VF231C

Crystal Oscillators LVPECL/LVDS 3.3V
5X7 mm Surface Mount
750 KHz to 800 MHz

RoHS 6/6

Description

Valpey Fisher's VF231C surface mount oscillators provide waveforms for clocking LVPECL and LVDS circuits. The 5X7mm footprint package provides the performance of larger oscillators with a level of board space reduction achieved. ASIC technology is used to accomplish size reduction and enhance performance and reliability. Low jitter output signals are generated. The wide range of frequencies offered, many stability options, and industrial temperature range availability, make this model the solution for many applications. A tristate function is included to allow for easy automated testing of assemblies. Tape and reel packaging is standard.

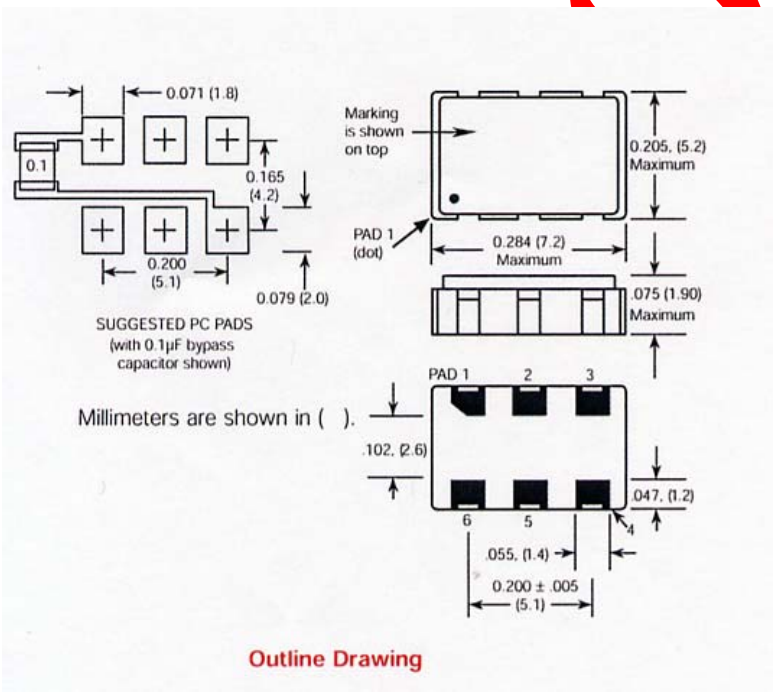
Features

- **High speed – Low jitter LVPECL or LVDS output with tristate**
- **Small SMD package (5X7 mm)**
- **Stability options from +/-20ppm to +/-100ppm**
- **Commercial or industrial temperature range**
- **Rugged, hermetic package for automated assembly**

Typical Applications

- **Telecom / networking systems that require low jitter clocks**
- **DSL**
- **10 Gigabit Ethernet**
- **SONET / SDH / Fibre Channel**

Not recommended for new designs below 640MHz – see VFXO301



Outline Drawing

CONNECTIONS

PIN 1	**N/C**
Pin 2	**Tristate**
PIN 3	**Ground**
PIN 4	**Output 1: Q**
PIN 5	**Output 2: Q**
PIN 6	**+V_{DD}**

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Valpey Fisher Corporation
High Frequency, Low Phase Noise Timing Solutions

ELECTRICAL SPECIFICATIONS

Frequency Range 750 KHz to 800 MHz

Frequency Stability
Includes calibration at 25°C, operating temperature, change of input voltage, change of load, shock and vibration — 100, 50, 25 or 20 ppm

	MIN	TYP	MAX	UNITS
Input Voltage, V_{DD}	3.15	3.3	3.45	volts
Jitter				
Period jitter RMS				
19.44MHz		2.2	3.5	ps
77.76MHz		3.5	5.0	ps
155.52MHz		4.3	5.8	ps
622.08MHz		5.0	6.5	ps
Integrated jitter RMS				
12 KHz to 20 MHz @ 155.52MHz		2.6	4	ps
Symmetry at (V_{DD}-1.3) V_{DC} (PECL)	40	50	60	percent
At (1.25 V_{DC}) (LVDS)	40	50	60	percent
Aging				
First year		3		ppm
After first year		1		ppm/yr

Tristate
Input Requirements for Pin 2:
"1": On-Pin 1 may float or 2.8V min
"0": Tristate-Pin 1 requires 0.4V max

Typical Phase Noise (dBc/Hz)	**10Hz**	**100Hz**	**1KHz**	**10KHz**	**100KHz**
Oscillator Frequency					
19.44MHz	-80	-108	-132	-142	-150
106.25MHz	-72	-103	-122	-130	-125
155.52MHz	-65	-95	-120	-125	-121
622.08MHz	-55	-85	-109	-115	-110

ENVIRONMENTAL SPECIFICATIONS

Temperature
*Operating 0° to 70°C
Storage -55°to +125°C
Shock- 1000 Gs, 0.35 ms, ½ sine wave, 3 shocks in each plane
Vibration- 10-2000 Hz of .06" d.a. or 20 Gs, whichever is less
Humidity- Resistant to 85° R.H. at 85°C

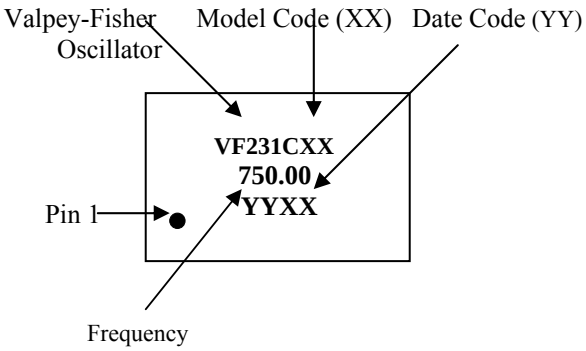
MECHANICAL SPECIFICATIONS

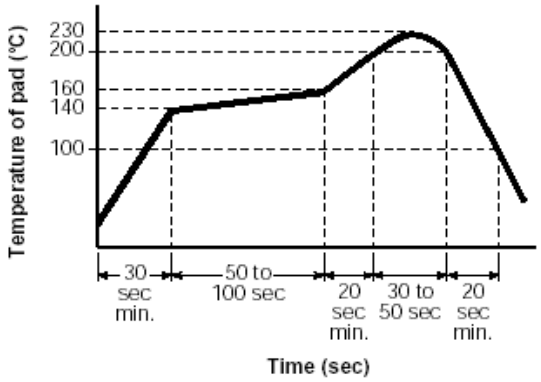
Leak- MIL STD 883, Method 1014, Condition A1
Case- Ceramic with hermetic resistance-welded metal lid
Pads- Solderable gold over nickel
Marking- Epoxy ink or laser engraved
Resistance to solvents- MIL STD 202, Method 215

*Operating -40 to +85°C also available.

MARKING SPECIFICATION

The format for the marking is:





Recommended Reflow Soldering Profile

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PECL Output Models
Electrical Specifications

.	MIN	TYP	MAX	UNITS
RL = 50 Ω to (V_{DD}- 2V)				
(see figure)				
Output High Voltage, V_{OH}		VDD-1.025		V
Output Low Voltage, V_{OL}			VDD-1.620	V
Input Current, PECL				
0.75 – 24 MHz			25	mA
24 – 160 MHz			65	mA
160 – 800 MHz			100	mA
Switching Characteristics				
Clock Rise Time, tr				
@20/80%		0.3	0.35	ns
Clock Fall Time, tf				
@80/20%		0.3	0.35	ns

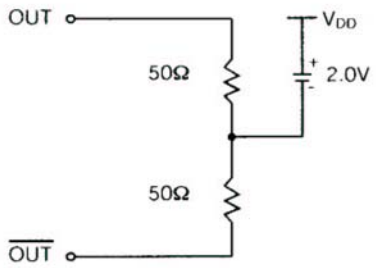

Fig 1.
PECL Levels Test Circuit

LVDS Output Models
Electrical Specifications

	MIN	TYP	MAX	UNITS
RL = 100 Ω				
(see figure)				
Output Differential Voltage, V_{OD}	247	355	454	mV
Output High Voltage, V_{OH}		1.4	1.6	V
Output Low Voltage, V_{OL}	0.9	1.1		V
Offset Voltage, V_{OS}	1.125	1.2	1.375	V
Input Current, LVDS				
0.75 – 24 MHz			25	mA
24 – 96 MHz			45	mA
96 – 800 MHz			80	mA
Switching Characteristics				
Differential Clock Rise Time, tr		0.3	0.4	ns
Differential Clock Fall Time, tf		0.3	0.4	ns

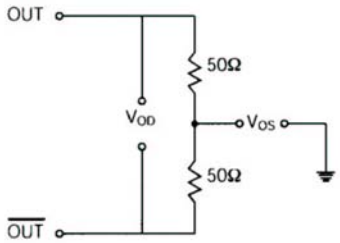

Fig 2.
LVDS Test Load

HOW TO ORDER

For part Number, put package type before model number, and add frequency in MHz, for example:

VF231C	A	A	T	A	125	M
	Frequency Stability	**Temperature Range**	**Tristate**	**Output Logic**	**Frequency**	**M=MHZ**
	A=+/-100ppm	A=0 to 70°C	T=Tristate	A=45/55%LVDS		**K=KHz**
	B=+/-50ppm	B=-40 to +85°C	N=Non Tristate	B=40/60%LVDS		
	C=+/-25ppm			C=45/55%PECL		
	D=+/-20ppm			D=40/60%PECL		