

This documentation process conversion measures necessary to comply with this revision shall be completed by 27 September 1999.

INCH-POUND

MIL-PRF-19500/412B(USAF)
 27 July 1999
 SUPERSEDING
 MIL-S-19500/412A(USAF)
 19 June 1990

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, POWER
 TYPES 2N3846, 2N3847, JAN, JANTX, JANTXV, AND JANS

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

1. SCOPE

1.1 Scope. This specification covers the performance requirements for NPN, silicon, power transistors. Four levels of product assurance are provided for each device type as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (TO-63).

1.3 Maximum ratings.

P _T 1/ T _A = +25°C	P _T 2/ T _C = +100°C	V _{EBO}	V _{CB0}		V _{CE0}		I _c	Safe operating region	T _{STG}	T _{op}
			2N3846	2N3847	2N3846	2N3847				
<u>W</u>	<u>W</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>A dc</u>	See figure 2	<u>°C</u>	<u>°C</u>
4	150	10	300	400	200	300	20		-65 to +200	-65 to +200

1/ Derate 26.6 mW/°C linearly to +175°C.

2/ Derate 2 W/°C linearly to +175°C.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAC, 3990 East Broad St., Columbus, OH 43216-5000, by using the addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.4 Primary electrical characteristics.

	h_{FE} $V_{CE} = 3 \text{ V dc}$ $I_C = 10 \text{ A dc}$ 1/	$ h_{fe} $ $V_{CE} = 10 \text{ V dc}$ $I_C = 1 \text{ A dc}$ $f = 1 \text{ MHz}$	V_{BE} $V_{CE} = 3 \text{ V dc}$ $I_C = 10 \text{ A dc}$ 1/	$V_{CE(sat)}$ $I_B = 1.6 \text{ A dc}$ $I_C = 10 \text{ A dc}$ 1/	C_{obo} $V_{CB} = 10 \text{ V dc}$ $I_E = 0$ $100 \text{ kHz} < f < 1 \text{ MHz}$
			<u>V dc</u>	<u>V dc</u>	<u>pF</u>
Min	12	10	---	---	---
Max	60	35	1.2	0.75	750

1/ Pulsed (see 4.5.1).

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 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

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

STANDARD

MILITARY

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

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Defense Automated Printing Service, 700 Robbins Avenue, Building 4D (DPM-DODSSP), Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

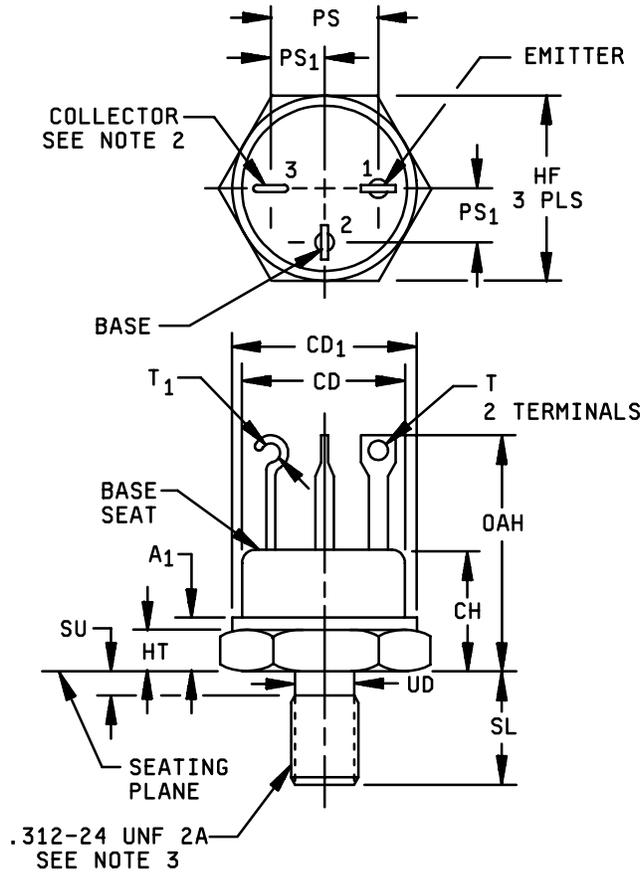
3. REQUIREMENTS

3.1 Qualification. Devices furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.4).

3.2 Specification. The individual item requirements shall be in accordance with MIL-PRF-19500, and as specified herein.

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

3.4 Interface requirements and physical dimensions. The Interface requirements and physical dimensions shall be as specified in MIL-PRF-19500, and figure 1 herein.



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
A ₁	---	.300	---	7.62	
CD	.745 DIA	.775 DIA	18.92 DIA	19.69 DIA	
CD ₁	.775 DIA	.875 DIA	19.69 DIA	22.23 DIA	
CH	.480	.535	12.19	13.59	
HF	.855	.875	21.72	22.23	
HT	.090	.167	2.29	4.24	
OAH	.937	1.030	23.80	26.16	7
PS	.485	.515	12.32	13.08	4, 6
PS ₁	.240	.260	6.10	6.60	4, 6
SL	.460	.495	11.68	12.57	
SU	---	.105	---	2.67	8
T	.060 DIA	.105 DIA	1.52 DIA	2.67 DIA	
T ₁	.060 DIA	.105 DIA	1.52 DIA	2.67 DIA	2
UD	.278	.312	7.06	7.92	

NOTES:

1. Metric equivalents are given for general information only.
2. The collector (hook) is electrically connected to the case. The other two terminals shall be electrically isolated from the case.
3. See FED-STD-H28.
4. The orientation of the terminals in relation to the hex flats is not controlled.
5. The case temperature may be measured anywhere on the seating plane within .125 (3.18 mm) of the stud.
6. Terminal spacing measured at base seat only.
7. All three terminals.
8. Maximum unthreaded dimension.

FIGURE 1. Physical dimensions of transistor (TO-63).

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

3.5 Marking. Marking shall be in accordance with MIL-PRF-19500, except at the option of the manufacturer, marking of the country of origin may be omitted from the body of the transistor, but shall be retained on the initial container.

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

3.7 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table I herein.

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).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500, quality assurance provisions, and as otherwise specified herein.

4.3 Screening (JANS, JANTX, AND JANTXV levels only). Screening shall be in accordance with MIL-PRF-19500 (table IV), 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 (see table IV of MIL-PRF-19500)	Measurement	
	JANS level	JANTX and JANTXV levels
1/	Thermal response, see 4.5.5	Thermal response, see 4.5.5
9	I_{CES} and h_{FE3} of table I shall be measured and the data recorded.	Not applicable
11	I_{CES} and h_{FE3} of table I shall be retested and the data recorded. $\Delta I_{CES} = 100$ percent or $200 \mu A$, whichever is greater. $\Delta h_{FE} = \pm 20$ percent	I_{CES} and h_{FE3} of table I shall be measured and the data recorded.
12	See 4.3.1	See 4.3.1
13	Subgroups 2 and 3 of table I herein; I_{CES} and h_{FE3} of table I shall be retested and the data recorded. $\Delta I_{CES} = 100$ percent or $200 \mu A$, whichever is greater. $\Delta h_{FE} = \pm 20$ percent	Subgroup 2 of table I herein; I_{CES} and h_{FE3} of table I shall be retested and the data recorded. $\Delta I_{CES} = 100$ percent or $200 \mu A$, whichever is greater. $\Delta h_{FE} = \pm 20$ percent

1/ Shall be performed any time before screen 10.

4.3.1 Power burn-in test conditions. Power burn-in conditions are as follows:

$$T_J = +187.5 \pm 12.5^\circ C \quad V_{CB} \geq 20 \text{ V dc} \quad T_A = 30^\circ C \pm 5^\circ C$$

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4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500, and table I herein. (End-points) electrical measurements shall be in accordance with table I, group A, subgroup 2 herein.)

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VIa (JANS) and table VIb (JAN, JANTX and JANTXV) of MIL-PRF-19500, and 4.4.2.1 and 4.4.2.2 herein. Electrical measurements (end points) shall be in accordance with table I, group A, subgroup 2 herein. For Delta requirements see 4.5.4.

4.4.2.1 Group B inspection, table VIa (JANS) of MIL-PRF-19500.

Subgroup	Method	Conditions
B1	2066	
B2	2026 1022	Depth \geq 0.10 inch; Time = 10 \pm 1 second
B3	1051 1071 2075 2037 2017	Test condition A
B4	1037	$V_{CB} \geq 20$ V dc, $P_T = 5$ W; $T_A \leq +35^\circ\text{C}$.
B5	1027 2037	$V_{CB} \geq 20$ V dc; $P_T \geq 4$ W at $T_A \leq 100^\circ\text{C}$; for 96 hours, adjusted as required by the chosen T_A to give an average lot $T_J = 275^\circ\text{C} \pm 12.5^\circ\text{C}$. Marking legibility requirements shall not apply. Test conditions A
B6	3131	See 4.5.3.

4.4.2.2 Group B inspection, table VIb (JAN, JANTX, JANTXV,) of MIL-PRF-19500.

Subgroup	Method	Conditions
B1	2026 1022	Depth \geq 0.10 inch; Time = 10 \pm 1 second
B2	1051 1071	
B3	1037	For solder die attach: 2,000 cycles. $V_{CB} \geq 20$ V dc. $T_A \leq 35^\circ\text{C}$
B3	1026	For eutectic die attach: $V_{CB} \geq 20$ V dc adjust P_T to achieve $T_J = 175^\circ\text{C}$ min. $T_A \leq 35^\circ\text{C}$
B4	2075 2037	Test condition A
B5		Not applicable
B6	1032	$T_A = +200^\circ\text{C}$

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4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500, and 4.4.3.1 herein. Electrical measurements shall be in accordance with Table I, subgroup 2 herein. Delta requirements shall be in accordance with paragraph 4.5.4 herein.

4.4.3.1 Group C inspection, appendix E, table VII of MIL-PRF-19500.

Subgroup	Method	Conditions
C1	2066	
C2	1056	Test condition B
	2036	Test condition A Weight = 7 pounds ± 5 ounces Application time = 15 s; tubulated leads only
	2036	Test condition D2 Torque = 30 inch-pounds Application time = 15 s.
	2036	Test condition D1 Torque = 6 inch-ounces Application time = 15 s; tubulated leads only
	1071 1021	
C3	2016	
	2056	
	2006	
C4	1041	
C5		Not applicable
C6	1037	For solder die attach: 6,000 cycles. $V_{CB} \geq 20$ V dc. $T_A \leq 35^\circ\text{C}$
	1026	For eutectic die attach: $V_{CB} \geq 20$ V dc adjust P_T to achieve $T_J = 175^\circ\text{C}$ min. $T_A \leq 35^\circ\text{C}$

4.4.4 Group E inspection. Group E inspection shall be in accordance with table IX herein.

4.4.5.1 Group E inspection, appendix E, table IX of MIL-PRF-19500.

Subgroup	Method	Conditions	Sample Plan
E1	1056 1071	0°C to +100°C, 100 cycles	22 devices, c = 0.
E2	1039 or 1049	Condition A, 1,000 hours	45 devices, c = 0.
E3	2102	Photos of cross sections shall be submitted in the qualification report. Vendor shall retain duplicate records.	3 devices, c = 0.
E4	3131	$R_{\theta JC} = 0.5^\circ\text{C/W}$ maximum See 4.5.3	22 devices, c = 0.
E5	1001	Pressure = 8.0 mm Hg; time = 60 seconds; normal mounting	22 devices, c = 0.
E6	1020		10 devices, c = 0.

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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 Burnout by pulsing. This test shall be conducted in a circuit capable of supplying the specified pulse conditions to the transistor under test. Good engineering practices shall be utilized to eliminate inductive effects in the circuitry and power supply. Rise and fall times of the pulse shall be less than 10 percent of the specified t_p . Noninductive monitoring techniques shall be utilized and the value of any monitoring resistor shall be less than $V_{CC}/20 I_C$.

4.5.3 Thermal resistance. Thermal resistance measurements shall be conducted in accordance with test method 3131 of MIL-STD-750. The following details shall apply:

- a. I_M measurement current: 10 mA.
- b. V_{CE} measurement voltage: 25 V (same as V_H) (minimum).
- c. I_H collector heating current: 4 mA (minimum).
- d. V_H collector emitter heating voltage: 25 V (minimum).
- e. t_H heating time: Steady state (see MIL-STD-750, method 3131 for definition).
- f. t_{MO} measurement delay time: 10 to 80 μ s.
- g. t_{SW} sample window time: 10 μ s (maximum).

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

Step	Inspection	MIL-STD-750		Symbol	Limit ^{1/}	Unit
		Method	Conditions			
1	Collector to emitter cutoff current 2N3846 2N3847	3041	Bias condition C $V_{BE} = 0$ $V_{CE} = 300$ V dc; $V_{CE} = 400$ V dc	ΔI_{CES}	100 percent of initial value or 200 μ A, whichever is greater	
2	Forward-current transfer ratio	3076	Pulsed (see 4.5.1) $V_{CE} = 3$ V dc; $I_C = 10$ A dc	Δh_{FE3}	± 20 percent change from initial reading.	
3	Collector to emitter voltage (saturated)	3071	Pulsed (see 4.5.1) $I_B = 1.6$ A dc, $I_C = 10$ A dc	$\Delta V_{CE(sat)}$	± 50 percent mV change from initial reading.	
4	Thermal response	3131		ΔV_{BE}		

^{1/} The delta measurements for table VIa (JANS) of MIL-PRF-19500 are as follows:

- a. Subgroup 4, steps 2, 3, and 4.
- b. Subgroup 5, steps 1, 2, and 3

^{2/} The delta measurements for table VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500 are as follows:

- a. Subgroup 3, steps 2 and 4.
- b. Subgroup 6, steps 1 and 2.

^{3/} The delta measurements for table VII of MIL-PRF-19500 are as follows:

- a. Subgroup 6, steps 1, 2, 4 for JANS; steps 2 and 4 for JAN, JANTX and JANTXV.

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical inspection	2071					
<u>Subgroup 2</u>						
Collector to emitter breakdown voltage	3011	Bias condition D; $I_C = 200 \text{ mA dc}; I_B = 0$ pulsed (see 4.5.1)	$V_{(BR)CEO}$			
2N3846				200	---	V dc
2N3847				300	---	V dc
Collector to emitter cutoff current	3041	Bias condition C; $V_{BE} = 0$	I_{CES}			
2N3846		$V_{CE} = 300 \text{ V dc};$		---	2	mA dc
2N3847		$V_{CE} = 400 \text{ V dc}$		---	2	mA dc
Collector to emitter cutoff current	3041	Bias condition D; $I_B = 0$	I_{CEO}			
2N3846		$V_{CE} = 200 \text{ V dc};$		---	5	mA dc
2N3847		$V_{CE} = 300 \text{ V dc}$		---	5	mA dc
Emitter to base cutoff current	3061	Bias condition D; $V_{BE} = 10 \text{ V dc}$ $I_C = 0$	I_{EBO}	---	250	$\mu\text{A dc}$
Forward-current transfer ratio	3076	Pulsed (see 4.5.1); $V_{CE} = 3 \text{ V dc};$ $I_C = 1 \text{ A dc}$	h_{FE1}	70	---	---
Forward-current transfer ratio	3076	Pulsed (see 4.5.1); $V_{CE} = 3 \text{ V dc};$ $I_C = 5 \text{ A dc}$	h_{FE2}	40	240	---
Forward-current transfer ratio	3076	Pulsed (see 4.5.1); $V_{CE} = 3 \text{ V dc};$ $I_C = 10 \text{ A dc}$	h_{FE3}	12	60	---
Base to emitter voltage	3066	Test condition B; pulsed (see 4.5.1); $V_{CE} = 3 \text{ V dc};$ $I_C = 10 \text{ A dc}$	V_{BE}	---	1.20	V dc
Base to emitter voltage (saturated)	3066	Test condition A; pulsed (see 4.5.1); $I_B = 1.6 \text{ A};$ $I_C = 10 \text{ A dc}$	$V_{BE(sat)}$	---	1.30	V dc
Collector to emitter voltage (saturated)	3071	Pulsed (see 4.5.1); $I_B = 1.6 \text{ A};$ $I_C = 10 \text{ A dc}$	$V_{CE(sat)}$	---	0.75	V dc

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u>						
High temperature operation:	3041	Bias condition C; $T_A = +150^\circ\text{C}$; $V_{BE} = 0$	I_{CES}	---	10	mA dc
Collector to emitter Cutoff current						
2N3846		$V_{CE} = 300\text{ V dc}$;		---	10	
2N3847		$V_{CE} = 400\text{ V dc}$		---	10	
Low temperature operation:	3076	$T_A = -55^\circ\text{C}$; pulsed (see 4.5.1) $V_{CE} = 3\text{ V dc}$; $I_C = 10\text{ A dc}$	h_{FE}	10	---	---
Forward-current transfer ratio						
<u>Subgroup 4</u>						
Magnitude of common-emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 10\text{ V dc}$ $f = 1\text{ MHz}$ $I_C = 1.0\text{ A dc}$	$ h_{fe} $	10	35	---
Small-signal short-circuit forward-current transfer ratio	3206	$V_{CE} = 10\text{ V dc}$; $I_C = 5\text{ A dc}$; $f = 1\text{ kHz}$	h_{fe}	50	250	---
Open circuit output capacitance	3236	$V_{CB} = 10\text{ V dc}$; $I_E = 0$; $100\text{ kHz} \leq f \leq 1\text{ MHz}$	C_{obo}	---	750	pF
Turn-on time		$I_C = 10\text{ A dc}$; $I_{B(1)} = 2\text{ A dc}$; $I_{B(2)} = -2\text{ A dc}$; $V_{BE(off)} \sim -7.5\text{ V dc}$; $R_L = 15\text{ ohms}$; See figure 2	t_{on}	---	4	μs
Turn-off time		$I_C = 10\text{ A dc}$; $I_{B(1)} = 2\text{ A dc}$; $I_{B(2)} = 2\text{ A dc}$; $V_{BE(off)} \sim -7.5\text{ V dc}$; $R_L = 15\text{ ohms}$; See figure 2	t_{off}	---	7	μs

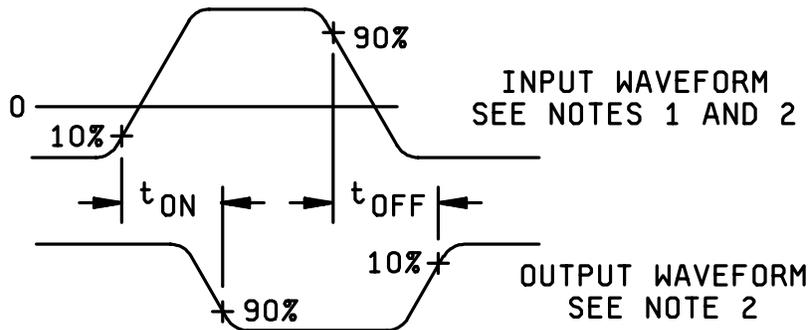
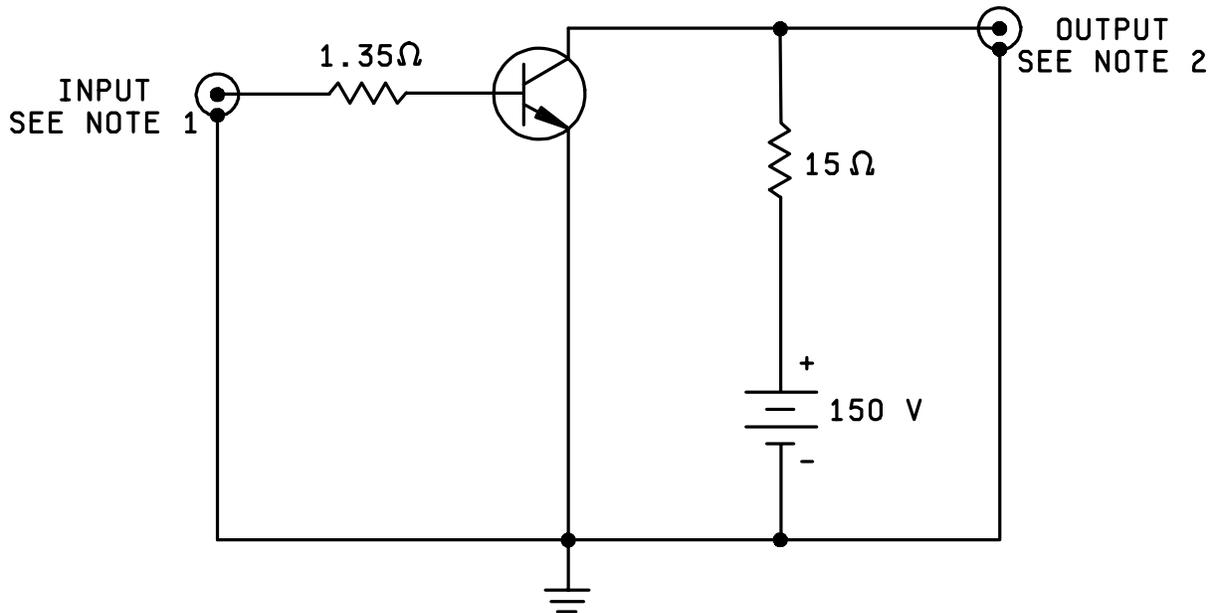
See footnote at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 5</u>						
Burnout by pulsing (safe operating area - dc)	3005 (3051)	T _C = +100°C; Pre-pulse condition; figure 3 V _{CE} = 0; I _C = 0; Pulse condition; (See 4.5.2)	---	---	---	---
Test 1		V _{CE} = 7.5 V dc I _C = 20 A dc t _p = 1.0 s, 1 cycle				
Test 2		V _{CE} = 200 V dc I _C = 100 mA dc t _p = 1.0 s, 1 cycle				
Test 3		V _{CE} = 58 V dc I _C = 1.0 A dc t _p = 1.0 s, 1 cycle				
Burnout by pulsing (safe operating area - dc) 2N3847 only	3005 (3051)	T _C = +100°C; Pre-pulse condition: figure 3; V _{CE} = 300 V dc; I _C = 20 mA dc; t _p = 1.0 s, 1 cycle	---	---	---	---
Unclamped inductive sweep	---	T _C = +100°C; I _B = 2 A dc; I _C = 20 A dc; See figure 4				
Clamped inductive sweep	---	T _C = +100°C; I _B = 2 A dc; I _C = 20 A dc; See figure 5				
End points		See table V, steps 1, 3, 7, and 9	---	---	---	---
<u>Subgroups 6 and 7</u>						
Not applicable						

1/ For sampling plan, see MIL-PRF-19500.



NOTES:

1. The input waveform has the following characteristics: $t_r \leq 100$ ns, $t_f \leq 100$ ns, $PW = 20$ μ s, duty cycle ≤ 0.2 percent.
2. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 5$ ns, $R_{in} \geq 1$ M Ω , $C_{in} \leq 5$ pF.
3. Resistors must be noninductive types.

FIGURE 2. Switching time test circuit.

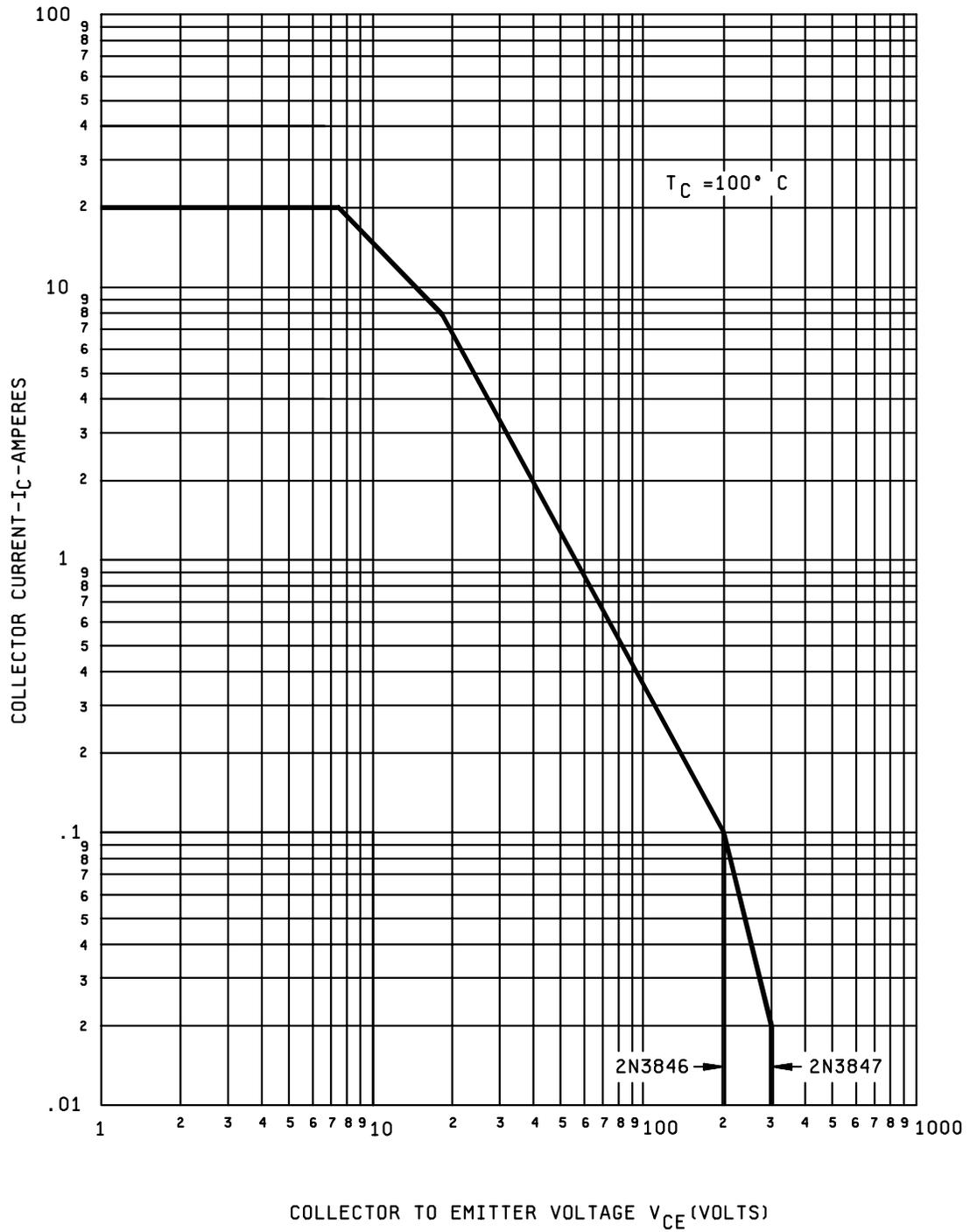
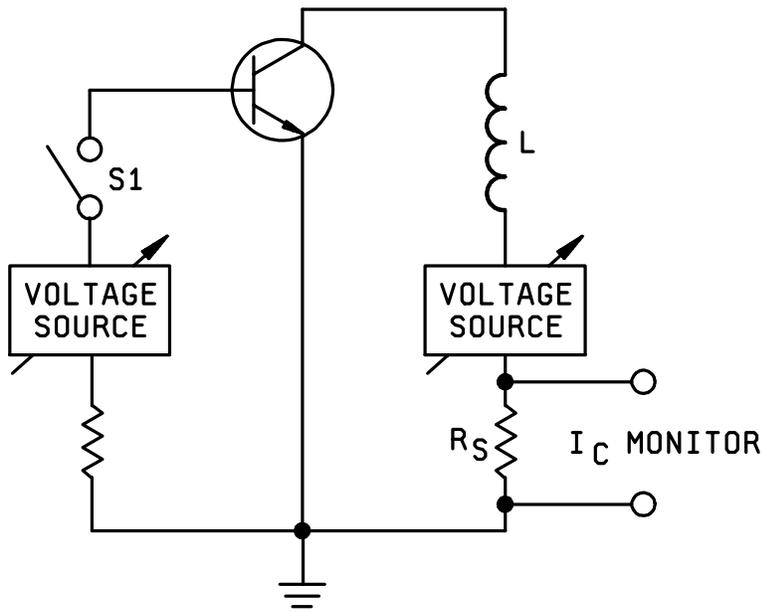


FIGURE 3. Rated safe operating region.

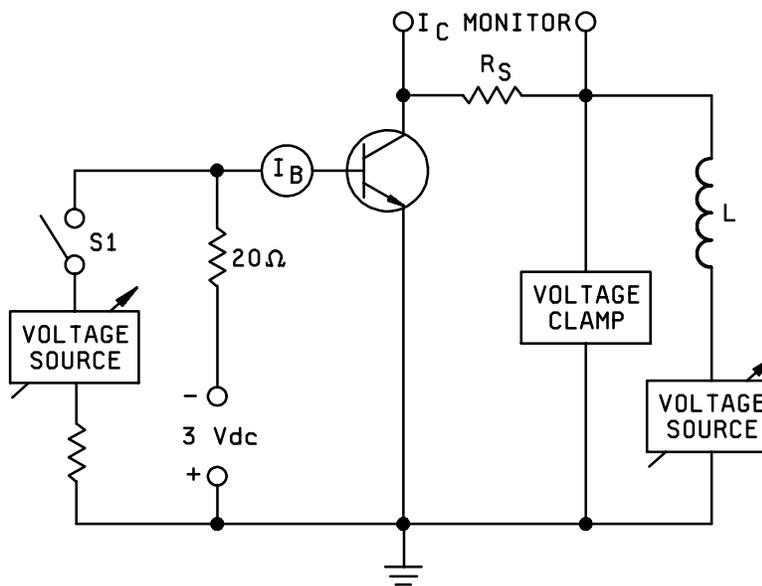


$R_S \leq 1.0$ ohm (noninductive)
 $L = 1.0$ mH

Procedure:

1. With switch S_1 closed, set the specified conditions.
2. Open S_1 .
3. Perform specified end-point tests.

FIGURE 4. Unclamped inductive sweep test circuit diagram.



$R_S \leq 1.0$ ohm (noninductive)
 $L = 1.0$ mH

Voltage clamp = 2N3846, 300 V dc
 2N3847, 400 V dc

Procedure:

1. With switch S_1 closed, set the specified conditions.
2. Open S_1 .
3. Perform specified end-point tests.

FIGURE 5. Clamped inductive sweep test circuit diagram.

4.5.5 Thermal response (ΔV_{BE} measurements). The ΔV_{BE} measurements shall be performed in accordance with MIL-STD-750, method 3131. The ΔV_{BE} conditions and maximum V_{BE} limit shall be derived by each vendor. The ΔV_{BE} measurement and conditions for each device in the qualification lot shall be submitted in the qualification report and a thermal response curve shall be plotted. The chosen ΔV_{BE} value shall be considered final after the manufacturer has had the opportunity to test five consecutive lots.

- a. I_M measurement current: 10 mA.
- b. V_{CE} measurement voltage: 25 V (same as V_H) (minimum).
- c. I_H collector heating current: 4 mA (minimum).
- d. V_H collector-emitter heating voltage: 25 V (minimum).
- e. t_H heating time: 100 ms.
- f. t_{MD} measurement delay time: 10 to 80 μ s.
- g. t_{SW} sample window time: 10 μ s (maximum).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Points' packaging activity within the Military Department or Defense Agency, or within the Military Departments' System Command. 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.)

6.1 Notes. The notes specified in MIL-PRF-19500 are applicable to this specification.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Issue of DODISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2.1).
- b. Lead finish (see 3.4.1).
- c. Type designation and product assurance level.
- d. Packaging requirements (see 5.1).

6.3 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

6.4 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 purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center Columbus, DSCC-VQE, Columbus, OH 43216.

6.5 Substitution information. Devices covered by this specification are substitutable for the manufacturer's and user's part numbers. This information in no way implies that manufacturer's part numbers are suitable as a substitute for the military part number.

MIL-PRF-19500/412B(USAF)

CONCLUDING MATERIAL

Custodian:
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC
(Project 5961-2155)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-19500/412B	2. DOCUMENT DATE
3. DOCUMENT TITLE Semiconductor Device, Transistor, NPN, Silicon, Power Types 2N3846, 2N3847, JANTX, JANTXV AND JANS, JAN		
4. NATURE OF CHANGE <i>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</i>		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (Last, First, Middle initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) Commercial DSN FAX EMAIL	7. DATE SUBMITTED
8. PREPARING ACTIVITY		
a. Point of Contact Alan Barone	b. TELEPHONE Commercial DSN FAX EMAIL 614-692-0510 850-0510 614-692-6939 alan_barone@dscclia.mil	
c. ADDRESS Defense Supply Center Columbus ATTN: DSCC-VAT Columbus, OH 43216-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office (DLSC -LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703) 767-6888 DSN 427-6888	