

# CERAMIC SMD CRYSTAL CLOCK OSCILLATOR WITH VOLTAGE CONTROL



7.0 x 5.0 x 1.8mm

ALVD



## FEATURES:

- Based on a proprietary digital multiplier
- Tri-State Output
- Low Phase Jitter
- 2.5V to 3.3V +/- 5% operation
- Ceramic SMD, low profile package

## APPLICATIONS:

- SONET, xDSL
- SDH, CPE
- STB

## STANDARD SPECIFICATIONS:

### PARAMETERS

ABRACON P/N	ALVD Series
Frequency Range	750 KHz to 800 MHz
Operating Temperature	0°C to +70°C (see options)
Storage Temperature	-55°C to +125°C
Overall Frequency Stability	±50 PPM max. (see options)
Supply Voltage (Vdd)	3.3V ± 10%
Voltage Control (Vcc)	0.3VDC min, 1.65VDC typ, 3.0 VDC max.
Symmetry at 1/2 Vdd	40/60% max.
Output Level	See options (PECL, CMOS, or LVDS)
Pullability	± 50ppm (see option)
Tristate Function	"1" (VIH ≥ 0.7* Vdd) or open: Oscillation "0" (VIL < 0.3* Vdd) : Hi Z
Aging per year	±5 ppm max.
RMS Phase Jitter	3ps typical, 5ps max. (12KHz~20MHz)
Period Jitter (peak to peak)	35 ps typical
Phase Noise	-112 dBc/Hz @ 1kHz Offset from 155.52MHz -125 dBc/Hz @ 10kHz Offset from 155.52MHz -123 dBc/Hz @ 100KHz Offset from 155.52MHz -109 dBc/Hz @ 1kHz Offset from 622.08MHz -110 dBc/Hz @ 10kHz Offset from 622.08MHz -109 dBc/Hz @ 100KHz Offset from 622.08MHz

### PECL:

Supply current (I<sub>DD</sub>): 25mA max (for Fo < 24MHz), 65mA max (for 24MHz < Fo < 96MHz), 100mA max (96MHz < Fo < 700MHz)

Output Logic High: V<sub>dd</sub>-1.025V min, V<sub>dd</sub>-0.880V max.

Output Logic Low: V<sub>dd</sub>-1.810V min, V<sub>dd</sub>-1.620V max.

Symmetry (Duty Cycle): 45% min, 50% typ, 55% max,

Rise time: 0.6nSec typ, 1.5nS max

Fall time: 0.6nSec typ, 1.5nS max

### CMOS:

Supply current (I<sub>DD</sub>): 15mA max (for Fo < 24MHz), 30mA max (for 24MHz < Fo < 96MHz), 40mA max (96MHz < Fo < 700MHz)

Output Clock Rise/ Fall Time [10%~90% VDD with 10pF load]: 1.2ns typ, 1.6ns max.

Output Clock Duty Cycle [Measured @ 50% VDD]: 45% min, 50% typical, 55% max



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## LVDS:

Supply current ( $I_{DD}$ ): 25mA max (for  $F_o < 24\text{MHz}$ ), 45mA max (for  $24\text{MHz} < F_o < 96\text{MHz}$ ), 80mA max ( $96\text{MHz} < F_o < 700\text{MHz}$ )

Output Clock Duty Cycle @ 1.25V: 45% min, 50% typical, 55% max

Output Differential Voltage ( $V_{OD}$ ): 247mV min, 355mV typical, 454mV max

VDD Magnitude Change ( $\Delta V_{OD}$ ): -50mV min, 50mV max

Output High Voltage:  $V_{OH} = 1.4\text{V}$  typical, 1.6V max.

Output Low Voltage:  $V_{OL} = 0.9\text{V}$  min, 1.1V typical

Offset Voltage [ $R_L = 100\Omega$ ]:  $V_{OS} = 1.125\text{V}$  min, 1.2V typical, 1.375V max

Offset Magnitude Change [ $R_L = 100\Omega$ ]:  $\Delta V_{OS} = 0\text{mV}$  min, 3mV typical, 25mV max

Power-off Leakage ( $I_{OXD}$ ) [ $V_{out} = V_{DD}$  or GND,  $V_{DD} = 0\text{V}$ ] =  $\pm 1\mu\text{A}$  typical,  $\pm 10\mu\text{A}$  max.

Differential Clock Rise Time ( $t_r$ ) [ $R_L = 100\Omega$ ,  $C_L = 10\text{pF}$ ]: 0.2nS min, 0.7nS typical, 1.0nS, max

Differential Clock Fall Time ( $t_f$ ) [ $R_L = 100\Omega$ ,  $C_L = 10\text{pF}$ ]: 0.2nS min, 0.7nS typical, 1.0nS max

## PIN ASSIGNMENTS

PIN #	Name	DESCRIPTION
1	Vc	Voltage Control
2	Tristate	Tristate
3	GND	Ground
4	Q	PECL, LVDS, or CMOS Output.
5	Q	Complimentary PECL, LVDS, or NC.
6	V <sub>DD</sub>	VDD Connection.

## TRI-STATE PIN OPERATION:

OUTPUT TYPE OPTION		PIN 2 logic level*	Output State (Tri-state)
P	PECL	0 (Default)	Enabled
		1	Disabled
P1	PECL1	0	Disabled
		1	Enabled
V	LVDS	0	Disabled
		1 (Default)	Enabled
C	CMOS	0	Disabled
		1 (Default)	Enabled

\*Connect to VDD for logic level "1", connect to ground for logic level "0".

## OPTIONS & PART IDENTIFICATION:

[Left blank if standard]

### ALVD - Frequency - □ - □ - □ - □ - □

Frequency	
XX.XXXX	MHz

Operating Temp.	
D	-10°C~60°C
E	-20°C~70°C
F	-30°C~70°C
N	-30°C~85°C
L	-40°C~85°C

Frequency Stability	
R	±25ppm max.
K	±30ppm max.
H	±35ppm max.

Output Level	
P	PECL
P1	PECL1
V	LVDS
C	CMOS

Packaging	
Blank	Bulk
T	Tape and Reel

Pullability	
N100	±100ppm



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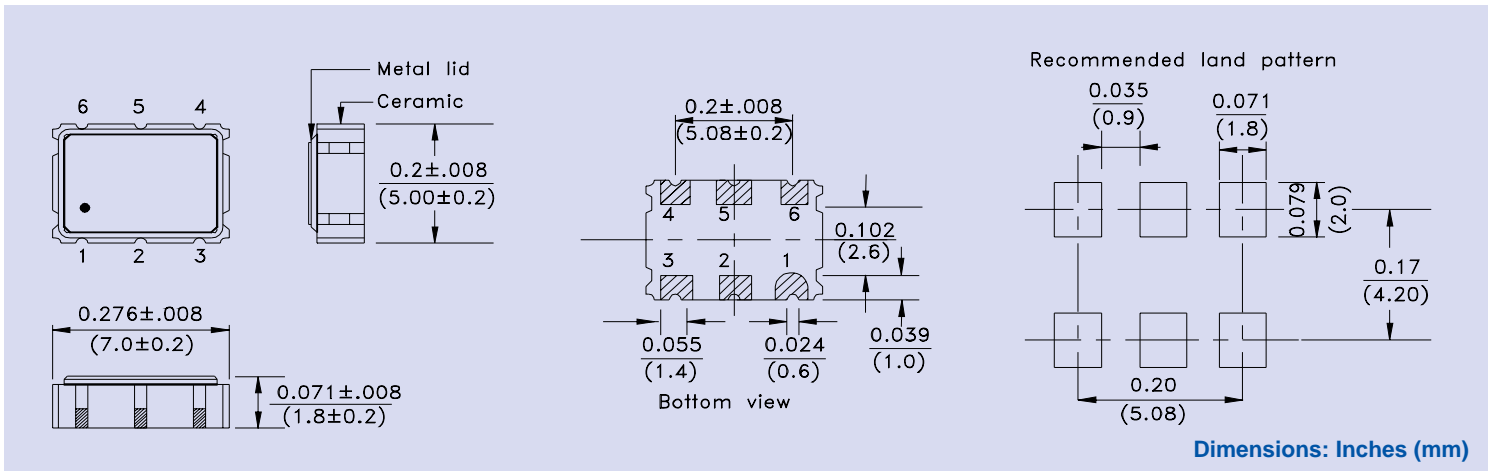


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## OUTLINE DRAWING:



PIN	FUNCTION
1	V <sub>C</sub>
2	Tri-state
3	GND
4	Q
*5	$\bar{Q}$
6	V <sub>DD</sub>

**Note:** It is recommended to use an approximately 0.01uF bypass capacitor between PIN 3 and 6.

\*Complimentary PECL/LVDS or NC.

## TAPE & REEL:

