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Defense Electronics Supply Center
Dayton, Ohio

Original date of drawing: 25 September 1987

AMSC N/A

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SIZE: A

CODE IDENT. NO.: 67268

REV

MILITARY DRAWING

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TITLE: MICROCIRCUIT, LINEAR, 4 CHANNEL VIDEO MULTIPLEXER, MONOLITHIC SILICON

DWG NO. 5962-87618

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5962-E439

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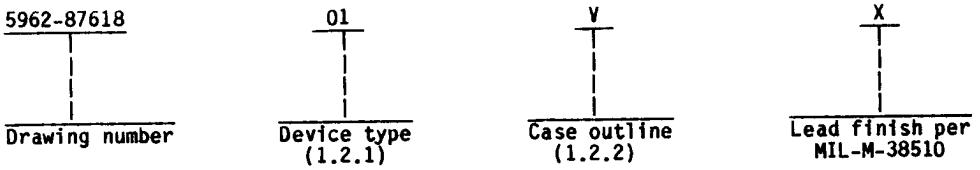
DESC FORM 193
MAY 86

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	HI524	4 channel wideband and video multiplexer

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

Outline letter	Case outline
V	D-6 (18-lead, 1/4" x 15/16"), dual-in-line package

1.3 Absolute maximum ratings.

Digital input voltage	-6 V dc $\leq V_{AH} \leq$ +6 V dc
Analog input (V_S) or output (V_O) maximum voltage	$+V_{supply}$ +2 V dc
Analog input (V_S) or output (V_O) minimum voltage	$-V_{supply}$ -2 V dc
Voltage between supply (V^+-V^-)	+33 V dc
Supply voltage to pwr gnd (V^+ to pwr gnd; pwr gnd to V^-)	+16.5 V dc
Power dissipation, (P_D)	1.23 W 1/
Storage temperature range, (T_S)	-65°C to +150°C
Thermal resistance, junction-to-ambient (θ_{JA})	81°C/W
Thermal resistance, junction-to-case (θ_{JC})	See MIL-M-38510, appendix C

1.4 Recommended operating conditions.

Ambient operating temperature range, (T_A)	-55°C to +125°C

1/ Derate 12.3 mW/°C above T_A = 75°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 and truth table. The terminal connections and truth table shall be as specified on figure 1.

3.2.2 Functional diagram. The functional diagram shall be as specified on figure 2.

3.2.3 Case outline. The case outline 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 recommended ambient operating temperature range.

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.

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).

TABLE I. Electrical performance characteristics.

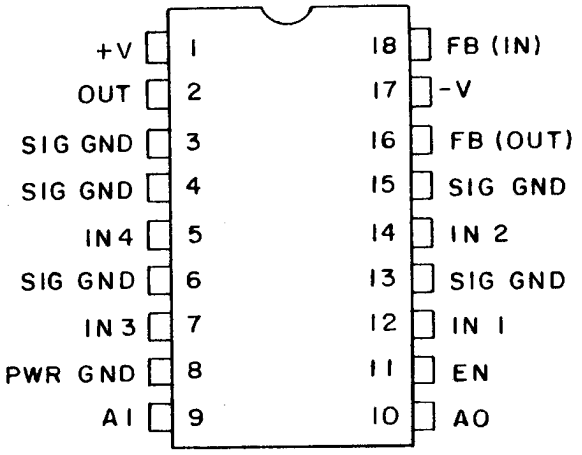
Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ $V- = -15$ V, $V+ = +15$ V, $V_{EN} = +2.4$ V unless otherwise specified	Group A subgroups	Limits Min	Limits Max	Unit
Input leakage 1/ current	I_{IH}	Measure inputs sequentially, connect all unused inputs to GND	1, 2, 3		1.0	µA
	I_{IL}	Measure inputs sequentially, connect all unused inputs to 5 V	1, 2, 3		20.0	
Leakage current into source terminal of an "OFF" switch	$+I_{S(OFF)}$	$V_S = +10$ V, $V_D = -10$ V, $V_{EN} = 0.8$ V all unused inputs = -10V	1, 2, 3	-50	50	nA
	$-I_{S(OFF)}$	$V_S = -10$ V, $V_D = +10$ V, $V_{EN} = 0.8$ V all unused inputs = +10V	1, 2, 3	-50	50	
Leakage current into drain terminal of an "OFF" switch	$+I_{D(OFF)}$	$V_D = +10$ V, $V_S = -10$ V, $V_{EN} = 0.8$ V all unused inputs = -10V	1, 2, 3	-50	50	
	$-I_{D(OFF)}$	$V_D = -10$ V, $V_S = +10$ V, $V_{EN} = 0.8$ V all unused inputs = +10V	1, 2, 3	-50	50	
Leakage current from an "ON" in driver into the switch (drain)	$+I_{D(ON)}$	$V_D = V_S = +10$ V all unused inputs = -10 V	1, 2, 3	-50	50	
	$-I_{D(ON)}$	$V_D = V_S = -10$ V all unused inputs = +10 V	1, 2, 3	-50	50	
(+) Supply current	I(+)	$V_{EN} = 2.4$ V, $V_S = 0$ V, (V_D open) Sequence all address combinations, record highest I(+)	1, 2, 3		25	mA
(-) Supply current	I(-)	$V_{EN} = 2.4$ V, $V_S = 0$ V, (V_D open) Sequence all address combinations, record highest I(-)	1, 2, 3	-25		
Standby positive supply current	$+I_{SBY}$	$V_{EN} = 0.8$ V, $V_A = 0$ V	1, 2 3		25	
Standby negative supply current	$-I_{SBY}$		1, 2, 3	-25		
Input low threshold voltage	V_{AL}		1, 2, 3		0.8	V
Input high threshhold voltage	V_{AH}		1, 2, 3	2.4		
Switch "ON" resistance	R_{DS}	$V_S = 0$ V, $I_D = 100$ µA	1, 2, 3		1.5	kΩ
Functional tests		see 4.3.1c	7,8			

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$, $V- = -15$ V, $V+ = +15$ V, $V_{EN} = +2.4$ V unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
Break-before-make time delay 2/	t_D	$R_L = 500\Omega$, $C_L = 12.5$ pF	$T_A = +25°C$	9	10		ns
			$T_A = +125°C$	10	2		
			$T_A = -55°C$	11	2		
Propagation delay times: address inputs to I/O channels	$t_{ON(A)}$, $t_{OFF(A)}$	$R_L = 10$ MΩ, $C_L = 12.5$ pF	$T_A = +25°C$	9		300	
			$T_A = -55°C$, $+125°C$	10, 11		500	
Enable to I/O time	$t_{ON(EN)}$	$R_L = 500\Omega$, $C_L = 12.5$ pF	$T_A = +25°C$	9		300	
			$T_A = -55°C$, $+125°C$	10, 11		500	
	$t_{OFF(EN)}$		$T_A = +25°C$	9		250	
			$T_A = -55°C$, $+125°C$	10, 11		500	
Address capacitance 3/	C_A	$V+ = V- = 0$ V, $f = 1$ MHz	$T_A = +25°C$	4		7	pF
Output switch capacitance 3/	C_{OS}			4		10	
Input switch capacitance 3/	C_{IS}			4		6	
Crosstalk 3/	C_T	$V_S = 3$ Vp-p, $f = 7$ MHz		4	56		dB
Bandwidth (-3 dB) 3/	BW	$V_S = 3$ Vp-p		4	6.8		MHz

1/ Input current of one input mode.
2/ Subgroup 11 parameter shall be gauranteed if not tested.
3/ Guaranteed if not tested.



A1	A0	EN	On channel
X	X	L	None
L	L	H	1
L	H	H	2
H	L	H	3
H	H	H	4

Channel 1 is shown
Selected in the diagram

FIGURE 1. Terminal connections and truth table.

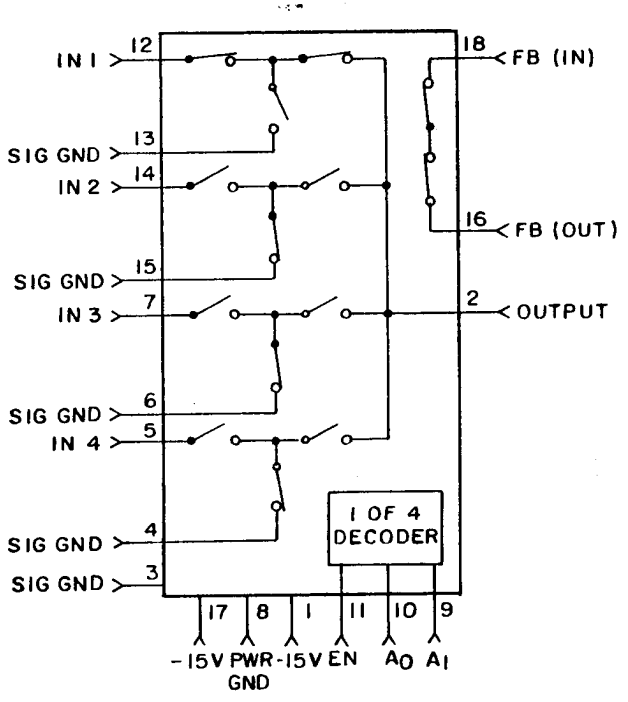


FIGURE 2. Functional diagram.

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 condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) T_A = +125°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 5 and 6 in table I method 5005 of MIL-STD-883 shall be omitted.

c. Subgroups 7 and 8 test sufficiently to verify 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 (method 1005 of MIL-STD-883) conditions:

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) T_A = +125°C, minimum.

(3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

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, 4, 7, 8, 9, 10, 11
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3
Additional electrical subgroups for group C periodic inspections	---

*PDA applies to subgroup 1.

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.

6.4 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has 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 1/
5962-8761801VX	34371	HI1-524/883

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

Vendor CAGE number	Vendor name and address
34371	Harris Semiconductor P.O. Box 883 Melbourne, FL 32901