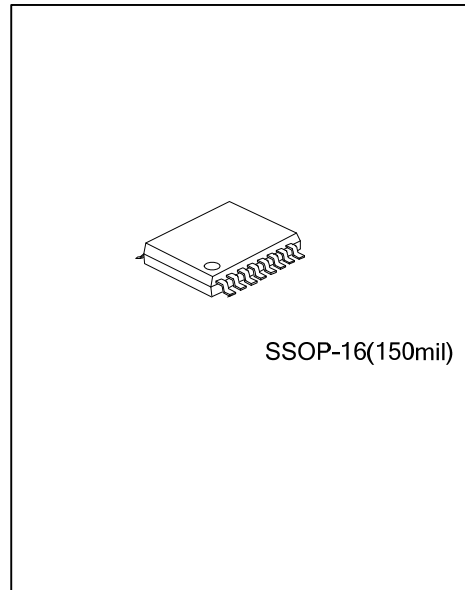




### WIDEBAND/VIDEO QUAD 2-CHANNEL MUX/DEMUX WITH LOW ON-RESISTANCE



#### DESCRIPTION

The UTC's **US5V330** video switch is a 4bit 2-channel multiplexer/demultiplexer with a single switch-enable input. Low differential gain and phase make switch ideal for both RGB and composite video switching applications.

Low On-Resistance and wide bandwidth make it ideal for video and other applications. UTC's **US5V330** can replac the U74HC4053 multiplier and buffer/ amplifier.

#### FEATURES

- \* Single supply operation: +5.0V
- \* Low Power Consumption (0.1µA typical)
- \* Wide bandwidth: 360 MHz (typical)
- \* Low On-Resistance: 5Ω (typical)
- \* Low crosstalk at 10 MHz: -48 db
- \* Control Inputs Can Be Driven by TTL or 5-V/3.3-V CMOS Outputs

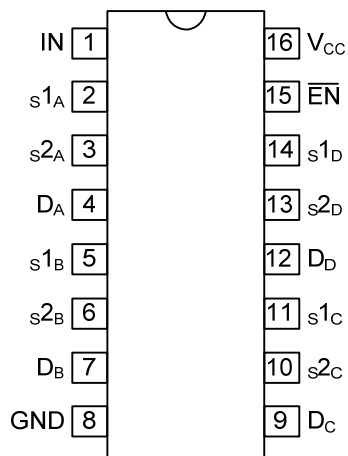
#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
US5V330L-R16-R	US5V330G-R16-R	SSOP-16	Tape Reel
US5V330L-R16-T	US5V330G-R16-T	SSOP-16	Tube

Note: xx: Output Voltage, refer to Marking Information.

<p>US5V330L-R16-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) R: Tape Reel, T: Tube (2) R16: SSOP-16 (3) L: Lead Free, G: Halogen Free</p>
--	---

■ PIN CONFIGURATION



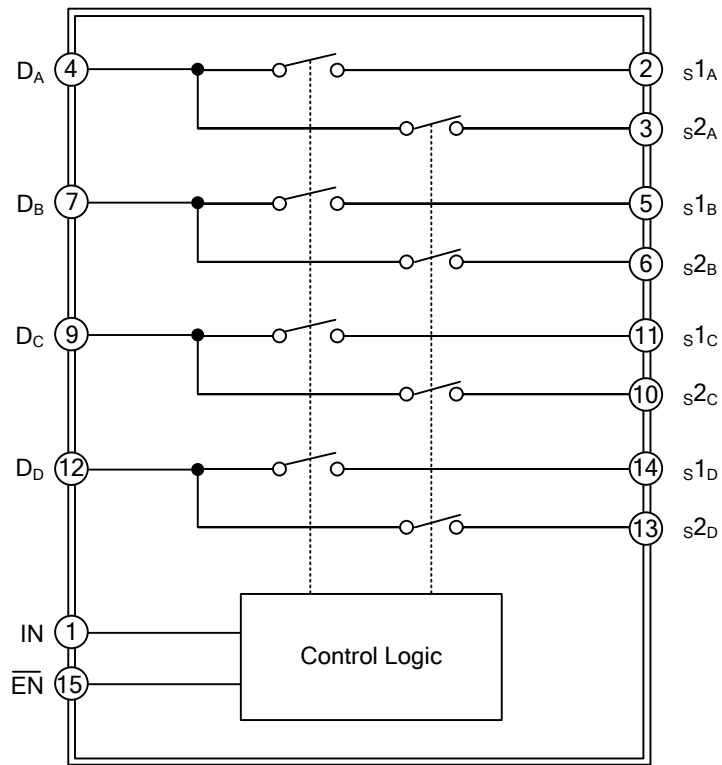
■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	IN	Select Input
2, 3, 5, 6, 10, 11, 13, 14	s1A, s2A, s1B, s2B, s2C, s1C, s2D, s1D	Analog Video I/O
4, 7, 9, 12	DA, DB, DC, DD	Analog Video I/O
8	GND	Ground
15	EN	Enable
16	VCC	Power

■ TRUTH TABLE

EN	IN	FUNCTIONAL
0	0	DA=s1A, DB=s1B, DC=s1C, DD=s1D
0	1	DA=s2A, DB=s2B, DC=s2C, DD=s2D
1	X	DA=Z, DB= Z, DC= Z, DD= Z

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

(Which the useful life may be impaired. For user guidelines, not tested.)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage to Ground Potential (Inputs & V <sub>CC</sub> Only)	V <sub>DC</sub>	-0.5~+7.0	V
Supply Voltage to Ground Potential (Outputs & D/O Only)		-0.5~+7.0	V
DC Input Voltage	V <sub>IO</sub>	-0.5~+7.0	V
DC Output Current	I <sub>IO</sub>	120	mA
Power Dissipation	P <sub>D</sub>	0.5	W
Storage Temperature	T <sub>STG</sub>	-65~+150	°C
Ambient Temperature with Power Applied	T <sub>A</sub>	-40~+85	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ DC ELECTRICAL CHARACTERISTICS

(Over the Operating Range, T<sub>A</sub>=-40°C~+85°C, V<sub>CC</sub>=5V±5%)

PARAMETER	SYMBOL	TEST CONDITIONS (Note 1)	MIN	TYP (Note 2)	MAX	UNIT
Analog Signal Range	V <sub>ANALOG</sub>		0		2.0	V
Input HIGH Voltage	V <sub>IH</sub>	Guaranteed Logic HIGH Level	2.0			V
Input LOW Voltage	V <sub>IL</sub>	Guaranteed Logic LOW Level	-0.5		0.8	V
Input HIGH Current	I <sub>IH</sub>	V <sub>CC</sub> =Max., V <sub>IN</sub> =V <sub>CC</sub>			±1	µA
Input LOW Current	I <sub>IL</sub>	V <sub>CC</sub> =Max., V <sub>IN</sub> =GND			±1	µA
Analog Output Leakage Current	I <sub>O</sub>	0 ≤ S1, S2 or D ≤ V <sub>CC</sub> , Switch OFF			±1	µA
Clamp Diode Voltage	V <sub>IK</sub>	V <sub>CC</sub> =Min., I <sub>IN</sub> =-18mA	-0.7	-1.2		V
Input Hysteresis at Control Pins	V <sub>H</sub>			150		mV
Switch On-Resistance (Note 3)	R <sub>ON</sub>	V <sub>CC</sub> =Min., V <sub>IN</sub> =1.0V, I <sub>ON</sub> =13mA		5	7	Ω
		V <sub>CC</sub> =Min., V <sub>IN</sub> =2.0V, I <sub>ON</sub> =26mA		7	10	Ω

Notes: 1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.

2. Typical values are at V<sub>CC</sub>=5.0V, T<sub>A</sub>=25°C ambient and maximum loading.

3. Measured by the voltage drop between S1, S2, and D I/O pins at indicated current through the switch. On-Resistance is determined by the lower of the voltages on the S1, S2, and D I/O pins.

### ■ DYNAMIC CHARACTERISTICS (Over the Operating Range, T<sub>A</sub>=-40°C~+85°C, V<sub>CC</sub>=5V±5%)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Turn On Time	t <sub>ON</sub>	R <sub>L</sub> =75Ω, C <sub>L</sub> =20PF, See Fig. 1		2.5	5	ns
Turn Off Time	t <sub>OFF</sub>	R <sub>L</sub> =75Ω, C <sub>L</sub> =20PF, See Fig. 1		1.1	5	ns
-3 dB Bandwidth	B <sub>w</sub> (Note)	See Fig. 2			400	MHz
Crosstalk	X <sub>TALK</sub>	10MHz, See Fig. 2		-48		dB
Input/Enable Capacitance	C <sub>IN</sub> (Note)	V <sub>IN</sub> = 0V, f=1MHz			6	pF
Capacitance, Switch Off	C <sub>OFF</sub> (Note)	V <sub>IN</sub> =0V, f=1MHz			6	pF
Capacitance, Switch On	C <sub>ON</sub> (Note)	V <sub>IN</sub> = 0V, f=1MHz			9	pF
Off Isolation	O <sub>IRR</sub>	10MHz, See Fig. 2		-36		dB

Note: This parameter is determined by device characterization but is not production tested.

■ POWER CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS (Note 1)		MIN	TYP (Note 2)	MAX	UNIT
Quiescent Power Supply Current	$I_{CC}$	$V_{CC}=\text{Max.}$	$I_N=\text{GND or } V_{CC}$		0.1	3.0	$\mu\text{A}$
Supply Current per Input @ TTL HIGH	$\Delta I_{CC}$	$V_{CC}=\text{Max.}$	$I_N=3.4\text{V (Note 3)}$			2.5	mA
Supply Current per Input per MHz (Note 4)	$I_{CCD}$	$V_{CC}=\text{Max.}, S1, S2 \text{ and D Pins Open}$ $\overline{EN} = \text{GND Control Input Toggling 50\% Duty Cycle}$				0.25	mA MHz

Notes: 1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.

2. Typical values are at  $V_{CC}=5.0\text{V}$ ,  $+25^\circ\text{C}$  ambient.

3. Per TTL driven input ( $V_{IN}=3.4\text{V}$ , control inputs only); S1, S2, and D pins do not contribute to  $I_{CC}$ .

4. This current applies to the control inputs only and represent the current required to switch internal capacitance at the specified frequency. The S1, S2, and D I/O pins generate no significant AC or DC currents as they transition. This parameter is not tested, but is guaranteed by design.

■ TYPICAL APPLICATION CIRCUIT

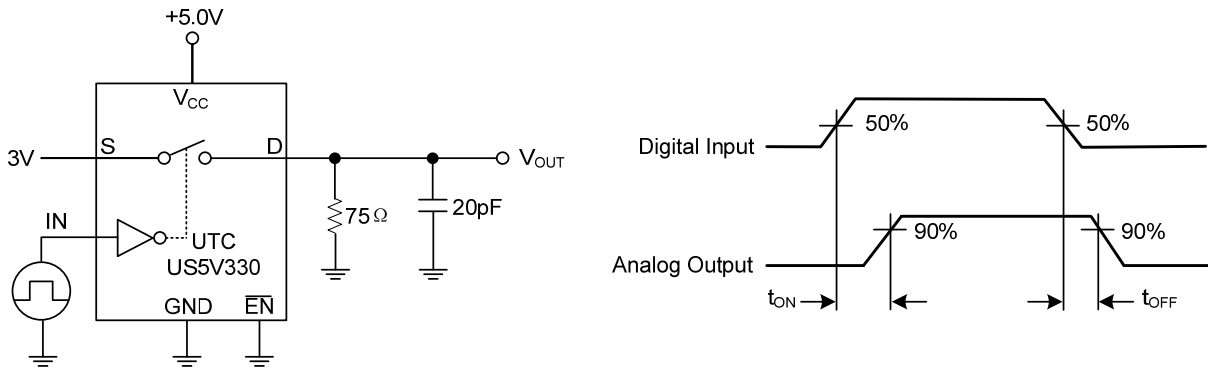


Figure 1. Switching Time

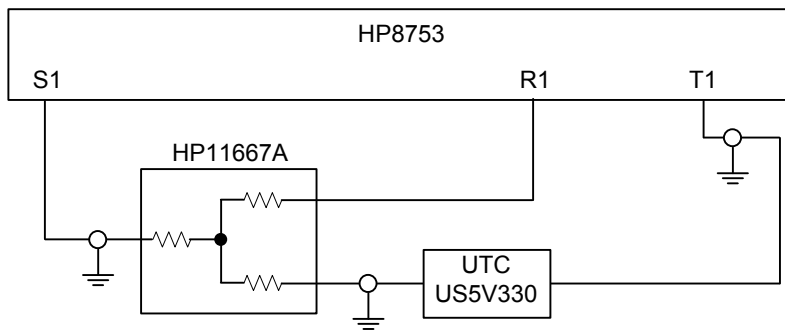


Figure 2. Gain/Phase, Crosstalk, Off-Isolation

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.