

This is an advance copy of the dated document. The final document from Defense Automated Printing Service may be slightly different in format due To electronic conversion processes. Actual technical content will be the same.

The documentation and process conversion measures necessary to comply with this revision shall be completed by 14 August 1999.

INCH-POUND

MIL-PRF-19500/514B
14 May 1999
SUPERSEDING
MIL-S-19500/514A
31 March 1993

PERFORMANCE SPECIFICATION SHEET
SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, POWER
TYPES 2N6274 AND 2N6277, JAN, JANTX, AND JANTXV

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, power transistors. Three levels of product assurance are provided for each encapsulated device type as specified in MIL-PRF-19500.

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

1.3 Maximum ratings.

Types	P_T		V_{CBO}	V_{CEO}	V_{EBO}	I_B	I_C	T_J and T_{STG}	$R_{\theta JC}$
	$T_C = +25^\circ\text{C}$ 1/	$T_C = +100^\circ\text{C}$ 1/							
	<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</u>
2N6274	250	143	120	100	6	20	50	-65 to +200	0.7
2N6277	250	143	180	150	6	20	50	-65 to +200	0.7

1/ Derate linearly 1.43 W/°C Between $T_C = +25^\circ\text{C}$ and $T_C = +200^\circ\text{C}$.

1.4 Primary electrical characteristics. at $T_C = +25^\circ\text{C}$ unless otherwise specified.

	h_{FE3} 1/		h_{FE2} 1/		$V_{BE(sat)}$ 1/		$V_{CE(sat)}$ 1/		Switching		C_{obo}		$ h_{fe} $	
	$V_{CE} = 4\text{ V dc}$ $I_C = 50\text{ A dc}$		$V_{CE} = 4\text{ V dc}$ $I_C = 20\text{ A dc}$		$I_C = 20\text{ A dc}$ $I_B = 2\text{ A dc}$		$I_C = 20\text{ A dc}$ $I_B = 2\text{ A dc}$		t_{on}	t_{off}	$V_{CB} = 10\text{ V dc}$ $I_E = 0$ $F = 1\text{ MHz}$		$V_{CE} = 10\text{ V dc}$ $I_C = 1\text{ mA dc}$ $f = 10\text{ MHz}$	
	<u>V dc</u>		<u>V dc</u>		<u>V dc</u>		<u>V dc</u>		<u>µs</u>		<u>pF</u>			
	Min	Max	Min	Max	Min	Max	Min	Max	Max	Max	Min	Max	Min	Max
2N6274	10		30	120		1.8		1.0	0.5	1.05		600	3	12
2N6277	10		30	120		1.8		1.0	0.5	1.05		600	3	12

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-VAT, 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.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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

MILITARY

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

STANDARD

MILITARY

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

(Copies of the specification and standard required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification takes precedence. Nothing in this specification, 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 (TO-3) herein.

3.3.1 Lead finish. Lead finish shall be solderable in accordance with MIL-PRF-19500. Where a choice of lead finish is desired, it shall be specified in the contract or purchase order (see 6.2).

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 1.3, 1.4, and table I herein.

3.6 Electrical test requirements. The electrical test requirements shall be the subgroups specified in 4.4.2 and 4.4.3.

3.7 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 6.2).

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.

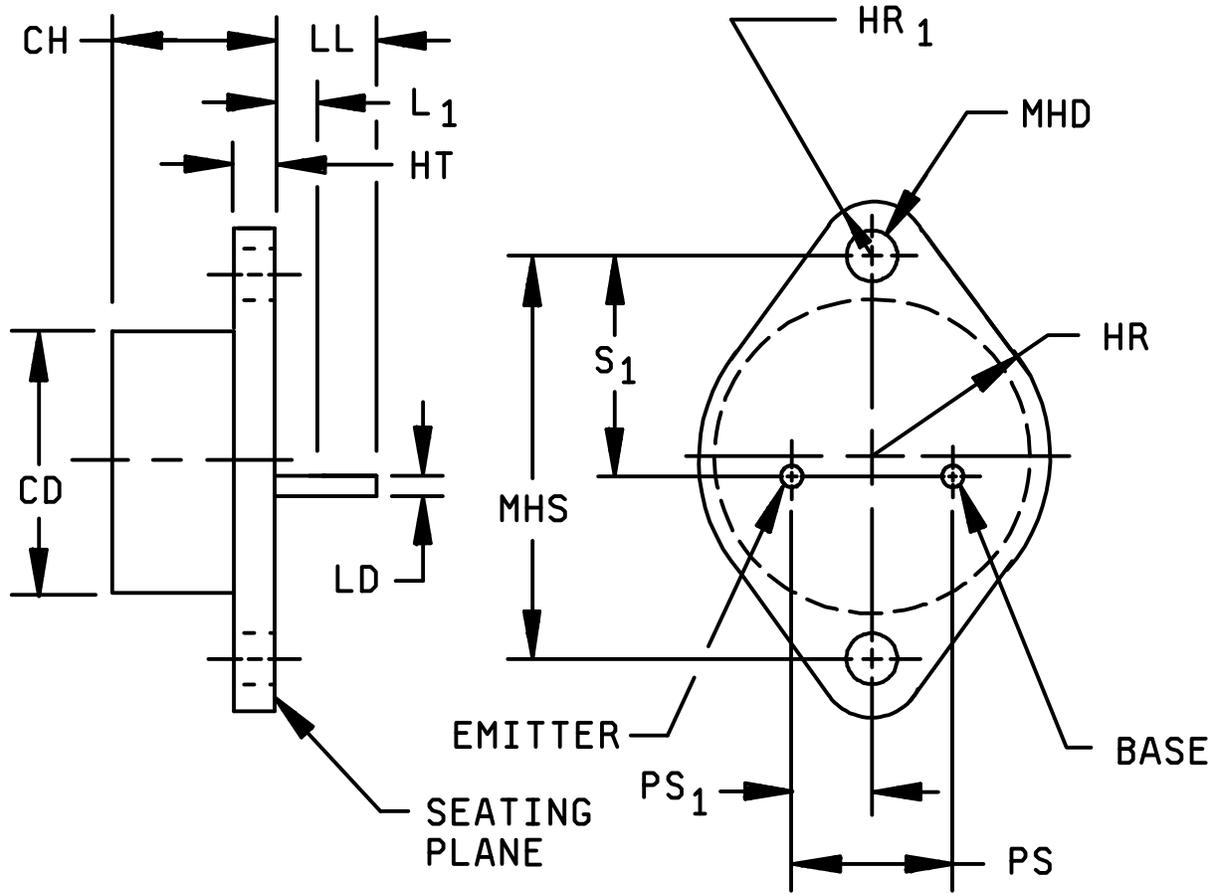


FIGURE 1. Physical dimensions.

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		0.875		22.22	3
CH	0.250	0.328	6.35	8.33	
HR	0.495	0.525	12.57	13.34	
HR1	0.131	0.188	3.33	4.78	
HT	0.060	0.135	1.52	3.43	
L1		0.050		1.27	5, 9
LD	0.057	0.063	1.45	1.60	5, 9
LL	0.312	0.500	7.92	12.70	5
MHD	0.151	0.161	3.84	4.09	7
MHS	1.177	1.197	29.90	30.40	
PS	0.420	0.440	10.67	11.18	4
PS1	0.205	0.225	5.21	5.72	4, 5
S	0.655	0.675	16.64	17.14	4

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Body contour is optional within zone defined by CD
4. These dimensions shall be measured at points .050 (1.27 mm) to .055 (1.40 mm) below seating plane. When gauge is not used, measurement shall be made at seating plane.
5. Both terminals.
6. At both ends.
7. Two holes.
8. Terminal 1 is the emitter, terminal 2 is base. The collector shall be electrically connected to the case.
9. LD applies between L1 and LL. Diameter is uncontrolled in L1.
10. In accordance with ANSI Y14.5M, diameters are equivalent to ϕ x symbology.

FIGURE 1. Physical dimensions - Continued.

4.3 Screening. 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)	Measurements
	JANTX and JANTXV levels
1/	Thermal response (see 4.3.3).
9	Not applicable
11	I_{CEX1} and h_{FE2}
12	See 4.3.1.
13	Subgroup 2 of table I herein; ΔI_{CEX1} = 100 percent of initial value or 1 μ A dc, whichever is greater. Δh_{FE2} = \pm 25 percent of initial value.

1/ This test shall be performed anytime between screens 3 and 9.

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

$$T_J = + 187.5 \text{ }^\circ\text{C}, \pm 12.5 \text{ }^\circ\text{C}; V_{CB} \geq 20 \text{ V dc.}$$

4.3.2 Thermal impedance (ΔV_{BE} measurements). The ΔV_{BE} measurements shall be performed in accordance with MIL-STD-750, method 3131. The ΔV_{BE} conditions maximum (I_H and V_H) and maximum limit shall be derived by each vendor. The chosen V_{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} shall be considered final after the manufacturer has had the opportunity to test five consecutive lots. One hundred percent Safe Operating Area (SOA) testing may be performed in lieu of thermal response testing herein provided that the appropriate conditions of temperature, time, current, and voltage to achieve die attach integrity are submitted to the qualifying activity. The following parameter measurements shall apply:

- a. I_M 10 mA.
- b. V_{CE} measurement voltage..... 20 V (same as V_H).
- c. I_H collector heating current 1 A (minimum).
- d. V_H collector-emitter heating voltage..... 20 V (minimum).
- e. t_H heating time 100 ms.
- f. t_{MD} measurement delay time..... 50 μ s to 80 μ s.
- g. t_{sw} sample window time..... 10 μ s (maximum).

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 table II herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500. Electrical measurements (end-points) shall be in accordance with table II herein.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
3	1027	$V_{CE} \geq 20 \text{ V dc}$; $T_J = 187.5^\circ\text{C}, \pm 12.5^\circ\text{C}$.
3	1037	$V_{CB} \geq 20 \text{ V dc}$; ΔT_J =between cycles $\geq 100^\circ \text{C}$; $t_{on} = t_{off} \geq 1 \text{ minute}$.1
5	3131	See 4.5.2 herein.

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. Electrical measurements (end-points) shall be in accordance with table II herein.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
2	2036	Test condition A; weight = 10 pounds; time = 15 s.
6	1027	$V_{CE} \geq 20 \text{ V dc}$; $T_J = 187.5^\circ\text{C}, \pm 12.5^\circ\text{C}$.

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

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

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

- a. Collector current magnitude during power application shall be 5 A dc.
- b. Collector to emitter voltage magnitude shall be $\geq 10 \text{ V dc}$.
- c. Reference temperature measuring point shall be the case.
- d. Reference point temperature shall be $25^\circ\text{C} \leq T_R \leq 75^\circ\text{C}$.
- e. Mounting arrangement shall be with heat sink to header.
- f. Maximum limit of $R_{\theta JC}$ shall be 0.7°C/W .

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Collector to emitter breakdown voltage 2N6274 2N6277	3011	Bias condition D, $I_C = 50$ mA dc; pulsed (see 4.5.1)	$V_{(BR)CEO}$	100 150		V dc
Collector to emitter cutoff current 2N6274 2N6277	3041	Bias condition D $V_{CE} = 50$ V dc $V_{CE} = 75$ V dc	I_{CEO}		50	μ A dc
Collector to emitter cutoff current 2N6274 2N6277	3041	Bias condition A; $V_{BE} = -1.5$ V dc $V_{CE} = 120$ V dc $V_{CE} = 180$ V dc	I_{CEX1}		10	μ A dc
Emitter-base cutoff current	3061	Bias condition D, $V_{EB} = 6$ V dc	I_{EBO}		100	μ A dc
Collector to base cutoff current 2N6274 2N6277	3036	Bias condition D, $V_{CB} = 120$ V dc $V_{CB} = 180$ V dc	I_{CBO}		10	μ A dc
Base emitter saturated voltage	3066	Test condition A, $I_C = 20$ A dc; pulsed (see 4.5.1) $I_B = 2.0$ A dc	$V_{BE(sat)}$		1.8	V dc
Forward-current transfer ratio	3076	$V_{CE} = 4$ V dc; $I_C = 1$ A dc; pulsed (see 4.5.1)	h_{FE1}	50		
Forward-current transfer ratio	3076	$V_{CE} = 4$ V dc; $I_C = 20$ A dc; pulsed (see 4.5.1)	h_{FE2}	30	120	
Forward-current transfer ratio	3076	$V_{CE} = 4$ V dc; $I_C = 50$ A dc; pulsed (see 4.5.1)	h_{FE3}	10		
Collector to emitter saturated voltage	3071	$I_C = 20$ A dc; pulsed (see 4.5.1) $I_B = 2.0$ A dc	$V_{CE(sat)1}$		1.0	V dc
Collector to emitter saturated voltage	3071	$I_C = 50$ A dc; $I_B = 10$ A dc; pulsed (see 4.5.1)	$V_{CE(sat)2}$		3.0	V dc

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u>						
High-temperature operation:		$T_A = +150^\circ\text{C}$				
Collector to emitter cutoff current	3041	Bias condition A; $V_{BE} = -1.5\text{ V dc}$	I_{CEX2}		1.0	mA dc
2N6274		$V_{CE} = 120\text{ V dc}$				
2N6277		$V_{CE} = 180\text{ V dc}$				
<u>Subgroup 3</u>						
Low-temperature operation :		$T_A = -55^\circ\text{C}$				
Forward-current transfer ratio	3076	$V_{CE} = 4.0\text{ V dc}$ $I_C = 20\text{ A dc}$; pulsed (see 4.5.1)	h_{FE4}	10		
<u>Subgroup 4</u>						
Pulse response:	3251	Test condition A, except test circuit and pulse requirements in accordance with figure 2 herein.				
Turn-on time		$V_{CC} = 80\text{ V dc}$; $I_C = 20\text{ A dc}$; $I_B = 2.0\text{ A dc}$;	t_{on}		0.5	μs
Turn-off time		$V_{CC} = 80\text{ V dc}$; $I_C = 20\text{ A dc}$; $I_{B1} = I_{B2} = 2.0\text{ A dc}$;	t_{off}		1.05	μs
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 10\text{ V dc}$; $I_C = 1\text{ A dc}$; $f = 10\text{ MHz}$	$ h_{fe} $	3	12	
Open capacitance (open circuit)	3236	$V_{CB} = 10\text{ V dc}$; $I_E = 0$; $f = 1.0\text{ MHz}$	C_{obo}		600	pF
<u>Subgroup 5</u>						
Safe operating area (dc operation)	3051	$T_C = +25^\circ\text{C}$ $t = 1\text{ s}$; 1 cycle; (See figure 3)				
<u>Test 1</u>		$V_{CE} = 5\text{ V dc}$; $I_C = 50\text{ A dc}$				
<u>Test 2</u>		$V_{CE} = 8.6\text{ V dc}$; $I_C = 165\text{ mA dc}$				
<u>Test 3</u>		$V_{CE} = 80\text{ V dc}$; $I_C = 29\text{ A dc}$				
2N6274						
<u>Test 4</u>		$V_{CE} = 120\text{ V dc}$; $I_C = 110\text{ mA dc}$				
2N6277						

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection ^{1/}	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 5</u> - Continued						
Safe operating area (switching)	3053	Load condition C, (unclamped inductive load) (see figure 4) T _C = + 25°C; duty cycle ≤ 10 percent; R _S = 0.1 ohms; t _r = t _f ≤ 500 ns				
<u>Test 1</u>		t _p approximately 5 ms (vary to obtain I _C); R _{BB1} = 2 ohms; V _{BB1} =12 V dc; R _{BB2} = ∞; V _{BB2} = 0 V; I _C = 40 A dc; V _{CC} = 50 V dc; L = 100 μH; (4 each Miller type 7827 in parallel, 40 A), 0.04 ohm, or equivalent)				
<u>Test 2</u>		t _p approximately 5 ms (vary to obtain I _C); R _{BB1} = 120ohms; V _{BB1} =12 V dc; R _{BB2} = ∞; V _{BB2} = 0 V; V _{CC} = 50 V dc; I _C = 850 mA dc; L = 100 μH; (= 80 + 20 mH 2 each Traid Transformer C-48u, in series), 0.713 ohm, or equivalent.				
Safe operating area (switching)	3053	Clamped inductive load T _A = + 25°C; duty cycle ≤ 5 percent; t _p approximately 1.5 ms (vary to obtain I _C) V _{CC} =50 V dc; I _C = 50 A dc; V _{BB1} =12 V dc; V _{BB2} = 1.5 V; R _{BB1} = 2 ohms; R _{BB2} = 100 ohms; R _S ≤ 0.1 ohms; L = 370 μH (Miller 7827 or equivalent)				
2N6274		Clamp voltage = 100 V dc				
2N6277		Clamp voltage = 150 V dc				
Electrical measurements		Table II, steps 1 and 5				
<u>Subgroups 6 and 7</u>						
Not applicable						

^{1/} For sampling plan see MIL-PRF 19500.

TABLE II. Groups A, B, and C electrical measurements. 3/ 4/ 5/ 6/

Steps	Inspection	MIL-STD-750		Symbol	Limits		Unit
		Method	Conditions		Min	Max	
1.	Collector to emitter cutoff current 2N6274 2N6277	3041	Bias condition A; $V_{BE} = +1.5$ V dc $V_{CE} = 120$ V dc $V_{CE} = 180$ V dc	I_{CEX1}		10	μ A dc
2.	Forward - current transfer ratio	3076	$V_{CE} = 4$ V dc; $I_C = 20$ A dc; pulsed (see 4.5.1)	h_{FE2}	30	120	
3.	Collector to emitter voltage (saturated)	3071	$I_C = 2.0$ A dc; $I_B = 20$ A dc, pulsed (see 4.5.1) See 4.3.3	$\Delta V_{CE(sat)1}$	± 50 mV change from previously measured value.		
4.	Thermal response 3/	3131		ΔV_{BE}			

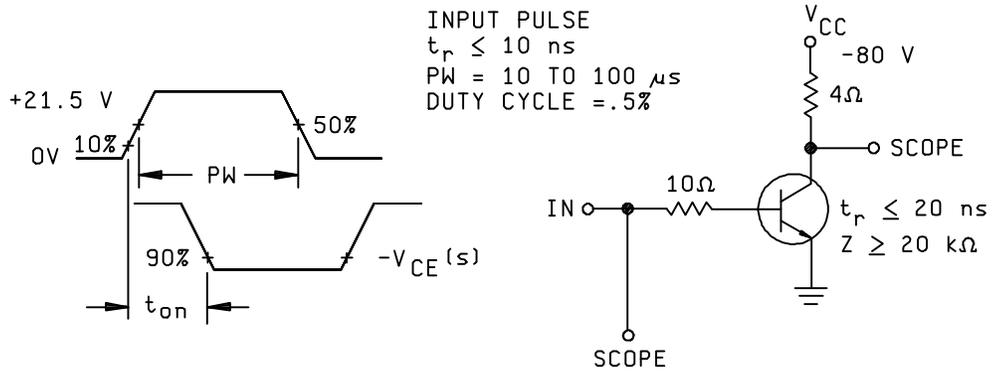
1/ The electrical measurements for table VIb (JANTX and JANTXV) of MIL-PRF-19500 are as follows:

- a. Subgroup 2, see table II herein, steps 1 and 2.
- b. Subgroup 3, see table II herein, steps 1, 2 and 4.
- c. Subgroup 6, see table II herein, steps 1, 2 and 3.

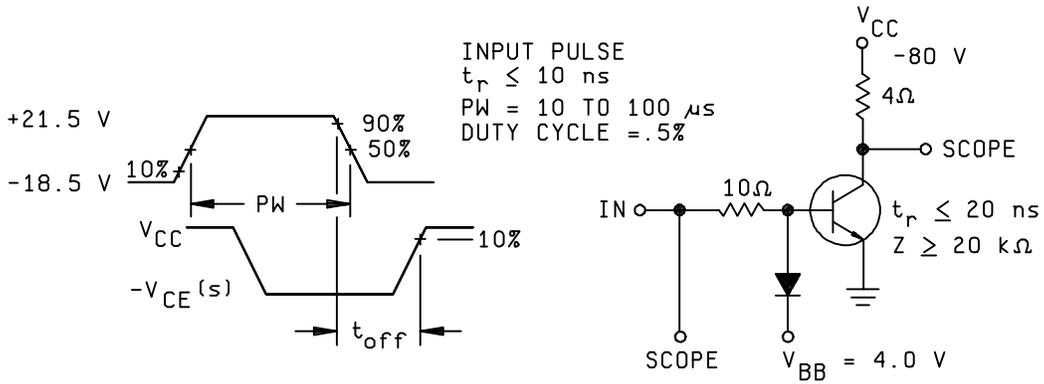
2/ The electrical measurements for table VII of MIL-PRF-19500 are as follows:

- a. Subgroup 2, see table II herein, steps 1 and 2.
- b. Subgroup 3, see table II herein, steps 1 and 2.
- c. Subgroup 6, see table II herein, steps 1, 2 and 3.

3/ Safe operating area (SOA) testing may be performed in lieu of thermal response testing herein provided that the appropriate conditions of temperature, time, current and voltage to achieve die attach integrity are submitted to the qualifying activity.



TURN-ON (t_{on}) TIME TEST CIRCUIT



TURN-OFF (t_{off}) TIME TEST CIRCUIT

FIGURE 2. Switching time test circuits.

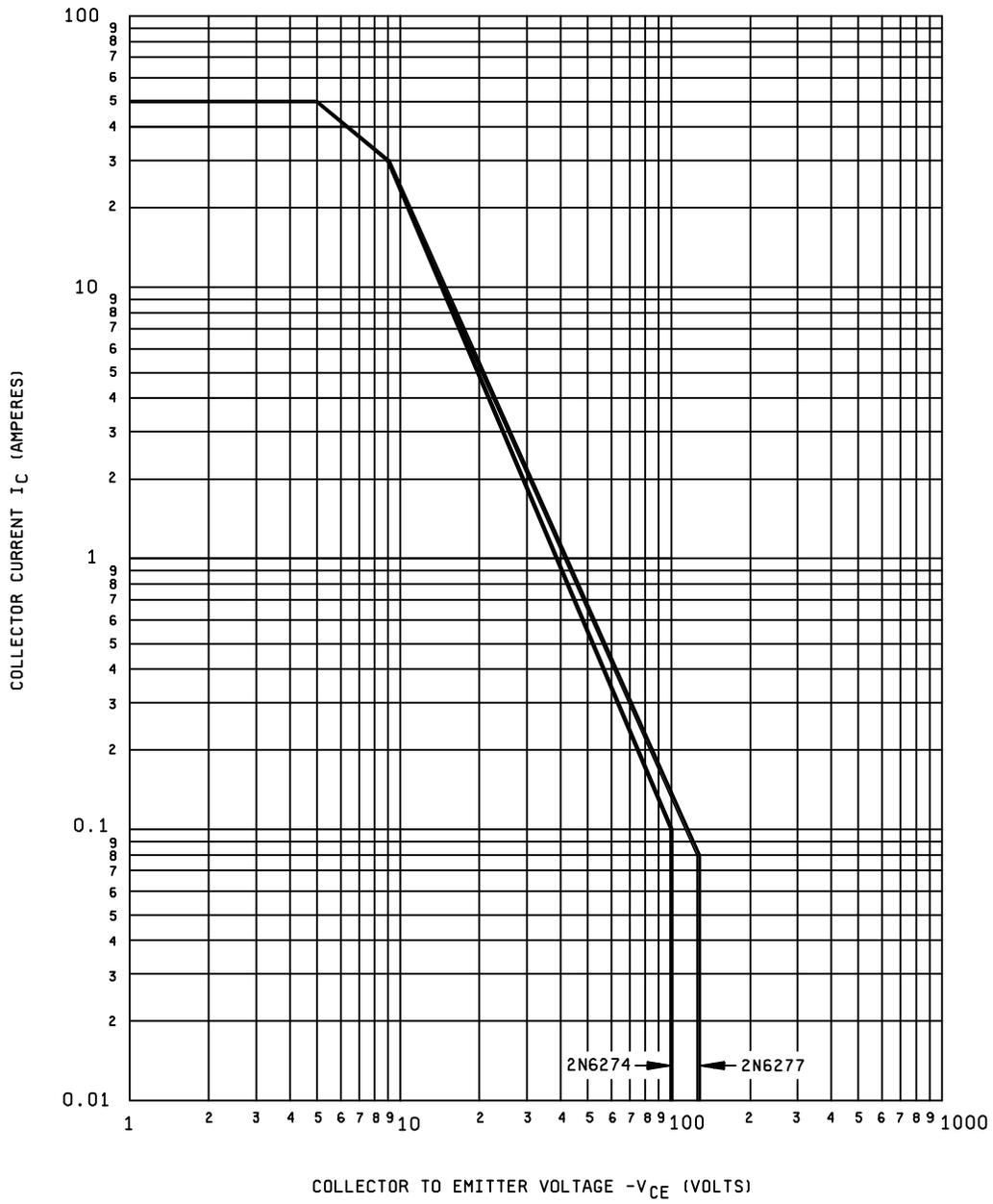


FIGURE 3. Maximum safe operating graph (continuous dc).

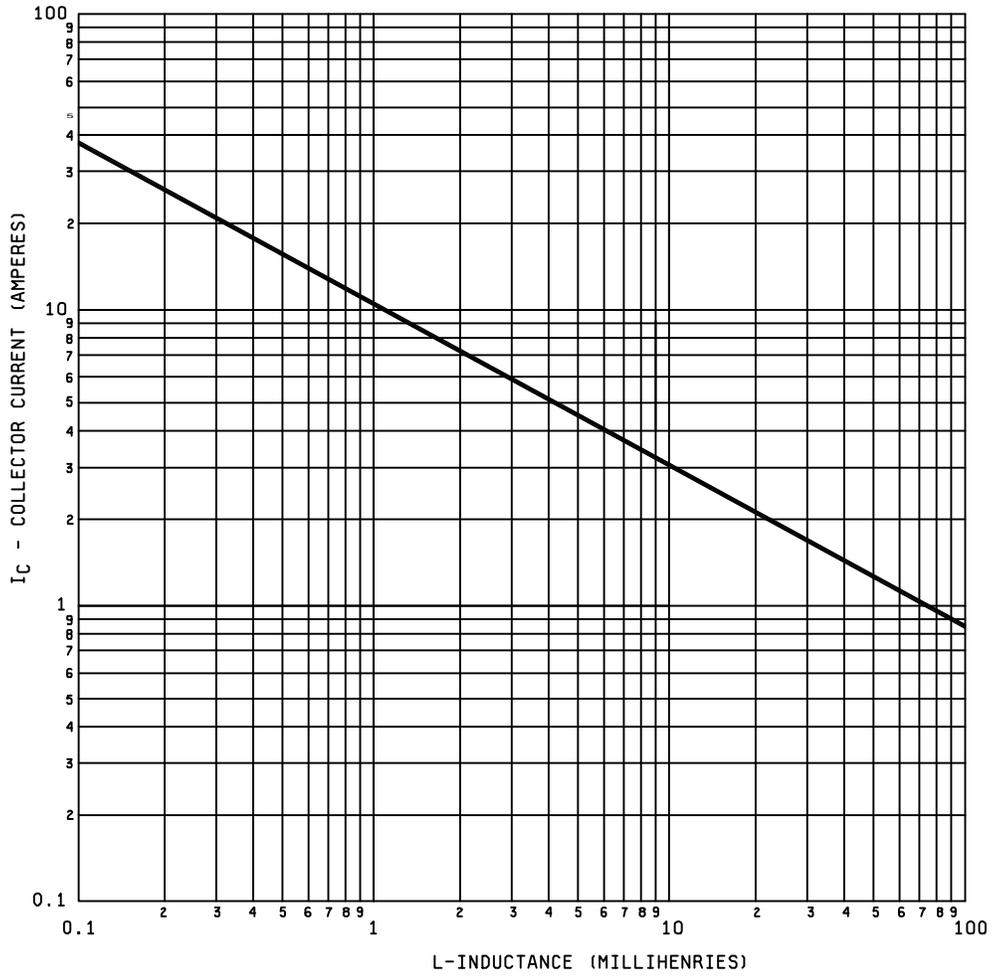
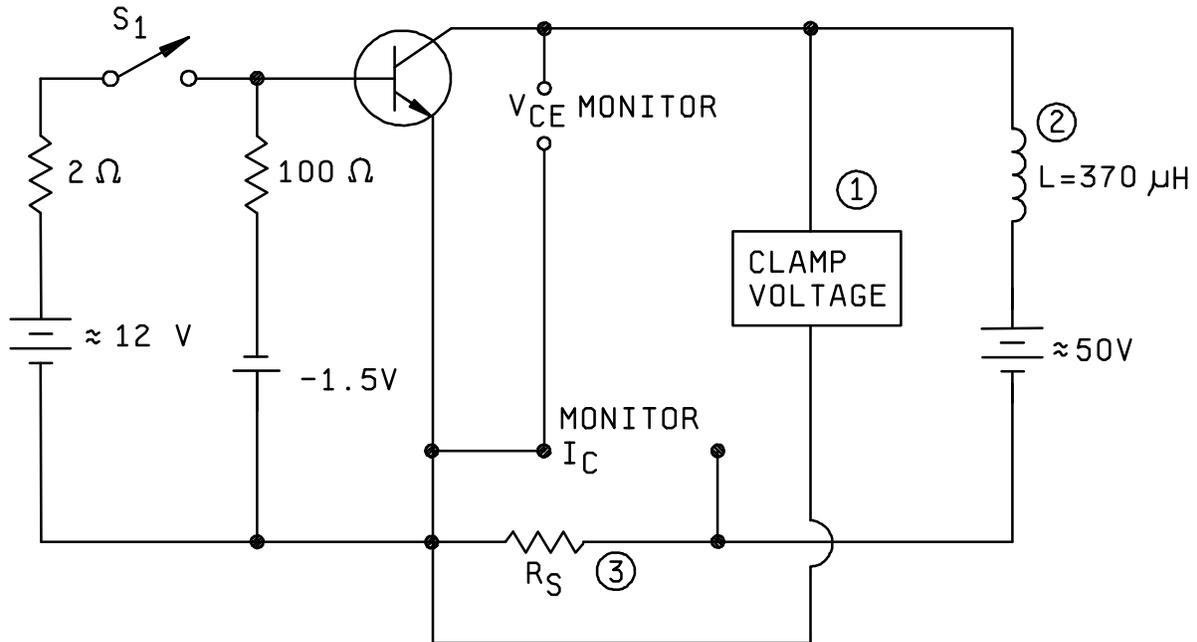


FIGURE 4. Safe operating area for switching between saturation and cutoff (unclamped inductive load).



NOTES:

1. Either a clamping circuit or clamping diode may be used.
2. The coil used shall provide a minimum inductance of 370 μH at 50 A with a maximum dc resistance of .15 ohm.
For reference only: Miller type 7827; or equivalent (see 4.4.4).
3. R_S ≤ .1 ohm, 12 W, 1 percent tolerance maximum, (noninductive).

Procedure:

1. With switch S₁ closed, set the specified test conditions.
2. Open S₁. Device fails if clamp voltage not reached and maintained until the current returns to zero.
3. Perform specified endpoint tests.

FIGURE 5. Clamped inductive sweep test circuit.

PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements should 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.

5.2 Marking. Unless otherwise specified (see 6.2), marking shall be in accordance with MIL-STD-129.

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 see MIL-PRF-19500

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 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

Preparing activity:
DLA-CC

(Project 5961-2073)

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.

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-19500/514B

2. DOCUMENT DATE (YYMMDD)
990514

3. DOCUMENT TITLE

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, POWER TYPES 2N6274 AND 2N6277, JAN, JANTX, AND JANTXV

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)
Commercial
DSN
FAX
EMAIL

7. DATE SUBMITTED
(YYMMDD)

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@dsc.dla.mil

c. ADDRESS : Defense Supply Center
Columbus, ATTN: DSCC-VQE, 3990 East
Broad Street, 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, Suite 2533, Fort Belvoir, VA 22060-6221
Telephone (703) 767-6888 DSN 427-68880