

SMD CMOS PROGRAMMABLE CRYSTAL OSCILLATOR

AP3S

Moisture Sensitivity Level (MSL) –
This product is Hermetically Sealed and
not Moisture Sensitive -MSL = N/A: Not Applicable



RoHS
Compliant



3.2 x 2.5 x 1.2mm

FEATURES:

- Performance comparable to fixed frequency oscillator
- Lowest peak-to-peak jitter
- Low supply current
- Short lead time
- Suitable for mass production
- Alternative to long lead-time XO's

For Small
Quantities,
Delivery Time
is 1-5 days

ELECTRICAL SPECIFICATIONS:

Parameters		Minimum	Typical	Maximum	Units	Notes
Frequency Range	V _{dd} = 3.3V	2.048	-----	200	MHz	
	V _{dd} = 2.5V	2.048	-----	166		
	V _{dd} = 1.8V	11	-----	110		
	V _{dd} = 1.8V	2.048	-----	10.999		In-house programming small quantity only ($< 1,000$ pcs) Contact Abracon for mass production quantity
Operating Temperature		-10	-----	+60	°C	See options
Storage Temperature		-55	-----	+150	°C	
Overall Frequency Stability*		-100	-----	+100	ppm	See options
Supply Voltage (V _{dd})	V _{dd} = 3.3V	2.97	3.30	3.63	V	Standard
	V _{dd} = 2.5V	2.25	2.50	2.75		V _{dd} option 1
	V _{dd} = 1.8V	1.62	1.80	1.98		V _{dd} option 2
Input Current	V _{dd} = 3.3V	-----	-----	10	mA	$2.048\text{ MHz} \leq F < 30\text{MHz}$
		-----	-----	15		$30\text{MHz} \leq F < 75\text{MHz}$
		-----	-----	20		$75\text{MHz} \leq F < 133\text{MHz}$
		-----	-----	22		$133\text{MHz} \leq F < 166\text{MHz}$
		-----	-----	25		$166\text{MHz} \leq F < 200\text{MHz}$
	V _{dd} = 2.5V	-----	-----	8		$2.048\text{ MHz} \leq F < 30\text{MHz}$
		-----	-----	10		$30\text{MHz} \leq F < 75\text{MHz}$
		-----	-----	15		$75\text{MHz} \leq F < 133\text{MHz}$
		-----	-----	15		$133\text{MHz} \leq F < 166\text{MHz}$
	V _{dd} = 1.8V	-----	-----	6		$2.048\text{ MHz} \leq F < 30\text{MHz}$
		-----	-----	8		$30\text{MHz} \leq F < 75\text{MHz}$
		-----	-----	2		$75\text{MHz} \leq F < 133\text{MHz}$
	Symmetry****		45	50		55
Rise and Fall Time (Tr/Tf)**	V _{dd} = 3.3V	-----	-----	3	ns	$2.048\text{ MHz} \leq F < 10\text{ MHz}$
		-----	-----	2		$10\text{ MHz} \leq F$
	V _{dd} = 2.5V	-----	-----	4		$2.048\text{ MHz} \leq F < 10\text{MHz}$
		-----	-----	3		$10\text{ MHz} \leq F$
	V _{dd} = 1.8V	-----	-----	5		$2.048\text{ MHz} \leq F < 10\text{MHz}$
		-----	-----	4		$10\text{ MHz} \leq F$
Output Load:		-----	-----	15	pF	CMOS

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Parameters		Minimum	Typical	Maximum	Units	Notes
Output Voltage	V_{OL}	-----	-----	0.33	V	$V_{dd} = 3.3V$
	V_{OH}	2.97	-----	-----		
	V_{OL}	-----	-----	0.25		$V_{dd} = 2.5V$
	V_{OH}	2.25	-----	-----		
	V_{OL}	-----	-----	0.18		$V_{dd} = 1.8V$
	V_{OH}	1.62	-----	-----		
Start-up Time		-----	-----	8.0	ms	
Tri-state function (Stand-by)		"1" ($V_{IH} > 0.7 \cdot V_{dd}$) or Open: Oscillation "0" ($V_{IH} < 0.3 \cdot V_{dd}$): Disable			-----	
Standby current		-----	-----	15	μA	
Period jitter Peak to Peak (Reference only. Please contact Abracon for each frequencies.):		-----	-----	40	ps	Standard frequencies***
		-----	-----	200	ps	Other frequencies Reference only Please contact Abracon
Aging:		-3.0	-----	+3.0	ppm	@+25°C First year

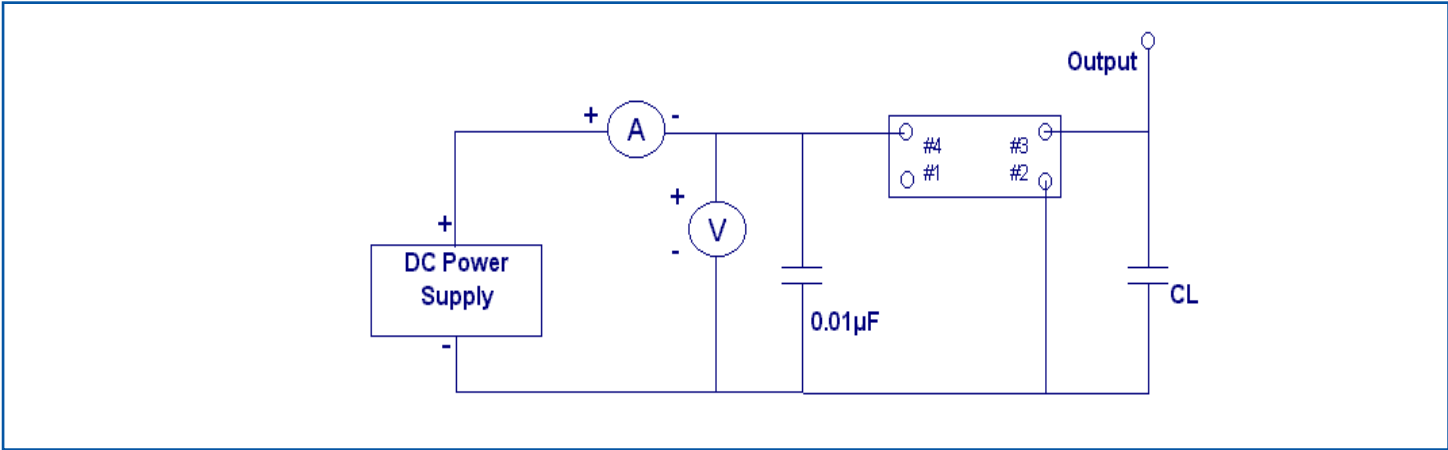
* Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging, shock, and vibration.
For ± 20 ppm, inclusive of calibration @25°C, operating temperature range, load variation, shock, and vibration.

** Transition times are measured between 10% and 90% of V_{dd} with an output load of 15 pF.

*** 4.0, 6.0, 8.0, 12.0, 13.0, 16.0 19.2, 20.0, 24.0, 26.0, 32.0, 38.4, and 40.0MHz

**** Only 40/60% is available for certain frequencies. Please contact Abracon when ordering.

TEST CIRCUIT:



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OPTIONS & PART IDENTIFICATION:

AP3S - MHz - -

Supply Voltage	Frequency in MHz	Operating Temp.	Overall Freq. Stability	Tri-state pin	Packaging
*Blank: 3.3V	Please specify the frequency in MHz. e.g. 14.31818MHz	I: 0°C ~ +50°C	J(****): ±20ppm	**Blank: OE	Blank: Bulk
1: 2.5V		E: -20°C ~ +70°C	R: ±25ppm	***B: Power Down	T: Tape & Reel (1k/reel)
2: 1.8V		F: -30°C ~ +70°C	K: ±30ppm		T3: Tape & Reel (3k/reel)
		N: -30°C ~ +85°C	C: ±50ppm		
		L: -40°C ~ +85°C			

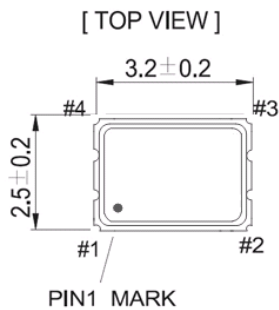
* 3.3V is standard

** OE: Tri-state the output buffer

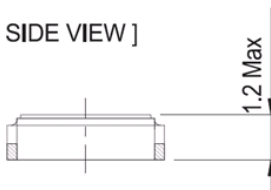
*** PDB: Tri-state the output buffer and shut off the oscillator, <10µA when PDB enabled.

**** Available for -10 to +60°C, I, or E temp options only. Contact ABRACON for EJ or LR options. (Availability limited)

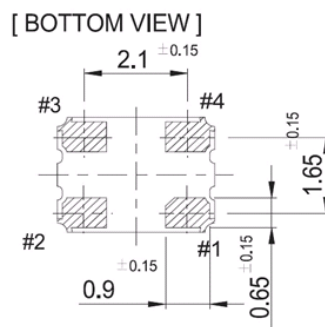
OUTLINE DRAWING:



[SIDE VIEW]



UNIT : mm

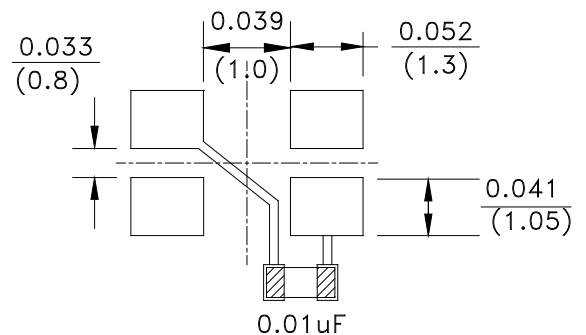


Pin	Function
1	Tri-State
2	GND/Case
3	Output
4	Vdd

*Note 1

- Do not leave Pin 1 (Tri-State) floating
- If Pin 1 (Tri-State) is not utilized for toggling, it must be tied to Vdd (logic 1)

Recommended land pattern

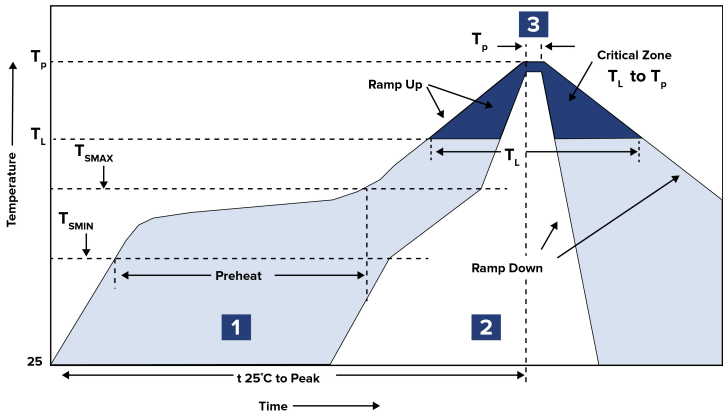


*Note 2

Recommend using an approximately 0.01µF bypass capacitor between PIN 2 and 4.

Dimensions: inches (mm)

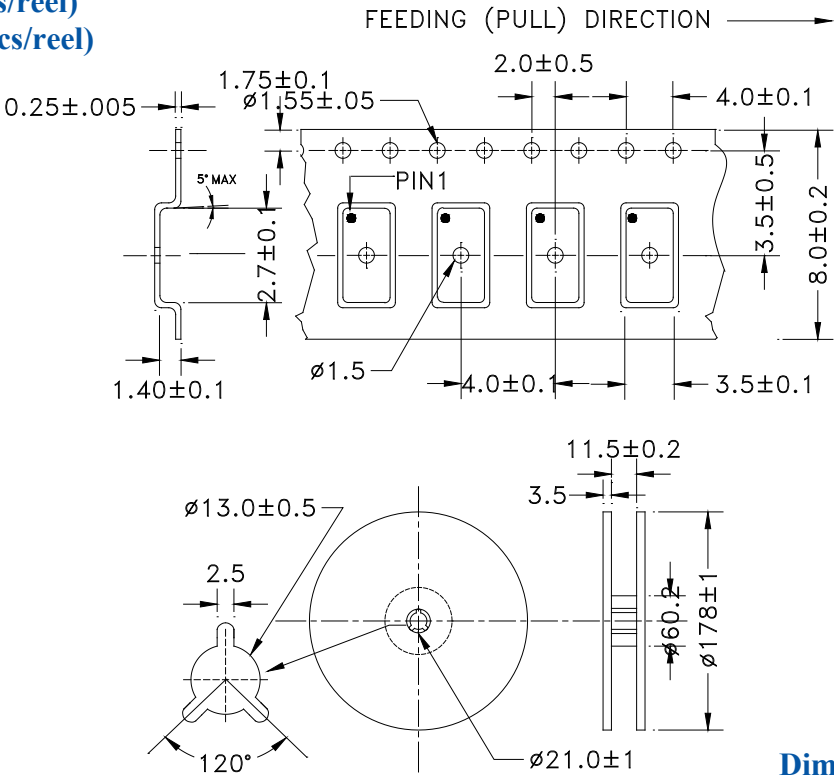
REFLOW PROFILE



Zone	Description	Temperature	Times
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 150°C ~ 180°C	60 ~ 120 sec.
2	Reflow	T_L 230°C	30 ~ 40 sec.
3	Peak Heat	T_P 260±5°C	10 sec. MAX

TAPE & REEL:

T= Tape and reel (1,000pcs/reel)
T3= Tape and reel (3,000pcs/reel)



Dimensions: mm