Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Model 589

Stratum 3
Temperature Compensated Crystal Oscillator
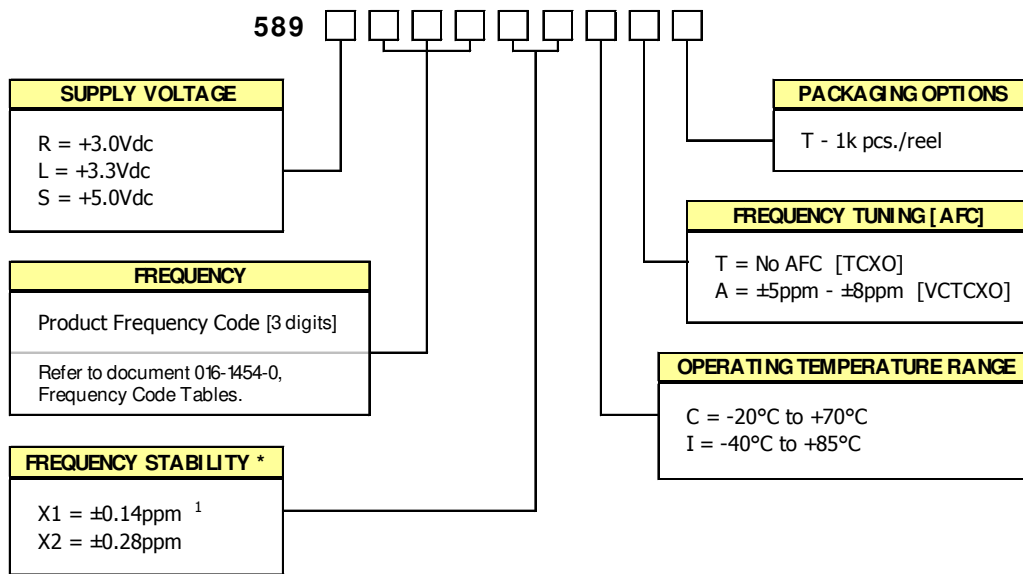
FEATURES

- **HCMOS Output**
- **Optional Voltage Control for Frequency Tuning [VCTCXO]**
- 7.0mm x 5.0mm Surface Mount Package
- Frequency Range 5 – 52 MHz
- Fundamental Crystal Design
- Operating Voltage, +3.0Vdc, +3.3Vdc or +5.0Vdc
- Overall Frequency Stability ±4.6ppm
- Operating Temperature to -40°C to +85°C
- Tape & Reel Packaging Standard, EIA-418
- **RoHS/ Green Compliant [6/ 6]**
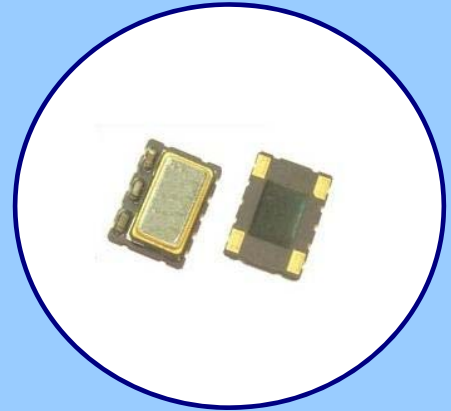
APPLICATIONS

The Model 589, a quartz based analog TCXO with HCMOS output and optional frequency tuning, is suitable for applications requiring Stratum 3 performance such as base stations, Microcells, Femtocells, 1588 and Synchronous Ethernet timing, wireless communications, test and measurement.

ORDERING INFORMATION

589 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

SUPPLY VOLTAGE
R = +3.0Vdc
L = +3.3Vdc
S = +5.0Vdc

FREQUENCY
Product Frequency Code [3 digits]
Refer to document 016-1454-0, Frequency Code Tables.

FREQUENCY STABILITY *
X1 = ±0.14ppm [1]
X2 = ±0.28ppm

* Frequency vs. Temperature Only

1] Only available with temperature range code "C".

PACKAGING OPTIONS
T - 1k pcs./reel

FREQUENCY TUNING [AFC]
T = No AFC [TCXO]
A = ±5ppm - ±8ppm [VCTCXO]

OPERATING TEMPERATURE RANGE
C = -20°C to +70°C
I = -40°C to +85°C

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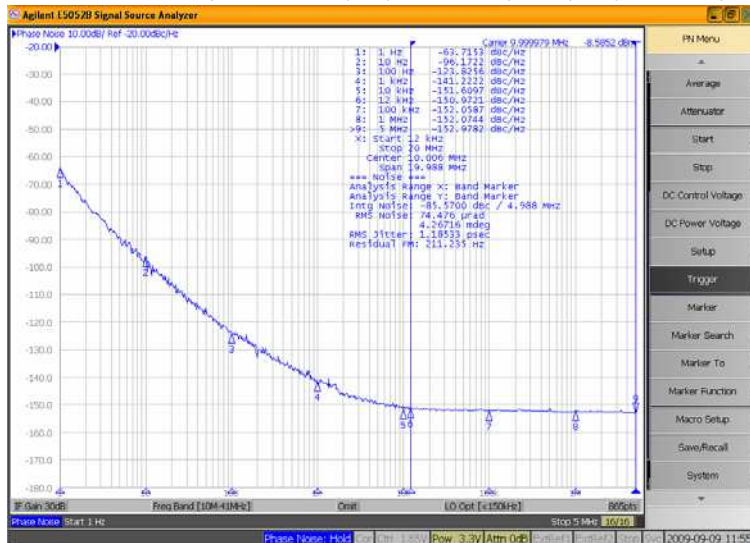
ELECTRICAL CHARACTERISTICS

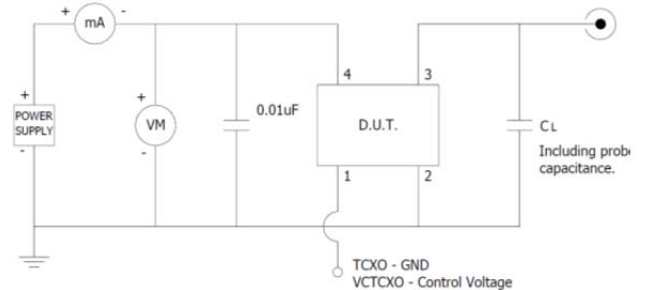|	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
ELECTRICAL PARAMETERS	Maximum Supply Voltage	V_{CC}	-	-0.6	-	6.0	V
	Maximum Control Voltage	V_C	-	-0.5	-	V_{CC}	V
	Storage Temperature	T_{STG}	-	-40	-	+100	°C

	Operating Temperature
	  Order Code 'C'
	  Order Code 'I'
		T_A	-	-20
				-40
					+25	+70
						+85
							°C

	Frequency Range	f_O	-	5	-	52	MHz

	Supply Voltage
	  Order Code 'R'
	  Order Code 'L'
	  Order Code 'S'
		V_{CC}	±5%	2.85
				3.14
				4.75
					3.0
					3.3
					5.0
						3.15
						3.47
						5.25
							V

	Supply Current	I_{CC}		-	-	6.0	mA

	Frequency Stability
	  Overall Frequency Stability
	  vs. Initial Calibration
		$\Delta f/f_O$	Reference to f_O, Including 20 years aging
			@ +25°C, at time of shipment
				-
				-
					-
					-
						4.60
						1.00
							± ppm

	vs. Operating Temperature	$\Delta f/f_{25}$	[Fmax. - Fmin.]/2, over -40°C to +85°C [Fmax. - Fmin.]/2, over -20°C to +70°C	- -	- -	0.28 0.14	
	vs. Supply Voltage		±5% change @ +25°C	-	-	0.40	
	vs. Load		±5% change	-	-	0.10	
	vs. Aging		20 years @ +40°C	-	-	2.80	
	Holdover	$\Delta f/f_O$	[Fmax. - Fmin.]/2, over 24 hours	-	-	0.32	
	Control Voltage	V_C	-	0.5	1.5	2.5	V
	Frequency Tuning [VCTCXO Only]	-	V_C = 1.5V ±1.0V, monotonic positive		5 - 8		± ppm
	V_C Input Impedance	ZV_C	-	100	-	-	kOhm
	Output Waveform		HCMOS				

	Output Voltage Levels
	  Logic '1' Level
	  Logic '0' Level
		V_{OH}
		V_{OL}
			HCMOS Load
			HCMOS Load
				0.9*V_{CC}
				-
					-
					-
						-
						0.1*V_{CC}
							V

	Output Load	C_L	-	-	-	15	pF
	Rise and Fall Time	T_R, T_F	@ 20% - 80% Levels	-	3.0	6.0	ns
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Start Up Time	T_S	-	-	-	2	ms

	Enable Function
	  Enable Input Voltage
	  Disable Input Voltage
		V_{IH}
		V_{IL}
			Pin 8 Logic '1', Output Enabled
			Pin 8 Logic '0', Output Disabled [High Imp]
				0.7*V_{CC}
				-
					-
					-
						-
						0.3*V_{CC}
							V

	Phase Noise [1]	-	-				dBc/Hz

Notes:

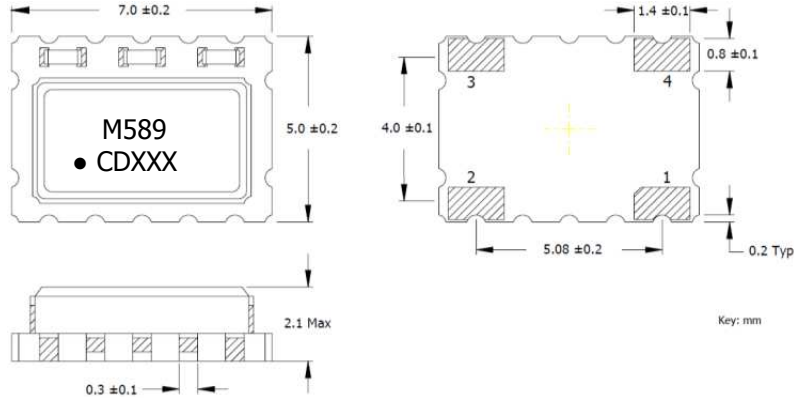1. Phase Noise performance may vary based on output frequency. See example plot at 10 MHz below.

TEST CIRCUIT – HCMOS LOAD

TCXO - GND
VCTCXO - Control Voltage

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING

M589
● CDXXX

7.0 ±0.2
5.0 ±0.2
4.0 ±0.1
2.1 Max
0.3 ±0.1

1.4 ±0.1
0.8 ±0.1
5.08 ±0.2
0.2 Typ

Key: mm

SUGGESTED SOLDER PAD GEOMETRY
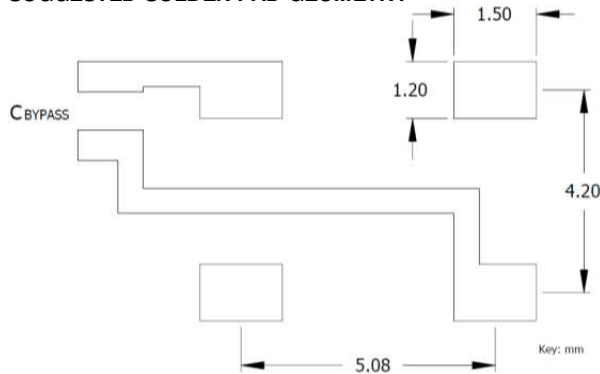

C BYPASS
1.50
1.20
4.20
5.08

Key: mm

MARKING INFORMATION
1. M589 – CTS Model Series.
2. ● – Pin 1 identifier.
3. C – CTS identifier.
4. D – Date code. See Table II for codes.
6. xxx – Frequency Code.
Refer to document 016-1454-0, Frequency Code Tables.

NOTES
1. DO NOT make connections to non-labeled pins or castellations as they may have internal connections used in the manufacturing process.
2. Termination pads (e4); barrier plating is nickel [Ni] with gold [Au] flash plate.
3. Reflow conditions per JEDEC J-STD-020, 260°C maximum.
4. MSL = 1.

D.U.T. PIN ASSIGNMENTS

PIN	SYMBOL	DESCRIPTION
1	V_C	Control Voltage – VCTCXO [Note 1]
		GND - TCXO
2	GND	Circuit & Package Ground
3	Output	HCMOS Output
4	V_{CC}	Supply Voltage

NOTES
1. Connect to ground for TCXO [no AFC] option.

TABLE II – DATE CODE

YEAR					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 INFORMATION [reference]
Device quantity is 1k pcs. maximum per 180mm reel.

4.0
8.0
Ø1.50
1.75
2.40
2.10
8.40
7.90
16.0
5.70
5.40

DIRECTION OF FEED

Dimensions in Millimeters

17.5
2.0
Ø13
120°
Ø60
Ø180
Ø23

Dimensions in Millimeters