

# HIGH-STABILITY, LOW PHASE NOISE SMD VCOCXO

**AOC2522A**

Request Samples



Check Inventory



ESD Sensitive



25.4 x 22 x 12.7 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

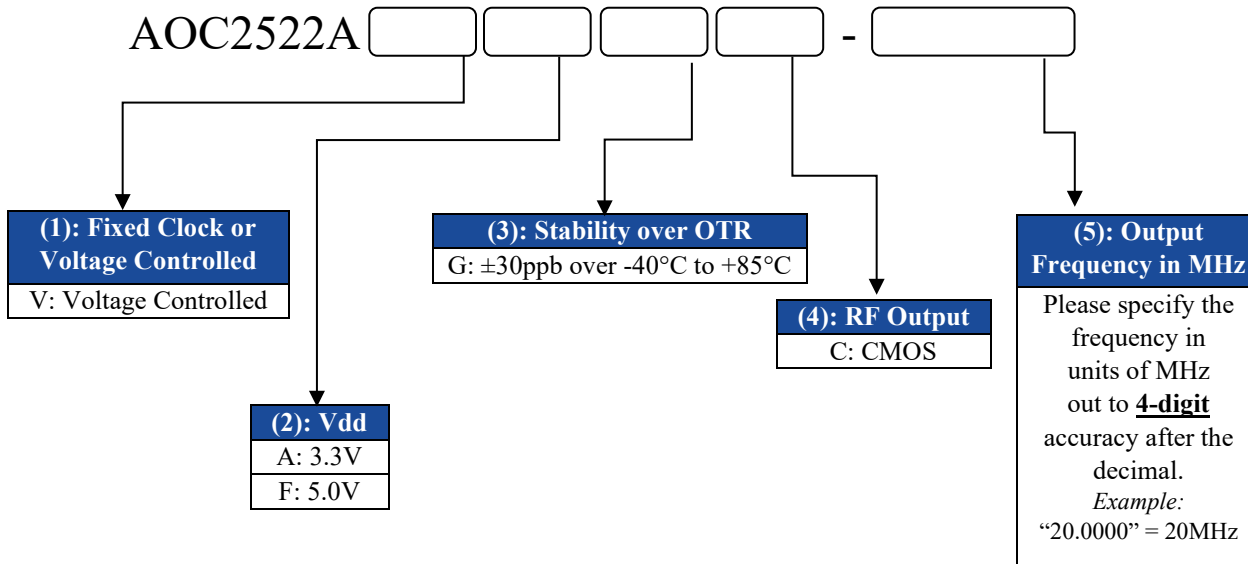
## Features

- Extremely low long-term aging:  $\pm 750$ ppb over 20 years
- Stability over temperature:  $\pm 30$ ppb over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- 10, 12.8, 16.384, 20, 38.88, 40, 100 MHz standard available frequencies
- 25.4 x 22mm, 5-pad SMD reflow-solderable package
- 3.3V & 5V Vdd supply options
- SC-Cut, High “Q” resonator-based design

## Applications

- Stratum 3 & Stratum 3E compliant
- Cellular infrastructure; Base stations
- Test & measurement equipment
- Switches & routers
- Time & frequency references
- Precision GPS

## Part Identification



### Part Number Example:

**AOC2522AVAGC-20.0000**

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## Electrical Specifications [Note 1]

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency (Fc)	10		100	MHz	
Standard Available Frequencies	10, 12.8, 16.384, 20, 38.88, 40, 100			MHz	
Operating Temperature Range	-40		+85	°C	
Storage Temperature Range	-55		+100	°C	
Supply Voltage (Vdd)	3.135	3.3	3.465	V	
	4.75	5.0	5.25		
Power Consumption (warm-up)			3.2	W	
Power Consumption (steady state @+25°C)			1.0	W	
Frequency Accuracy (calibration) <small>[Note 2]</small>		±100	±200	ppb	10MHz ≤ Fc ≤ 40MHz
		±200	±300		Fc = 100MHz
Frequency Stability over Operating Temperature Range <small>[Note 3]</small>			±30	ppb	Over -40°C to +85°C
Frequency Stability vs. Supply Voltage Change (Vdd±5%)			±10	ppb	10MHz ≤ Fc ≤ 40MHz
			±15		Fc = 100MHz
Frequency Stability vs. Load Change			±5	ppb	Load=15pF±10%
Aging per Day		±1	±2	ppb	@+25°C
Aging per Year		±50	±100	ppb	
Aging 10 Years			±500	ppb	
All-Inclusive Frequency Tolerance over 20 Year Product Life <small>[Note 4]</small>			±750	ppb	
Warm-Up Time <small>[Note 5]</small>			5	min.	
Output Signal	LVCMOS				@ Vdd=3.3V
	HCMOS				@ Vdd=5.0V
Output Load	13.5	15	16.5	pF	Output to ground
Duty Cycle	45	50	55	%	@ 50% Vdd
Output High Voltage (VOH)	VOH	0.9*Vdd		V	
Output Low Voltage (VOL)					
Rise (Tr) / Fall (Tf) Time			6	ns	@10%Vdd-90%Vdd
Center Control Voltage (Vc)		Vdd/2		V	
Control Voltage Range	0		Vdd	V	
Frequency Pullability	±0.7			ppm	
Control Port Input Impedance	100			kΩ	
EFC Linearity			10	%	
Tuning Slope	Positive				
Reference Voltage (Vref)	2.6	2.8	3.0	V	@ Vdd=3.3V
	4.3	4.5	4.7		@ Vdd=5.0V

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Parameters	Min.	Typ.	Max.	Units	Notes
Phase Noise (@ 10.0000MHz)		-88	-85	dBc/Hz	Offset @1Hz
		-120	-115		Offset @10Hz
		-137	-135		Offset @100Hz
		-146	-143		Offset @1kHz
		-150	-147		Offset @10kHz
		-152	-150		Offset @100kHz
Phase Noise (@ 20.0000MHz)		-85	-80	dBc/Hz	Offset @1Hz
		-128	-110		Offset @10Hz
		-142	-135		Offset @100Hz
		-149	-145		Offset @1kHz
		-151	-150		Offset @10kHz
		-152	-150		Offset @100kHz
Phase Noise (@ 100.0000MHz)		-60	-55	dBc/Hz	Offset @1Hz
		-93	-80		Offset @10Hz
		-125	-120		Offset @100Hz
		-146	-140		Offset @1kHz
		-158	-150		Offset @10kHz
		-158	-155		Offset @100kHz

- Note 1: Above table: All measurements at +25°C, nominal Vdd, nominal Vc, and nominal load, unless otherwise specified
- Note 2: @ +25°C; relative to carrier; initial set-tolerance frequency at time of shipment, pre-reflow
- Note 3: Over -40°C to +85°C; relative to stabilized frequency (at +25°C) after 1 hour of continuous operation, post-reflow
- Note 4: Includes stability over temperature, initial frequency accuracy (calibration), load pulling, power supply variation, and 20 years aging
- Note 5: @ +25°C; within ±100ppb of F where F is the stabilized frequency reached after 1 hour of continuous operation



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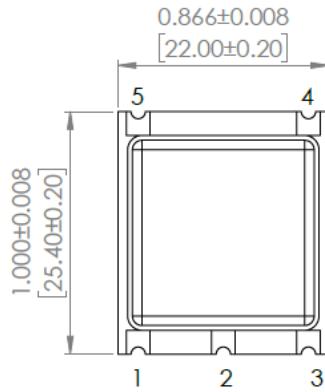


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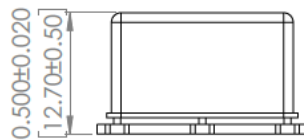


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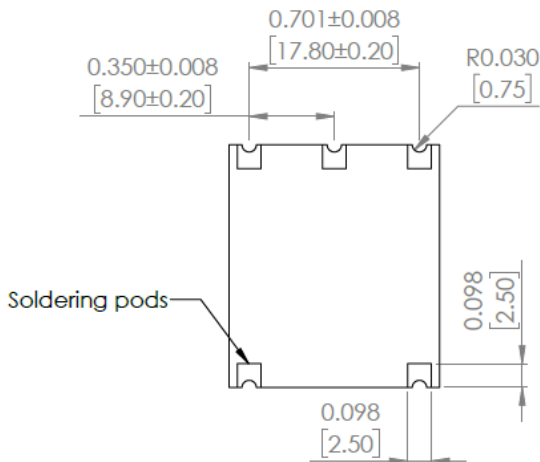
## Mechanical Dimensions



**TOP VIEW**

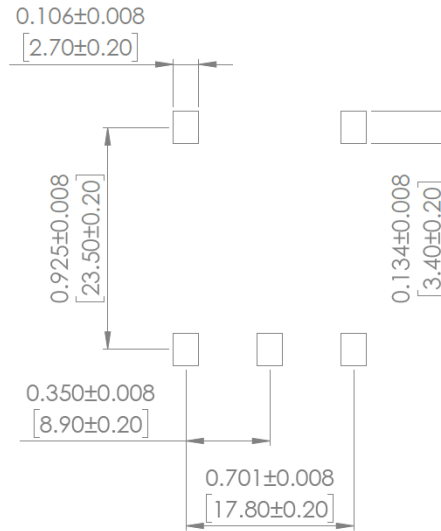


**SIDE VIEW**



**BOTTOM VIEW**

### RECOMMENDED LAND PATTERN



Pin #	Function
#1	Voltage-Control (Vc)
#2	Reference Voltage (Vref)
#3	Supply Voltage (Vdd)
#4	Output
#5	GROUND

Dimensions: inches [mm]



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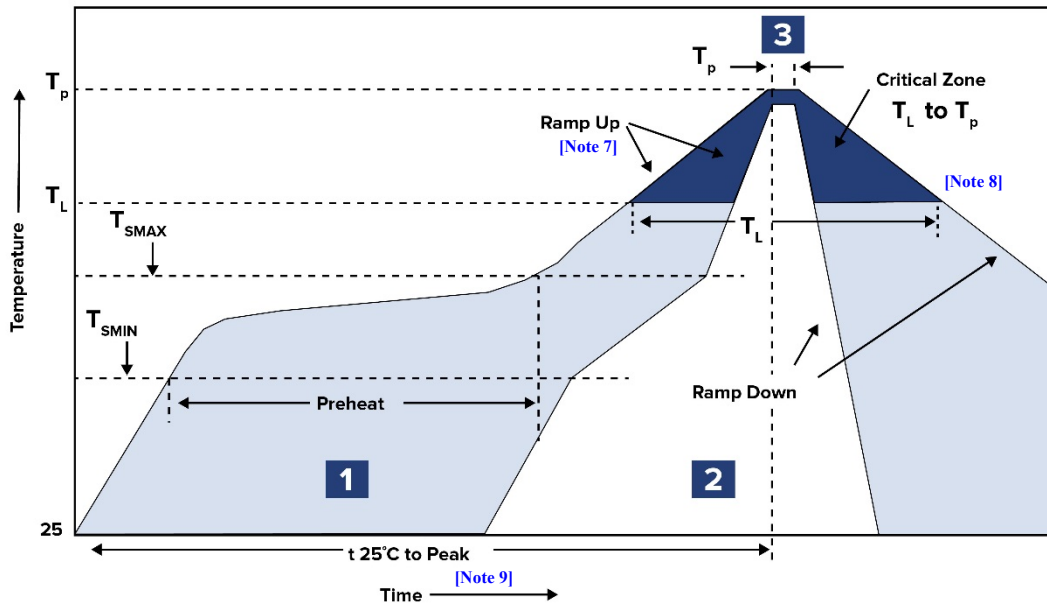


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## Reflow Profile [Note 6]



Zone	Description	Temperature	Times
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 150°C ~ 200°C	60 ~ 180 sec.
2	Reflow	$T_L$ 217°C	60 ~ 150 sec.
3	Peak heat	$T_P$ 260°C	10 sec. MAX

Note 6: Can withstand 2 times reflow; all temperatures refer to topside of the package, measured on the package body surface

Note 7: Ramp Up Rate ( $T_L \rightarrow T_P$ ) = 3°C / sec. MAX

Note 8: Ramp Down Rate ( $T_P \rightarrow T_L$ ) = 6°C / sec. MAX

Note 9: Time 25°C to Peak Temperature ( $25^\circ\text{C} \rightarrow T_P$ ) = 8 minutes MAX



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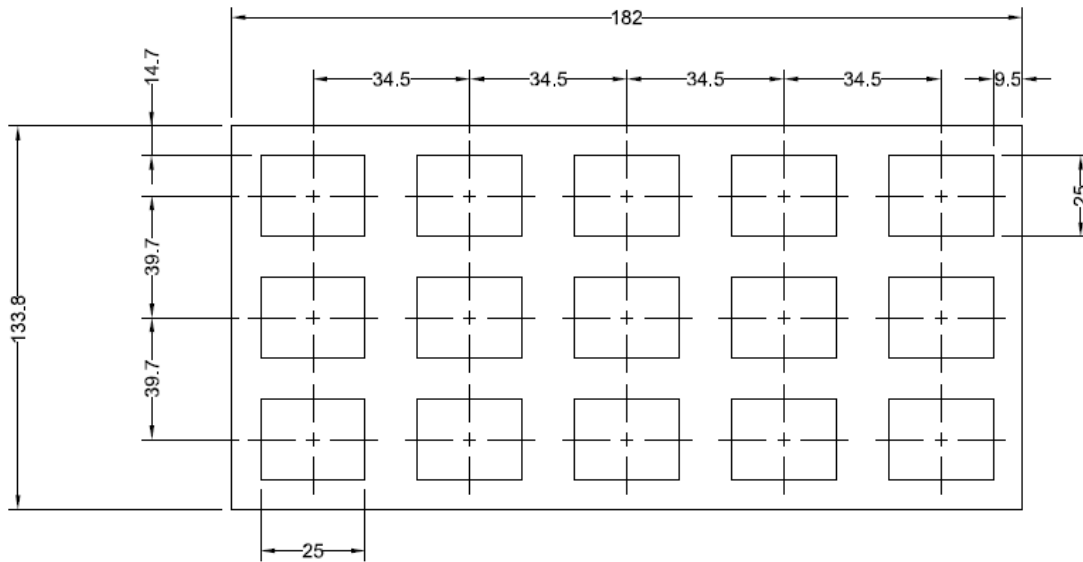
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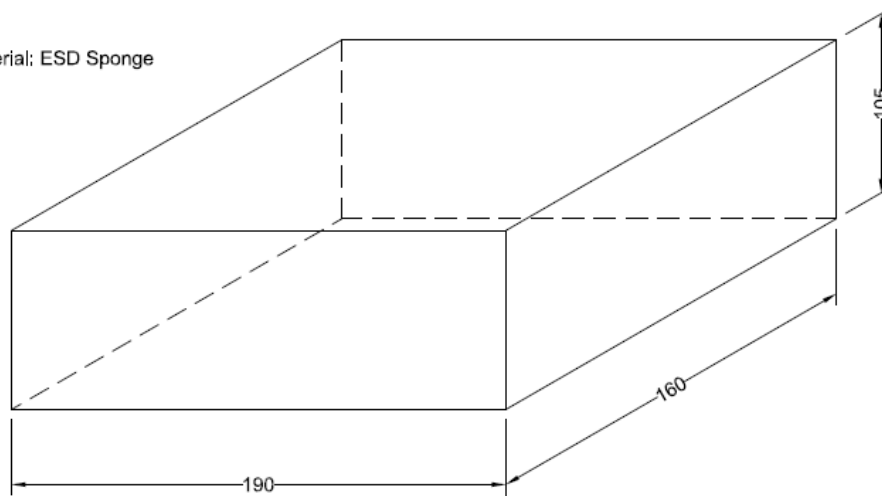
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## Packaging

(15) units per tray



Trap Material: ESD Sponge



Dimensions: mm

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