

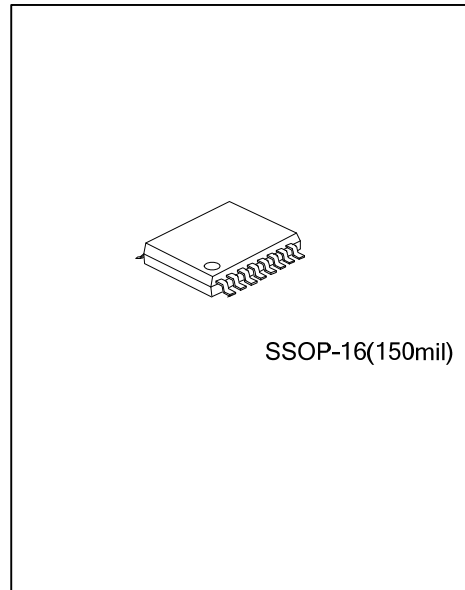


US5V330

Preliminary

CMOS IC

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 replace 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

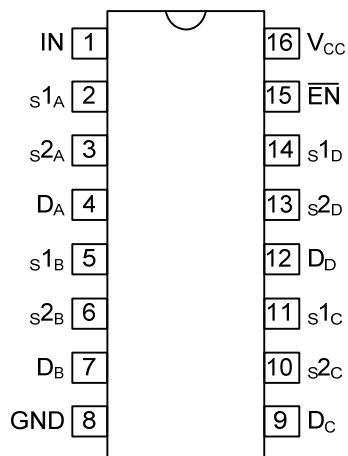
ORDERING INFORMATION

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>
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■ PIN CONFIGURATION



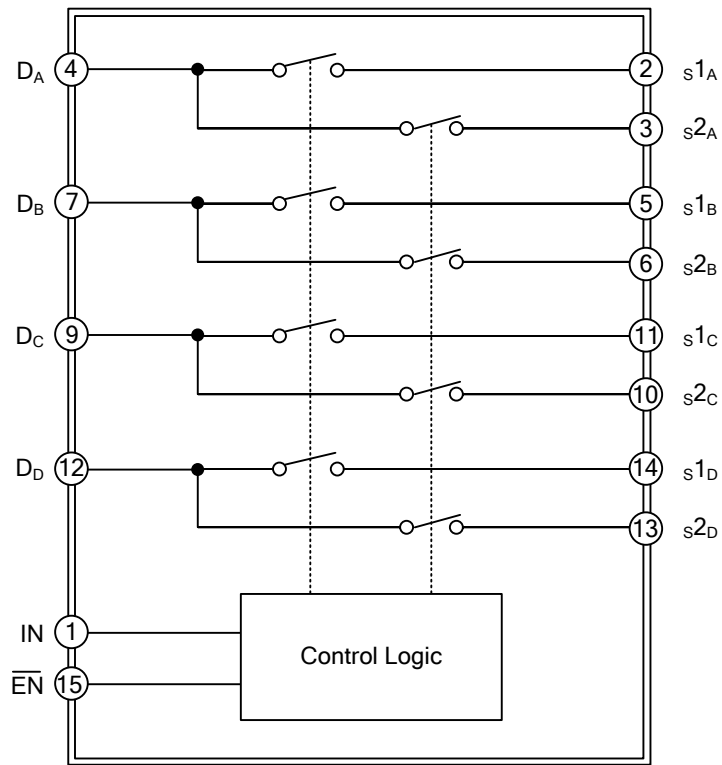
■ PIN DESCRIPTION

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 _{CC} Only)	V _{DC}	-0.5~+7.0	V
Supply Voltage to Ground Potential (Outputs & D/O Only)		-0.5~+7.0	V
DC Input Voltage	V _{IO}	-0.5~+7.0	V
DC Output Current	I _{IO}	120	mA
Power Dissipation	P _D	0.5	W
Storage Temperature	T _{STG}	-65~+150	°C
Ambient Temperature with Power Applied	T _A	-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_A=-40°C~+85°C, V_{CC}=5V±5%)

PARAMETER	SYMBOL	TEST CONDITIONS (Note 1)	MIN	TYP (Note 2)	MAX	UNIT
Analog Signal Range	V _{ANALOG}		0		2.0	V
Input HIGH Voltage	V _{IH}	Guaranteed Logic HIGH Level	2.0			V
Input LOW Voltage	V _{IL}	Guaranteed Logic LOW Level	-0.5		0.8	V
Input HIGH Current	I _{IH}	V _{CC} =Max., V _{IN} =V _{CC}			±1	µA
Input LOW Current	I _{IL}	V _{CC} =Max., V _{IN} =GND			±1	µA
Analog Output Leakage Current	I _O	0 ≤ S1, S2 or D ≤ V _{CC} , Switch OFF			±1	µA
Clamp Diode Voltage	V _{IK}	V _{CC} =Min., I _{IN} =-18mA	-0.7	-1.2		V
Input Hysteresis at Control Pins	V _H			150		mV
Switch On-Resistance (Note 3)	R _{ON}	V _{CC} =Min., V _{IN} =1.0V, I _{ON} =13mA		5	7	Ω
		V _{CC} =Min., V _{IN} =2.0V, I _{ON} =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_{CC}=5.0V, T_A=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_A=-40°C~+85°C, V_{CC}=5V±5%)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Turn On Time	t _{ON}	R _L =75Ω, C _L =20PF, See Fig. 1		2.5	5	ns
Turn Off Time	t _{OFF}	R _L =75Ω, C _L =20PF, See Fig. 1		1.1	5	ns
-3 dB Bandwidth	B _w (Note)	See Fig. 2			400	MHz
Crosstalk	X _{TALK}	10MHz, See Fig. 2		-48		dB
Input/Enable Capacitance	C _{IN} (Note)	V _{IN} = 0V, f=1MHz			6	pF
Capacitance, Switch Off	C _{OFF} (Note)	V _{IN} =0V, f=1MHz			6	pF
Capacitance, Switch On	C _{ON} (Note)	V _{IN} = 0V, f=1MHz			9	pF
Off Isolation	O _{IRR}	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	μA
Supply Current per Input @ TTL HIGH	ΔI_{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}	$V_{CC}=\text{Max.}, S1, S2 \text{ and D Pins Open}$ $\overline{EN} = \text{GND Control Input Toggling } 50\% \text{ Duty Cycle}$				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

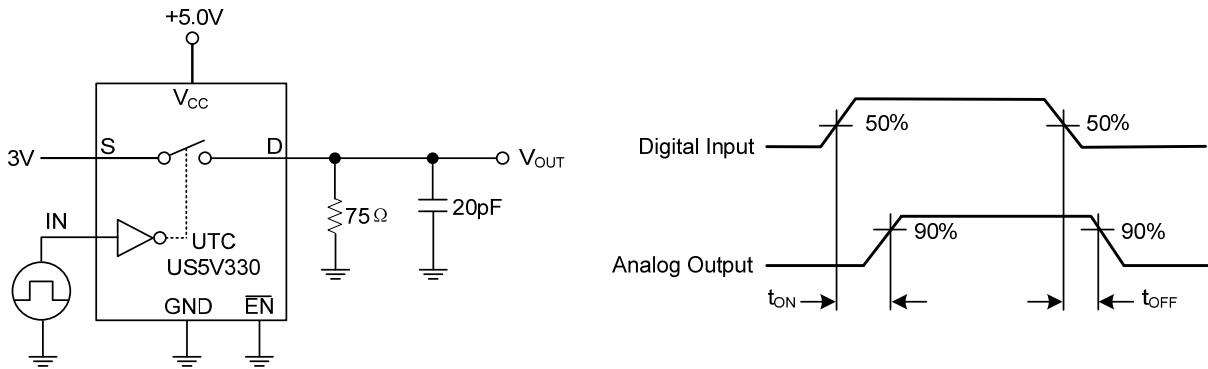


Figure 1. Switching Time

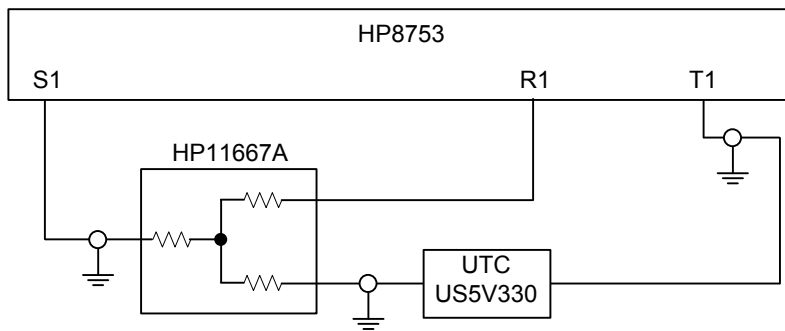


Figure 2. Gain/Phase, Crosstalk, Off-Isolation

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