



DESCRIPTION

The PT2328 is a true bidirectional Quad 2-channel multiplexer/ de-multiplexer utilizing CMOS Technology. It is recommended for both RGB and composite video switching applications. The video switch can be driven from a video DAC or a composite video source.

The very low ON-resistance and wide bandwidth make it ideal for video and other applications. High output current which is far greater than most analog switches offered today, only need a single 5V supply for operation. The PT2328 is a good choice to replacing the “switches + buffer amplifier” solution in both cost and performance reasons.

FEATURES

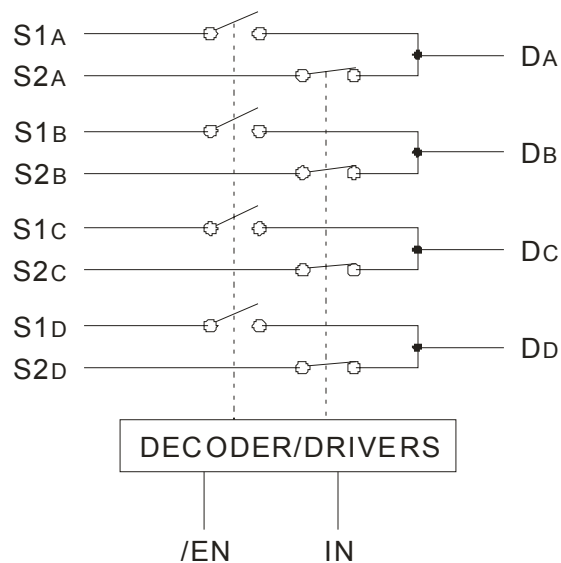
- Video signal switch
- Wide bandwidth: 240MHz
- Low On-Resistance: 5Ω, Low signal loss
- Low crosstalk: 10MHz/-58dB
- Extremely low power consumption
- Single supply: +5V
- Switching speed: 5nS
- Output driver current: >100mA
- 16 pins, Multi-package mode

APPLICATIONS

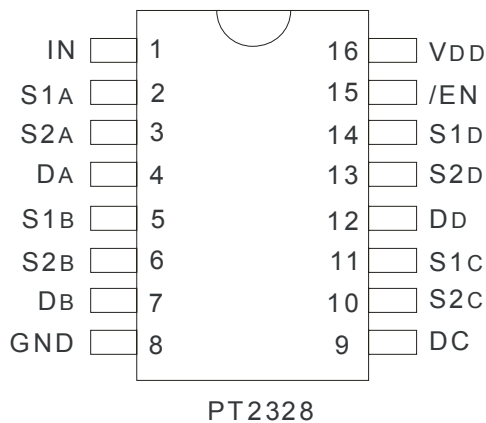
- LCD monitor, TV
- DVD player with recorder
- A/V power amplifier
- A/V switching
- CATV Tuner, Set-Top Box, Satellite Receiver



BLOCK DIAGRAM



PIN CONFIGURATION





PIN DESCRIPTION

Pin Name	I/O	Description	Pin No.
IN	I	Select Input	1
S1A	I/O	1 st analog video I/O	2
S2A	I/O	1 st analog video I/O	3
DA	I/O	1 st analog video O/I	4
S1B	I/O	2 nd analog video I/O	5
S2B	I/O	2 nd analog video I/O	6
DB	I/O	2 nd analog video O/I	7
GND	-	Ground	8
DC	I/O	3 rd analog video O/I	9
S2C	I/O	3 rd analog video I/O	10
S1C	I/O	3 rd analog video I/O	11
DD	I/O	4 th analog video O/I	12
S2D	I/O	4 th analog video I/O	13
S1D	I/O	4 th analog video I/O	14
/EN	I	Enable select input	15
VDD	-	Supply Voltage	16



FUNCTION DESCRIPTION

POWER SUPPLY

The power supplied to the PT2328 only needs single 5V, maximum workable voltage is 7V. In theoretical the chip itself does not consume the current. Minimum supply voltage not less than 5V for ensure low on-resistance of switch to keep the signal transmission quality.

ON/OFF SWITCH

PT2328 including 4 groups two way input/output multiplexer, please refer to the following truth table. In 5V supply voltage please maintain the input signal amplitude not greater than 2V for better signal transmission quality.

TRUTH TABLE

/EN	IN	ON Switch
0	0	S1A,S1B,S1C,S1D
0	1	S2A,S2B,S2C,S2D
1	×	Output Off



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-65 ~ +150	°C
Supply Voltage	VDD	-0.5 ~ +7.0	V
DC Input Voltage	Vimax	-0.5 ~ +7.0	V
DC Output Current	Iomax	120	mA
Power Dissipation	PD	0.5	W

Note: Input pins surge current can reach 100mA does not induce the CMOS latched up.



Low On-Resistance Wideband/Video Quad 2-Channel Mux/DeMux

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ELECTRICAL CHARACTERISTICS

(T_{opr}=-40°C~+85°C, V_{DD}=5V±5%)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Analog Signal Range	VANALOG	V _{DD} =5V, R _L >75Ω	0	2	2.4	V
Input High Voltage	V _{IH}	Guaranteed Logic HIGH Level	1.8	-	-	V
Input Low Voltage	V _{IL}	Guaranteed Logic LOW Level	-	-	0.8	V
Input High Current	I _{IH}	V _{DD} =5V, V _{IN} =V _{DD}	-	-	±1	μA
Input Low Current	I _{IL}	V _{DD} =5V, V _{IN} =GND	-	-	±1	μA
Analog Output Leakage Current	I _O	0 ≤ S1, S2 ≤ V _{DD} , Switch Off	-	-	±1	μA
Clamp Diode Voltage	V _{IK}	V _{DD} =5V, I _{IN} =-18mA	-0.9	-0.7	-0.5	V
Short Circuit Current	I _{OS}	S1 or S2=V _{DD} , D=0V SW On<0.3Sec	100	-	-	mA
Input Hysteresis at Control Pins	V _H	V _{IH} -V _{IL}	150	300	450	mV
Switch On-Resistance	R _{ON}	V _{DD} =5V, V _{IN} =1.0V R _L =75Ω, I _{ON} =13mA	-	5	7	Ω
		V _{DD} =5V, V _{IN} =2.0V R _L =75Ω, I _{ON} =26mA	-	7	10	Ω

DYNAMIC CHARACTERISTICS

(T_{opr}=-40°C~+85°C, V_{DD}=5V±5%)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn On Time	T _{ON}	R _L =75Ω, C _L =20pF	-	3	5	nS
Turn Off Time	T _{OFF}	R _L =75Ω, C _L =20pF	-	2	5	nS
Break before make	T _{bk}	R _L =75Ω, C _L =20pF		5	8	nS
Bandwidth	BW	R _L =150Ω	240	-	-	MHz
Crosstalk	XTALK	R _{IN} =10Ω; R _L =150Ω, 10MHz	-	-55	-50	dB
Off Isolation	OIRR	R _L =150Ω, 100MHz	-	-50	-45	dB

POWER SUPPLY CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Quiescence Current	I _{CC}	V _{DD} =5V, I _N =V _{DD} or GND	-	0.1	3.0	μA
Current Consumption vs Switching Frequency	I _{CCD}	V _{DD} =5V, S1, S2 and D pins Open /EN=GND V _{IN} =3V square wave, duty cycle=50%	-	-	0.25	mA/MHz
		V _{IN} =3V square waveform, F=1MHz	-	-	1	mA



CHARACTERISTICS DIAGRAM

Instrument: Agilent E5071B Network Analyzer

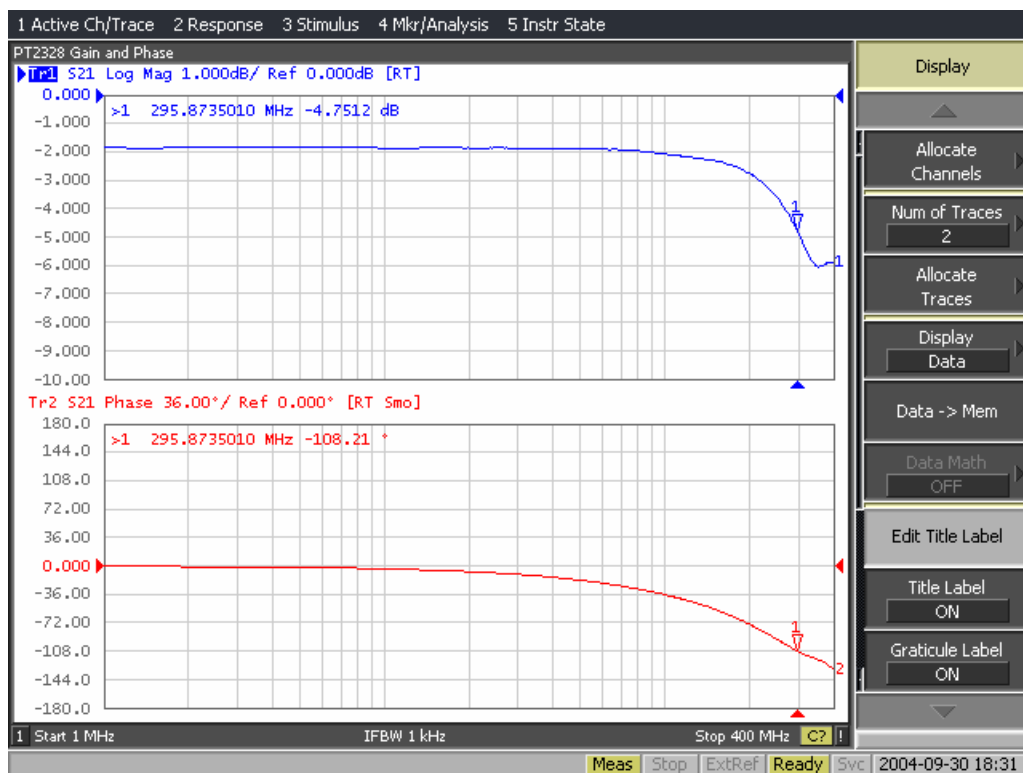


Figure 1. PT2328, Bandwidth vs. Phase



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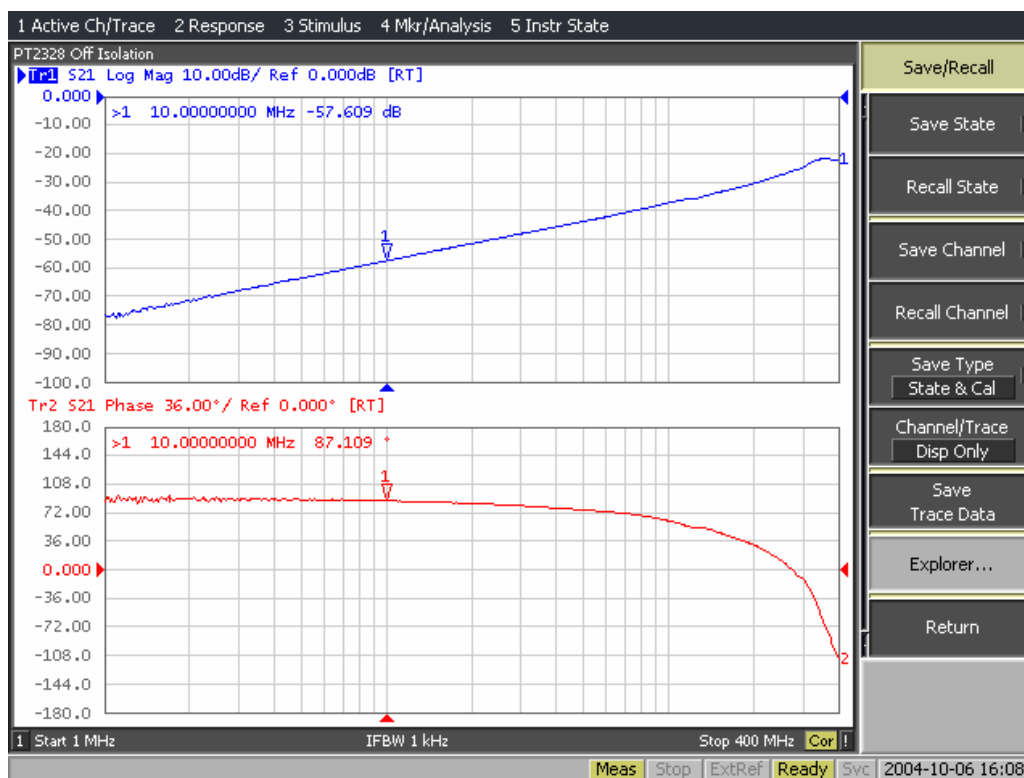


Figure 2. PT2328, Off Isolation



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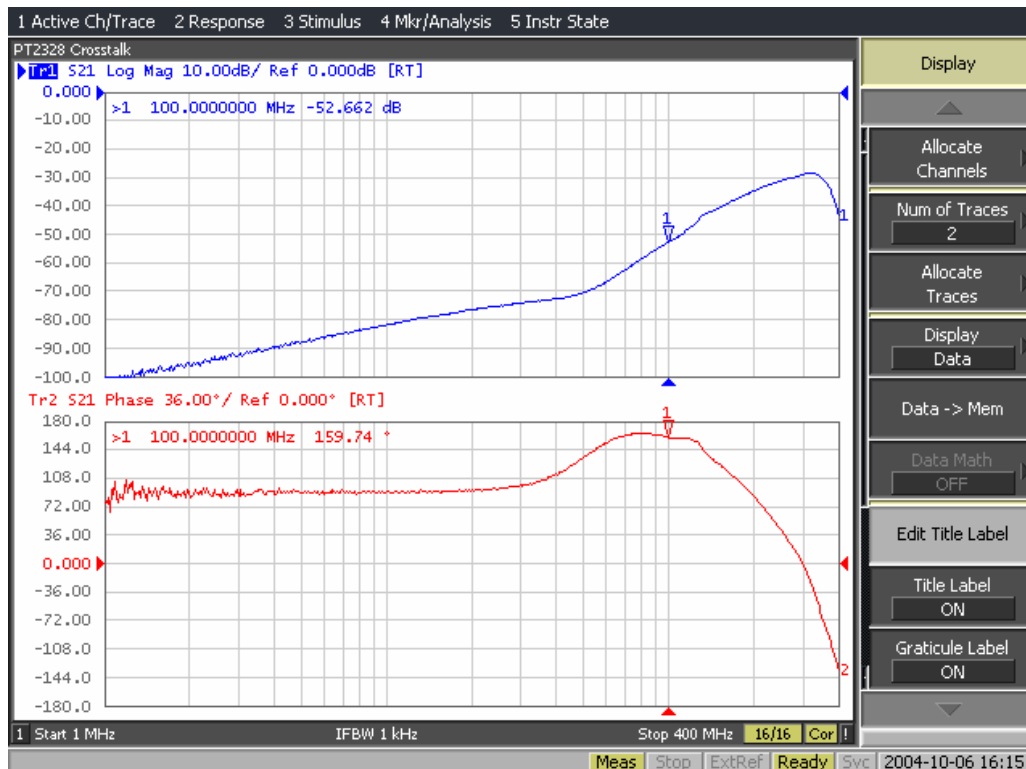


Figure 3. PT2328, Crosstalk

CHARACTERISTICS TESTING CIRCUIT

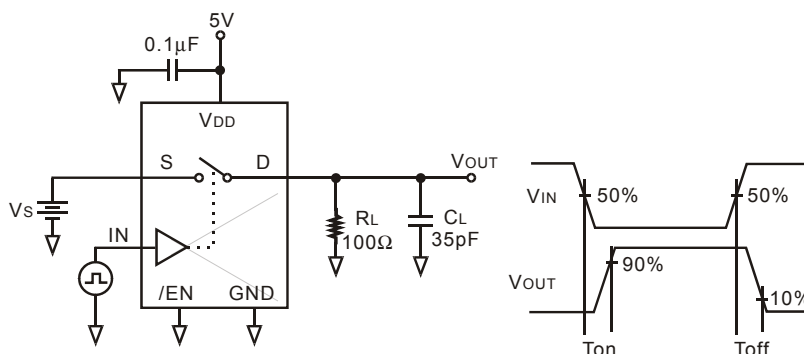


Fig.4 Switching On/Off time

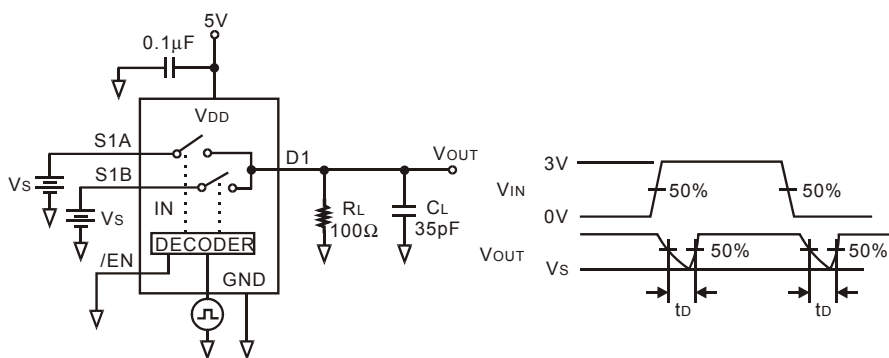


Fig.5 Break before make time

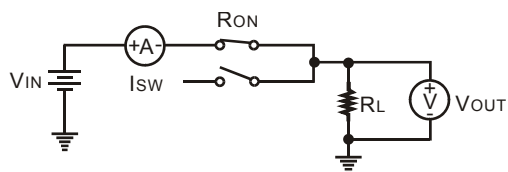


Fig.6 ON Resistance

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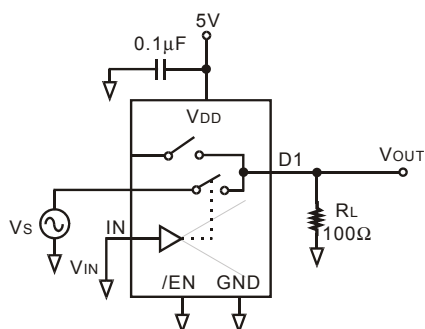


Fig.7 Bandwidth Testing

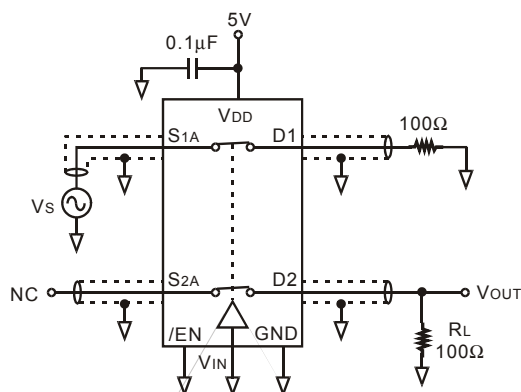


Fig.8 Crosstalk

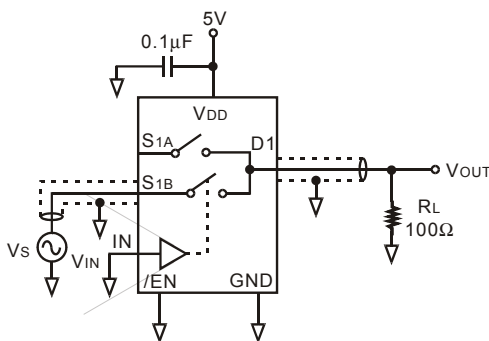


Fig.9 Off Isolation

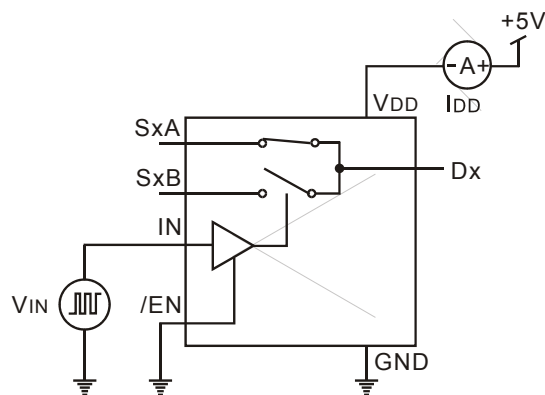
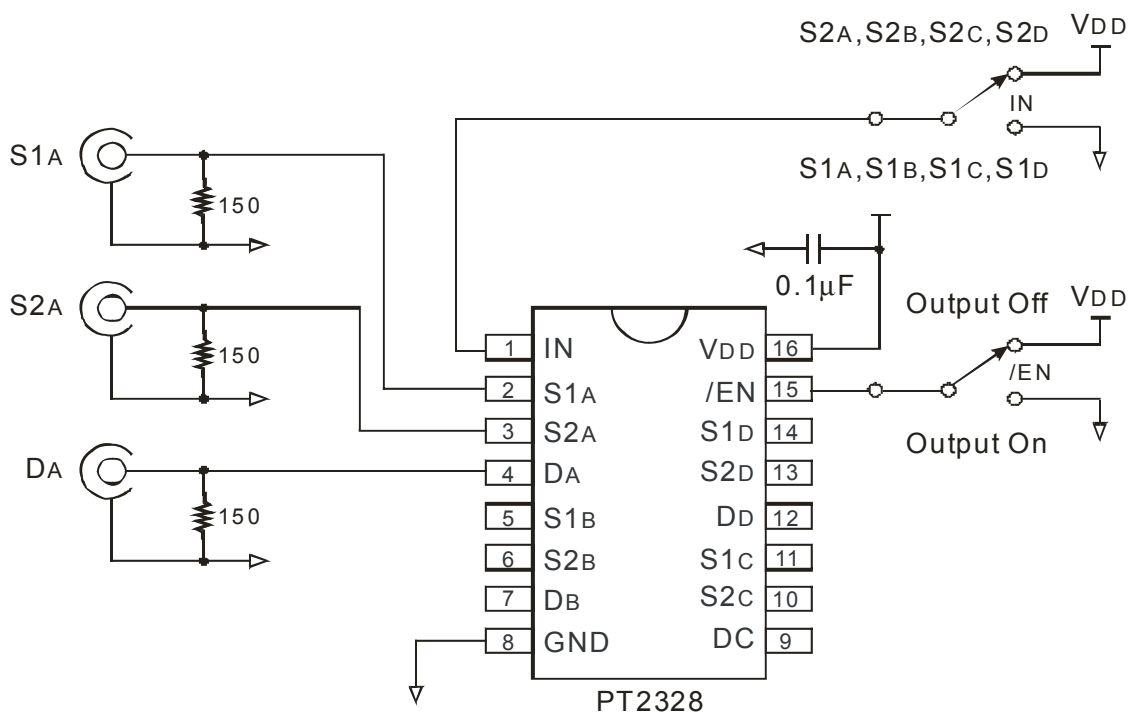


Fig.10 Current consumption VS switching frequency



APPLICATION CIRCUIT



Note: Group A is the representative at this figure.



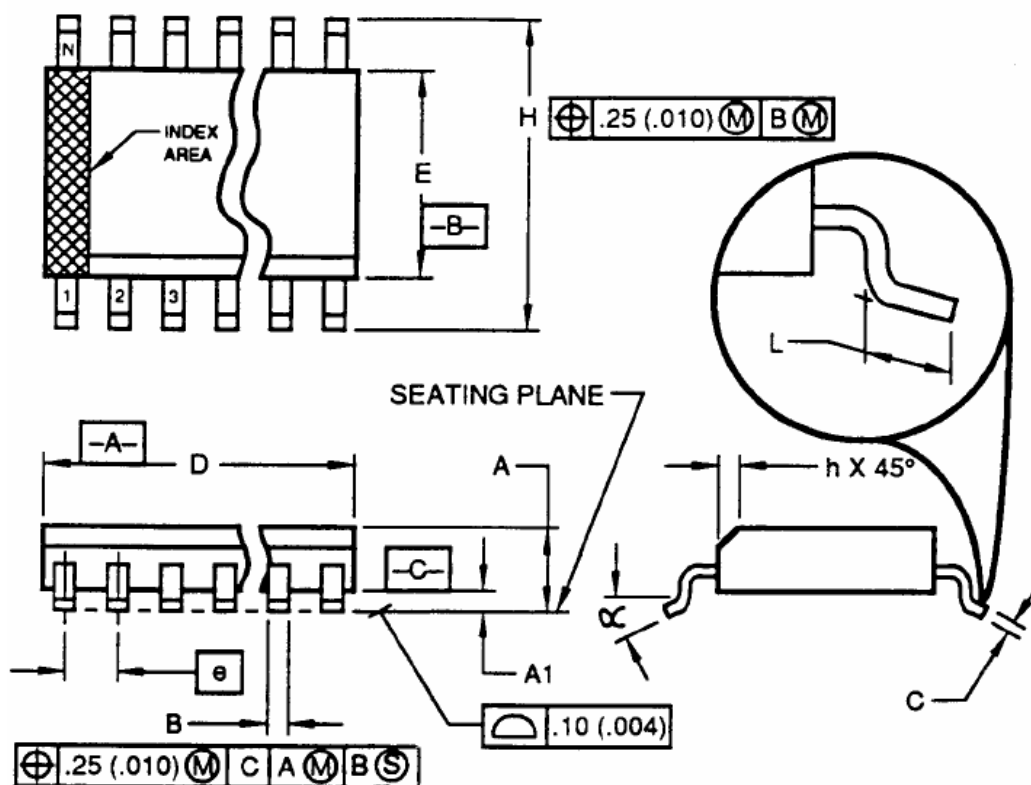
ORDER INFORMATION

Valid Part Number	Package Type	Top Code
PT2328-SJ	16 Pins, SOP, 300mil	PT2328-SJ
PT2328-SA	16 Pins, SOP, 150mil	PT2328-SA
PT2328-X	16 Pins, SSOP, 150mil	PT2328-X



PACKAGE INFORMATION

16 PINS, SOP, 300 MIL



Symbol	Min.	Max
A	2.35	2.65
A1	0.10	0.30
B	0.33	0.51
C	0.23	0.32
D	10.10	10.50
E	7.40	7.60
e	1.27 BSC.	
H	10.00	10.65
h	0.25	0.75
L	0.40	1.27
α	0°	8°



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Notes:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold Flash, protrusion or gate burrs shall not exceed 0.15 mm (0.006 in) per side.
3. Dimension "E" does not include interlead flash or protrusions. Interlead flash or protrusions shall not exceed 0.25 mm (0.010 in) per side.
4. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
5. "L" is the length of the terminal for soldering to a substrate.
6. N is the number of the terminal positions (N=16)
7. The lead width "B" as measured 0.36 mm (0.014 in) or greater above the seating plane, shall not exceed a maximum value of 0.61 mm (0.24 in).
8. Controlling dimension : MILLIMETER.
9. Refer to JEDEC MS-013, Variation AA.

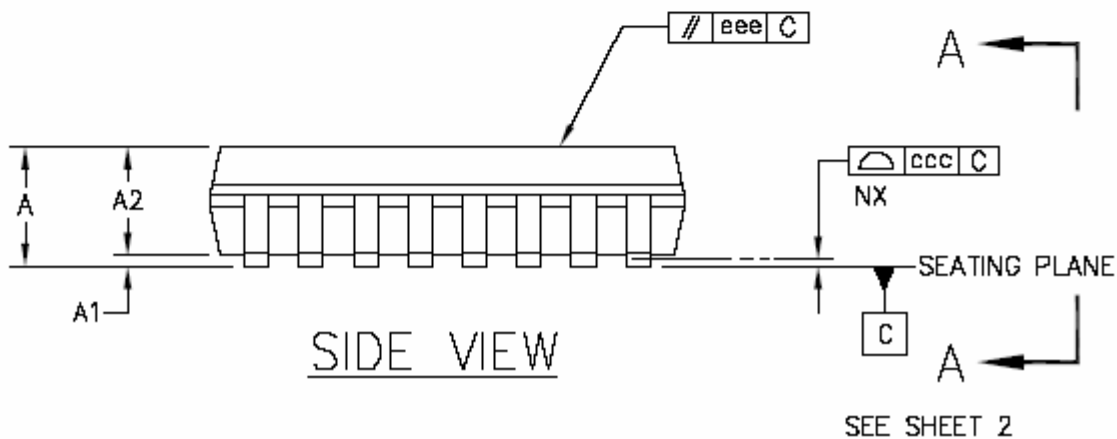
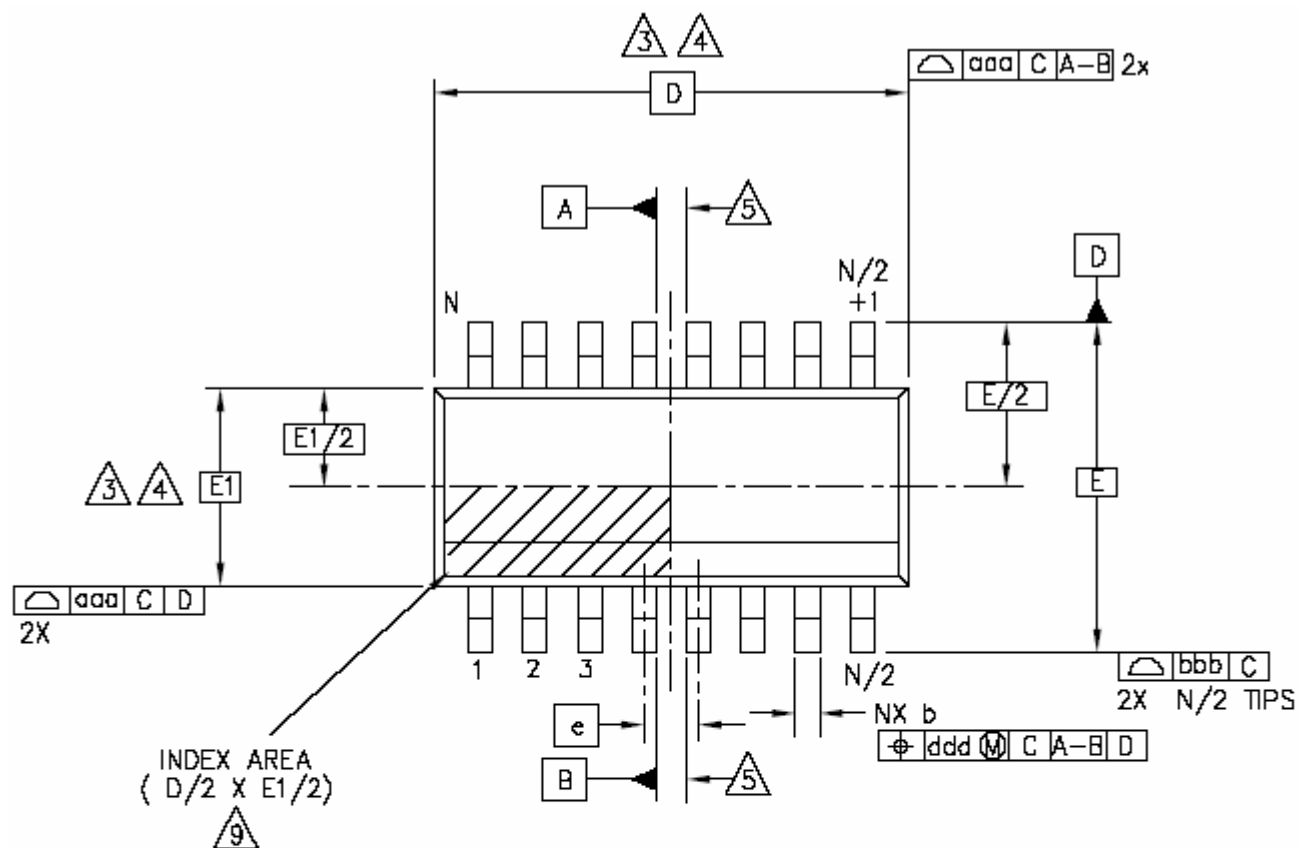
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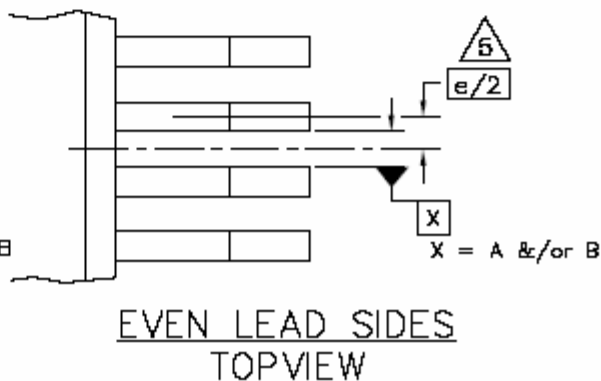
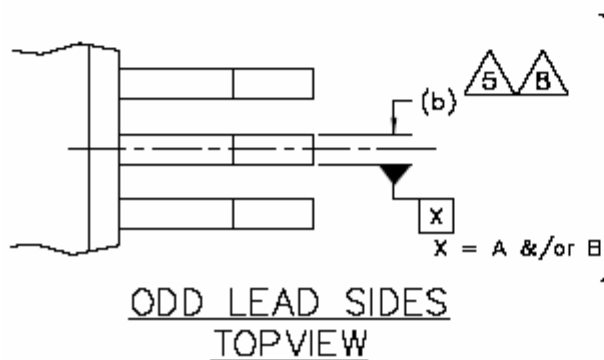
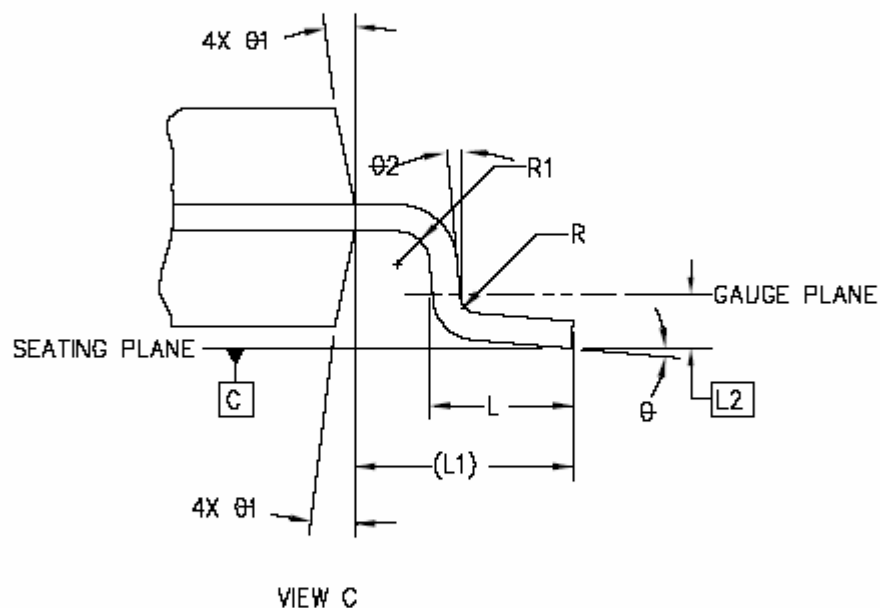
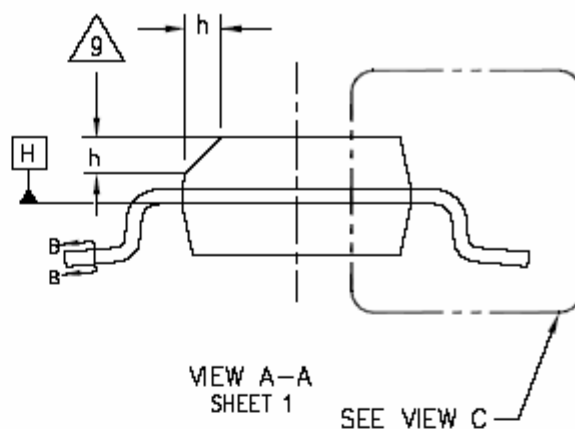
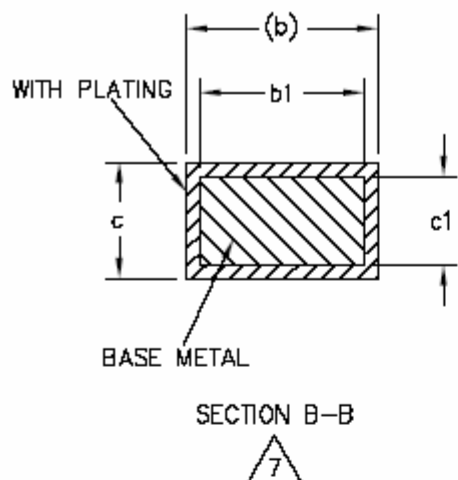
16 PINS, SOP, 150MIL





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Symbol	Min.	Typ.	Max.
A	1.35	-	1.75
A1	0.10	-	0.25
A2	1.25	-	1.65
b	0.31	-	0.51
b1	0.28	-	0.48
c	0.17	-	0.25
c1	0.17	-	0.23
D	9.90 BSC.		
E	6.00 BSC.		
E1	3.90 BSC.		
e	1.27 BSC.		
L	0.40	-	1.27
L1	1.04 REF.		
L2	0.25 BSC.		
R	0.07	-	-
R1	0.07	-	-
h	0.25	-	0.50
θ	0°	-	8°
θ1	5°	-	15°
θ2	0°	-	-

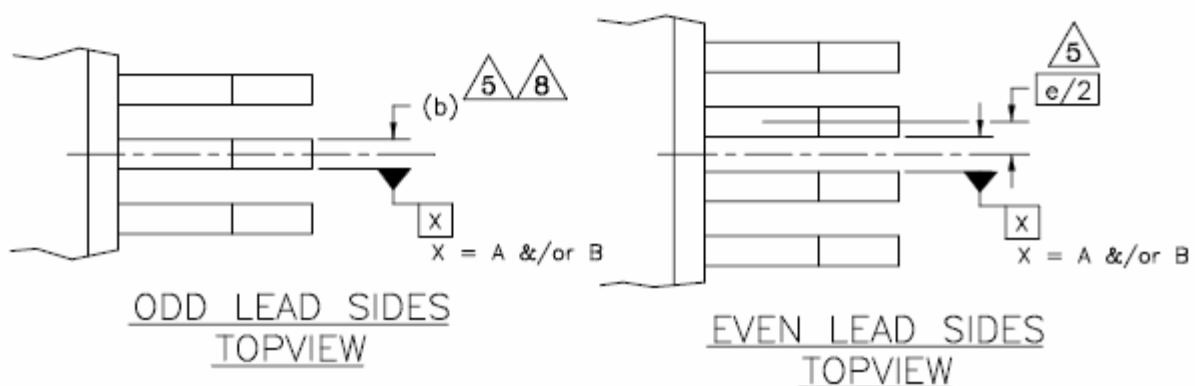
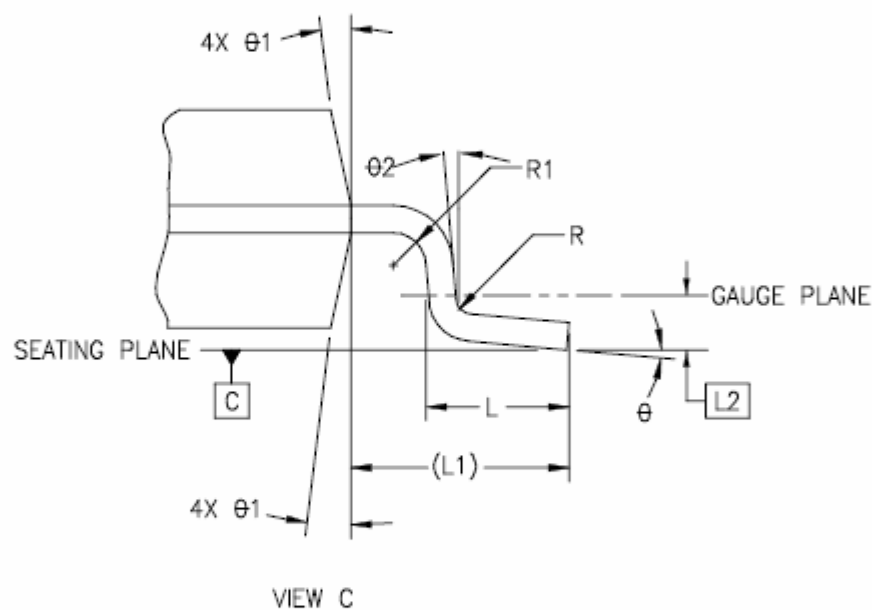
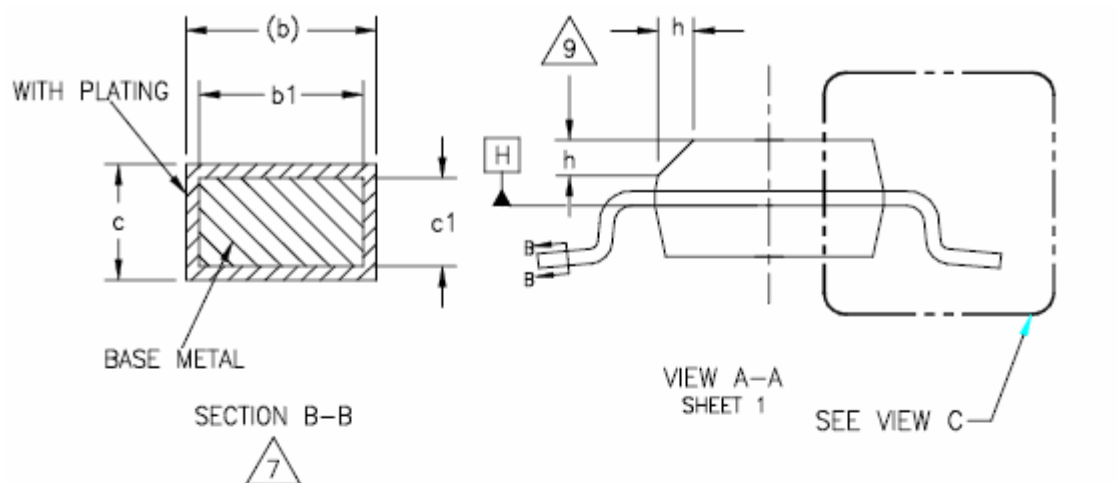
Note:

1. Dimensioning and tolerancing per ANSI Y 14.5M-1994
 2. Controlling Dimension: MILLIMETERS.
 3. Dimension D does not include mold flash protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15 mm (0.006 in) per end. Dimension E1 does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side. D and E1 dimensions are determined at datum H.
 4. The package top may be smaller than the package bottom. Dimensions D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic body.
 5. Datums A & B to be determined at datum H.
 6. N is the number of terminal positions. (N=16)
 7. The dimensions apply to the flat section of the lead between 0.10 to 0.25mm from the lead tip.
 8. Dimension "b" does not include dambar protrusion. Allowable dambar protrusion shall be 0.10mm total in excess of the "b" dimension at maximum material condition. The dambar cannot be located on the lower radius of the foot.
 9. This chamfer feature is optional. If it is not present, then a pin 1 identifier must be located within the index area indicated.
 10. Refer to JEDEC MS-012, Variation AC.
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Symbol	Min.	Nom.	Max.
A	0.053	-	0.069
A1	0.004	-	0.010
A2	0.049	-	0.065
b	0.008	-	0.012
b1	0.008	0.010	0.011
c	0.006	-	0.010
c1	0.006	0.008	0.009
D	0.193 BSC		
E	0.236 BSC		
E1	0.154 BSC		
e	0.025 BAS		
L	0.016	-	0.050
L1	0.041 REF		
L2	0.010 BAS		
R	0.003	-	-
R1	0.003	-	-
θ	0°	-	8°
$\theta 1$	5°	-	15°
$\theta 2$	0°	-	-
aaa	0.004		
bbb	0.008		
ccc	0.004		
ddd	0.007		
eee	0.004		



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Notes:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
2. Dimensions in inches (angles in degrees)
3. Dimension D does not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.006" per end. Dimension E1 does not include interlead flash or protrusions. Interlead flash or protrusions shall not exceed "0.006" per side. D1 and E1 dimensions are determined at datum H.
4. The package top may be smaller than the package bottom. Dimensions D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic.
5. Datums A and B to be determined at datum H.
6. N is the maximum number of terminal position. (N=16)
7. The dimensions apply to the flat section of the lead between 0.004 to 0.010 inches from the lead tip.
8. Dimension b does not include dambar protrusion. Allowable dambar protrusion shall be 0.004" total in excess of b dimension at maximum material condition. The dambar can not be located on the lower radius of the foot.
9. Refer to JEDEC MO-137 variation AB.

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