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	SHEET	1	2	3	4	5	6	7	8	9	10								
PMIC N/A	PREPARED BY <i>Marcia B. Kelleher</i>					DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444													
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY <i>Ray Monnin</i>					MICROCIRCUIT, LINEAR, ANALOG SWITCH WITH DRIVER, MONOLITHIC SILICON													
	APPROVED BY <i>MC</i>					SIZE A	CAGE CODE 67268	5962-87673											
	DRAWING APPROVAL DATE 6 JUNE 1988					SHEET 1 OF 10													
REVISION LEVEL																			

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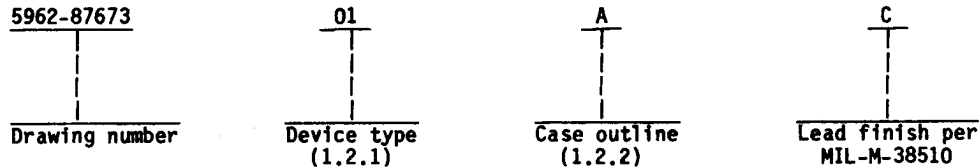
U.S. GOVERNMENT PRINTING OFFICE: 1987 - 748-129/60911
5962-E528

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	DG180A	High-speed driver with JFET switches

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
A	F-1 (14-lead, .280" x .260" x .085"), flat package
C	D-1 (14-lead, .785" x .310" x .200"), dual-in-line package
I	A-2 (10-lead, .370" x .185"), can package

1.3 Absolute maximum ratings.

Voltage, negative supply to positive supply (V_{CC+} to V_{CC-})	36 V dc
Voltage, drain to positive supply (V_{CC+} to V_D)	33 V dc
Voltage, negative supply to drain (V_D to V_{CC-})	33 V dc
Voltage, source to drain (V_D to V_S)	*22 V dc
Voltage, negative supply to logic supply (V_L to V_{CC-})	36 V dc
Voltage, input to logic supply (V_L to V_{IN})	8 V dc
Voltage, reference supply to logic supply (V_L to V_R)	8 V dc
Voltage, reference supply to input (V_{IN} to V_R)	8 V dc
Voltage, negative supply to reference supply (V_R to V_{CC-})	27 V dc
Voltage, input to reference supply (V_R to V_{IN})	20 V dc
Current, source or drain	200 mA
Current, all other pins	30 mA
Lead temperature (soldering, 10 seconds)	+300°C
Storage temperature	-65°C to +150°C
Junction temperature (T_J)	+175°C
Power dissipation (P_D): 1/	
Case A	750 mW
Case C	825 mW
Case I	450 mW
Thermal resistance (θ_{JC})	See MIL-M-38510, appendix C

1/ Power ratings based on device mounted with all leads welded or soldered to PC board. Derate at +75°C the following cases: Case A at 10 mW/°C, Case C at 11 mW/°C, Case I at 6 mW/°C.

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1.4 Recommended operating conditions.

Positive supply voltage (V_{CC+})	-----	+15 V dc
Negative supply voltage (V_{CC-})	-----	-15 V dc
Reference supply voltage (V_R)	-----	GND
Logic supply voltage (V_L)	-----	+5 V dc
Ambient operating temperature range (T_A)	-----	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Logic diagram. The logic diagram shall be as specified on figure 1.

3.2.3 Truth table. The truth table shall be as specified on figure 1.

3.2.4 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full ambient operating temperature range.

3.3.1 AC test circuit. AC test circuits shall be as specified on figure 2.

3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein.

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TABLE I. Electrical performance characteristics.						
Test	Symbol	Conditions -55°C < T _A < +125°C V ₊ = 15 V, V ₋ = -15 V, V _I = 5 V (unless otherwise specified)	Group A subgroups	Limits		Unit
				Min	Max	
Resistance (on) drain-to-source	R _{DS}	V _D = -7.5 V I _S = -10 mA V _{IN} = 0.8 V	1, 2, 3	2	10	Ω
Source leakage current (off)	I _{S(OFF)}	V ₊ = 10 V, V ₋ = -20 V V _D = -10 V, V _S = 10 V, V _{IN} = 2 V	1	-10.0	10.0	nA
			2, 3	-1000	1000	
		V _D = -7.5 V, V _S = 7.5 V, V _{IN} = 2 V	1	-10.0	10.0	
			2, 3	-1000	1000	
Drain leakage current (off)	I _{D(OFF)}	V _D = 7.5 V, V _S = -7.5 V, V _{IN} = 2 V	1	-10.0	10.0	
			2, 3	-1000	1000	
		V ₊ = 10 V, V ₋ = -20 V V _D = 10 V, V _S = -10 V, V _{IN} = 2 V	1	-10.0	10.0	
			2, 3	-1000	1000	
Channel leakage current (on)	I _{D(ON)} + I _{S(ON)}	V _S = V _D = -7.5 V, V _{IN} = 0.8 V	1	-2.0	2.0	
			2, 3	-200	200	
Low level input current	I _{IL}	V _{IN} under test = 0 V	1, 2, 3	-250	10.0	μA
High level input current	I _{IH}	V _{IN} under test = 5 V	1	-10.0	10.0	
			2, 3	-20	20	

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _A < +125°C V ₊ = 15 V, V ₋ = -15 V, V _L = 5 V (unless otherwise specified)	Group A subgroups	Limits		Unit
				Min	Max	
Positive supply current	I _{CC+}	V _{IN} = 0 V	1		1.5	mA
			2		1.5	
			3		2.5	
		V _{IN} = 5 V	1		1.5	
			2		1.5	
			3		2.5	
Negative supply current	I _{CC-}	V _{IN} = 5 V	1	-5.0		
			2	-5.0		
			3	-8.0		
		V _{IN} = 0 V	1	-5.0		
			2	-5.0		
			3	-8.0		
Logic supply current	I _L	V _{IN} = 0 V and V _{IN} = 5 V	1		4.5	
			2		4.5	
			3		7.5	
Reference supply current	I _R	V _{IN} = 0 V and V _{IN} = 5 V	1	-2.0		
			2	-2.0		
			3	-2.5		
Functional tests		See 4.3.1c	7			
Turn on time	t _{ON}	See figure 2	9		300	ns
			10,11 <u>1/</u>		450	
Turn off time	t _{OFF}	See figure 2	9		250	
			10,11 <u>1/</u>		350	

1/ Guaranteed if not tested.

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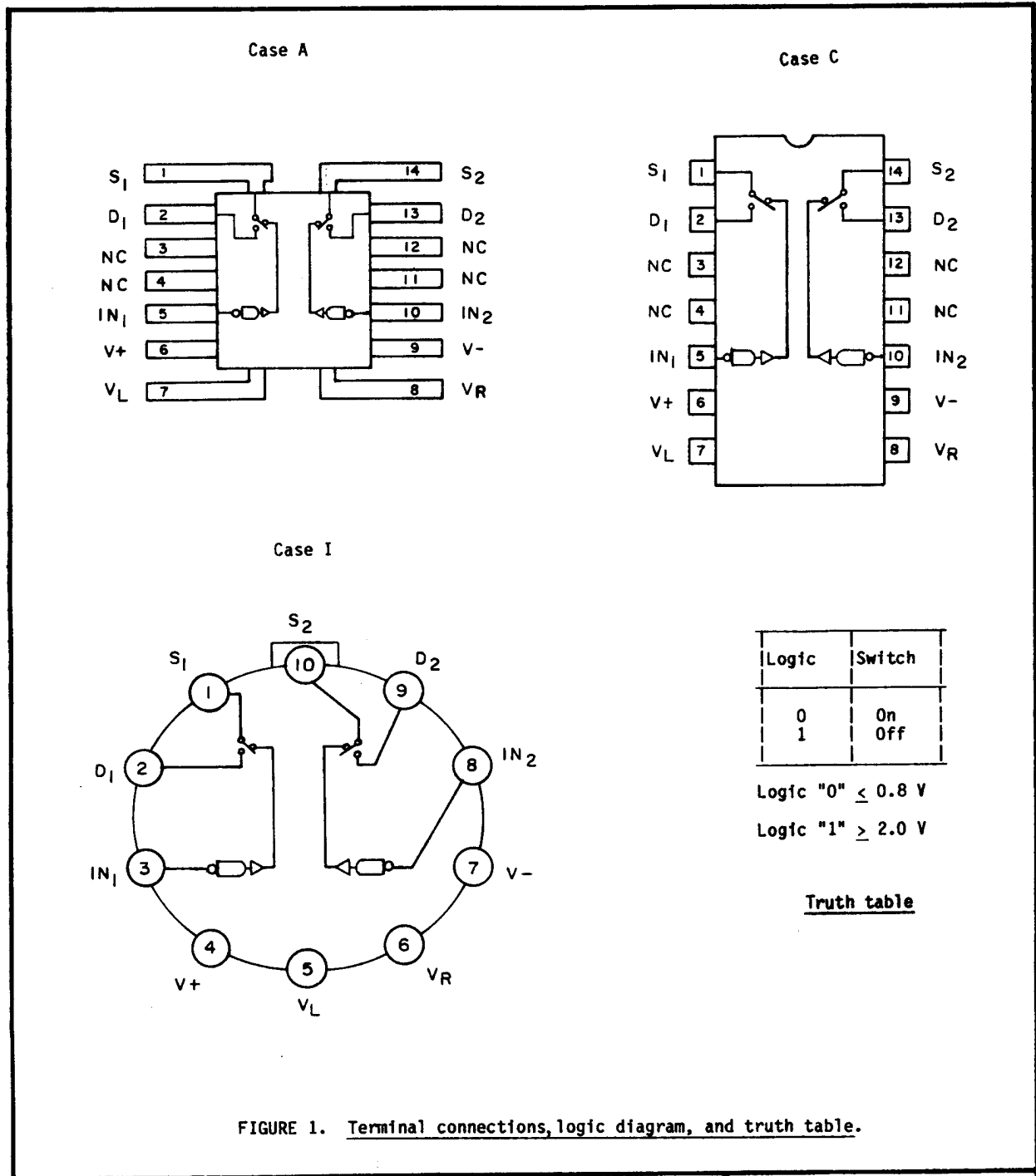


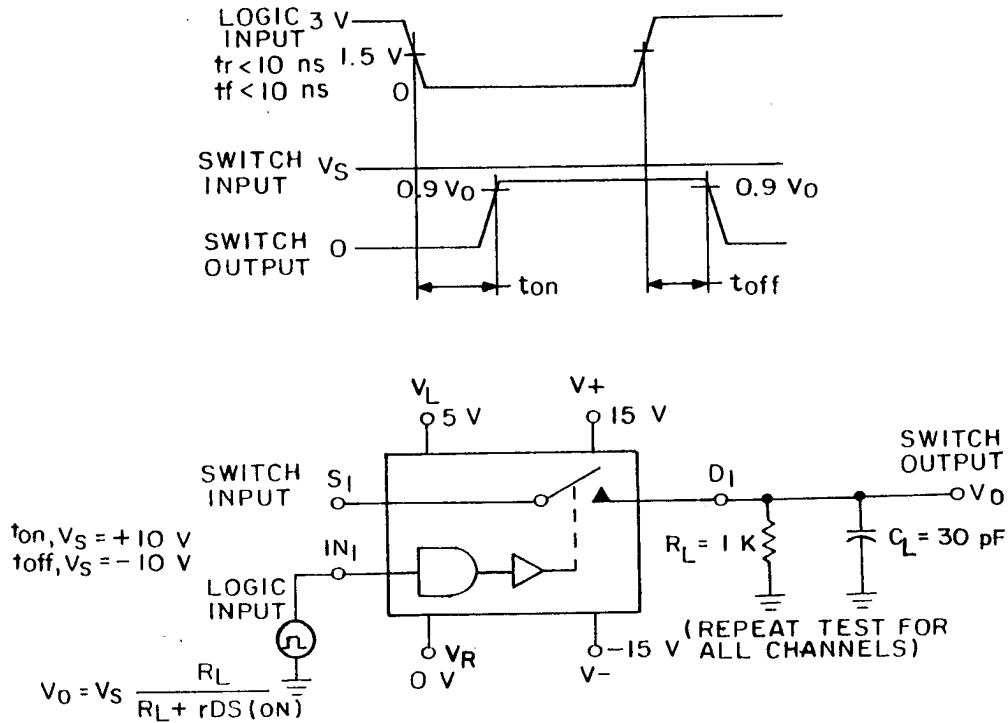
FIGURE 1. Terminal connections, logic diagram, and truth table.

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Logic input for off to on condition



V_0 is the steady state output with the switch on. Feedthrough via switch capacitance may result in spikes at the leading and trailing edge of the output waveform. Switch output waveform shown for $V_S = \text{constant}$ with logic input waveform as shown. Note that V_S may be + or - as per switching time test circuit.

FIGURE 2. AC switching diagram.

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3.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.8 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

- a. Burn-in test, method 1015 of MIL-STD-883.
 - (1) Test conditions A or C using the circuit submitted with the certificate of compliance (see 3.5 herein).
 - (2) $T_A = +125^\circ\text{C}$, minimum.
- b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 5, 6, and 8 of method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 7 tests shall include verification of the truth table.

4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
 - (1) Test condition A or C using the circuit submitted with the certificate of compliance (see 3.5 herein).
 - (2) $T_A = +125^\circ\text{C}$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	1
Final electrical test parameters (method 5004)	1*,2,3,7,9
Group A test requirements (method 5005)	1,2,3,7,9,10**,11**
Groups C and D end-point electrical parameters (method 5005)	1

* PDA applies to subgroup 1.
 ** Subgroups 10 and 11, if not tested, shall be guaranteed to the limits as specified in table I.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

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6.4 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have agreed to this drawing and a certificate of compliance (see 3.5 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>
5962-8767301AX	17856 32293	DG180AP/883 DG180AP/883
5962-8767301CX	17856 32293	DG180AL/883 DG180AL/883
5962-8767301IX	17856 32293	DG180AA/883 DG180AA/883

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

<u>Vendor CAGE number</u>	<u>Vendor name and address</u>
17856	Siliconix, Incorporated 2201 Laurelwood Road Santa Clara, CA 95054
32293	Intersil, Incorporated 10600 Ridgeview Court Cupertino, CA 95014

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