

## OSCILLATORS

### VF170 Series CMOS HYBRID CRYSTAL CLOCK OSCILLATORS

Valpey-Fisher VF170 hybrid oscillators are compatible with CMOS circuitry and offer a proven, low power consumption frequency source. The VF170 series can be used with a wide range of supply voltages, and can be specified to frequencies much lower than other oscillator types. The advanced VF170 series is also available with dual and triple outputs and enable/disable function.

Package options include traditional full size, plated-through-hole designs as well as surface mount, with either leads or pads for soldering. Tape and reel is also available to facilitate automatic insertion or pick-and-place assembly equipment.

### VF170 Series CMOS Hybrid Crystal Clock Oscillators

Specifications				
FREQUENCY RANGE:	1 KHz to 12 MHz			
OUTPUT: Symmetry:	CMOS 40/60 to 60/40%* ( $C_L = 15\text{pf}$ @ $V_O = 1/2V_{DD}$ ) "1" Source Current: 120 $\mu\text{A}$ "0" Sink Current: 360 $\mu\text{A}$			
Rise & Fall Times:	$V_{OH}$ (Logic "1") min.	+5V	+10V	+15V
	$V_{OL}$ (Logic "0") max.	4.5	9.0	13.5
1.000 KHz-3.999 MHz 4.000 MHz-12.000 MHz (10% to 90% $V_{DD}$ $C_L = 15\text{pf}$ )	+5V	+10V	+15V	
	100ns	30ns	25ns	
6.000 MHz-7.999 MHz 8.000 MHz-12.000 MHz	+5V	+10V	+15V	
	55ns	30ns	25ns	
INPUT VOLTAGE:	+5 to +15VDC, $\pm 10\%$			
INPUT CURRENT (max., unloaded):	+5V	+10V	+15V	
	1.000 KHz-3.999 MHz	5.5mA	14mA	25mA
4.000 MHz-5.999 MHz 6.000 MHz-7.999 MHz 8.000 MHz-12.000 MHz	1.5mA	5mA	9.5mA	
	2.0mA	6mA	12mA	
	N/A	7.5mA	15mA	
STORAGE TEMPERATURE:	-55°C to +125°C			
PACKAGE:	See Oscillator Package Chart, pages 16, 17 and 18.			
ELECTRICAL CONNECTIONS:	PIN #1 N.C. <sup>1</sup> PIN #7 Case GND PIN #14 +5VDC to +15VDC <sup>2</sup> PIN #8 Output			

<sup>1</sup> In the 1.0 KHz to 3.999 MHz range an additional output is available which is a multiple of the output at PIN #8.

<sup>2</sup> Specify

\*The symmetry shown is standard. Tighter symmetries, such as 45/55, are available upon special request and are indicated by the letter "H" between the code for stability and the code for operating temperature. For example, an 8.0 MHz oscillator with 0.005% stability, an operating temperature range of -40°C to 85°C, and a 45/55 stability would be designated VF170BH-1.

In addition to specifying the *frequency*, use the Valpey-Fisher part number in the chart below to designate the *exact frequency range*, *stability*, and *operating temperature* you require:

Frequency Range	Stability (%)	Operating Temperature Range (°C)		
		0 to +70	-40 to +85	-55 to +125
1.0 KHz to 12.0 MHz	0.0025	VF170A	VF170A-1	VF170A-2*
	0.005	VF170B	VF170B-1	VF170B-2
	0.01	VF170	VF170-1	VF170-2
	0.05	VF170C	VF170C-1	VF170C-2
	0.25	VF170D	VF170D-1	VF170D-2

\* -55 to +105

### VFHS170 Series HCMOS HYBRID CRYSTAL CLOCK OSCILLATORS

Valpey-Fisher VFHS170 oscillators are compatible with HCMOS circuitry and offer a proven frequency source for use in today's higher speed, lower power circuit designs. The advanced VFHS170 series provides high frequency, low power drain output, which makes this oscillator the ideal choice for applications in portable electronics, such as leading-edge computers, instrumentation, and communications equipment. The VFHS170 series is also available with dual and triple outputs and enable/disable function. In addition, a tri-state option can be specified to allow use of the VFHS170 series in circuits which will be checked using automatic test equipment (ATE).

Package options include traditional full size or new half size plated-through-hole designs as well as surface mount, both full and half size, with either leads or pads for soldering. Tape and reel can be specified as well to allow circuit assembly using today's higher speed automatic insertion or pick-and-place equipment.

### VFHS170 Series HCMOS Hybrid Crystal Clock Oscillators

Specifications			
FREQUENCY RANGE:	4.0 MHz to 50.0 MHz		
OUTPUT: Symmetry:	HCMOS 40/60 to 60/40%* (20% to 80% $V_{DD}$ )		
Rise & Fall Times:	$C_L$ (pf)	$t_r$ (ns)	$t_f$ (ns)
	15	4	5
50	7	8	
	100	14	15
$V_{OL}$ : +0.4V max. $V_{OH}$ : $V_{DD}$ - 0.4V min.			
INPUT VOLTAGE:	+5VDC $\pm 10\%$		
INPUT CURRENT (max, unloaded):	15 mA		
STORAGE TEMPERATURE:	-55°C to +125°C		
PACKAGE:	See Oscillator Package Chart, pages 16, 17 and 18.		
ELECTRICAL CONNECTIONS:	PIN #1 N.C.                      PIN #7 Case GND PIN #14 +5VDC                PIN #8 Output		

\*The symmetry shown is standard. Tighter symmetries, such as 45/55, are available upon special request and are indicated by the letter "H" between the code for stability and the code for operating temperature. For example, an 8.0 MHz oscillator with 0.005% stability, an operating temperature range of -40°C to 85°C, and a 45/55 stability would be designated VFHS170BH-1.

In addition to specifying the *frequency*, use the Valpey-Fisher part number in the chart below to designate the *exact frequency range*, *stability*, and *operating temperature* you require:

Frequency Range (MHz)	Stability (%)	Operating Temperature Range (°C)		
		0 to +70	-40 to +85	-55 to +125
4.0 to 50.0	0.0025	VFHS170A	VFHS170A-1	VFHS170A-2*
	0.005	VFHS170B	VFHS170B-1	VFHS170B-2
	0.01	VFHS170	VFHS170-1	VFHS170-2
	0.05	VFHS170C	VFHS170C-1	VFHS170C-2
	0.25	VFHS170D	VFHS170D-1	VFHS170D-2

\* -55 to +105