

The documentation and process conversion measures necessary to comply with this revision shall be completed by 29 October 1999.

INCH-POUND

MIL-PRF-19500/456D
29 July 1999
SUPERSEDING
MIL-S-19500/456C
18 November 1993

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, HIGH-POWER
TYPE 2N5302 and 2N5303, JAN, JANTX, JANTXV, AND JANS

This specification is approved 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, high-power transistors. Four level of product assurance are provided for each device type as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (similar to TO-3). See 3.3.

1.3 Maximum ratings.

Type	P_T 1/ $T_A = +25^\circ\text{C}$	P_T 1/ $T_C = +100^\circ\text{C}$	V_{CBO}	V_{CEO}	V_{EBO}	I_B	I_C	T_J and T_{STG}	$R_{\theta JC}$
	<u>W</u>	<u>W</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>A dc</u>	<u>A dc</u>	<u>°C</u>	<u>°C/W Max</u>
2N5302	5	115	60	60	5.0	7.5	30	-65 to +200	0.875
2N5303	5	115	80	80	5.0	7.5	20	-65 to +200	0.875

1/ Derate linearly, 1.14 mW/°C above $T_C = +100^\circ\text{C}$.

Derate linearly, 28.57 mW/°C above $T_A = +25^\circ\text{C}$.

1.4 Primary electrical characteristics.

	$h_{FE2} \text{ 1/}$	$h_{FE2} \text{ 1/}$	$ h_{FE} $	$V_{BE(sat)2} \text{ 1/}$		$V_{CE(sat)2} \text{ 1/}$		C_{obo}	Pulse response	
	$V_{CE} = 2 \text{ V dc}$ $I_C = 15 \text{ A dc}$	$V_{CE} = 2 \text{ V dc}$ $I_C = 10 \text{ A dc}$	$V_{CE} = 10 \text{ V dc}$ $I_C = 1 \text{ A dc}$ $f = 1 \text{ MHz}$	$I_C = 15 \text{ A dc}$ $I_B = 1.5 \text{ A dc}$		$I_C = 15 \text{ A dc}$ $I_B = 1.5 \text{ A dc}$		$V_{CB} = 10 \text{ V dc}$ $I_E = 0$ $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	t_{on}	t_{off}
Min Max	<u>2N5302</u>	<u>2N5303</u>	<u>V dc</u>	<u>2N5302</u> <u>V dc</u>	<u>2N5303</u> <u>V dc</u>	<u>2N5302</u> <u>V dc</u>	<u>2N5303</u> <u>V dc</u>	<u>pF</u>	<u>μs</u>	<u>μs</u>
	15 60	15 60	2 40	1.8	2	1	1.5	800	1.1	3.0

1/ Pulsed (see 4.5.1).

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 Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5961

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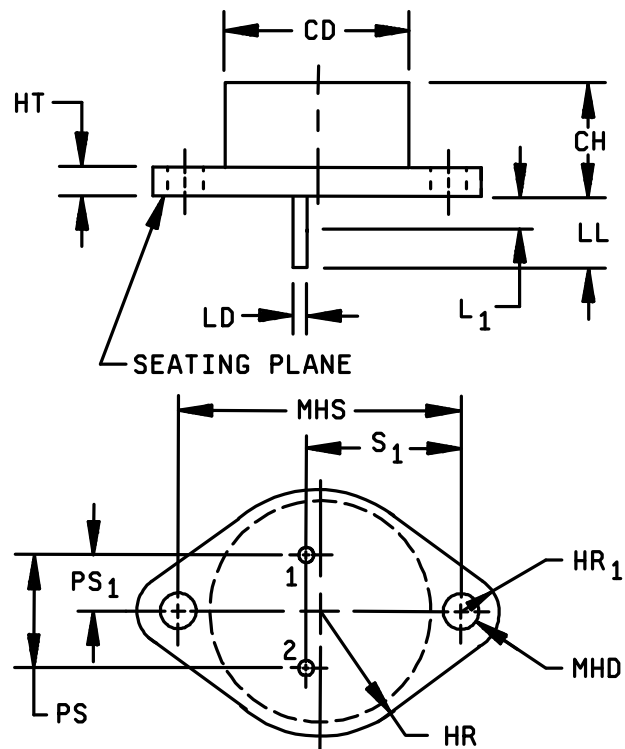


FIGURE 1. Physical dimensions – (similar to TO-3).

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.270	.380	6.86	8.89	
HR	.495	.525	12.57	13.34	4
HR ₁	.131	.188	3.33	4.78	4
HT	.060	.135	1.52	3.43	
LD	.038	.043	0.97	1.09	4,6
LL	.312	.500	7.92	12.70	
L ₁		.050		1.27	
MHD	.151	.161	3.84	4.09	4
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	3,4
PS ₁	.205	.225	5.21	5.72	3,4
s ₁	.655	.675	16.64	17.15	

NOTES:

1. Dimensions are in inches. Lead 1 is emitter, lead 2 is base, and case is collector.
2. Metric equivalents are given for general information only.
3. These dimensions should be measured at points .050 inch (1.27 mm) +.005 inch (0.13 mm) -.000 inch (0.00 mm) below seating plane. When gauge is not used, measurement will be made at the seating plane.
4. Two places.
5. 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.
6. Lead diameter shall not exceed twice LD within L₁.
7. In accordance with ANSI Y14.5M, diameters are equivalent to ϕ x symbology.

FIGURE 1. Physical dimensions – (similar to TO-3).

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 - Semiconductor Devices, General Specification for.

STANDARD

DEPARTMENT OF DEFENSE

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

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

3.3 Interface requirements and physical dimensions. The Interface requirements and physical dimensions shall be as specified in, MIL-PRF-19500 and figure 1, (similar to TO-3), herein.

3.3.1 Lead finish. Lead finish shall be solderable in accordance with MIL-PRF-19500, MIL-STD-750, and herein.

3.4 Marking. Marking shall be in accordance with MIL-PRF-19500.

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

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

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

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 and as specified herein.

4.3 Screening (JANS, JANTX and JANTXV levels). 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 JANTXV levels
9	ICEX1 and hFE2	Not applicable
11	ICEX1 and hFE2; $\Delta ICEX1 \leq 100$ percent of initial value or 50 μA dc, whichever is greater. $\Delta hFE2 \leq \pm 20$ percent of initial value.	ICEX1 and hFE2
12	See 4.3.1	See 4.3.1
13	Subgroups 2 and 3 of table I herein; $\Delta ICEX1 \leq 100$ percent of initial value or 50 μA dc whichever is greater; $\Delta hFE2 \leq \pm 15$ percent of initial value.	Subgroup 2 of table I herein; $\Delta ICEX1 \leq 100$ percent of initial value or 100 μA dc, whichever is greater; $\Delta hFE2 \leq 20$ percent of initial value.

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

$$T_J = +187.5^\circ C \pm 12.5^\circ C, V_{CE} \geq 10 \text{ V dc}, T_A \leq +35^\circ C$$

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. Electrical measurements (end-points) shall be in accordance with the applicable inspections of 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 tables VIa (JANS) and VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500 and paragraphs 4.4.2.1 and 4.4.2.2 herein. Electrical measurements (end-points) shall be in accordance with the applicable inspections of table I, group A, subgroup 2 herein.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B4	1037	$V_{CB} = 20 \text{ V dc}$; $P_D = 5 \text{ W}$ at $T_A = \text{room ambient}$ as defined in 4.5 of MIL-STD-750; $t_{on} = t_{off} = 3 \text{ minutes}$ minimum for 2,000 cycles. No heat sink or forced air cooling on devices shall be permitted.
B5	1027	$V_{CB} = 20 \text{ V dc}$; $T_A = +125^\circ\text{C} \pm 25^\circ\text{C}$ for 96 hours; $P_T = 5 \text{ W}$ at $T_A = +125^\circ\text{C}$ or adjusted as required by the chosen T_A to give an average lot, $T_J = +275^\circ\text{C}$.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	1037	For solder die attach: $V_{CB} \geq 10 \text{ V dc}$; $T_A \leq 35^\circ\text{C}$, 2,000 cycles. No heat sink or forced air cooling on devices shall be permitted.
B3	1026	For eutectic die attach: $V_{CB} \geq 10 \text{ V dc}$; $T_A \leq 35^\circ\text{C}$, adjust P_T to achieve $T_J = 175^\circ\text{C}$ minimum.

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 as follows. Electrical measurements (end-points) shall be in accordance with table I, group A, subgroup 2 herein.

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

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
C6	1037	For solder die attach: $V_{CB} \geq 10 \text{ V dc}$; $T_A \leq 35^\circ\text{C}$, 6,000 cycles. No heat sink or forced air cooling on devices shall be permitted.
C6	1026	For eutectic die attach: $V_{CB} \geq 10 \text{ V dc}$; $T_A \leq 35^\circ\text{C}$, adjust P_T to achieve $T_J = 175^\circ\text{C}$ minimum.

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 measurements shall be conducted in accordance with method 3131, MIL-STD-750. The following details shall apply:

- Collector current magnitude during power application shall be 3.14 A dc.
- Collector to emitter voltage magnitude shall be 20 V dc.
- Reference temperature measuring point shall be the case.
- Reference point temperature shall be $+25^\circ\text{C} \leq T_R \leq +75^\circ\text{C}$ and recorded before the test is started.
- Mounting arrangement shall be with heat sink to header.
- Maximum limit of $R_{\theta JC}$ shall be 0.875°C/W .

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Collector - emitter breakdown voltage	3011	Bias condition D; $I_C = 200 \text{ mA dc}$ pulsed (see. 4.5.1)	$V_{(BR)CEO}$	60 80		V dc V dc
2N5302 2N5303						
Collector - emitter cutoff current	3041	Bias condition D; $V_{CE} = 60 \text{ V dc}$ $V_{CE} = 80 \text{ V dc}$	I_{CEO}		10.0	$\mu\text{A dc}$
2N5302 2N5303						
Emitter - base cutoff current	3061	Bias condition D; $V_{EB} = 5 \text{ V dc}$	I_{EBO}		5.0	$\mu\text{A dc}$
Collector - emitter cutoff current	3041	Bias condition A; $V_{BE} = 1.5 \text{ V dc}$; $V_{CE} = 60 \text{ V dc}$ $V_{CE} = 80 \text{ V dc}$	I_{CEX1}		5.0	$\mu\text{A dc}$
2N5302 2N5303						
Collector - base cutoff current	3036	Bias condition D; $V_{CE} = 60 \text{ V dc}$ $V_{CE} = 80 \text{ V dc}$	I_{CBO}		5.0	$\mu\text{A dc}$
2N5302 2N5303						
Base - emitter saturated voltage	3066	Test condition A; $I_C = 10 \text{ A dc}$; $I_B = 1 \text{ A dc}$; pulsed (see 4.5.1)	$V_{BE(sat)1}$		1.7	V dc
Base - emitter saturated voltage	3066	Test condition A; $I_C = 15 \text{ A dc}$; $I_B = 1.5 \text{ A dc}$ pulsed (see 4.5.1)	$V_{BE(sat)2}$		1.8 2.0	V dc V dc
2N5302 2N5303						
Base - emitter saturated voltage	3066	Test condition A; $I_C = 20 \text{ A dc}$; pulsed (see 4.5.1); $I_B = 2 \text{ A dc}$ $I_B = 4 \text{ A dc}$	$V_{BE(sat)3}$		2.5 2.5	V dc V dc
2N5302 2N5303						
Base - emitter voltage (nonsaturated)	3066	Test condition B; $V_{CE} = 2 \text{ V dc}$; pulsed (see 4.5.1); $I_C = 15 \text{ A dc}$ $I_C = 10 \text{ A dc}$	V_{BE1}		1.8 1.5	V dc V dc
2N5302 2N5303						

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 2</u> - Continued						
Base - emitter voltage (unsaturated) 2N5302 2N5303	3066	Test condition B; V _{CE} = 4 V dc, pulsed (4.5.1) I _C = 30 A dc I _C = 20 A dc	V _{BE2}		3.0 2.5	V dc V dc
Collector - emitter saturated voltage 2N5302 2N5303	3071	I _C = 10 A dc; I _B = 1 A dc; pulsed (see 4.5.1)	V _{CE(sat)1}		0.75 1.0	V dc V dc
Collector - emitter saturated voltage 2N5302 2N5303	3071	I _C = 15 A dc; I _B = 1.5 A dc; pulsed (see 4.5.1)	V _{CE(sat)2}		1.0 1.5	V dc V dc
Collector - emitter saturated voltage 2N5302 2N5303	3071	I _C = 20 A dc; pulsed (see 4.5.1); I _B = 2 A dc I _B = 4 A dc	V _{CE(sat)3}		2.0 2.0	V dc V dc
Collector - emitter saturated voltage 2N5302 (only)	3071	I _C = 30 A dc; pulsed (see 4.5.1); I _B = 6 A dc	V _{CE(sat)4}		3.0	V dc
Forward-current transfer ratio	3076	V _{CE} = 2 V dc; I _C = 1 A dc; pulsed (see 4.5.1)	h _{FE1}	40		
Forward-current transfer ratio 2N5302 2N5303	3076	V _{CE} = 2 V dc; pulsed (see 4.5.1); I _C = 15 A dc I _C = 10 A dc	h _{FE2}	15 15	60 60	
Forward-current transfer ratio 2N5302 2N5303	3076	V _{CE} = 4 V dc; pulsed (see 4.5.1); I _C = 30 A dc I _C = 20 A dc	h _{FE3}	5 5		
<u>Subgroup 3</u>						
High-temperature operation:		T _A = +150°C				
Collector to emitter cutoff current 2N5302 2N5303	3041	Bias condition A; V _{BE} = 1.5 V dc; V _{CE} = 60 V dc V _{CE} = 80 V dc	I _{CEx2}		50	μA dc

See footnote at end of table.

TABLE I. Group A inspection - Continued.

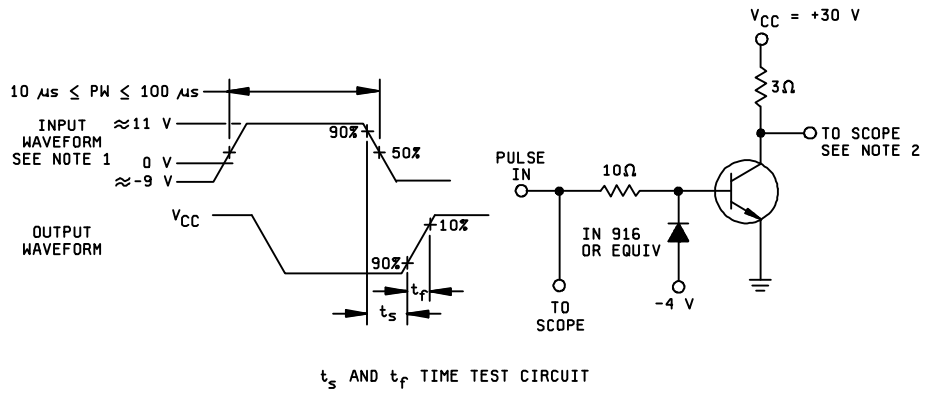
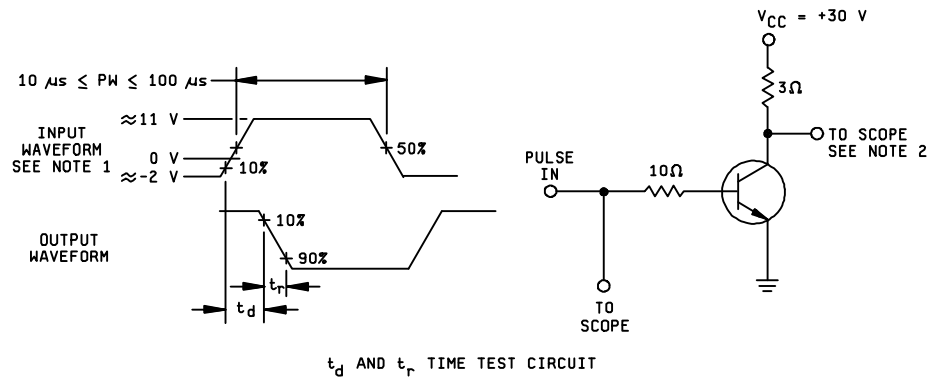
Inspection 1/ 	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u> - Continued						
Low-temperature operation:		T _A = -55°C				
Forward current transfer ratio 2N5302 2N5303	3076	V _{CE} = 2 V dc; pulsed (see 4.5.1); I _C = 15 A dc I _C = 10 A dc	h _{FE4}	7 7		
<u>Subgroup 4</u>						
Small-signal short-circuit forward-current transfer ratio	3206	V _{CE} = 10 V dc; I _C = 1 A dc; f = 1 kHz	h _{fe}	40	240	
Magnitude of small-signal short-circuit forward-current transfer ratio	3306	V _{CE} = 10 V dc; I _C = 1 A dc; f = 1 MHz	h _{fe}	2	40	
Open circuit output capacitance	3236	V _{CB} = 10 V dc; I _E = 0; 100 kHz < f ≤ 1 MHz	C _{obo}		800	pF
Switching parameters:						
Pulse delay time		See figure 2	t _d		0.2	μs
Pulse rise time		See figure 2	t _r		0.9	μs
Pulse storage time		See figure 2	t _s		2.0	μs
Pulse fall time		See figure 2	t _f		1.0	μs
<u>Subgroup 5</u>						
Safe operating area (continuous dc)	3051	T _C = 25°C; power application time ≥ 1 sec, 1 cycle (see figures 3 and 4)				
<u>Test 1</u>						
2N5302		V _{CE} = 6.67 V dc; I _C = 30 A dc				
2N5303		V _{CE} = 10 V dc; I _C = 20 A dc				
<u>Test 2</u>						
2N5302, 2N5303		V _{CE} = 20 V dc; I _C = 10 A dc				

See footnote at end of table.

TABLE I. Group A inspection – Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 5</u> - Continued						
<u>Test 3</u>						
2N5302, 2N5303		$V_{CE} = 40 \text{ V dc};$ $I_C = 3 \text{ A dc}$				
<u>Test 4</u>						
2N5302		$V_{CE} = 50 \text{ V dc};$ $I_C = 600 \text{ mA dc}$				
2N5303		$V_{CE} = 60 \text{ V dc};$ $I_C = 600 \text{ mA dc}$				
Safe operating area (clamped switching)		$T_A = 25^\circ\text{C};$ $V_{CE} = 15 \text{ V dc};$ (see figures 5 and 6)				
2N5302		Clamp voltage = 60 V dc; $I_C = 30 \text{ A dc}$				
2N5303		Clamp voltage = 80 V dc; $I_C = 20 \text{ A dc}$				
Electrical measurements		See table I, group A, subgroup 2				
<u>Subgroups 6 and 7</u>						
Not applicable						

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



NOTES:

1. The rise time (t_r) of the applied pulse shall be $\leq 2\text{ ns}$; duty cycle ≤ 2 percent; generator source impedance shall be $50\ \Omega$.
2. Output sampling oscilloscope: $Z_{IN} \geq 100\text{ k}\Omega$; $C_{IN} \leq 12\text{ pF}$; rise time $\leq 0.2\text{ ns}$.

FIGURE 2. Pulse response test circuit.

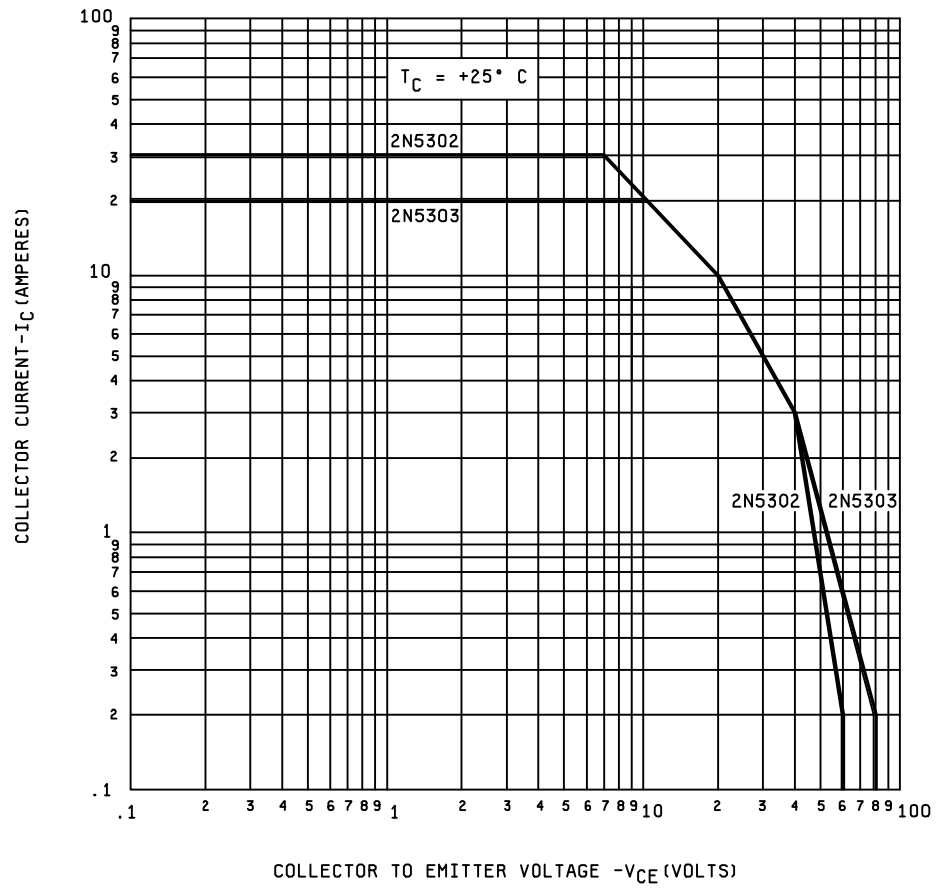


FIGURE 3. Maximum safe operating area graph dc.

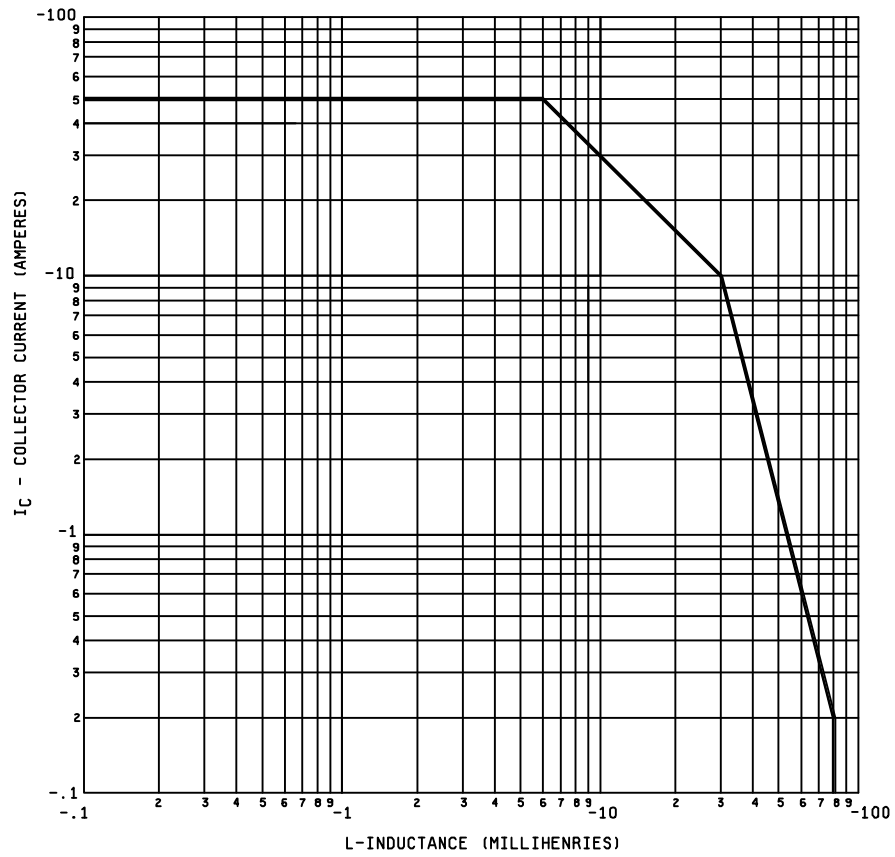
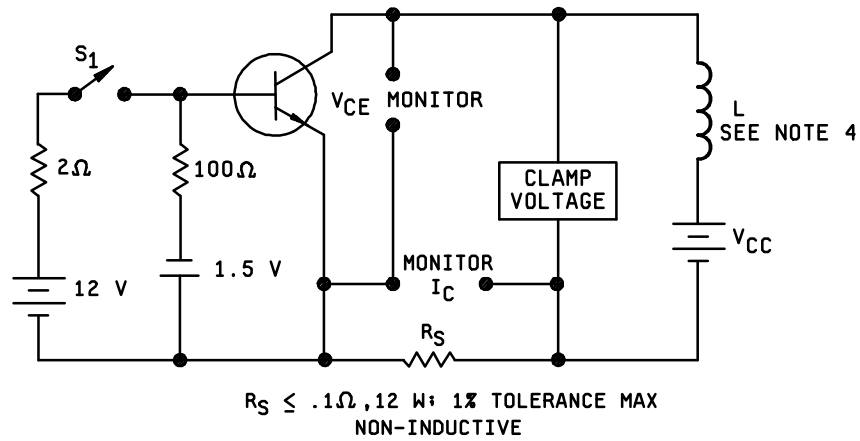


FIGURE 4. Safe operating area for switching between saturation and cutoff (unclamped inductive load).



*L = 2.0 mH (2 each 1 mH, 50 A, .001 Ω , Sanford Miller CK-50, or equivalent).

Procedure:

1. With switch S1 closed, set the specified test conditions.
2. Open S1. Device fails if the clamp voltage is not reached.
3. Perform specified endpoints tests.

FIGURE 5. Clamped inductive sweep test circuit.

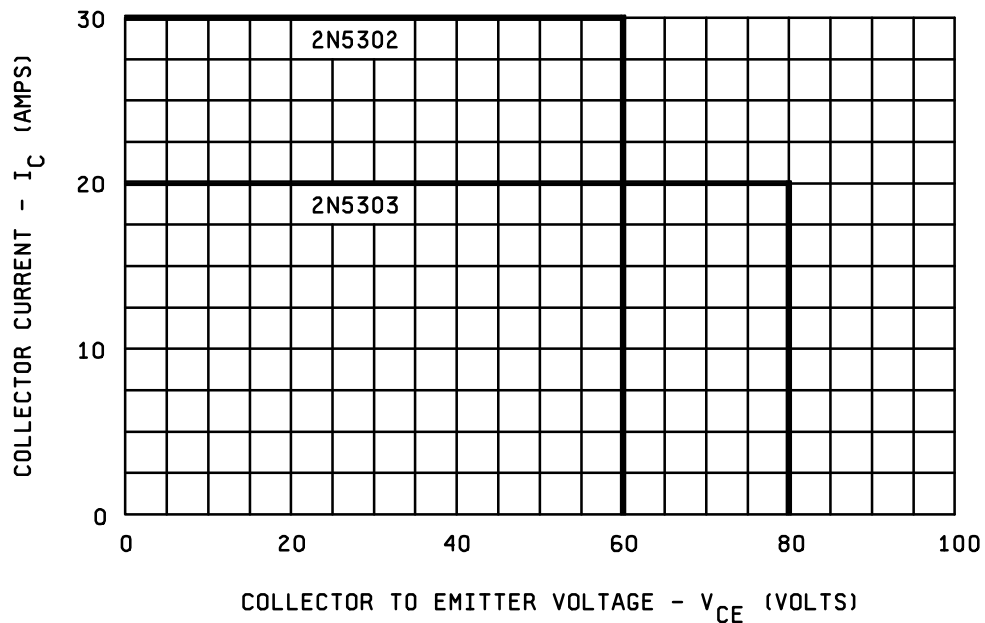


FIGURE 6. Safe operating area for switching between saturation and cutoff (clamped inductive load).

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 Departments' or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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.
- b. Lead finish as specified.
- c. Type designation and product assurance level.

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 extensiveness 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 Manufacturer's 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.

Custodians:

Army - CR
Navy - EC
Air Force - 11
NASA - NA
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2182)

Review activities:

Army - AR, AV, MI, SM
Navy - AS, CG, MC
Air Force - 13, 19

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, and send to preparing activity.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-PRF-19500/456D

2. DOCUMENT DATE (YYYYMMDD)

3. DOCUMENT TITLE

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, HIGH-POWER, TYPE: 2N5302, 2N5303, JAN, JANTX, JANTXV, AND JANS

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*
(1) Commercial
(2) DSN
(If applicable)

7. DATE SUBMITTED
(YYYYMMDD)

8. PREPARING ACTIVITY

a. NAME
Alan Barone

b. TELEPHONE *(Include Area Code)*
(1) Commercial
614-692-0510
(2) DSN
850-0510

c. ADDRESS *(Include Zip Code)*
DSCC-VAC
3990 East Broad Street
Columbus, Ohio 43216-5000

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Defense Standardization Program Office (DLSC-LM)
8725 John J. Kingman Road, Suite 2533
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