5x7mm Surface Mount TCXO's for Cospas-Sarsat Beacons Model CSBxx Series

CONNOR WINFIELD

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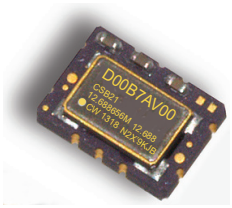
Description:

The Connor-Winfield's CSBxx Series precision TCXO's are ideally suited for the next generation of emergency beacon applications. The CSBxx Series are Surface Mount, 5x7mm, 3.3V, LVCMOS or Clipped Sinewave Temperature Compensated Crystal Oscillators (TCXO) designed for emergency beacon applications requiring tight frequency stability and low power. The data is serialized and available on-line to the customer for future reference during certification. See page 4 for instructions.



Features:

Model: CSBxx Series
3.3 Vdc Operation
Frequency Stability: ± 0.20 ppm
Mean Slope = ±0.7 ppb/min
Temperature Ranges Available:
Class I -40 to 55°C , Class II -20 to 55°C
LVCMOS or Clipped Sinewave Output
Ceramic Surface Mount Package
Tape and Reel Packaging
RoHS Compliant / Pb Free

Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Notes
Storage Temperature	-40	-	85	°C	
Supply Voltage (Vcc)	-0.5	-	6.0	Vdc	
Input Voltage	-0.5	-	Vcc+0.5	Vdc	

Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Frequency Range: (Fo)	10	-	20	MHz	
Standard Frequencies:	10.0, 12.688375, 12.688575, 12.688656, 12.68875,16.367, 20.0			MHz	
Frequency Stability					1
Calibration @ 25 °C	-0.50	-	0.50	ppm	2
Frequency vs. Temperature	-0.20	-	0.20	ppm	3
Frequency vs. Voltage	-0.10	-	0.10	ppm	4
Frequency vs. Load	-0.10	-	0.10	ppm	5
Allan Variance (tau = 100ms)	-1.00	-	1.00	ppb	
Mean Slope dF/dt					
Steady state conditions	-	-	±0.7	ppb/min	1
During and 15 min after variable temp	-	-	±1.7	ppb/min	1, 6
Residual dF from slope	-	-	±2.0	ppb	1, 6
Reflow Soldering	-1.0	-	1.0	ppm	
Aging for 1st Year	-1.0	-	1.0	ppm	
Aging for 10 Years	-3.0	-	3.0	ppm	
Operating Temperature Range:					
Model CSB1x (Class I)	-40	-	55	°C	
Model CSB2x (Class II)	-20	-	55	°C	
Supply Voltage (Vcc)	2.97	3.30	3.63	Vdc	±10%
Supply Current (Icc)					
Model CSBx1 (LVCMOS Output)	-	2.1	-	mA	
Model CSBx2 (Clipped Sine Output)	-	1.3	-	mA	
SSB Phase Noise Fo = 10.0 MHz					
@ 10Hz offset	-	-90	-	dBc/Hz	
@ 100Hz offset	-	-115	-	dBc/Hz	
@ 1KHz offset	-	-127	-	dBc/Hz	
@ 10KHz offset	-	-137	-	dBc/Hz	
@ 100KHz offset	-	-143	-	dBc/Hz	
Start-up Time	-	-	10	ms	

Models CSB11 and CSB21 LVCMOS Output Characteristics

Parameter		Minimum	Nominal	Maximum	Units	Notes
Load		-	15	-	pF	8
Voltage (High)	(Voh)	90%Vcc	-	-	Vdc	
(Low)	(Vol)	-	-	10%Vcc	Vdc	
Current (High)	(Ioh)	-	-	-4	mA	
(Low)	(Iol)	-	-	4	mA	
Duty Cycle at 50% of Vcc		45	50	55	%	
Rise / Fall Time 10% to 90%		-	-	8	ns	

Models CSB12 and CSB22 Clipped Sinewave Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Output Load Resistance	-	10K	-	Ohm	8
Output Load Capacitance	-	10	-	pF	8
Output Voltage	1.0	-	-	V pk-pk	AC Coupled

Tri-State Enable / Disable Input Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Enable Voltage (High)	70%Vcc		-	Vdc	7
Disable Voltage (Low)	-	-	30%Vcc	Vdc	

Ordering Information

CSB	1	1	- 010.0M
Package Type 5x7 mm Package C/S Beacon	Temperature Range 1 = -40 to 55°C (Class I) 2 = -20 to 55°C (Class II)	Output Type 1 = LVCMOS 2 = Clipped Sinewave	Output Frequency Frequency Format * -xxx.xM Min., -xxx.xxxxxxM Max.* Amount of numbers after the decimal point. M = MHz

Example Part Number: CSB11-010.0M

RoHS COMPLIANT

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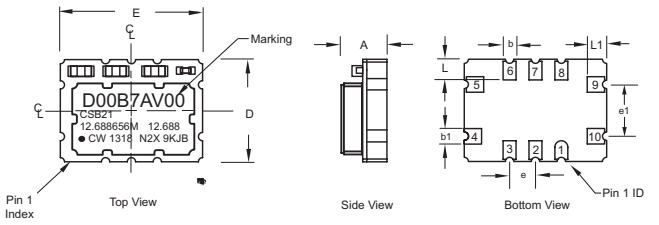
Package Characteristics

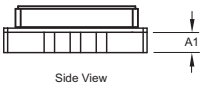
Package	Hermetically sealed ceramic package and grounded metal cover. RoHS compliant, lead free.

Notes:

1. *Medium term stability (Specified and measured according to the latest release of "Specification for Cospas-Sarat-406 MHz distress Beacon" C/S T.001. Averaged over 18 measurements in 15 minute period and following 15 minute warm up.)*
2. *Frequency referenced to Fo.*
3. *Frequency stability vs. change in temperature. [±(Fmax - Fmin)/(2*Fo)].*
4. *Vcc ±10%. Referenced to Fo measured at 3.3 Vdc*
5. *Referenced to 15 pF, ±5%.*
6. *dT/dt ≤±5°C/hour*
7. *Oscillator and compensation circuit are still active when output is disabled during tri-state mode. Output is enabled with no connection on pad 8. Supply current is ~ 1mA when output is disabled.*
8. *Attention: To achieve optimal frequency stability, and in some cases to meet the specification stated on this data sheet, it is required that the circuit connected to this TCXO output must have the equivalent input capacitance that is specified by the nominal load capacitance. Deviations from the nominal load capacitance will have a graduated effect on the stability of approximately 20 ppb per pF load difference.*

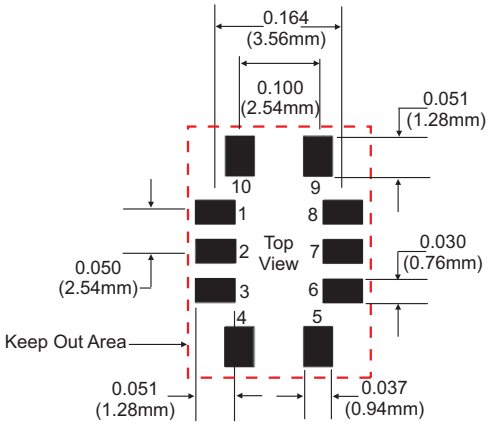
Package Layout





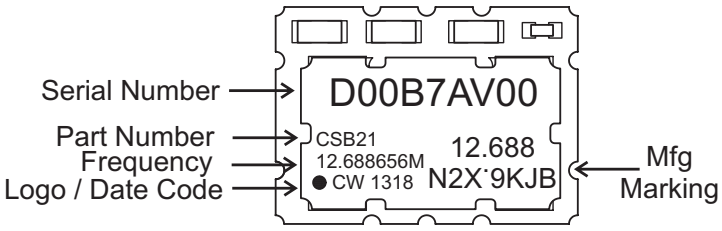
	mm			inches		
Symbol	Min	Nom.	Max.	Min	Nom.	Max.
A	1.75	1.87	2.0	0.069	0.074	0.079
D	4.85	5.0	5.15	0.191	0.197	0.203
E	6.85	7.0	7.15	0.270	0.276	0.2.82
A1	-	1.04	-	-	0.041	-
L	-	1.02	-	-	0.040	-
L1	-	0.96	-	-	0.038	-
b	-	0.63	-	-	0.025	-
b1	-	0.76	-	-	0.030	-
e	-	1.27	-	-	0.050	-
e1	-	2.54	-	-	0.100	-

Suggested Pad Layout



Keep Out Area: Do not route any traces in the keep out area. It is recommended the next layer under the keep out area is to be ground plane.

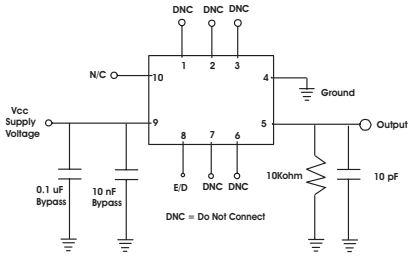
Marking Information.



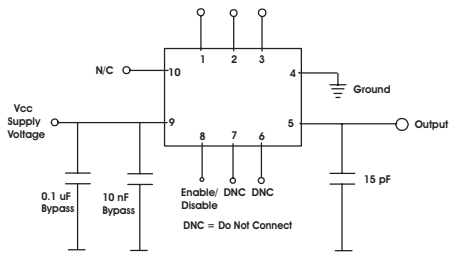
Pad Connections

1:	Do Not Connect
2:	Do Not Connect
3:	Do Not Connect
4:	Ground
5:	Output
6:	Do Not Connect
7:	Do Not Connect
8:	Enable /Disable
9:	Supply Voltage Vcc
10:	N/C

Clipped Sinewave Test Circuit



CMOS Test Circuit



Environmental Characteristics

Vibration:	Vibration per Mil Std 883E Method 2007.3 Test Condition A
Shock:	Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B.
Soldering Process;	RoHS compliant lead free. See soldering profile on page 2.

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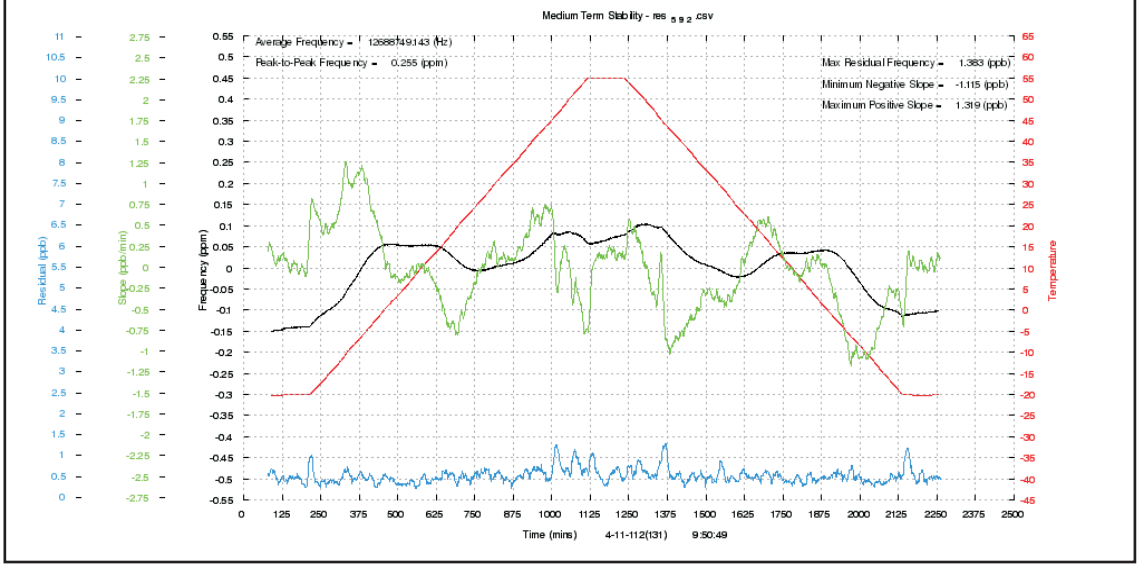
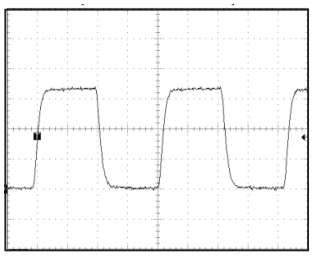
Conformance Data

CSBxx - Series Conformance Data
COSPAS standards for TCXO's

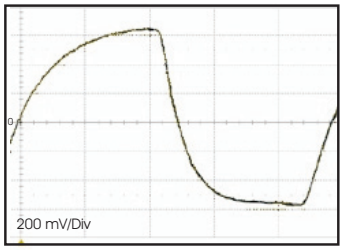


Output Waveform

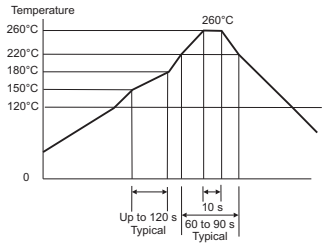
CMOS



Clipped Sinewave

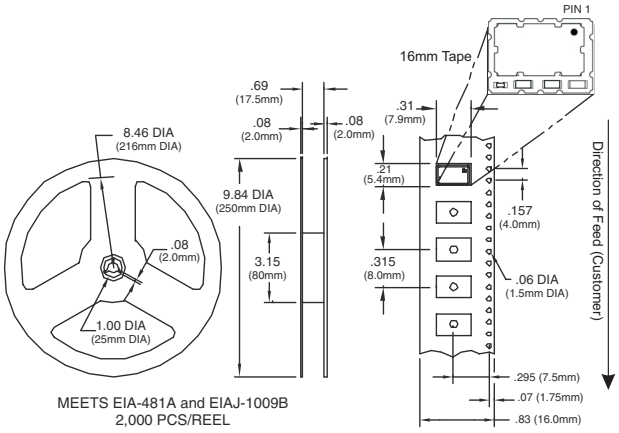


Solder Profile



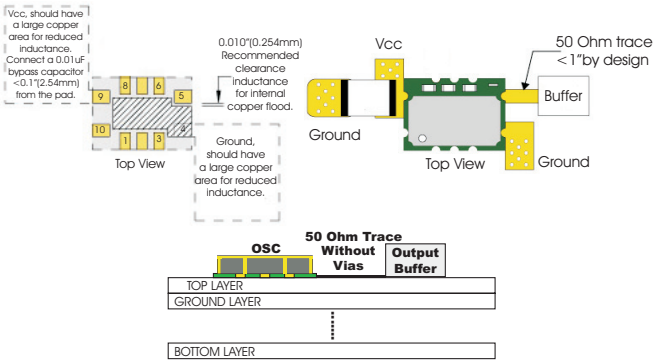
Meets IPC/JEDEC J-STD-020C

Tape and Reel Dimensions



MEETS EIA-481A and EIAJ-1009B
2,000 PCS/REEL

Design Recommendations



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Revision	**04**
Date	**22 Oct 2013**

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Test Data Availability

Serialized test data files are available on-line for all CSB-Series parts.
Please contact Connor-Winfield's Sales Department for more information.
Call: 630-851-4722 or Email: sales@conwin.com

Revision History

Revision 00	Data sheet release. 01/03/10
Revision 01	Added 12.68875 MHz to the data sheet. 01/28/11
Revision 02	Added conformance data 07/31/12
Revision 03	Updated marking, added serial number. 04/30/13
Revision 04	Added IPC package drawing, footprint and test data availability. 10/22/13.