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

REV																			
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REV STATUS OF SHEETS	REV														
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12		

PMIC N/A

STANDARD MICROCIRCUIT DRAWING

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

AMSC N/A

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DRAWING APPROVAL DATE
96-04-10

REVISION LEVEL

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUIT, DIGITAL, RADIATION HARDENED, CMOS/TTL CONVERTER, 8-BIT, BIDIRECTIONAL, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	67268	5962-96786

SHEET 1 OF 12

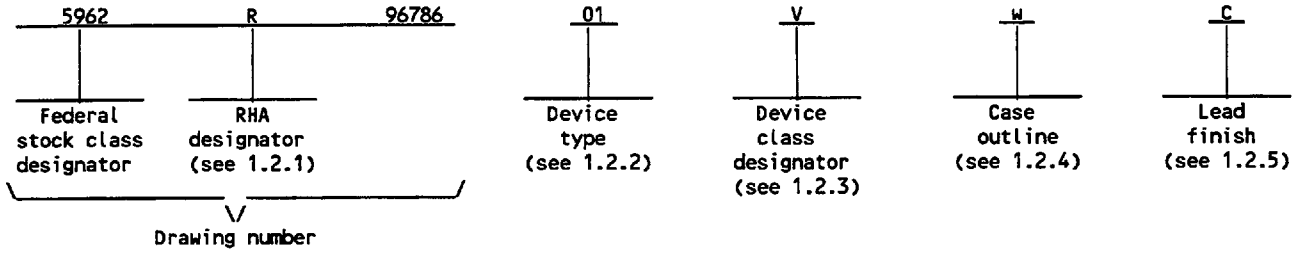
DESC FORM 193
JUL 94

9004708 0021607 045

1. SCOPE

1.1 Scope. This drawing forms a part of a one part - one part number documentation system (see 6.6 herein). Two product assurance classes consisting of military high reliability (device classes Q and M) and space application (device class V), and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). Device class M microcircuits represent non-JAN 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". When available, a choice of Radiation Hardness Assurance (RHA) levels are reflected in the PIN.

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



1.2.1 RHA designator. Device class M RHA marked devices shall meet the MIL-I-38535 appendix A specified RHA levels and shall be marked with the appropriate RHA designator. Device classes Q and V RHA marked devices shall meet the MIL-I-38535 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

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

Device type	Generic number	Circuit function
01	HS-3374RH	Radiation hardened, 8-bit bidirectional CMOS/TTL level converter

1.2.3 Device class designator. The device class designator shall be a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
M	Vendor self-certification to the requirements for non-JAN class B microcircuits in accordance with 1.2.1 of MIL-STD-883
Q or V	Certification and qualification to MIL-I-38535

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

Outline letter	Descriptive designator	Terminals	Package style
W	CDIP2-T22	22	Dual-in-line

1.2.5 Lead finish. The lead finish shall be as specified in MIL-STD-883 (see 3.1 herein) for class M or MIL-I-38535 for classes Q and V. Finish letter "X" shall not be marked on the microcircuit or its packaging. The "X" designation is for use in specifications when lead finishes A, B, and C are considered acceptable and interchangeable without preference.

1.3 Absolute maximum ratings. 1/

Supply voltage (V_{DD})	+11.0 V
Supply voltage (V_{CC})	+V_{DD}
I/O voltage applied	GND -0.3V to V_{DD} +0.3 V
Maximum package power dissipation (T_A = +125°C)	0.67 W 2/
Thermal resistance, junction-to-case (Θ_{JC})	12.3°C/W
Thermal resistance, junction-to-ambient (Θ_{JA})	74.8°C/W
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.

Supply voltage ranges:	
V_{DD}	+9.5 V to 10.5 V
V_{CC}	+4.75 V to 5.25 V
Input voltage ranges:	
Data inputs (CMOS)	GND -0.3V to V_{DD} +0.3 V
Data inputs (TTL)	GND -0.3V to V_{CC} +0.3 V
Enable, disable inputs	GND -0.3V to V_{DD} +0.3 V
Input low voltage (CMOS)	GND to 1 V
Input high voltage (CMOS)	V_{DD} -1.0 V to V_{DD}
Input low voltage (TTL)	0.8 V
Input high voltage (TTL)	2.8 V
Ambient operating temperature range (T_A)	-55°C to +125°C
Radiation features:	
Total dose	> 100 Krads (Si)
Latch up	None 4/
Single event phenomenon (SEP) effective linear energy threshold, no upsets (see 4.4.4.3)	3/, 4/

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, bulletin, and handbook. Unless otherwise specified, the following specification, standards, bulletin, and handbook 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-I-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-973 - Configuration Management.
MIL-STD-1835 - Microcircuit Case Outlines.

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.
2/ If power exceeds package dissipation capability, provide heat sinking or derate linearly (the derating is based on Θ_{JA}) at the rate of 13.4 mW/°C.
3/ Value to be specified when testing is completed.
4/ Guaranteed by process or design.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standard Microcircuit Drawings (SMD's).

HANDBOOK

MILITARY

MIL-HDBK-780 - Standardized Military Drawings.

(Copies of the specification, standards, bulletin, and handbook 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 for device class M 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. The individual item requirements for device classes Q and V shall be in accordance with MIL-I-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-STD-883 (see 3.1 herein) for device class M and MIL-I-38535 for device classes Q and V and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein.

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

3.2.3 Truth table. The truth table shall be as specified on figure 2.

3.2.4 Radiation exposure circuit. The radiation exposure test connections shall be as specified in table III.

3.3 Electrical performance characteristics and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and post irradiation parameter limits 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 IIA. The electrical tests for each subgroup are defined in table I.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. Marking for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein). In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103. Marking for device classes Q and V shall be in accordance with MIL-I-38535.

3.5.1 Certification/compliance mark. The compliance mark for device class M shall be a "C" as required in MIL-STD-883 (see 3.1 herein). The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-I-38535.

3.6 Certificate of compliance. For device class M, 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 6.7.2 herein). For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.7.1 herein). The certificate of compliance submitted to DESC-EC prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device class M, the requirements of MIL-STD-883 (see 3.1 herein), or for device classes Q and V, the requirements of MIL-I-38535 and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required for device class M in MIL-STD-883 (see 3.1 herein) or for device classes Q and V in MIL-I-38535 shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DESC-EC of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-973.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ V_{DD} = 10.5 V, V_{CC} = 5.25 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
ENABLE AND DISABLE INPUTS							
Input leakage current	I_{IH} CMOS	V_{IN} = 10.5 V, floating outputs	1, 2, 3	01		1	µA
TTL INPUT TO CMOS OUTPUTS							
Input leakage current	I_{IL}	V_{IN} = 0.8 V, other inputs = 2.8 V	1, 2, 3	01	-1		µA
	I_{IH}	V_{IN} = 2.8 V, other inputs = 0.8 V				1	
High level output voltage	V_{OH}	V_{DD} = 9.5 V, V_{CC} = 4.75 V, V_{IH} = 2.8 V, V_{IL} = 0.8 V, I_{OH} = -2.0 mA	1, 2, 3	01	9		V
Low level output voltage	V_{OL}	V_{IH} = 2.8 V, V_{IL} = 0.8 V, I_{OH} = 2.0 mA	1, 2, 3	01		0.5	V
CMOS TO TTL OUTPUTS							
High level output voltage	V_{OH}	V_{DD} = 9.5 V, V_{CC} = 4.75 V, V_{IH} = 8.5 V, V_{IL} = 1.0 V, I_{OH} = -2.0 mA	1, 2, 3	01	3		V
Low level output voltage	V_{OL}	V_{IH} = 9.5 V, V_{IL} = 1.0 V, I_{OH} = 11 mA	1, 2, 3	01		0.4	V
Output leakage current	I_{OZL}	V_{IN} = 0 V, all other pins high	1, 2, 3	01	-10		µA
	I_{OZH}	V_{IN} = 2.8 V, all other pins at GND				10	
Functional tests (see 4.4.1c)	FT (CMOS)	V_{DD} = 10.5 V, V_{CC} = 5.25 V V_{IH} = V_{DD} -1 V, V_{IL} = 1 V	7, 8	01			
		V_{DD} = 9.5 V, V_{CC} = 4.75 V, V_{IH} = V_{DD} -1 V, V_{IL} = 1 V					
	FT (TTL)	V_{DD} = 10.5 V, V_{CC} = 5.25 V V_{IH} = 2.8 V, V_{IL} = 0.8 V					
		V_{DD} = 9.5 V, V_{CC} = 4.75 V, V_{IH} = 2.8 V, V_{IL} = 0.8 V					
Static current	SI_{CC}	EN = 0 V, DISABLE = 2.8 V floating output, measure V_{CC} pin	1, 2, 3	01		5	µA

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_{DD} = 10.5 V, V_{CC} = 5.25 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
CMOS TO TTL OUTPUTS - continued							
Static current 1	SI_{DD1}	EN = 2.8 V, DISABLE = 2.8 V, floating outputs	1, 2, 3	01		300	µA
Static current 2	SI_{DD2}	EN = 0 V, DISABLE = 2.8 V, floating outputs	1, 2, 3	01		100	µA
AC ELECTRICAL							
Propagation delay times CMOS data in to TTL data out	t_{PHLCT}	2/	9, 10, 11	01		40	ns
	t_{PLHCT}	2/				50	
Propagation delay times TTL data in to CMOS data out	t_{PHLTC}	2/	9, 10, 11	01		85	ns
	t_{PLHTC}	2/				70	
Transition times CMOS input to TTL output	t_{THLCT}	2/	9, 10, 11	01		20	ns
	t_{TLHCT}	2/				70	
Transition times TTL input to CMOS output	t_{THLTC}	2/	9, 10, 11	01		50	ns
	t_{TLHTC}	2/				50	
Propagation delay times TTL/CMOS ENABLE to CMOS out	t_{PHZTC}	2/	9, 10, 11	01		90	ns
	t_{PZHTC}	2/				90	
	t_{PLZTC}	2/				85	
	t_{PZLTC}	2/				90	
Propagation delay times CMOS/TTL DISABLE to TTL out	t_{PHZCT}	2/	9, 10, 11	01		70	ns
	t_{PZHCT}	2/				130	
	t_{PLZCT}	2/				120	
	t_{PZLCT}	2/				125	

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_{DD} = 10.5 V, V_{CC} = 5.25 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
CAPACITANCE							
Input capacitance 3/	C_{IN}	V_{DD} = open, f = 1 Mhz, all measurements referenced to device ground	4	01		15	pF
Input, output capacitance 3/	$C_{I/O}$ (CMOS)	V_{DD} = open, f = 1 Mhz, all measurements referenced to device ground	4	01		13	pF
	$C_{I/O}$ (TTL)					17	

1/ Devices supplied to this drawing meet all levels M, D, L and R of irradiation however this device is only tested at the R level. Pre and post irradiation values are identical unless otherwise specified in table I. When performing post irradiation electrical measurements for any RHA level, T_A = +25°C.

2/ C_L = 100 pF, V_{DD} = 9.5 V, V_{CC} = 4.75 V, V_{IH} = 8.5 V for CMOS input to TTL output, V_{IH} = 2.8 V for TTL input to CMOS output, V_{IL} = 1.0 V for CMOS input to TTL output, V_{IL} = 0.8 V for TTL input to CMOS output.

3/ These parameters are controlled via design or process parameters and are not tested. These parameters are characterized upon initial design release and upon design changes which would affect these characteristics.

Device type	01
Case outline	W
Terminal number	Terminal symbol
1	V_{DD}
2	A0
3	A1
4	A2
5	A3
6	A4
7	A5
8	A6
9	A7
10	ENABLE
11	GND
12	NC
13	DISABLE
14	B7
15	B6
16	B5
17	B4
18	B3
19	B2
20	B1
21	B0
22	V_{CC}

Notes: Ax = CMOS INPUT/OUTPUT
Bx = TTL INPUT/OUTPUT
NC = no connect

FIGURE 1. Terminal connections.

ENABLE	DISABLE	FUNCTION
X	0	Convert CMOS level to TTL level
1	1	Convert TTL level to CMOS level
0	1	High impedance (Z)

NOTES: 0 = low level
1 = high level
X = don't care
Z = high impedance on both CMOS and TTL sides.

FIGURE 2. Truth table.

TABLE IIA. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, TM 5005, table I)	Subgroups (in accordance with MIL-I-38535, table III)	
	Device class M	Device class Q	Device class V
Interim electrical parameters (see 4.2)	1,7,9	1,7,9	1,7,9
Final electrical parameters (see 4.2)	1,2,3,7,8, 9,10,11 1/	1,2,3,7,8, 9,10,11 1/	1,2,3, 1/ 2/ 7,8,9,10,11
Group A test requirements (see 4.4)	1,2,3,4,7,8, 9,10,11	1,2,3,4,7,8, 9,10,11	1,2,3,4,7,8, 9,10,11
Group C end-point electrical parameters (see 4.4)	1,2,3,7,8, 9,10,11	1,2,3,7,8, 9,10,11	1,2,3,7,8, 9,10,11
Group D end-point electrical parameters (see 4.4)	1,7	1,7	1,7
Group E end-point electrical parameters (see 4.4)	1,7,9	1,7,9	1,7,9

1/ PDA applies to subgroup 1 and 7. For class V to subgroups 1, 7, and Δ.
2/ Delta limits (see table IIB) shall be required and the delta values shall be computed with reference to the zero hour electrical parameters (see table I).

TABLE IIB. Post burn-in delta parameters (+25°C).

Parameters	Symbol	Delta limits
Static current 1	SI_{DD1}	±50 μA
Static current 2	SI_{DD2}	±30 μA
Low input leakage current	I_{IL}	±100 nA
High input leakage current	I_{IH}	±100 nA
Low output leakage current	I_{OZL}	±1 μA
High output leakage current	I_{OZH}	±1 μA

TABLE III. Irradiation test connections. (T_A = +25°C ±5°C, V_{CC} = 5.0 V ±0.5 V, V_{DD} = 10 V ±0.5 V)

TEST	GROUND	V_{CC}	V_{DD}	NO CONNECT
Radiation exposure	11,18,19, 20,21	10,13,14,15, 16,17,22	1	2,3,4,5,6,7,8,9,12

3.9 Verification and review for device class M. For device class M, 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.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 37 (see MIL-I-38535, appendix A).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. For device class M, sampling and inspection procedures shall be in accordance with MIL-STD-883 (see 3.1 herein). For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-I-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

4.2 Screening. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. For device classes Q and V, screening shall be in accordance with MIL-I-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection.

4.2.1 Additional criteria for device class M.

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 the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table IIA herein.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-I-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.

b. Interim and final electrical test parameters shall be as specified in table IIA herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in appendix B of MIL-I-38535 or as modified in the device manufacturer's Quality Management (QM) plan.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-I-38535. Inspections to be performed shall be those specified in MIL-I-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Quality conformance inspection for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein) and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4). Technology conformance inspection for classes Q and V shall be in accordance with MIL-I-38535 or as specified in QM plan including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-I-38535 permits alternate in-line control testing.

4.4.1 Group A inspection.

a. Tests shall be as specified in table IIA herein.

b. Subgroups 5 and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. For device class M, Q and V, subgroups 7 and 8 tests shall be sufficient to verify the truth table.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

a. 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 the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005.

b. T_A = +125°C, minimum.

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

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB, in accordance with MIL-I-38535, and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels for device classes M, Q, and V shall be specified in MIL-I-38535. End-point electrical parameters shall be as specified in table IIA herein.

4.4.4.1 Total dose irradiation testing. Total dose irradiation testing shall be performed in accordance with MIL-STD-883 method 1019 and as specified herein.

4.4.4.1.1 Accelerated aging test. Accelerated aging tests shall be performed on all devices requiring a RHA level greater than 5k rads(Si). The post-anneal end-point electrical parameter limits shall be as specified in table I herein and shall be the pre-irradiation end-point electrical parameter limit at 25°C ±5°C. Testing shall be performed at initial qualification and after any design or process changes which may affect the RHA response of the device.

4.4.4.2 Dose rate induced latchup testing. Dose rate induced latchup testing shall be performed in accordance with test method 1020 of MIL-STD-883 and as specified herein (see 1.4). Tests shall be performed on devices, SEC, or approved test structures at technology qualification and after any design or process changes which may effect the RHA capability of the process.

4.4.4.3 Single event phenomena (SEP). SEP testing shall be required on class V devices (see 1.4 herein). SEP testing shall be performed on a technology process on the Standard Evaluation Circuit (SEC) or alternate SEP test vehicle as approved by the qualifying activity at initial qualification and after any design or process changes which may affect the upset or latchup characteristics. The recommended test conditions for SEP are as follows:

a. The ion beam angle of incidence shall be between normal to the die surface and 60° to the normal, inclusive (i.e. 0° ≤ angle ≤ 60°). No shadowing of the ion beam due to fixturing or package related effects is allowed.

b. The fluence shall be ≥ 100 errors or ≥ 10^6 ions/cm^2.

c. The flux shall be between 10^2 and 10^5 ions/cm^2/s. The cross-section shall be verified to be flux independent by measuring the cross-section at two flux rates which differ by at least an order of magnitude.

d. The particle range shall be ≥ 20 microns in silicon.

e. The test temperature shall be +25°C and the maximum rated operating temperature ±10°C.

f. Bias conditions shall be defined by the manufacturer for latchup measurements.

g. Test four devices with zero failures.

4.5 Methods of inspection. Methods of inspection shall be as specified as follows:

4.5.1 Voltage and current. Unless otherwise specified, all voltages given are referenced to the microcircuit GND terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-STD-883 (see 3.1 herein) for device class M and MIL-I-38535 for device classes Q and V.

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.

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

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 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.

6.3 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and which SMD's are applicable to that system. 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 microelectronic devices (FSC 5962) should contact DESC-EC, telephone (513) 296-6047.

6.4 Comments. Comments on this drawing should be directed to DESC-EC, Dayton, Ohio 45444-5270, or telephone (513) 296-5377.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-I-38535 and MIL-STD-1331.

6.6 One part - one part number system. The one part - one part number system described below has been developed to allow for transitions between identical generic devices covered by the three major microcircuit requirements documents (MIL-H-38534, MIL-I-38535, and 1.2.1 of MIL-STD-883) without the necessity for the generation of unique PIN's. The three military requirements documents represent different class levels, and previously when a device manufacturer upgraded military product from one class level to another, the benefits of the upgraded product were unavailable to the Original Equipment Manufacturer (OEM), that was contractually locked into the original unique PIN. By establishing a one part number system covering all three documents, the OEM can acquire to the highest class level available for a given generic device to meet system needs without modifying the original contract parts selection criteria.

Military documentation format	Example PIN under new system	Manufacturing source listing	Document listing
New MIL-H-38534 Standard Microcircuit Drawings	5962-XXXXXZZ(H or K)YY	QML-38534	MIL-BUL-103
New MIL-I-38535 Standard Microcircuit Drawings	5962-XXXXXZZ(Q or V)YY	QML-38535	MIL-BUL-103
New 1.2.1 of MIL-STD-883 Standard Microcircuit Drawings	5962-XXXXXZZ(M)YY	MIL-BUL-103	MIL-BUL-103

6.7 Sources of supply.

6.7.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DESC-EC and have agreed to this drawing.

6.7.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-BUL-103. 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-EC.

6.8 Additional information. A copy of the following additional data shall be maintained and available from the device manufacturer:

a. RHA upset levels.

b. Test conditions (SEP).

c. Number of upsets (SEP).

d. Number of transients (SEP).

e. Occurrence of latchup (SEP).