



9920 & 9940

Hybrid Space-Qualified XO and VCXO

KEY FEATURES

- Choose between 9920 series XO or 9940 series VCXO.
- 10 MHz to 1.2 GHz Output Frequency
- MIL-PRF-38534C Class H or K Certified
- Sine Wave or PECL Outputs
- Low Aging and Phase Noise
- Radiation Hardened
- Environmentally Robust

OPTIONS

Available options for these products include:

- Output frequency
- Output format (Sine wave or PECL) and corresponding package style
- Supply Voltage (PECL output units)
- Mil-PRF-38534C Class H or K certification

Contact Symmetricom to configure a 9920- or 9940-series oscillator that will meet your specific needs.

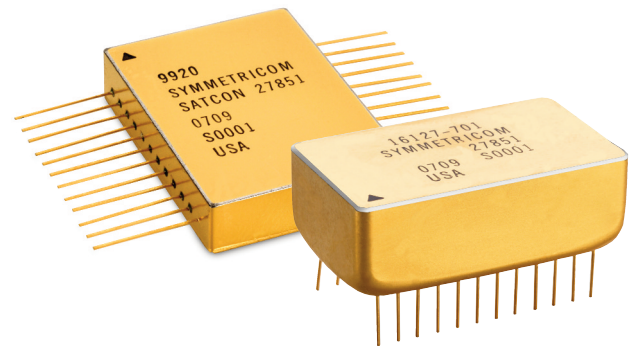
Symmetricom has a 35-year legacy of high-reliability and high-performance quartz oscillators, and these oscillators are now available in hybrid construction for applications that require minimal size, weight and power. Choose between the model 9920 Series crystal oscillator (XO) or 9940 Series voltage-controlled crystal oscillator (VCXO).

Both the 9920 and 9940 series utilize 3rd or 5th overtone AT-cut crystals in a Colpitts configuration with optional multiplication circuitry and output amplifier or driver stages. The precision crystals are contained within hermetic or vacuum sealed packages housed within the hybrid circuit package, resulting in the lowest end-of-life frequency drift possible.

These hybrid oscillators are based on heritage designs and manufacturing techniques proven for reliability in numerous space applications. The hybrids are manufactured in a MIL-PRF-38534C class K facility, in a class 100,000 clean room that provides for maximum reliability.

Output frequency, output waveform, and package style can be chosen to meet a wide variety of standard and custom applications.

The 9920 and 9940 series have demonstrated excellent performance after exposure to high levels of shock, vibration, and radiation, consistent with the rigorous requirements of space applications.



9920 & 9940 SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

	9920	9940	9922	9942
• Standard Output Frequency	50 MHz	150 MHz	600 MHz	400 MHz
• Available Output Frequency	10 MHz to 500 MHz	10 MHz to 250 MHz	10 MHz to 1.2 GHz	10 MHz to 600 MHz
• Initial Accuracy	±10 ppm	Settable to ±1 ppm	±10 ppm	Settable to ±1 ppm
• Format	Sine wave	Sine wave	PECL	PECL
• Amplitude	≥7.0 dBm	≥7.0 dBm	N/A	N/A
• Harmonic distortion	<-20 dBc	<-20 dBc	N/A	N/A
• Subharmonic distortion	<-20 dBc	<-20 dBc	N/A	N/A
• Non-harmonic distortion	<-65 dBc	<-65 dBc	<-65 dBc	<-65 dBc
• Load impedance	50 Ω	50 Ω	50 Ω	50 Ω
• VSWR	2.0:1	2.0:1	2.0:1	2.0:1

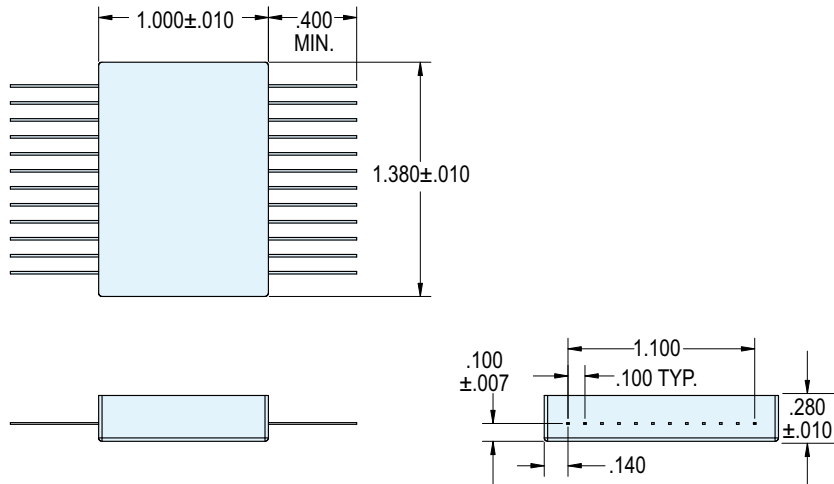
PERFORMANCE PARAMETERS

• SSB phase noise (static)				
10 Hz	-80 dBc	-56 dBc	-68 dBc	-50 dBc
100 Hz	-110 dBc	-90 dBc	-100 dBc	-80 dBc
1 kHz	-140 dBc	-128 dBc	-118 dBc	-110 dBc
10 kHz	-155 dBc	-138 dBc	-128 dBc	-130 dBc
100 kHz	-155 dBc	-142 dBc	-132 dBc	-138 dBc
• Aging				
Per year:	≤1 ppm	≤2 ppm	≤1 ppm	≤2 ppm
10 years:	≤5 ppm	≤15 ppm	≤8 ppm	≤15 ppm
• Acceleration sensitivity				
Per g, total gamma:	≤3.0E-9	≤3.0E-9	v3.0E-9	≤3.0E-9
• Frequency change vs. Temperature				
-40° C to +85° C:	±30 ppm	±40 ppm	±30 ppm	±30 ppm
-20° C to +70° C:	±20 ppm	±30 ppm	±20 ppm	±20 ppm
0° C to +50° C:	±5 ppm	±15 ppm	±10 ppm	±10 ppm
• Input Voltage				
Range:	8 - 15 Vdc	8 - 15 Vdc	+5 Vdc or +3.3 Vdc	+5 Vdc or +3.3 Vdc
Sensitivity:	<1 ppm for ±5% voltage change	<2.5 ppm for ±5% voltage change	<1 ppm for ±5% voltage change	<1 ppm for ±5% voltage change
• Steady-state power consumption:	220 mW	220 mW	375 mW	375 mW
• Electronic Frequency Control (EFC) Range	N/A	±50 ppm	N/A	±50 ppm
EFC Input	N/A	0.5 to 4.5 Vdc	N/A	0.5 to 4.5 Vdc (5V PECL); 0.3 to 3.3 Vdc (3.3V PECL)
EFC Linearity	±20%	±20%	±20%	±20%
• Load change sensitivity:	<0.1 ppm for ±5% load change	<0.1 ppm for ±5% load change	<0.1 ppm for ±5% load change	<0.1 ppm for ±5% load change

ENVIRONMENTAL & PHYSICAL SPECIFICATIONS

• Operating Temperature:	-55° C to +125° C	-55° C to +125° C	-55° C to +125° C	-55° C to +125° C
• Storage temperature:	-65° C to +125° C	-65° C to +125° C	-65° C to +125° C	-65° C to +125° C
• Random vibration				
Operating (endurance):	20 g rms	20 g rms	20 g rms	20 g rms
• Pyrotechnic shock:	500 g for 6 ms half-sine impulse	500 g for 6 ms half-sine impulse	500 g for 6 ms half-sine impulse	500 g for 6 ms half-sine impulse
• Radiation Performance:				
Total Dose:	100 kRad (Si)	100 kRad (Si)	100 kRad (Si)	100 kRad (Si)
ELDRS:	Compliant	Compliant	Compliant	Compliant
SEL:	Compliant	Compliant	Contact Factory	Contact Factory
Neutron Fluence:	Contact Factory	Contact Factory	Contact Factory	Contact Factory
Prompt Dose Rate:	Contact Factory	Contact Factory	Contact Factory	Contact Factory
• EMI/EMC Performance:	Contact Factory	Contact Factory	Contact Factory	Contact Factory
• MTBF	>20,000,000 hours	>20,000,000 hours	>20,000,000 hours	>20,000,000 hours
• Reliability specification:	MIL-HDBK-217F	MIL-HDBK-217F	MIL-HDBK-217F	MIL-HDBK-217F
• Crystal:	T05	Surface mount	Surface mount	Surface mount
• Package Style:	24-pin ddip, 0.5" profile	24-pin ddip, 0.5" profile	24-pin flatpak, 0.3" profile	24-pin flatpak, 0.3" profile
• Weight:	<30 grams	<30 grams	<30 grams	<30 grams

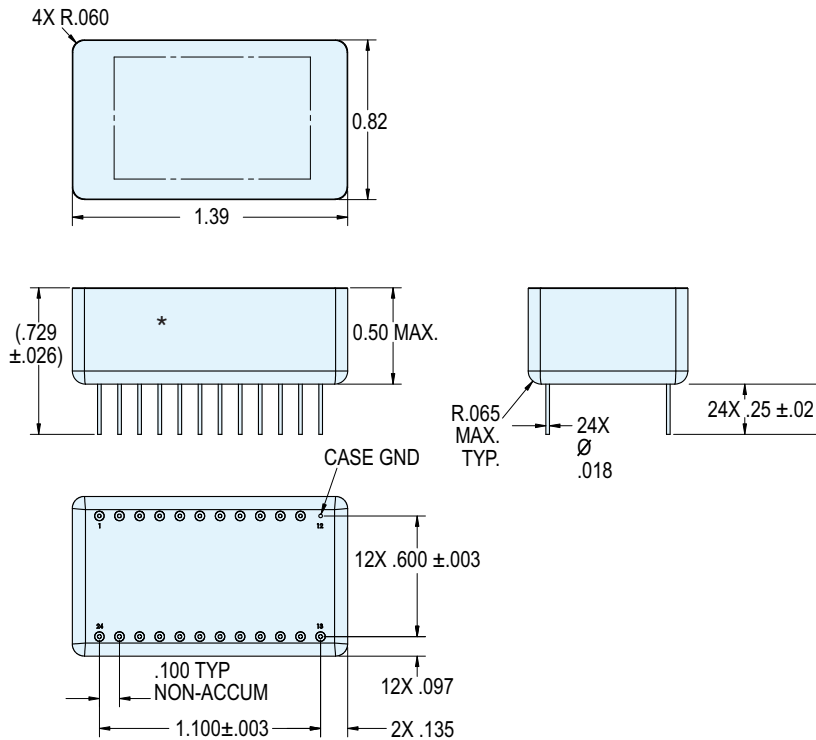
24-PIN FLATPAK OUTLINE DRAWING



24-PIN FLATPAK CONNECTION DESCRIPTIONS

PIN NO.	FUNCTION
1	VCXO OUTPUT
2	N/C
3	N/C
4	N/C
5	N/C
6	N/C
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	GROUND
13	Q
14	\bar{Q}
15	GROUND
16	N/C
17	N/C
18	N/C
19	N/C
20	N/C
21	N/C
22	N/C
23	N/C
24	+5VDC (or 3.3VDC)

24-PIN DDIP OUTLINE DRAWING



24-PIN DDIP CONNECTION DESCRIPTIONS

PIN NO.	FUNCTION
1	EXTERNAL RESISTOR OR V TUNE
2	N/C
3	N/C
4	N/C
5	N/C
6	N/C
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	CASE GND
13	RF OUT
14	N/C
15	N/C
16	N/C
17	N/C
18	N/C
19	N/C
20	N/C
21	N/C
22	N/C
23	N/C
24	8-15 VDC INPUT



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