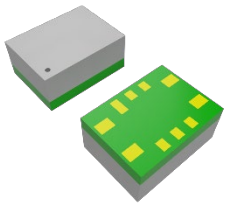
AOC75 series
HIGH-STABILITY SMD OCXO

Description

The AOC75 series is an Oven Controlled Crystal Oscillator (OCXO) offered in a 7.5mm x 5.5mm x 3.3mm four-pad SMD package. Tight frequency stability of ±30ppb over an extended operating temperature range of -40°C to +95°C is achieved using an SC-Cut, High "Q" resonator-based design. This series offers a CMOS-compatible output with a 3.3Vdc +/-5% supply voltage, common for most communication infrastructure, base station, and test and measurement equipment applications. The AOC75 series offers industry standard frequencies in the range of 10MHz to 40MHz with low long-term aging and excellent phase noise.



Features

- SC-Cut, High "Q" resonator-based design
- 3.3Vdc supply voltage
- CMOS compatible output logic
- 7.5mm x 5.5mm x 3.3mm SMD package
- Stability over temperature: ±30ppb over -40°C to +95°C and ±50ppb over -40°C to +105°C options
- Low long-term aging: ±300ppb over first year
- Industry standard frequencies available
- Excellent phase noise

Typical Applications

- Cellular infrastructure; Base stations
- Test & measurement equipment
- Switches & routers
- Time & frequency references
- Precision GPS
- Satellite Timing and Frequency
- High End Synthesizers
- Oil and Gas Exploration

Electrical Specifications [Note 1]

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	10		40	MHz	
Standard Available Frequencies	10, 19.2, 20, 25, 38.4, 38.88, 40			MHz	Contact Abracon for non-standard frequencies
Supply Voltage (Vdd)	3.135	3.3	3.465	V	
Input Power (warm-up)			2.1	W	
Input Power (steady-state)			0.8	W	
Operating Temperature Range	-40		+95	°C	***See Options***
Storage Temperature Range	-55		+105	°C	
Initial Frequency Tolerance [Note 2]			±1.5	ppm	
Frequency Stability over Operating Temperature Range [Note 3]			±30	ppb	***See Options***
Stability vs. Supply Voltage			±10	ppb	Vdd varied from 3.135V to 3.465V
Stability vs. Load			±10	ppb	5% load change
Aging per Day			±5	ppb	after 30 days of operation
Aging per Year			±300	ppb	after 30 days of operation
Allan Deviation			5.0E-11		τ=1s
Start-up Time [Note 4]			15	ms	
Output Waveform					
High-level Output Voltage (V_{OH})	2.4			V	
Low-level Output Voltage (V_{OL})			0.4	V	
Output Signal		CMOS			
Output Load		15		pF	
Rise and Fall Time (t_r, t_f)			5	ns	10% to 90% of waveform
Duty Cycle	45		55	%	@50% of waveform

Electrical Specifications *continued* [Note 1]

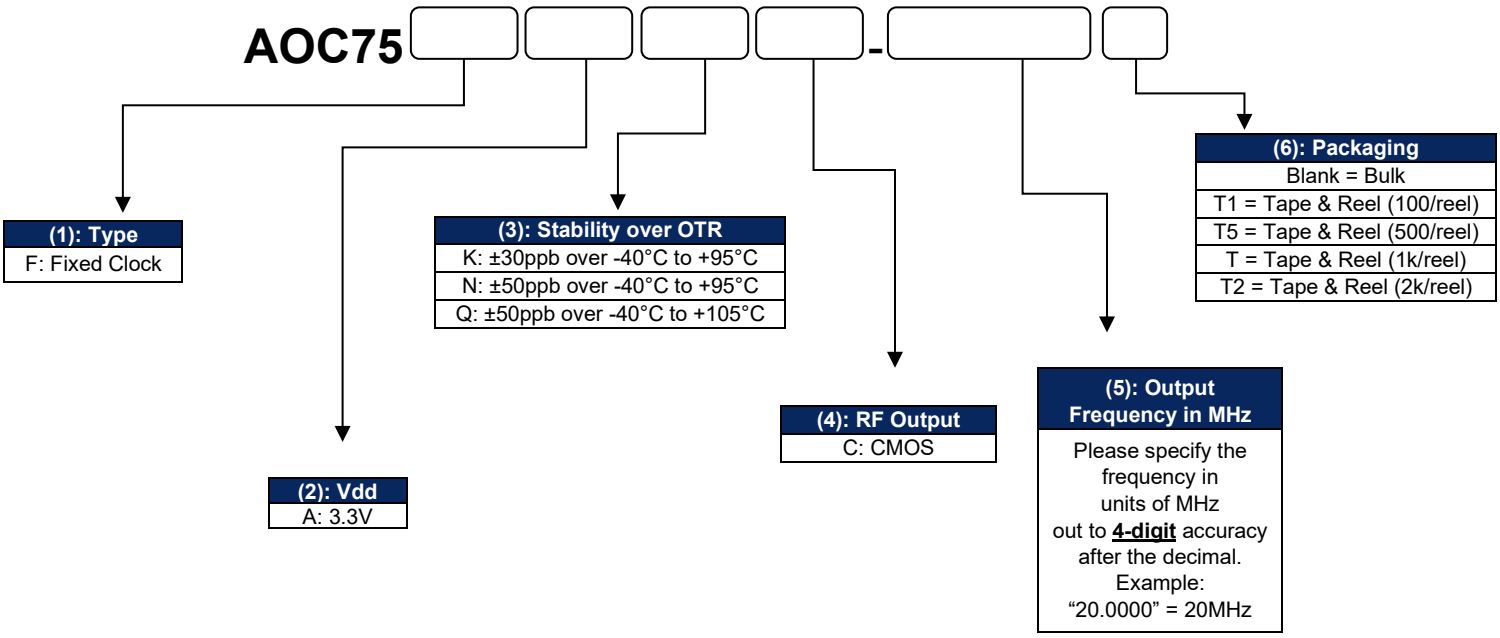
Parameters	Min.	Typ.	Max.	Units	Notes
Phase Noise (@ 10.0000MHz)		-110	-100	dBc/Hz	10Hz offset
		-140	-130		100Hz offset
		-156	-151		1kHz offset
		-161	-156		10kHz offset
		-161	-156		100kHz offset
		-161	-156		1MHz offset
Phase Noise (@ 19.2000MHz)		-110	-100	dBc/Hz	10Hz offset
		-140	-130		100Hz offset
		-156	-151		1kHz offset
		-161	-156		10kHz offset
		-161	-156		100kHz offset
		-161	-156		1MHz offset
Phase Noise (@ 20.0000MHz)		-110	-100	dBc/Hz	10Hz offset
		-140	-130		100Hz offset
		-160	-155		1kHz offset
		-163	-158		10kHz offset
		-163	-158		100kHz offset
		-163	-158		1MHz offset
Phase Noise (@ 25.0000MHz)		-110	-100	dBc/Hz	10Hz offset
		-140	-130		100Hz offset
		-156	-151		1kHz offset
		-161	-156		10kHz offset
		-161	-156		100kHz offset
		-161	-156		1MHz offset
Phase Noise (@ 38.4000MHz)		-110	-100	dBc/Hz	10Hz offset
		-140	-130		100Hz offset
		-156	-151		1kHz offset
		-161	-156		10kHz offset
		-161	-156		100kHz offset
		-161	-156		1MHz offset
Phase Noise (@ 40.0000MHz)		-110	-100	dBc/Hz	10Hz offset
		-140	-130		100Hz offset
		-156	-151		1kHz offset
		-161	-156		10kHz offset
		-161	-156		100kHz offset
		-161	-156		1MHz offset

Note 1: All measurements guaranteed at +25°C, Vdd = 3.3V, CL =15pF unless otherwise specified.
Note 2: Measured at +25°C, Vdd=3.3V within 30 days, at time of shipment.
Note 3: Varied over full operating temperature range, @ fref =(fmax +fmin)/2, Vdd=3.3V, CL=15pf, less than 2°C per minute
Note 4: Time until RF output waveform is within output logic levels, duty cycle and rise/fall time specifications.

Environmental and Mechanical

Parameters	Description
MSL	3
REACH/RoHS II	Compliant
ESD	Sensitive

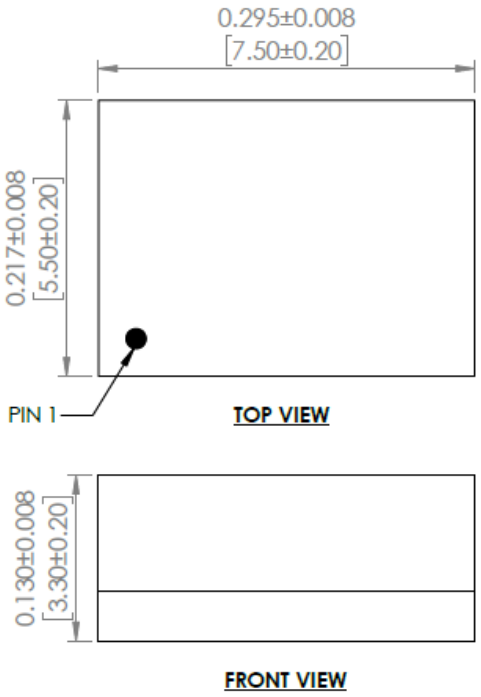
Part Identification

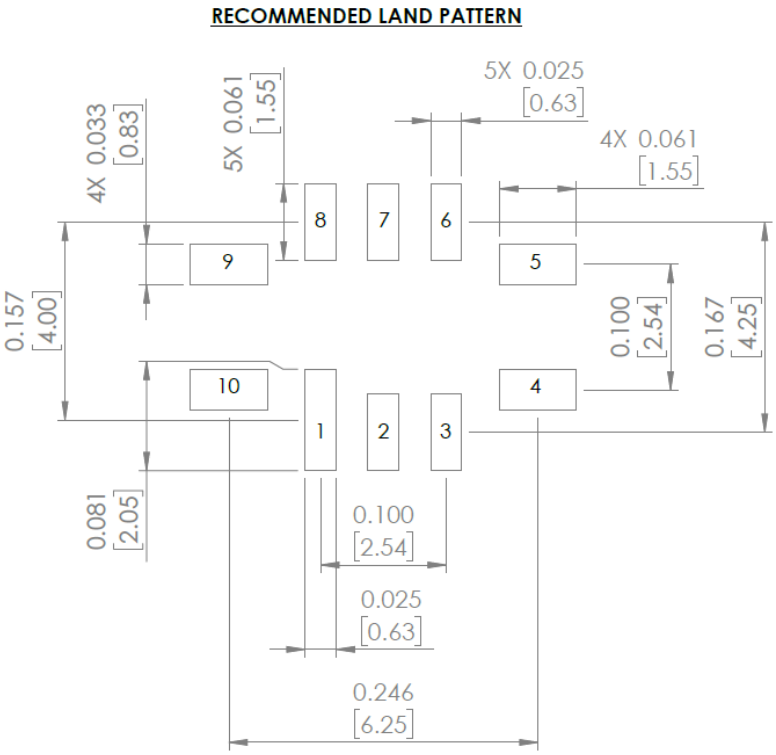


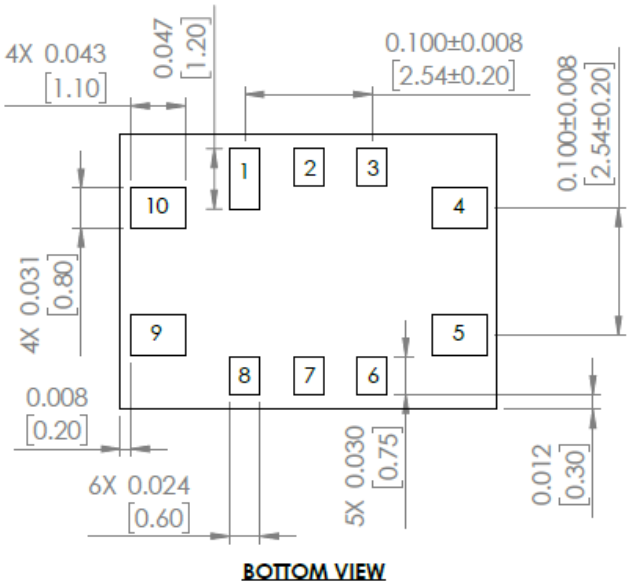
Part Number Example:

AOC75FAKC-38.4000T

Mechanical Dimensions







Pin #	Function
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	Do Not Connect
9	Supply Voltage (Vdd)
10	Do Not Connect

Dimensions: inches [mm]

Tolerance ±0.2mm without mark

Reflow Profile [JEDEC J-STD-020]

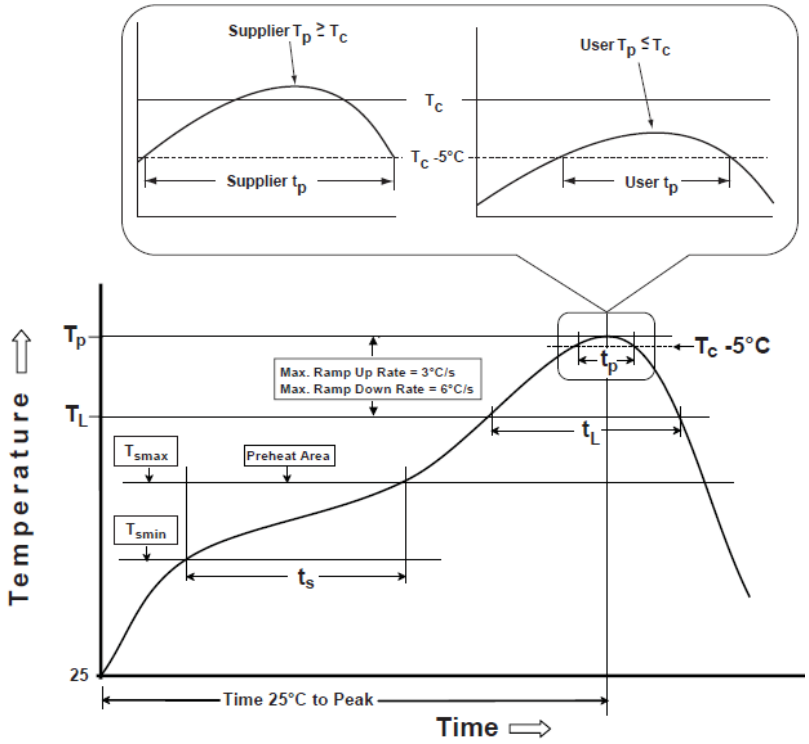


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≥350**
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	**Volume mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >2000**
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

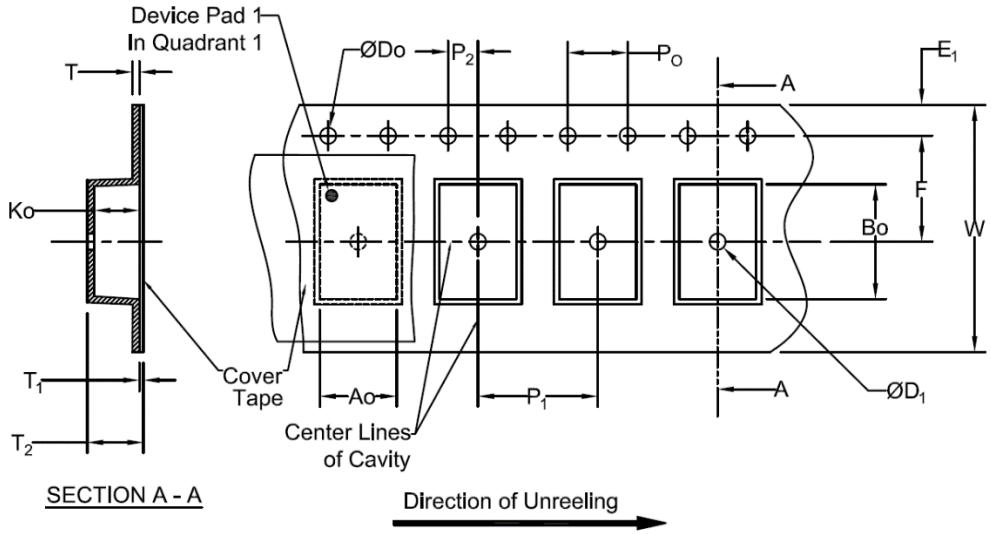
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_P)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_P)*	**see Table 1**	**see Table 2**
Time (t_p)** within 5°C of the specified classification temperature (T_C)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.

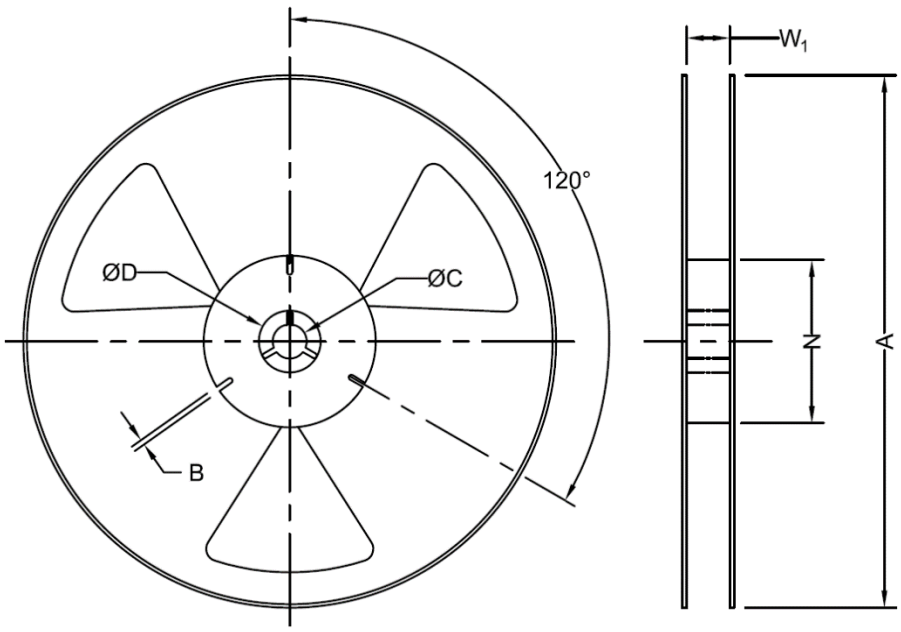
Packaging

T1 = Tape & Reel (100/reel)
T5 = Tape & Reel (500/reel)
T = Tape & Reel (1k/reel)
T2 = Tape & Reel (2k/reel)



Tape Specifications (mm)							
Width	Ao	Bo	Do	D_1 (Min)	E_1	F	Ko
16mm	*	*	1.5+0.1/-0.0	1.50	1.75±0.1	6.25	*
Width	P_1	P_2	P_0	T (Max)	T_1 (Max)	T_2 (Max)	W (Max)
16mm	8.0±0.1	2.0±0.1	4.0±0.1	0.3	0.1	4.0	16.0

*Note: Compliant to EIA-481



Reel Specifications (mm)							
Width	Qty/Reel (Max)	A	B	C	D	N	*W_1
16mm	2000	330±1.0	2.5±0.3	13.0±0.2	22±0.6	99.5±0.5	16.8+1.0/-0.2

*Note: Measured at Hub