

PART NUMBER

26S02PC

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All re-creations are done with the approval of the Original Component Manufacturer. (OCM)

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-38535
 - Class Q Military
 - Class V Space Level

Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Update boilerplate. Editorial changes throughout. --les	00-08-16	Raymond L. Monnin
B	Update to current requirements. Editorial changes throughout. --gap	06-04-25	Raymond L. Monnin
C	Update drawing to current MIL-PRF-38535 requirements. --jt	13-11-13	C. SAFFLE
D	Update drawing to current Mil-PRF-38535 requirements. - jt	18-11-14	C. SAFFLE



The original first page of this drawing has been replaced.

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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	12
PMIC N/A		PREPARED BY David W. Queenan					DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 http://www.dla.mil/landandmaritime								
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE		CHECKED BY Dan DiCenzo													
		APPROVED BY Michael A. Frye					MICROCIRCUIT, DIGITAL, SCHOTTKY, DUAL RETRIGGERABLE, RESETTABLE, MONOSTABLE MULTIVIBRATOR, MONOLITHIC SILICON								
		DRAWING APPROVAL DATE 88-01-28													
		REVISION LEVEL D													
		AMSC N/A		SIZE A		CAGE CODE 67268		5962-87662							
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DSCC FORM 2233

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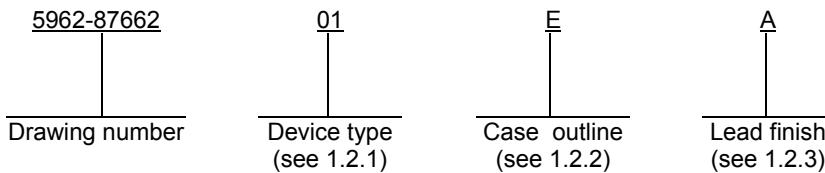
DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

5962-E062-19

1. SCOPE

1.1 Scope. This drawing describes device requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A.

1.2 Part or Identifying Number (PIN). The complete PIN is as shown in the following example:



1.2.1 Device type. The device types identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	26S02	Schottky dual retriggerable, resettable, monostable multivibrator

1.2.2 Case outlines. The case outlines are as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
E	GDIP1-T16 or CDIP2-T16	16	Dual-in-line
F	GDFP2-F16 or CDFP3-F16	16	Flat pack

1.2.3 Lead finish. The lead finish is as specified in MIL-PRF-38535, appendix A.

1.3 Absolute maximum ratings.

Supply voltage range (V _{CC})	-0.5 V dc to +7.0 V dc
DC input voltage range (V _{IN})	-1.2 V dc to +5.5 V dc
DC output voltage range (V _{OUT})	-0.5 V dc to +5.5 V dc
Storage temperature range (T _{STG})	-65°C to +150°C
Maximum power dissipation (P _D) ^{1/}	700 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ _{JC})	See MIL-STD-1835
Junction temperature (T _J)	+175°C
DC input current	-30 mA to +5.0 mA
DC output current, into output	+30 mA

1.4 Recommended operating conditions.

Supply voltage range (V _{CC})	+4.5 V dc to +5.5 V dc
Ambient operating temperature range (T _A)	-55°C to +125°C
Minimum high-level input voltage (V _{IH})	2.0 V dc
Maximum low-level input voltage (V _{IL})	0.8 V dc

^{1/} Must withstand the added P_D due to short circuit test (e.g., I_{os}).

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**SIZE
A**

5962-87662

REVISION LEVEL
D

SHEET
2

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.

MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-103 - List of Standard Microcircuit Drawings.

MIL-HDBK-780 - Standard Microcircuit Drawings.

(Copies of these documents are available online at <https://quicksearch.dla.mil/>)

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 requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-PRF-38535 may be processed as QML product in accordance with the manufacturers approved program plan and qualifying activity approval in accordance with MIL-PRF-38535. This QML flow as documented in the Quality Management (QM) plan may make modifications to the requirements herein. These modifications shall not affect form, fit, or function of the device. These modifications shall not affect the PIN as described herein. A "Q" or "QML" certification mark in accordance with MIL-PRF-38535 is required to identify when the QML flow option is used.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535, appendix A and herein.

3.2.1 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

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

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

3.2.4 Logic diagrams. The logic diagrams shall be as specified on figure 3.

3.2.5 Test circuit and switching waveforms. Test circuit and switching waveforms shall be as specified on figure 4.

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.

**STANDARD
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SIZE A		5962-87662
	REVISION LEVEL D	SHEET 3

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-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked. For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device.

3.5.1 Certification/compliance mark. A compliance indicator "C" shall be marked on all non-JAN devices built in compliance to MIL-PRF-38535, appendix A. The compliance indicator "C" shall be replaced with a "Q" or "QML" certification mark in accordance with MIL-PRF-38535 to identify when the QML flow option is used.

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-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DLA Land and Maritime -VA prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38535, appendix A and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DLA Land and Maritime -VA shall be required for any change that affects this drawing.

3.9 Verification and review. DLA Land and Maritime, DLA Land and Maritime'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. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

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. 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 method 1015 of MIL-STD-883.

(2) $T_A = +125^\circ\text{C}$, 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.

**STANDARD
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**SIZE
A**

5962-87662

REVISION LEVEL
D

SHEET

4

TABLE I. Electrical performance characteristics

Test	Symbol	Conditions -55°C ≤ TA ≤ +125°C Unless otherwise specified	Group A subgroups	Device type	Limits		Unit	
					Min	Max		
High-level output voltage	V _{OH}	V _{CC} = 4.5 V, I _{OH} = -2.0 mA, V _{IN} = 2.0 V or 0.8 V	1, 2, 3	01	2.5		V	
Low-level output voltage	V _{OL}	V _{CC} = 4.5 V, I _{OH} = 20 mA, V _{IN} = 2.0 V or 0.8 V	1, 2, 3	01		0.5	V	
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V, I _{IN} = -18 mA <u>1/</u>	1, 2, 3	01		-1.2	V	
High-level input current	I _{IH1}	V _{CC} = 5.5 V, V _{IN} = 2.7 V <u>1/</u>	1, 2, 3	01		20	μA	
	I _{IH2}	V _{CC} = 5.5 V, V _{IN} = 5.5 V <u>1/</u>	1, 2, 3	01		1.0	mA	
Low-level input current	I _{IL}	V _{CC} = 5.5 V, V _{IN} = 0.5 V	1, 2, 3	01		-0.4	mA	
Short circuit input current	I _{OS}	V _{CC} = 5.5 V, V _{OUT} = 1.0 V <u>2/</u>	1, 2, 3	01	-8	-35	mA	
Supply current	I _{CC}	V _{CC} = 5.5 V, I _O = GND I _{IX} = 0.33 mA <u>3/</u>	1, 2, 3	01		69	mA	
Functional tests		See 4.3.1c		7, 8	01			
Timing resistor	R _X	<u>4/</u>			01	5	50	kΩ
Propagation delay from T ₀ to Q	t _{PLH1}	C _L = 15pF R _L = 280Ω R _X = 5 kΩ C _X = 0 pF (See figure 4)	5/	9	01		20	ns
Propagation delay from T ₀ to <u>Q</u>	t _{PHL1}		6/	9, 10, 11	01		30	ns
Propagation delay from I ₁ to Q	t _{PLH2}		5/	9	01		23	ns
Propagation delay from I ₁ to <u>Q</u>	t _{PHL2}		6/	9, 10, 11	01		30	ns
Propagation delay from, clear to <u>Q</u>	t _{PLH3}		5/	9	01		20	ns
Propagation delay from, clear to <u>Q</u>	t _{PHL3}		6/	9, 10, 11	01		26	ns
Propagation delay from, clear to Q	t _{PLH3}		5/	9	01		25	ns
Propagation delay from, clear to Q	t _{PHL3}		6/	9, 10, 11	01		33	ns

See footnotes at end of table I.

**STANDARD
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SIZE
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DSHEET
5

TABLE I. Electrical performance characteristics

Test	Symbol	Conditions -55°C ≤ TA ≤ +125°C Unless otherwise specified		Group A subgroups	Device type	Limits		Unit
						Min	Max	
Pulse width	t _{PW}	C _L = 15pF R _L = 280Ω R _x = 5 kΩ C _x = 0 pF (See figure 4)	5/	9 T ₀ high or I ₁ low	01	20		ns
				9 T ₀ low or I ₁ high	01	16		ns
			6/	9, 10, 11 T ₀ high or I ₁ low	01	26		ns
				9, 10, 11 T ₀ low or I ₁ high	01	20		ns
		R _x = 10 kΩ C _x = 1000 pF (See figure 4)	5/	9 Clear low	01	24		ns
			6/	9, 10, 11 Clear low	01	31		ns
		C _L = 15pF R _L = 280Ω R _x = 5 kΩ C _x = 0 pF (See figure 4)	5/	9	01	-10		ns
			6/	9, 10, 11	01	-8		ns
Setup time, clear recovery inactive to trigger	t _S	C _L = 15pF R _L = 280Ω R _x = 5 kΩ C _x = 0 pF (See figure 4)	5/	9	01	740	870	ns
			6/	9, 10, 11	01	710	920	ns
Minimum pulse width Q output	t _{PWQ} (min)	R _L = 1 kΩ R _x = 10 kΩ C _x = 200 pF (See figure 4)	5/	9	01	3.23	3.61	μs
			6/	9, 10, 11	01	3.07	3.83	μs
Pulse width Q output	t _{PWQ}	C _L = 15pF R _L = 280Ω R _x = 10 kΩ C _x = 1000 pF (See figure 4)	5/	9	01			
			6/	9, 10, 11	01			

- 1/ Input test do not apply to C_x, R_x/C_x pins.
- 2/ Not more than one output should be shorted at a time and the duration of the short circuit condition should not exceed 1 second.
- 3/ I_{ix} is the current into the R_xC_x node to simulate R_x: R_x/C_x = I_{ix}.
- 4/ Timing resistor range for which timing resistor equation applies.
- 5/ V_{CC} = +5.0 V
- 6/ V_{CC} = +4.5 V to +5.5 V
- 7/ C_x is a silver mica type capacitor.
- 8/ C_x = 200 pF test is not performed but correlated to 1000 pF test.

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COLUMBUS, OHIO 43218-3990

SIZE
A**5962-87662**REVISION LEVEL
D

SHEET

6

Device Type	01
Case outline	E and F
Terminal Connection	Terminal Symbol
1	C_x
2	R_x/C_x
3	\bar{C}_D
4	I_1
5	\bar{I}_0
6	Q
7	\bar{Q}
8	GND
9	\bar{Q}
10	Q
11	\bar{I}_0
12	I_1
13	\bar{C}_D
14	R_x/C_x
15	C_x
16	V_{CC}

FIGURE 1. Terminal connections.

Inputs			Outputs	
\bar{C}_D	I_1	\bar{I}_0	Q	\bar{Q}
L	X	X	L	H
H	H	X	L	H
H	L	↓	◻	◻
H	X	L	L	H
H	↑	H	◻	◻

H = High
 L = Low
 \uparrow = Low-to-high transition
 \downarrow = High-to-low transition
 \square = Low-high-low pulse
 $\square\downarrow$ = High-low-high pulse
 X = Don't care

FIGURE 2. Truth table.

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SIZE
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5962-87662

REVISION LEVEL
D

SHEET
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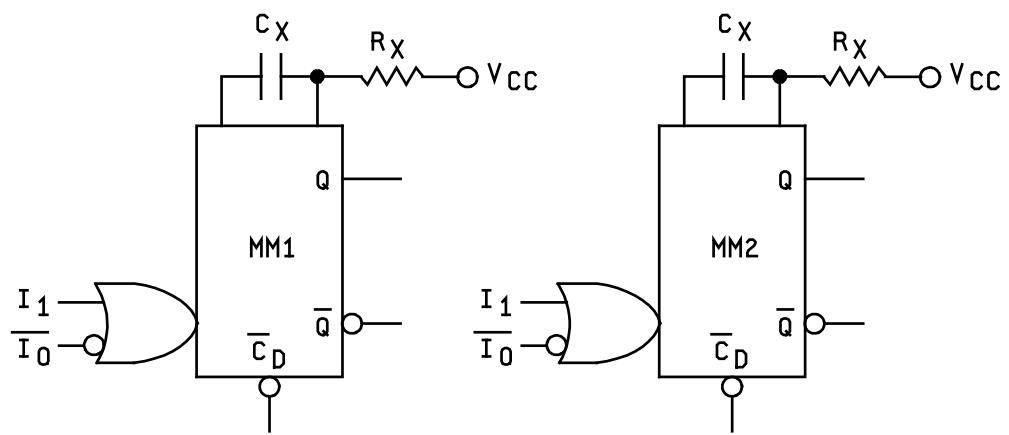


FIGURE 3. Logic diagram.

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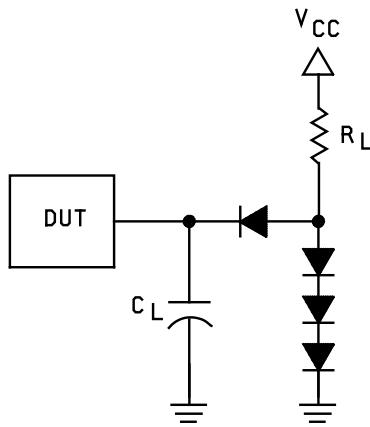
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5962-87662

REVISION LEVEL
D

SHEET
8

AC BENCH LOAD TEST CIRCUIT
FOR NON THREE-STATE OUTPUTS



NOTES:

1. Pulse generator for all pulses:
Rate ≤ 1.0 MHz; $Z_0 \pm 50 \Omega$; $t_r \leq 15$ ns; $t_f \leq 6.0$ ns.
2. C_L includes probe and jig capacitance.
3. All diodes are 1N916 or 1N3064.

PROPAGATION DELAY

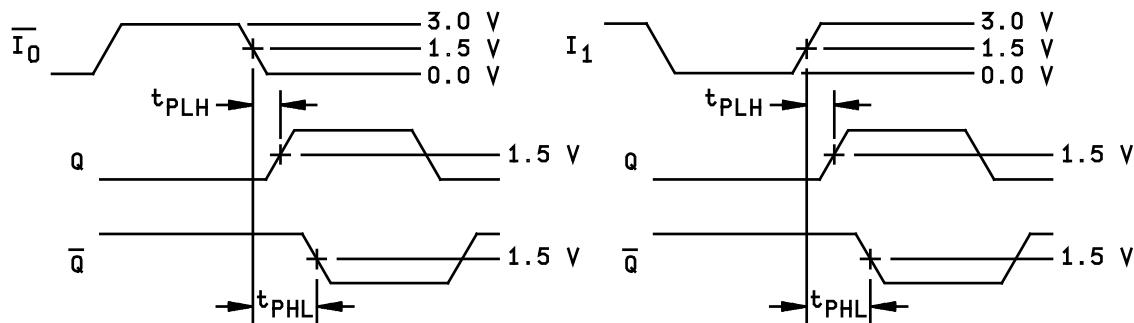


FIGURE 4. Switching waveforms and test circuit.

STANDARD
MICROCIRCUIT DRAWING
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COLUMBUS, OHIO 43218-3990

SIZE
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5962-87662

REVISION LEVEL
D

SHEET
9

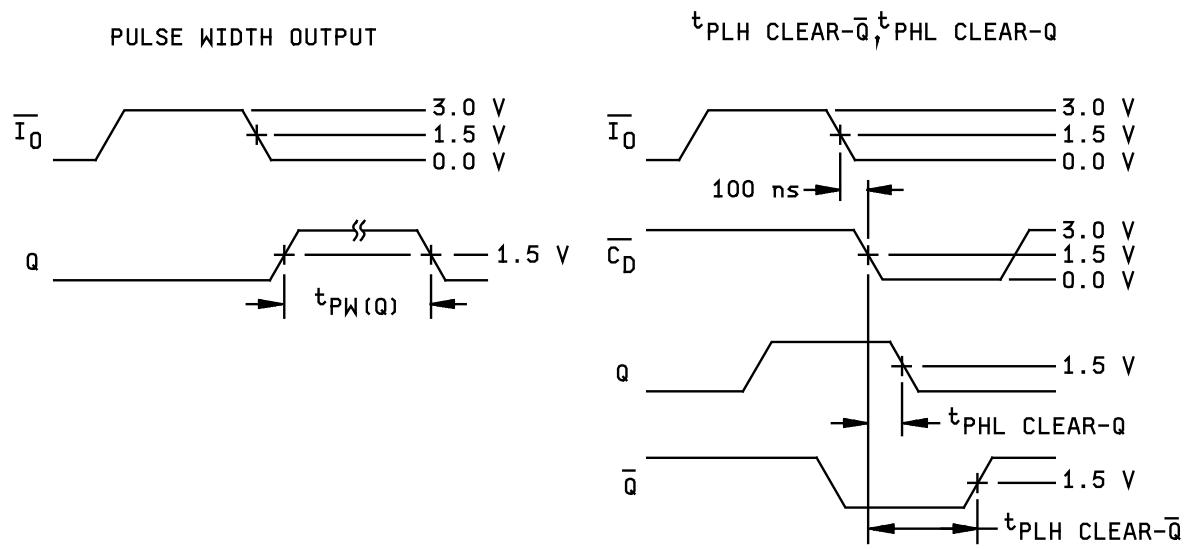


FIGURE 4. Switching waveforms and test circuit - continued.

**STANDARD
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COLUMBUS, OHIO 43218-3990

**SIZE
A**

5962-87662

REVISION LEVEL
D

SHEET
10

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*, 2, 3, 7, 8, 9, 10**, 11**
Group A test requirements (method 5005)	1, 2, 3, 7, 8, 9, 10**, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

* PDA applies to subgroup 1.

** Subgroups 10 and 11, if not tested, shall be guaranteed to the limits specified in table I.

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.

- Tests shall be as specified in table II herein.
- Subgroups 4, 5 and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.
- Subgroups 7 and 8 shall include verification of the truth table.

4.3.2 Groups C and D inspections.

- End-point electrical parameters shall be as specified in table II herein.
- Steady-state life test conditions, method 1005 of MIL-STD-883.
 - 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 method 1005 of MIL-STD-883.
 - $T_A = +125^\circ\text{C}$, minimum.
 - Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

**STANDARD
MICROCIRCUIT DRAWING**
DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

**SIZE
A**

5962-87662

REVISION LEVEL
D

SHEET
11

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535, appendix A.

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 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform DLA Land and Maritime when a system application requires configuration control and the applicable SMD to that system. DLA Land and Maritime 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 DLA Land and Maritime -VA, telephone (614) 692-8108.

6.5 Comments. Comments on this drawing should be directed to DLA Land and Maritime -VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0540.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103 and QML-38535. The vendors listed in MIL-HDBK-103 and QML-38535 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DLA Land and Maritime -VA.

**STANDARD
MICROCIRCUIT DRAWING**
DLA LAND AND MARITIME
COLUMBUS, OHIO 43218-3990

**SIZE
A**

5962-87662

REVISION LEVEL
D

SHEET
12

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 18-11-14

Approved sources of supply for SMD 5962-87662 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 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 DLA Land and Maritime -VA. This information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535. DLA Land and Maritime maintains an online database of all current sources of supply at <https://landandmaritimeapps.dla.mil/Programs/Smcr/>.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-8766201EA	3V146	26S02/BEA
5962-8766201FA	3V146	26S02/BFA

- 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 its 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.

Vendor CAGE number

3V146

Vendor name and address

Rochester Electronics
16 Malcolm Hoyt Drive
Newburyport, MA 01950

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