

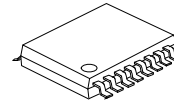


WIDEBAND/VIDEO QUAD 2-CHANNEL MUX/DEMUX WITH LOW ON-RESISTANCE

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.



SSOP-16(150mil)

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

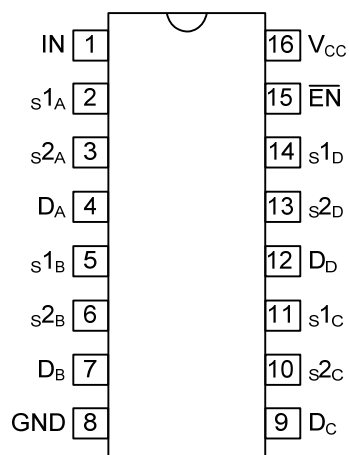
ORDERING INFORMATION

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.

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

■ PIN CONFIGURATION



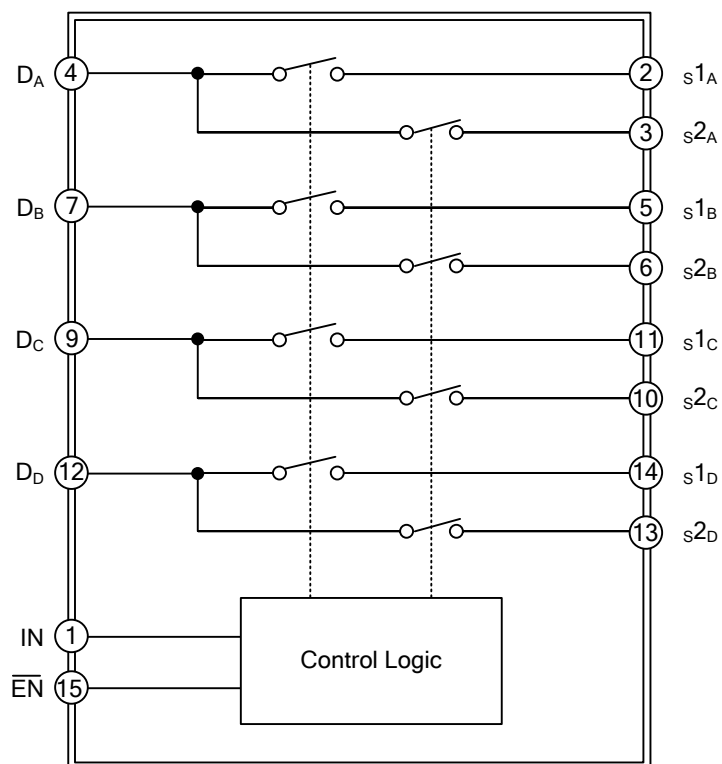
■ PIN DESCRIPTION

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, $T_A = -40^{\circ}\text{C} \sim +85^{\circ}\text{C}$, $V_{CC} = 5\text{V} \pm 5\%$)

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}	$V_{CC} = \text{Max.}, V_{IN} = V_{CC}$			± 1	μA
Input LOW Current	I_{IL}	$V_{CC} = \text{Max.}, V_{IN} = \text{GND}$			± 1	μA
Analog Output Leakage Current	I_{O0}	$\leq S1, S2 \text{ or } D \leq V_{CC}, \text{ Switch OFF}$			± 1	μA
Clamp Diode Voltage	V_{IK}	$V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$	-0.7	-1.2		V
Input Hysteresis at Control Pins	V_H			150		mV
Switch On-Resistance (Note 3)	R_{ON}	$V_{CC} = \text{Min.}, V_{IN} = 1.0\text{V}, I_{ON} = 13\text{mA}$		5	7	Ω
		$V_{CC} = \text{Min.}, V_{IN} = 2.0\text{V}, I_{ON} = 26\text{mA}$		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 $V_{CC} = 5.0\text{V}$, $T_A = 25^{\circ}\text{C}$ 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, $T_A = -40^{\circ}\text{C} \sim +85^{\circ}\text{C}$, $V_{CC} = 5\text{V} \pm 5\%$)

PARAMETER SYMBOL		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Turn On Time	t_{ON}	$R_L = 75\Omega, C_L = 20\text{PF}$, See Fig. 1		2.5	5	ns
Turn Off Time	t_{OFF}	$R_L = 75\Omega, C_L = 20\text{PF}$, 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)	$V_{IN} = 0\text{V}, f = 1\text{MHz}$			6	pF
Capacitance, Switch Off	C_{OFF} (Note)	$V_{IN} = 0\text{V}, f = 1\text{MHz}$			6	pF
Capacitance, Switch On	C_{ON} (Note)	$V_{IN} = 0\text{V}, f = 1\text{MHz}$			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}	$V_{CC} = \text{Max.}$	IN=GND or V_{CC}		0.1	3.0	μA
Supply Current per Input @ TTL HIGH	ΔI_{CC}	$V_{CC} = \text{Max.}$	IN=3.4V (Note 3)		2.5		mA
Supply Current per Input per MHz (Note 4)	I_{CCD}	$V_{CC} = \text{Max.}$, S1, S2 and D Pins Open $\overline{\text{EN}} = \text{GND}$ 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

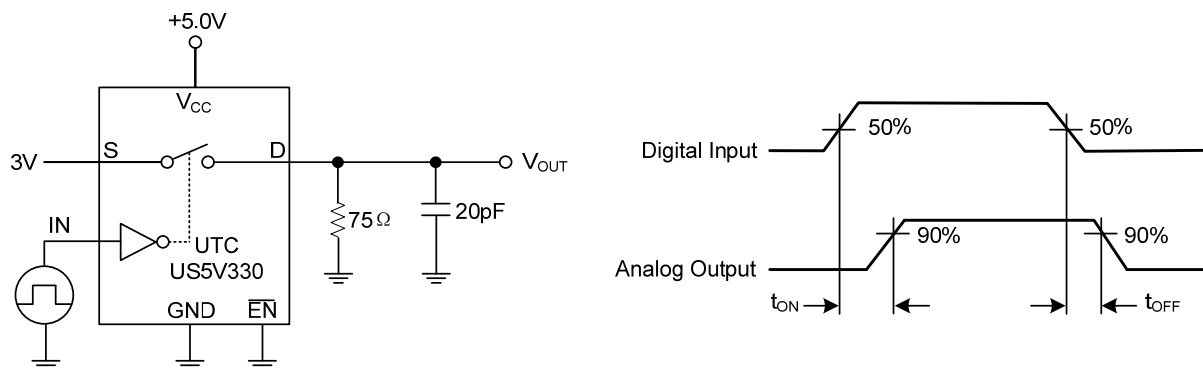


Figure 1. Switching Time

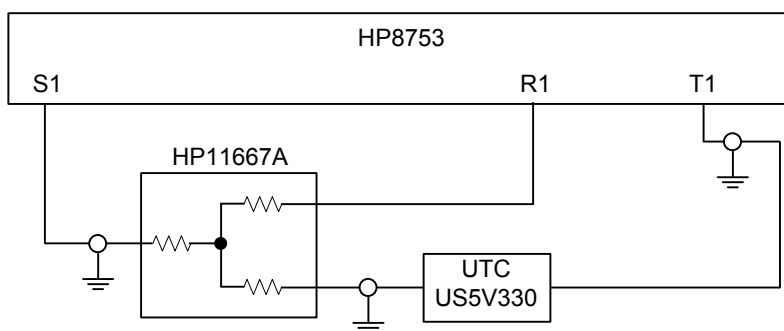


Figure 2. Gain/Phase, Crosstalk, Off-Isolation

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