Quad, Wide-Bandwidth SPDT Video Analog Switch

UM330EEUE TSSOP16

General Description

The UM330EEUE is a quad, bi-directional, 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 UM330EEUE features quad 6Ω 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

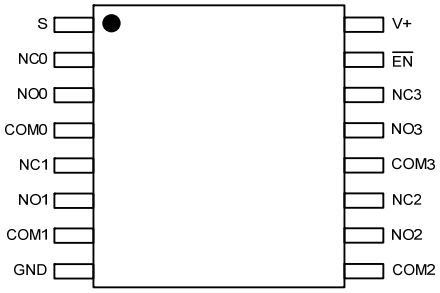
- Personal Video Recorders
- Terrestrial Set-Top Boxes
- Hard Disk Recorders
- DVD Players
- Game Consoles
- Digital VCRs
- Desktop Video Editors
- Audio and Video Switching

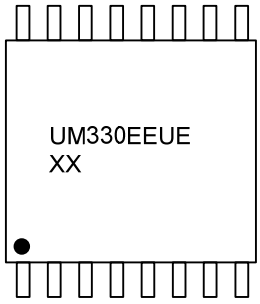
Features

- 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



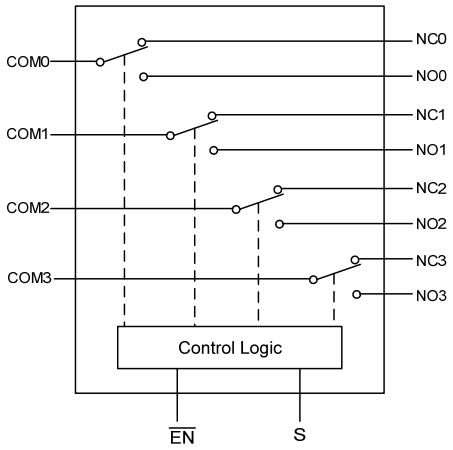


XX: Week Code
UM330EEUE
TSSOP16

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_+	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
UM330EEUE	TSSOP16	UM330EEUE	3000pcs/13 Inch Tape & Reel

Absolute Maximum Ratings

Symbol	Parameter	Limit	Unit
V_+	Supply Voltage	-0.3 to +6.0	V
V_{IN}	Select Input Voltage	-0.3 to +6.0	
V_I	Analog I/O Input Voltage	-0.3 to +6.0	
Ioc	Continuous Current	±200	mA
T_O	Operating Temperature Range	-40 to +85	°C
T_J	Junction Temperature	+150	
T_{STG}	Storage Temperature Range	-65 to +150	
T_L	Junction Lead Temperature (Soldering, 10 Seconds)	+300	
ESD	ESD Method 3015.7	4000	V

DC Electrical Characteristics

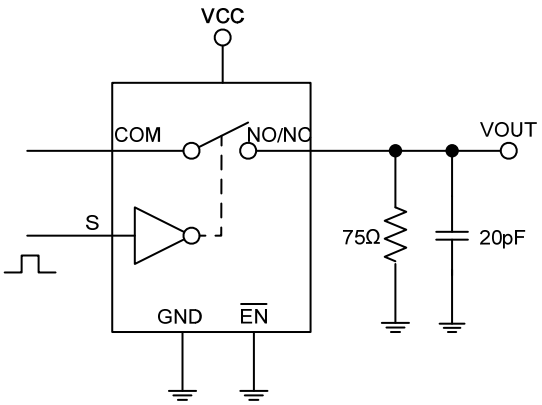
(Over the Operating Range, V_+=+5V±10%, T_A=-40°C to +85°C.)

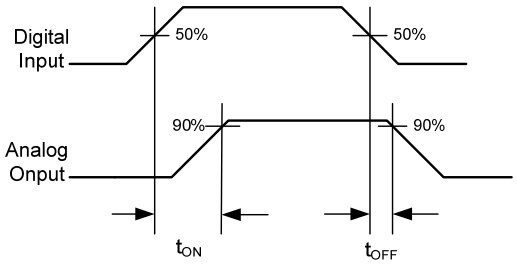
Symbol	Parameter	Test Conditions	Limits (-40°C to 85°C)			Unit
			Min	Typ	Max	
V_{ANALOG}	Analog Signal Range		0		V_+	V
R_{ON}	On Resistance	V_+=4.5V, V_I=1.0V, R_L=75Ω, I_{ON}=13mA		6	9	Ω
		V_+=4.5V, V_I=2.0V, R_L=75Ω, I_{ON}=26mA		7	10	Ω
I_{CC}	Quiescent Power Supply Current	V_+=5.5V, V_{IN}= GND or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

AC Electrical Characteristics

Symbol	Parameter	Test Conditions	Limits (-40°C to 85°C)			Unit
			Min	Typ	Max	
t_{ON}	Turn On Time	R_L=75Ω, C_L=20pF		14	17	ns
t_{OFF}	Turn Off Time	R_L=75Ω, C_L=20pF		4	7	ns
V_{ISO}	Off Isolation	R_L=150Ω, f=10MHz		-50		dB
VCT	Crosstalk	R_{IN}=10Ω, R_L=150Ω, f=10MHz		-60		dB
BW	-3dB Bandwidth	R_L=150Ω		500		MHz
DG	Differential Gain	R_L=150Ω, f=3.58MHz		0.51		%
DP	Differential Phase	R_L=150Ω, 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
Capacitance						
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

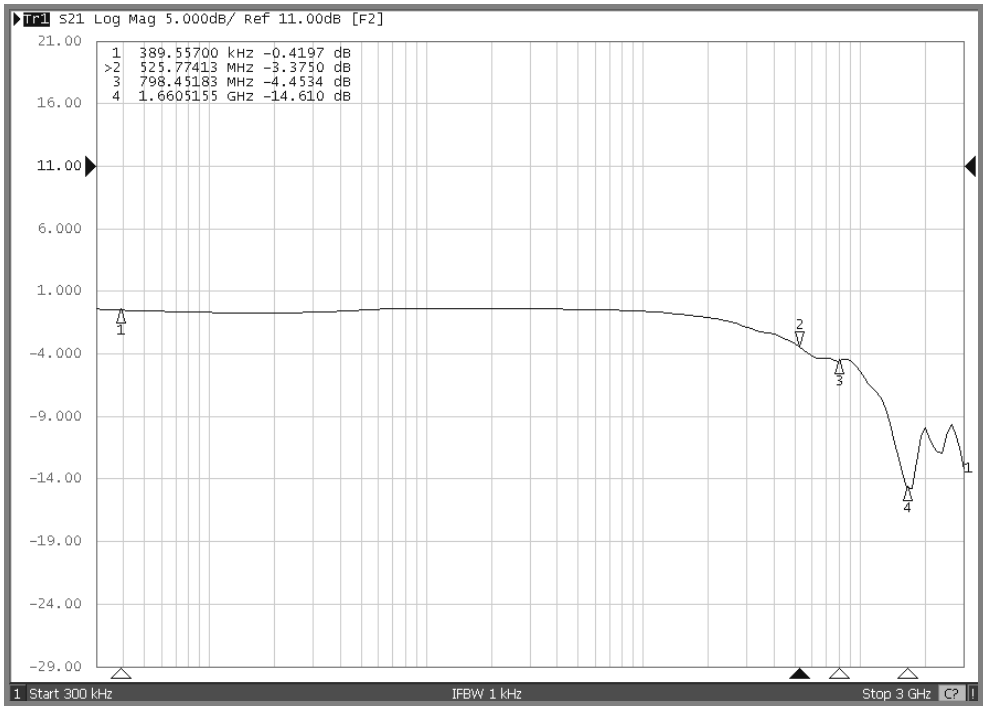
Switching Time Test



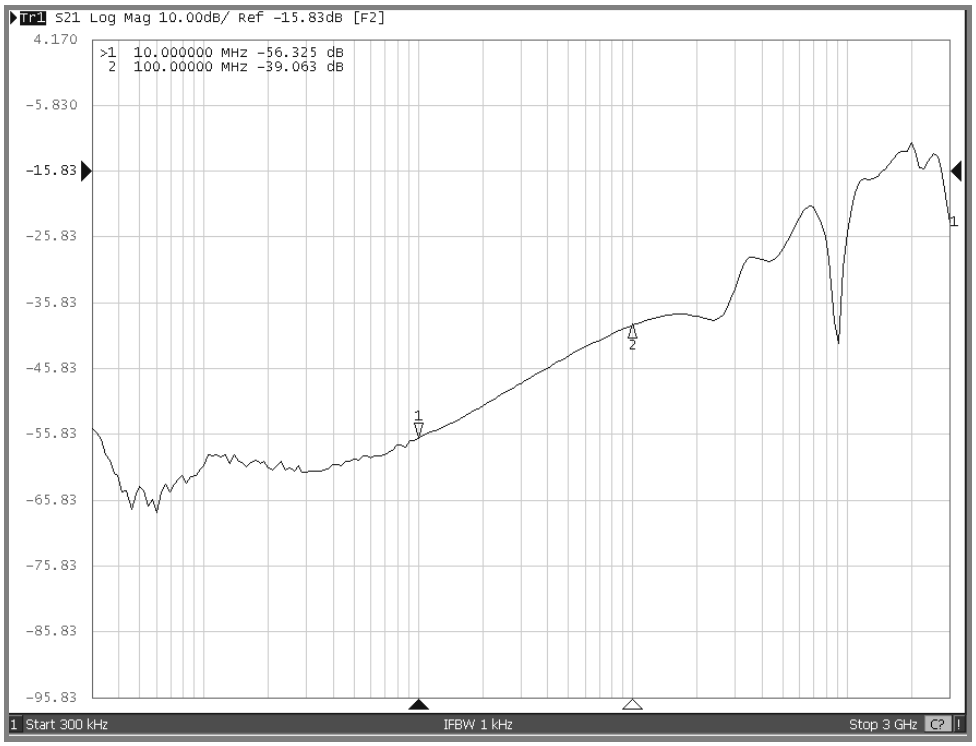


Typical Operating Characteristics

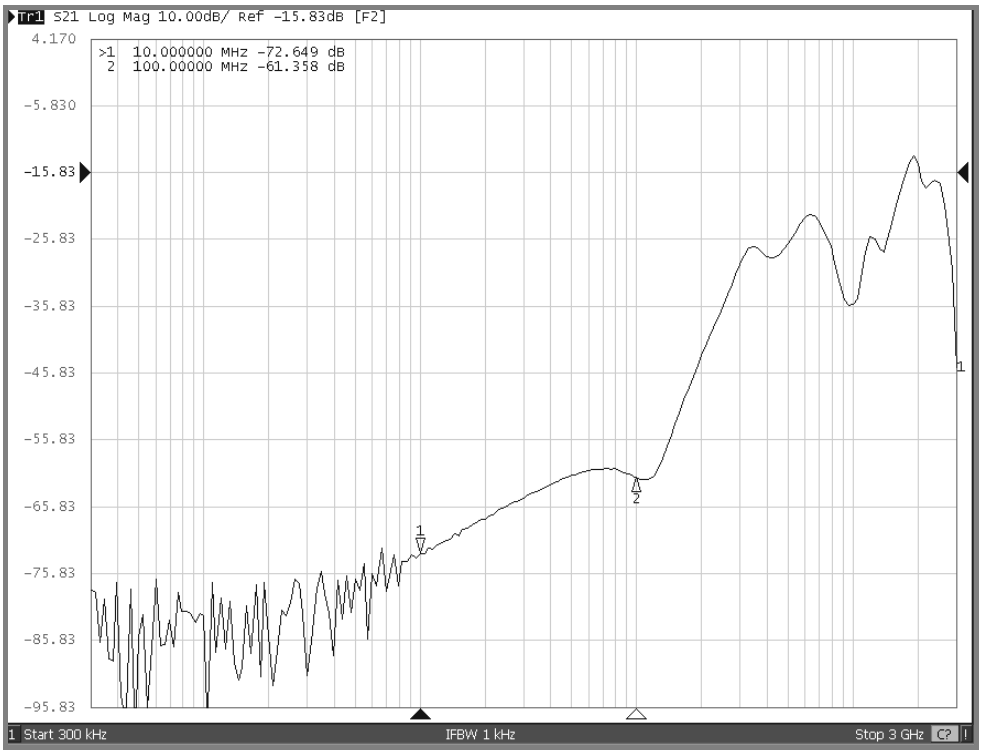
Bandwidth vs. Frequency



Off-Isolation vs. Frequency



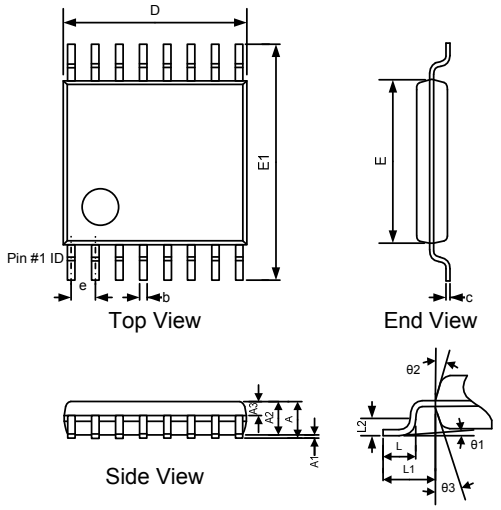
Crosstalk vs. Frequency



Package Information

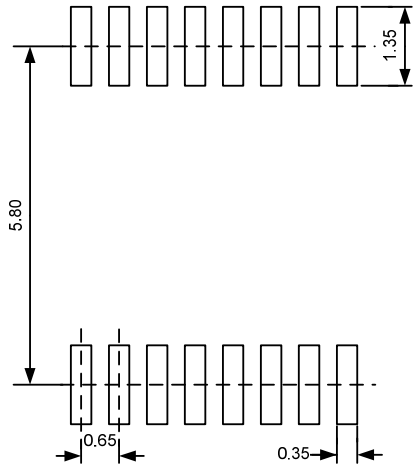
UM330EEUE TSSOP16

Outline Drawing



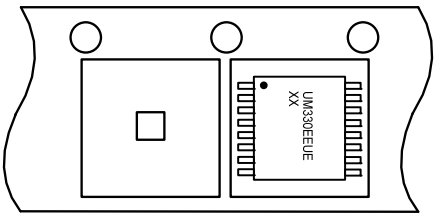
Symbol	DIMENSIONS					
	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	-	-	1.20	-	-	0.047
A1	0.05	-	0.15	0.002	-	0.006
A2	0.80	-	1.05	0.031	-	0.041
A3	0.34	0.44	0.54	0.013	0.017	0.021
b	0.19	-	0.30	0.007	-	0.012
c	0.09	-	0.20	0.004	-	0.008
D	4.86	4.96	5.10	0.191	0.195	0.201
E	4.30	4.40	4.50	0.169	0.173	0.177
E1	6.20	6.40	6.60	0.244	0.252	0.260
e	0.65BSC			0.026BSC		
L	0.45	0.60	0.75	0.018	0.024	0.030
L1	1.00REF			0.039REF		
L2	0.25BSC			0.010BSC		
θ1	0°	-	8°	0°	-	8°
θ2	10°	12°	14°	10°	12°	14°
θ3	10°	12°	14°	10°	12°	14°

Land Pattern



NOTES:
1. Compound dimension: 4.96×4.40.
2. Unit: mm.
3. General tolerance ±0.05mm unless otherwise specified.
4. The layout is just for reference.

Tape and Reel Orientation



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