

High precision - Squarewave HCMOS output

FEATURES

- Ultra-high precision OCXO using AT or SC-Cut crystals
- Wide frequency range: 1.25MHz to 100MHz
- Squarewave HCMOS output
- Power supply 5.0 Volts or 12.0 Volts

DESCRIPTION

OC31T series oven-controlled crystal oscillators provide ultra-high precision stability with HCMOS Ohm sine wave output. As well as standard AT-Cut crystals, SC-Cut crystals may also be specified for enhanced performance. 5.0 Volt or 12.0 Volt supply.

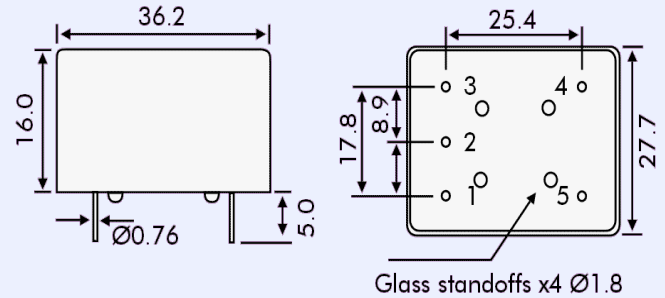
SPECIFICATION

Frequency Range:	1.25MHz to 100.0MHz
Crystal Cut	AT-Cut: Use 'A' crystal code SC-Cut: Use 'S' crystal code (See note on crystal cuts below)
Supply Voltage:	+5.0V $\pm 0.2V$ or +12.0V $\pm 0.5V$
Initial Calibration Tolerance:	$\pm 0.5\text{ppm}$ max. ($V_{\text{CON}} = +2.5V$)
Frequency Stability:	See table 1.
Ageing:	See Table 2.
Warm-up time	AT-Cut Crystal: 3 minutes max. within 0.5ppm SC-Cut Crystal: 1 minute max. within $\pm 0.1\text{ppm}$
Stability vs. Voltage Change:	$\leq 20\text{ppb}$ for $\pm 5\%$ variation
Stability vs. Load Change:	$\leq 20\text{ppb}$ for $\pm 5\%$ load change

VOLTAGE CONTROL

Freq. Deviation Range:	AT-Cut: $\pm 5.0\text{ppm}$ min. $\pm 20\text{ppm}$ max. SC-Cut: $\pm 0.5\text{ppm}$ min. $\pm 2.0\text{ppm}$ max.
Control Voltage Range:	+2.5V $\pm 0.0V$
Transfer Function:	Positive: Incr. of control voltage increases output frequency.
Input Impedance:	100k Ω min.
EFC Linearity:	$\pm 10\%$ max.
Power Dissipation @25°C:	1.2 W max. steady state 3.5 W max. at turn on.
Load (Fan out):	15pF HCMOS
Output Logic HIGH '1':	+4.5 V min.
Output Logic LOW '0':	+0.5V max.
Duty Cycle:	50% $\pm 10\%$
Rise and Fall Time:	5ns max. (20%~80% of waveform)
Reference Voltage:	+4.0V $\pm 0.3VDC$ or custom

OUTLINE & DIMENSIONS



Pin Connections

1. Voltage Control EFC
2. Reference Voltage Output
3. Supply Voltage
4. RF Output
5. Ground/case



TABLE 1. STABILITY OVER TEMPERATURE RANGE

Supply V.	+12.0 Volts		+5.0 Volts	
	AT-Cut	SC-Cut	AT-Cut	SC-Cut
0~+60°C	± 0.03	± 0.01	± 0.03	± 0.01
-20~+70°C	± 0.08	± 0.02	± 0.08	± 0.02
-40~+85°C	± 0.2	± 0.03	± 0.2	± 0.03

TABLE 2. AGEING (after 72 hours of continuous operation)

Crystal Cut	Per Day	Per Year*	10 years
AT-Cut	$\pm 5\text{ppb}$	$\pm 0.5\text{ppm}$	$\pm 3\text{ppm}$
SC-Cut	$\pm 2\text{ppb}$	$\pm 0.01\text{ppm}$	$\pm 0.5\text{ppm}$

* Ageing per year relates to first year of use.

TABLE 3. PHASE NOISE

Crystal Cut Offset	Phase Noise (dBc)				
	1Hz	10Hz	100Hz	1kHz	10kHz
AT-Cut	-75	-100	-130	-140	-150
SC-Cut	-80	-120	-140	-145	-150

PART NUMBER FORMAT

Example: OC31T5S-10.000-0.01/-20+70

OC	31	T	5	S	-	10.000	-	0.01	/	-20+70
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① ② ③ ④ ⑤ dash ⑥ dash ⑦ slash ⑧

- ① "OC" Product prefix for OCXO range
- ② "31" for OC31 package
- ③ Output waveform code "T" for HCMOS square wave
- ④ Supply voltage code "5" = +5.0 Volts
- ⑤ Crystal type, "A" = AT-Cut, "S" = SC-Cut
- ⑥ Frequency in MHz
- ⑦ Frequency stability in $\pm\text{ppm}$
- ⑧ Operating temperature range, in this case -20° to +70°C.

CRYSTAL CUT

AT-Cut = standard crystal cut, lower cost
SC-Cut = improved performance, higher cost