

Monolithic Dual SPST CMOS Analog Switch

FEATURES

- ± 15 V Input Signal Range
- 44-V Maximum Supply Ranges
- On-Resistance: 45Ω
- 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

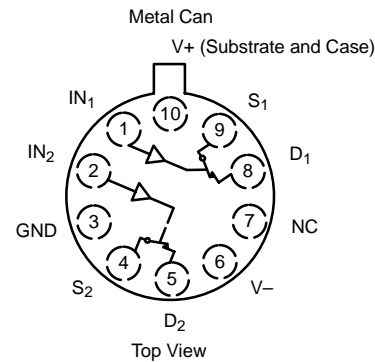
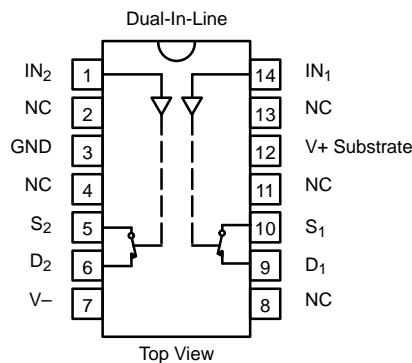
DESCRIPTION

The DG200A_MIL 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_MIL is designed on Vishay 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

ORDERING INFORMATION		
Temp Range	Package	Part Number
-55 to 125°C	14-Pin CerDIP	DG200AAK
		DG200AAK/883, JM38510/12301BCA, 5962-9562901QCA
	10-Pin Metal Can	DG200AAA
		DG200AAA/883, JM38510/12301BIC
	14-Pin Sidebrazed	JM38510/12301BCC

ABSOLUTE MAXIMUM RATINGS

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	-65 to 150°C

Power Dissipation (Package) ^b	
10-Pin Metal Can ^c	450 mW
14-Pin CerDIP ^d	825 mW

- Notes:
- 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

SCHEMATIC DIAGRAM (TYPICAL CHANNEL)

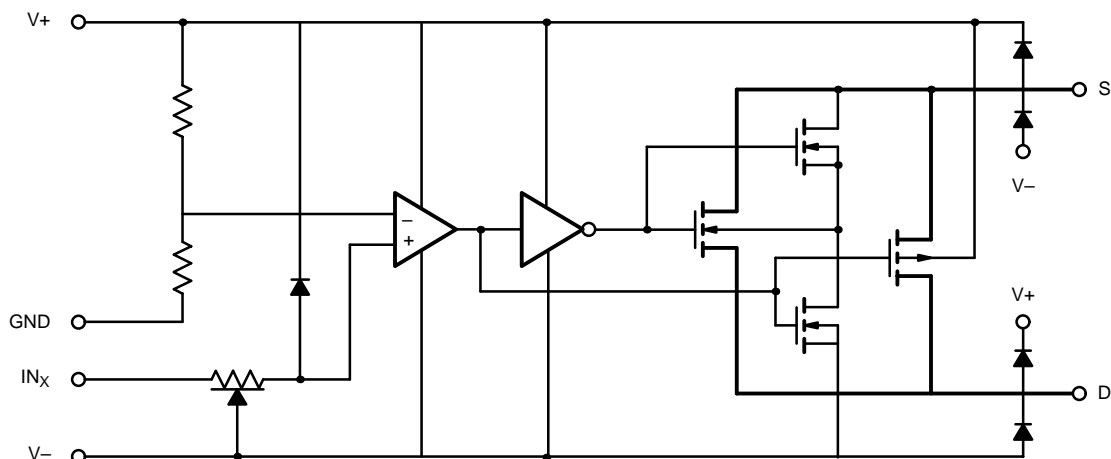


FIGURE 1.

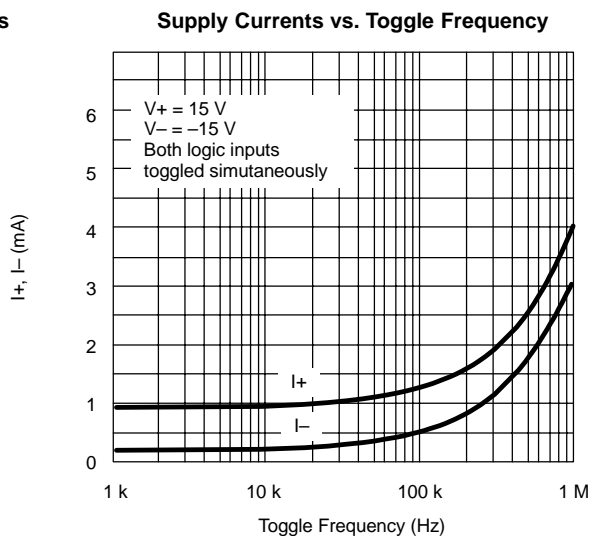
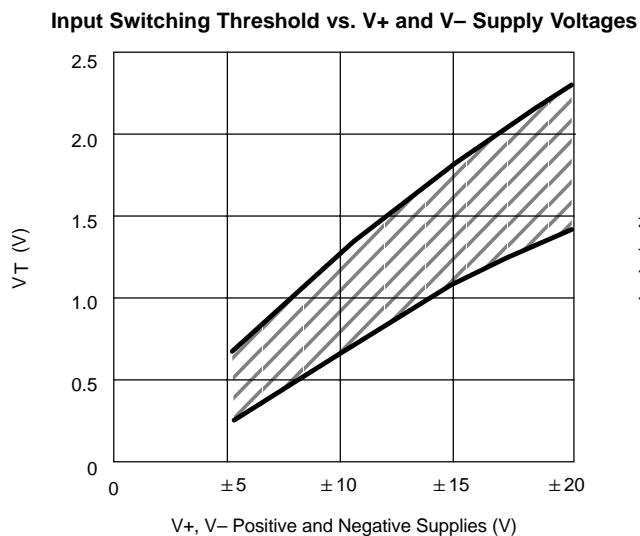
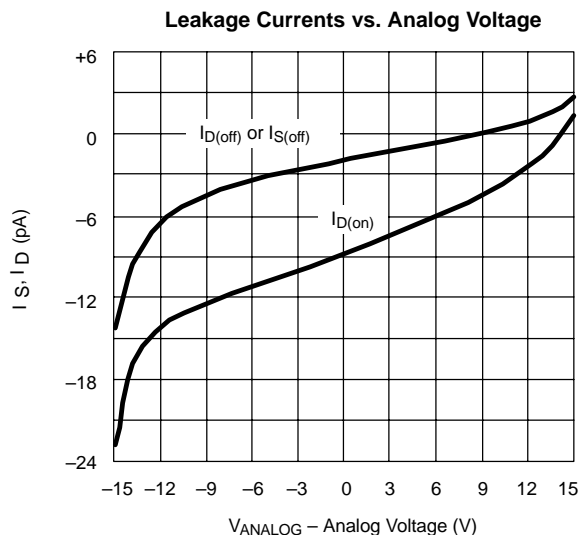
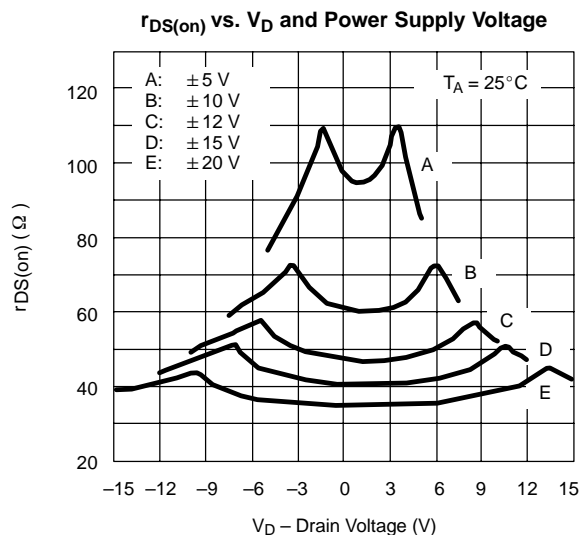


SPECIFICATIONS ^a							
Parameter	Symbol	Test Conditions Unless Otherwise Specified $V_+ = 15\text{ V}, V_- = -15\text{ V}$ $V_{IN} = 2.4\text{ V}, 0.8\text{ V}^f$	Temp ^b	Limits -55 to 125°C			Unit
				Min ^c	Typ ^d	Max ^c	
Analog Switch							
Analog Signal Range ^e	V_{ANALOG}		Full	-15		15	V
Drain-Source On-Resistance	$r_{DS(on)}$	$V_D = \pm 10\text{ V}, I_S = -1\text{ mA}$	Room Full		45	70 100	Ω
Source Off Leakage Current	$I_{S(off)}$	$V_S = \pm 14\text{ V}, V_D = \mp 14\text{ V}$	Room Full	-2 -100	± 0.01	2 100	nA
Drain Off Leakage Current	$I_{D(off)}$	$V_D = \pm 14\text{ V}, V_S = \mp 14\text{ V}$	Room Full	-2 -100	± 0.01	2 100	
Channel On Leakage Current ^f	$I_{D(on)}$	$V_S = V_D = \pm 14\text{ V}$	Room Full	-2 -200	± 0.1	2 200	
Digital Control							
Input Current with Input Voltage High	I_{INH}	$V_{IN} = 2.4\text{ V}$	Room Full	-0.5 -1	0.0009		μA
		$V_{IN} = 15\text{ V}$	Room Full		0.005	0.5 1	
Input Current with Input Voltage Low	I_{INL}	$V_{IN} = 0\text{ V}$	Room Full	-0.5 -1	-0.0015		
Dynamic Characteristics							
Turn-On Time	t_{ON}	See Switching Time Test Circuit	Room		440	1000	ns
Turn-Off Time	t_{OFF}		Room		340	425	
Charge Injection	Q	$C_L = 1000\text{ pF}, V_g = 0\text{ V}$ $R_g = 0\ \Omega$	Room		-10		pC
Source-Off Capacitance	$C_{S(off)}$	f = 140 kHz $V_{IN} = 5\text{ V}$	Room		9		pF
Drain-Off Capacitance	$C_{D(off)}$		Room		9		
Channel-On Capacitance	$C_{D(on)} + C_{S(on)}$	$V_D = V_S = 0\text{ V}, V_{IN} = 0\text{ V}$	Room		25		
Off Isolation	OIRR	$V_{IN} = 5\text{ V}, R_L = 75\ \Omega$ $V_S = 2\text{ V}, f = 1\text{ MHz}$	Room		75		dB
Crosstalk (Channel-to-Channel)	X_{TALK}		Room		90		
Power Supplies							
Positive Supply Current	I+	Both Channels On or Off $V_{IN} = 0\text{ V and } 2.4\text{ V}$	Room		0.8	2	mA
Negative Supply Current	I-		Room	-1	-0.23		

Notes:

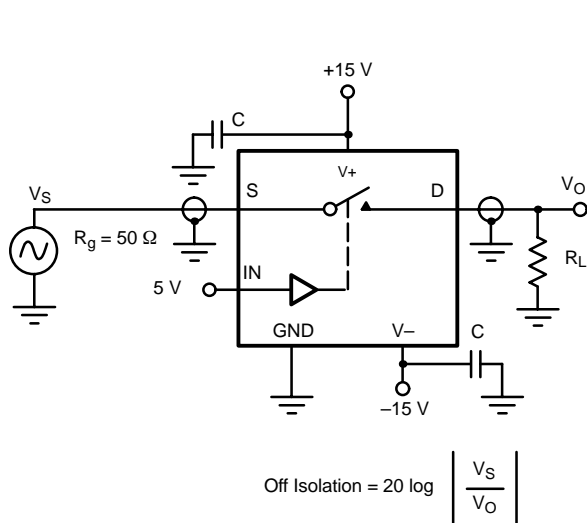
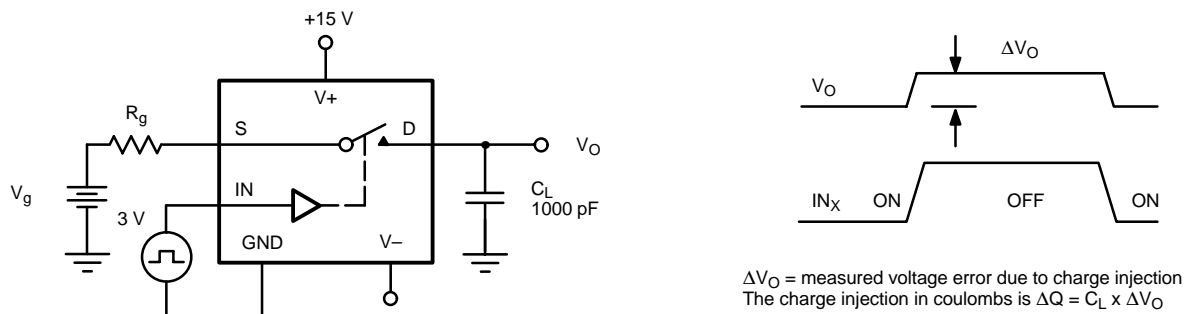
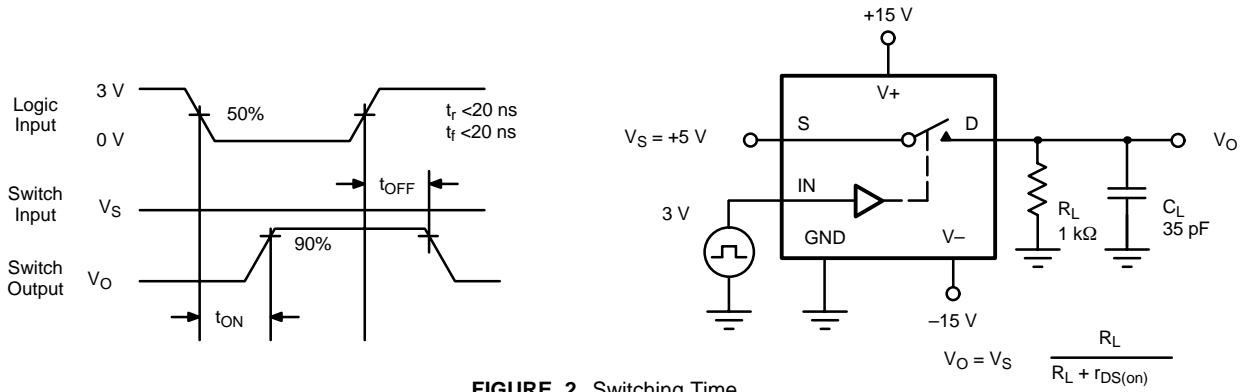
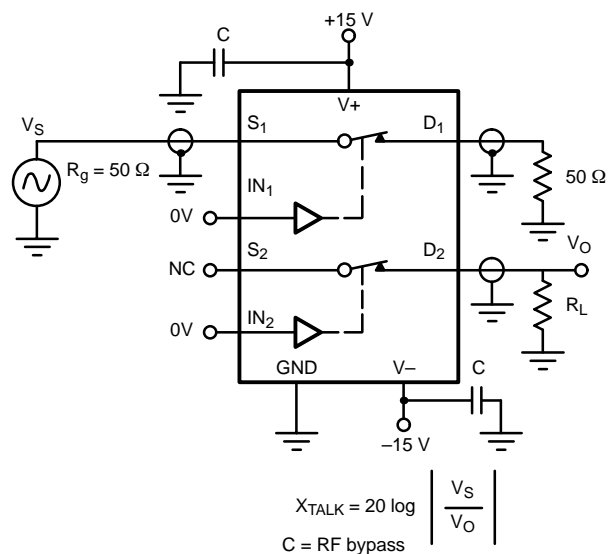
- Refer to PROCESS OPTION FLOWCHART.
- Room = 25°C, Full = as determined by the operating temperature suffix.
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
- Typical values are for DESIGN AID ONLY, not guaranteed nor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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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.


FIGURE 4. Off Isolation

FIGURE 5. Channel-to-Channel Crosstalk



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Vishay:](#)

[DG200AAA](#) [DG200AAK](#) [DG200AAA/883](#) [DG200ABK](#)