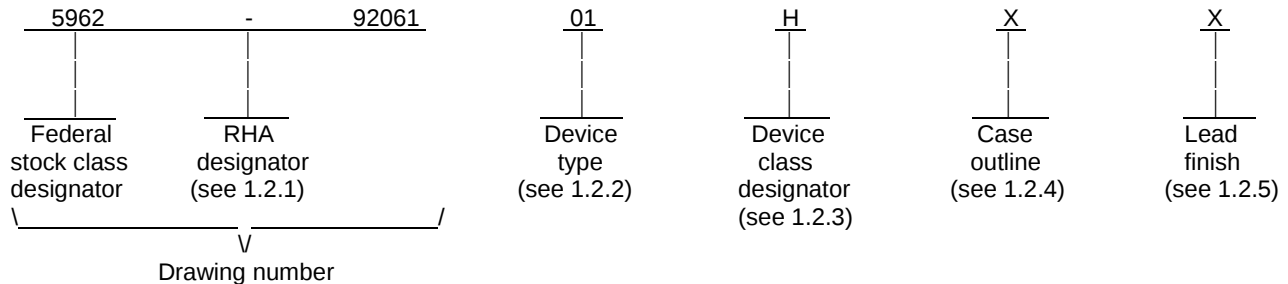


REVISIONS																			
LTR	DESCRIPTION													DATE (YR-MO-DA)				APPROVED	
A	Added device type 02. Made corrections to paragraph 1.3 and table I. Added waveform distortion test to table I. Rewrote entire document.													93-06-15				K. A. Cottongim	
B	Added vendor cage number 57363. Added device types 03, 04, 05, and 06. Added case outlines M, N, T, and U.													93-10-08				K. A. Cottongim	
C	Added case outlines 4 and 5.													95-01-13				K. A. Cottongim	
D	Remove vendor cage 8K957. Added vendor cage 88379. Added device types 07, 08, 09, and 10. Updated requirements to MIL-PRF-38534.													95-12-06				K. A. Cottongim	
E	Table I; For the t_{DT} test changed the max limit for device types 07 and 08 from 150 ns to 250 ns. For the t_{DI-L} test changed the max limit for device types 07 and 08 from 250 ns to 450 ns. For the I_{CC4} test under the conditions block added for device types 07-10 to use 100% duty cycle at 1 MHz, see note 11. Changed the max limit for the I_{CC4} test, device types 07-10 from 650 mA to 750 mA. -sld													01-06-22				Raymond Monnin	
F	Case outline N, dimension Q maximum, change .122" to .135".													03-12-19				Raymond Monnin	
G	Paragraph 1.2.4, case outline Z, correct terminals from 36 to 24. -gz													08-11-07				Robert M. Heber	
H	Table I, I_{CC5} test for device types 03 through 06, change test condition from 80% duty cycle at 1 MHz to 75% duty cycle at 1 MHz. -gz													10-07-20				Charles F. Saffle	
J	Updated drawing paragraphs. -sld													12-05-07				Charles F. Saffle	
K	Add case outline 6. -gc													13-01-22				Charles F. Saffle	
THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.																			
REV																			
SHEET																			
REV	K	K	K	K	K	K	K	K	K	K	K	K	K						
SHEET	15	16	17	18	19	20	21	22	23	24	25	26	27						
REV STATUS				REV				K	K	K	K	K	K	K	K	K	K	K	K
OF SHEETS				SHEET				1	2	3	4	5	6	7	8	9	10	11	12
PMIC N/A				PREPARED BY Gary Zahn								DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990 http://www.landandmaritime.dla.mil/							
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A				CHECKED BY Michael C. Jones															
				APPROVED BY Gregory A. Lude								MICROCIRCUIT, HYBRID, DIGITAL, MULTICHIP, DUAL CHANNEL, DRIVER-RECEIVER							
				DRAWING APPROVAL DATE 92-07-08															
				REVISION LEVEL K								SIZE A		CAGE CODE 67268		5962-92061			
								SHEET 1 OF 27											

1. SCOPE

1.1 Scope. This drawing documents five product assurance classes as defined in paragraph 1.2.3 and MIL-PRF-38534. A choice of case outlines and lead finishes which are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of radiation hardness assurance levels are reflected in the PIN.

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



1.2.1 Radiation hardness assurance (RHA) designator. RHA marked devices shall meet the MIL-PRF-38534 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

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

Device type	Generic number	Circuit function
01	MR63147M	+5 V, dual channel, MIL-STD-1553 transceiver (Harris interface)
02	MR63147M-2	+5 V, dual channel, MIL-STD-1553 transceiver (Smith interface)
03	NHI-1559, NHI-1567, NHI-1573, NHI-1579	+5 V, dual channel, MIL-STD-1553 transceiver (standby low)
04	NHI-1560, NHI-1568, NHI-1574, NHI-1580	+5 V, dual channel, MIL-STD-1553 transceiver (standby high)
05	NHI-1563, NHI-1569, NHI-1578, NHI-1593	+5 V, dual channel, MacAir transceiver (standby low)
06	NHI-1570, NHI-1577, NHI-1581, NHI-1594	+5 V, dual channel, MacAir transceiver (standby high)
07	ACT4458-201	+5 V, dual channel, MIL-STD-1553 transceiver (standby low)
08	ACT4464-201	+5 V, dual channel, MIL-STD-1553 transceiver (standby high)
09	ACT4460-201	+5 V, dual channel, MacAir transceiver (standby low)
10	ACT4454-201	+5 V, dual channel, MacAir transceiver (standby high)

1.2.3 Device class designator. This device class designator shall be a single letter identifying the product assurance level. All levels are defined by the requirements of MIL-PRF-38534 and require QML Certification as well as qualification (Class H, K, and E) or QML Listing (Class G and D). The product assurance levels are as follows:

Device class	Device performance documentation
K	Highest reliability class available. This level is intended for use in space applications.
H	Standard military quality class level. This level is intended for use in applications where non-space high reliability devices are required.
G	Reduced testing version of the standard military quality class. This level uses the Class H screening and In-Process Inspections with a possible limited temperature range, manufacturer specified incoming flow, and the manufacturer guarantees (but may not test) periodic and conformance inspections (Group A, B, C, and D).

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E	Designates devices which are based upon one of the other classes (K, H, or G) with exception(s) taken to the requirements of that class. These exception(s) must be specified in the device acquisition document; therefore the acquisition document should be reviewed to ensure that the exception(s) taken will not adversely affect system performance.
D	Manufacturer specified quality class. Quality level is defined by the manufacturers internal, QML certified flow. This product may have a limited temperature range.

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

Outline letter	Descriptive designator	Terminals	Package style
M	See figure 1	20	Dual-in-line
N	See figure 1	20	Flat pack
T	See figure 1	36	Dual-in-line
U	See figure 1	36	Flat pack
X	See figure 1	36	Dual-in-line
Y	See figure 1	36	Flat pack
Z	See figure 1	24	Micro flat pack
6	See figure 1	24	Micro flat pack
4	See figure 1	36	Dual-in-line (ceramic)
5	See figure 1	36	Flat pack (ceramic)

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

1.3 Absolute maximum ratings. 1/

Supply voltage range (V_{CC})	-0.3 V dc to +7.0 V dc
Logic input voltage range	-0.3 V dc to +5.5 V dc
Receiver differential input voltage	10 V_{P-P}
Driver peak output current	+1.0 A
Power dissipation (P_D), device types 01 and 02:	
Hottest die (100% duty cycle)	2.2 W
Total hybrid (standby)	500 mW
Total hybrid (100% duty cycle)	2.46 W
Power dissipation (P_D), device types 03 through 06:	
Hottest die (100% duty cycle)	500 mW
Total hybrid (standby)	450 mW
Total hybrid (100% duty cycle)	950 mW
Power dissipation (P_D), device types 07 through 10:	
Total hybrid (standby)	100 mW
Total hybrid (100% duty cycle)	2 W
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C
Junction temperature (T_J)	+135°C
Thermal resistance, junction-to-case (θ_{JC}):	
Device types 01 through 06	4°C/W (hottest die)
Device types 07 through 10	5°C/W
Thermal resistance, junction-to-air (θ_{CA})	20°C/W (still air)

1/ Stresses above the absolute maximum ratings may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

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1.4 Recommended operating conditions.

Supply voltage range (V_{CC}):

Device types 01, 02, 07, 08, 09, and 10	+4.75 V dc to +5.25 V dc
Device types 03, 04, 05, and 06	+4.5 V dc to +5.5 V dc
Logic input voltage range	0 V dc to +5.0 V dc
Receiver differential voltage	8.0 V _{P-P}
Driver peak output current	+700 mA
Maximum serial data rate	0 Hz to 1.0 MHz
Case operating temperature range (T _C).....	-55°C to +125°C

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-38534 - Hybrid Microcircuits, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.

MIL-STD-1835 - Interface Standard for 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://assist.dla.mil/quicksearch/> or 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 classes D, E, G, H, and K shall be in accordance with MIL-PRF-38534. Compliance with MIL-PRF-38534 shall 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. The manufacturer may eliminate, modify or optimize the tests and inspections herein, however the performance requirements as defined in MIL-PRF-38534 shall be met for the applicable device class. In addition, the modification in the QM plan shall not affect the form, fit, or function of the device 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 outlines. The case outlines shall be in accordance with 1.2.4 herein and figure 1.

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

3.2.3 Timing waveforms. The timing waveforms shall be as specified on figure 3.

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.

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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 devices. Marking of devices 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.

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 (DLA Land and Maritime -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 DLA Land and Maritime -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. VERIFICATION

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.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/ 2/ 3/</u> -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
RECEIVER							
Output low voltage	V _{OL}	I _{OL} = 4.0 mA	1,2,3	01,02		0.65	V
				03,04, 05,06		0.4	
				07,08, 09,10		0.5	
Output high voltage	V _{OH}	I _{OH} = -0.4 mA	1,2,3	01,02, 07,08, 09,10	2.5		V
				03,04, 05,06	2.7		
Differential input level	V _I		4,5,6	All		8	V _{P-P}
Input common-mode voltage	V _{ICM}	<u>4/</u>	4,5,6	All	-5	+5	V-pk
Differential input resistance	R _{IN}	1 MHz sine wave <u>4/</u>	4,5,6	01,02	2		kΩ
				03,04, 05,06	4		
				07,08, 09,10	20		
Input capacitance	C _{IN}	1 MHz sine wave <u>4/</u>	4,5,6	All		10	pF
Threshold voltage	V _{TH}	1 MHz sine wave <u>5/</u>	4,5,6	All	0.56	1.2	V
Receiver delay	t _{DR}	From input <u>zero</u> crossing to DATA or DATA, See figure 3	9,10,11	01,02		600	ns
				03,04, 05,06		450	
				07,08, 09,10		500	
RECEIVER STROBE							
Input low voltage	V _{SIL}		1,2,3	All		0.7	V
See footnotes at end of table.							
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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/ 2/ 3/</u> -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Device types	Limits		Unit		
					Min	Max			
RECEIVER STROBE- Continued.									
Input high voltage	V _{SIH}		1,2,3	All	2.0		V		
Input low current	I _{SIL}	V _{SIL} = 0.4 V	1,2,3	01,02	-1.1		mA		
				03-10	-0.4				
Input high current	I _{SIH}	V _{SIH} = 2.7 V	1,2,3	01,02, 07,08, 09,10		40	μA		
				03-06		20			
Strobe delay	t _{DS}	From strobe rising or falling edge to DATA or DATA, See figure 3	9,10,11	01,02		200	ns		
				03-06		40			
				07-10		100			
TRANSMITTER									
Input low voltage	V _{IL}		1,2,3	All		0.7	V		
Input high voltage	V _{IH}		1,2,3	All	2.0		V		
Input low current	I _{IL}	V _{IL} = 0.4 V	1,2,3	01,02	-1.1		mA		
				03-10	-0.4				
Input high current	I _{IH}	V _{IH} = 2.7 V	1,2,3	01,02, 07,08, 09,10		40	μA		
				03-06		20			
Differential output voltage	V _O	35Ω load	4,5,6	01,02, 07,08, 09,10	6	9	V _{P-P}		
				03-06	7	9			
		140Ω load		01,02, 07,08, 09,10	24	36			
				03-06	28	36			
See footnotes at end of table.									
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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/ 2/ 3/</u> -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
TRANSMITTER - Continued.							
Differential output noise	V _{ON}	Inhibited <u>4/</u>	4,5,6	All		10	mV _{P-P}
Differential output resistance	R _{OUT}	Transmitter off <u>4/</u>	4,5,6	01-06	10		kΩ
		<u>6/</u>		07-10	2		
Output impedance	R _{OUT}	When transmitting <u>4/</u>	4,5,6	05,06		10	Ω
		<u>7/</u>		09,10		40	
Output capacitance	C _{OUT}	1 MHz sine wave <u>4/</u>	4,5,6	01-06		15	pF
		<u>7/</u>		07-10		15	
Differential offset voltage	V _{OS}	35Ω load <u>8/</u>	4,5,6	All	-90	+90	mVpk
		140Ω load <u>8/</u>			-360	+360	
Waveform distortion	V _{wd}	35Ω load <u>9/</u>	4,5,6	01,02	-1	+1	V _{peak}
		35Ω load <u>10/</u>		03-10	-0.1	+0.1	
Rise time	t _r	35Ω load, see figure 3	9,10,11	01-04, 07,08	100	300	ns
Fall time	t _f	35Ω load, see figure 3		01-04, 07,08	100	300	
Rise time	t _r	10% to 90%, see figure 3		05,06	220	300	
Fall time	t _f	10% to 90%, see figure 3		09,10	200	300	
				05,06	220	300	
Driver delay	t _{DT}	TX DATA in to TX DATA out, see figure 3	9,10,11	09,10	200	300	ns
				01,02		450	
				03-06		150	
				07,08		250	
				09,10		400	
See footnotes at end of table.							
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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/</u> <u>2/</u> <u>3/</u> -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
TRANSMITTER - Continued.							
Output harmonic content (referenced to the average peal value at 1.0 MHz)		f = 1.5 MHz <u>3/</u>	9,10,11	05,06, 09,10		-3	dB
		f = 2.5 MHz <u>3/</u>				-13.5	
		f = 4.0 MHz <u>3/</u>				-25.5	
TRANSMITTER INHIBIT							
Input low voltage	V _{IIL}		1,2,3	All		0.7	V
Input high voltage	V _{IIH}				2.0		
Input low current	I _{IIL}	V _{IIL} = 0.4 V		01,02	-1.1		mA
				03-10	-0.4		
Input high current	I _{IIH}	V _{IIH} = 2.7 V	01,02, 07-10		40	μA	
				03-06			20
Inhibit delay	t _{DI-H}	Inhibited output, see figure 3	9,10,11	01,02, 07-10		450	ns
				03-06		150	
	t _{DI-L}	Active output, see figure 3		01,02		250	
				03-06		150	
				07-10		450	
POWER SUPPLY							
Supply current	I _{CC1}	Standby, data applied, inhibit high	1,2,3	01,02		55	mA
				03-06		45	
				07-10		30	
See footnotes at end of table.							
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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/</u> <u>2/</u> <u>3/</u> -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
POWER SUPPLY - Continued.							
Supply current	I _{CC2}	25% duty cycle at 1 MHz <u>11/</u>	4,5,6	01,02		300	mA
				03-10		195	
	I _{CC3}	50% duty cycle at 1 MHz <u>11/</u>		01,02		500	
				03-06		325	
				07-10		345	
				I _{CC4}	100% duty cycle at 500 kHz	01,02	
	03-06					625	
	07-10					750	
	I _{CC5}	100% duty cycle at 1 MHz <u>11/</u>		01,02		800	
		80% duty cycle at 1 MHz		03-06		600	
75% duty cycle at 1 MHz							

1/ V_{CC} = +5.0 V dc ±0.1 V dc, unless otherwise specified.

2/ All specifications and limits are for a single channel with no connections made to the other channel.

3/ Device types 03, 04, 05, 06, 07, 08, 09, and 10 are fully compliant to MIL-STD-1553 electrical specification.

4/ Parameter 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.

5/ Threshold determined by first missing word of a 33 word transmission to a 15530 CMOS Manchester encoder-decoder.

6/ When measured from 75 kHz to 1 MHz at transformer secondary with transformer self impedance of 3 kohms minimum, power on/off.

7/ When measured from 75 kHz to 1 MHz at transformer secondary.

8/ Offset is measured 2.5 μs after the mid-bit zero crossing of the last parity bit of a 660 μs transmission.

9/ This parameter exceeds the limits as indicated in MIL-STD-1553 for device types 01 and 02.

10/ The limits for device types 03, 04, 05, 06, 07, 08, 09, and 10 fully complies to MIL-STD-1553.

11/ For device types 07, 08, 09, and 10 the maximum supply currents are with respect to a 2.5:1 transformer. Frequency equals 1 MHz.

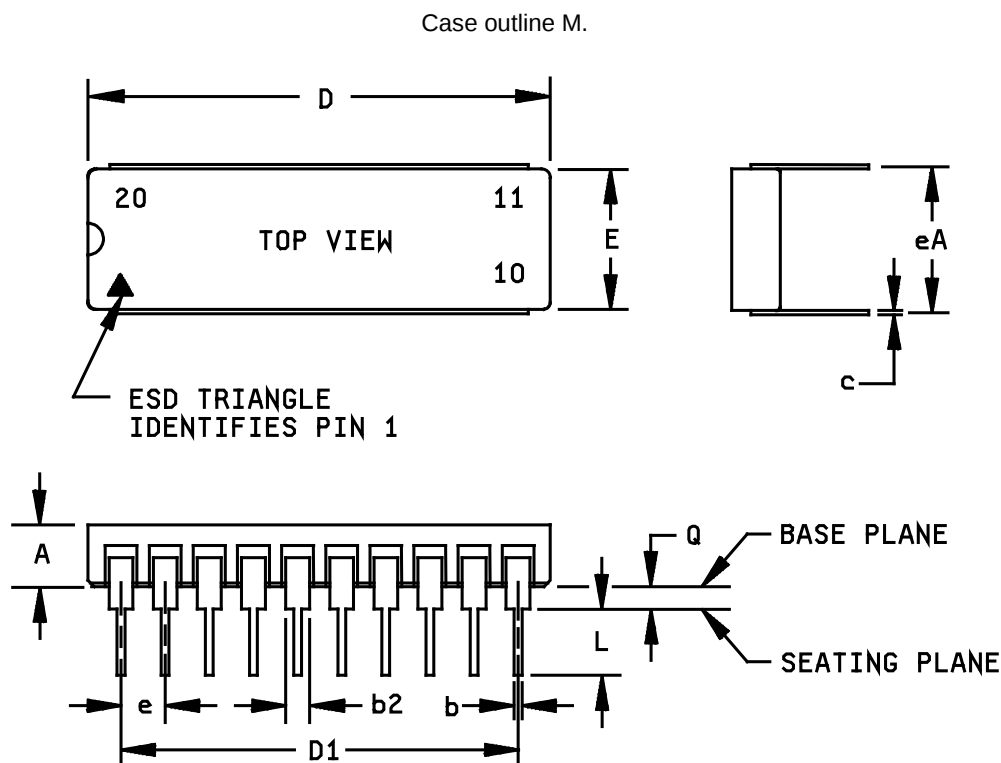
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Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.49	3.10	.098	.122
b	0.41	0.51	.016	.020
b2	1.27 TYP		.050 TYP	
c	0.20	0.30	.008	.012
D	25.15	25.65	.990	1.010
D1	22.61	23.11	.890	.910
e	2.54 BSC		.100 BSC	
E	7.29	7.70	.287	.303
eA	7.37	7.87	.290	.310
L	3.81		.150	
Q	0.64	1.14	.025	.045

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 are for reference only.

FIGURE 1. Case outlines.

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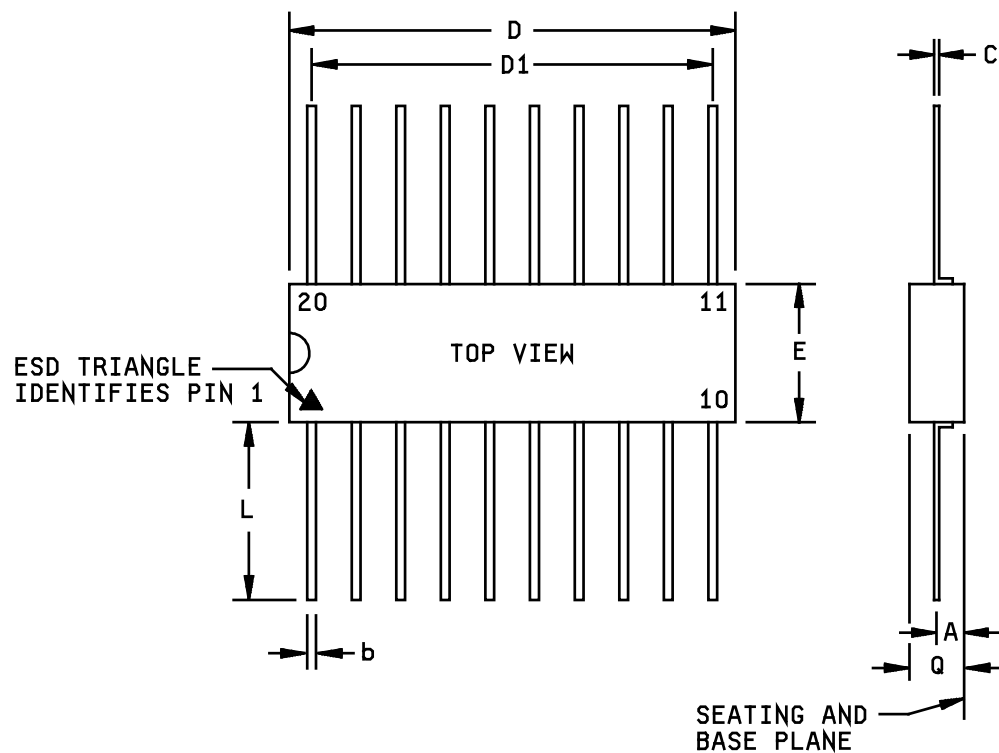
SIZE
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Case outline N.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.27	1.78	.050	.070
b	0.41	0.51	.016	.020
c	0.20	0.30	.008	.012
D	25.15	25.65	.990	1.010
D1	22.61	23.11	.890	.910
E	7.37	7.87	.290	.310
L	10.16		.400	
Q	2.49	3.43	.098	.135

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 are for reference only.

FIGURE 1. Case outlines - Continued.

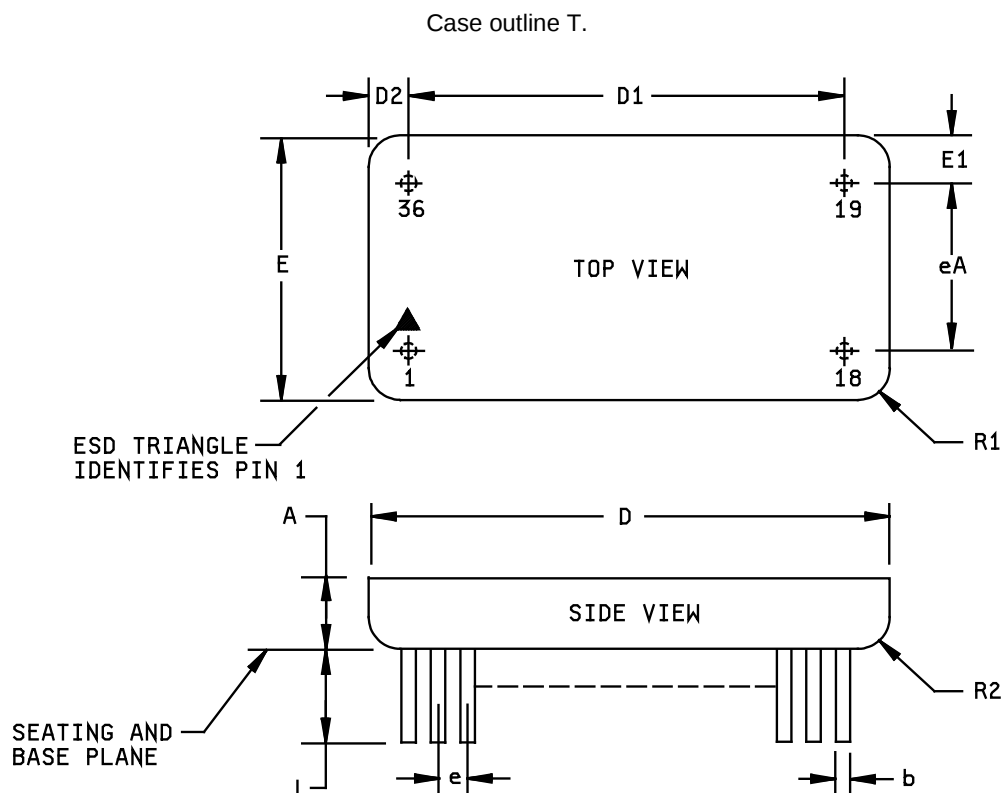
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Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	4.45	4.95	.175	.195
b	0.41	0.51	.016	.020
D	48.01	48.51	1.890	1.910
D1	43.05	43.31	1.695	1.705
D2	2.29	2.79	.090	.110
E	19.56	20.07	.770	.790
E1	2.03	2.54	.080	.100
e	2.54 BSC		.100 BSC	
eA	14.99	15.49	.590	.610
L	6.35		.250	
R1	2.18 TYP		.086 TYP	
R2	1.40 TYP		.055 TYP	

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 are for reference only.

FIGURE 1. Case outlines - Continued.

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

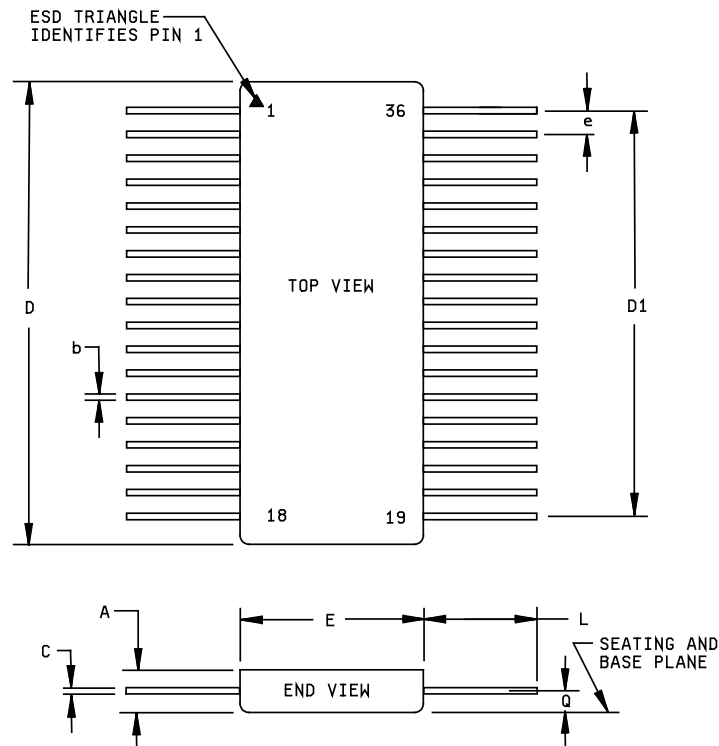
SIZE
A

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K

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Case outline U.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.81	4.32	.150	.170
b	0.30	0.51	.012	.020
c	0.20	0.30	.008	.012
D	48.01	48.51	1.890	1.910
D1	48.05	43.31	1.695	1.705
e	2.54 BSC		.100 BSC	
E	19.56	20.07	.770	.790
L	10.16		.400	
Q	1.78	2.29	.070	.090

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 are for reference only.

FIGURE 1. Case outlines - Continued.

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Case outline X.

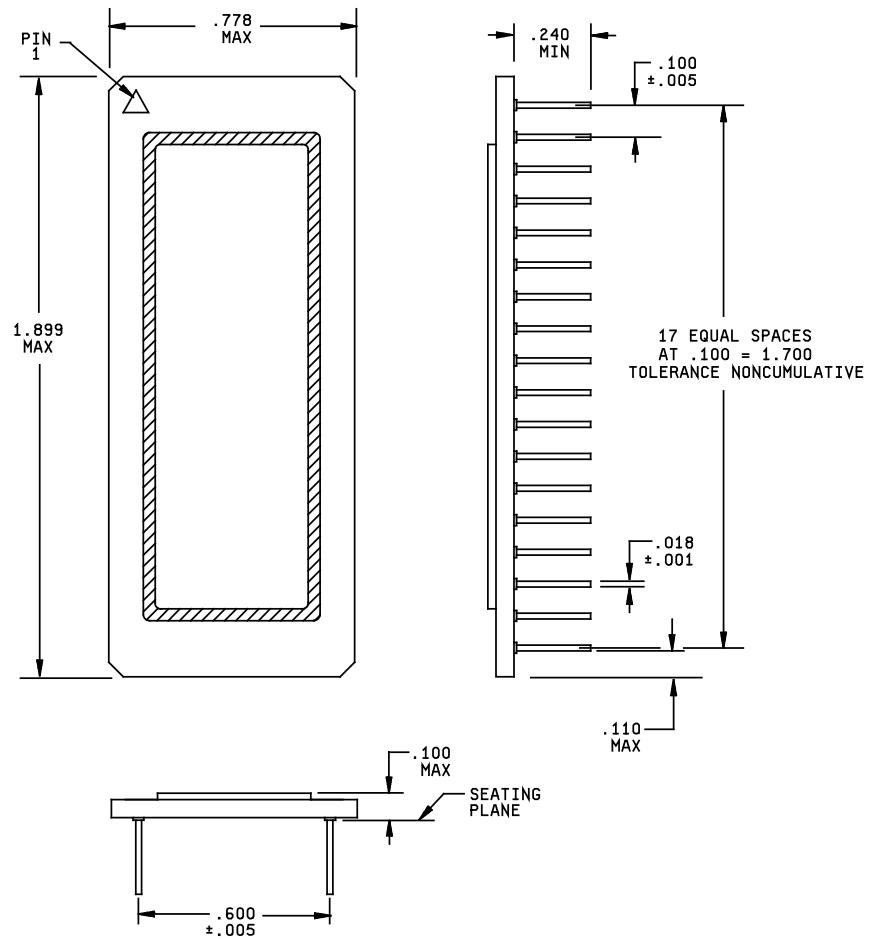


FIGURE 1. Case outlines - Continued.

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MICROCIRCUIT DRAWING**
DLA LAND AND MARITIME
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Case outline Y.

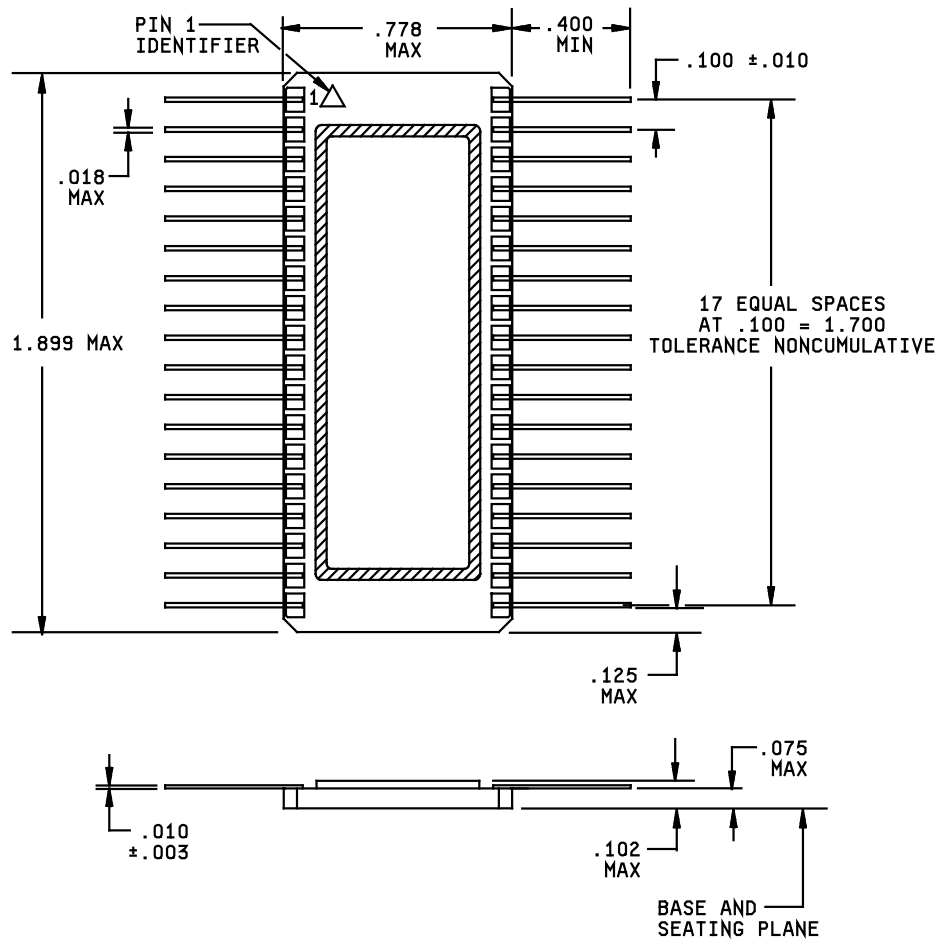


FIGURE 1. Case outlines - Continued.

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Technical drawing of a 16-pin connector showing top and side views with dimensions.

Top View Dimensions:

- Overall width: .808 MAX
- Pin pitch (center-to-center): .018 MAX
- Distance from left edge to Pin 1: .596 MAX
- Distance from Pin 1 to right edge: .400 MIN
- Distance from right edge of pins to right edge of housing: .050 ± .005
- Distance from center of housing to right edge of pins: .140 MAX
- Number of pins: 11 EQUAL SPACES AT .050 = .550 NONCUMULATIVE TOLERANCE

Side View Dimensions:

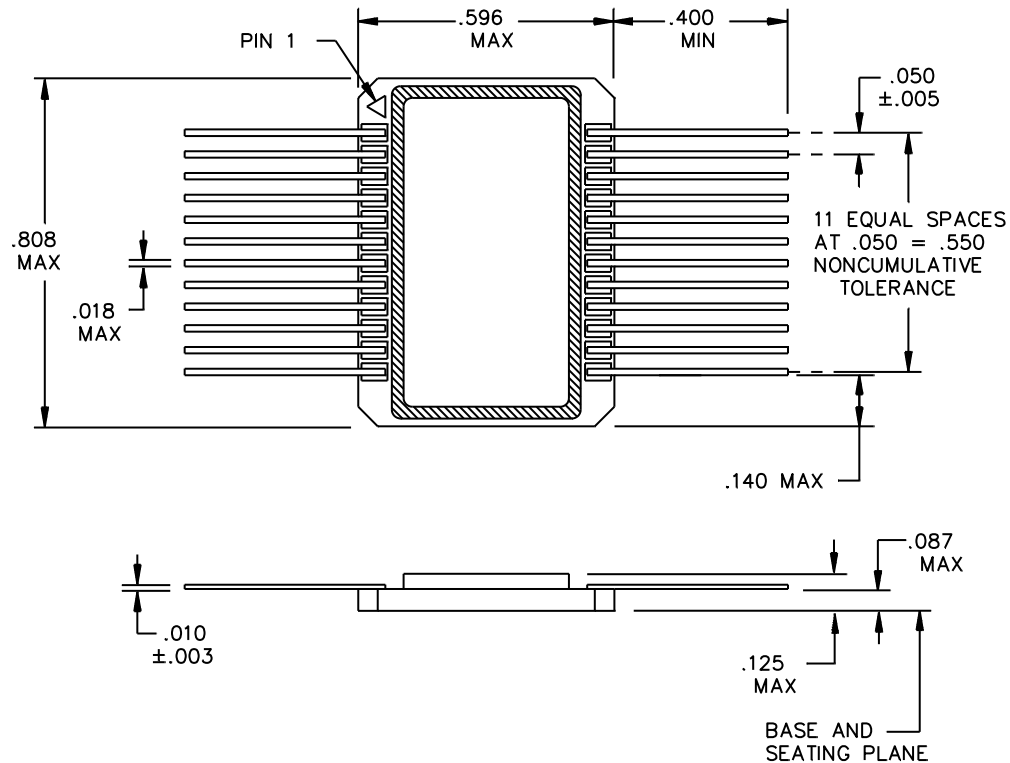
- Pin height: .056 MAX
- Distance from base to top of pin: .125 MAX
- Distance from base to top of housing: .010 ± .003
- Base and Seating Plane

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Case outline 6.



Inches	mm	Inches	mm	Inches	mm
.001	0.03	.075	1.91	.400	10.16
.003	0.08	.087	2.21	.550	13.97
.005	0.13	.100	2.54	.596	15.14
.010	0.25	.102	2.59	.600	15.24
.018	0.46	.110	2.79	.778	19.76
.050	1.27	.125	3.18	.808	20.53
.056	1.42	.140	3.56	1.700	43.18
		.240	6.10	1.899	48.23

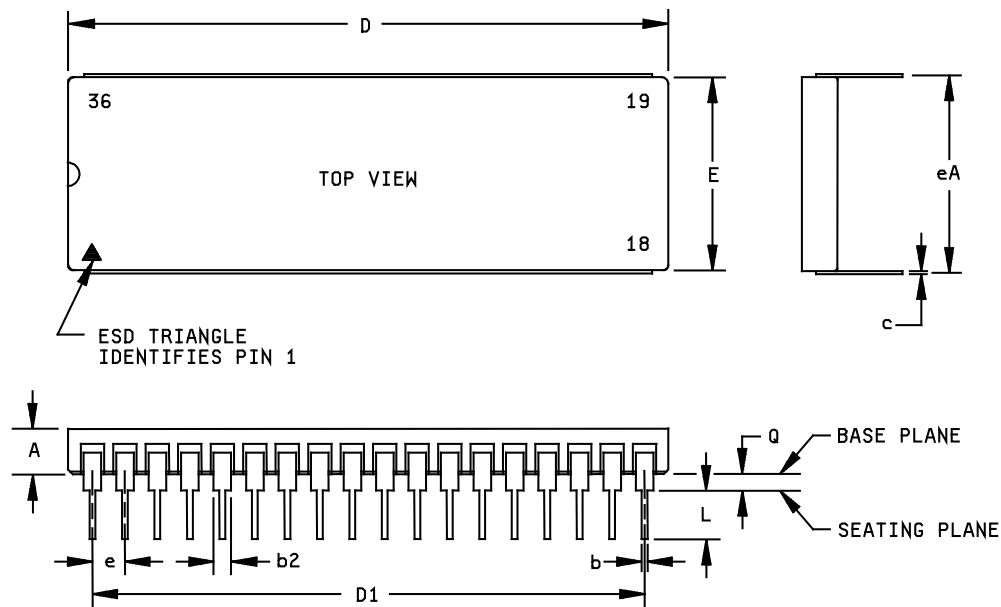
NOTES:

1. Dimensions are in inches.
2. Metric equivalents are for general information only.
3. Unless otherwise specified, tolerance for three place decimals shall be ± 0.005 (0.013 mm).
4. Case outline X, leads are bottom brazed to the package.
5. Case outlines Y, Z and 6 may be supplied with a ceramic tiebar beyond the .400 inches (10.16 mm) lead dimension, to hold leads in place. Finished lead length visual acceptance criteria for solder dip apply to the leads up to .400 inches (10.16 mm). The lead spacing measured shall be no less than .400 inches (10.16 mm) from edge of package.

FIGURE 1. Case outlines - Continued.

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Case outline 4.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		3.56		.140
b	0.41	0.51	.016	.020
b2	1.23	1.32	.048	.052
c	0.20	0.30	.008	.012
D	46.61	47.37	1.835	1.865
D1		43.18		1.700
e	2.54 BSC		.100 BSC	
E	14.78	15.19	.582	.598
eA	14.99	15.49	.590	.610
L	3.81		.150	
Q	1.02	1.52	.040	.060

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 are for reference only.

FIGURE 1. Case outlines - Continued.

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DLA LAND AND MARITIME
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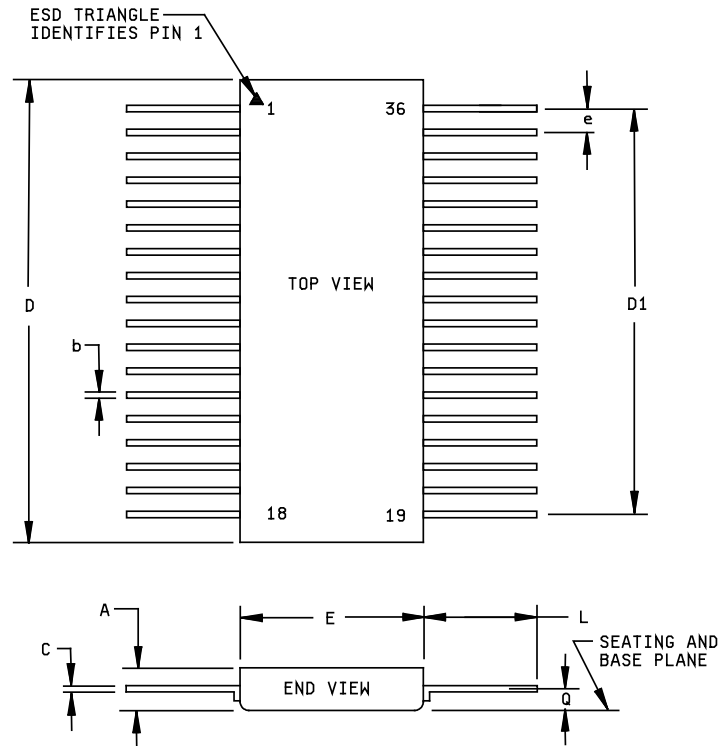
SIZE
A

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Case outline 5.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.74	3.35	.108	.132
b	0.41	0.51	.016	.020
c	0.20	0.30	.008	.012
D	46.61	47.37	1.835	1.865
D1		43.18		1.700
e	2.54 BSC		.100 BSC	
E	14.99	15.49	.590	.610
L	12.70		.500	
Q	1.78	2.29	.070	.090

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 are for reference only.

FIGURE 1. Case outlines - Continued.

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DLA LAND AND MARITIME
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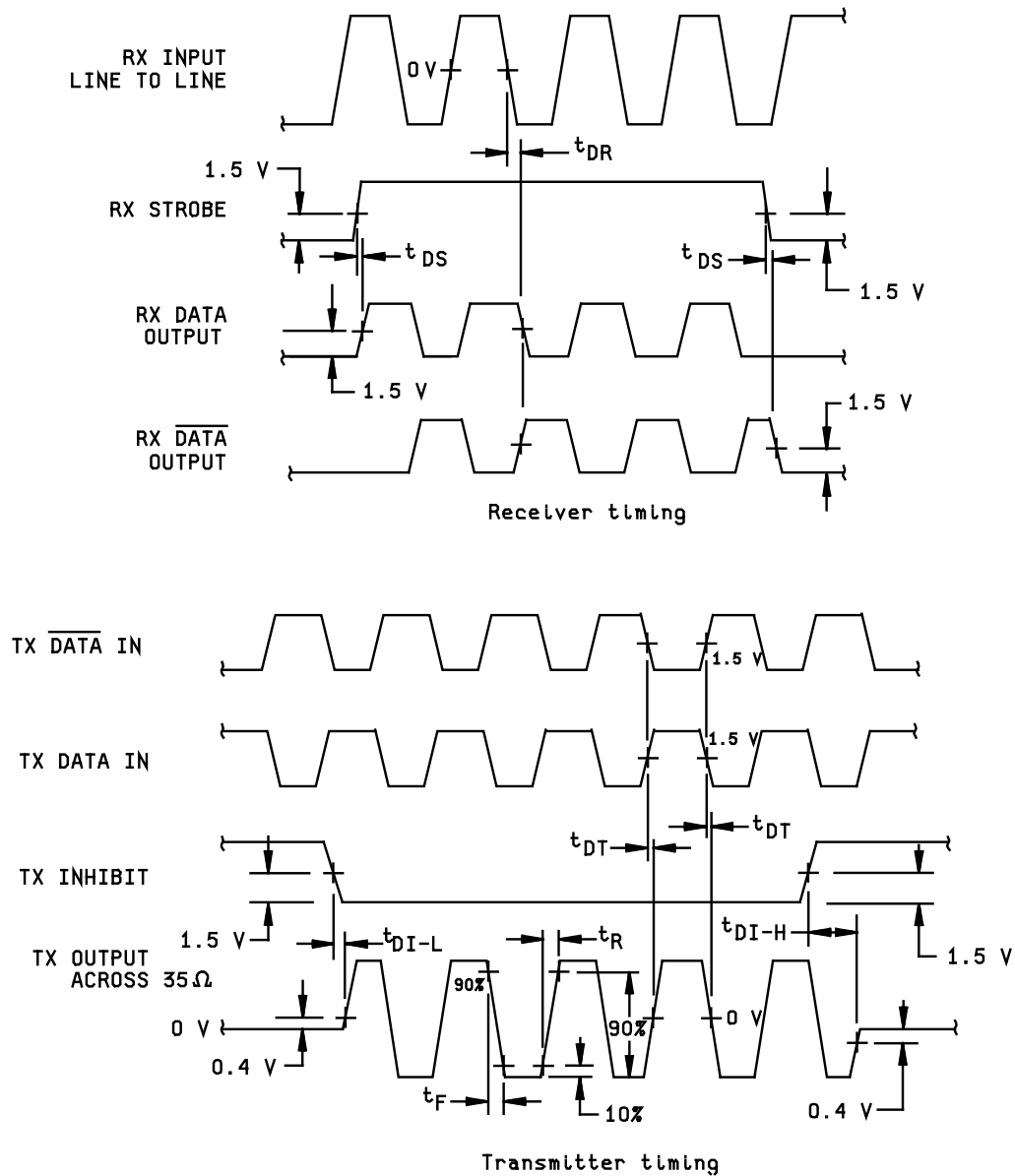
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Device types	03 through 06		All		01 through 10	
Case outlines	M and N		X and Y (Device types 01 and 02). U, T, 4, and 5 (Device types 03 through 06).		Z	
Terminal number	Terminal symbol	Channel	Terminal Symbol	Channel	Terminal symbol	Channel
1	+5 V dc (V _{cc})	A	TX <u>DATA</u> out	One	TX <u>DATA</u> out/RX <u>DATA</u> in	One
2	BUS_A	A	TX DATA out	One	TX DATA out/RX DATA in	One
3	BUS_A_L	A	GND	One	GND	One
4	RXENA_A	A	NC		RX DATA out	One
5	GND_A	A	RX DATA out	One	Strobe	One
6	+5 V dc (V _{cc})	B	Strobe	One	RX DATA out	One
7	BUS_B	B	GND	One	TX <u>DATA</u> out/RX <u>DATA</u> in	Two
8	BUS_B_L	B	RX DATA out	One	TX DATA out/RX DATA in	Two
9	RXENA_B	B	GND (case)	One	GND	Two
10	GND_B	B	TX <u>DATA</u> out	Two	RX DATA out	Two
11	RXB_L	B	TX DATA out	Two	Strobe	Two
12	RXB	B	GND	Two	RX DATA out	Two
13	TXINH_B	B	NC		GND	Two
14	TX_B	B	RX DATA out	Two	+5 V dc (V _{cc})	Two
15	TXB_L	B	Strobe	Two	GND	Two
16	RXA_L	A	GND	Two	Inhibit	Two
17	RXA	A	RX DATA out	Two	TX <u>DATA</u> in	Two
18	TXINH_A	A	NC		TX DATA in	Two
19	TXA	A	NC		GND	One
20	TXA_L	A	RX <u>DATA</u> in	Two	+5 V dc (V _{cc})	One
21	---	---	RX DATA in	Two	GND	One
22	---	---	GND	Two	Inhibit	One
23	---	---	NC		TX <u>DATA</u> in	One
24	---	---	+5 V dc (V _{cc})	Two	TX DATA in	One
25	---	---	Inhibit	Two	---	---
26	---	---	TX <u>DATA</u> in	Two	---	---
27	---	---	TX DATA in	Two	---	---
28	---	---	NC		---	---
29	---	---	RX <u>DATA</u> in	One	---	---
30	---	---	RX DATA in	One	---	---
31	---	---	GND	One	---	---
32	---	---	NC		---	---
33	---	---	+5 V dc (V _{cc})	One	---	---
34	---	---	Inhibit	One	---	---
35	---	---	TX <u>DATA</u> in	One	---	---
36	---	---	TX DATA in	One	---	---

FIGURE 2. Terminal connections.

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Device types 01, 03, and 07.

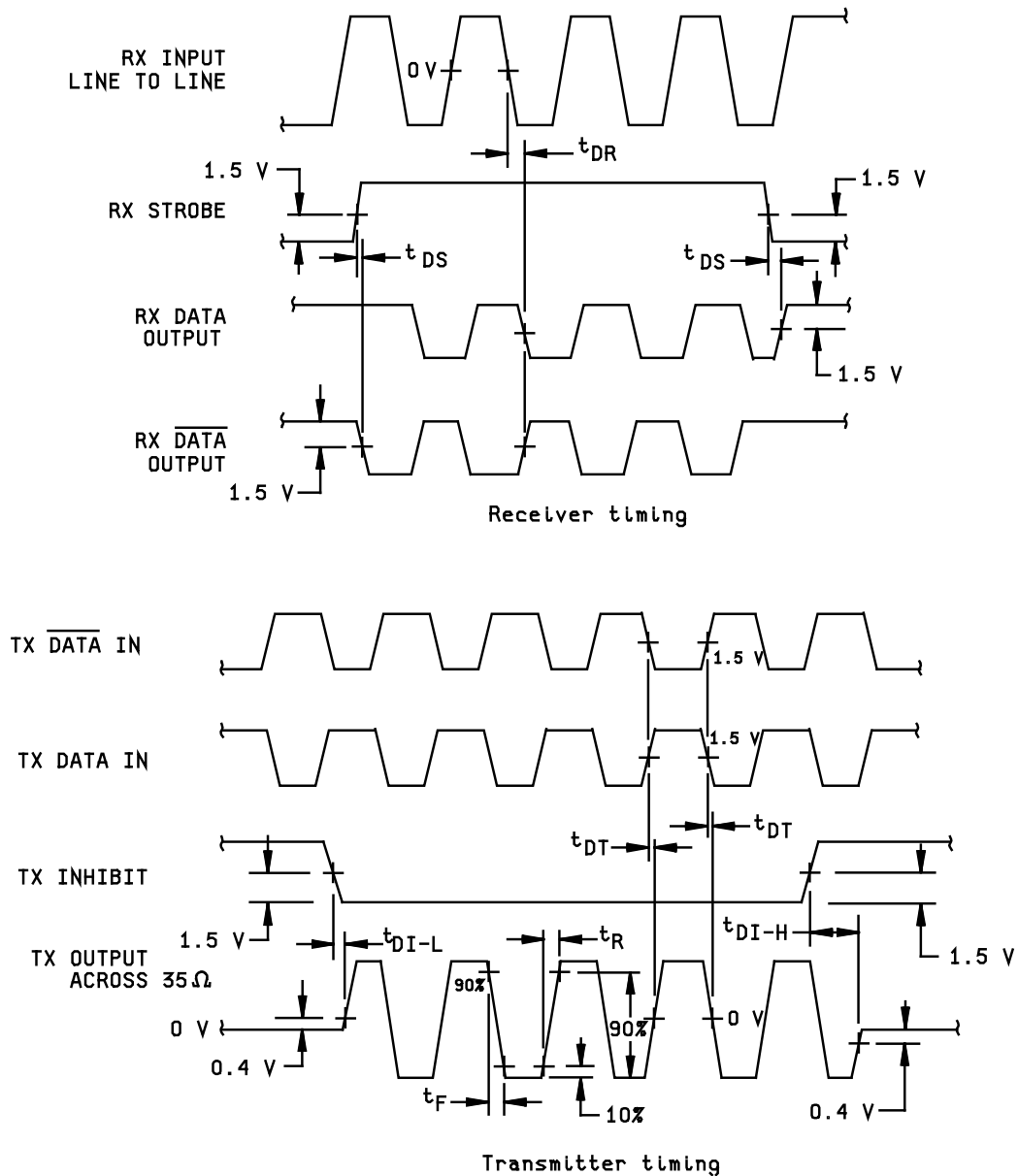


NOTE: Both inputs "TX DATA in" and "TX DATA in" must be in the same logic states during off times.

FIGURE 3. Timing waveforms.

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Device types 02, 04, and 08.



NOTE: Both inputs "TX DATA in" and "TX DATA in" must be in the same logic states during off times.

FIGURE 3. Timing waveforms - Continued.

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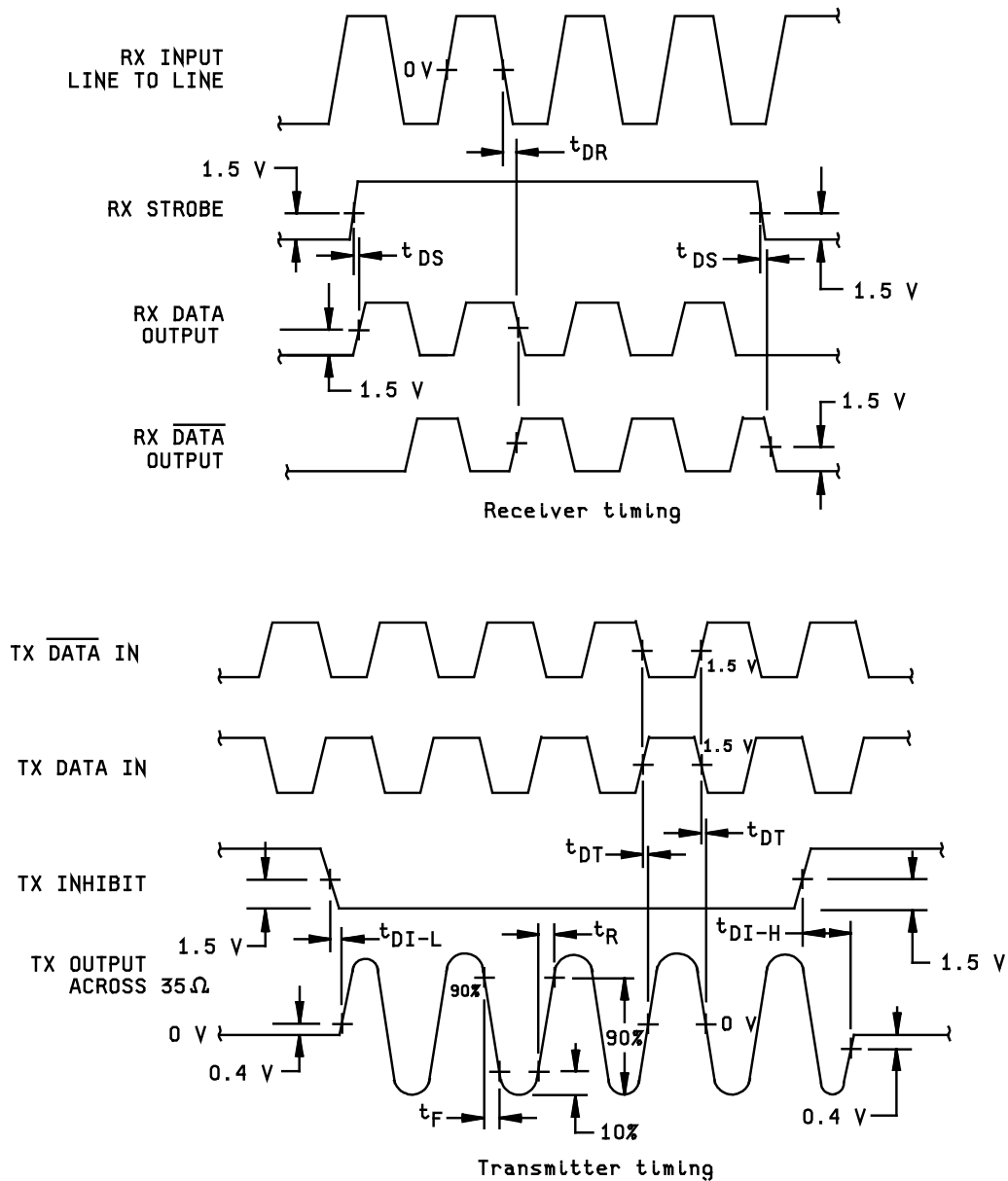
SIZE
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Device types 05 and 09.

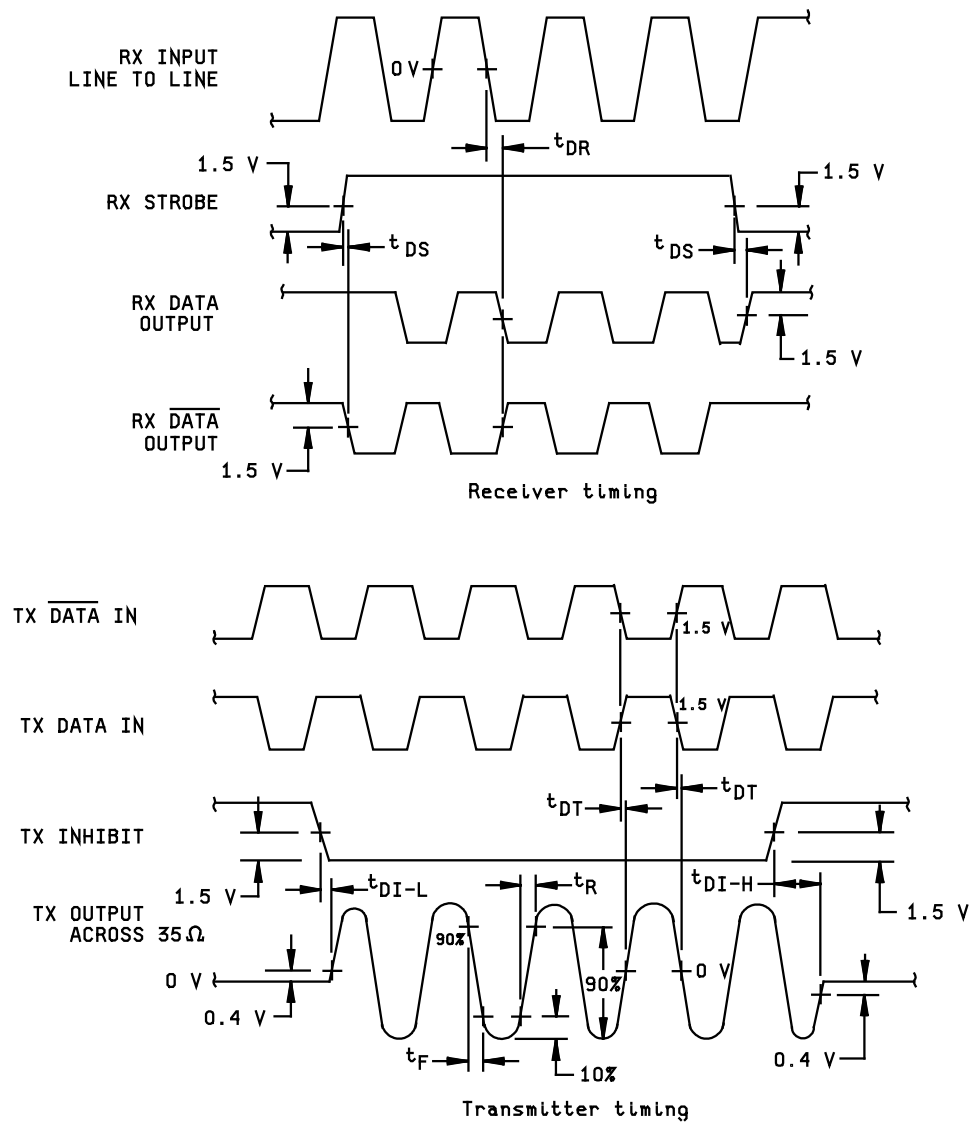


NOTE: Both inputs "TX DATA in" and "TX DATA in" must be in the same logic states during off times.

FIGURE 3. Timing waveforms - Continued.

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Device types 06 and 10.



NOTE: Both inputs "TX DATA in" and "TX DATA in" must be in the same logic states during off times.

FIGURE 3. Timing waveforms - Continued.

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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	3, 6, 11
Final electrical parameters	1*,2,3,4,5,6,9,10,11
Group A test requirements	1,2,3,4,5,6,9,10,11
Group C end-point electrical parameters	1,2,3
End-point electrical parameters for Radiation Hardness Assurance (RHA) devices	Not applicable

* PDA applies to subgroup 1.

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 DLA Land and Maritime -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 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.

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 7 and 8 shall be omitted.

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

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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 DLA Land and Maritime -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 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.

4.3.5 Radiation Hardness Assurance (RHA) inspection. RHA inspection is not currently applicable to this drawing.

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 as specified in MIL-PRF-38534.

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 microelectronic 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) 692-1081.

6.6 Sources of supply. Sources of supply are listed in MIL-HDBK-103 and QML-38534. The vendors listed in MIL-HDBK-103 and QML-38534 have submitted a certificate of compliance (see 3.7 herein) to DLA Land and Maritime-VA and have agreed to this drawing.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 13-01-22

Approved sources of supply for SMD 5962-92061 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38534 during the next revisions. MIL-HDBK-103 and 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 DLA Land and Maritime -VA. This information bulletin is superseded by the next dated revisions of MIL-HDBK-103 and QML-38534. DLA Land and Maritime maintains an online database of all current sources of supply at <http://www.landandmaritime.dla.mil/Programs/Smcr/>.

Standard microcircuit drawing PIN <u>1</u> /	Vendor CAGE number	Vendor similar PIN <u>2</u> /
5962-9206101HXA 5962-9206101HYA 5962-9206101HZA 5962-9206102HXA 5962-9206102HYA 5962-9206102HZA	<u>3</u> / <u>3</u> / <u>3</u> / <u>3</u> / <u>3</u> / <u>3</u> /	MR63147MPS MR63147MFS MR63147MFM MR63147MPS-2 MR63147MFS-2 MR63147MFM-2
5962-9206103HMA 5962-9206103HMC 5962-9206103HNA 5962-9206103HNC 5962-9206103HTA 5962-9206103HTC 5962-9206103HUA 5962-9206103HUC 5962-9206103HZA 5962-9206103HZC 5962-9206103H4A 5962-9206103H4C 5962-9206103H5A 5962-9206103H5C 5962-9206103H6A 5962-9206103H6C	27851 27851 27851 27851 27851 27851 27851 27851 <u>3</u> / <u>3</u> / 27851 27851 27851 27851 27851 27851	NHI-1567/883 NHI-1567/883 NHI-1567FP/883 NHI-1567FP/883 NHI-1559/883 NHI-1559/883 NHI-1559FP/883 NHI-1559FP/883 NHI-1573FP/883 NHI-1573FP/883 NHI-1579/883 NHI-1579/883 NHI-1579FP/883 NHI-1579FP/883 NHI-1573FP/883 NHI-1573FP/883
5962-9206104HMA 5962-9206104HMC 5962-9206104HNA 5962-9206104HNC 5962-9206104HTA 5962-9206104HTC 5962-9206104HUA 5962-9206104HUC 5962-9206104HZA 5962-9206104HZC 5962-9206104H4A 5962-9206104H4C 5962-9206104H5A 5962-9206104H5C 5962-9206104H6A 5962-9206104H6C	27851 27851 27851 27851 27851 27851 27851 27851 <u>3</u> / <u>3</u> / 27851 27851 27851 27851 27851 27851	NHI-1568/883 NHI-1568/883 NHI-1568FP/883 NHI-1568FP/883 NHI-1560/883 NHI-1560/883 NHI-1560FP/883 NHI-1560FP/883 NHI-1574FP/883 NHI-1574FP/883 NHI-1580/883 NHI-1580/883 NHI-1580FP/883 NHI-1580FP/883 NHI-1574FP/883 NHI-1574FP/883

STANDARD MICROCIRCUIT DRAWING BULLETIN - CONTINUED.

DATE: 13-01-22

Standard microcircuit drawing PIN <u>1</u> /	Vendor CAGE number	Vendor similar PIN <u>2</u> /
5962-9206105HMA	27851	NHI-1569/883
5962-9206105HMC	27851	NHI-1569/883
5962-9206105HNA	27851	NHI-1569FP/883
5962-9206105HNC	27851	NHI-1569FP/883
5962-9206105HTA	27851	NHI-1563/883
5962-9206105HTC	27851	NHI-1563/883
5962-9206105HUA	27851	NHI-1563FP/883
5962-9206105HUC	27851	NHI-1563FP/883
5962-9206105HZA	<u>3</u> /	NHI-1593FP/883
5962-9206105HZC	<u>3</u> /	NHI-1593FP/883
5962-9206105H4A	27851	NHI-1578/883
5962-9206105H4C	27851	NHI-1578/883
5962-9206105H5A	27851	NHI-1578FP/883
5962-9206105H5C	27851	NHI-1578FP/883
5962-9206105H6A	27851	NHI-1593FP/883
5962-9206105H6C	27851	NHI-1593FP/883
5962-9206106HMA	27851	NHI-1570/883
5962-9206106HMC	27851	NHI-1570/883
5962-9206106HNA	27851	NHI-1570FP/883
5962-9206106HNC	27851	NHI-1570FP/883
5962-9206106HTA	27851	NHI-1577/883
5962-9206106HTC	27851	NHI-1577/883
5962-9206106HUA	27851	NHI-1577FP/883
5962-9206106HUC	27851	NHI-1577FP/883
5962-9206106HZA	<u>3</u> /	NHI-1594FP/883
5962-9206106HZC	<u>3</u> /	NHI-1594FP/883
5962-9206106H4A	27851	NHI-1581/883
5962-9206106H4C	27851	NHI-1581/883
5962-9206106H5A	27851	NHI-1581FP/883
5962-9206106H5C	27851	NHI-1581FP/883
5962-9206106H6A	27851	NHI-1594FP/883
5962-9206106H6C	27851	NHI-1594FP/883
5962-9206107HZA	88379	ACT4458-201-2
5962-9206107HZC	88379	ACT4458-201-1
5962-9206108HZA	88379	ACT4464-201-2
5962-9206108HZC	88379	ACT4464-201-1
5962-9206109HZA	88379	ACT4460-201-2
5962-9206109HZC	88379	ACT4460-201-1
5962-9206110HZA	88379	ACT4454-201-2
5962-9206110HZC	88379	ACT4454-201-1

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.

3/ Not available from an approved source.

STANDARD MICROCIRCUIT DRAWING BULLETIN - CONTINUED.

DATE: 13-01-22

<u>Vendor CAGE number</u>	<u>Vendor name and address</u>
27851	Spectrum Microwave, Incorporated Division API Technologies RF Solutions-Spectrum Microwave 400 Nickerson Road Marlborough, MA 01752
88379	Aeroflex Plainview Incorporated, (Aeroflex Microelectronic Solutions) 35 South Service Road Plainview, NY 11803-4193

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