Quad SPST JFET Analog Switch

SW201

1.0 SCOPE

This specification documents the detail requirements for space qualified product manufactured on Analog Devices, Inc.'s QML certified line per MIL-PRF-38535 Level V except as modified herein.

The manufacturing flow described in the STANDARD SPACE LEVEL PRODUCTS PROGRAM brochure is to be considered a part of this specification. http://www.analog.com/aerospace

This data sheet specifically details the space grade version of this product. A more detailed operational description and a complete data sheet for commercial product grades can be found at www.analog.com/SW201

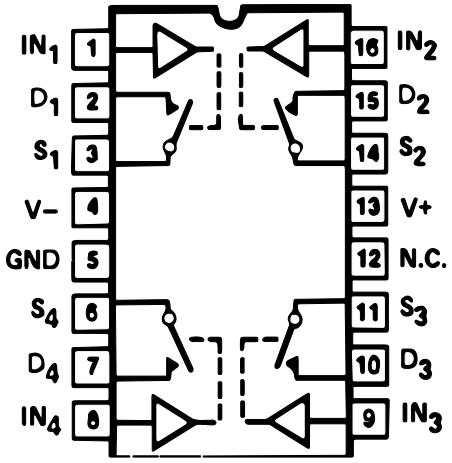
2.0 Part Number. The complete part number(s) of this specification follow:

Part Number	Description
SW201-803Q	Quad SPST JFET Analog Switch
SW201-813Q	Radiation Tested, Quad SPST JFET Analog Switch

2.1 Case Outline.

Letter	Descriptive designator	Case Outline (Lead Finish per MIL-PRF-38535)
Q	GDIP1-T16	16-Lead ceramic dual-in-line package (CERDIP)

2.1 Figure 1 - Terminal connections.



2.1.1 SW201 Logic Table:

Control Logic	
Logic Input	Switch State
0	ON
1	OFF

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3.0 Absolute Maximum Ratings. (T_A = 25°C, unless otherwise noted)

Operating Temperature Range ..... -55°C to +125°C
Storage Temperature Range ..... -65°C to +150°C
Power Dissipation 900mW
Lead Temperature (Soldering, 60 sec.) ..... +300°C
Maximum Junction Temperature (T_J) ..... +150°C
V+ Supply to V- Supply 36V
V+ Supply to Ground 36V
Logic Input Voltage Range ..... (-4V or V-) to V+ Supply
Analog Input Voltage
Continuous ..... V- Supply to V+ Supply +20V
1% Duty Cycle and Driving all 4 inputs
with 500µS pulse ..... V- Supply –15V to V+ Supply +20V
Maximum Current Through Any Pin 30mA

3.1 Thermal Characteristics:

Thermal Resistance, Q (cerdip) Package
Junction-to-Case (Θ_{JC}) = 29°C/W Max
Junction-to-Ambient (Θ_{JA}) = 91°C/W Max

4.0 Electrical Table:

TABLE I

Parameter See notes at end of table	Symbol	Conditions VS = ±15V Unless otherwise specified	Sub-group	Limit Min	Limit Max	Units
Positive Supply Current	I+	All channels OFF or ON	1 2,3		9 13.5	mA
Negative Supply Current	I-	All Channels OFF or ON	1 2,3		6.0 8.5	
Ground Current	I_G	All Channels OFF or ON	1 2,3		4 6	
Logic “0” Input Current	I_{IL}		1 2,3		5 10	µA
Logic “1” Input Current (Note 1)	I_{IH}		1 2,3		5 10	
“ON” Resistance	R_{ON}	V_A = -10V to 10V; I_S = 1mA	1 2,3		80 110	Ω
ΔR_{ON} vs. V_A	ΔR_{ON}	$V_A \leq$ 10V, I_S = 1mA	1		15	%
R_{ON} Match Between Switches (Note 3)	R_{ON} (Match)	V_A = 0V, I_D = 100µA	1 2,3		15 20	
Analog Current Range (Note 2)	IA	VS = ±10V	1 2,3	10 7		mA
Analog Voltage Range (Note 2)	VA	IS = 1mA	1,2,3	±10		V

4.0 Electrical Table: (Cont'd)

Parameter See notes at end of table	Symbol	Conditions VS = ±15V Unless otherwise specified	Sub-group	Limit Min	Limit Max	Units
Source Current "OFF" Condition	$I_{S(OFF)}$	VS = +10V, VD = -10V	1		2	nA
			2		60	
		VS = -10V, VD = +10V	1		2	
			2		60	
Drain Current "OFF" Condition	$ID_{(OFF)}$	VS = +10V, VD = -10V	1		2	
			2		60	
		VS = -10V, VD = +10V	1		2	
			2		60	
Leakage Current "ON" Condition	$I_{D(ON)}$ + $I_{S(ON)}$	VS = VD = ±10V	1		2	
			2		100	
Logic "0" Input Voltage	V_{IL}		1,2,3		0.8	V
Logic "1" Input Voltage	V_{IH}		1,2,3	2		V
Turn-On-Time	t_{ON}	V_S = -5V, R_L = 1KΩ, C_L = 13pF	9		500	nS
Turn-Off-Time	t_{OFF}		9		400	
Break-Before-Make Time	t_{ON}-t_{OFF}		9	50		

Table I notes:

1 Current Tested at VIN = 2V (worst case condition)

2 V_A, V_{IH}, V_{IL} is verified by leakage and R_{ON} tests.

3 R_{ON} Match specified as a percentage of $R_{average}$ where $R_{average} = \frac{R_{ON1} + R_{ON2} + R_{ON3} + R_{ON4}}{4}$

4.1 Electrical Test Requirements:

Table II	
Test Requirements	Subgroups (in accordance with MIL-PRF-38535, Table III)
Interim Electrical Parameters	1
Final Electrical Parameters	1, 2, 3 1/ 2/
Group A Test Requirements	1, 2, 3, 9
Group C end-point electrical parameters	1 2/
Group D end-point electrical parameters	1
Group E end-point electrical parameters	1

1/ PDA applies to Subgroup 1. Exclude delta's from PDA.
2/ See Table III for delta parameters. See Table I for test conditions.

4.2 Table III. Burn-in test delta limits.

Table III			
TEST TITLE	ENDPOINT LIMIT	DELTA LIMIT	UNITS
R_{ON}	80	±15	ohm

5.0 Life Test/Burn-In Circuit:

5.1 HTRB is not applicable for this drawing.
5.2 Burn-in is per MIL-STD-883 Method 1015 test condition C.
5.3 Steady state life test is per MIL-STD-883 Method 1005.

Rev	Description of Change	Date
A	Initiate	July 12, 2000
B	Update web site address. Under max ratings change TJ to T_J. For RON conditions, change I_D = 1mA to I_S = 1mA. RON (Match), change subgroups from 1,2 to 2,3. Break before make specification must a minimum. Add subgroup 9 to Group A requirements on Table II. Change BI circuit from condition A to Condition C.	20-Dec-01
C	Delete subgroups 4, 5, 6 from Table II, they are not used in Table I. Change paragraph 5.2 from cond. B to Cond. C (BI circuit not changed).	Feb. 21, 2002
D	Update web address. Delete burn-in circuit	June 20, 2003
E	Update header/footer & add to 1.0 Scope description.	Feb. 22,2008