

# Ultra Low Jitter SMD Crystal Oscillator

ASG-ULJ



RoHS  
Compliant



7.0 x 5.0 x 1.5 mm

Moisture Sensitivity Level (MSL) – 1

## FEATURES:

- Ultra low phase Jitter: 0.2ps max integrated 12 kHz to 20 MHz BW
- $\pm 50$ ppm total frequency stability over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  temperature range
- Output type: LVCMOS, LVPECL, LVDS
- Industry standard ceramic SMD package: 7.0 x 5.0 mm

## APPLICATIONS:

- Fiber Channel 10G/12G SERDES
- 10/40/400 Gigabit Ethernet
- PCI-Express
- Storage
- Communications
- Backplane reference clock
- FPGA

## STANDARD SPECIFICATIONS:

### Key Electrical Specifications

Parameters	Minimum	Typical	Maximum	Units	Notes	
Operating Temperature	-40		+85	$^{\circ}\text{C}$		
Storage Temperature	-55		+125	$^{\circ}\text{C}$		
Overall Frequency Stability	-50		+50	ppm	<i>See Note # 1</i>	
Initial Tolerance + Stability over operating temperature	-35.00		+35.00	ppm		
Supply Voltage (V <sub>dd</sub> )	V <sub>dd</sub> = 3.3V	3.135	3.300	3.465	V	
	V <sub>dd</sub> = 2.5V	2.375	2.500	2.625	V	
Enable/Disable Function :	"1" (V <sub>IH</sub> $\geq$ 0.7*V <sub>dd</sub> ) or Open: Oscillation "0" (V <sub>IL</sub> $<$ 0.3*V <sub>dd</sub> ) : High Z					
Phase jitter RMS (12kHz to 20MHz BW)			0.2	ps	at 25 $^{\circ}\text{C}$	

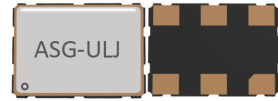
**Note #1:** Inclusive of initial tolerance at 25 $^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , operating temperature range, input voltage variation, load variation & 10 years aging at 25 $^{\circ}\text{C}$ .

### Key Electrical Specifications – LVCMOS

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	1		200	MHz	
Supply Current (I <sub>dd</sub> )			40	mA	
Output Logic Level	V <sub>OH</sub>	0.9*V <sub>dd</sub>		V	I = $\pm 6$ mA
	V <sub>OL</sub>		0.1*V <sub>dd</sub>	V	
Rise Time			3	ns	10% to 90%
Fall Time			3	ns	
Duty Cycle	45	50	55	%	
Output Load			15	pF	

### Key Electrical Specifications – LVDS

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	1		705.8	MHz	
Supply Current (I <sub>dd</sub> )			80	mA	Freq. dependent
Differential Output Voltage Swing		350		mV	
Duty Cycle	45		55	%	@1.25V
Rise Time			0.6	ns	RL=100 $\Omega$ /CL=10pF
Fall Time			0.6		

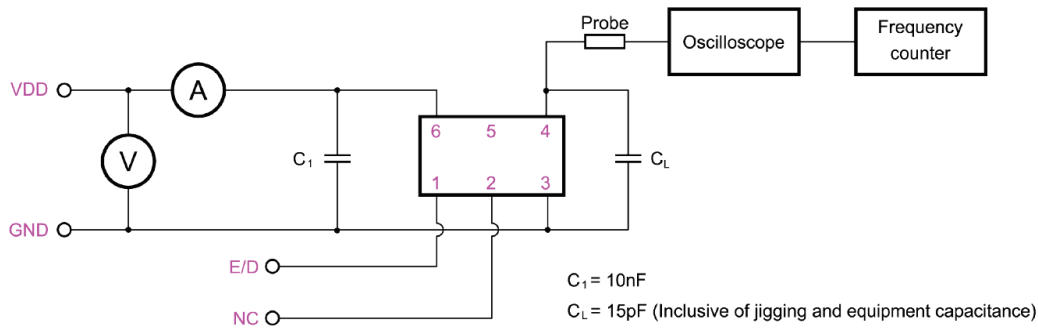


### Key Electrical Specifications – LVPECL

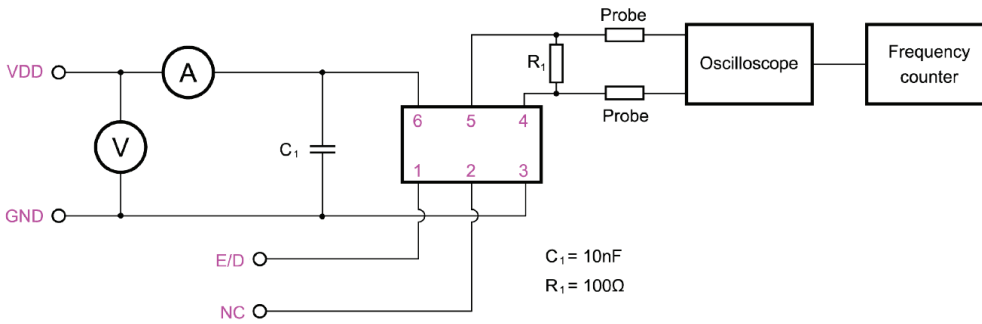
Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	1		705.8	MHz	
Supply Current ( $I_{dd}$ )			120	mA	Freq. dependent
Output Logic Level	$V_{OH}$	$V_{dd} - 1.03$		V	50Ω nominal load
	$V_{OL}$		$V_{dd} - 1.6$	V	
Duty Cycle	45		55	%	@V <sub>dd</sub> -1.3V
Rise Time	$T_r$		0.6	ns	20% to 80%
Fall Time	$T_f$		0.6		

### TEST CIRCUIT

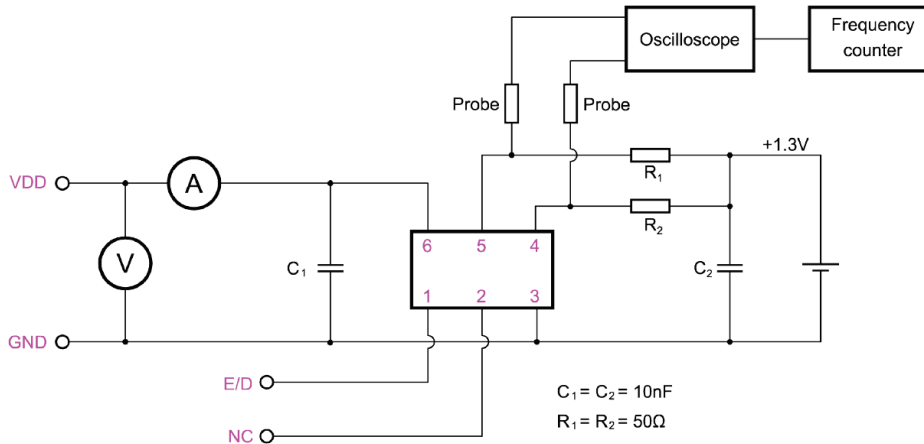
#### LVCMOS Output:



#### LVDS Output:

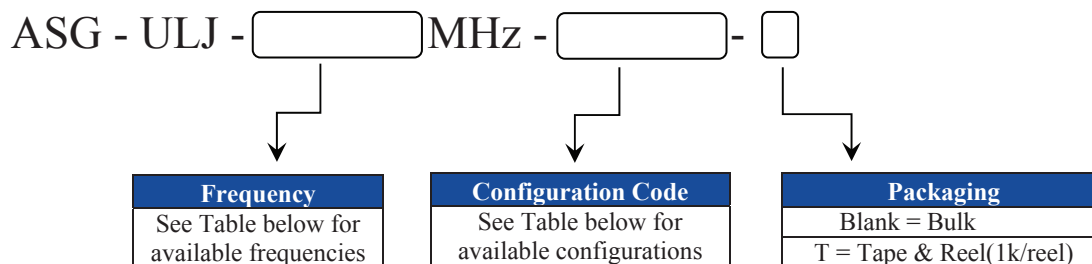


#### LVPECL Output:





### PART IDENTIFICATION:



**Table of Available Configurations**

Abracon P/N	Frequency (MHz)	Overall Freq. Stability max <sup>(1)</sup> (ppm)	Operating Temperature (°C)	Aging (years)	RMS Jitter max <sup>(2)</sup> (ps)	Supply Voltage (V)	Supply Current max. (mA)	Output Type
ASG-ULJ-156.250MHz-514613	156.250	±50	-40 to +85	10	0.15	3.3	75	LVPECL
ASG-ULJ-190.000MHz-514594	190.000	±50	-40 to +85	10	0.15 (12kHz to 5MHz BW)	3.3	40	LCVMOS
ASG-ULJ-156.250MHz-514644	156.250	±50	-40 to +85	10	0.15	2.5	75	LVPECL
ASG-ULJ-705.800MHz-514676	705.800	±50	-40 to +85	10	0.10	3.3	85	LVPECL
ASG-ULJ-100.000MHz-514895	100.000	±50	-40 to +85	10	0.15	2.5	75	LVPECL
ASG-ULJ-114.285MHz-515136	114.285	±25	-40 to +85	5	0.10 (12kHz to 5MHz BW)	3.3	30	LCVMOS
ASG-ULJ-156.250MHz-517114	156.250	±35	-40 to +85	10	0.15	3.3	75	LVPECL
ASG-ULJ-125.000MHz-514807	125.000	±35	-40 to +85	10	0.20	3.3	75	LVPECL
ASG-ULJ-114.285MHz-512383	114.285	±50	-40 to +85	10	0.10	3.3	40	LCVMOS
ASG-ULJ-98.304MHz-509595	98.304	±50	-40 to +85	10	0.10	3.3	40	LCVMOS

Note:

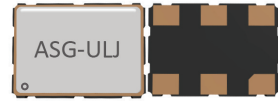
- Inclusive of initial tolerance at 25°C±3°C, operating temperature range, input voltage variation, load variation & aging at 25°C.
- RMS Jitter Max is defined over 12kHz to 20MHz BW from the carrier at 25°C, unless otherwise specified
- Please contact Abracon for the availability of other configurations.

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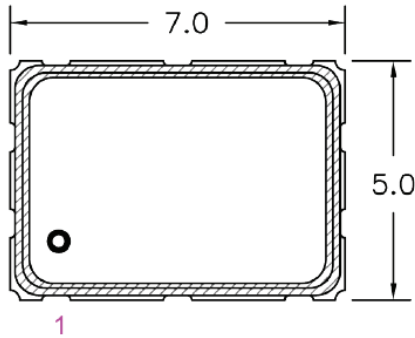


RoHS  
Compliant



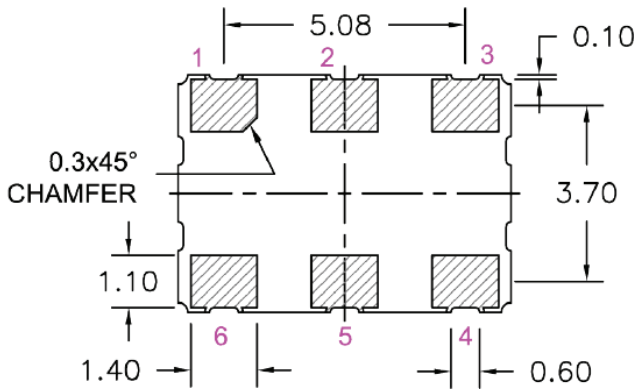
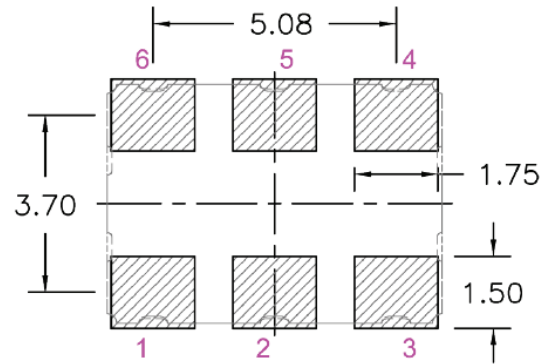
7.0 x 5.0 x 1.5 mm

## OUTLINE DIMENSIONS:

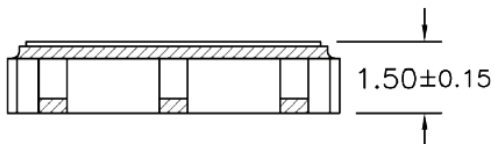


Top View

### Recommended Land Pattern



Bottom View



Side View

Pin #	Pin Description	
	LVC MOS	LVDS/LVPECL
1	Output Enable (OE) or No Connect (N/C)	
2	No Connect (N/C) or Output Enable (OE)	
3	GND	
4	RF Output	
5	No Connect (N/C)	Complimentary Output
6	Vdd	

Abracon P/N	OE Pin #
ASG-ULJ-156.250MHz-514613	1
ASG-ULJ-190.000MHz-514594	1
ASG-ULJ-156.250MHz-514644	1
ASG-ULJ-705.800MHz-514676	2
ASG-ULJ-100.000MHz-514895	1
ASG-ULJ-114.285MHz-515136	1
ASG-ULJ-156.250MHz-517114	1
ASG-ULJ-125.000MHz-514807	1

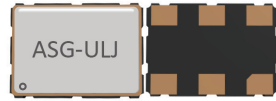
Dimensions: mm

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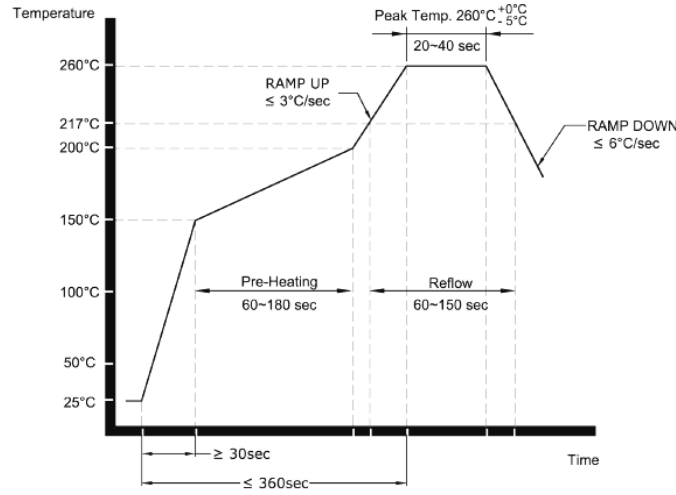


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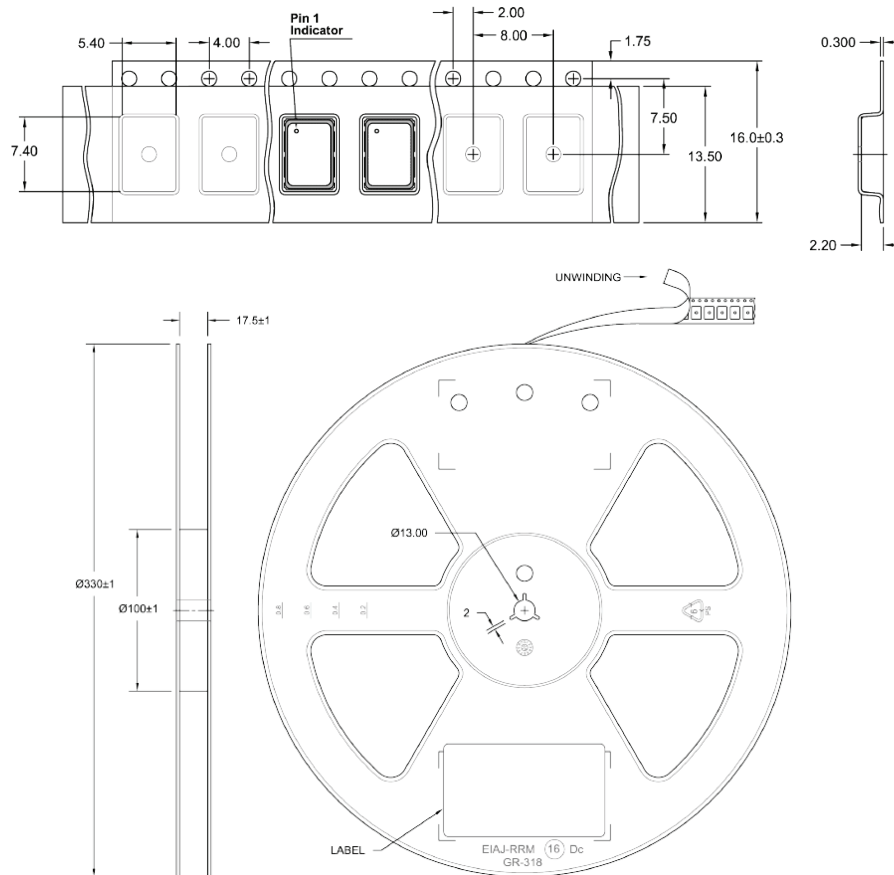
7.0 x 5.0 x 1.5 mm

## RECOMMENDED REFLOW PROFILE



## TAPE & REEL:

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



Dimensions: mm

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