TOPAZ SEMICONDUCTOR

CDG2269

DUAL SPDT CMOS/D-MOS ANALOG SWITCHES WITH DATA LATCHES

ORDERING INFORMATION

	16-Pin Plastic DIP	SO-16 Surface Mount
Commercial Temp. Range	CDG2269CJ	CDG2269CY
Package Dimensions	See Package 10	See Package 21

FEATURES

- High OFF Isolation
- Low Channel-to-Channel Crosstalk
- Wide Bandwidth
- Analog Signal Range +10V to -10V
- Low ON Resistance, 20Ω typ.

APPLICATIONS

- RF & Video Switches
- High Speed Precision Data Acquisition
- L-PAD Digital Controlled Attenuators

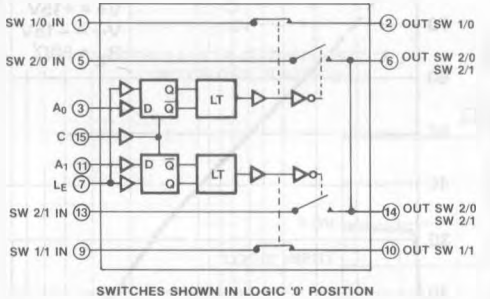
DESCRIPTION

Topaz Semiconductor CMOS/D-MOS Analog Switches feature high-speed, low-power 5 volt CMOS input logic and level translation circuitry are fabricated together on a single silicon chip. This part is designed for applications where high "off" isolation at high frequencies is needed.

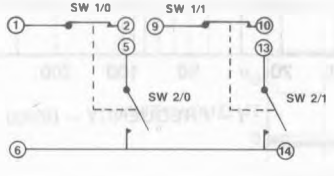
NOTE

All devices contain diodes to protect inputs against damage due to high static voltages or electric fields; however, it is advised that precautions be taken not to exceed the maximum recommended input voltages. All unused inputs must be connected to an appropriate logic level (either V_{CC} or GND).

LOGIC DIAGRAM



SWITCHES SHOWN IN LOGIC '0' POSITION



FUNCTION TABLE

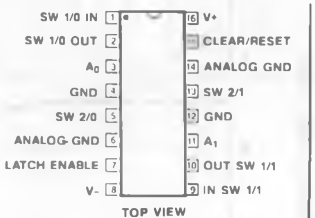
INPUT			SWITCH	
A	L_E	C	SW_1	SW_2
L	H	L	ON	OFF
H	H	L	OFF	ON
X	X	H	OFF	ON
L	L	L	*(1)	*(2)

X = undefined

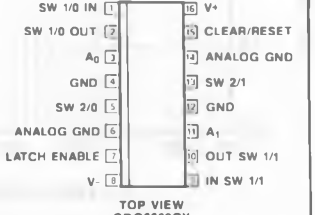
*(1) Hold input state one setup before L_E High to Low transition. If Input state Low then Switch ON. If Input state High then Switch OFF.

*(2) $SW_1 = \overline{SW_2}$

PIN CONFIGURATION



TOP VIEW
CDG2269CJ
(PACKAGE 10)



TOP VIEW
CDG2269CY
(PACKAGE 21)

ABSOLUTE MAXIMUM RATINGS

$V-$	Negative Supply Voltage	-20V
$V+$	Positive Supply Voltage	+20V
V_{IN}	Control Input Voltage Range	V+ +0.3V, V- -0.3V
I_L	Continuous Current, any Pin except S or D	20mA
I_S	Continuous Current, S or D	30mA
I_S	Peak Pulsed Current, S or D, 80μsec, 1% Duty Cycle	100mA
T_J	Junction Temperature Range	-55 to +125°C
T_S	Storage Temperature Range	-55 to +125°C
P_D	Power Dissipation	500mW

RECOMMENDED OPERATING CONDITIONS

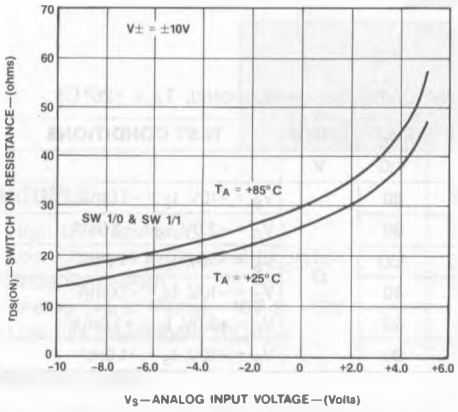
$V-$	Negative Supply Voltage	-8.0 to -15V
$V+$	Positive Supply Voltage	+8.0 to +15V
V_{IN}	Control Input Voltage Range	0 to +5V
T_{OP}	Operating Temperature Range (C Suffix)	0 to +70°C

ELECTRICAL CHARACTERISTICS (V- = -15V, V+ = +15V, per channel, unless otherwise noted, T_A = +25°C)

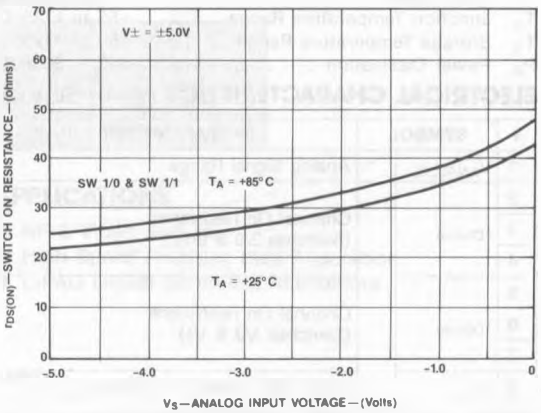
#	SYMBOL		PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS	
1	V_{ANALOG}		Analog Signal Range		-10		+10	V		
2	$r_{DS(on)}$	STATIC	Channel On Resistance (Switches 2/0 & 2/1)			29	80	Ω	V_S = -10V, I_S = -1.0mA	
3						40	80		V_S = +2.0V, I_S = +1.0mA	
4						100	160		V_S = +10V, I_S = +1.0mA	
5	$r_{DS(on)}$		Channel On Resistance (Switches 1/0 & 1/1)			13	40		V_S = -10V, I_S = -1.0mA	
6						20	40		V_S = +2.0V, I_S = +1.0mA	
7						50	80		V_S = +10V, I_S = +1.0mA	
8	V_{IH}		Logic High Level Input Voltage		4.5	3.4		V		
9	V_{IL}		Logic Low Level Input Voltage				1.0			
10	I_{IN}		Logic Input Leakage Current			0.01	0.1	μA	V_{IN} = +5.0V	
11						0.02	0.1		V_{IN} = +15V	
12	$I_{D(OFF)}$		Switch OFF Leakage Currents	(Switches 2/0 & 2/1)		0.4	5.0	nA	V_D = +10V, V_S = -10V	
13	$I_{S(OFF)}$					4.0	20		V_S = +10V, V_D = -10V	
14	$I_{D(OFF)}$			(Switches 1/0 & 1/1)		0.4	5.0		V_D = +10V, V_S = -10V	
15	$I_{S(OFF)}$					4.0	20		V_S = +10V, V_D = -10V	
16	I-		Negative Supply Quiescent Current			-.05	-0.5	μA	V_{IN} = 0 or V+	
17	I+		Positive Supply Quiescent Current			.03	0.5			
18		DYNAMIC	Propagation Delay	Data to Switch ON		180	250	nSec		
19				Data to Switch OFF		100	200			
20				Latch Enable to Sw. ON		180	250			
21				Latch Enable to Sw. OFF		140	200			
22				Clear to Switch ON		180	250			
23				Clear to Switch OFF		90	150			
24	t_S		Set Up Time		150	120				
25	t_H		Hold Time		150	90				
26	P_W		Pulse Width		50	40				
27	O_{IRR}		OFF Isolation Rejection Ratio (Switches 1/0 & 1/1)		42	45		dB	f = 10MHz	R_L = 50Ω
28					12	15			f = 200MHz	
29			Frequency Roll-Off (Bandwidth)			1.0	3.0		f = 200MHz, R_L = 50Ω	
30	I_L		Insertion Loss (Switches 1/0 & 1/1)			2.0			f = 10MHz	R_L = 50Ω
31						3.0			f = 200MHz	
32	c_d		Drain-Node Capacitance			0.6		pF	V_D = 0	f = 1MHz, V_{IN} = 0
33	c_s		Source-Node Capacitance			6.0			V_S = 0	

TYPICAL PERFORMANCE CHARACTERISTICS (T_A = +25°C unless otherwise noted)

SWITCH ON RESISTANCE —vs— ANALOG INPUT VOLTAGE



SWITCH ON RESISTANCE —vs— ANALOG INPUT VOLTAGE



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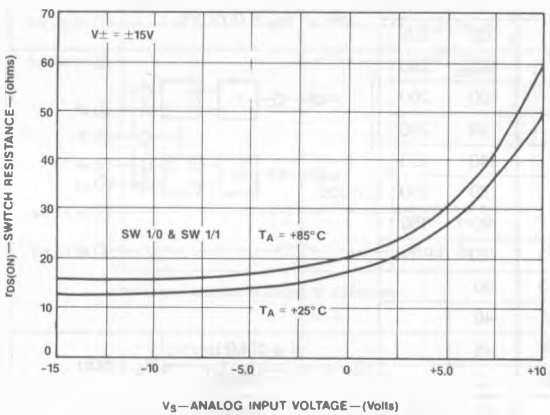
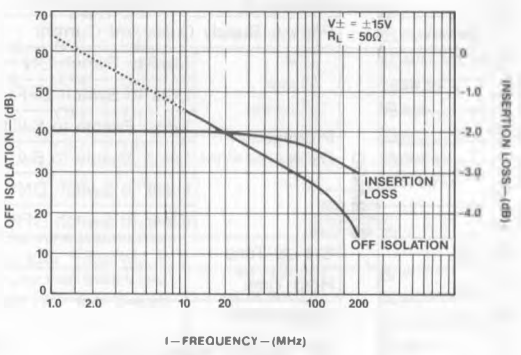
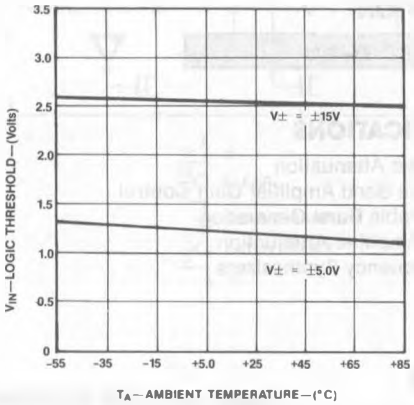


OFF ISOLATION & INSERTION LOSS —vs— FREQUENCY

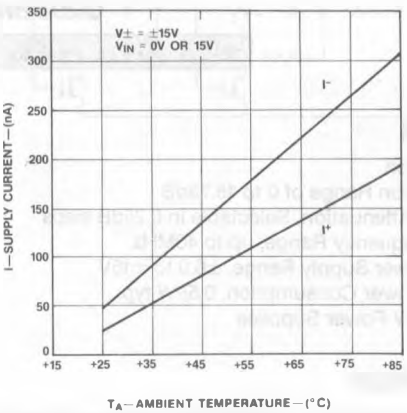


TYPICAL PERFORMANCE CHARACTERISTICS (T_A = +25°C unless otherwise noted)

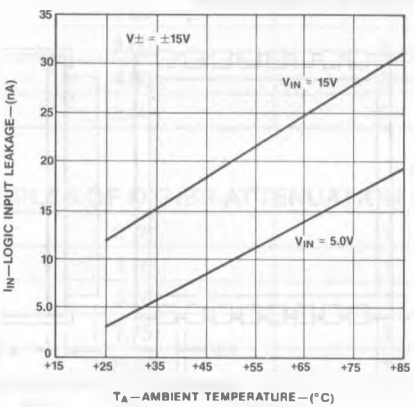
LOGIC THRESHOLD —VS— SUPPLY VOLTAGES & TEMPERATURE



SUPPLY CURRENTS —VS— AMBIENT TEMPERATURE



LOGIC INPUT LEAKAGE CURRENT —VS— AMBIENT TEMPERATURE



SWITCH OFF LEAKAGES —VS— AMBIENT TEMPERATURE