

The documentation and process conversion measures necessary to comply with this document shall be completed by 30 June 2025.

INCH-POUND

MIL-PRF-19500/510K
w/AMENDMENT 1
30 January 2025
SUPERSEDING
MIL-PRF-19500/510K
15 October 2018

PERFORMANCE SPECIFICATION SHEET

TRANSISTOR, NPN, SILICON, POWER, TYPES 2N6249, 2N6250, 2N6251,
QUALITY LEVELS 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 NPN silicon, power transistors. Four levels of product assurance (JAN, JANTX, JANTXV, and JANS) are provided for each encapsulated device. Two levels of product assurance (JANHC and JANKC) are provided for each unencapsulated device. Provisions for radiation hardness assurance (RHA) to eight radiation levels is provided for JANS and JANKC product assurance levels. RHA level designators "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. The device package outlines are as follows: TO-3 in accordance with [figure 1](#), TO-254AA in accordance with [figure 2](#), TO-257AA in accordance with [figure 3](#) for all encapsulated device types. See [figure 4](#) for unencapsulated devices.

1.3 Maximum ratings. Unless otherwise specified, at $T_A = +25^\circ\text{C}$.

Type	P_T $T_A = +25^\circ\text{C}$	P_T (1) $T_C = +25^\circ\text{C}$	$R_{\theta JC}$ (2)	V_{CBO}	V_{CEO}	V_{EBO}	I_C	I_B	T_J and T_{STG}
	<u>W</u>	<u>W</u>	<u>$^\circ\text{C/W}$</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>A dc</u>	<u>A dc</u>	<u>$^\circ\text{C}$</u>
2N6249	6.0	175	1.0	300	200	6.0	10	5.0	-65
2N6249T1	6.0	175	1.0	300	200	6.0	10	5.0	
2N6249T3	4.0	125 (3)	1.3	300	200	6.0	10	5.0	
2N6250	6.0	175	1.0	375	275	6.0	10	5.0	+200
2N6250T1	6.0	175	1.0	375	275	6.0	10	5.0	
2N6250T3	4.0	125 (3)	1.3	375	275	6.0	10	5.0	
2N6251	6.0	175	1.0	450	350	6.0	10	5.0	
2N6251T1	6.0	175	1.0	450	350	6.0	10	5.0	
2N6251T3	4.0	125 (3)	1.3	450	350	6.0	10	5.0	

- (1) For temperature-power derating curves, see [figures 5](#) and [6](#).
(2) For thermal impedance curves, see [figures 7](#), [8](#), and [9](#).
(3) For TO-257 devices with typical mounting and small footprint, conservatively rating at 125 W and 1.3 $^\circ\text{C/W}$ only.

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>.



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1.4 Primary electrical characteristics. Unless otherwise specified, at $T_A = +25^\circ\text{C}$.

Types	Limits	h_{FE1} $I_C = 10\text{ A dc}$ $V_{CE} = 3\text{ V dc}$	C_{obo} $V_{CB} = 10\text{ V dc}$ $I_C = 0$ $100\text{ kHz} \leq f \leq 1\text{ MHz}$	$ h_{fe} $ $V_{CE} = 10\text{ V dc}$ $I_C = 1\text{ A dc}$ $f = 1\text{ MHz}$	Pulse response	
					t_{on}	t_{off}
2N6249, 2N6249T1, 2N6249T3	Minimum	10	<u>pF</u>	2.5	<u>μs</u>	<u>μs</u>
	Maximum	50	500	15.0	2.0	4.5
2N6250, 2N6250T1, 2N6250T3	Minimum	8		2.5		
	Maximum	50	500	15.0	2.0	4.5
2N6251, 2N6251T1, 2N6251T3	Minimum	6		2.5		
	Maximum	50	500	15.0	2.0	4.5

1.5 Part or Identifying Number (PIN). The PIN is in accordance with [MIL-PRF-19500](#) and as specified herein. See [6.4](#) for PIN construction example and [6.5](#) for a list of available PINs.

1.5.1 JAN certification mark and quality level.

1.5.1.1 Quality levels 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 levels 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: "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: "6249", "6250", and "6251".

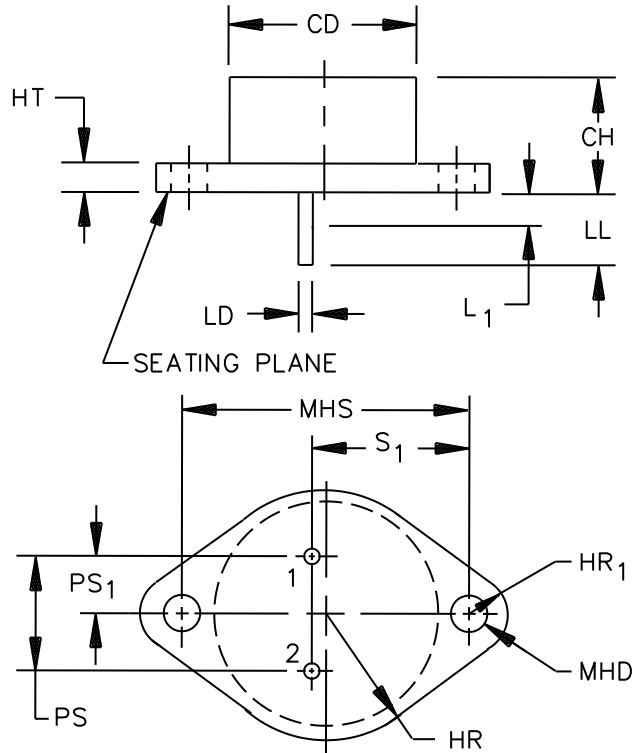
1.5.4 Suffix letters. No suffix letters are used on devices that are packaged in the TO-3 package of [figure 1](#). The suffix letters "T1" are used on devices that are packaged in the TO-254AA package of [figure 2](#). The suffix letters "T3" are used on devices that are packaged in the TO-257AA package of [figure 3](#).

1.5.5 Lead finish. The lead finishes applicable to this specification sheet are listed on [QPDSIS-19500](#).

1.5.6 Die identifiers for unencapsulated devices (manufacturers and critical interface identifiers). The manufacturer die identifier that is applicable for this specification sheet is "B" (see [figure 4](#) and [6.5](#)).

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	Dimensions				
Symbol	Inches		Millimeters		Note
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.250	.450	6.35	11.43	
HR	.495	.525	12.57	13.34	3
HR ₁	.131	.188	3.33	4.78	3
HT	.050	.135	1.27	3.43	
LD	.038	.053	0.97	1.35	3, 4
LL	.312	.500	7.92	12.70	4
L ₁		.050		1.27	4
MHD	.151	.161	3.84	4.09	5
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	6
PS ₁	.205	.25	5.21	6.35	3, 6
S ₁	.655	.675	16.64	17.15	3, 6



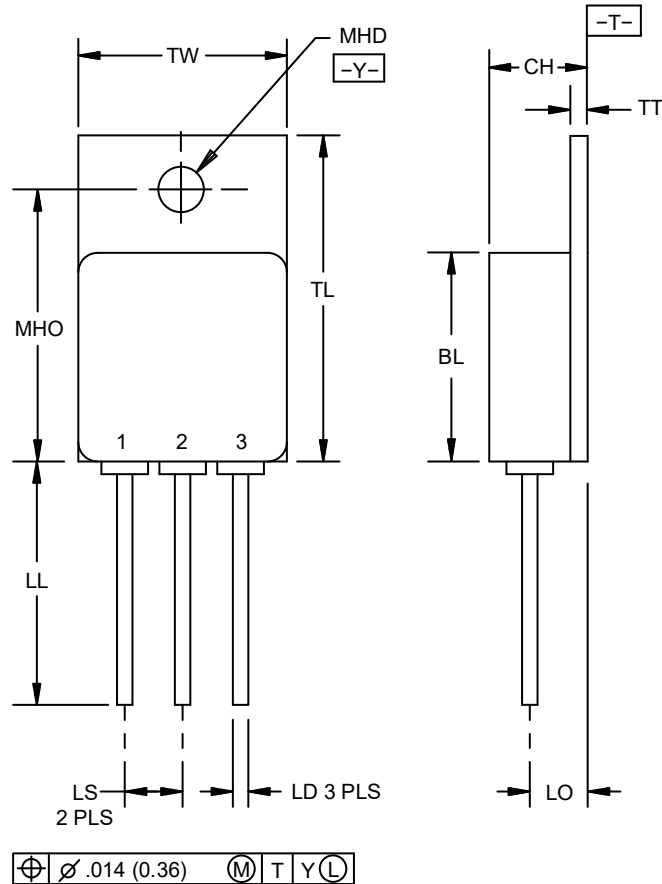
NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Terminal 1 is emitter; terminal 2 is base; collector shall be electrically connected to the case.
3. Dimension applies to both terminals.
4. Dimension LD applies between dimensions L₁ and LL maximum. Lead diameter shall not exceed twice dimension LD within dimension L₁.
5. Mounting holes shall be deburred on the seating plane side.
6. These dimensions should be measured at points .050 (1.27 mm) to .055 (1.40 mm) below seating plane. When gage is not used, measurement will be made at seating plane.
7. The seating plane of the header shall be flat within .001 inch (0.03 mm) concave to .004 inch (0.10 mm) convex inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.

FIGURE 1. Physical dimensions of TO-204AA package (similar to TO-3).

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Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.535	.545	13.59	13.84
CH	.249	.260	6.32	6.60
LD	.035	.045	0.89	1.14
LL	.530	.550	13.46	13.97
LO	.150 BSC		3.81 BSC	
LS	.150 BSC		3.80 BSC	
MHD	.139	.149	3.53	3.78
MHO	.665	.685	16.89	17.40
TL	.790	.800	20.07	20.32
TT	.040	.050	1.02	1.27
TW	.535	.545	13.59	13.84
Term 1	Base			
Term 2	Collector			
Term 3	Emitter			



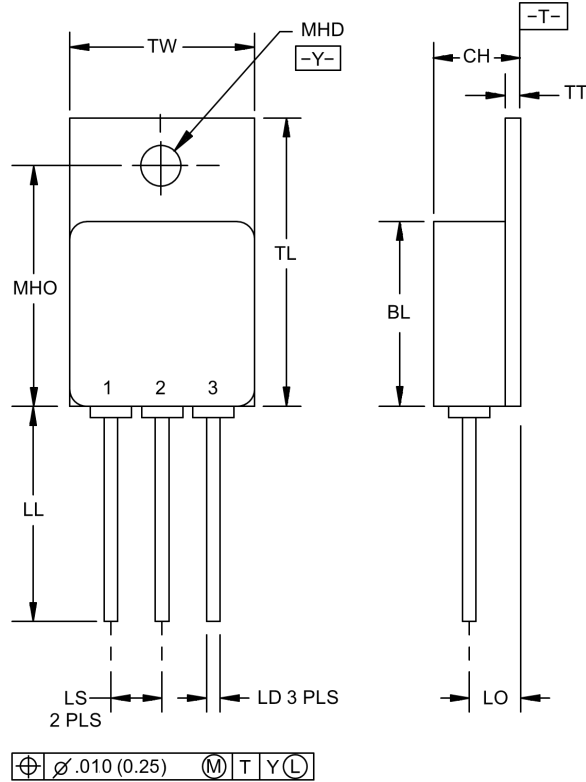
NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Protrusion of ceramic eyelets included in dimension LL.
3. All terminals are isolated from case.

FIGURE 2. Dimensions and configuration three terminal flange mount header TO-254AA package.

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Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.410	.430	10.41	10.92
CH	.190	.200	4.83	5.08
LD	.025	.035	0.64	0.89
LL	.500	.750	12.70	19.05
LO	.120 BSC		3.05 BSC	
LS	.100 BSC		2.54 BSC	
MHD	.140	.150	3.56	3.81
MHO	.527	.537	13.39	13.63
TL	.645	.665	16.38	16.89
TT	.035	.045	0.89	1.14
TW	.410	.420	10.41	10.67
Term 1	Base			
Term 2	Collector			
Term 3	Emitter			

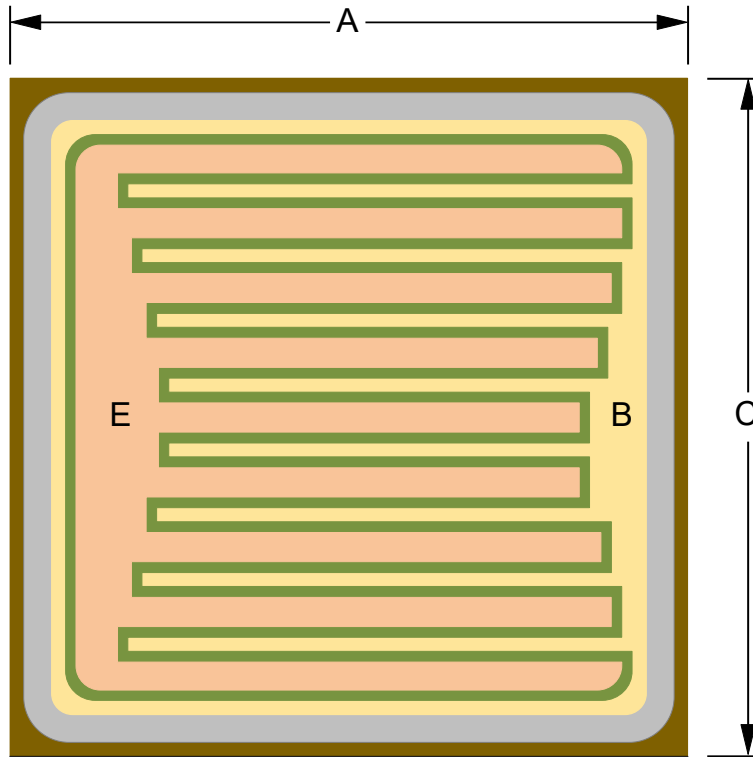


NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Protrusion of ceramic eyelets included in dimension LL.
3. All terminals are isolated from case.

FIGURE 3. Dimensions and configuration for three terminal flange mount header TO-257AA package.

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Letter	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A, C	.205	.215	5.21	5.46

NOTES:

Design data

Chip thickness: .012 inch (0.305 mm) $\pm$.002 inch (0.051 mm).

Bonding pad: B = .018 inch (0.46 mm) x .040 (1.02 mm).

E = .018 inch (0.46 mm) x .040 (1.02 mm).

Metallization:

Top metal: Aluminum 54,000 Å minimum, 60,000 Å nominal.

Back metal: Al/Ti/Ni/Au 10,000 Å minimum, 12,500 Å nominal.

Back side: Collector.

FIGURE 4. JANHCB and JANKCB (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 manufacturer's list (QML) 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**.

3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in **MIL-PRF-19500**, and on [figure 1](#) (TO-3), [figure 2](#) (TO-254AA), [figure 3](#) (TO-257AA), and [figure 4](#) (die) 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).

3.4.2 Construction. These devices shall be constructed in a manner and using materials which enable the devices to meet the applicable requirements of **MIL-PRF-19500** and this document. Methods used for electrical isolation of package terminal feedthroughs shall employ materials that contain a minimum of 90 percent AL₂O₃ (ceramic).

3.5 Marking. Marking shall be in accordance with **MIL-PRF-19500**. The radiation hardened designator M, D, P, L, R, F, G, or H shall immediately precede (or replace) the device "2N" identifier (depending upon degree of abbreviation required).

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

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

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

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 table I and II, and III).

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.

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4.3 Screening (JANS, JANTX, and JANTXV levels only). Screening shall be in accordance with table IV of 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	Measurements for JANS	Measurements for JANTX and JANTXV
(1) 3c	Thermal impedance, method 3131 of MIL-STD-750 (see 4.3.1)	Thermal impedance, method 3131 of MIL-STD-750 (see 4.3.1)
9	ICEX1 and hFE1	
11	ICEX1 and hFE1 $\Delta ICEX1 = 100$ percent of initial value or 2 μA dc, whichever is greater; $\Delta hFE1 = \pm 15$ percent of initial value.	ICEX1 and hFE1
12	See 4.3.2	See 4.3.2
13	Subgroup 2 and 3 of table I herein; $\Delta ICEX1 = 100$ percent of initial value or 2 μA dc, whichever is greater; $\Delta hFE1 = \pm 25$ percent of initial value.	Subgroup 2 of table I herein; $\Delta ICEX1 = 100$ percent of initial value or 2 μA dc, whichever is greater; $\Delta hFE1 = \pm 25$ percent of initial value.
17	For TO-254AA and TO-257AA packages only. See 4.3.4.	For TO-254AA and TO-257AA packages only. See 4.3.4.

- (1) Thermal impedance ($Z_{\theta JC}$) limits shall not exceed figures 7, 8, or 9 thermal impedance curves. This test shall be performed anytime after temperature cycling, screen 3a; JANTX and JANTXV does not need to be repeated in screening requirements.

4.3.1 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 used in screen 3c and table I, subgroup 2 shall comply with the thermal impedance graphs on figures 7, 8, or 9 (less than or equal to the curve value at the same t_H time) and/or shall be less than the process determined statistical maximum limit as outlined in method 3131.

4.3.2 Power burn-in conditions. Power burn-in conditions are as follows: $V_{CB} = 10$ to 30 V dc, $T_A = +30^\circ C$ maximum, $T_J = +175^\circ C$ minimum.

4.3.4 Dielectric withstanding voltage. The test for dielectric withstanding voltage shall be performed in accordance with method 1081 of MIL-STD-750. Endpoints shall be in accordance with subgroup 2 of table I herein. The following details shall apply:

- a. Magnitude of test voltage..... 900 V dc.
- b. Duration of application of test voltage..... 15 seconds (min).
- c. Points of application of test voltage..... All leads to case (bunch connection).
- d. Method of connection..... Mechanical.
- e. Kilovolt-ampere rating of high voltage source..... 1,200 V/1.0 mA (min).
- f. Maximum leakage current..... 1.0 mA.
- g. Voltage ramp up time..... 500 V/second.

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4.4 Conformance inspection. Conformance inspection shall be in accordance with [MIL-PRF-19500](#) and as specified herein. Group A inspection shall be performed on each subplot.

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 the conditions specified for subgroup testing in table E-VIA (JANS) and table E-VIB (JAN, JANTX, and JANTXV) of [MIL-PRF-19500](#).

4.4.2.1 Quality level JANS.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	2037	Test condition A, all internal leads for each device shall be pulled separately.
B4	1037	$V_{CB} = 10 \text{ V dc}$; adjust power or current to achieve $\Delta T_J = +100^\circ\text{C}$.
B5	1027	$V_{CB} = 10 \text{ V dc}$; adjust T_A and P_D to achieve $T_J = +275^\circ\text{C}$ minimum. $P_D = 100$ percent of rated P_T minimum; $T_A = +100^\circ\text{C}$ maximum.

4.4.2.2 Quality levels JAN, JANTX and JANTXV.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	1037 or 1027	$V_{CB} = 10 \text{ V dc}$; adjust power or current to achieve $\Delta T_J = +100^\circ\text{C}$. $V_{CB} = 10 \text{ V dc}$; $T_J = +175^\circ\text{C}$ minimum; $T_A = +30^\circ\text{C}$ maximum.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-VII of [MIL-PRF-19500](#).

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
C2	2036	Test condition A; weight = 10 pounds (4.54 kg); time = 15 seconds.
C3	2016	Non-operating 1,500 G; 0.5 ms, 5 blows in each orientation: X_1 , Y_1 , Y_2 , Z_1 (total 20 blows).
C5	3131	See 4.5.2 . See thermal impedance curves figures 7 , 8 , and 9 .
C6	1027 or 1037	$V_{CB} = 10 \text{ V dc}$; $T_J = +175^\circ\text{C}$ minimum; $T_A = +30^\circ\text{C}$ maximum. $V_{CB} = 10 \text{ V dc}$, adjust power or current to achieve $\Delta T_J = +100^\circ\text{C}$.

4.4.4 Group D inspection. Conformance inspection for hardness assured JANS and JANKC 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.e](#) herein), except group D, subgroup 2 may be performed separate from other subgroups. Group D inspection may also be performed ahead of the screening lot using die selected in accordance with [MIL-PRF-19500](#) and related documents. 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 appendix E, table E-IX of [MIL-PRF-19500](#) and as specified herein.

4.5 Methods 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 Thermal resistance. Thermal resistance measurement shall be conducted in accordance with test method 3131 of [MIL-STD-750](#). The following details shall apply:

- a. Collector current magnitude during power applications shall be 3.0 A dc.
- b. Collector to emitter voltage magnitude shall be 10 V dc.
- c. Reference temperature measuring point shall be the case.
- d. Reference point temperature shall be $+25^{\circ}\text{C} \leq t_r \leq +75^{\circ}\text{C}$ and recorded before the last is started.
- e. Mounting arrangement shall be with heat sink to header.
- f. Maximum limit for $R_{\theta JC}$ see thermal impedance curves [figures 7, 8, and 9](#).

4.5.3 Coil selection for safe operating area (SOA) tests. In selecting coils for use in the clamped and unclamped inductive SOA tests, prime consideration should be given to the recommended commercially available coil. However, due to the extreme critical nature of the coil in these circuits and the wide tolerance of some commercially available coils (+100, -50 percent), it shall be the semiconductor manufacturer's responsibility, to prove upon request, compliance or equivalency of any coil used (commercial or in-plant designed) to within (+20, -10 percent), of the specified inductance at the rated current and dc resistance.

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.

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TABLE I. Group A inspection.

Inspection <u>1</u> /	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Thermal impedance <u>2</u> /	3131	See 4.3.1	$Z_{\theta JX}$			°C/W
Breakdown voltage, collector to emitter 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3011	Bias condition B, $I_C = 200$ mA dc, $L = 42$ mH, $f = 30 - 60$ Hz (see figure 10)	$V_{(BR)CEO}$	200 275 350		V dc V dc V dc
Breakdown voltage, collector to emitter 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3011	Bias condition B, $I_C = 200$ mA dc, $L = 14$ mH, $f = 30 - 60$ Hz $R_{BE} = 50$ ohms (see figure 10)	$V_{(BR)CER}$	225 300 375		V dc V dc V dc
Emitter to base cutoff current	3061	Bias condition D, $V_{EB} = 6$ V dc	I_{EBO}		100	μA dc
Collector to emitter cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3041	Bias condition D $V_{CE} = 150$ V dc $V_{CE} = 225$ V dc $V_{CE} = 300$ V dc	I_{CEO}		1.0 1.0 1.0	mA dc mA dc mA dc
Collector to emitter cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3041	Bias condition A, $V_{BE} = -1.5$ V dc $V_{CE} = 225$ V dc $V_{CE} = 300$ V dc $V_{CE} = 375$ V dc	I_{CEX1}		10 10 10	μA dc μA dc μA dc

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 2</u> – Continued						
Collector to base cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3036	Bias condition D $V_{CB} = 300$ V dc $V_{CB} = 375$ V dc $V_{CB} = 450$ V dc	I_{CBO}		0.5 0.5 0.5	mA dc mA dc mA dc
Forward-current transfer ratio 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3076	$V_{CE} = 3$ V dc; $I_C = 10$ A dc; pulsed (see 4.5.1)	h_{FE1}	10 8 6	50 50 50	
Collector to emitter saturated voltage 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3071	$I_C = 10$ A dc; pulsed (see 4.5.1) $I_B = 1.0$ A dc $I_B = 1.25$ A dc $I_B = 1.67$ A dc	$V_{CE(SAT)}$		1.5 1.5 1.5	V dc V dc V dc
Base to emitter saturated voltage 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3066	Test condition A; $I_C = 10$ A dc; pulsed (see 4.5.1) $I_B = 1.0$ A dc $I_B = 1.25$ A dc $I_B = 1.67$ A dc	$V_{BE(SAT)}$		2.25 2.25 2.25	V dc V dc V dc

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u>						
High temperature operation		T _A = +125°C.				
Collector to emitter cutoff current	3041	Bias condition A, V _{BE} = -1.5 V dc.	I _{CEX2}			
2N6249, 2N6249T1		V _{CE} = 225 V dc			90	μA dc
2N6249T3		V _{CE} = 300 V dc			90	μA dc
2N6250, 2N6250T1		V _{CE} = 375 V dc			90	μA dc
2N6250T3						
2N6251, 2N6251T1						
2N6251T3						
Low-temperature operation		T _A -55°C.				
Forward-current transfer ratio	3076	V _{CE} = 3 V dc; I _C = 10 A dc; pulsed (see 4.5.1).	h _{FE2}			
2N6249, 2N6249T1				5		
2N6249T3						
2N6250, 2N6250T1				4		
2N6250T3						
2N6251, 2N6251T1				3		
2N6251T3						
<u>Subgroup 4</u>						
Pulsed response:	3251	Test conditions A except test circuit and pulse requirements in accordance with figure 11.	t _{on}			
Turn-on time		V _{CC} = 200 V dc; I _C = 10 A dc.				
2N6249, 2N6249T1		I _B = 1.0 A dc			2.0	μs
2N6249T3		I _B = 1.25 A dc			2.0	μs
2N6250, 2N6250T1		I _B = 1.67 A dc			2.0	μs
2N6250T3						
2N6251, 2N6251T1						
2N6251T3						
Turn-off time		V _{CC} = 200 V dc; I _C = 10 A dc.	t _{off}			
2N6249, 2N6249T1		I _B = 1.0 A dc			4.5	μs
2N6249T3		I _B = 1.25 A dc			4.5	μs
2N6250, 2N6250T1		I _B = 1.67 A dc			4.5	μs
2N6250T3						
2N6251, 2N6251T1						
2N6251T3						

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1</u> /	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 5</u>						
Magnitude of small signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 10 \text{ V dc}$; $I_C = 1.0 \text{ A dc}$; $f = 1 \text{ MHz}$.	$ h_{FE} $	2.5	15	
Open capacitance open circuit	3236	$V_{CE} = 10 \text{ V dc}$; $I_C = 0$; $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$.	C_{obo}		500	pF
Safe operating area (dc operation)	3051	$T_C = +25^\circ\text{C}$; $t = 1 \text{ s}$; 1 cycle (see figure 12).				
Test 1		$I_C = 10 \text{ A dc}$; $V_{CE} = 17.5 \text{ V dc}$				
Test 2		$I_C = 5.8 \text{ A dc}$; $V_{CE} = 30 \text{ V dc}$				
Test 3		$I_C = 0.3 \text{ A dc}$; $V_{CE} = 100 \text{ V dc}$				
Test 4		2N6249, 2N6249T1, and 2N6249T3 only; $I_C = 0.13 \text{ A dc}$; $V_{CE} = 200 \text{ V dc}$				
Test 5		2N6250, 2N6250T1, and 2N6250T3 only; $I_C = 0.09 \text{ A dc}$; $V_{CE} = 275 \text{ V dc}$				
Test 6		2N6251, 2N6251T1, and 2N6251T3 only; $I_C = 0.065 \text{ A dc}$; $V_{CE} = 350 \text{ V dc}$				
End-point electrical measurements		Table I , subgroup 2				

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 5</u> - continued						
Safe operating area (switching)	3053	Load condition C; (unclamped inductive load) (see figure 13 .) $T_C = +25^\circ\text{C}$; duty cycle ≤ 10 percent; $R_S = 0.1$.				
Test 1		$T_P \approx 5$ ms (vary to obtain I_C); $R_{BB1} = 2\Omega$, $V_{BB1} = 10$ V dc $R_{BB2} = 50\Omega$, $V_{BB2} = 4$ V dc $V_{CC} = 10$ V dc, $I_C = 10$ A dc $L = 50$ μH at 10 A dc				
Test 2		$T_P \approx 5$ ms (vary to obtain I_C); $R_{BB1} = 40\Omega$, $V_{BB1} = 10$ V dc $R_{BB2} = 50\Omega$, $V_{BB2} = 4$ V dc $V_{CC} = 10$ V dc, $I_C = 2.0$ A dc $L = 500$ μH at 2.0 A dc $R_L = 0.01\Omega$				
Safe operating area (switching)		(See figure 14) clamped inductive sweep $T_C = +25^\circ\text{C}$; duty cycle ≤ 10 percent; $T_P \approx 5$ ms (vary to obtain I_C); $R_S = 0.1\Omega$, $V_{CC} = 10$ V dc $I_C = 10$ A dc Clamp voltage: 2N6249, 2N6249T1 2N6249T3 = 200 V dc 2N6250, 2N6250T1 2N6250T3 = 275 V dc 2N6251, 2N6251T1 2N6251T3 = 350 V dc				
End-point electrical measurements		table I , subgroup 2				
<u>Subgroups 6 and 7</u>						
Not applicable						

1/ For sampling plan, see [MIL-PRF-19500](#).

2/ For end-point measurements, this test is required for the following subgroups:
Group B, subgroups 3, 4, and 5 (JANS).
Group B, subgroups 2 and 3 (JAN, JANTX, and JANTXV).
Group C, subgroup 2 and 6.
Group E, subgroup 1.

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TABLE II. Group D inspection.

Inspection <u>1/</u> <u>2/</u> <u>3/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1 4/</u>						
Neutron irradiation	1017	Neutron exposure $V_{CES} = 0$ V				
Breakdown voltage, collector to emitter	3011	Bias condition D, $I_C = 200$ mA dc, $L = 42$ mH, $f = 30 - 60$ Hz (see figure 10)	$V_{(BR)CEO}$			
2N6249, 2N6249T1 2N6249T3				200		V dc
2N6250, 2N6250T1 2N6250T3				275		V dc
2N6251, 2N6251T1 2N6251T3				350		V dc
Breakdown voltage, collector to emitter	3011	Bias condition D, $I_C = 200$ mA dc, $L = 14$ mH, $f = 30 - 60$ Hz, $R_{BE} = 50$ ohms (see figure 10)	$V_{(BR)CER}$			
2N6249, 2N6249T1 2N6249T3				225		V dc
2N6250, 2N6250T1 2N6250T3				300		V dc
2N6251, 2N6251T1 2N6251T3				375		V dc
Emitter to base cutoff current	3061	Bias condition D, $V_{EB} = 6$ V dc	I_{EBO}		200	μ A dc
Collector to emitter cutoff current	3041	Bias condition D	I_{CEO}			
2N6249, 2N6249T1 2N6249T3		$V_{CE} = 150$ V dc			2.0	mA dc
2N6250, 2N6250T1 2N6250T3		$V_{CE} = 225$ V dc			2.0	mA dc
2N6251, 2N6251T1 2N6251T3		$V_{CE} = 300$ V dc			2.0	mA dc
Collector to emitter cutoff current	3041	Bias condition A, $V_{BE} = -1.5$ V dc	I_{CEX1}			
2N6249, 2N6249T1 2N6249T3		$V_{CE} = 225$ V dc			20	μ A dc
2N6250, 2N6250T1 2N6250T3		$V_{CE} = 300$ V dc			20	μ A dc
2N6251, 2N6251T1 2N6251T3		$V_{CE} = 375$ V dc			20	μ A dc

See footnotes at end of table.

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TABLE II. Group D inspection - Continued.

Inspection <u>1/ 2/ 3/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1 4/ continued</u>						
Collector to base cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3036	Bias condition D $V_{CB} = 300 \text{ V dc}$ $V_{CB} = 375 \text{ V dc}$ $V_{CB} = 450 \text{ V dc}$	I_{CBO}		1.0 1.0 1.0	mA dc mA dc mA dc
Forward-current transfer ratio 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3076	$V_{CE} = 3 \text{ V dc}; I_C = 10 \text{ A dc};$ pulsed (see 4.5.1)	$[h_{fe1}] \text{ 5/}$	[5] [4] [3]	50 50 50	
Collector to emitter saturated voltage 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3071	$I_C = 10 \text{ A dc};$ pulsed (see 4.5.1) $I_B = 1.0 \text{ A dc}$ $I_B = 1.25 \text{ A dc}$ $I_B = 1.67 \text{ A dc}$	$V_{CE(SAT)}$		1.725 1.725 1.725	V dc V dc V dc
Base to emitter saturated voltage 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3066	Test condition A; $I_C = 10 \text{ A dc};$ pulsed (see 4.5.1) $I_B = 1.0 \text{ A dc}$ $I_B = 1.25 \text{ A dc}$ $I_B = 1.67 \text{ A dc}$	$V_{BE(SAT)}$		2.59 2.59 2.59	V dc V dc V dc
<u>Subgroup 2</u>						
Total dose irradiation 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	1019	Condition A, gamma exposure $V_{CES} = 160 \text{ V}$ $V_{CES} = 220 \text{ V}$ $V_{CES} = 280 \text{ V}$				

See footnotes at end of table.

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TABLE II. Group D inspection - Continued.

Inspection <u>1/</u> <u>2/</u> <u>3/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
Subgroup 2 – Continued						
Breakdown voltage, collector to emitter 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3011	Bias condition D, I _C = 200 mA dc, L = 42 mH, f = 30 - 60 Hz (see figure 10)	V _{(BR)CEO}	200		V dc
				275		V dc
				350		V dc
Breakdown voltage, collector to emitter 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3011	Bias condition D, I _C = 200 mA dc, L = 14 mH, f = 30 - 60 Hz, R _{BE} = 50 ohms (see figure 10)	V _{(BR)CER}	225		V dc
				300		V dc
				375		V dc
Emitter to base cutoff current	3061	Bias condition D, V _{EB} = 6 V dc	I _{EBO}		200	µA dc
Collector to emitter cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3041	Bias condition D V _{CE} = 150 V dc V _{CE} = 225 V dc V _{CE} = 300 V dc	I _{CEO}		2.0	mA dc
					2.0	mA dc
					2.0	mA dc
Collector to emitter cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3041	Bias condition A, V _{BE} = -1.5 V dc V _{CE} = 225 V dc V _{CE} = 300 V dc V _{CE} = 375 V dc	I _{CEX1}		20	µA dc
					20	µA dc
					20	µA dc

See footnotes at end of table.

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w/AMENDMENT 1

TABLE II. Group D inspection - Continued.

Inspection 1/ 2/ 3/	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 2</u> - Continued						
Collector to base cutoff current 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3036	Bias condition D $V_{CB} = 300$ V dc $V_{CB} = 375$ V dc $V_{CB} = 450$ V dc	I_{CBO}		1.0 1.0 1.0	mA dc mA dc mA dc
Forward-current transfer ratio 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3076	$V_{CE} = 3$ V dc; $I_C = 10$ A dc; pulsed (see 4.5.1)	[hfe1] 5/	[5] [4] [3]	50 50 50	
Collector to emitter saturated voltage 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3071	$I_C = 10$ A dc; pulsed (see 4.5.1) $I_B = 1.0$ A dc $I_B = 1.25$ A dc $I_B = 1.67$ A dc	$V_{CE(SAT)}$		1.725 1.725 1.725	V dc V dc V dc
Base to emitter saturated voltage 2N6249, 2N6249T1 2N6249T3 2N6250, 2N6250T1 2N6250T3 2N6251, 2N6251T1 2N6251T3	3066	Test condition A; $I_C = 10$ A dc; pulsed (see 4.5.1) $I_B = 1.0$ A dc $I_B = 1.25$ A dc $I_B = 1.67$ A dc	$V_{BE(SAT)}$		2.59 2.59 2.59	V dc V dc 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 all device types unless otherwise noted.

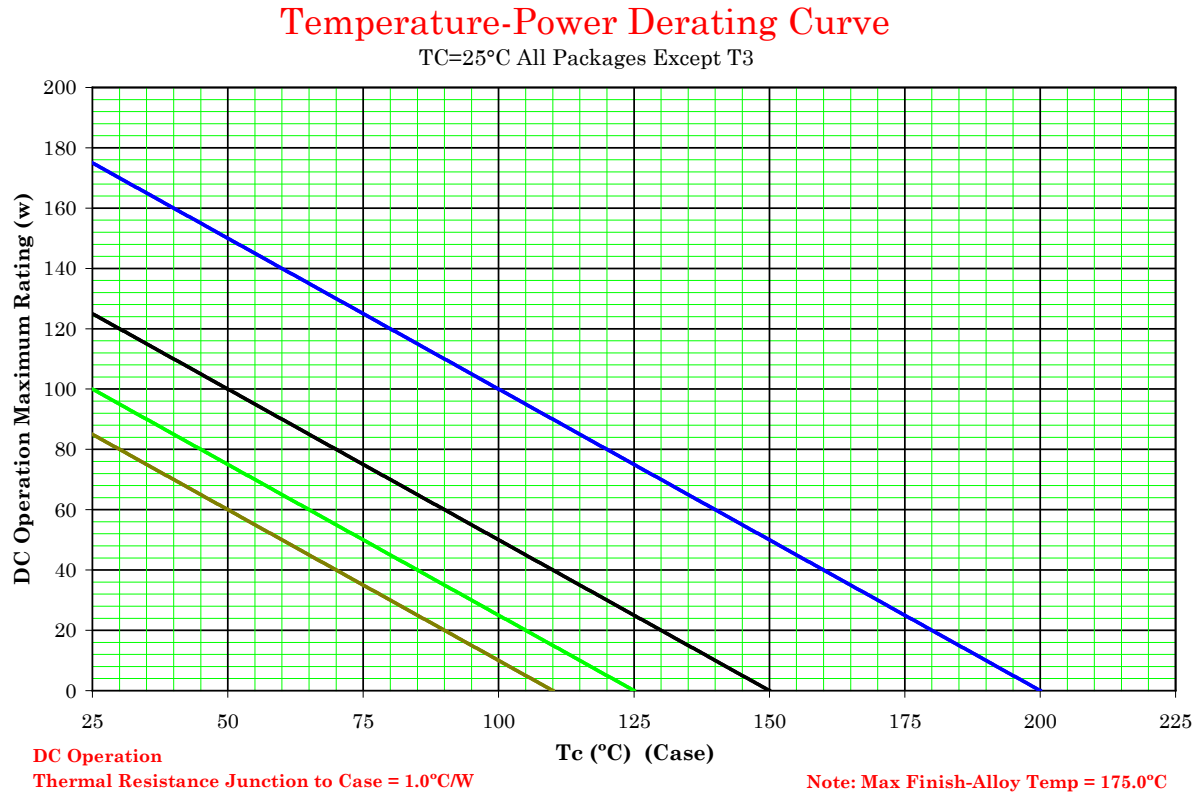
4/ See 6.2.e herein.

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 that [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.

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w/AMENDMENT 1

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

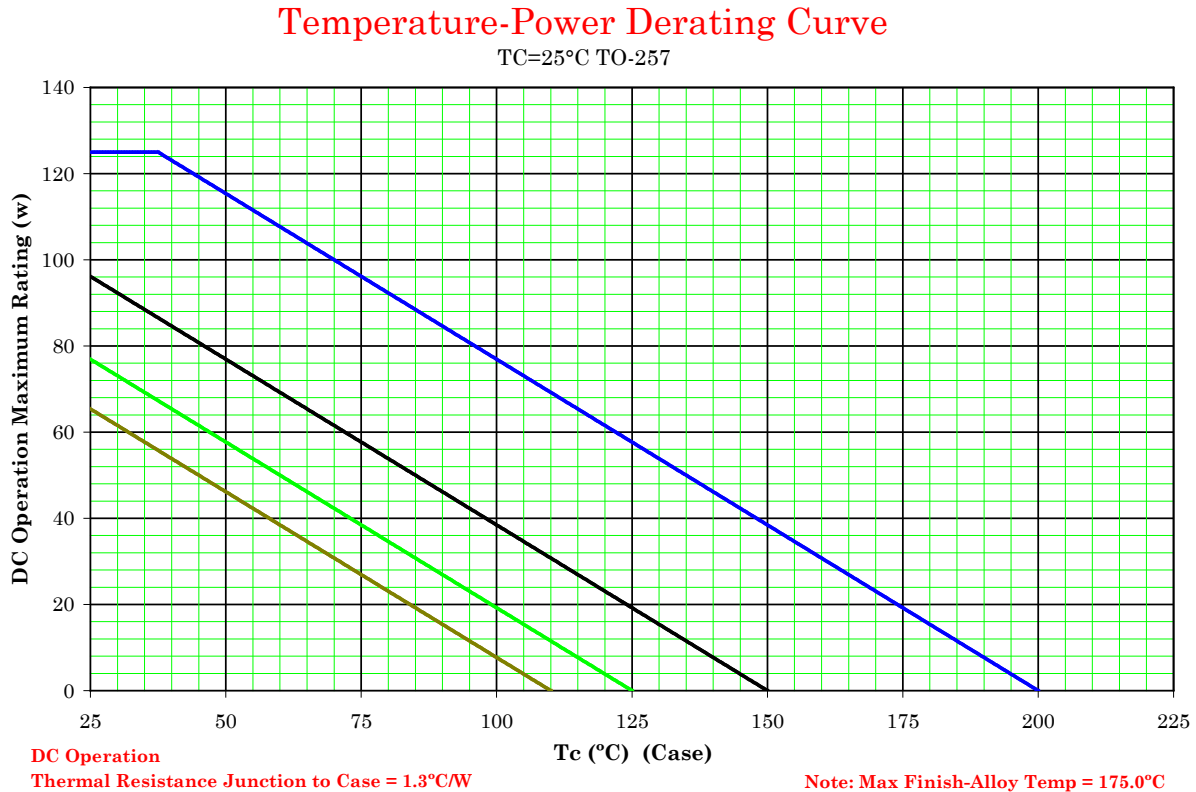
Inspection	MIL-STD-750		Sample plan
	Method	Conditions	
<u>Subgroup 1</u>			45 devices c = 0
Temperature cycling (air to air)	1051	Test condition C, 500 cycles	
Hermetic seal	1071	Fine and gross leak	
End-point electrical measurements		See table I , subgroup 2	
<u>Subgroup 2</u>			45 devices, c = 0
Intermittent life	1037	V _{CB} = 10 V dc, 6,000 cycles, adjust power or current to achieve $\Delta T_J = +100^\circ\text{C}$	
End-point electrical measurements		See table I , subgroup 2	
<u>Subgroup 4</u>			Sample size N/A
Thermal impedance curves		See MIL-PRF-19500 , table E-IX, group E, subgroup 4	
<u>Subgroup 5</u>			
Barometric pressure	1001	Condition C, see 1.3 , all devices	15 devices, c = 0
<u>Subgroup 8;</u>			45 devices, c = 0
Reverse stability	1033	Condition A for devices ≥ 400 V, condition B for devices < 400 V	



NOTES:

1. Top curve is thermal runaway loci and cannot be used as a derate design curve since it exceeds the maximum ratings for this part. Operating under this curve using these mounting conditions assures the device will not have a thermal runaway. This is the true inverse of the worst case thermal resistance value extrapolated out to the thermal runaway point.
2. Derate design curve constrained by the maximum junction temperature ($T_J \leq +200^\circ\text{C}$) and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq +150^\circ\text{C}$, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at $T_J \leq +125^\circ\text{C}$, and $+110^\circ\text{C}$ to show power rating where most users want to limit T_J in their application.

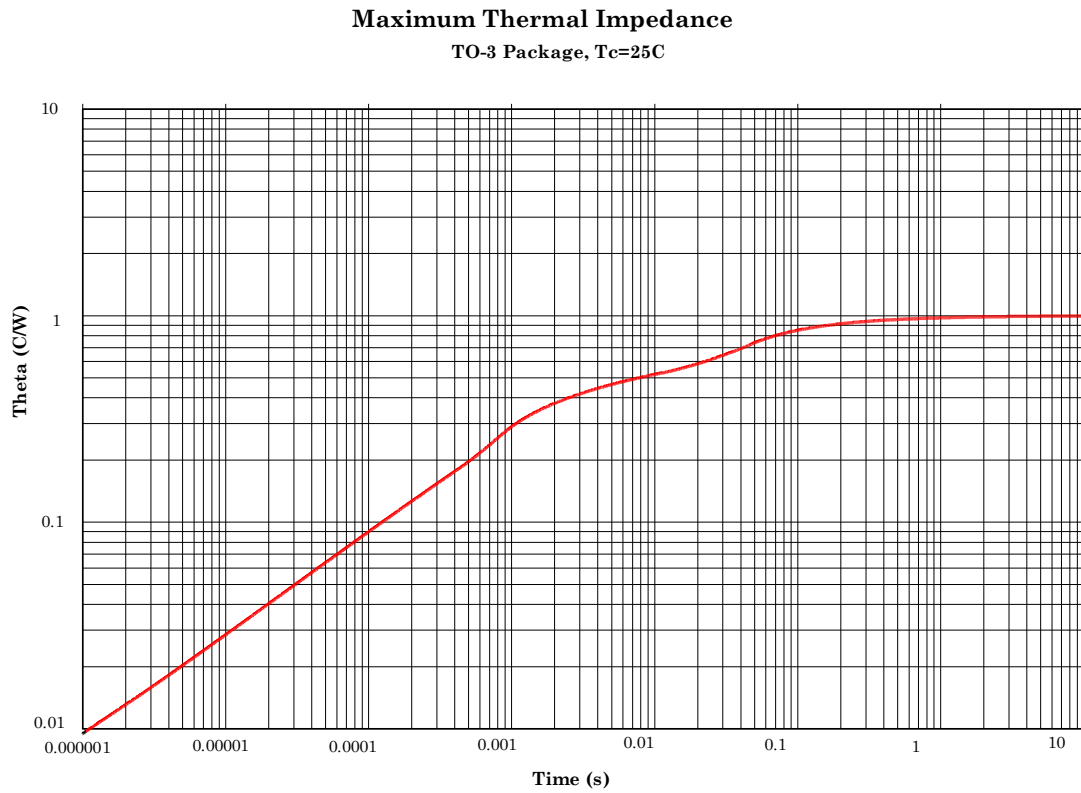
FIGURE 5. Derating for all devices except the T3 (TO-257AA) devices.



NOTES:

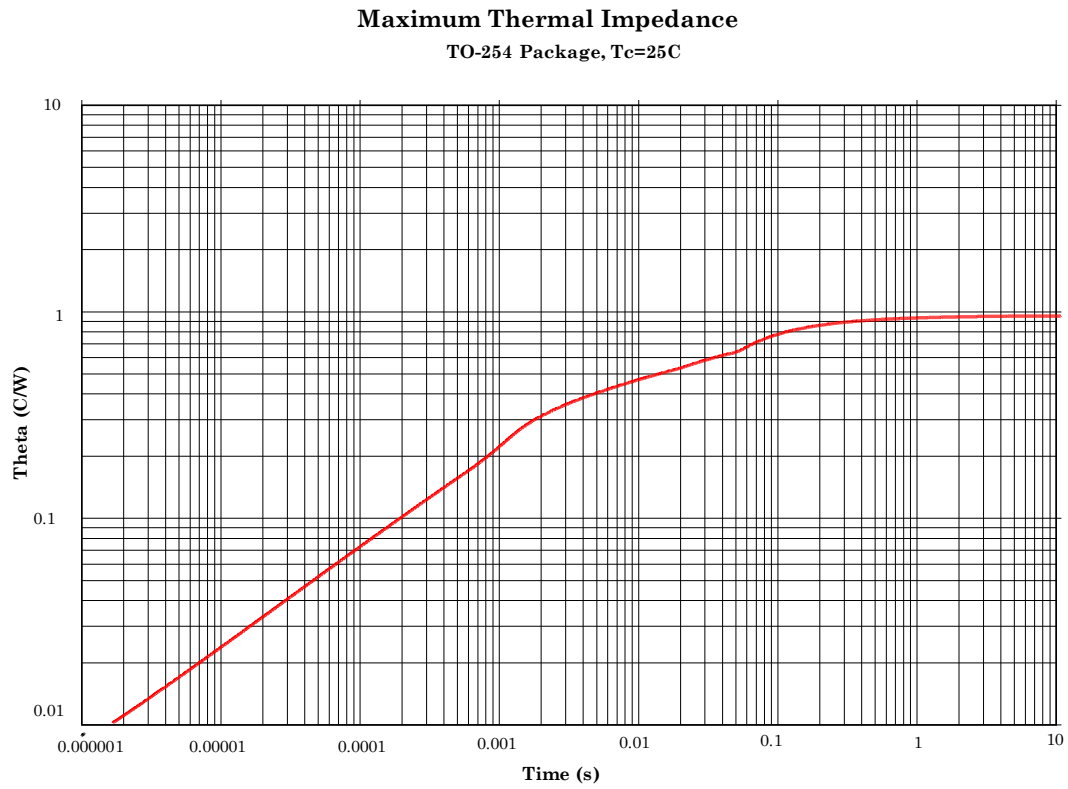
1. Top curve is thermal runaway loci and cannot be used as a derate design curve since it exceeds the maximum ratings for this part. Operating under this curve using these mounting conditions assures the device will not have a thermal runaway. This is the true inverse of the worst case thermal resistance value extrapolated out to the thermal runaway point.
2. Derate design curve constrained by the maximum junction temperature ($T_J \leq +200^\circ\text{C}$) and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq +150^\circ\text{C}$, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at $T_J \leq +125^\circ\text{C}$, and $+110^\circ\text{C}$ to show power rating where most users want to limit T_J in their application.

FIGURE 6. Derating for T3 (TO-257AA) packages.



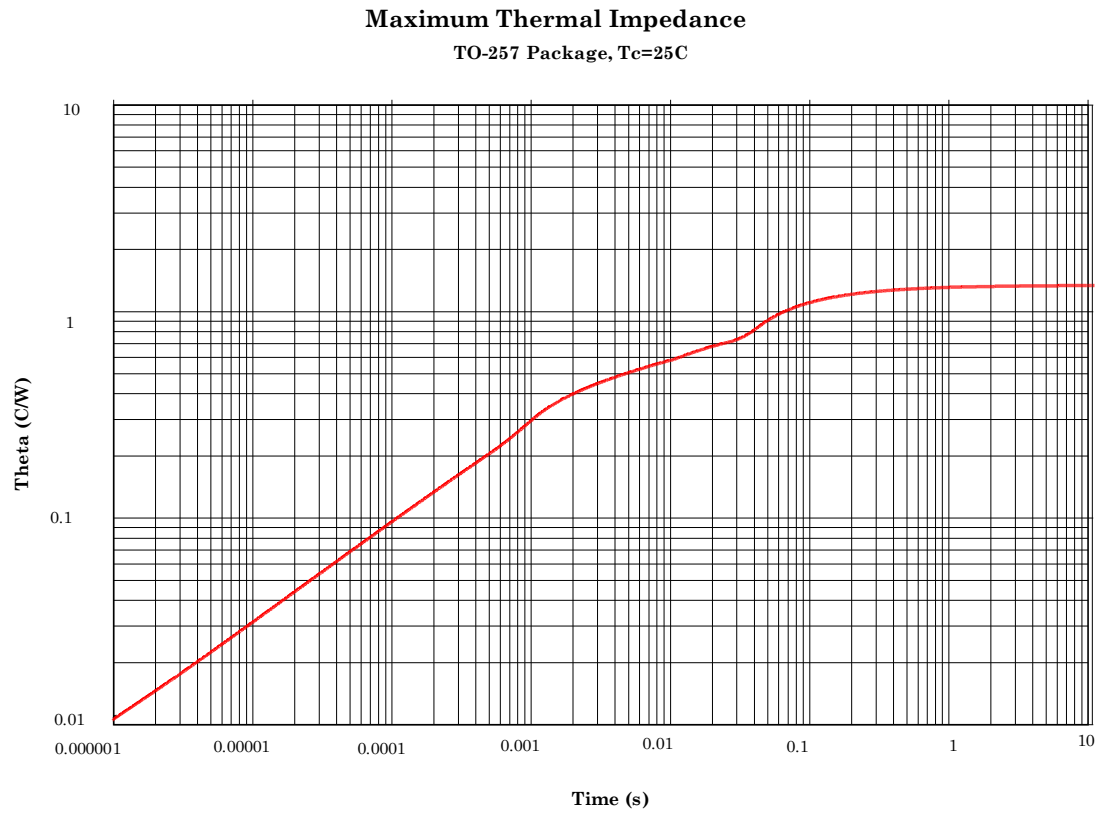
$$R_{\theta JC} = 1.0^\circ\text{C/W}$$

FIGURE 7. Thermal impedance graph for 2N6249, 2N6250, and 2N6251 (TO-3).



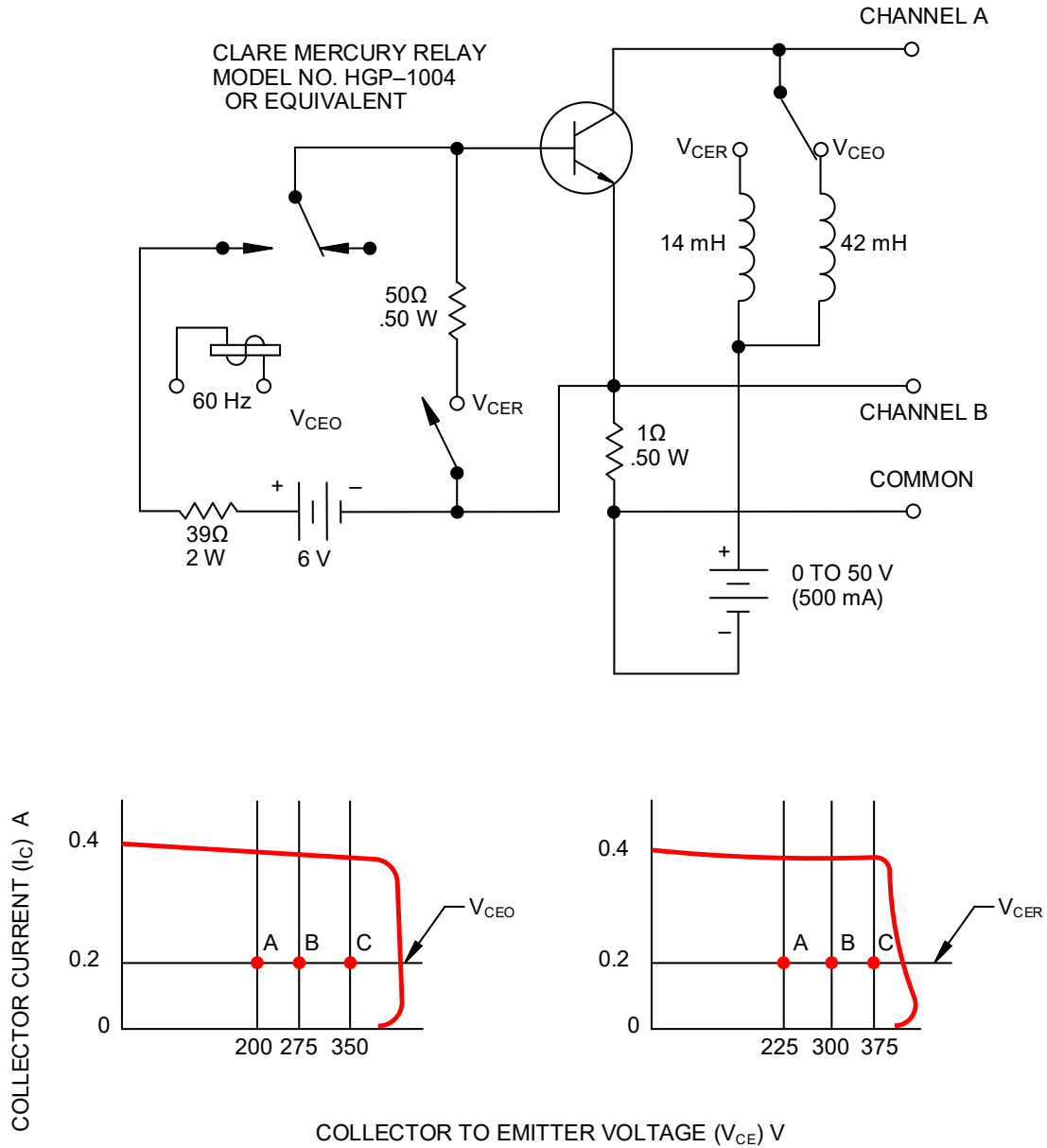
$$R_{\theta JC} = 1.0^\circ\text{C/W}$$

FIGURE 8. Thermal impedance graph for 2N6249T1, 2N6250T1, and 2N6251T1 (TO-254AA).



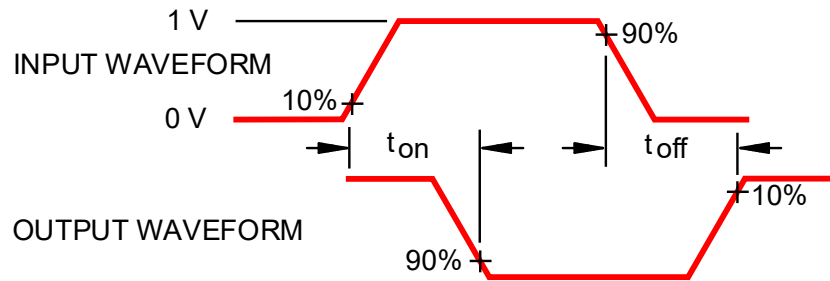
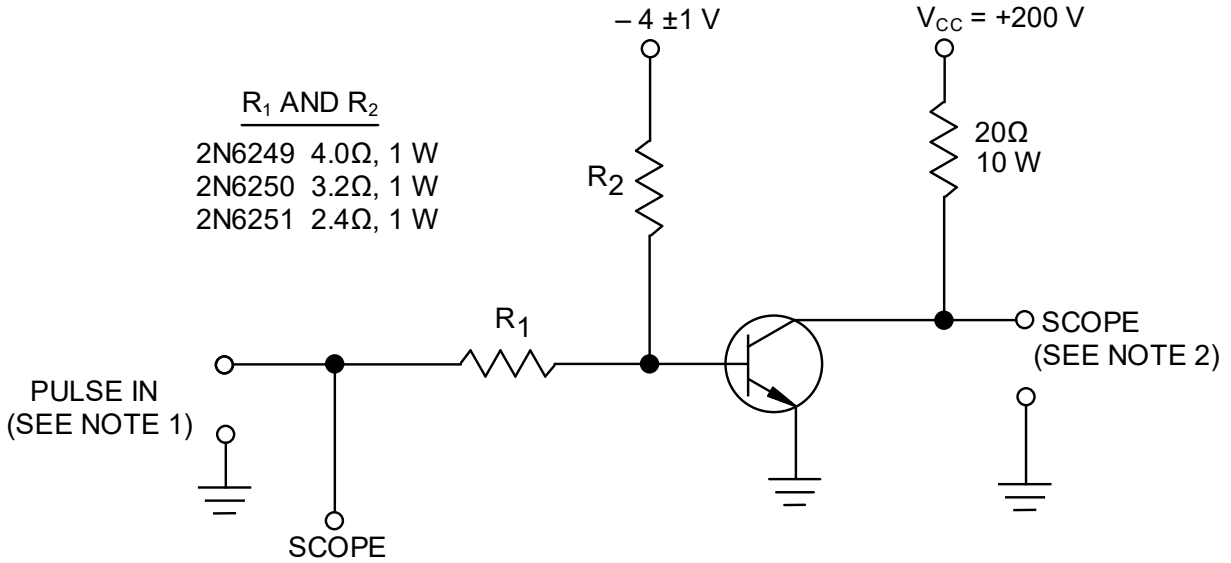
$$R_{\theta JC} = 1.3^{\circ}\text{C/W}$$

FIGURE 9. Thermal impedance graph for 2N6249T3, 2N6250T3, and 2N6251T3 (TO-257AA).



NOTE: The sustaining voltages V_{CEO} and V_{CER} are acceptable when the traces fall to the right of point "A" for type 2N6249 and 2N6249T1, point "B" for type 2N6250 and 2N6250T1, and point "C" for type 2N6251 and 2N6251T1 ($I_C = 0.2$ A).

FIGURE 10. Test circuit and waveforms for measurement of V_{CEO} and V_{CER} measurement circuit.



NOTES:

1. The rise time (t_r) and the fall time (t_f) of the applied pulse shall be each < 20 ns, duty cycle ≤ 2 percent; generator source impedance shall be 50 Ω; pulse width = 20 μs.
2. Output sampling oscilloscope; Z_{in} ≥ 100 Ωk; c_{in} ≤ 50 pF, rise time < 2 ns.

FIGURE 11. Pulse response test circuit.

SOA MIL-PRF-19500/510 JAN2N6249, 50, 51, T1, T3

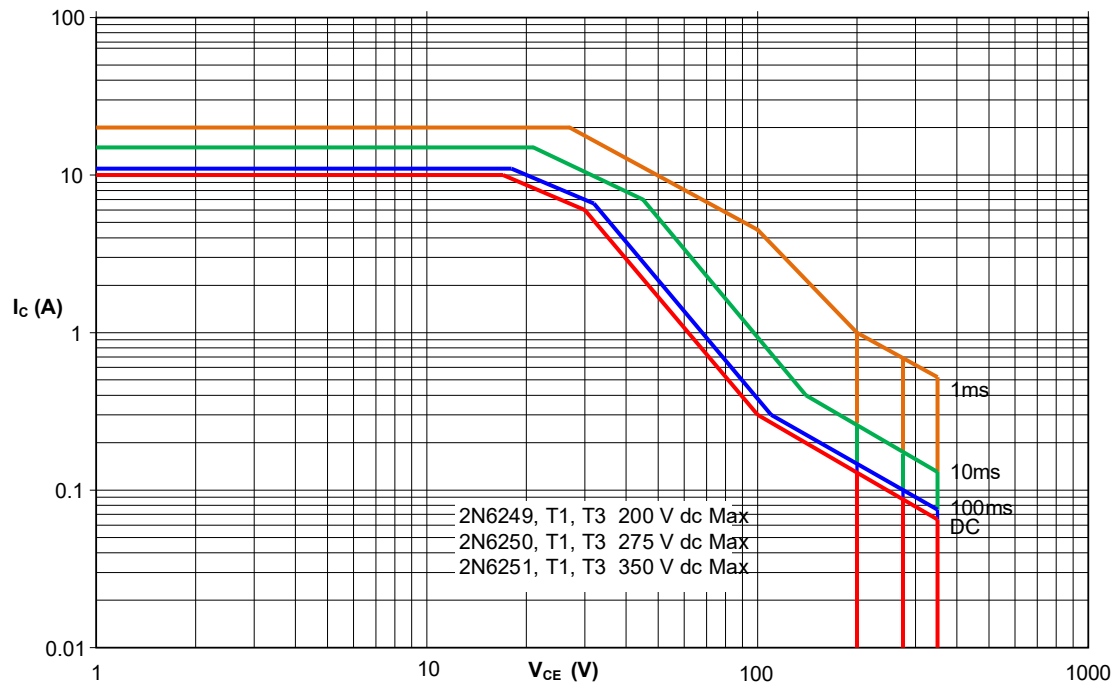


FIGURE 12. Maximum safe operating area graph (continuous dc).

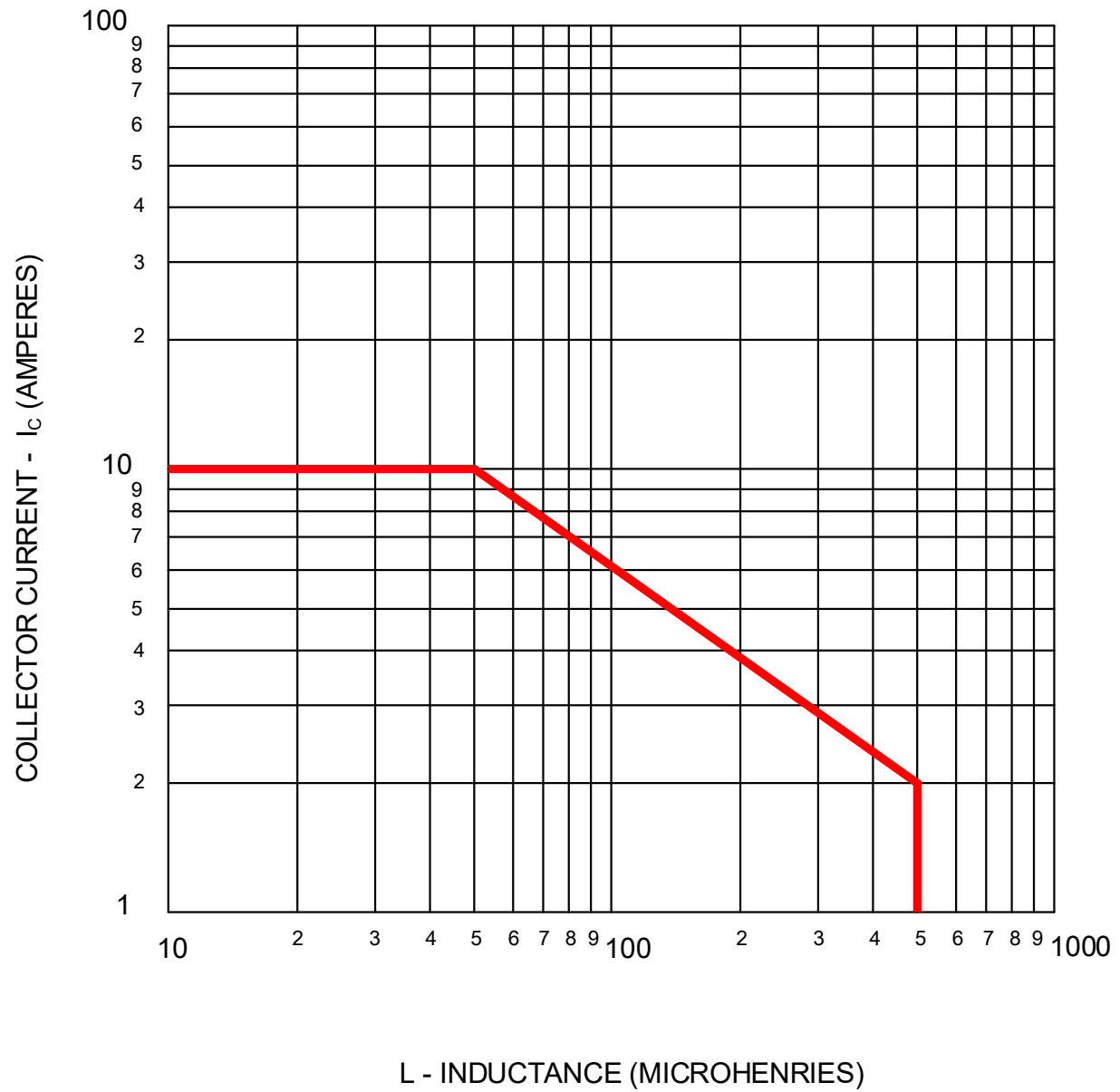
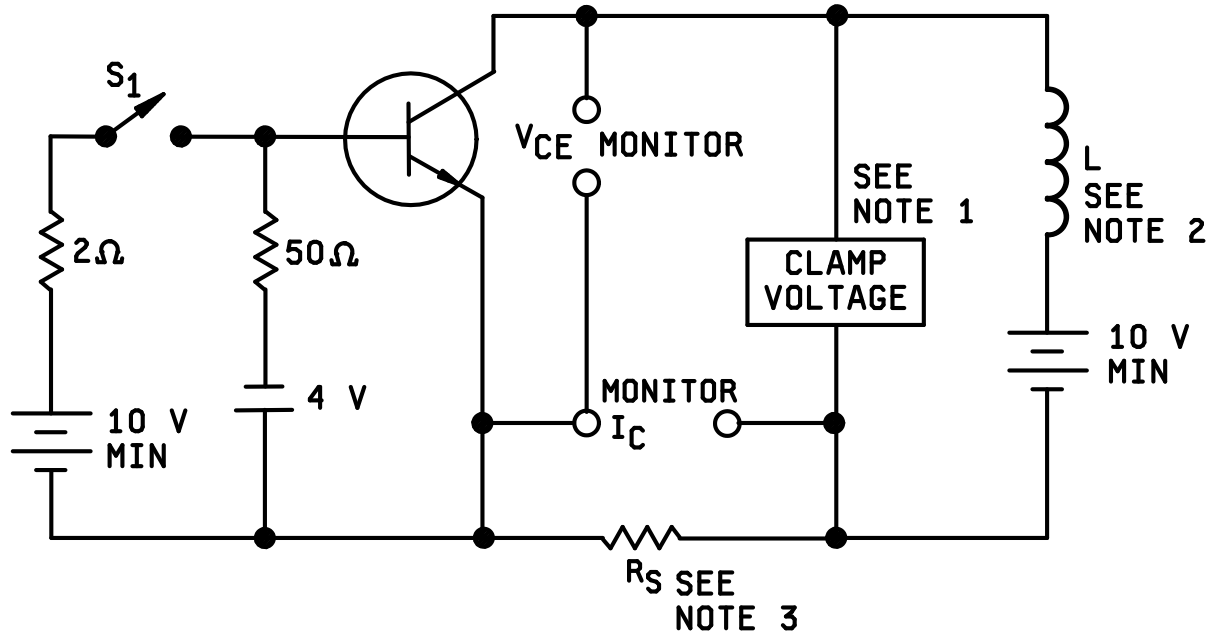


FIGURE 13. Safe operating area for switching between saturation and cutoff (unclamped inductive load).



Procedure:

1. With switch S_1 closed set the specified test conditions.
2. Open S_1 . Device fails if clamp voltage not reached and maintained until the current returns to zero.
3. Perform specified end-point tests.

NOTES:

1. Either a clamping circuit or clamping diode may be used.
2. The coil used shall provide a minimum inductance of 50 μH at 10 A with a maximum dc resistance of 0.1 Ω (see 4.5.3).
3. $R_S \leq 0.1 \Omega$, 12 W, 1 percent tolerance maximum (non-inductive).

FIGURE 14. Clamped inductive sweep test circuit.

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 material 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.

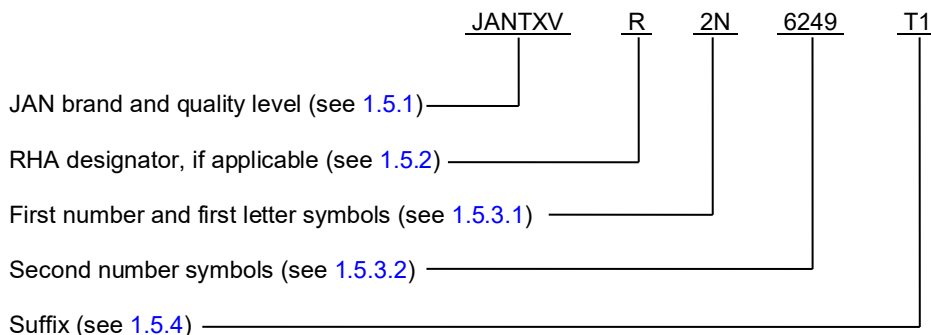
6.2 Acquisition requirements. Acquisition documents should specify the following:

- 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 6.5.
- e. For acquisition of RHA designed devices, table II, subgroup 1 testing of group D is optional. If subgroup 1 testing is desired, it should be specified in the contract.

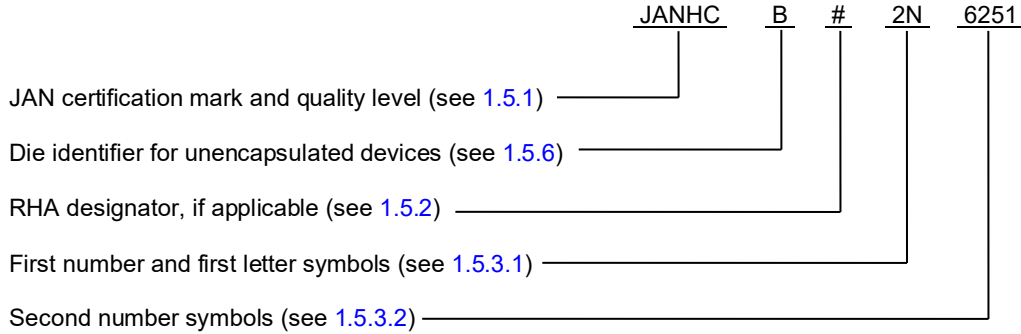
6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List (QML 19500) whether or not such products have actually been so listed by that date. The attention 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@dlamail. 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 PIN construction examples.

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



6.4.2 Unencapsulated devices. The PINs for unencapsulated devices are constructed using the following form.



6.5 List of PINs.

6.5.1 List of 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	PINs for devices of the "S" quality level
JAN2N6249	JANTX2N6249	JANTXV#2N6249	JANS#2N6249
JAN2N6249T1	JANTX2N6249T1	JANTXV#2N6249T1	JANS#2N6249T1
JAN2N6249T3	JANTX2N6249T3	JANTXV#2N6249T3	JANS#2N6249T3
JAN2N6250	JANTX2N6250	JANTXV#2N6250	JANS#2N6250
JAN2N6250T1	JANTX2N6250T1	JANTXV#2N6250T1	JANS#2N6250T1
JAN2N6250T3	JANTX2N6250T3	JANTXV#2N6250T3	JANS#2N6250T3
JAN2N6251	JANTX2N6251	JANTXV#2N6251	JANS#2N6251
JAN2N6251T1	JANTX2N6251T1	JANTXV#2N6251T1	JANS#2N6251T1
JAN2N6251T3	JANTX2N6251T3	JANTXV#2N6251T3	JANS#2N6251T3

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

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6.5.2 List of PINs for unencapsulated devices. The following is a list of possible PINs available on this specification sheet. The qualified JANHC and JANKC suppliers with the applicable letter version (example JANHCB2N6249) will be identified on the QML.

JANHC and JANKC ordering information		
PIN	Manufacturer	
	33178 (1)	43611 (2)
2N6249	A6249	JANHCB#2N6249 JANKCB#2N6249
2N6250	A6250	JANHCB#2N6250 JANKCB#2N6250
2N6251	A6251	JANHCB#2N6251 JANKCB#2N6251

- (1) The "A" version of the JANHC and the JANKC part numbers, 2N6249T1, 2N6249T3, 2N6250T1, 2N6250T3, 2N6251T1, and 2N6251T3, were qualified from 29 November 2001; however, they are obsolete at this time.
- (2) The number sign (#) represent one of eight RHA designators available (M, D, P, L, R, F, G, or H). The PIN is also available without a RHA designator.

6.6 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.

6.7 Amendment notations. The margins of this specification are marked with vertical lines 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
Air Force – 85
NASA – NA
DLA – CC

Preparing activity:
DLA – CC
(Project 5961–2025–003)

Review activities:
Army – MI
Air Force – 19

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>.