

# CERAMIC SMD CRYSTAL CLOCK OSCILLATOR



7.0 x 5.0 x 1.8mm

ABFM SERIES



RoHS  
Compliant

## FEATURES:

- Based on a proprietary analog multiplier
- Tri-State Output
- Ultra low Phase Noise
- 125MHz, 156.25MHz, 187.5MHz, and 212.5MHz applications
- 2.5V to 3.3V +/- 10% operation
- Ceramic SMD, low profile package

## APPLICATIONS:

- Fiber Channel
- 12Gbit SERDES
- 10Gbit SERDES
- PCI Express

## STANDARD SPECIFICATIONS:

### PARAMETERS

ABRACON P/N	ABFM Series
Frequency Range	30 MHz to 280 MHz (Contact ABRACON for frequencies out of the range)
Operating Temperature	0°C to + 70°C (see options)
Storage Temperature	- 55°C to + 125°C
Frequency Stability over Operating Temp. (ref to +25°C)	± 50 ppm max. (see options)
Supply Voltage (V <sub>DD</sub> )	3.3V or 2.5V ±10% (see options)
Jitter (12KHz - 20MHz)	RMS phase jitter = 0.5pS max. period jitter = 20pS peak to peak typical
Low Phase Noise	-130 dBc/Hz @ 1kHz Offset from 212.5 MHz -140 dBc/Hz @ 10kHz Offset from 212.5 MHz -145 dBc/Hz @ 100kHz Offset from 212.5 MHz
Aging (PPM/year)	TBD Per Crystal

### PECL

Supply Current (I <sub>DD</sub> ) [F <sub>out</sub> = 212.50MHz]	85mA max.
Output Clock Duty Cycle @ V <sub>DD</sub> -1.3V	45% min, 50% typical, 55% max.
Output High Voltage (V <sub>OH</sub> )	V <sub>DD</sub> -1.025V min
Output Low Voltage (V <sub>OL</sub> )	V <sub>DD</sub> -1.620V max
Clock Rise time (t <sub>r</sub> ) @ 20/80%	0.2nS typ, 0.5nS max
Clock Fall time (t <sub>f</sub> ) @ 80/20%	0.2nS typ, 0.5nS max

### LVDS

Supply Current (I <sub>DD</sub> ) [F <sub>out</sub> = 212.50MHz]	55mA typical, 60mA max
Output Clock Duty Cycle @ 1.25V	45% min, 50% typical, 55% max
Output Differential Voltage (V <sub>OD</sub> )	247mV min, 355mV typical, 454mV max
V <sub>DD</sub> Magnitude Change (ΔV <sub>OD</sub> )	-50mV min, 50mV max
Output High Voltage (V <sub>OH</sub> )	1.4V typical, 1.6V max
Output Low Voltage (V <sub>OL</sub> )	1.1V typical, 0.9V min
Offset Voltage [R <sub>L</sub> = 100Ω]	V <sub>OS</sub> = 1.125V min, 1.2V typical, 1.375V max
Offset Magnitude Voltage [R <sub>L</sub> = 100Ω]	ΔV <sub>OS</sub> = 0mV min, 3mV typical, 25mV max
Power-off Leakage (I <sub>OXD</sub> ) [V <sub>out</sub> =V <sub>DD</sub> or GND, V <sub>DD</sub> =0V]	±1 mA typical, ±10 μA max
Output Short Circuit Current (I <sub>OSD</sub> )	-5.7mA typ, -8mA max
Differential Clock Rise Time (t <sub>r</sub> ) [R <sub>L</sub> =100Ω, CL=10pF]	0.2ns min, 0.5ns typical, 0.7ns max
Differential Clock Fall Time (t <sub>f</sub> ) [R <sub>L</sub> =100Ω, CL=10pF]	0.2ns min, 0.5ns typical, 0.7ns max

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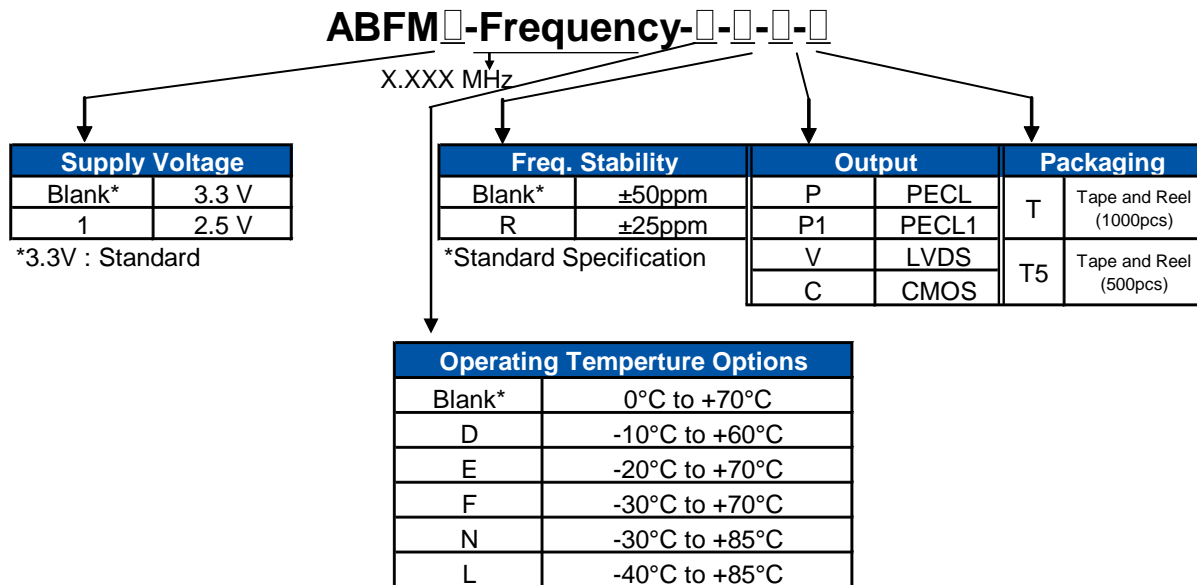


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## STANDARD SPECIFICATIONS:

<b>CMOS</b>	
Supply Current ( $I_{DD}$ ) [at 100MHz, load 15pF]	16mA typ, 20mA max
Output Clock Duty Cycle @ 50% $V_{DD}$	45% min, 50% typical, 55% max
Output High Voltage ( $V_{OH}$ ) [ $I_{OH} = -8.5mA$ ]	2.4V min
Output Low Voltage ( $V_{OL}$ ) [ $I_{OL} = 8.5mA$ ]	0.4V max
Output Drive Current ( $I_{OSD}$ ) [ $V_{OL} = 0.4V, V_{OH} = 2.4V$ ]	8.5mA typ
Output Clock Rise/Fall time [10% ~ 90% $V_{DD}$ w/10pF load]	1.2nS typical, 1.6nS max
Output Clock Duty cycle [Measured @ 50% $V_{DD}$ ]	45% min, 50% typical, 55% max

## OPTIONS AND PART IDENTIFICATION (Left blank if standard):



\*Standard Specification  
Contact ABRACON for extended temperatures.

## PIN ASSIGNMENTS:

PIN #	NAME	DESCRIPTION
1	Tri-state	Tri-state
2	NC	No Connect
3	GND	Ground
4	Q	PECL, LVDS
5	$\overline{Q}$	Complimentary PECL, LVDS
6	$V_{DD}$	VDD Connection

## TRI-STATE PIN OUT DESCRIPTION:

OUTPUT TYPE OPTION		PIN 1 LOGIC LEVEL*	OUTPUT STATE
P	PECL	1	Tri-state
		0 (Default)	Enabled
P1	PECL1	0	Tri-state
		1	Enabled
V	LVDS	0	Tri-state
		1 (Default)	Enabled
C	CMOS	0	Tri-state
		1 (Default)	Enabled

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



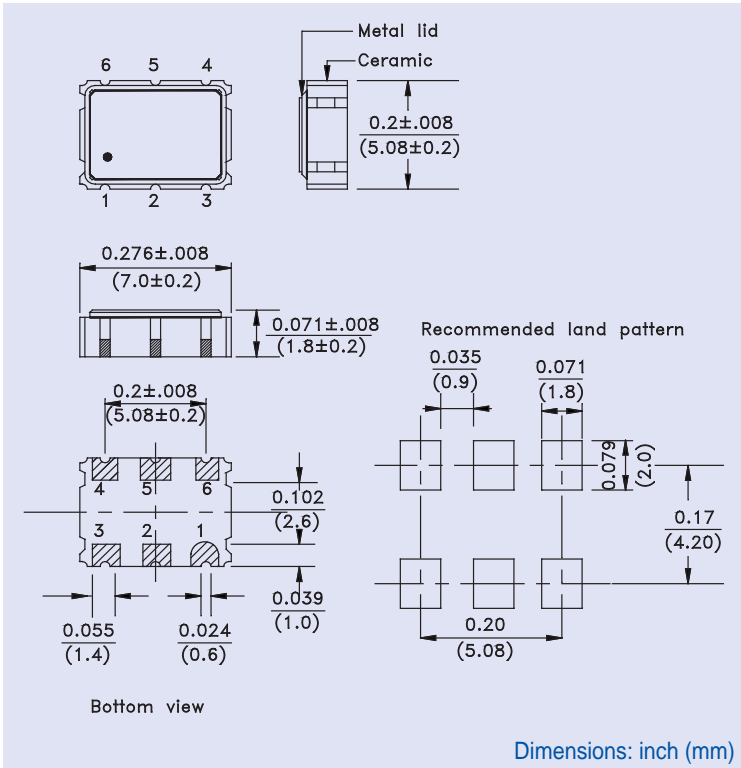
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ABFM SERIES

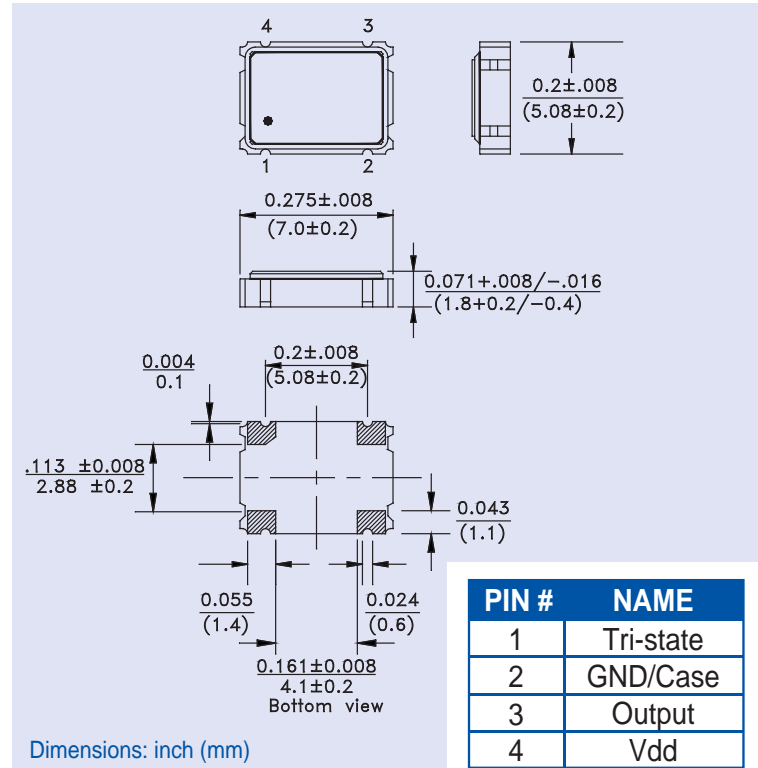


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## PECL & LVDS DRAWING:



## CMOS DRAWING:



## TAPE & REEL:

