

Monolithic Dual SPST CMOS Analog Switch

Features

- ± 15 V Input Signal Range
- 44-V Maximum Supply Ranges
- On-Resistance: $45\ \Omega$
- TTL and CMOS Compatibility

Benefits

- Wide Dynamic Range
- Simple Interfacing
- Reduced External Component Count

Applications

- Servo Control Switching
- Programmable Gain Amplifiers
- Audio Switching
- Programmable Filters

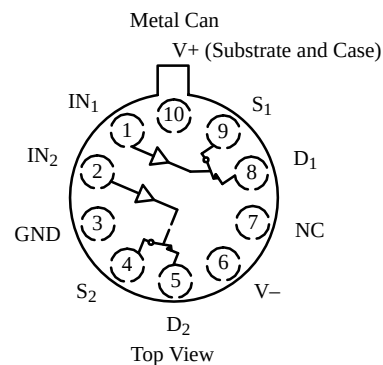
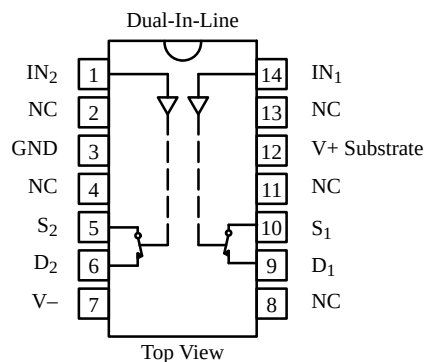
Description

The DG200A is a dual, single-pole, single-throw analog switch designed to provide general purpose switching of analog signals. This device is ideally suited for designs requiring a wide analog voltage range coupled with low on-resistance.

Each switch conducts equally well in both directions when on, and blocks up to 30 V peak-to-peak when off. In the on condition, this bi-directional switch introduces no offset voltage of its own.

The DG200A is designed on Siliconix' improved PLUS-40 CMOS process. An epitaxial layer prevents latchup.

Functional Block Diagram and Pin Configuration



Truth Table

Logic	Switch
0	ON
1	OFF

Logic "0" ≤ 0.8 V
Logic "1" ≥ 2.4 V

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70035.

Temp Range	Package	Part Number
0 to 70°C	14-Pin Plastic DIP	DG200ACJ
-25 to 85°C	14-Pin CerDIP	DG200ABK
	10-Pin Metal Can	DG200ABA
-55 to 125°C	14-Pin CerDIP	DG200AAK
		DG200AAK/883, JM38510/12301BCA
	10-Pin Metal Can	DG200AAA
		DG200AAA/883, JM38510/12301BIC
	14-Pin Sidebrazed	JM38510/12301BCC

V+ to V-	44 V
GND to V-	25 V
Digital Inputs ^a , V _S , V _D	(V-) -2 V to (V+) +2 V or 30 mA, whichever occurs first
Current (Any Terminal) Continuous	30 mA
Current S or D (Pulsed at 1 ms, 10% Duty Cycle Max)	100 mA
Storage Temperature (AX, BX Suffix)	-65 to 150°C
(CJ Suffix)	-65 to 125°C

10-Pin Metal Can ^c	450 mW
14-Pin CerDIP ^d	825 mW
14-Pin Plastic DIP ^e	470 mW

- Signals on S_X , D_X , or IN_X exceeding $V+$ or $V-$ will be clamped by internal diodes. Limit forward diode current to maximum current ratings.
- All leads welded or soldered to PC Board.
- Derate 6 mW/°C above 75°C
- Derate 11 mW/°C above 75°C
- Derate 6.5 mW/°C above 25°C

[illegible]

Siliconix
S-52880—Rev. B, 28-Apr-97

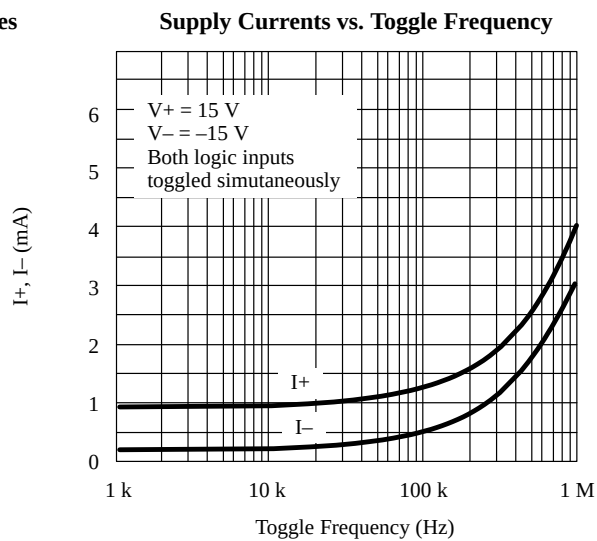
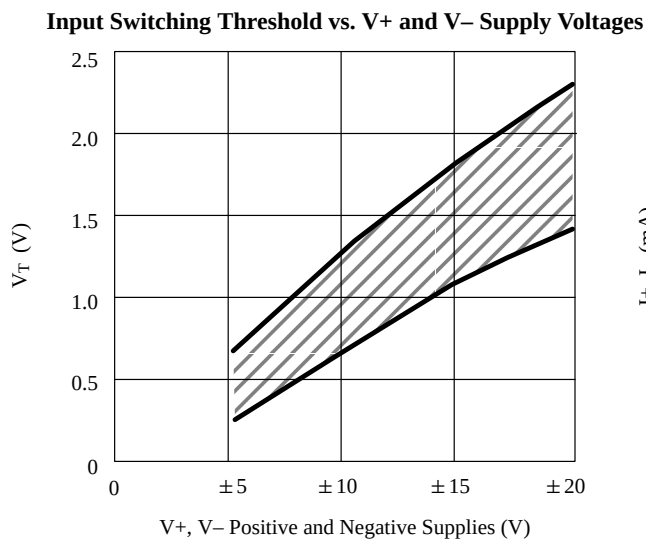
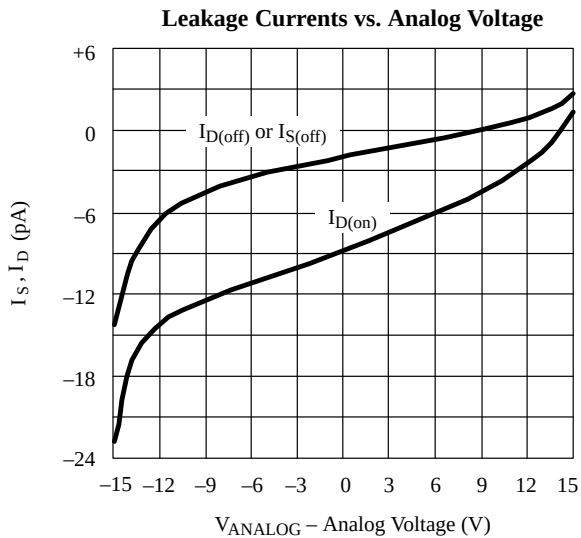
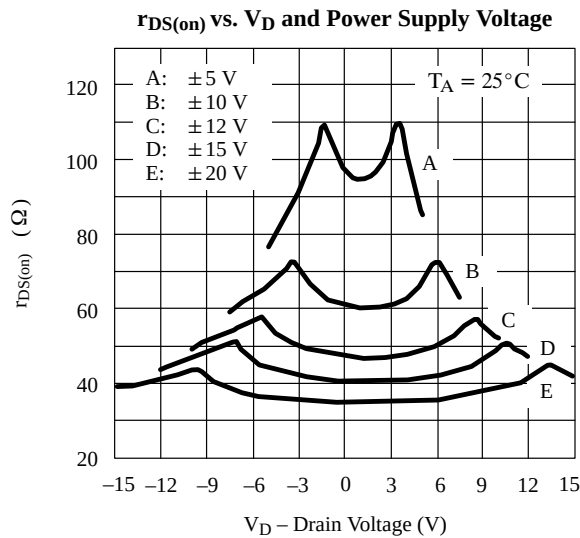
Specifications^a

Parameter	Symbol	Test Conditions Unless Otherwise Specified V+ = 15 V, V− = −15 V VIN = 2.4 V, 0.8 V ^f	Temp ^b	Typ ^c	A Suffix −55 to 125°C		B, C Suffix		Unit
					Min ^d	Max ^d	Min ^d	Max ^d	
Analog Switch									
Analog Signal Range ^e	V _{ANALOG}		Full		−15	15	−15	15	V
Drain-Source On-Resistance	r _{DS(on)}	V _D = ± 10 V, I _S = −1 mA	Room Full	45		70 100		80 100	Ω
Source Off Leakage Current	I _{S(off)}	V _S = ± 14 V, V _D = ∓ 14 V	Room Full	± 0.01	−2 −100	2 100	−5 −100	5 100	nA
Drain Off Leakage Current	I _{D(off)}	V _D = ± 14 V, V _S = ∓ 14 V	Room Full	± 0.01	−2 −100	2 100	−5 −100	5 100	
Channel On Leakage Current ^f	I _{D(on)}	V _S = V _D = ± 14 V	Room Full	± 0.1	−2 −200	2 200	−5 −200	5 200	
Digital Control									
Input Current with Input Voltage High	I _{INH}	V _{IN} = 2.4 V	Room Full	0.0009	−0.5 −1		−1 −10		μA
		V _{IN} = 15 V	Room Full	0.005		0.5 1		1 10	
Input Current with Input Voltage Low	I _{INL}	V _{IN} = 0 V	Room Full	−0.0015	−0.5 −1		−1 −10		
Dynamic Characteristics									
Turn-On Time	t _{ON}	See Switching Time Test Circuit	Room	440		1000		1000	ns
Turn-Off Time	t _{OFF}		Room	340		425		425	
Charge Injection	Q	C _L = 1000 pF, V _g = 0 V R _g = 0 Ω	Room	−10					pC
Source-Off Capacitance	C _{S(off)}	f = 140 kHz V _{IN} = 5 V	Room	9					pF
Drain-Off Capacitance	C _{D(off)}		V _D = 0 V	Room	9				
Channel-On Capacitance	C _{D(on)} + C _{S(on)}	V _D = V _S = 0 V, V _{IN} = 0 V	Room	25					
Off Isolation	OIRR	V _{IN} = 5 V, R _L = 75 Ω V _S = 2 V, f = 1 MHz	Room	75					dB
Crosstalk (Channel-to-Channel)	X _{TALK}		Room	90					
Power Supplies									
Positive Supply Current	I+	Both Channels On or Off V _{IN} = 0 V and 2.4 V	Room	0.8		2		2	mA
Negative Supply Current	I−		Room	−0.23	−1		−1		

Notes:

- Refer to PROCESS OPTION FLOWCHART.
- Room = 25°C, Full = as determined by the operating temperature suffix.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
- Guaranteed by design, not subject to production test.
- V_{IN} = input voltage to perform proper function.

Typical Characteristics



Test Circuits

V_O is the steady state output with switch on. Feedthrough via gate capacitance may result in spikes at leading and trailing edge of output waveform.

