOX Xpresso®**  
 Covered by one or more of listed  
 U.S. Patents: 6,664,860; 5,960,403  
 5,960,405 5,952,800 6,188,290  
 Foreign Patents:  
 China ZL 98902217.6 Mexico 232 323  
 R.S.A. 98/0866, ROC 120851,  
 Singapore 67081; 67082,  
 EP 0958652 Hong Kong HK1026079  
 Malaysia MY-118540-A  
 Philippines Patent: 1-1998-000245  
 US and Foreign Patents Pending  
 Xpresso® is a Registered Trademark of Fox Electronics

An additional identification code is contained internally if tracking should ever be necessary

