The documentation and process conversion measures necessary to comply with this document shall be completed by 21 September 2023.

INCH-POUND
MIL-PRF-19500/779
w/AMENDMENT 2
21 September 2023
MIL-PRF-19500/779
w/AMENDMENT 1
7 December 2021

PERFORMANCE SPECIFICATION SHEET

TRANSISTOR, PNP, SILICON, SWITCHING,
TYPES 2N3906A, JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-19500.

1. SCOPE

1.1 Scope. This specification covers the performance requirements for PNP, silicon, switching transistors. Four levels of product assurance (JAN, JANTX, JANTXV, and JANS) are provided for each encapsulated device type as specified in MIL-PRF-19500, and two levels of product assurance (JANHC and JANKC) are provided for each unencapsulated device type. RHA level designators "E", "K", "U", "M", "D", "P", "L", "R", "F", "G" and "H" are appended to the device prefix to identify devices, which have passed RHA requirements.

1.2 Package outlines and die topography. The device packages for the encapsulated device types are as follows: TO-206AA (formerly TO-18) in accordance with figure 1. (UB, UBC, UBN, and UBCN) in accordance with figure 2. The dimensions and topography for JANHC and JANKC unencapsulated die is as follows: The A version die in accordance with figure 3. The B version die in accordance with figure 4.

1.3 Maximum ratings. Unless otherwise specified T_A = +25°C.

Types	I_C	V_{CBO}	V_{CEO}	V_{EBO}	T_J and T_{STG}
	mA dc	V dc	V dc	V dc	°C
All devices	200	40	40	5	-65 to +200

Types	P_T T_A = +25°C (1) (2)	P_T T_C = +25°C (1) (2)	P_T $T_{SP(IS)}$ = +25°C (1) (2)	$R_{\theta JA}$ (2) (3)	$R_{\theta JC}$ (2) (3)	$R_{\theta JSP(IS)}$ (2) (3)
	W	W	W	°C/W	°C/W	°C/W
2N3906A	0.50	1	N/A	325	150	N/A
2N3906AUB, UBC, UBN, and UBCN	0.50	N/A	1	254	N/A	85

(1) For derating, see figure 5, figure 6, and figure 7.
(2) See 3.3 for abbreviations.
(3) For thermal impedance curves, see figure 8, figure 9, and figure 10.

Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, ATTN: VAC, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to Semiconductor@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

AMSC N/A
FSC 5961
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1.4 Primary electrical characteristics. Unless otherwise specified, T_A = +25°C.

Limits	h_{FE} at V_{CE} = 1.0 V dc				
	h_{FE1} (1) I_C = 0. 1 mA dc	h_{FE2} (1) I_C = 1.0 mA dc	h_{FE3} (1) I_C = 10 mA dc	h_{FE4} (1) I_C = 50 mA dc	h_{FE5} (1) I_C = 100 mA dc
	2N3906A	2N3906A	2N3906A	2N3906A	2N3906A
Min	60	80	100	60	30
Max			300		

Types	Limit	/h_{fe}/ f = 100 MHz V_{CE} = 20 V dc I_C = 10 mA dc	C_{obo} (pf) f = 1 MHz V_{CB} = 5.0 V dc I_E = 0	C_{ibo} (pf) f = 1 MHz V_{BE} = 0.5 V dc I_C = 0	Switching (figure 11-12)			
					t_d (ns)	t_r (ns)	t_s (ns)	t_f (ns)
					V_{CC} = 3.0 V dc $V_{BE(OFF)}$ = 0.5 V dc I_C = 10 mA dc I_{B1} = 1.0 mA dc		V_{CC} = 3.0 V dc I_C = 10 mA dc I_{B1} = I_{B2} = 1.0 mA dc	
2N3906A	Min	2.5						
	Max		4.5	10.0	35	35	225	75

Types	Limit	$V_{CE(sat)1}$ (1) I_C = 10 mA dc I_B = 1 mA dc	$V_{CE(sat)2}$ (1) I_C = 50 mA dc I_B = 5 mA dc	$V_{BE(sat)1}$ (1) I_C = 10 mA dc I_B = 1 mA dc	$V_{BE(sat)2}$ (1) I_C = 50 mA dc I_B = 5 mA dc
		V dc	V dc	V dc	V dc
2N3906A	Min			0.65	
	Max	0.25	0.40	0.85	0.95

(1) Pulsed see 4.5.1.

1.5 Part or Identifying Number (PIN). The PIN is in accordance with MIL-PRF-19500, and as specified herein. See 6.6 for PIN construction example and 6.7 for a list of available PINs.

1.5.1 JAN certification mark and quality level.

1.5.1.1 Quality level designators for encapsulated devices. The quality level designators for encapsulated devices that are applicable for this specification sheet from the lowest to the highest level are as follows: "JAN", "JANTX", "JANTXV", and "JANS".

1.5.1.2 Quality level designators for unencapsulated devices (die). The quality level designators for unencapsulated devices (die) that are applicable for this specification sheet from the lowest to the highest level are as follows: "JANHC" and "JANKC".

1.5.2 Radiation hardness assurance (RHA) designator. The RHA levels that are applicable for this specification sheet from lowest to highest are as follows: "E", "K", "U", "M", "D", "P", "L", "R", "F", "G", and "H").

1.5.3 Device type. The designation system for the device types of transistors covered by this specification sheet are as follows.

1.5.3.1 First number and first letter symbols. The transistors of this specification sheet use the first number and letter symbols "2N".

1.5.3.2 Second number symbols. The second number symbols for the transistors covered by this specification sheet are as follows: "3906".

1.5.4 Suffix symbols. The following suffix letters are incorporated in the PIN in the order listed in the table as applicable:

A	Indicates a modified version of the non-suffix device, in a TO-206AA package. (see figure 1)
L	Indicates a longer leaded version of the non L suffix device. (see figure 1)
UB	Indicates a 4 pad surface mount package. The metal lid is connected to pad 4 (see figure 2)
UBN	Indicates a 4 pad surface mount package. Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Isolated lid with three pads only. (see figure 2).
UBC	Indicates a 4 pad surface mount package. (ceramic lid) only: Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Connected to the lid braze ring. (see figure 2)
UBCN	Indicates a 4 pad surface mount package. (ceramic lid) only: Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Isolated lid with three pads only. (see figure 2)

1.5.5 Lead finish. The lead finishes applicable to this specification sheet are listed on QML 19500.

1.5.6 Die identifiers for unencapsulated devices (manufacturers and critical interface identifiers). The manufacturer die identifiers that are applicable for this specification sheet are "A" and “B”.

* 1.6 Radiation features. The following radiation features are applicable for RHA devices supplied to this specification sheet.

* 1.6.1 Maximum total ionizing dose (TID). The maximum TID that RHA devices were tested to in accordance with condition A (dose rate = 50 to 300 rad(Si)/s) of method 1019 of MIL-STD-750 are as follows:

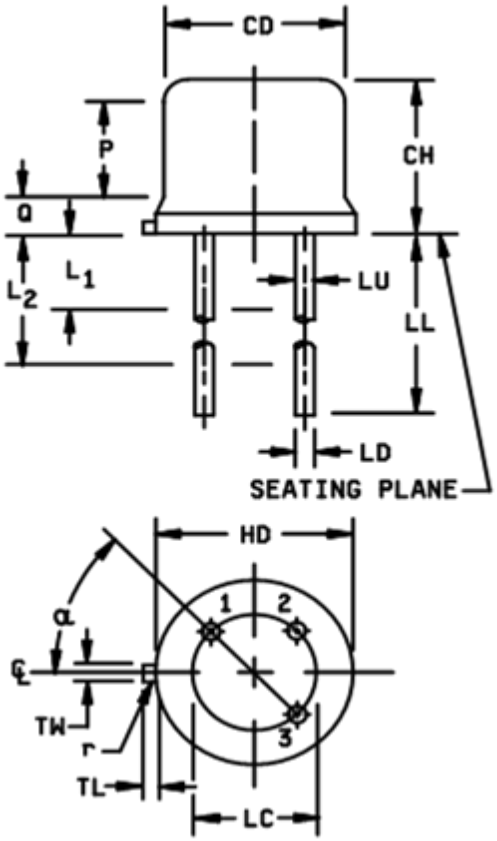
For device type 2N3906A, 2N3906AUB, UBC, UBN, and UBCN:..... 100 krads(Si) 1/

* 1.6.2 Maximum total ionizing dose (TID). The maximum TID that RHA devices were tested to in accordance with condition D (dose rate ≤ 10 mrad(Si)/s) of method 1019 of MIL-STD-750 are as follows:

For device type 2N3906A, 2N3906AUB, UBC, UBN, and UBCN:..... 100 krads(Si) 2/

* 1/ The manufacturers supplying these device types have performed characterization testing in accordance with condition A (dose rate = 50 to 300 rad(Si)/s) of method 1019 of MIL-STD-750. The radiation end point limits are guaranteed only to a maximum TID level of 300 krads(Si).
* 2/ The manufacturers supplying these device types have performed characterization testing in accordance with condition D (dose rate ≤ 10 mrad(Si)/s) of method 1019 of MIL-STD-750. The radiation end point limits are guaranteed only to a maximum TID level of 100 krads(Si).

Symbol	Dimensions				Note
	in	in	mm	mm	
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	
LC	.100	TP	2.54	TP	6
LD	.016	.021	0.41	0.53	7,8
* LL	.500	.750	12.70	19.05	7,8, 12
LU	.016	.019	0.41	0.48	7,8
L_1		.050		1.27	7,8
L_2	.250		6.35		7,8
P	.100		2.54		
Q		.030		0.76	5
TL	.028	.048	0.71	1.22	3,4
TW	.036	.046	0.91	1.17	3
r		.010		0.25	10
* α	45°	TP	45°	TP	6
1, 2, 9, 11, 12					



NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TL shall be held for a minimum length of .011 inch (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. Leads at gauge plane .054 +.001 -.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
7. Dimension LU applies between L_1 and L_2. Dimension LD applies between L_2 and LL minimum. Diameter is uncontrolled in L_1 and beyond LL minimum.
8. All three leads.
9. The collector shall be internally connected to the case.
10. Dimension r (radius) applies to both inside corners of tab.
11. * Lead 1 = emitter, lead 2 = base, lead 3 = collector.
12. * For L suffix devices, dimension LL = 1.5 inches (38.10 mm) min. and 1.75 inches (44.45 mm) max.

FIGURE 1. Physical dimensions for TO-206AA package (formerly TO-18).

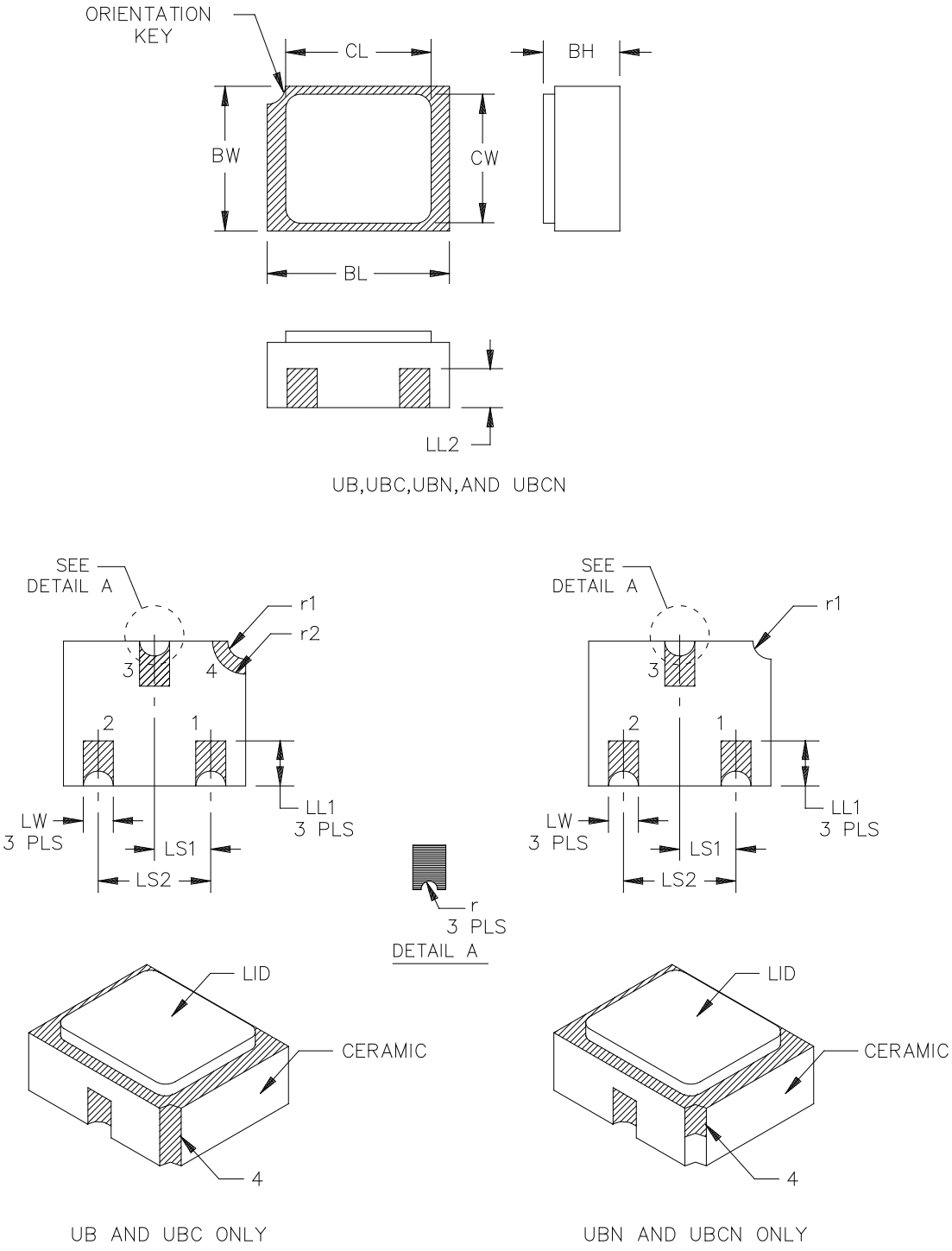
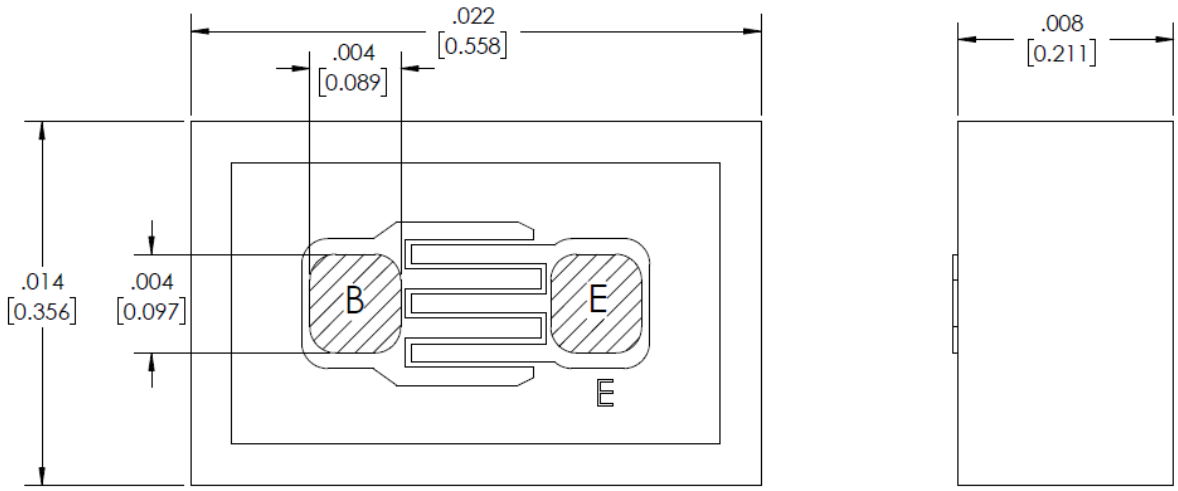


FIGURE 2. Physical dimensions, surface mount (UB, UBN, UBC, and UBCN versions).

Symbol	Dimensions				Note
	in	in	mm	mm	
	Min	Max	Min	Max	
BL	.115	.128	2.92	3.25	
BW	.085	.108	2.16	2.74	
BH	.040	.056	1.02	1.42	UB only, 4
BH	.040	.056	1.02	1.42	UBN only, 5
BH	.055	.069	1.40	1.75	UBC only, 6
BH	.055	.069	1.40	1.75	UBCN only, 7
CL		.128		3.25	
CW		.108		2.74	
LL1	.022	.038	0.56	0.97	3 places
LL2	.014	.035	0.356	0.89	3 places
LS_1	.035	.040	0.89	1.02	
LS_2	.071	.079	1.80	2.01	
LW	.016	.024	0.41	0.61	
r		.008		0.20	6
r1		.012		0.30	8
r2		.022		0.56	UB and UBC only, 8

NOTES:
1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Hatched areas on package denote metallized areas.
4. UB only: Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Shielding connected to the metal lid.
5. UBN only: Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Isolated lid with three pads only.
6. UBC (ceramic lid) only: Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Connected to the lid braze ring.
7. UBCN (ceramic lid) only: Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Isolated lid with three pads only.
8. For design reference only.

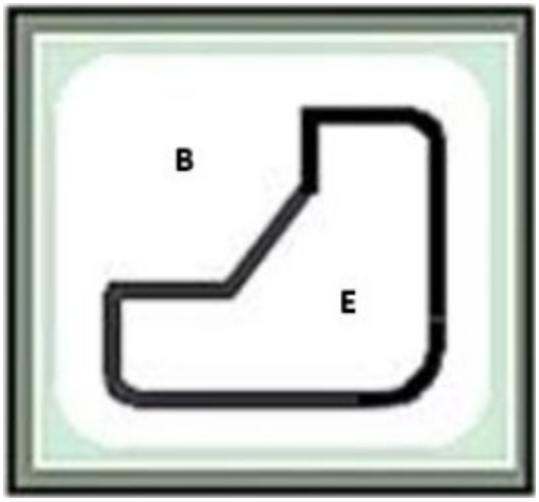
* FIGURE 2. Physical dimensions, surface mount (UB, UBN, UBC, and UBCN versions) - Continued.



Physical characteristics:
A-version

NOTES:
1. Chip size: .022 x .014 inch (0.558 mm x 0.356 mm).
2. Chip thickness: .008 inch (0.211 mm).
3. Top metal: Aluminum 18,000Å minimum, 20,000Å nominal.
4. Back metal: Gold 5.000Å minimum, 6,500Å nominal.
5. Glassivation: Silox 5,000 Å minimum, 6,000 Å nominal.
6. Backside: Collector.
7. Bonding pad: B = .004 x .004 inch (0.089 mm x 0.089 mm).
   E = .004 x .004 inch (0.089 mm x 0.089 mm).

* FIGURE 3. JANHC and JANKC (A-version) die dimensions.



Physical characteristics:
B-version

NOTES:
1. Chip size: .010 x .010 inch ± .002 Inch (0.254 mm x 0.254 mm ± 0.0508mm).
2. Chip thickness: .007 inch ± .002 Inch (0.178 mm ± 0.0508mm).
3. Top metal: Aluminum 14,000Å minimum, 20,000Å nominal.
4. Back metal: Gold 5,600Å minimum, 8,000Å nominal.
5. Glassivation: Silicon Nitride 7,000 Å minimum, 9,000 Å nominal.
6. Backside: Collector.
7. Bonding pad: B = .003 x .003 inch (0.076 mm x 0.076 mm).
   E = .003 x .003 inch (0.076 mm x 0.076 mm).

* FIGURE 4. JANHC and JANKC (B-version) die dimensions.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-19500 - Semiconductor Devices, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-750 - Test Methods for Semiconductor Devices.

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

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. The individual item requirements shall be as specified in MIL-PRF-19500 and as modified herein.

3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.2 and 6.3).

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500 and as follows.

$R_{\theta JA}$ ..... Thermal resistance junction to ambient.
$R_{\theta JC}$ ..... Thermal resistance junction to case.

3.4 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-19500, and figure 1 (TO-206AA) , figure 2 (UB), figure 3 (JANHC and JANKC version A), and figure 4 (JANHC and JANKC version B) herein.

3.4.1 Lead finish. Lead finish shall be solderable in accordance with MIL-PRF-19500, MIL-STD-750, and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see 6.2).

3.5 Radiation hardness assurance (RHA). Radiation hardness assurance requirements, PIN designators, and test levels shall be as defined in MIL-PRF-19500.

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in paragraph 1.3, 1.4, and table I.

3.7 Electrical test requirements. The electrical test requirements shall be as specified in table I.

3.8 Marking. Marking shall be in accordance with MIL-PRF-19500, except for the UB, UBC, UBN, and UBCN suffix packages. Marking on the UB, UBC, UBN, and UBCN packages shall consist of an abbreviated part number, the date code, and the manufacturer's symbol or logo. The prefixes JAN, JANTX, JANTXV, and JANS can be abbreviated as J, JX, JV, and JS respectively. The radiation hardened designator "E", "K", "U", M, D, P, L, R, F, G, or H shall immediately precede (or replace) the device "2N" identifier (depending upon degree of abbreviation required).

3.9 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Screening (see 4.3).

c. Conformance inspection (see 4.4, and tables I and II).

d. Element evaluation (see 4.4.6).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.2.1 JANHC and JANKC qualification. JANHC and JANKC qualification inspection shall be in accordance with MIL-PRF-19500.

4.2.2 Group E qualification. Group E inspection shall be performed for qualification or re-qualification only. In case qualification was awarded to a prior revision of the specification sheet that did not request the performance of table III tests, the tests specified in table III herein that were not performed in the prior revision shall be performed on the first inspection lot of this revision to maintain qualification.

4.3 Screening of encapsulated devices (Quality levels JANS, JANTX, and JANTXV levels only). Screening shall be in accordance with table E-IV MIL-PRF-19500, and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen	Measurement	Measurement
	JANS level	JANTX and JANTXV levels
2	Optional	Optional
3a 3b (1) 3c	Required Not applicable Thermal impedance (transient), method 3131 of MIL-STD-750. (see 4.3.2)	Required Not applicable Thermal impedance (transient), method 3131 of MIL-STD-750. (2) (see 4.3.2)
4	Required	Optional
5	Required	Not applicable
8	Required	Not required
9	I_{CBO}, h_{FE3}	Not applicable
10	48 hours minimum	48 hours minimum
11	I_{CBO}; h_{FE3}; ΔI_{CBO} = 100 percent of initial value or 15 nA dc, whichever is greater. Δh_{FE3} = ± 15 percent	I_{CBO}; h_{FE3}
12	See 4.3.1	See 4.3.1
(2) 13	Subgroups 2 and 3 of table I herein; ΔI_{CBO} = 100 percent of initial value or 15 nA dc, whichever is greater; Δh_{FE3} = ± 15 percent	Subgroup 2 of table I herein; ΔI_{CBO} = 100 percent of initial value or 15 nA dc, whichever is greater; Δh_{FE3} = ± 15 percent
15	Required	Not required
16	Required	Not required

(1) Thermal impedance limits shall not exceed figure 8, figure 9 and figure 10.
(2) Shall be performed anytime after temperature cycling, screen 3a; JANTX and JANTXV levels do not need to be repeated in screening requirements.

4.3.1 Power burn-in conditions. Power burn-in conditions shall be as follows: V_{CB} = 10 - 30 V dc. Power shall be applied to achieve T_J = +135°C minimum using a minimum P_D = 75 percent of P_T maximum, T_A ambient rated as defined in 1.3. With approval of the qualifying activity and preparing activity, alternate burn-in criteria (hours, bias conditions, T_J, and mounting conditions) may be used for JANTX and JANTXV quality levels. A justification demonstrating equivalence is required. In addition, the manufacturing site's burn-in data and performance history will be essential criteria for burn-in modification approval. Method 3100 of MIL-STD-750 to measure T_J shall be used.

4.3.2 Thermal impedance. The thermal impedance measurements shall be performed in accordance with method 3131 of MIL-STD-750 using the guidelines in that method for determining I_M, I_H, t_H, t_{MD} (and V_C where appropriate). The thermal impedance limit shall comply with the thermal impedance graph on figure 8, figure 9, and figure 10 (less than or equal to the curve value at the same t_H time) and shall be less than the process determined statistical maximum limit as outlined in method 3131 of MIL-STD-750. See table III, subgroup 4 herein.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein. If alternate screening is being performed in accordance with MIL-PRF-19500, a sample of screened devices shall be submitted to and pass the requirements of subgroups 1 and 2, of table I herein, inspection only (table E-VIB, group B, subgroup 1 is not required to be performed since solderability and resistance to solvents testing is performed in A1 herein).

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500, and table I herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with 4.4.2.1 for quality level JANS and 4.4.2.2 for quality levels JAN, JANTX, and JANTXV.

4.4.2.1 Group B inspection (JANS), table E-VIa of MIL-PRF-19500. Group B inspection for quality level JANS shall be conducted in accordance with the conditions specified for subgroup testing in table E-VIA of MIL-PRF-19500 and herein. Delta measurements shall be in accordance with 4.5.4 herein, delta measurements only apply to subgroups B4, and B5.

Subgroup	Method	Condition
B4	1037	V_{CB} = 10 V dc, adjust device current, or power, to achieve a minimum ΔT_J of +100°C.
B5	1027	V_{CB} = 10 V dc; $P_D \geq$ 100 percent of maximum rated P_T (see 1.3). (NOTE: If a failure occurs, resubmission shall be at the test conditions of the original sample.) Option 1: 96 hours minimum sample size in accordance with MIL-PRF-19500, table E-VIA, adjust T_A or P_D to achieve T_J = +275°C minimum. Option 2: 216 hours minimum, sample size = 45, c = 0; adjust T_A or P_D to achieve a T_J = +225°C minimum.

4.4.2.2 Group B inspection, (JAN, JANTX, and JANTXV). Group B inspection for quality levels JAN, JANTX, and JANTXV shall be conducted in accordance with the conditions specified in table E–VIC (small die flow) of MIL-PRF-19500 and herein. Delta measurements shall be after each step and shall be in accordance with 4.5.4 herein. All catastrophic failures during CI shall be analyzed to the extent possible to identify root cause and corrective action. Whenever a failure is identified as wafer lot or wafer processing related, the entire wafer lot and related devices assembled from the wafer lot shall be rejected unless an appropriate determined corrective action to eliminate the failure mode has been implemented and the devices from the wafer lot are screened to eliminate the failure mode.

Step	Method	Condition
1	1026	Steady-state life: 1,000 hours minimum, V_{CB} = 10 V dc, power shall be applied to achieve T_J = +150°C minimum using a minimum of P_D = 75 percent of maximum rated P_T as defined in 1.3. n = 45 devices, c = 0. The sample size may be increased and the test time decreased as long as the devices are stressed for a total of 45,000 device hours minimum, and the actual time of test is at least 340 hours.
2	1048	Blocking life, T_A = +150°C, V_{CB} = 80 percent of rated voltage, 48 hours minimum. n = 45 devices, c = 0.
3	1032	High-temperature life (non-operating), t = 340 hours, T_A = +200°C. n = 22, c = 0.

4.4.2.2.1 Group B sample selection. Samples selected for small die flow group B inspection shall be in accordance with all of the following requirements:

a. Samples shall be selected from an inspection lot that has been submitted to and passed table I, subgroup 2, conformance inspection.

b. When the final lead finish is solder, or any plating prone to oxidation at high temperature, the samples for life test (Step 1) may be tested prior to the application of final lead finish.

c. Separate samples may be used for each step.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the test and conditions specified for subgroup testing in table E-VII of MIL-PRF-19500, and in 4.4.3.1 (JANS) and 4.4.3.2 (JAN, JANTX, and JANTXV) herein for group C testing. Delta requirements shall be in accordance with 4.5.4 herein; delta requirements only apply to subgroup C6.

4.4.3.1 Group C inspection (JANS), table E-VII of MIL-PRF-19500.

Subgroup	Method	Condition
C2	2036	Test condition E; not applicable for UA, UB, UBC, UBN, and UBCN devices.
C5	3131	$R_{\theta JA}$ and $R_{\theta JC}$ only, as applicable (see 1.3) and in accordance with thermal impedance curves.
C6	1026	1,000 hours at V_{CB} = 10 V dc; power shall be applied to achieve T_J = +150°C minimum and a minimum of P_D = 75 percent of maximum rated P_T as defined in 1.3 n = 45, c = 0. The sample size may be increased and the test time decreased as long as the devices are stressed for a total of 45,000 device hours minimum, and the actual time of test is at least 340 hours.

4.4.3.2 Group C inspection (JAN, JANTX, and JANTXV), table E-VII of MIL-PRF-19500.

Subgroup	Method	Condition
C2	2036	Test condition E; not applicable for UA, UB, UBC, UBN, and UBCN devices.
C5	3131	$R_{\theta JA}$ and $R_{\theta JC}$ only, as applicable (see 1.3 and 4.3.2) and in accordance with thermal impedance curves.
C6		Not applicable.

4.4.3.3 Group C sample selection. Samples for subgroups in group C shall be chosen at random from any inspection lot containing the intended package type and lead finish procured to the same specification which is submitted to and passes table I tests herein for conformance inspection. When the final lead finish is solder or any plating prone to oxidation at high temperature, the samples for C6 life test may be pulled prior to the application of final lead finish. Testing of a subgroup using a single device type enclosed in the intended package type shall be considered as complying with the requirements for that subgroup.

4.4.4 Group D inspection. Conformance inspection for radiation hardness assured JANS and JANTXV types shall include the group D tests specified in table II herein. These tests shall be performed as required in accordance with MIL-PRF-19500 and method 1019 of MIL-STD-750, for total ionizing dose or method 1017 of MIL-STD-750 for neutron fluence as applicable (see 6.2 herein), except group D, subgroup 2 may be performed separate from other subgroups. Alternate package options may also be substituted for the testing provided there is no adverse effect to the fluence profile.

4.4.5 Group E inspection. Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-IX of MIL-PRF-19500 and as specified in table III herein. Delta measurements shall be in accordance with the applicable steps of 4.5.4.

4.4.6 Element evaluation of unencapsulated die. The element evaluation of unencapsulated die shall be in accordance with appendix G of MIL-PRF-19500. For subgroup 4, the burn-in duration for the JANKC level shall follow the JANS requirements and the JANHC shall follow the JANTX requirements.

4.5 Method of inspection. Methods of inspection shall be as specified in the appropriate tables and as follows.

4.5.1 Pulse measurements. Conditions for pulse measurement shall be as specified in section 4 of MIL-STD-750.

4.5.2 Input capacitance. This test shall be conducted in accordance with method 3240 of MIL-STD-750, except the output capacitor shall be omitted.

4.5.3 Displacement damage characterization. For RHA devices, each supplier shall perform a displacement damage characterization. The characterization shall demonstrate exposure versus data and does not indicate pass or fail criteria. The exposure shall be conducted in accordance with method 1017 of MIL-STD-750. The following details shall apply:

a. Samples may be taken from any wafer of the qualification lot.

b. As a minimum, testing shall be at 2E+12 n/cm^2 plus two additional fluence levels chosen by the manufacturer.

c. If the device degrades less than 5 percent of the specification at the highest fluence level, a single data point may be sufficient.

Alternate package options may be substituted for characterization. The displacement damage characterization data shall be made available from the manufacturer.

4.5.4 Delta measurements. Delta measurements shall be as specified below:

Step	Inspection	MIL-STD-750		Symbol	Limit	Unit
		Method	Conditions			
1	Collector-base cutoff current	3036	Bias condition D, V_{CB} = 30 V dc	ΔI_{CB0} (1)	100 percent of initial value or 24 nA dc, whichever is greater.	
2	Forward current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 10 mA dc; pulsed, see 4.5.1	Δh_{FE3} (1)	± 25 percent change from initial reading.	

(1) Devices which exceed the table I limits herein for this test shall not be accepted.

* TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
Subgroup 1 2/						
Visual and mechanical examination 3/	2071					
Solderability 3/ 4/	2026	n = 15 leads, c = 0				
Resistance to solvents 3/ 4/ 5/	1022	n = 15 devices, c = 0				
Salt atmosphere (corrosion) 4/	1041	n = 6 devices, c = 0, (For laser marked devices only)				
Temp cycling 3/ 4/	1051	Test condition C, 25 cycles. n = 22 devices, c = 0				
Hermetic seal 4/ 6/ Fine leak Gross leak	1071	n = 22 devices, c = 0				
Electrical measurements 4/		Table I, subgroup 2				
Bond strength 3/ 4/	2037	Precondition T_A = +250°C at t = 24 hours or T_A = +300°C at t = 2 hours n = 11 wires, c = 0				
Decap internal visual (design verification) 4/	2075	n = 4 devices, c = 0				
Subgroup 2						
Thermal impedance 7/	3131	See 4.3.2	$Z_{\theta JX}$			°C/W
Collector to base cutoff current	3036	Bias condition D; V_{CB} = 30 V dc	I_{CBO}		30	nA dc
Emitter to base cutoff current	3061	Bias condition D; V_{EB} = 3 V dc	I_{EBO}		30	nA dc
Breakdown voltage, collector to emitter	3011	Bias condition D; I_C = 1.0 mA dc; pulsed (see 4.5.1)	$V_{(BR)CEO}$	40		V dc
Breakdown voltage, collector to base	3001	Bias condition D; I_C = 10 uA dc	$V_{(BR)CBO}$	40		V dc
Breakdown voltage, emitter to base	3026	Bias condition D; I_E = 10 uA dc	$V_{(BR)EBO}$	5.0		V dc
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 0.1 mA dc; pulsed (see 4.5.1)	h_{FE1}	60		

See footnotes at end of table.

* TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
Subgroup 2 - Continued						
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 1.0 mA dc; pulsed (see 4.5.1)	h_{FE2}	80		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 10 mA dc; pulsed (see 4.5.1)	h_{FE3}	100	300	
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 50 mA dc; pulsed (see 4.5.1)	h_{FE4}	60		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 100 mA dc	h_{FE5}	30		
Collector-emitter saturation voltage	3071	I_C = 10 mA dc; I_B = 1 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)1}$		0.25	V dc
Collector-emitter saturation voltage	3071	I_C = 50 mA dc; I_B = 5 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)2}$		0.40	V dc
Base-emitter saturation voltage	3066	Test condition A; I_C = 10 mA dc; I_B = 1 mA dc; pulsed (see 4.5.1)	$V_{BE(sat)1}$	0.65	0.85	V dc
Base-emitter saturation voltage	3066	Test condition A; I_C = 50 mA dc; I_B = 5 mA dc; pulsed (see 4.5.1)	$V_{BE(sat)2}$		0.95	V dc
Subgroup 3						
High temperature operation Collector to base cutoff current	3036	T_A = +150°C Bias condition D; V_{CB} = 30 V dc	I_{CBO1}		30	µA dc
Low temperature operation Forward-current transfer ratio	3076	T_A = -55°C V_{CE} = 1.0 V dc; I_C = 10 mA dc	h_{FE6}	35		
Subgroup 4						
Open circuit output capacitance	3236	V_{CB} = 5.0 V dc; I_E = 0; f = 1 MHz	C_{obo}		4.5	pF
Small-signal short-circuit forward current transfer ratio	3206	V_{CE} = 10 V dc; I_C = 1 mA dc; f = 1 kHz	h_{fe}	100	400	

See footnotes at end of table.

* TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
Subgroup 4 continued						
Noise figure	3246	V_{CE} = 5.0 V dc; I_C = 100 µA dc; R_S = 1 kohm, f = 10 Hz to 15.7 kHz	N.F.		4.0	dB
Unity gain frequency	3261	I_C = 10 mA dc; V_{CE} = 20V dc; f = 100 MHz	f_T	250		MHz
* Input capacitance (output open-circuited)	3240	V_{EB} = 0.5 V dc; I_C = 0; f = 1 MHz	C_{ibo}		10.0	pF
Delay time	3251	I_C = 10 mA dc; V_{CC} = 3.0 V dc; $V_{BE(off)}$ = 0.5 V dc; I_{B1} = 1 mA dc; (See figure 11)	t_d		35	ns
Rise time	3251	I_C = 10 mA dc; V_{CC} = 3.0 V dc; $V_{BE(off)}$ = 0.5 V dc; I_{B1} = 1 mA dc; (See figure 11)	t_r		35	ns
Storage time	3251	V_{CC} = 3.0 V dc; I_C = 10 mA dc; I_{B1} = I_{B2} = 1.0 mA dc; (See figure 12)	t_s		225	ns
Fall time	3251	V_{CC} = 3.0 V dc; I_C = 10 mA dc; I_{B1} = I_{B2} = 1.0 mA dc; (See figure 12)	t_f		75	ns
Subgroups 5 and 6						
Not required						

1/ For sampling plan see MIL-PRF-19500.
2/ For resubmission of failed test in subgroup 1 of table I, double the sample size of the failed test or sequence of tests. A failure in table I, subgroup 1 shall not require retest of the entire subgroup. Only the failed test shall be rerun upon submission.
3/ Separate samples may be used.
4/ Not required for JANS devices.
5/ Not required for laser marked devices.
6/ This hermetic seal test is an end-point to temp-cycling in addition to electrical measurements.
7/ For end-point measurements, this test is required for the following subgroups:
Group B, subgroup 3, 4, and 5 (JANS).
Group B, step 1 (TX and TXV).
Group C, subgroup 2 and 6.

TABLE II. Group D inspection.

Inspection 1/ 2/ 3/	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
Subgroup 1 4/						
Neutron irradiation	1017	Neutron exposure V_{CES} = 0V				
Collector to base cutoff current	3036	Bias condition D; V_{CB} = 30 V dc	I_{CBO}		60	nA dc
Emitter to base cutoff current	3061	Bias condition D; V_{EB} = 3 V dc	I_{EBO}		60	nA dc
Breakdown voltage, collector to emitter	3011	Bias condition D; I_C = 1.0 mA dc; pulsed (see 4.5.1)	$V_{(BR)CEO}$	40		V dc
Breakdown voltage, collector to base	3001	Bias condition D; I_C = 10 uA dc	$V_{(BR)CBO}$	40		V dc
Breakdown voltage, emitter to base	3026	Bias condition D; I_E = 10 uA dc	$V_{(BR)EBO}$	5.0		V dc
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 0.1 mA dc; pulsed (see 4.5.1)	[h_{FE1}] 5/	[30]		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 1.0 mA dc; pulsed (see 4.5.1)	[h_{FE2}] 5/	[40]		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 10 mA dc; pulsed (see 4.5.1)	[h_{FE3}] 5/	[50]	300	
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 50 mA dc; pulsed (see 4.5.1)	[h_{FE4}] 5/	[30]		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 100 mA dc	[h_{FE5}] 5/	[15]		
Collector-emitter saturation voltage	3071	I_C = 10 mA dc; I_B = 1 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)1}$		0.29	V dc
Collector-emitter saturation voltage	3071	I_C = 50 mA dc; I_B = 5 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)2}$		0.46	V dc
Base-emitter saturation voltage	3066	Test condition A; I_C = 10 mA dc; I_B = 1 mA dc; pulsed (see 4.5.1)	$V_{BE(sat)1}$	0.65	0.98	V dc
Base-emitter saturation voltage	3066	Test condition A; I_C = 50 mA dc; I_B = 5 mA dc; pulsed (see 4.5.1)	$V_{BE(sat)2}$		1.09	V dc
Subgroup 2						
* Total dose irradiation	1019	Gamma exposure V_{CES} = 32 V, Condition A for High dose rate, or Condition D for low dose rate				
Collector to base cutoff current	3036	Bias condition D; V_{CB} = 30 V dc	I_{CBO}		60	nA dc

See footnotes at end of table.

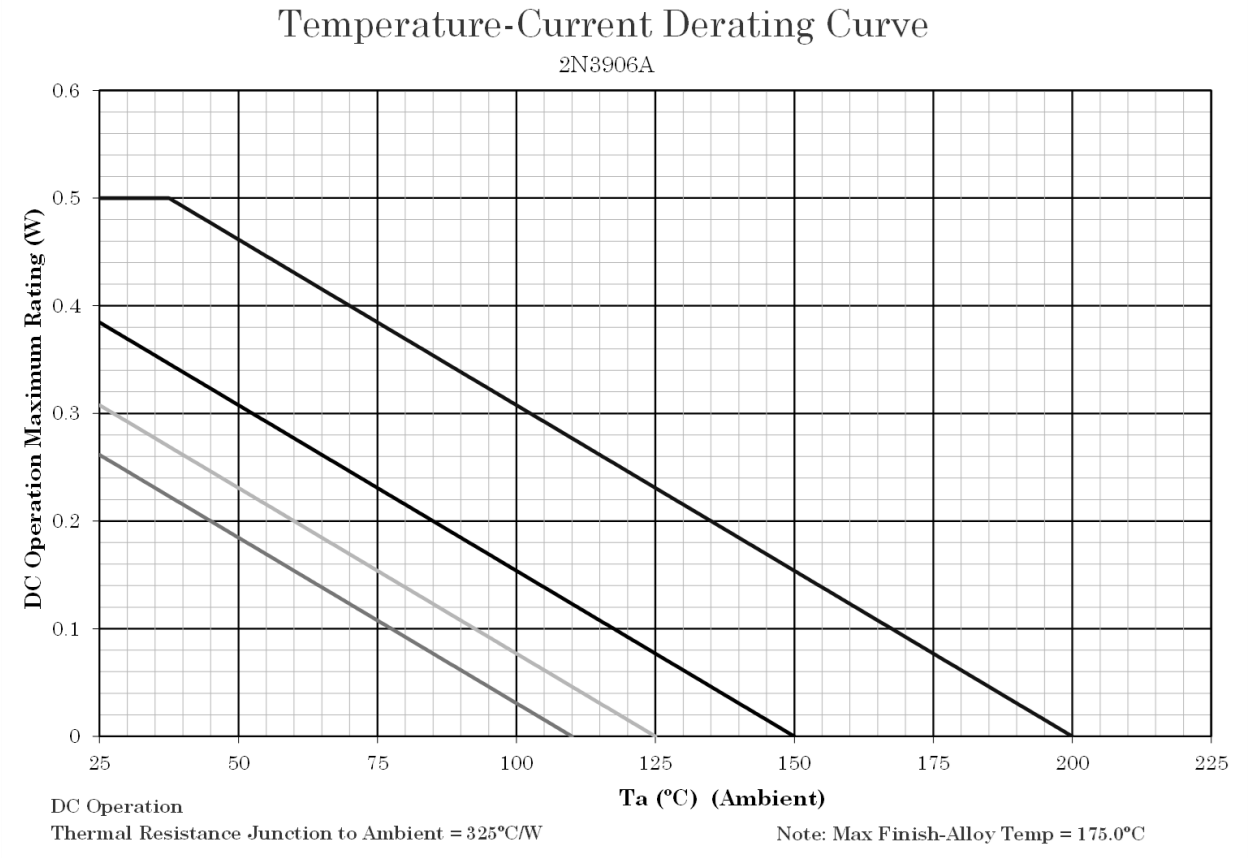
TABLE II. Group D inspection - Continued.

Inspection 1/ 2/ 3/	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
Subgroup 2 - Continued						
Emitter to base cutoff current	3061	Bias condition D; V_{EB} = 3 V dc	I_{EBO}		60	nA dc
Breakdown voltage, collector to emitter	3011	Bias condition D; I_C = 1.0 mA dc; pulsed (see 4.5.1)	$V_{(BR)CEO}$	40		V dc
Breakdown voltage, collector to base	3001	Bias condition D; I_C = 10 uA dc	$V_{(BR)CBO}$	40		V dc
Breakdown voltage, emitter to base	3026	Bias condition D; I_E = 10 uA dc	$V_{(BR)EBO}$	5.0		V dc
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 0.1 mA dc; pulsed (see 4.5.1)	[h_{FE1}] 5/	[30]		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 1.0 mA dc; pulsed (see 4.5.1)	[h_{FE2}] 5/	[40]		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 10 mA dc; pulsed (see 4.5.1)	[h_{FE3}] 5/	[50]	300	
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 50 mA dc; pulsed (see 4.5.1)	[h_{FE4}] 5/	[30]		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 100 mA dc	[h_{FE5}] 5/	[15]		
Collector-emitter saturation voltage	3071	I_C = 10 mA dc; I_B = 1 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)1}$		0.29	V dc
Collector-emitter saturation voltage	3071	I_C = 50 mA dc; I_B = 5 mA dc; pulsed (see 4.5.1)	$V_{CE(sat)2}$		0.46	V dc
Base-emitter saturation voltage	3066	Test condition A; I_C = 10 mA dc; I_B = 1 mA dc; pulsed (see 4.5.1)	$V_{BE(sat)1}$	0.65	0.98	V dc
Base-emitter saturation voltage	3066	Test condition A; I_C = 50 mA dc; I_B = 5 mA dc; pulsed (see 4.5.1)	$V_{BE(sat)2}$		1.09	V dc

1/ Tests to be performed on all devices receiving radiation exposure.
2/ For sampling plan, see MIL-PRF-19500.
3/ Electrical characteristics apply to the corresponding A suffix versions unless otherwise noted.
4/ See 6.2.e herein.
5/ See method 1019 of MIL-STD-750 for how to determine [h_{FE}] by first calculating the delta (1/h_{FE}) from the pre- and Post-radiation h_{FE}. Notice the [h_{FE}] is not the same as h_{FE} and cannot be measured directly. The [h_{FE}] value can never exceed the pre-radiation minimum h_{FE} that it is based upon.

TABLE III. Group E inspection (all quality levels) - for qualification or re-qualification only.

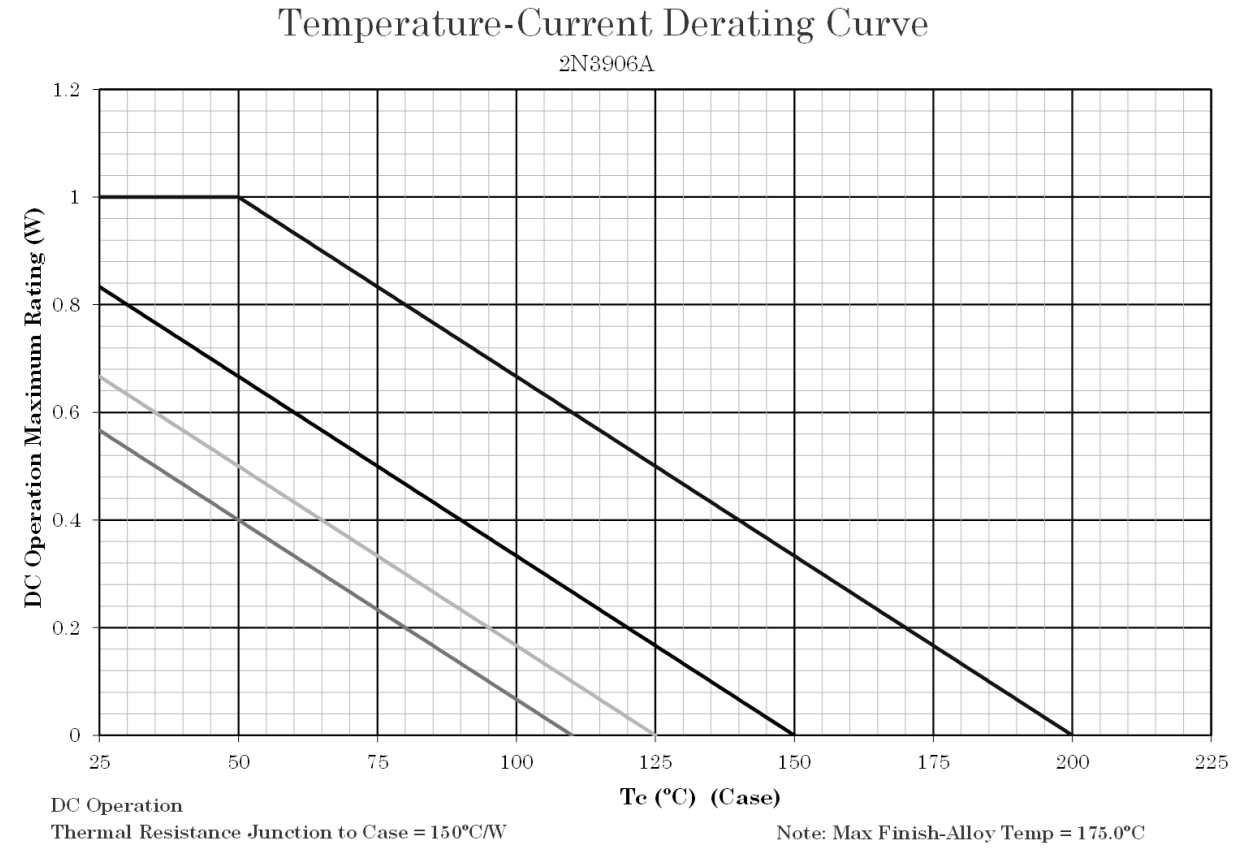
Inspection	MIL-STD-750		Qualification
	Method	Conditions	
Subgroup 1			45 devices c = 0
Temperature cycling (air to air)	1051	Test condition C, 500 cycles	
Hermetic seal	1071		
Fine leak Gross leak			
Electrical measurements		See table I, subgroup 2 and 4.4.6 herein	
Subgroup 2			
Intermittent life	1037	Intermittent operation life: V_{CB} = 10 V dc, 6,000 cycles. Adjust device current, or power, to achieve a minimum ΔT_J of +100°C	45 devices c = 0
Electrical measurements		See table I, subgroup 2 and 4.4.6 herein	
Subgroup 4			
Thermal resistance	3131		15 devices, c = 0
Thermal impedance curves		See MIL-PRF-19500, table E-IX, group E, subgroup 4	Sample size N/A
Subgroup 5			
Not applicable			
Subgroup 6			
Electrostatic discharge (ESD)	1020		
Subgroup 8			45 devices c = 0
Reverse stability	1033	Condition B	
Subgroup 12			
Neutron Irradiation	1017	See 4.5.3	



NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at ≤ T_J specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperature (T_J ≤ 200°C) and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at T_J ≤ 150°C, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at T_J ≤ 125°C, and 110°C to show power rating where most users want to limit T_J in their application.

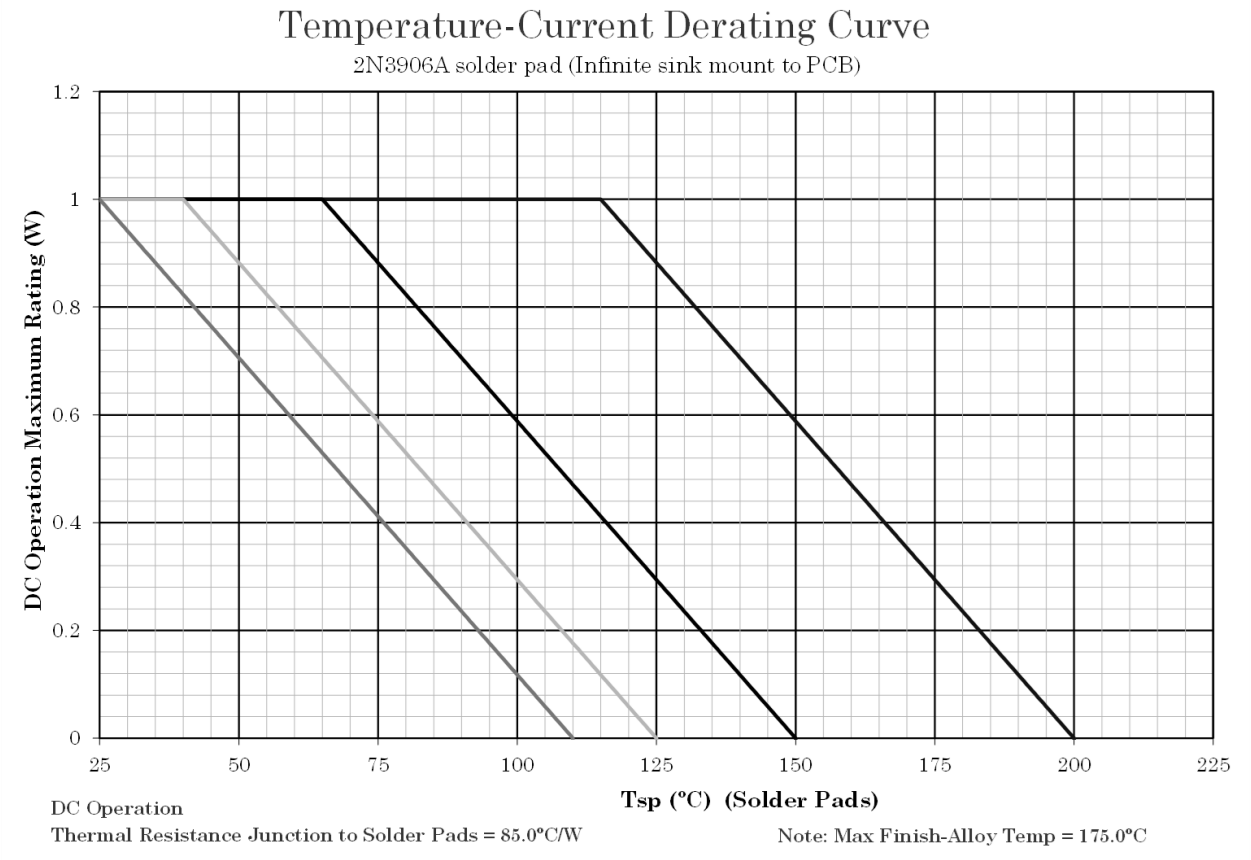
FIGURE 5. Temperature-power derating for 2N3906A (TO-206AA package).



NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at ≤ T_J specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperatures and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq +150°C$, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at $T_J \leq +125°C$, and +110°C to show power rating where most users want to limit T_J in their application.

FIGURE 6. Temperature-power derating for 2N3906A (TO-206AA) package case base mounted).



NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at ≤ T_J specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperatures and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq +150°C$, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at $T_J \leq +125°C$, and +110°C to show power rating where most users want to limit T_J in their application.

FIGURE 7. Temperature-power derating for 2N3906AUB (UB, UBC, UBN, UBCN) package infinite sink mounted).

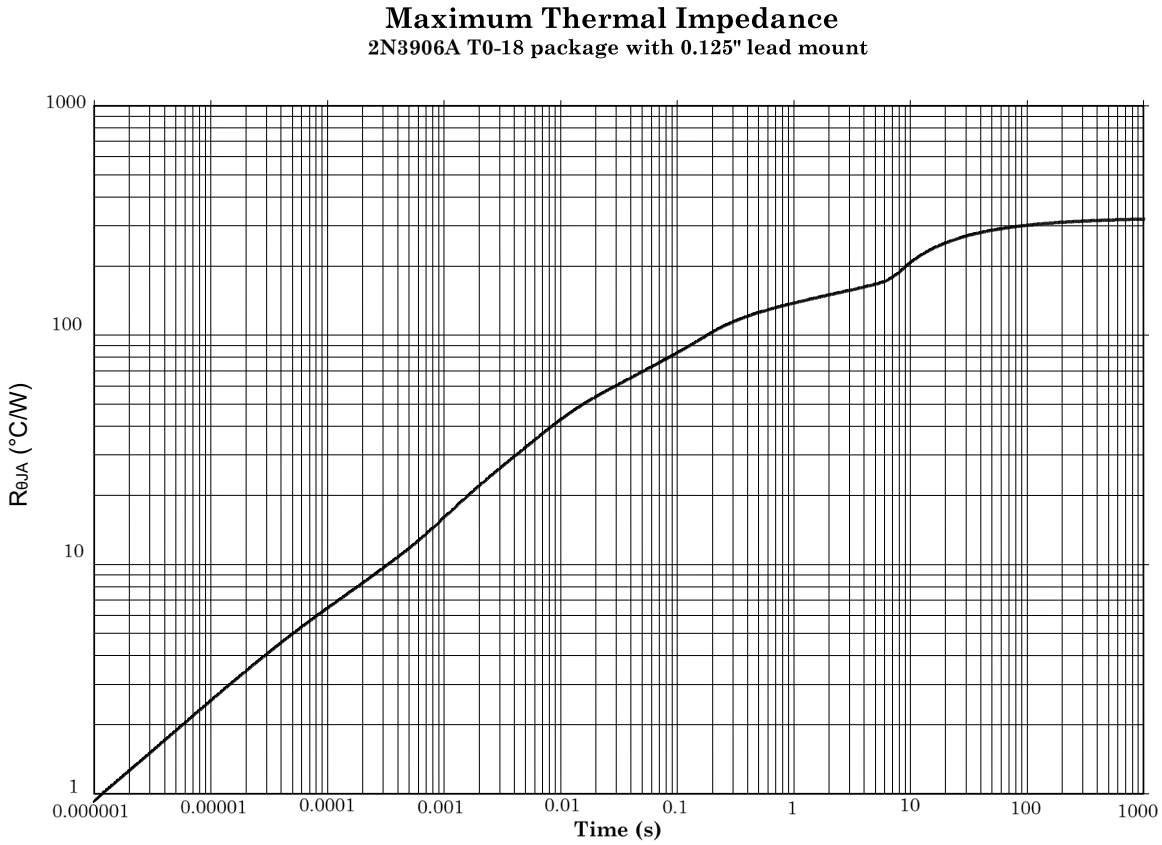


FIGURE 8. Thermal impedance graph ($R_{\theta JA}$) for 2N3906A (TO-206AA).

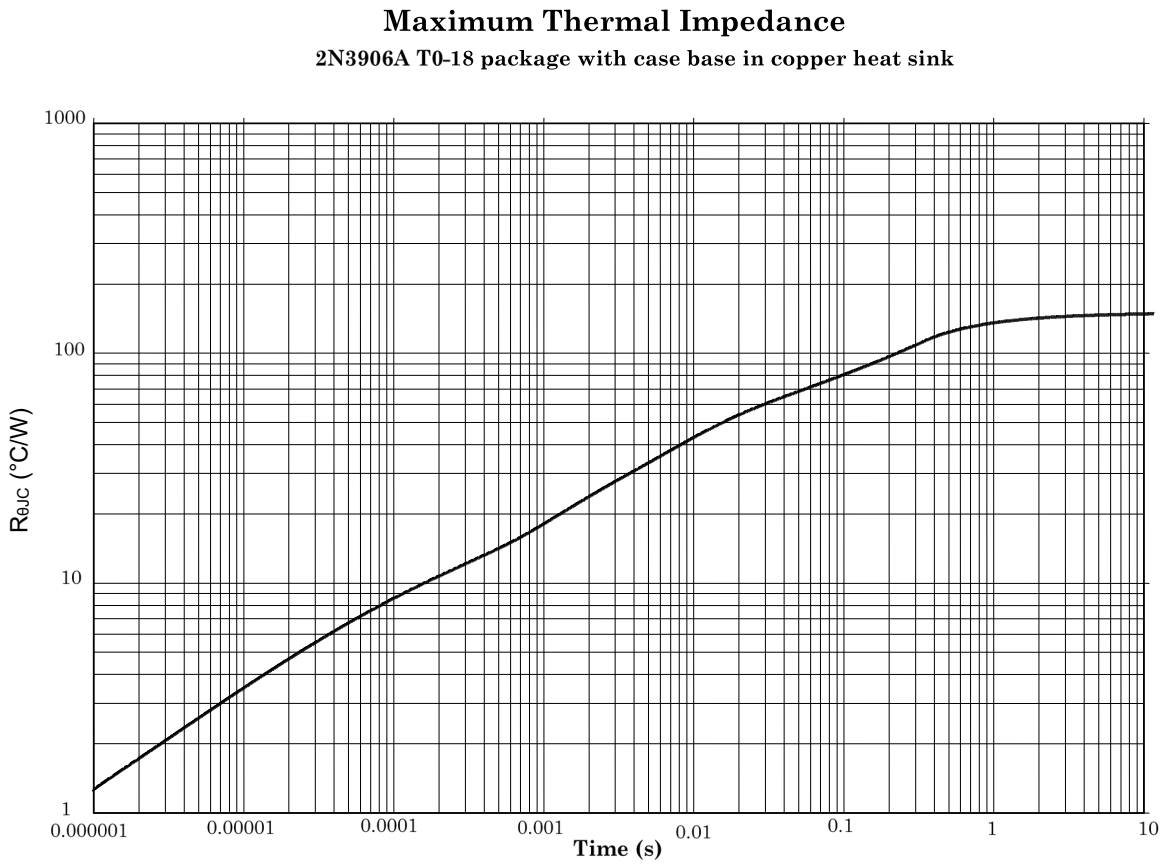


FIGURE 9. Thermal impedance graph ($R_{\theta JC}$) for 2N3906A (TO-206AA).

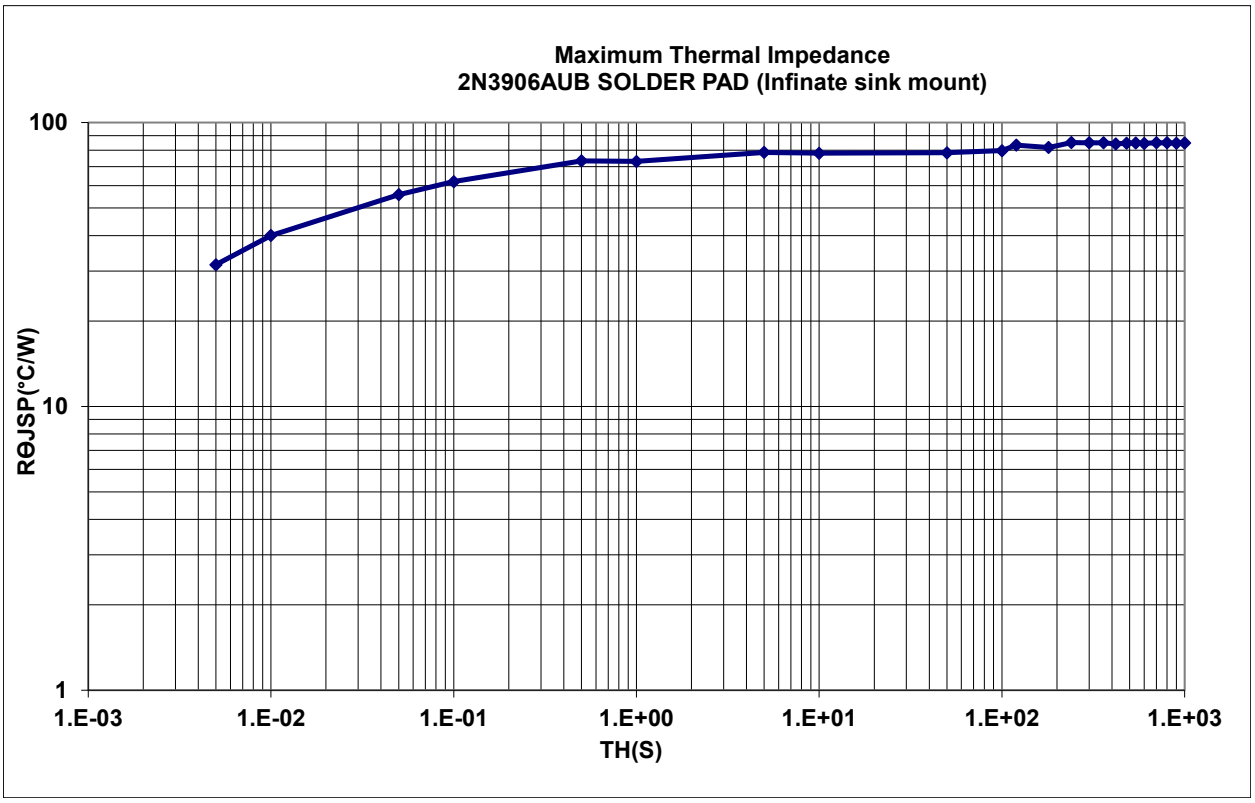
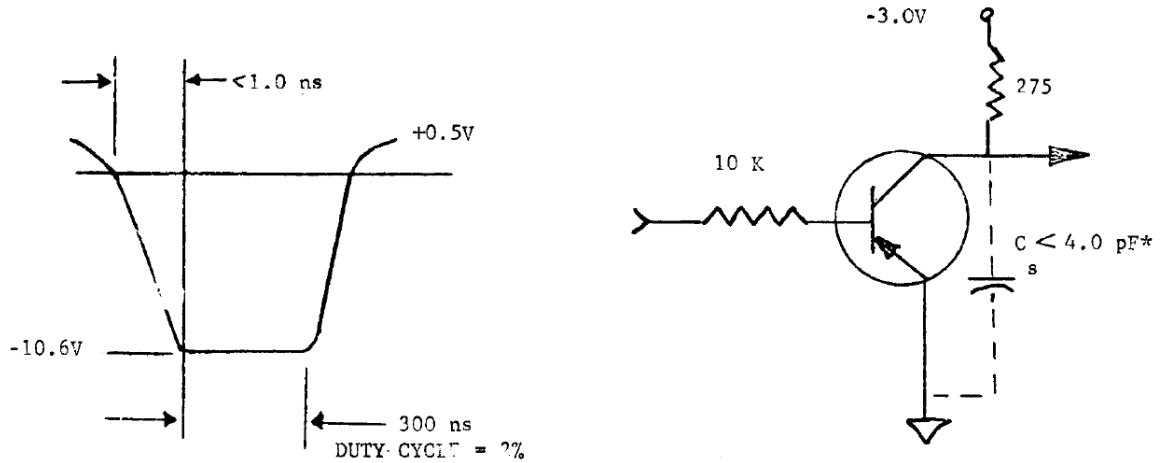
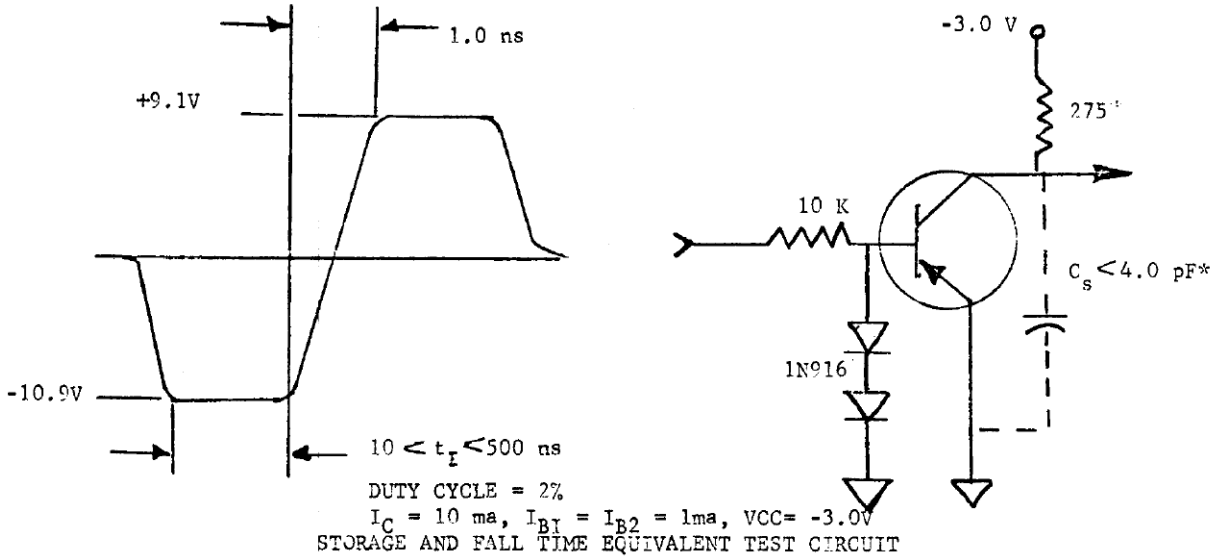


FIGURE 10. Thermal impedance graph ($R_{\theta JSP(IS)}$) for 2N3906AUB, UBC, UBN and UBCN.



TOTAL SHUNT CAPACITANCE OF TEST FIXTURE AND CONNECTORS

FIGURE 11. Delay time and Rise time test circuits.



TOTAL SHUNT CAPACITANCE OF TEST FIXTURE AND CONNECTORS

FIGURE 12. Storage time and Fall time test circuits.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory. The notes specified in MIL-PRF-19500 are applicable to this specification.)

6.1 Intended use. Semiconductors conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Packaging requirements (see 5.1).

c. Lead finish (see 3.4.1).

d. The complete PIN, see 1.5 and 6.6.

e. For acquisition of RHA designated devices, table II, subgroup 1 testing of group D herein is optional. If table II subgroup 1 is desired, it must be specified in the contract.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List (QML 19500) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DLA Land and Maritime, ATTN: VQE, P.O. Box 3990, Columbus, OH 43218-3990 or e-mail vqe.chief@dla.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://qpldocs.dla.mil.

6.4 Supersession data. Devices covered by this specification supersede the manufacturers' and users' Part or Identifying Number (PIN). The term PIN is equivalent to the term part number which was previously used in this specification. This information in no way implies that manufacturers' PIN's are suitable as a substitute for the military PIN.

6.4.1 Cross reference list. The JAN2N3906, found in MIL-PRF-19500/530, is a plastic encapsulated device qualified prior to the non-hermetic appendix J of MIL-PRF-19500. The JAN2N3906A (TO-206AA) listed herein may be used in place of the JAN2N3906.

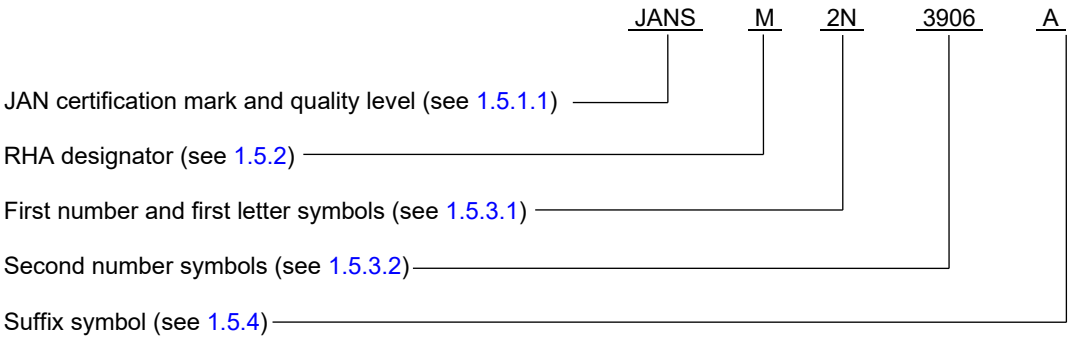
6.5 Suppliers of JANHC and JANKC die. The qualified JANHC and JANKC suppliers with the applicable letter version (example JANHCA2N3906A) will be identified on the QML. The JANHCA/JANKCA die version is obsolete as of the date of this revision.

Die ordering information (1)		
PIN	Manufacturer	Manufacturer
	34156	52GC4
2N3906A	JANHCA2N3906A	JANHCB2N3906A

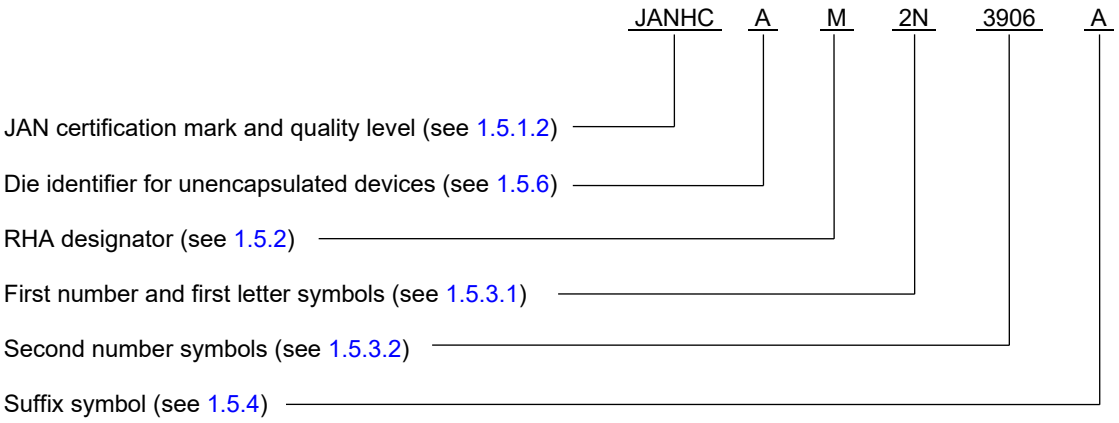
(1) For JANKC level, replace JANHC with JANKC.

6.6 PIN construction example.

6.6.1 Encapsulated devices The PINs for encapsulated devices are constructed using the following form.



6.6.2 Unencapsulated devices. The PINs for un-encapsulated devices are constructed using the following form.



6.7 List of PINs.

6.7.1 PINs for encapsulated devices. The following is a list of possible PINs for encapsulated devices available on this specification sheet.

PINs for devices of the base quality level	PINs for devices of the "TX" quality level	PINs for devices of the "TXV" quality level (1)	PINs for devices of the "S" quality level (1)
JAN2N3906A	JANTX2N3906A	JANTXV#2N3906A	JANS#2N3906A
JAN2N3906AL	JANTX2N3906AL	JANTXV#2N3906AL	JANS#2N3906AL
JAN2N3906AUB	JANTX2N3906AUB	JANTXV#2N3906AUB	JANS#2N3906AUB
JAN2N3906AUBN	JANTX2N3906AUBN	JANTXV#2N3906AUBN	JANS#2N3906AUBN
JAN2N3906AUBC	JANTX2N3906AUBC	JANTXV#2N3906AUBC	JANS#2N3906AUBC
JAN2N3906AUBCN	JANTX2N3906AUBCN	JANTXV#2N3906AUBCN	JANS#2N3906AUBCN

(1) The number sign (#) represent one of eleven RHA designators available (E, K, U, M, D, P, L, R, F, G, or H). The PIN is also available without a RHA designator.

6.7.2 PINs for unencapsulated devices (die). The following is a list of possible PINs for unencapsulated devices available on this specification sheet.

Quality level HC	Quality level KC
JANHCA#2N3906A	JANKCA#2N3906A
JANHCB#2N3906A	JANKCB#2N3906A

(1) The number sign (#) represents one of eleven RHA designators available (E, K, U, M, D, P, L, R, F, G, or H). The PIN is also available without a RHA designator.

6.8 Request for new types and configurations. Requests for new device types or configurations for inclusions in this specification sheet should be submitted to: DLA Land and Maritime, ATTN: VAC, Post Office Box 3990, Columbus, OH 43218-3990 or by electronic mail at Semiconductor@dla.mil or by facsimile (614) 693-1642 or DSN 850-6939.

6.9 Amendment notations. The margins of this specification are marked with asterisks to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Army - CR
Navy - SH
Air Force - 85
NASA - NA
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2023-072)

Review activities:
Army - AR, MI, SM
Navy - AS, MC
Air Force - 19, 71

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.