

**REVISIONS**

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add device type 03, 04, 05, and 06. Add outline letter D. Make changes to 1.2.1, 1.2.2, 1.3, 1.4, table I, figure 1, and throughout.	92-12-09	M. A. Frye

THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.

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REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A	A	A	A						
	SHEET	1	2	3	4	5	6	7	8	9	10	11							

<p align="center"><b>STANDARDIZED MILITARY DRAWING</b></p> <p>THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p>AMSC N/A</p>	PREPARED BY Rick C. Officer	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444		
	CHECKED BY Charles E. Besore			
	APPROVED BY Michael A. Frye			
	DRAWING APPROVAL DATE 90-05-05	SIZE <b>A</b>	CAGE CODE <b>67268</b>	<b>5962-90604</b>
	REVISION LEVEL A	SHEET 1 OF 11		



1.3 Absolute maximum ratings.

Supply voltage ( $V_{DD}$ ) . . . . .	18 V dc
Differential input voltage ( $V_{ID}$ ) . . . . .	$\pm V_{DD}$
Input voltage range ( $V_I$ ) . . . . .	-0.3 V dc to $V_{DD}$
Input current (any input) ( $I_I$ ) . . . . .	$\pm 5$ mA
Output current (each output) ( $I_O$ ) . . . . .	$\pm 30$ mA
Total current into $V_{DD}$ terminal . . . . .	45 mA
Total current out of ground terminal . . . . .	45 mA
Output short-circuit duration <sup>1/</sup> . . . . .	Unlimited
Power dissipation ( $P_D$ ):	
Cases C and 2 . . . . .	1375 mW at $T_A = +25^\circ\text{C}$ <sup>2/</sup>
Case D . . . . .	996 mW at $T_A = +25^\circ\text{C}$ <sup>2/</sup>
Storage temperature range . . . . .	$-65^\circ\text{C}$ to $+150^\circ\text{C}$
Lead temperature (soldering, 60 second): . . . . .	$+260^\circ\text{C}$
Thermal resistance, junction-to-case ( $\Theta_{JC}$ ) . . . . .	See MIL-STD-1835
Junction Temperature ( $T_J$ ) . . . . .	$+150^\circ\text{C}$

1.4 Recommended operating conditions.

Supply voltage range ( $V_{DD}$ ) . . . . .	4 V dc to 16 V dc
Common-mode input voltage:	
$V_{DD} = 5$ V . . . . .	+3.5 V dc maximum
$V_{DD} = 10$ V . . . . .	+8.5 V dc maximum
Ambient operating temperature range ( $T_A$ ) . . . . .	$-55^\circ\text{C}$ to $+125^\circ\text{C}$
Unity gain bandwidth: ( $T_A = +25^\circ\text{C}$ )	
$V_{DD} = 5$ V (device types 01 and 02) . . . . .	1.5 MHz
$V_{DD} = 10$ V (device types 01 and 02) . . . . .	2.0 MHz
$V_{DD} = 5$ V (device types 03 and 04) . . . . .	525 kHz
$V_{DD} = 10$ V (device types 03 and 04) . . . . .	635 kHz
$V_{DD} = 5$ V (device types 05 and 06) . . . . .	85 kHz
$V_{DD} = 10$ V (device types 05 and 06) . . . . .	110 kHz

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and bulletin. Unless otherwise specified, the following specification, standards, and bulletin 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.

STANDARDS

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.  
 MIL-STD-1835 - Microcircuit Case Outlines.

<sup>1/</sup> Short circuit may be to ground or either power supply. Rating applied to  $T_A = +25^\circ\text{C}$ .  
<sup>2/</sup> For case outlines C and 2, derate at 12 mW/ $^\circ\text{C}$  above  $T_A = +25^\circ\text{C}$ . For case outline D, derate at 8 mW/ $^\circ\text{C}$  above  $T_A = +25^\circ\text{C}$ .

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE <b>A</b>		5962-90604
		REVISION LEVEL <b>A</b>	SHEET <b>3</b>

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

(Copies of the specification, standards, and bulletin 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 Case outline(s). The case outline(s) shall be in accordance with 1.2.2 herein.

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

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

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

3.6 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 MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-EC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 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.

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

3.9 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.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-90604
		REVISION LEVEL A	SHEET 4

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Device type	V <sub>DD</sub>	Group A subgroups	Limits 1/		Unit
						Min	Max	
Input offset voltage 2/ 3/	V <sub>IO</sub>	V <sub>O</sub> = 1.4 V, V <sub>IC</sub> = 0 V, R <sub>S</sub> = 50Ω	01, 03, 05	5 V	1	10	mV	
					2,3	12		
				10 V	1	10		
					2,3	12		
			02	5 V	1,2,3	3.75		
				10 V		4.3		
			04, 06	5 V	4	900	μV	
					2,3	3750		
				10 V	1	1200		
					2,3	4300		
Input offset current	I <sub>IO</sub>	V <sub>O</sub> = 2.5 V, V <sub>IC</sub> = 2.5 V	All	5 V	1	.100	nA	
					2	15		
		V <sub>O</sub> = 5 V, V <sub>IC</sub> = 5 V	All	10 V	1	.100		
					2	15		
Input bias current	I <sub>IB</sub>	V <sub>O</sub> = 2.5 V, V <sub>IC</sub> = 2.5 V	All	5 V	1	.150		
					2	35		
		V <sub>O</sub> = 5 V, V <sub>IC</sub> = 5 V	All	10 V	1	.150		
					2	35		
Common-mode input voltage range 4/	V <sub>ICR</sub>		All	5 V	1	0 to 4	V	
					2,3	0 to 3.5		
				10 V	1	0 to 9		
					2,3	0 to 8.5		
High level output voltage 3/	V <sub>OH</sub>	V <sub>ID</sub> = 100 mV	All	5 V	1	3.2	V	
					2,3	3		
				10 V	1	8		
					2,3	7.8		

See footnote at end of table.

STANDARDIZED  
MILITARY DRAWING  
DEFENSE ELECTRONICS SUPPLY CENTER  
DAYTON, OHIO 45444

SIZE  
A

5962-90604

REVISION LEVEL  
A

SHEET  
5

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Device type	V <sub>DD</sub>	Group A subgroups	Limits <sup>1/</sup>		Unit	
						Min	Max		
Low level output voltage	V <sub>OL</sub>	V <sub>ID</sub> = -100 mV, I <sub>OL</sub> = 0 mA	ALL	5 V	1,2,3		50	mV	
				10 V	1,2,3		50		
Large-signal differential voltage gain <sup>4/</sup>	A <sub>VD</sub>	V <sub>O</sub> = 0.25 V to 2 V	01,02	5 V	4	5		V/mV	
					5,6	3.5			
		V <sub>O</sub> = 1 V to 6 V	01,02	10 V	4	10			
					5,6	7			
		V <sub>O</sub> = 0.25 V to 2 V	03,04	5 V	4	25			
					5,6	15			
		V <sub>O</sub> = 1 V to 6 V	03,04	10 V	4	25			
					5,6	15			
		V <sub>O</sub> = 0.25 V to 2 V	05,06	5 V	4	50			
					5,6	25			
		V <sub>O</sub> = 1 V to 6 V	05,06	10 V	4	50			
					5,6	25			
Common-mode rejection ratio	CMRR	V <sub>IC</sub> = V <sub>ICR</sub> minimum	ALL	5 V	1	65		dB	
					2,3	60			
					10 V	1	65		
					2,3	60			
Power supply rejection ratio	PSRR	V <sub>DD</sub> = 5 V to 10 V, V <sub>O</sub> = 1.4 V	01,02	5 V and 10 V	1	65		dB	
					2,3	60			
					03,04, 05,06	1	70		
					2,3	60			

See footnote at end of table.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-90604
		REVISION LEVEL A	SHEET 6

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Device type	V <sub>DD</sub>	Group A subgroups	Limits 1/		Unit
						Min	Max	
Supply current (four amplifiers)	I <sub>DD</sub>	V <sub>O</sub> = 2.5 V, V <sub>IC</sub> = 2.5 V, No Load	01,02	5 V	1		6.4	mA
					2		4.4	
					3		10	
		V <sub>O</sub> = 5 V, V <sub>IC</sub> = 5 V, No Load	01,02	10 V	1		8	mA
					2		5.6	
					3		12	
		V <sub>O</sub> = 2.5 V, V <sub>IC</sub> = 2.5 V, No Load	03,04	5 V	1		1120	μA
					2		720	
					3		1760	
	V <sub>O</sub> = 5 V, V <sub>IC</sub> = 5 V, No Load	03,04	10 V	1		1200		
				2		960		
				3		2000		
	V <sub>O</sub> = 2.5 V, V <sub>IC</sub> = 2.5 V, No Load	05,06	5 V	1		68		
				2		48		
				3		120		
	V <sub>O</sub> = 5 V, V <sub>IC</sub> = 5 V, No Load	05,06	10 V	1		92		
				2		60		
				3		192		

See footnotes at end of table.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE <b>A</b>		5962-90604
		REVISION LEVEL A	SHEET 7