

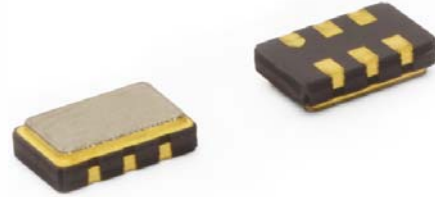


# Model 375

## HFF LVDS VCXO

### Features

- Ceramic Surface Mount Package
- Ultra-Low Phase Jitter Performance
- High Frequency Fundamental Crystal Design
- Frequency Range 100 – 250MHz \*
- +2.5V or +3.3V Operation
- Output Enable Standard
- Tape and Reel Packaging, EIA-418



Part Dimensions:  
5.0 × 3.2 × 1.2mm • 62.28mg

### Applications

- Small Cells
- Wireless Communication
- Broadband Access
- SONET/SDH/DWDM
- Base Stations
- Ethernet/GbE/SyncE
- Digital Video
- Test and Measurement

#### Standard Frequencies

- 100.00MHz
- 122.88MHz
- 125.00MHz
- 153.60MHz
- 155.52MHz
- 156.25MHz
- 166.00MHz
- 200.00MHz
- 204.80MHz
- 245.76MHz

\* Check with factory for availability.

### Description

CTS Model 375 is a low cost, small size, high performance VCXO. Employing the latest IC technology, coupled with a high frequency fundamental crystal, M375 has excellent stability and low jitter/phase noise performance.

### Ordering Information

Model	Supply Voltage	Absolute Pull Range	Frequency Stability	Temperature Range	Frequency Code [MHz]	Packaging																		
375	L	B	3	I	XXX or XXXX	T																		
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Notes:

- 1] Only available with "C" temperature range.
- 2] Refer to document 016-1454-0, Frequency Code Tables.  
3-digits for frequencies <100MHz, 4-digits for frequencies 100MHz or greater.
- 3] Frequencies ≥200MHz, APR is ±30ppm.

**Not all performance combinations and frequencies may be available.  
Contact your local CTS Representative or CTS Customer Service for availability.**

## Electrical Specifications

### Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum Supply Voltage	$V_{CC}$	-	-0.3	-	5.0	V
Maximum Control Voltage	$V_C$	-	-0.5	-	$V_{CC}$	V
Supply Voltage	$V_{CC}$	$\pm 5\%$	3.14 2.38	3.3 2.5	3.47 2.63	V
Supply Current	$I_{CC}$	LVDS Load	-	20	55	mA
Output Load	$R_L$	Between Outputs	-	100	-	Ohms
Operating Temperature	$T_A$	-	-20 -40	+25	+70 +85	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-	-40	-	+100	$^{\circ}\text{C}$

### Frequency Stability

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Frequency Range	$f_0$	-		100 - 250		MHz
Frequency Stability [Note 1]	$\Delta f/f_0$	$\pm 20\text{ppm}$ stability, $-20^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ only		20, 25 or 50		$\pm\text{ppm}$
Absolute Pull Range [Note 2]	APR	Frequencies $\geq 200\text{MHz}$ , APR is $\pm 30\text{ppm}$	50	-	-	$\pm\text{ppm}$
Aging	$\Delta f/f_{25}$	First Year @ $+25^{\circ}\text{C}$ , nominal $V_{CC}$ and $V_C$	-3	-	3	ppm

1.] Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year aging.

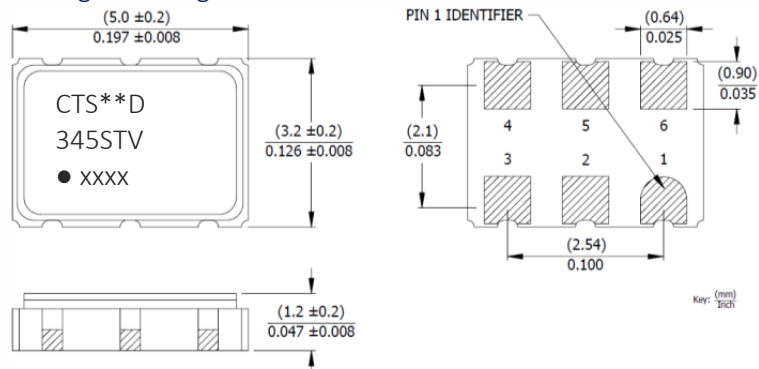
2.] Minimum guaranteed frequency shift from  $f_0$  over variations in temperature, aging, power supply and load.

### Output Parameters

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Output Type	-	-		LVDS		-
Output Voltage Levels	$V_{OH}$	LVDS Load	-	1.43	1.60	V
	$V_{OL}$	LVDS Load	0.90	1.10	-	
Differential Output Voltage	$V_{OD}$	$R_L = 100$ Ohms	247	350	454	mV
Offset Voltage	$V_{OS}$	$R_L = 100$ Ohms	1.125	1.25	1.375	V
Output Duty Cycle	SYM	@ 1.25V	45	-	55	%
Rise and Fall Time	$T_R, T_F$	@ 20%/80% Levels	-	0.4	1.0	ns
Start Up Time	$T_S$	Application of $V_{CC}$	-	5	10	ms
<b>Enable Function</b>						
Enable Input Voltage	$V_{IH}$	Pin 2 Logic '1', Output Enabled	$0.7V_{CC}$	-	-	V
Disable Input Voltage	$V_{IL}$	Pin 2 Logic '0', Output Disabled	-	-	$0.3V_{CC}$	V
Standby Current	$I_{STB}$	Pin 2 Logic '0', Output Standby	-	-	10	$\mu\text{A}$
Enable Time	$T_{PLZ}$	Pin 2 Logic '1'	-	-	20	$\mu\text{s}$
Phase Jitter, RMS	$t_{jrms}$	Bandwidth 12 kHz - 20 MHz	-	70	500	fs
Phase Noise	-	See Typical Plots	-	-	-	-

## Mechanical Specifications

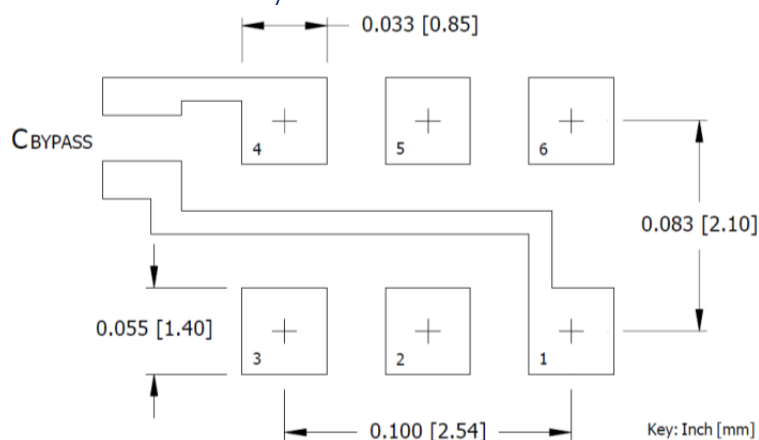
### Package Drawing



### Marking Information

- \*\* - Manufacturing Site Code.
- D - Date Code. See Table I for codes.
- ST - Frequency Stability/Temperature Code. [Refer to Ordering Information]
- V - Voltage Code. L = 3.3V, N = 2.5V
- xxxx - Frequency Code. 4-digits required for frequencies 100MHz and above. [See document 016-1454-0, Frequency Code Tables.]

### Recommended Pad Layout



### Notes

- Termination pads (e4). Barrier-plating is nickel [Ni] with gold [Au] flash plate.
- Reflow conditions per JEDEC J-STD-020;  $+260^\circ\text{C}$  maximum, 20 seconds.
- MSL = 1.

### Pin Assignments

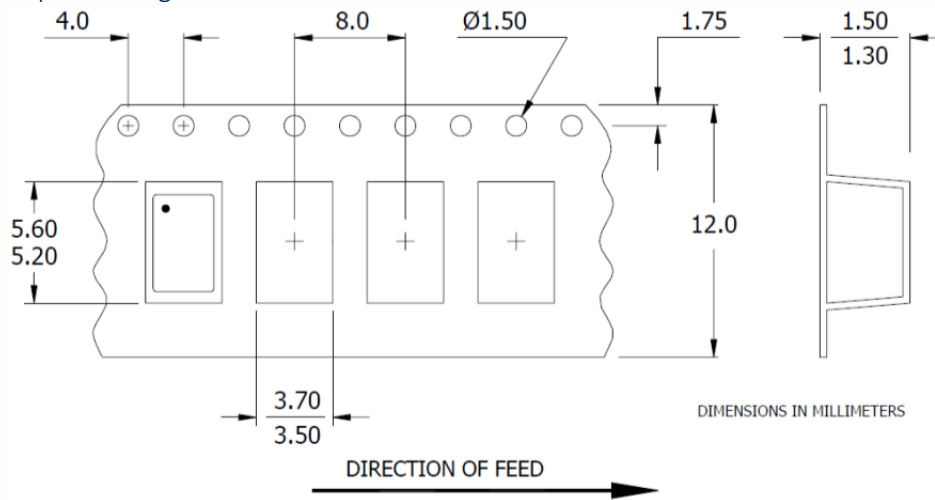
Pin	Symbol	Function
1	$V_C$	Control Voltage
2	EOH	Enable
3	GND	Circuit & Package
4	Output	RF Output
5	Output	RF Output, Complementary
6	$V_{CC}$	Supply Voltage

Table I - Date Code

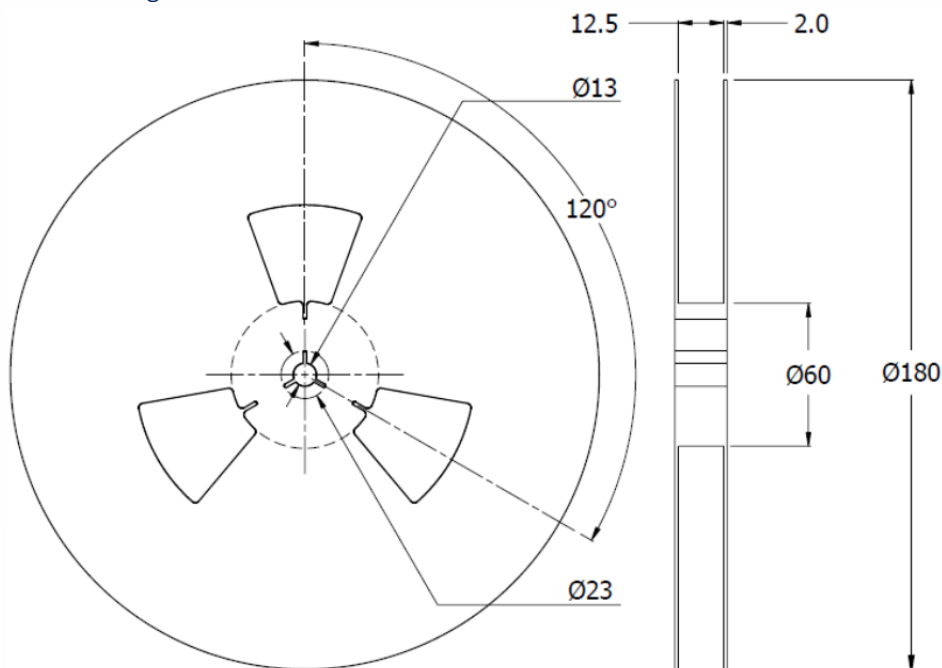
YEAR		MONTH					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2001	2005	2009	2013	2017		A	B	C	D	E	F	G	H	J	K	L	M	
2002	2006	2010	2014	2018		N	P	Q	R	S	T	U	V	W	X	Y	Z	
2003	2007	2011	2015	2019		a	b	c	d	e	f	g	h	j	k	l	m	
2004	2008	2012	2016	2020		n	p	q	r	s	t	u	v	w	x	y	z	

### Packaging - Tape and Reel

#### Tape Drawing



#### Reel Drawing



#### Notes

1. Device quantity is 1k pieces maximum per 180mm reel.
2. Complete CTS part number, frequency value and date code information must appear on reel and carton labels.