

## Quad, Wide-Bandwidth SPDT Video Analog Switch

### UM330 TSSOP16

#### General Description

The UM330 is a quad, bidirectional, single-pole/double-throw (SPDT) video analog switch operates from a single +5V supply. The device is recommended for both RGB and composite video switching applications. The video switch can be driven from a current output RAMDAC or voltage output composite video source.

The UM330 features quad  $6\Omega$   $R_{ON}$  (TYP) SPDT switches with 500MHz bandwidth and low crosstalk. The switch offers a high-performance, low-cost solution to switch between video sources. The switch is available in Pb-free TSSOP16 package.

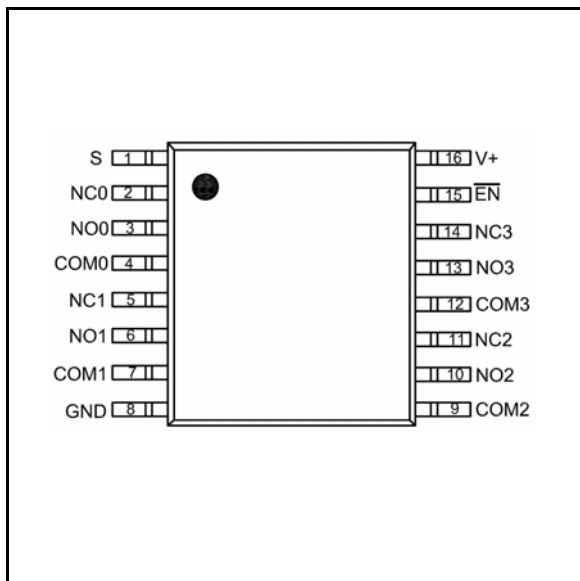
#### Applications

- Personal Video Recorders
- Terrestrial Set-Top Boxes
- Hard Disk Recorders
- DVD Players
- Game Consoles
- Digital VCRs
- Desktop Video Editors
- Audio and Video Switching

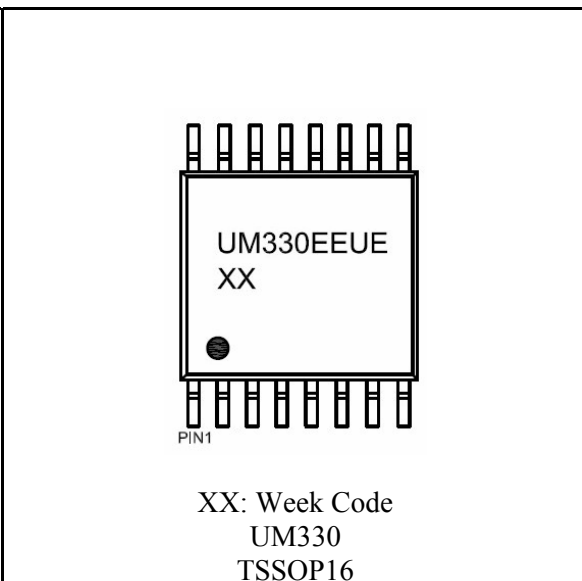
#### Features

- Wide Bandwidth:500MHz(TYP)
- Low On-Resistance:6Ω (TYP)
- Single-Supply Operation:5V
- Fast Switching Time
- Rail-to-Rail Operation
- Typical Power Consumption(5μW)
- TTL/CMOS Compatible
- Low Crosstalk: -60dB (10MHz)
- Hot insertion capable(It will need extra protection in power path)
- Micro Size Package: TSSOP16

#### Pin Configurations



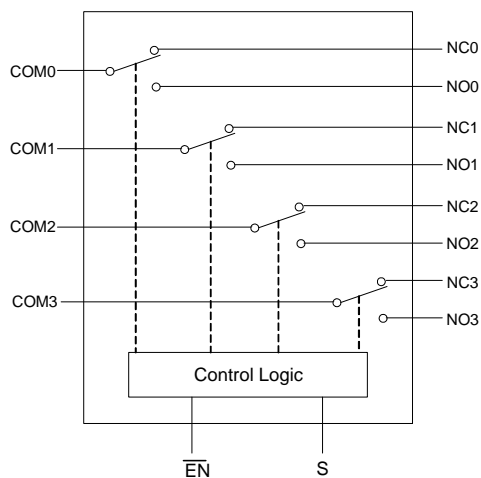
#### Top View



## Pin Description

Name	Function
NC0,NC1,NC2,NC3,NO0,NO1,NO2,NO3	Analog video I/O
S	Select input
EN	Switch-enable input
COM0,COM1,COM2,COM3	Analog video I/O
GND	Ground
V <sub>+</sub>	Power supply

## Block Diagram



## Function Table

$\overline{EN}$	S	COM0	COM1	COM2	COM3	Function
H	X	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Disable
L	L	NC0	NC1	NC2	NC3	S=0
L	H	NO0	NO1	NO2	NO3	S=1

## Ordering Information

Part Number	Packaging Type	Marking Code	Shipping Qty
UM330	TSSOP16	UM330EEUE	3000pcs/13 Inch Tape & Reel

**Absolute Maximum Ratings**

Symbol	Parameter	Limit	Unit
V <sub>+</sub>	Supply Voltage	- 0.3 to + 6.0	V
V <sub>S</sub>	DC Output Voltage	- 0.3 to + 6.0	
V <sub>IN</sub>	DC Input Voltage	- 0.3 to + 6.0	
I <sub>O</sub>	Continuous Current	±200	mA
T <sub>O</sub>	Operating Temperature Range	- 40 to +85	°C
T <sub>J</sub>	Junction Temperature	+150	
T <sub>STG</sub>	Storage Temperature Range	- 65 to +150	
T <sub>L</sub>	Junction Lead Temperature (Soldering, 10seconds)	+300	
ESD	ESD Method 3015.7	4000	

**DC Electrical Characteristics**

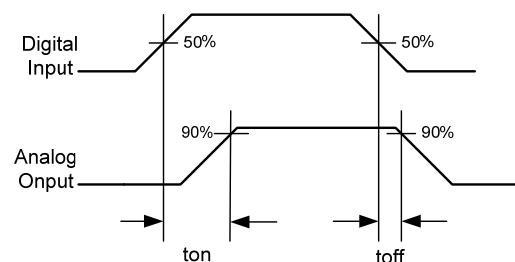
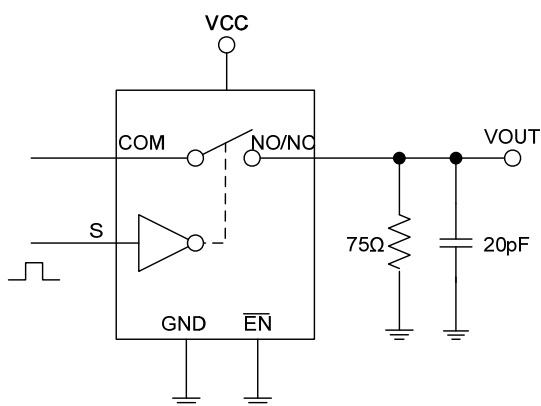
 (Over the Operating Range, V<sub>+</sub>=+5V±10%, T<sub>A</sub>=-40°C to +85°C.)

Symbol	Parameter	Test Conditions	Limits (-40 to 85 °C)			Unit
			Min	Typ	Max	
V <sub>ANALOG</sub>	Analog Signal Range		0		2.0	V
R <sub>ON</sub>	On Resistance	V <sub>+</sub> =4.5V, V <sub>I</sub> =1.0V, R <sub>L</sub> =75Ω, I <sub>ON</sub> =13mA		6	9	Ω
		V <sub>+</sub> =4.5V, V <sub>I</sub> =2.0V, R <sub>L</sub> =75Ω, I <sub>ON</sub> =26mA		7	10	Ω
I <sub>CC</sub>	Quiescent Power Supply Current	V <sub>+</sub> =5.5V, V <sub>IN</sub> = GND or 5V		0.1	1	μA
I <sub>CCT</sub>	Transience Power Supply Current	V <sub>+</sub> =4.3V, V <sub>IN</sub> =1.8V		11	20	μA
Δ <sub>ICC</sub>	Supply Current per Input @ TTL HIGH	V <sub>+</sub> =5.5V, V <sub>IN</sub> = 3.4V			15	μA
I <sub>IH</sub>	Input High Current	V <sub>+</sub> =5.5V, V <sub>IN</sub> = V <sub>+</sub>			±1	μA
I <sub>IL</sub>	Input Low Current	V <sub>+</sub> =5.5V, V <sub>IN</sub> = GND			±1	μA
I <sub>O</sub>	Analog Output Leakage Current	0≤NO,NC or COM≤V <sub>+</sub> , Switch OFF			±1	μA
I <sub>OS</sub>	Short Circuit Current			230		mA
V <sub>IH</sub>	Input High Voltage		2			V
V <sub>IL</sub>	Input Low Voltage		-0.5		0.8	V
V <sub>IK</sub>	Clamp Diode Voltage	V <sub>+</sub> =4.5V, I <sub>IN</sub> = -18mA	-0.7	-0.9		V
V <sub>H</sub>	Input Hysteresis at Control Pins			200		mV

## AC Electrical Characteristics

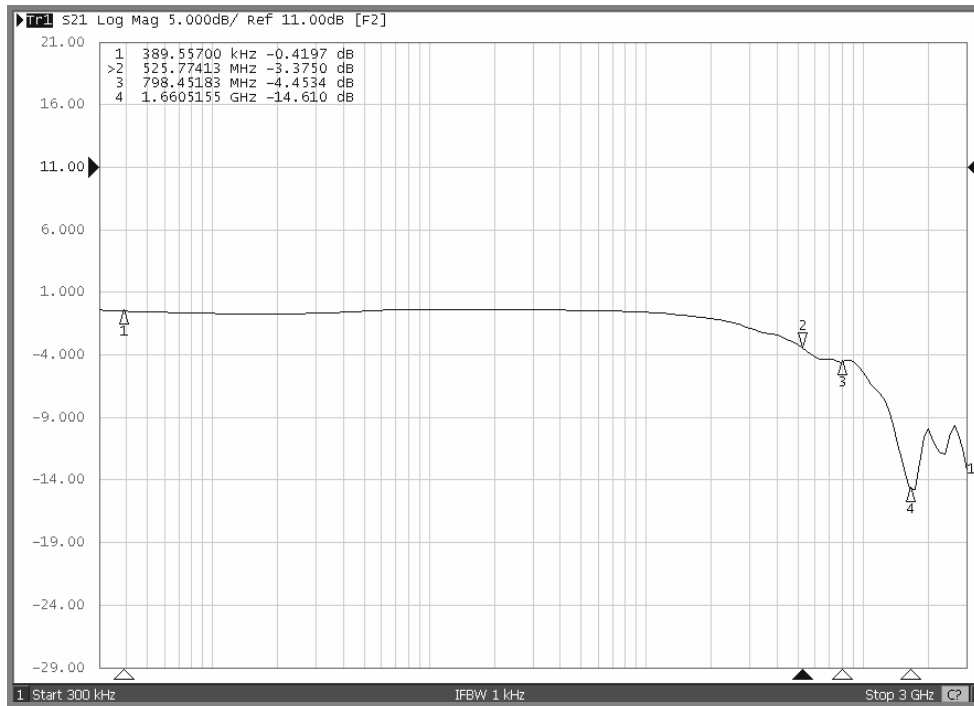
Symbol	Parameter	Test Conditions	Limits (-40 to 85 °C)			Unit
			Min	Typ	Max	
$t_{ON}$	Turn On Time	$R_L=75\Omega, C_L=20pF$		14	17	ns
$t_{OFF}$	Turn Off Time	$R_L=75\Omega, C_L=20pF$		4	7	ns
$V_{ISO}$	Off Isolation	$R_L=150\Omega, f = 10MHz$		-50		dB
VCT	Crosstalk	$R_{IN}=10\Omega, R_L=150\Omega, f = 10MHz$		-60		dB
BW	-3dB Bandwidth	$R_L=150\Omega$		500		MHz
DG	Differential Gain	$R_L=150\Omega, f = 3.58MHz$		0.51		%
DP	Differential Phase	$R_L=150\Omega, f = 3.58MHz$		0.01		°
$I_{CCD}$	Supply Current per Input per MHz	$V+=5.5V, NO,NC$ and $COM$ Pins Open, $EN=GND$ , Control Input Toggling 50% Duty Cycle		0.25		mA/MHz
<b>Capacitance</b>						
$C_{IN}$	Input/Enable Capacitance	$V_{IN}= 0V, f=1MHz$		5		pF
$C_{OFF}$	Switch Off Capacitance	$V_{IN}= 0V, f=1MHz$		5		pF
$C_{ON}$	Switch On Capacitance	$V_{IN}= 0V, f=1MHz$		10		pF

## Switching Time Test



## Typical Operating Characteristics

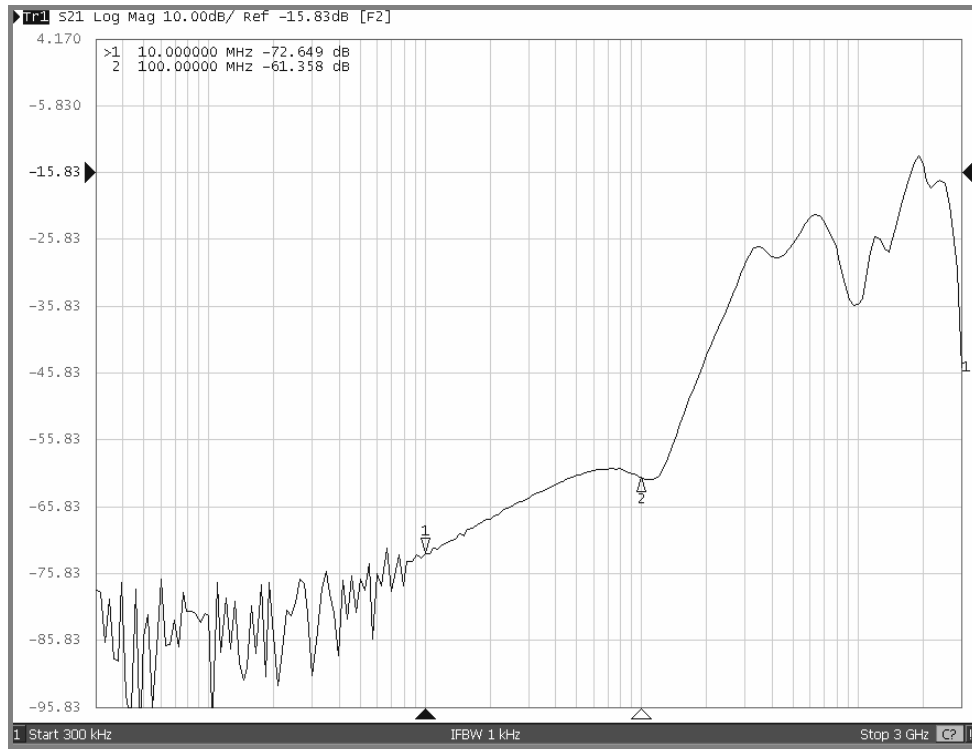
### Bandwidth vs. Frequency



### Off-isolation vs. Frequency



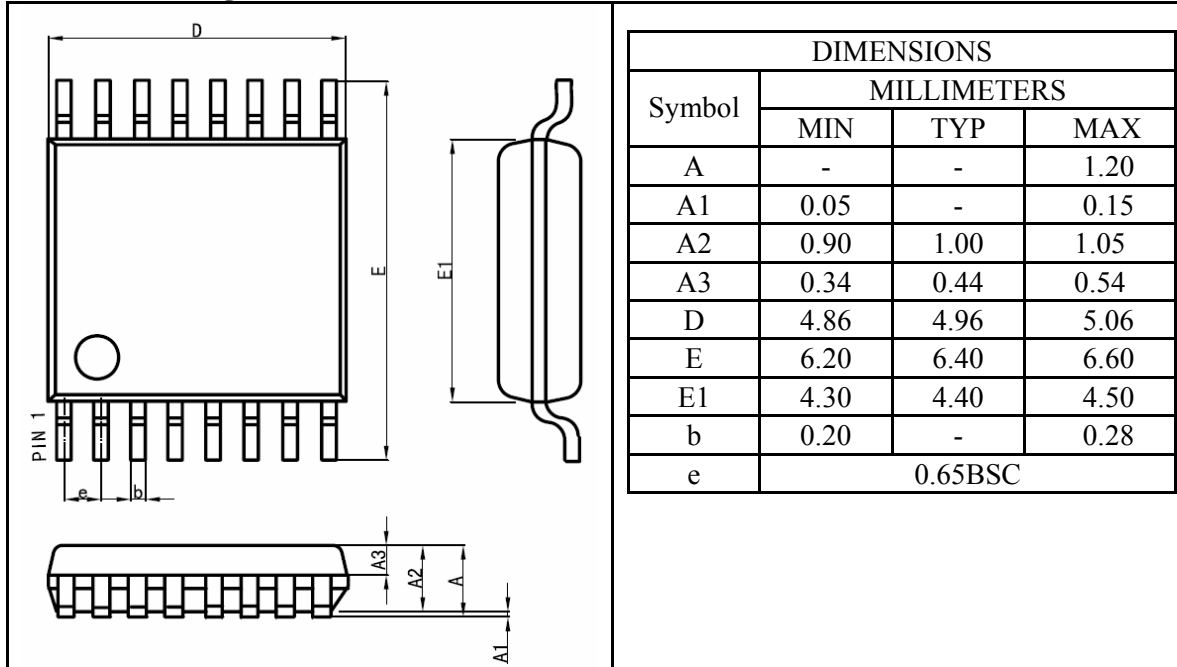
**Crosstalk vs. Frequency**



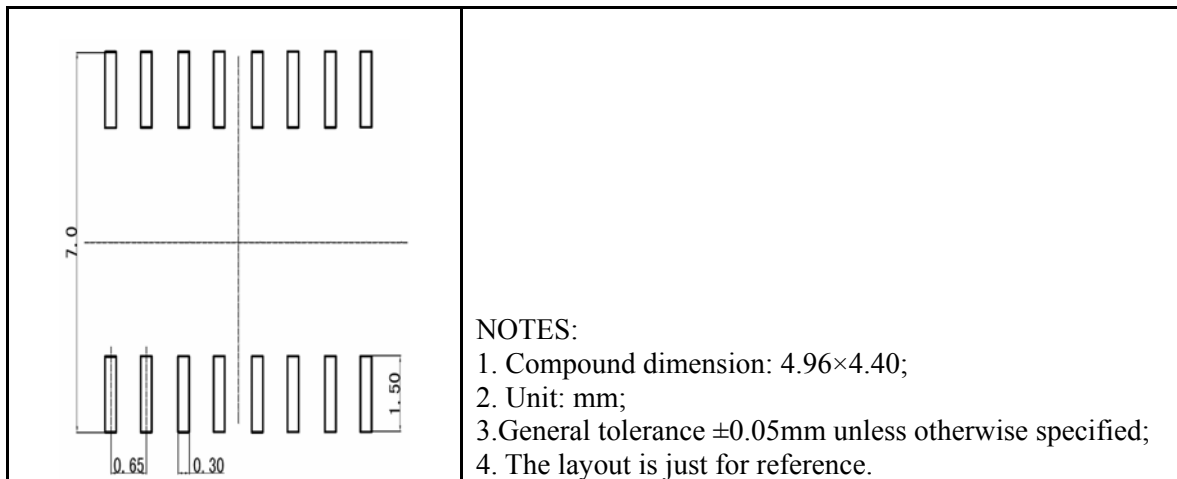
## Package Information

### UM330 TSSOP16

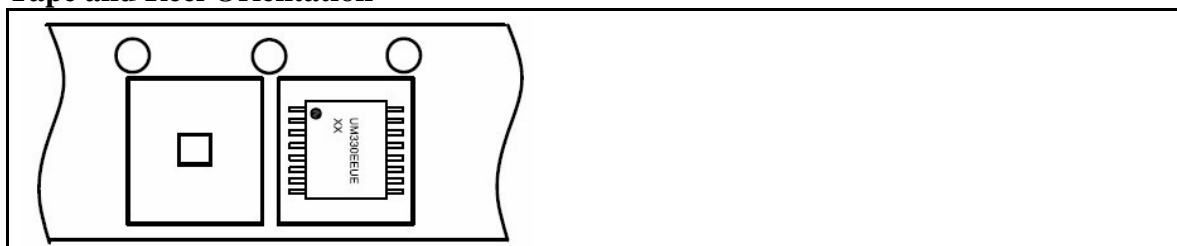
#### Outline Drawing



#### Land Pattern



#### Tape and Reel Orientation



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