

1.0 SCOPE

This specification covers the detail requirements for a four-channel, single-pole, single-throw analog switch that employs both bipolar and ion-implanted FET devices.

It is highly recommended that this data sheet be used as a baseline for new military or aerospace spec control drawings.

1.2 Part Number. The complete part numbers per Table I of this specification follow:

<u>Device</u>	<u>Part Number</u>	<u>Package</u>
B	SW-06BQ/883	Q
B	SW-06BRC/883	RC

1.2.3 Case Outline.

<u>Letter</u>	<u>Case Outline (Lead finish per MIL-M-38510)</u>
Q	16-lead dual-in-line package (CERDIP)
RC	20-contact leadless chip carrier (LCC)

1.3 Absolute Maximum Ratings. ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Operating Temperature Range	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C
Power Dissipation	
Q Package	900mW
RC Package	500mW
Lead Temperature (Soldering, 60 sec)	+300°C
Maximum Junction Temperature Range (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 Range Continuous	V- Supply to V+ Supply +20V
Maximum Current Through Any Pin Including Switch	30mA

1.5 Thermal Characteristics:

Thermal Resistance, CERDIP (Q) package:
 Junction-to-Case (θ_{JC}) = 29°C/W MAX
 Junction-to-Ambient (θ_{JA}) = 91°C/W MAX

Thermal Resistance, LCC (RC) package:
 Junction-to-Case (θ_{JC}) = 35°C/W MAX
 Junction-to-Ambient (θ_{JA}) = 110°C/W MAX

TABLE 1

$V_S = \pm 15V$; $V_{IL} = 0.8V$; $V_{IH} = 2V$; $T_A = 25^\circ C$ unless otherwise specified.

Characteristics	Symbol	Special Conditions	SW-06/883		Units
			LIMITS B		
			Min	Max	
Positive Supply Current	I+	All switches OFF	--	6	mA
		All switches OFF $-55^\circ C \leq T_A \leq +125^\circ C$	--	9	mA
Negative Supply Current	I-	All switches OFF	--	-5.0	mA
		All switches OFF $-55^\circ C \leq T_A \leq +125^\circ C$	--	-7.5	mA
Ground Current	I _G	All switches OFF or ON	--	4	mA
		All switches OFF or ON $-55^\circ C \leq T_A \leq +125^\circ C$	--	6	mA
Logic "0" Input Current	I _{IL}	$V_{IN} = 0.8V$	--	5	μA
		$V_{IN} = 0.8V$ $-55^\circ C \leq T_A \leq +125^\circ C$	--	10	μA
Logic "1" Input Current (Note 1)	I _{IH}	$V_{IN} = 2V$ to 15V	--	5	μA
		$V_{IN} = 2V$ to 15V $-55^\circ C \leq T_A \leq +125^\circ C$	--	10	μA
"ON" Resistance	R _{ON}	$V_S = -10V$ to +10V; $I_S = 1mA$	--	80	Ω
		$V_S = -10V$ to +10V; $I_S = 1mA$ $-55^\circ C \leq T_A \leq +125^\circ C$	--	110	Ω
Delta R _{ON} vs. V _A	ΔR_{ON}	$V_A = -10V$ to +10V; $I_S = 1mA$	--	15	%
R _{ON} Match Between Switches (Note 2)	R _{ON} (Match)	$V_S = 0V$, $I_S = 100\mu A$	--	10	%
		$V_S = 0V$, $I_S = 100\mu A$ $-55^\circ C \leq T_A \leq +125^\circ C$	--	20	%
Analog Current Range (Note 3)	I _A	$V_S = \pm 10V$	10	--	mA
		$V_S = \pm 10V$ $-55^\circ C \leq T_A \leq +125^\circ C$	7	--	mA

TABLE 1 (Continued)

$V_S = \pm 15V$; $V_{IL} = 0.8V$; $V_{IH} = 2V$; $T_A = 25^\circ C$ unless otherwise specified.

Characteristics	Symbol	Special Conditions	SW-06/883 LIMITS B		Units
			Min	Max	
Source Current Switches OFF	$I_{S(OFF)}$	$V_S = 10V, V_D = -10V$	-	2	nA
		$V_S = 10V, V_D = -10V$ $T_A = +125^\circ C$	-	60	nA
Logic "1" Input Voltage (Note 4)	V_{IH}	$-55^\circ C \leq T_A \leq +125^\circ C$	2.0	-	V
Logic "0" Input Voltage (Note 4)	V_{IL}	$-55^\circ C \leq T_A \leq +125^\circ C$	-	0.8	V
Drain Current Switches OFF	$I_{D(OFF)}$	$V_S = 10V, V_D = -10V$	-	2	nA
		$V_S = 10V, V_D = -10V$ $T_A = +125^\circ C$	-	60	nA
Source Current Switch ON	$I_{S(ON)}^+$ $I_{D(ON)}$	$V_S = V_D = \pm 10V$	-	2	nA
		$V_S = V_D = \pm 10V$ $T_A = +125^\circ C$	-	100	nA
Analog Voltage Range (Note 4)	V_A	$I_S = 1mA$ $-55^\circ C \leq T_A \leq +125^\circ C$	± 10	-	V
Turn-On-Time	t_{ON}	$V_S = -5V, R_L = 1k\Omega$ $C_L = 30pF$	-	500	ns
Turn-Off-Time	t_{OFF}	$V_S = -5V, R_L = 1k\Omega$ $C_L = 30pF$	-	400	ns

NOTES:

- Current tested at $V_{IN} = 2V$ (worst case condition).
- R_{ON} Match specified as a percentage of $R_{average}$ where: $R_{average} = \frac{R_{ON1} + R_{ON2} + R_{ON3} + R_{ON4}}{4}$
- I_A is defined as follows: For analog currents less than or equal to I_A min. the switch channel "ON" resistance will not exceed twice the specified R_{ON} for that device grade.
- V_A, V_{IH}, V_{IL} is verified by leakage and R_{ON} tests.

15 SWITCHES & MULTIPLEXERS

TABLE 2

SW-06/883

Electrical Test Requirements For Class B Devices

MIL-STD-883 Test Requirements	Subgroups (see Table 3)
Interim Electrical Parameters (pre Burn-In)	1
Final Electrical Test Parameters	1*, 2, 3
Group A Test Requirements	1, 2, 3, 9

* PDA applies to Subgroup 1 only.
No other Subgroups are included in PDA.

TABLE 3

Group A Inspection

 $V_S = \pm 15V$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	SW-06/883		Units
			LIMITS B		
			Min	Max	
Subgroup 1 $T_A = 25^\circ C$	I+	All switches OFF	-	6	mA
	I-	All switches OFF	-	-5.0	mA
	I_G	All switches OFF or ON	-	4	mA
	I_{IL}	$V_{IL} = 0.8V$	-	5	μA
	I_{IH}	$V_{IH} = 2V$ to $15V$	-	5	μA
	R_{ON}	$V_S = \pm 10V, I_S = 1mA$	-	80	Ω
	ΔR_{ON}	$V_A = \pm 10V, I_S = 1mA$	-	15	%
	R_{ON} (Match)	$V_S = 0V, I_S = 100\mu A$	-	10	%
	I_A	$V_S = \pm 10V$ (Note 1)	10	-	mA
	$I_{S(OFF)}$	$V_S = 10V, V_D = -10V$	-	2	nA
	$I_{D(OFF)}$	$V_S = 10V, V_D = -10V$	-	2	nA
	$I_{S(ON)}^+$ $I_{D(ON)}$	$V_S = V_D = \pm 10V$	-	2	nA
Subgroup 2 $T_A = +125^\circ C$	I+	All switches OFF	-	9	mA
	I-	All switches OFF	-	-7.5	mA
	I_G	All switches OFF or ON	-	6	mA
	I_{IL}	$V_{IL} = 0.8V$	-	10	μA
	I_{IH}	$V_{IH} = 2V, 15V$	-	10	μA
	R_{ON}	$V_S = \pm 10V, I_S = 1mA$	-	110	Ω

TABLE 3

Group A Inspection (Continued)

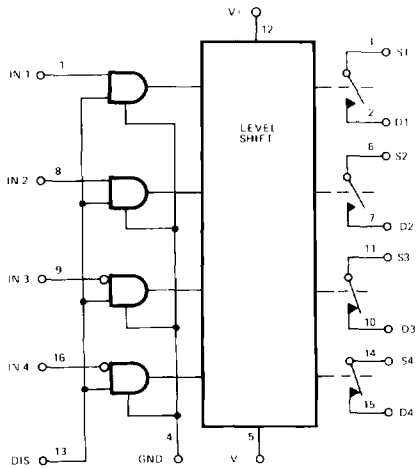
$V_S = \pm 15V$ unless otherwise specified.

Subgroup	Symbol	Special Conditions	SW-06/883		Units
			LIMITS B		
			Min	Max	
Subgroup 2 $T_A = +125^\circ C$ (Continued)	R_{ON} (Match)	$V_A = 0V, I_S = 100\mu A$	--	20	%
	$I_{S(OFF)}$	$V_S = 10V, V_D = -10V$	--	60	nA
	$I_{D(OFF)}$	$V_S = 10V, V_D = -10V$	--	60	nA
	$I_{S(ON)}^+$ $I_{D(ON)}$	$V_S = V_D = \pm 10V$	--	100	nA
	I_A	$V_S = \pm 10V$ (Note 1)	7	--	mA
Subgroup 3 $T_A = -55^\circ C$	I+	All switches OFF	--	9	mA
	I-	All switches OFF	--	-7.5	mA
	I_G	All switches OFF or ON	--	6	mA
	I_{IL}	$V_{IL} = 0.8V$	--	10	μA
	I_{IH}	$V_{IH} = 2V, 15V$	--	10	μA
	R_{ON}	$V_S = \pm 10V$	--	110	Ω
	R_{ON} (Match)	$V_S = 0V, I_S = 100\mu A$	--	20	%
I_A	$V_S = \pm 10V$ (Note 1)	7	--	mA	
Subgroup 9 $T_A = +25^\circ C$	t_{ON}	$V_S = -5V, R_L = 1k\Omega$ $C_L = 30pF$	--	500	ns
	t_{OFF}	$V_S = -5V, R_L = 1k\Omega$ $C_L = 30pF$	--	400	ns

NOTES:

- I_A is defined as follows: For analog currents less than or equal to I_A min. the switch channel "ON" resistance will not exceed twice the specified R_{ON} for that device grade.

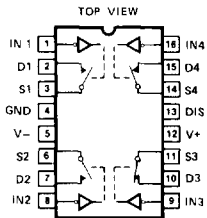
3.2.1 Functional Diagram and Pin Connections.



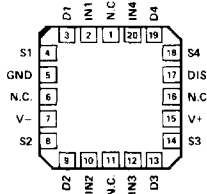
Truth Table

DISABLE INPUT	LOGIC INPUT	SWITCH STATE	
		CHANNELS 1 & 2	CHANNELS 3 & 4
0	X	OFF	OFF
1 or NC	0	OFF	ON
1 or NC	1	ON	OFF

Switches are shown in the logic "0" input state and DIS = "1"



16-PIN DUAL-IN-LINE PACKAGE
(Q OR P Package)



SW-06BRC/883 LCC PACKAGE
(RC-Suffix)

SW-06

3.2.4 Microcircuit Group Assignment. This microcircuit is covered by microcircuit group 58.

4.2 Life Test/Burn-In Circuit.

