

SCOPE: QUAD, SPST, HIGH SPEED ANALOG SWITCH

<u>Device Type</u>	<u>Generic Number</u>	<u>SMD Number</u>
01	DG441A(x)/883B	5962-9204101M2C
02	DG442A(x)/883B	5962-9204102M2C

Case Outline(s). The case outlines shall be designated in Mil-Std-1835 and as follows:

<u>Outline Letter</u>		<u>Mil-Std-1835</u>	<u>Case Outline</u>	<u>Package Code</u>
MAXIM	SMD			
K	E	GDIP1-T16 or CDIP2-T16	16 LEAD Cerdip	J16
Z	2	CQCC1-N20	20-Pin Ceramic LCC	L20

Absolute Maximum Ratings

Voltage Referenced to V⁻

V ⁺ to V ⁻	44V
V ⁻ to GND	25V
Digital Inputs to V ⁻ 1/	(GND-0.3V) to 44V dc
Digital Inputs, V _S , V _D 1/	(V ⁻) -2V to (V ⁺) +2V or 30mA whichever occurs first
Continuous Current, Any terminal	30mA
Peak Current, S or D (Pulsed at 1ms, 10% duty cycle max)	40mA
Lead Temperature (soldering, 10 seconds)	+300°C
Storage Temperature	-65°C to +150°C

Continuous Power Dissipation	T _A = +70°C
16 lead Cerdip (derate 10.0mW/°C above +70°C)	800mW
20 lead LCC (derate 9.1mW/°C above +70°C)	727mW
Junction Temperature T _J	+150°C
Thermal Resistance, Junction to Case, θ_{JC} :	
Case Outline 16 lead Cerdip	50°C/W
Case Outline 20 lead LCC	20°C/W
Thermal Resistance, Junction to Ambient, θ_{JA} :	
Case Outline 16 lead Cerdip	100°C/W
Case Outline 20 lead LCC	110°C/W

Recommended Operating Conditions

Ambient Operating Range (T _A)	-55°C to +125°C
Positive Supply Voltage (V ⁺)	+15V
Negative Supply Voltage (V ⁻)	-15V
V _{AL} (max)	0.8V
V _{AH} (min)	2.4V

NOTE 1: Signals on S, D, or IN exceeding V⁺ or V⁻ are clamped by internal diodes. Limit forward current to maximum current ratings.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TABLE 1. ELECTRICAL TESTS:

TEST	Symbol	CONDITIONS -55 °C ≤ T _A ≤ +125°C V ⁺ =+15V, V ⁻ =-15V, GND=0V V _{AH} =2.4V, V _{AL} =0.8V Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
SWITCH							
Analog-Signal Range	V _{ANALOG}		1,2,3	All	-15	15	V
Drain-Source ON Resistance	r _{DS(ON)}	I _S = -10mA, V _D = ±8.5V, V ⁺ = 13.5V, V ⁻ = -13.5V, V _{IN} = 0.8V	1,3 2	01		85 100	Ω
Drain-Source ON Resistance	r _{DS(ON)}	I _S = -10mA, V _D = ±8.5V, V ⁺ = 13.5V, V ⁻ = -13.5V, V _{IN} = 2.4V	1,3 2	02		85 100	Ω
Drain-Source ON Resistance	r _{DS(ON)}	I _S = -10mA, V _D = 3.0V, V ⁺ = 10.8V, V ⁻ = 0V, V _{IN} = 0.8V	1,3 2	01		160 200	Ω
Drain-Source ON Resistance	r _{DS(ON)}	I _S = -10mA, V _D = 8.0V, V ⁺ = 10.8V, V ⁻ = 0V, V _{IN} = 0.8V	1,3 2	01		160 200	Ω
Drain-Source ON Resistance	r _{DS(ON)}	I _S = -10mA, V _D = 3.0V, V ⁺ = 10.8V, V ⁻ = 0V, V _{IN} = 2.4V	1,3 2	02		160 200	Ω
Drain-Source ON Resistance	r _{DS(ON)}	I _S = -10mA, V _D = 8.0V, V ⁺ = 10.8V, V ⁻ = 0V, V _{IN} = 2.4V	1,3 2	02		160 200	Ω
Source-OFF Leakage Current	I _{S(OFF)}	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 2.4V V _S = ±15.5V V _D = ±15.5V	1 2,3	01	-0.5 -20	0.5 20	nA
Source-OFF Leakage Current	I _{S(OFF)}	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 0.8V V _S = ±15.5V V _D = ±15.5V	1 2,3	02	-0.5 -20	0.5 20	nA
Drain-OFF Leakage Current	I _{D(OFF)}	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 2.4V V _S = ±15.5V V _D = ±15.5V	1 2,3	01	-0.5 -20	0.5 20	nA
Drain-OFF Leakage Current	I _{D(OFF)}	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 0.8V V _S = ±15.5V V _D = ±15.5V	1 2,3	02	-0.5 -20	0.5 20	nA
Channel-On Leakage Current	I _{D(ON)} + I _{S(ON)}	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 0.8V V _S = ±15.5V V _D = ±15.5V	1 2,3	01	-0.5 -40	0.5 40	nA
Channel-On Leakage Current	I _{D(ON)} + I _{S(ON)}	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 2.4V V _S = ±15.5V V _D = ±15.5V	1 2,3	02	-0.5 -40	0.5 40	nA
INPUT							
Input Current/Voltage High	I _{INH}	V _{IN} under test = 2.4V All other = 0.8V	1,2,3	All	-0.5	+0.5	μA
Input Current/Voltage Low	I _{INL}	V _{IN} under test = 0.8V All other = 2.4V	1,2,3	All	-0.5	+0.5	μA
SUPPLY							
Positive Supply Current	I ⁺	V ⁺ = 16.5V, V ⁻ = -16.5V, V _{IN} = 0 or 5V	1,2,3	All		0.1	mA
		V ⁺ = 13.2V, V ⁻ = 0V, V _{IN} = 0 or 5V					

TABLE 1. ELECTRICAL TESTS:

TEST	Symbol	CONDITIONS -55 °C ≤ T _A ≤ +125°C V ⁺ =+15V, V ⁻ =15V, GND=0V V _{AH} =2.4V, V _{AL} =0.8V Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
Negative Supply Current	I ⁻	V ⁺ =16.5V, V ⁻ =-16.5V, V _{IN} =0 or 5V	1,3 2	All	-1 -100		μA
		V ⁺ =13.2V, V ⁻ =0V, V _{IN} =0 or 5V	1,3 2	All	-1 -100		
Ground Current	I _{GND}	V ⁺ =16.5V, V ⁻ =-16.5V, V _{IN} =0 or 5V	1,2,3	All	-100		μA
		V ⁺ =13.2V, V ⁻ =0V, V _{IN} =0 or 5V					
Functional Tests	FT	Verify the Truth Table	7,8				
DYNAMIC							
Turn-On Time	t _{ON}	V _S =±10V, R _L =1kΩ, C _L =35pF	9	01 02		250 315	ns
			10,11	01 02		300 400	
		V _S =8.0V, R _L =1kΩ, C _L =35pF V ₊ =+12V, V ₋ =0V	9	01 02		400 450	
			10,11	01 02		600 675	
Turn-Off Time	t _{OFF}	V _S =±10V, R _L =1kΩ, C _L =35pF Figure 2	9	01 02		120 210	ns
			10,11	01 02		150 250	
		V _S =8.0V, R _L =1kΩ, C _L =35pF V ₊ =+12V, V ₋ =0V	9,10,11	All		200	

ORDERING INFORMATION:	SMD NUMBER	Pkg. Code
DG441AK/883B	5962-9204101MEA	16 CDIP
DG441AZ/883B	5962-9204101M2C	20 LCC
DG442AK/883B	5962-9204102MEA	16 CDIP
DG442AZ/883B	5962-9204102M2C	20 LCC

TRUTH TABLE

TERMINAL CONNECTION

LOGIC	DG441A SWITCH		TERMINAL NUMBER	01 DG441A	01 DG441A	02 DG442A	02 DG442A
0	ON			J16	20LCC	J16	20LCC
1	OFF		1	IN1	NC	IN1	NC
			2	D1	IN1	D1	IN1
			3	S1	D1	S1	D1
LOGIC	DG442A		4	V-	S1	V-	S1
	SWITCH		5	GND	V-	GND	V-
0	OFF		6	S4	NC	S4	NC
1	ON		7	D4	GND	D4	GND
			8	IN4	S4	IN4	S4
			9	IN3	D4	IN3	D4
			10	D3	IN4	D3	IN4
			11	S3	NC	S3	NC
			12	NC	IN3	NC	IN3
			13	V+	D3	V+	D3
			14	S2	S3	S2	S3
			15	D2	NC	D2	NC
			16	IN2	NC	IN2	NC
			17		V+		V+
			18		S2		S2
			19		D2		D2
			20		IN2		IN2

QUALITY ASSURANCE

Sampling and inspection procedures shall be in accordance with MIL-Prf-38535, Appendix A as specified in Mil-Std-883.

Screening shall be in accordance with Method 5004 of Mil-Std-883. Burn-in test Method 1015:

1. Test Condition, A, B, C, or D.
2. TA = +125°C minimum.
3. Interim and final electrical test requirements shall be specified in Table 2.

Quality conformance inspection shall be in accordance with Method 5005 of Mil-Std-883, including Groups A, B, C, and D inspection.

Group A inspection:

1. Tests as specified in Table 2.
2. Selected subgroups in Table 1, Method 5005 of Mil-Std-883 shall be omitted.

Group C and D inspections:

- a. End-point electrical parameters shall be specified in Table 1.
- b. Steady-state life test, Method 1005 of Mil-Std-883:
 1. Test condition A, B, C, D.
 2. TA = +125°C, minimum.
 3. Test duration, 1000 hours, except as permitted by Method 1005 of Mil-Std-883.

TABLE 2. ELECTRICAL TEST REQUIREMENTS

Mil-Std-883 Test Requirements	Subgroups per Method 5005, Table 1
Interim Electric Parameters Method 5004	1
Final Electrical Parameters Method 5005	1*, 2, 3, 9
Group A Test Requirements Method 5005	1, 2, 3, 7, 8, 9,10,11
Group C and D End-Point Electrical Parameters Method 5005	1

* PDA applies to Subgroup 1 only.