

## VHC/VHCT Introduction

Fairchild Semiconductor's Very High-speed CMOS (VHC) logic family provides standard logic users a high-technology upgrade from older logic families such as HCMOS. VHC delivers nearly three times the speed of comparable HCMOS functions at twice the output current drive. Despite the higher performance, power consumption and device generated noise is at or below that of HC making VHC design-in simple and familiar. Enhanced datasheet specifications such as output noise and power-down leakage further simplify design-in. VHC is specified over a 2.0V to 5.5V  $V_{CC}$  range of operation. A complete set of 3.3V specifications aid in today's low voltage designs. VHC inputs are protected against over-voltage to 7.0V under all  $V_{CC}$  condi-

tions. This feature is beneficial in mixed supply voltage applications where 5V logic is driving 3.3V VHC.

VHCT options exist for many VHC functions similar to HCT options of HCMOS parts. For these parts input thresholds have been adjusted to provide TTL levels of  $V_{ILmax} = 0.8V$  and  $V_{IHmin} = 2.0V$ . This allows VHCT to be interfaced directly with TTL parts and sub-systems. VHCT versions operate in a standard 4.5V to 5.5V TTL supply range.

VHC/VHCT is a general purpose family available in a large number of gate, MSI and octal buffer functions. Package options include PDIP, JEDEC SOIC, EIAJ SOIC and TSSOP.

Feature	Benefit
3X faster than HCMOS	Meets higher speed demands of new designs
2X the output current drive of HCMOS; $\pm 8$ mA	Extends drive capability for on-board signal routing
Guaranteed 3.3V specifications	Eases design in low-voltage applications
Input over-voltage tolerant to 7.0V regardless of $V_{CC}$	Safely interfaces parts and sub-systems of differing supply voltages
Guaranteed noise specifications	Simplifies component choice in noise sensitive applications
Wide range of package options: PDIP, JEDEC SOIC, EIAJ SOIC, TSSOP	Applicable as upgrade to older technologies and for your most advanced designs

### VHC vs HC Specifications

	VHC 04	HC 04	VHC 244	HC 244	Unit	$V_{CC}$
<b>DC Spec</b>						
$I_{OH}/I_{OL}$	-8/8	-4/4	-8/8	-6/6	mA	4.5V
$I_{CC}$	20.0	20.0	40.0	80	$\mu A$	5.5V
$V_{OLP}/V_{OLV}$	0.8/-0.8	not spec'd	0.8/-0.8	not spec'd	V	5.0V
$V_{ILD}/V_{IHD}$	1.5/3.5	not spec'd	1.5/3.5	not spec'd	V	5.0V
<b>AC Spec (<math>T_A = -40^\circ C</math> to <math>+85^\circ C</math>)</b>						
$t_{PHL, PLH}$	8.5	24	8.5	29	ns	$5.0 \pm 0.5V$
$t_{PZH, PZL}$			10.5	38	ns	$5.0 \pm 0.5V$
$t_{PHZ, PLZ}$			10.5	38	ns	$5.0 \pm 0.5V$
$C_{PD}$ ( $T_A = 20^\circ C$ )	18	20	19	50	pF	