



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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SMD CMOS PROGRAMMABLE CRYSTAL OSCILLATOR



AP2S

2.5 x 2.0 x 0.9mm

AP2S

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



RoHS
Compliant

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	In-house programming small quantity only (< 1,000pcs) Contact Abracon for mass production quantity
	V _{dd} = 2.5V	2.048	-----	166		
	V _{dd} = 1.8V	11	-----	110		
	V _{dd} = 1.8V	2.048	-----	10.999		
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 MHz ≤ F < 30 MHz
		-----	-----	15		30 MHz ≤ F < 75 MHz
		-----	-----	20		75 MHz ≤ F < 133MHz
		-----	-----	22		133 MHz ≤ F < 166MHz
		-----	-----	25		166 MHz ≤ F < 200MHz
	V _{dd} = 2.5V	-----	-----	8		2.048 MHz ≤ F < 30MHz
		-----	-----	10		30MHz ≤ F < 75MHz
		-----	-----	15		75MHz ≤ F < 133MHz
		-----	-----	15		133MHz ≤ F < 166MHz
	V _{dd} = 1.8V	-----	-----	6		2.048 MHz ≤ F < 30MHz
		-----	-----	8		30MHz ≤ F < 75MHz
		-----	-----	2		75MHz ≤ F < 133MHz
Symmetry****		45	50	55	%	@ 1/2 V _{dd}
Rise and Fall Time (Tr/Tf)**	V _{dd} = 3.3V	-----	-----	3	ns	2.048 MHz ≤ F ≤ 10 MHz
		-----	-----	2		10 MHz ≤ F 200 MHz
	V _{dd} = 2.5V	-----	-----	4		2.048 MHz ≤ F ≤ 10 MHz
		-----	-----	3		10 MHz ≤ F 166 MHz
	V _{dd} = 1.8V	-----	-----	5		2.048 MHz ≤ F ≤ 10 MHz
		-----	-----	4		10 MHz ≤ F 110 MHz
Output Load:		-----	-----	15	pF	CMOS



ELECTRICAL SPECIFICATIONS:

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	$V_{dd} = 2.5V$
	V_{OH}	2.25	-----	-----		
	V_{OL}	-----	-----	0.18	V	$V_{dd} = 1.8V$
	V_{OH}	1.62	-----	-----		
Start-up Time	-----	-----	2.0	ms		
Tri-state function (Stand-by)	"1" ($V_{IH} > 0.7 * V_{dd}$) or Open: Oscillation "0" ($V_{IH} < 0.3 * V_{dd}$): 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.

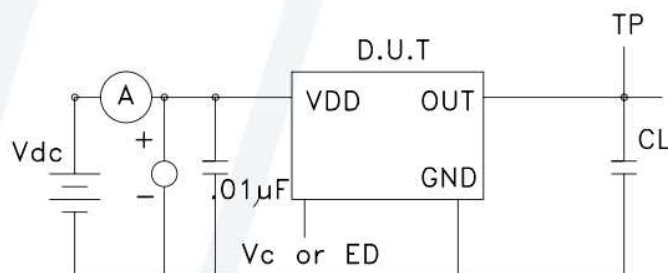
For ± 20 ppm, inclusive of calibration @25°C, operating temperature range, load variation, shock, and vibration.

** 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:



$CL = 15pF$ (including probe capacitance)

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2.5 x 2.0 x 0.9mm

AP2S



RoHS
Compliant

OPTIONS & PART IDENTIFICATION:

AP2S - 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			

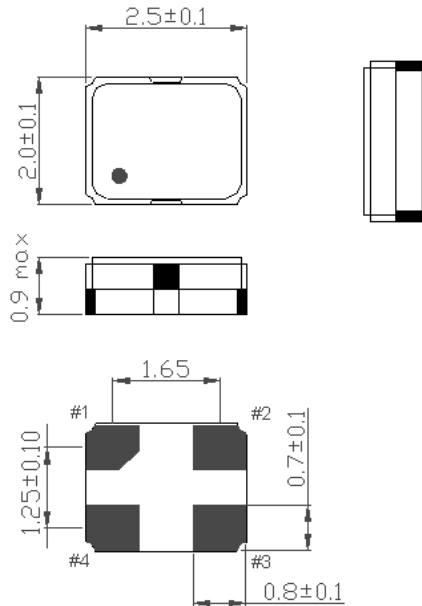
* 3.3V is standard

** OE: Tri-state the output buffer

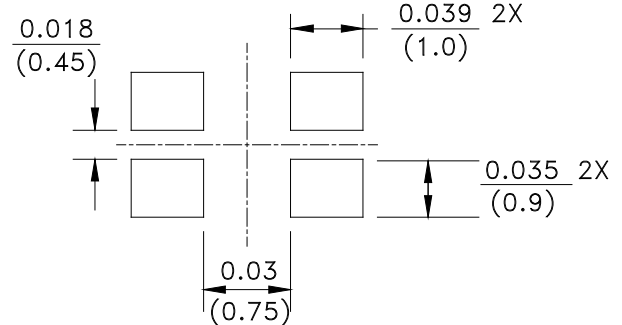
*** PDB: Tri-state the output buffer and shut off the oscillator, <10µA when PDB enabled.

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

OUTLINE DRAWING:



Recommended land pattern



*Note 2

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

Pin	Function
1	Tri-State
2	GND/Case
3	Output
4	V _{dd}

*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 V_{dd} (logic 1)

Dimensions: inches (mm)

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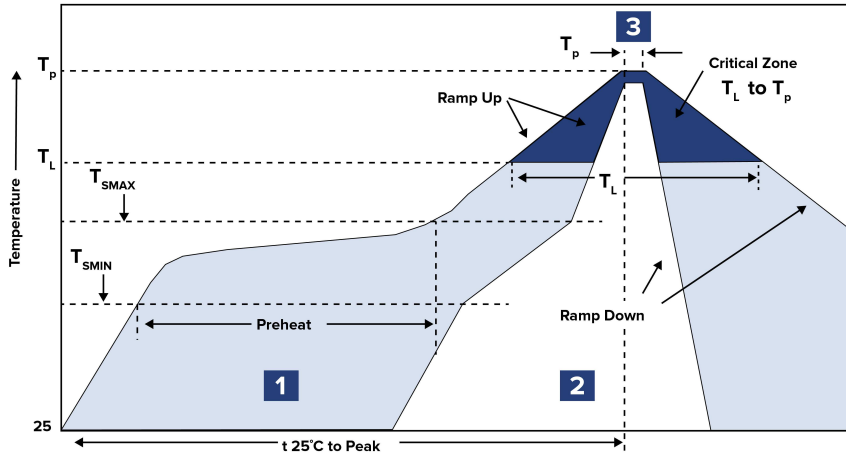
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Pb | **RoHS**
Compliant

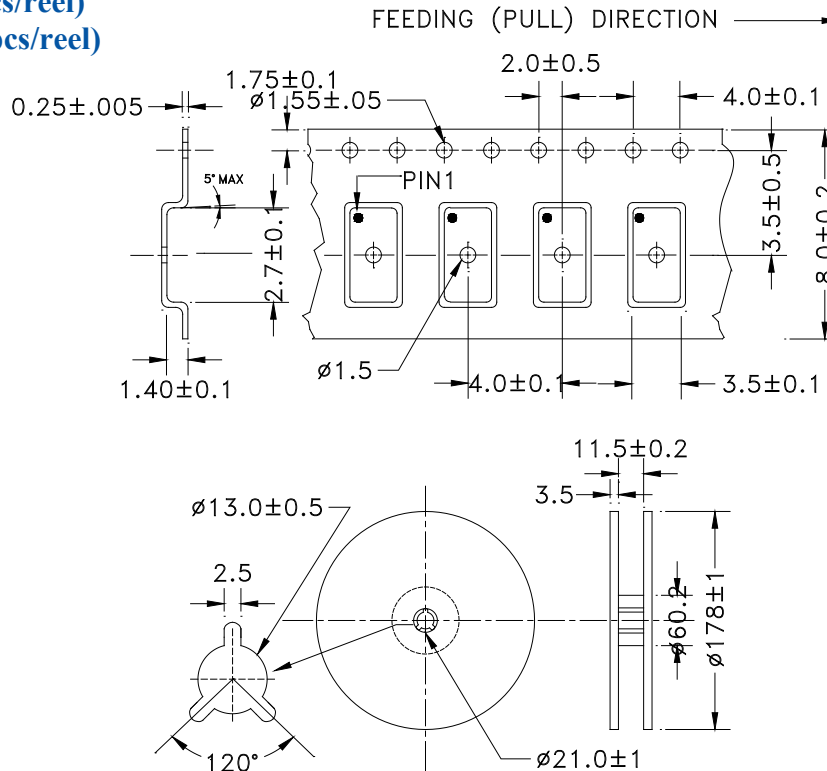
REFLOW PROFILE



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



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