REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

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

PMIC N/A

STANDARDIZED MILITARY DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

PREPARED BY: Joseph A. Kerby

CHECKED BY: Charles E. Besore

APPROVED BY: Michael A. Frye

DRAWING APPROVAL DATE: 8 AUGUST 1990

REVISION LEVEL:

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUIT, LINEAR, SWITCHED MODE CONTROLLER FOR DC MOTOR DRIVE, MONOLITHIC SILICON

SIZE	CAGE CODE	5962-89957
A	67268	

SHEET 1

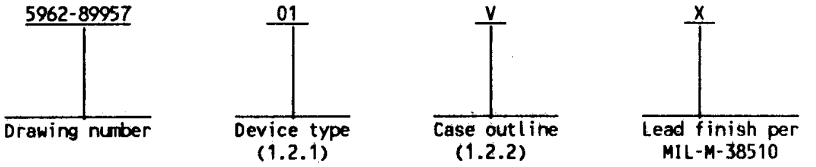
DESC FORM 193
SEP 87

* U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60911

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	UC1637	Switched mode controller for DC motor drive

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, .960" X .310" X .200"), dual-in-line package

1.3 Absolute maximum ratings. 1/

Supply voltage (V_S)	±20 V dc
Output current, source/sink (pins 4, 7)	500 mA
Analog inputs (pins 1 thru 3 and 8 thru 16)	V_S
Error amplifier output current (pin 17)	±20 mA
Oscillator charging current (pin 18)	-2.0 mA
Power dissipation at T_A = 25°C	1000 mW 2/
Power dissipation at T_C = 25°C	2000 mW 3/
Thermal resistance, junction-to-case (Θ_{JC})	See MIL-M-38510, appendix C
Thermal resistance, junction-to-ambient (Θ_{JA})	100°C/W
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C

1.4 Recommended operating conditions.

Supply voltage range (V_S)	±2.5 V to ±19 V
Oscillator $+V_{TH}$, $-V_{TH}$ input range	$-V_S$ + 2 V to $+V_S$ - 2 V
PWM comparator common mode range	$-V_S$ + 1 V to $+V_S$ - 2 V
Current limit common mode range	$-V_S$ to $+V_S$ -3 V
Ambient operating temperature range (T_A)	-55°C to +125°C

1/ Currents are positive into, negative out of the specified terminal. All currents should be treated as absolute values.
2/ Derate at 10 mW/°C for T_A above 50°C
3/ Derate at 16 mW/°C for T_C above 25°C

2. APPLICABLE DOCUMENTS

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

STANDARD

MILITARY

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

BULLETIN

MILITARY

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

(Copies of the specification, standard, 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 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 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 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.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1988—550-547

3.5 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 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-ECS 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-ECS 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.

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 3.6 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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Oscillator						
Initial accuracy		R_T = 16.7 kΩ from I_{SET} to 0 V, C_T = 1500 pF	4	9.4	10.6	kHz
			5, 6	9.2	10.8	
Voltage stability		V_S = ±5.0 V to ±20 V, $V_{PIN\ 1}$ = 3.0 V, $V_{PIN\ 3}$ = -3.0 V	4, 5, 6		7.0	%
$+V_{TH}$ input bias current		$V_{PIN\ 2}$ = 6.0 V	1, 2, 3		±10	µA
$-V_{TH}$ input bias current		$V_{PIN\ 2}$ = 0 V	1, 2, 3		-10	
Error amplifier						
Input offset voltage	V_{IO}	V_{CM} = 0 V	1, 2, 3		±5.0	mV
Input bias current	I_{IB}	V_{CM} = 0 V	1, 2, 3		5.0	µA
Input offset current	I_{IO}	V_{CM} = 0 V	1, 2, 3		±1.0	
Open loop voltage gain	A_{VS}	R_L = 10 kΩ	4, 5, 6	75		dB
Common mode rejection ratio	CMRR	$V_{CM} = -V_S + 2V$ to $+V_S$	4, 5, 6	75		
Power supply rejection ratio	PSRR	V_S = ±5.0 V to ±20 V	4, 5, 6	75		
Output sink current	I_{SINK}	$V_{PIN\ 17}$ = 0 V	1, 2, 3	20		mA
Output source current	I_{SOURCE}	$V_{PIN\ 17}$ = 0 V	1, 2, 3		-5.0	
High level output voltage	V_{OH}		1, 2, 3	13		V
Low level output voltage	V_{OL}		1, 2, 3		-13	
PWM comparators						
Input offset voltage	V_{IO}	V_{CM} = 0 V	1, 2, 3	-10	50	mV
Input bias current	I_{IB}	V_{CM} = 0 V	1, 2, 3		-10	µA
Input hysteresis	HYS_{IN}	V_{CM} = 0 V	1, 2, 3		30	mV

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Current limit						
Input offset voltage	V_{IO}	V_{CM} = 0 V	1	190	210	mV
			2, 3	160	370	
Input bias current	I_{IB}		1, 2, 3		-10	µA
Shutdown						
Shutdown threshold		3/	1, 2, 3	-2.2	-2.7	V
Input bias current	I_{IB}	$V_{PIN\ 14}$ = $+V_S$ to $-V_S$	1, 2, 3		-10	µA
Under-voltage lockout						
Start threshold		4/	1, 2, 3		5.0	V
Hysteresis	HYS		1, 2, 3	75	500	mV
Total standby current						
Supply current			1, 2, 3		15	mA
Output section						
Output low level	V_{OL}	I_{SINK} = 20 mA	1, 2, 3		-13	V
		I_{SINK} = 100 mA	1, 2, 3		-13	
Output high level	V_{OH}	I_{SOURCE} = -20 mA	1, 2, 3	13		
		I_{SOURCE} = -100 mA	1, 2, 3	12		
Rise time	t_r	C_L = 1 nF, T_J = 25°C, 2/	9		600	ns
Fall time	t_f	C_L = 1 nF, T_J = 25°C, 2/	9		300	

1/ Unless otherwise specified; $+V_S$ = +15 V, $-V_S$ = -15 V, $+V_{TH}$ = 5.0 V, $-V_{TH}$ = -5.0 V, R_T = 16.7 kΩ, C_T = 1500 pF
2/ If not tested, shall be guaranteed to the specified limits.
3/ Parameter measured, voltage rising (becoming less negative), with respect to $+V_S$ (pin 6).
4/ Parameter measured at $+V_S$ (pin 6) with respect to $-V_S$ (pin 5).

Device type	01
Case outline	V
Terminal number	Terminal symbol
1	$+V_{TH}$
2	C_T
3	$-V_{TH}$
4	A_{OUT}
5	$-V_S$
6	$+V_S$
7	B_{OUT}
8	$+B_{IN}$
9	$-B_{IN}$
10	$-A_{IN}$
11	$+A_{IN}$
12	+C/L
13	-C/L
14	SHUTDOWN
15	+E/A
16	-E/A
17	E/A OUTPUT
18	I_{SET}

Figure 1. Terminal connections.

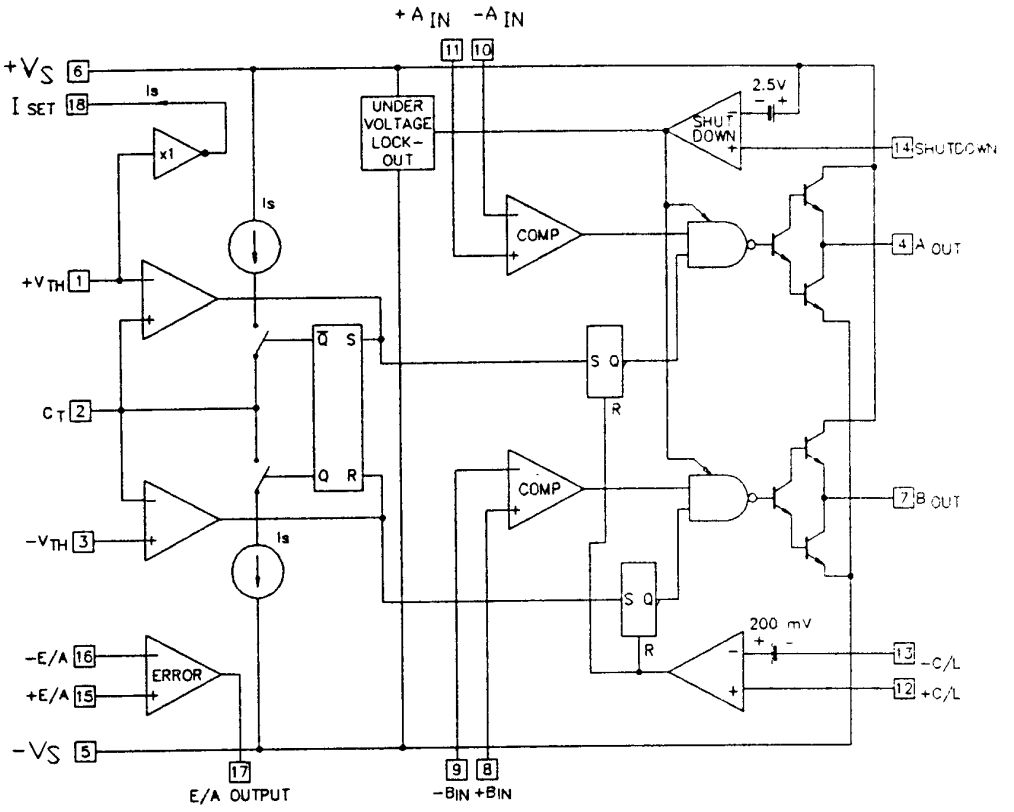


Figure 2. Block diagram

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-89957
		REVISION LEVEL	SHEET 8

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*,2,3,4,5,6
Group A test requirements (method 5005)	1,2,3,4,5,6,9
Group C and D end-point electrical parameters (method 5005)	1,2,3

*PDA applies to subgroup 1.

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 7, 8, 10 and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

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, B, C or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) T_A = +125°C, minimum.

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

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 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECS, telephone (513) 296-6022.

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

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. Additional sources will be added to MIL-BUL-103 as they become available. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECS. The approved sources of supply listed below are for information purposes only and are current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/	Replacement military specification part number
5962-8995701VX	48726	UC1637J/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.

Vendor CAGE number	Vendor name and address
48726	Unitrode Corporation 7 Continental Blvd Merrimack, NH 03054