

REVISIONS																			
LTR	DESCRIPTION										DATE (YR-MO-DA)				APPROVED				
A	Changed to reflect MIL-H-38534 processing. Editorial changes throughout.										92-03-23				K. A. Cottongim				
B	Changed in accordance with NOR 5962-R111-95.										95-04-11				K. A. Cottongim				
C	Add vendor CAGE codes 31757 and 51651. Changes to table I.										98-03-05				K. A. Cottongim				
D	Changes to table I, conditions column for device type 02. Add case outline Y.										99-02-19				K. A. Cottongim				
<p>THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.</p>																			
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REV STATUS OF SHEETS				REV		D	D	D	D	D	D	D	D	D	D				
				SHEET		1	2	3	4	5	6	7	8	9	10	11			
PMIC N/A				PREPARED BY Charles E. Besore						<b>DEFENSE SUPPLY CENTER COLUMBUS</b> <b>P. O. BOX 3990</b> <b>COLUMBUS, OHIO 43216-5000</b>									
<b>STANDARD MICROCIRCUIT DRAWING</b>  THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE  AMSC N/A				CHECKED BY D. A. DiCenzo															
				APPROVED BY Robert P. Evans															
				DRAWING APPROVAL DATE 87-11-10															
				REVISION LEVEL D						SIZE <b>A</b>	CAGE CODE <b>67268</b>	<b>5962-87617</b>							
						SHEET    1                      OF                      11													

## 1. SCOPE

1.1 Scope. This drawing describes device requirements for class H hybrid microcircuits to be processed in accordance with MIL-PRF-38534 and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN).

1.2 PIN. The PIN shall be as shown in the following example:



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

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	0006, 51992, 11105-DESC	1.5 amperes, high voltage driver
02	0008	3.0 amperes, high voltage, high current driver

1.2.2 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
X	See figure 1	10	Can (with standoff)
Y	See figure 1	10	Can (without standoff)

1.2.3 Lead finish. The lead finish shall be as specified in MIL-PRF-38534.

1.3 Absolute maximum ratings. 1/

Peak power supply voltage ( $V_P$ ), for less than 0.1 s	+60 V dc
Continuous supply voltage ( $V_S$ )	+45 V dc
Input voltage ( $V_{IN}$ )	+5.5 V dc
Input extender current ( $I_X$ )	5.0 mA
Peak output current ( $I_{OUT}$ ), 50 ms on, 1 s off:	
Device type 01	1.5 A
Device type 02	3.0 A
Continuous output current ( $I_{OUTC}$ ):	
Device type 01	0.4 A
Device type 02	0.5 A
Thermal resistance, junction-to-case ( $\theta_{JC}$ )	(See MIL-STD-1835)
Power dissipation ( $P_D$ ), $T_A = +25^\circ\text{C}$ :	
Device type 01	750 mW 2/
Device type 02	950 mW 2/
Junction temperature ( $T_J$ )	+175°C
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C

1.4 Recommended operating conditions.

Ambient operating temperature range ( $T_A$ )	-55°C to +125°C
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1/ Unless otherwise specified, all voltages are referenced to ground.

2/ Derate at 210°C/W above  $T_A = +25^\circ\text{C}$ .

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## 2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbook. The following specification, standards, and handbook form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

### SPECIFICATION

#### DEPARTMENT OF DEFENSE

MIL-PRF-38534 - Hybrid Microcircuits, General Specification for.

### STANDARDS

#### DEPARTMENT OF DEFENSE

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

MIL-STD-973 - Configuration Management.

MIL-STD-1835 - Microcircuit Case Outlines.

### HANDBOOK

#### DEPARTMENT OF DEFENSE

MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbook are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Item requirements. The individual item performance requirements for device class H shall be in accordance with MIL-PRF-38534. Compliance with MIL-PRF-38534 may include the performance of all tests herein or as designated in the device manufacturer's Quality Management (QM) plan or as designated for the applicable device class. Therefore, the tests and inspections herein may not be performed for the applicable device class (see MIL-PRF-38534). Furthermore, the manufacturers may take exceptions or use alternate methods to the tests and inspections herein and not perform them. However, the performance requirements as defined in MIL-PRF-38534 shall be met for the applicable device class.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.2 herein and figure 1.

3.2.2 Terminal connections and functional diagram. The terminal connections and functional diagram shall be as specified on figure 2.

3.2.3 Switching time waveform(s). The switching time waveform(s) shall be as specified on figure 3.

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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 specified 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 defined in table I.

3.5 Marking of Device(s). Marking of device(s) shall be in accordance with MIL-PRF-38534. The device shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's vendor similar PIN may also be marked as listed in QML-38534.

3.6 Data. In addition to the general performance requirements of MIL-PRF-38534, the manufacturer of the device described herein shall maintain the electrical test data (variables format) from the initial quality conformance inspection group A lot sample, for each device type listed herein. Also, the data should include a summary of all parameters manually tested, and for those which, if any, are guaranteed. This data shall be maintained under document revision level control by the manufacturer and be made available to the preparing activity (DSCC-VA) upon request.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to supply to this drawing. The certificate of compliance (original copy) submitted to DSCC-VA shall affirm that the manufacturer's product meets the performance requirements of MIL-PRF-38534 and herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38534 shall be provided with each lot of microcircuits delivered to this drawing.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38534 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38534. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

(2)  $T_A$  as specified in accordance with table I of method 1015 of MIL-STD-883.

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.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55° C ≤ T <sub>A</sub> ≤ +125° C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Logic "1" input voltage <u>1</u> /	V <sub>IH</sub>	10 V ≤ V <sub>CC</sub> ≤ 45 V	1, 2, 3	01, 02	2.0		V
Logic "0" input voltage <u>1</u> /	V <sub>IL</sub>					0.8	
Logic "1" output voltage	V <sub>OH</sub>	V <sub>CC</sub> = 10 V, V <sub>IN</sub> = 2 V, <u>1</u> / I <sub>OUT</sub> = 150 mA	1, 2, 3	01	8.8		V
		V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 2 V, R <sub>L</sub> = 82 Ω			26.5		
		V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 2 V, R <sub>L</sub> = 39 Ω	1, 2, 3	02	26.5		
		V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 2 V, <u>1</u> / I <sub>OUT</sub> = 1.6 A			43.0		
Logic "0" output voltage	V <sub>OL</sub>	V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 0.8 V, R <sub>L</sub> = 100 Ω	1, 2, 3	01		10	mV
				02		100	
Logic "1" input current <u>1</u> /	I <sub>IH</sub>	V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 2.4 V	1, 2, 3	01, 02		5.0	μA
		V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 5.5 V				100	
Logic "0" input current <u>1</u> /	I <sub>IL</sub>	V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 0.4 V	1, 2, 3	01, 02	-1.0		mA
Input breakdown voltage <u>1</u> /	B <sub>VIN</sub>		1, 2, 3	01, 02	5.5		V
"Off" power supply current	I <sub>CC(off)</sub>	V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 0.8 V	1, 2, 3	01		2.0	mA
		V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 0 V		02		2.0	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
"On" power supply current	I <sub>CC(on)</sub>	V <sub>CC</sub> = 45 V, V <sub>IN</sub> = 2 V, I <sub>OUT</sub> = 0 mA	1, 2, 3	01, 02		8.0	mA
Rise time <u>2/</u>	t <sub>r</sub>	V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 82 Ω, see figure 3	9, 10, 11	01		300	ns
		V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 39 Ω, see figure 3		02		500	
Fall time <u>2/</u>	t <sub>f</sub>	V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 82 Ω, see figure 3	9, 10, 11	01		1.7	μs
		V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 39 Ω, see figure 3	9, 11	02		4.0	
			10			6.0	
Turn on time <u>2/</u>	t <sub>on</sub>	V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 82 Ω, see figure 3	9, 10, 11	01		1.0	μs
		V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 39 Ω, see figure 3		02		1.0	
Turn off time <u>2/</u>	t <sub>off</sub>	V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 82 Ω, see figure 3	9, 10, 11	01		8.0	μs
		V <sub>CC</sub> = 28 V, V <sub>IN</sub> = 5 V, R <sub>L</sub> = 39 Ω, see figure 3	9, 11	02		10	
			10			14	

1/ Parameter shall be guaranteed to the limits specified in table I for all lots not specifically tested.

2/ Subgroups 10 and 11 shall be tested as part of device initial characterization and after design and process changes. Parameter shall be guaranteed to the limits specified in table I for all lots not specifically tested.

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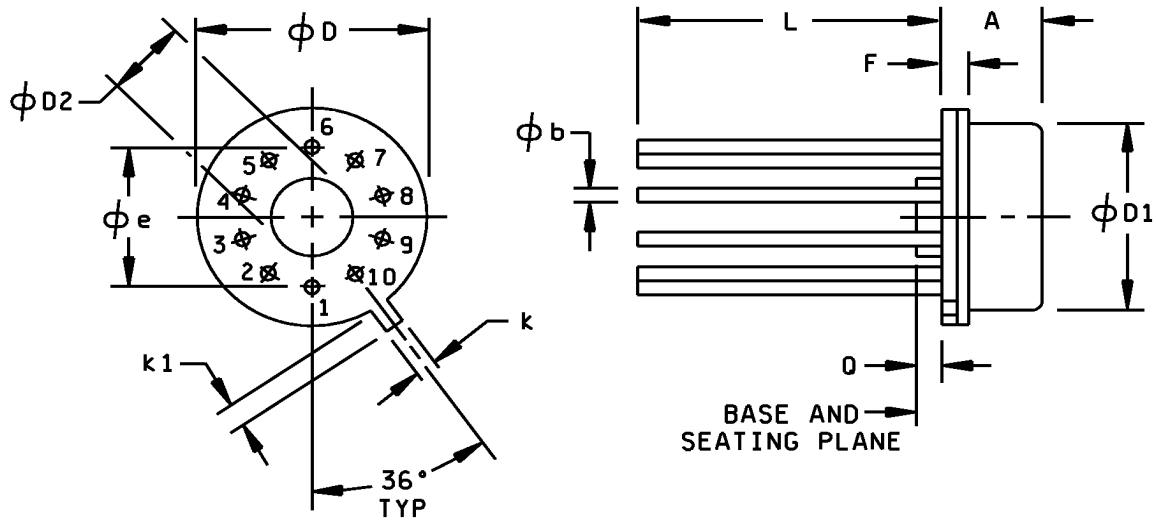
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Case outline X.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.94	4.70	0.155	0.185
$\phi b$	0.38	0.48	0.015	0.019
$\phi D$	8.51	9.40	0.335	0.370
$\phi D1$	7.75	8.51	0.305	0.335
$\phi D2$	3.05	4.06	0.120	0.160
$\phi e$	5.84 BSC		0.230 BSC	
F		1.02		0.040
k	0.66	0.86	0.026	0.034
k1	0.74	1.14	0.029	0.045
L	12.70		0.500	
Q	1.27			0.050

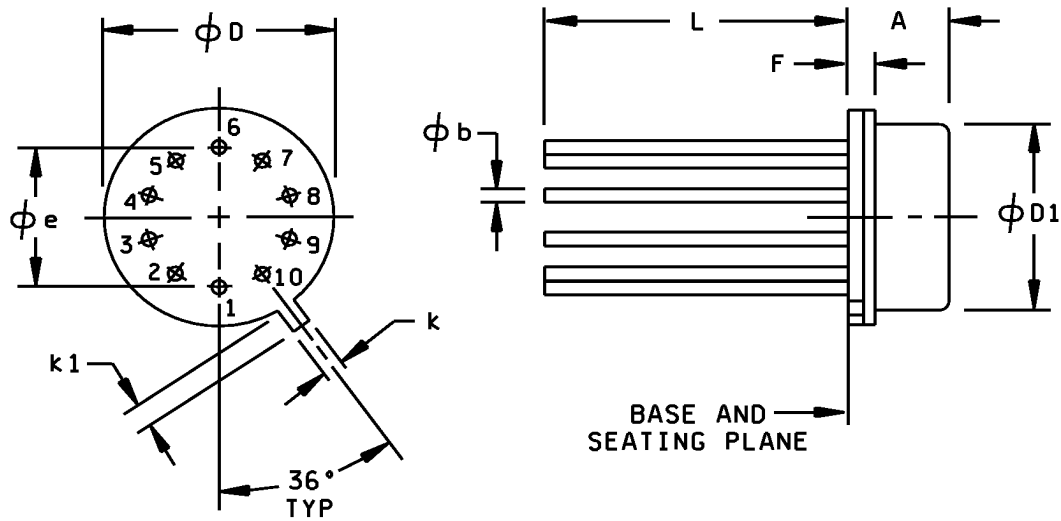
NOTES:

1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers shown for reference only.

FIGURE 1. Case outline(s).

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Case outline Y.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.94	4.70	0.155	0.185
$\phi b$	0.38	0.48	0.015	0.019
$\phi D$	8.51	9.40	0.335	0.370
$\phi D1$	7.75	8.51	0.305	0.335
$\phi e$	5.84 BSC		0.230 BSC	
F		1.02		0.040
k	0.66	0.86	0.026	0.034
k1	0.74	1.14	0.029	0.045
L	12.70		0.500	

NOTES:

1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers shown for reference only.

FIGURE 1. Case outline(s) - Continued.

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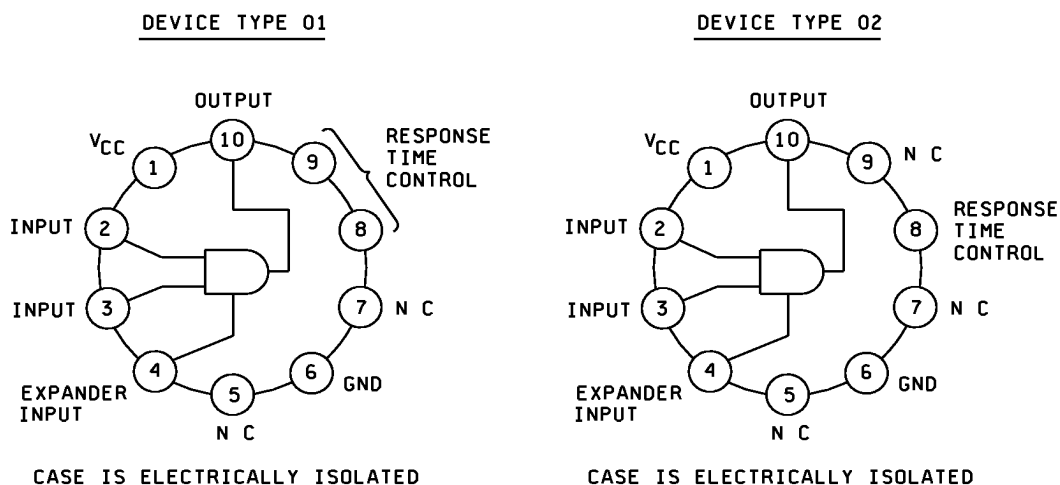


FIGURE 2. Terminal connections and functional diagram (top view).

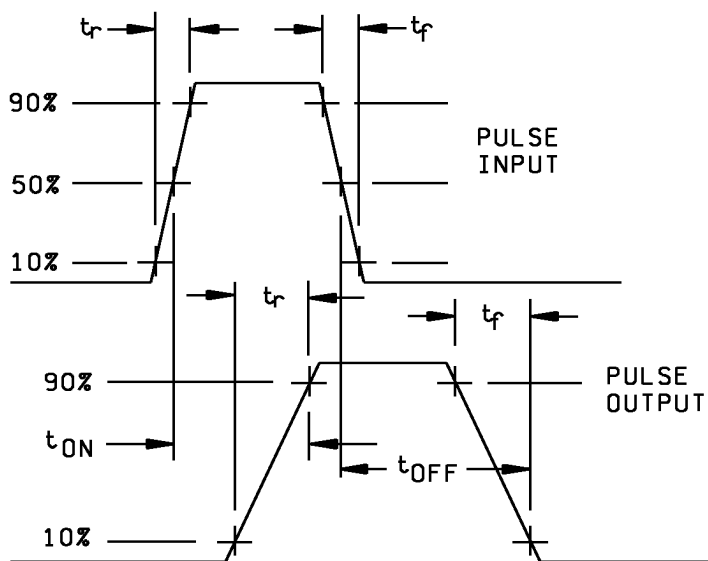


FIGURE 3. Switching time waveforms.

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TABLE II. Electrical test requirements.

MIL-PRF-38534 test requirements	Subgroups (in accordance with MIL-PRF-38534, group A test table)
Interim electrical parameters	1
Final electrical parameters	1*, 2, 3, 9
Group A test requirements	1, 2, 3, 9, 10, 11
Group C end-point electrical parameters	1, 2, 3

\* PDA applies to subgroup 1.

4.3 Conformance and periodic inspections. Conformance inspection (CI) and periodic inspection (PI) shall be in accordance with MIL-PRF-38534 and as specified herein.

4.3.1 Group A inspection (CI). Group A inspection shall be in accordance with MIL-PRF-38534 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 5, 6, 7, and 8 shall be omitted.

4.3.2 Group B inspection (PI). Group B inspection shall be in accordance with MIL-PRF-38534.

4.3.3 Group C inspection (PI). Group C inspection shall be in accordance with MIL-PRF-38534 and as follows:

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test, method 1005 of MIL-STD-883.
  - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
  - (2)  $T_A$  as specified in accordance with table I of method 1005 of MIL-STD-883.
  - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.3.4 Group D inspection (PI). Group D inspection shall be in accordance with MIL-PRF-38534.

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## 5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38534.

## 6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

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-973 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus when a system application requires configuration control and the applicable SMD. DSCC 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 microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-7603.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, P. O. Box 3990, Columbus, Ohio 43216-5000, or telephone (614) 692-0676.

6.6 Sources of supply. Sources of supply are listed in QML-38534. The vendors listed in QML-38534 have submitted a certificate of compliance (see 3.7 herein) to DSCC-VA and have agreed to this drawing.

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DSCC FORM 2234  
APR 97

# STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN

DATE: 99-02-19

Approved sources of supply for SMD 5962-87617 are listed below for immediate acquisition only and shall be added to QML-38534 during the next revision. QML-38534 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of QML-38534.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-8761701XA 5962-8761701XC 5962-8761701XA 5962-8761701XC 5962-8761701XA 5962-8761701XC	31757 31757 51651 51651 <u>3/</u> <u>3/</u>	51992 51992 MSK 0006H MSK 0006H 11105-DESC 11105-DESC
5962-8761701YA 5962-8761701YC	<u>3/</u> <u>3/</u>	11105-DESC 11105-DESC
5962-8761702XA 5962-8761702XC	51651 51651	MSK 0008H MSK 0008H

- 1/ The lead finish shown for each PIN, representing a hermetic package, is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the Vendor to determine availability.
- 2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.
- 3/ Not available from a QML source.

Vendor CAGE  
number

31757

51651

Vendor name  
and address

Micropac Industries, Incorporated  
905 East Walnut Street  
Garland, TX 75040-6611

M. S. Kennedy Corporation  
8170 Thompson Road  
Cicero, NY 13039-9393

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