

The documentation and process conversion measures necessary to comply with this revision shall be completed by 21 November 1998.

INCH-POUND

MIL-PRF-19500/376D
 21 August 1998
 SUPERSEDING
 MIL-S-19500/376C
 9 August 1993

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, LOW-POWER
 TYPES 2N2484 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, low-power transistors. Four levels of product assurance is provided for each device type as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (similar to T0-18).

1.3 Maximum ratings.

P _T		V _{CBO}	V _{EBO}	V _{CEO}	I _C	T _J and T _{STG}
T _A = +25°C 1/	T _C = +25°C 2/					
mW	W	V dc	V dc	V dc	mA dc	°C
360	1.2	60	6	60	50	-65 to +200

1/ Derate linearly at 2.06 mW/°C above T_A = +25°C.

2/ Derate linearly at 6.85 mW/°C above T_C = +25°C.

1.4 Primary electrical characteristics.

LIMITS	h _{fe}	C _{obo}	h _{fe} ²	V _{CE(sat)} 1/	R _{θJC}
	V _{CE} = 5 V dc I _C = 1 mA dc f = 1 kHz	I _E = 0 V _{CB} = 5 V dc 100 kHz ≤ f ≤ 1 MHz	I _C = 500 μA dc V _{CE} = 5 V dc f = 30 MHz	I _C = 1.0 mA dc I _B = 0.1 mA dc	°C /W
		pF		V dc	
Min	250		2.0		
Max	900	5.0	7.0	0.3	146

1/ Pulsed (see 4.5.1).

	F I _C = 10 μA dc, V _{CE} = 5 V dc R _g = 10 kΩ			h _{FE2}	h _{FE5}
	f = 100 Hz	f = 1000 Hz	f = 10 kHz	V _{CE} = 5 V dc I _C = 10 μA dc	V _{CE} = 5 V dc I _C = 1 mA dc
	dB	dB	dB		
Min				200	250
Max	7.5	3	2	500	800

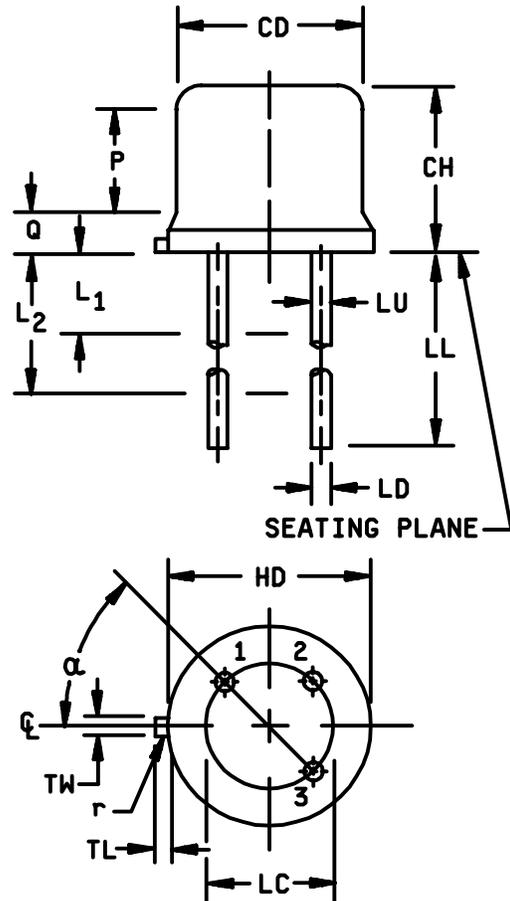
Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAT, 3990 East Broad St., Columbus, OH 43216-5000, by using the addressed Standardization Document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

AMSC N/A

FSC 5961

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	
LC	.100 TP		2.54 TP		6
LD	.016	.021	0.41	0.53	7,8
LL	.500	.750	12.70	19.05	7,8
LU	.016	.019	0.41	0.48	7,8
L1	---	.050	---	1.27	7,8
L2	.250	---	6.35	---	7,8
P	.100	---	2.54	---	
Q	---	.040	---	0.86	5
TL	.028	.048	0.71	1.22	3,4
TW	.036	.046	0.91	1.17	3
r	---	.010	---	0.25	10
α	45° TP		45° TP		6



NOTES:

1. Dimension are in inches.
2. Metric equivalents are given for general information only.
3. Beyond r (radius) maximum, TW shall be held for a minimum length of .011 (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. Leads at gauge plane .054 +.001 -.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
7. Dimension LU applies between L₁ and L₂. Dimension LD applies between L₂ and LL minimum. Diameter is uncontrolled in L₁ and beyond LL minimum.
8. All three leads.
9. The collector shall be internally connected to the case.
10. Dimension r (radius) applies to both inside corners of tab.
11. In accordance with ANSI Y14.5M, diameters are equivalent to ϕ x symbology.
12. Lead 1 = emitter, lead 2 = base, lead 3 = collector.

FIGURE 1. Physical dimensions (similar to TO-18).

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 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

MILITARY

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

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, 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, MIL-HDBK-6100, and herein.

3.3.1 Lead finish. Lead finish shall be solderable in accordance with MIL-PRF-19500.

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

3.5 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).

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

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

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.

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
3c	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2)
9	I_{CBO2} , h_{FE2}	Not applicable
10	48 hours minimum	48 hours minimum
11	I_{CBO2} , h_{FE2} ; ΔI_{CBO2} = 100% of initial value or 2 nA dc, whichever is greater. Δh_{FE2} = $\pm 15\%$	I_{CBO2} , h_{FE4}
12	See 4.3.1 240 hours minimum	See 4.3.1 80 hours minimum
13	Subgroups 2 and 3 of table I herein; ΔI_{CBO2} = 100% of initial value or 2 nA dc, whichever is greater; Δh_{FE2} = $\pm 15\%$	Subgroup 2 of table I herein; ΔI_{CBO2} = 100% of initial value or 2 nA dc, whichever is greater; Δh_{FE4} = $\pm 25\%$

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows: T_A = Room ambient as defined in the general requirements of 4.5 of MIL-STD-750;

$$V_{CB} = 10 - 30 \text{ V dc}; P_T = 360 \text{ mW}.$$

NOTE: No heat sink or forced air cooling on the devices shall be permitted.

4.3.2 Thermal impedance ($Z_{\theta JX}$ measurements). The $Z_{\theta JX}$ measurements shall be performed in accordance with MIL-STD-750, Method 3131.

- a. I_M measurement current 5 mA.
- b. I_H forward heating current 200 mA (min).
- c. t_H heating time 25 - 30 ms.
- d. t_{md} measurement delay time 60 μ s max.
- e. V_{CE} collector-emitter voltage 10 V dc minimum

The maximum limit for $Z_{\theta JX}$ under these test conditions are $Z_{\theta JX}$ (max) = 150°C/W.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein. If alternate screening is being performed per MIL-PRF-19500, a sample of screened devices shall be submitted to and pass the requirements of group A1 and A2 inspection only (table VIb, group B, subgroup 1 is not required to be performed again if group B has already been satisfied per 4.4.2).

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 VIa (JANS) of MIL-PRF-19500 and 4.4.2.1. Electrical measurements (end-points) and delta requirements shall be in accordance with group A, subgroup 2 and 4.5.2 herein. See 4.4.2.2 for JAN, JANTX, and JANTXV group B testing. Electrical measurements (end-points) and delta requirements for JAN, JANTX, and JANTXV shall be after each step in 4.4.2.2 and shall be in accordance with group A, subgroup 2 and 4.5.2 herein.

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

Subgroup	Method	Condition
B4	1037	$V_{CB} = 10 \text{ V dc}$; $T_J = 150^\circ\text{C}$, $t_{on} = t_{off} = 3 \text{ minutes}$ minimum for 2,000 cycles. No heat sink or forced-air cooling on devices shall be permitted.
B5	1027	$V_{CB} = 10 \text{ V dc}$; $T_A = +125^\circ\text{C} \pm 25^\circ\text{C}$ for 96 hours with P_T adjusted according to the chosen T_A to give an average $T_J = +275^\circ\text{C}$.

4.4.2.2 Group B inspection, (JAN, JANTX, and JANTXV). 1/

Step	Method	Condition
1	1039	Steady-state life: Test condition B, 340 hours, $V_{CB} = 10 - 30 \text{ V dc}$, $T_J = 150^\circ\text{C min}$. No heat sink or forced-air cooling on the devices shall be permitted. $n = 45 \text{ devices}$, $c = 0$
2	1039	The steady state life test of step 1 shall be extended to 1,000 hrs for each die design. Samples shall be selected from a wafer lot every twelve months of wafer production. Group B step 2 shall not be required more than once for any single wafer lot. $n = 45$, $c = 0$.
3	1032	High-Temperature life (non-operating), $t = 340 \text{ hours}$, $T_A = +200^\circ\text{C}$. $n = 22$, $c = 0$

1/ Separate samples may be used for each step. In the event of a group B failure, the manufacturer may pull a new sample at double size from either the failed assembly lot or from another assembly lot from the same wafer lot. If the new "assembly lot" option is exercised, the failed assembly lot shall be scrapped.

4.4.2.3 Group B sample selection. Samples selected from group B inspection shall meet all of the following requirements:

- For JAN, JANTX, and JANTXV samples shall be selected randomly from a minimum of three wafers (or from each wafer in the lot) from each wafer lot. For JANS, samples shall be selected from each inspection lot. See MIL-PRF-19500.
- Must be chosen from an inspection lot that has been submitted to and passed group A, subgroup 2, conformance inspection. When the final lead finish is solder or any plating prone to oxidation at high temperature, the samples for life test (subgroups B4 and B5 for JANS, and group B for JAN, JANTX, and JANTXV) may be pulled prior to the application of final lead finish.

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 in 4.4.3.1 (JANS) and 4.4.3.2 (JAN, JANTX, and JANTXV) herein for group C testing. Electrical measurements (end points) and delta requirements shall be in accordance with group A, subgroup 2 and 4.5.2 herein.

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

Subgroup	Method	Condition
C2	2036	Test condition E.
C6	1026	1,000 hours at $V_{CB} = 10 \text{ V dc}$; $T_J = 150^\circ\text{C min}$. No heat sink or forced-air cooling on device shall be permitted.

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

Subgroup	Method	Condition
C2	2036	Test condition E.
C6		Not Applicable

4.4.3.3 Group C sample selection. Samples for subgroups in group C shall be chosen at random from any inspection lot containing the intended package type and lead finish procured to the same specification which is submitted to and passes group A tests for conformance inspection. Testing of a subgroup using a single device type enclosed in the intended package type shall be considered as complying with the requirements for that subgroup.

4.4.4 Group E Inspection. Group E inspection shall be performed for qualification or re-qualification only. The tests specified in table II herein must be performed to maintain qualification.

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 Delta Requirements. Delta requirements shall be as specified below:

Step	Inspection	MIL-STD-750		Symbol	Limits		Unit
		Method	Conditions		Min	Max	
1.	Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc}; I_C = 500 \mu\text{A dc};$ pulsed see 4.5.1	Δh_{FE4} <u>1/</u>			±25 percent change from initial recorded reading
2.	Collector to emitter voltage (saturated)	3071	$I_C = 1.0 \text{ mA dc}; I_B = 100 \mu\text{A dc}$	$\Delta V_{CE(sat)}$ <u>1/, 2/</u>			±50 mV dc change from previously measured value.
3.	Collector to emitter voltage (saturated)	3041	Bias condition C; $V_{CB} = 45 \text{ V dc}$	ΔI_{CES} <u>1/, 2/</u>			100 percent of initial value or 2 nA dc, whichever
4.	Collector-base cutoff current	3036	Bias condition D, $V_{CB} = 45 \text{ V dc}$	ΔI_{CB02} <u>1/</u>			100 percent of initial value or 2 nA dc, whichever is greater.

1/ Devices which exceed the group A limits for this test shall not be accepted.

2/ Applies to JANS level only.

TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical <u>3/</u> examination	2071	n = 45 devices, c = 0				
Solderability <u>3/</u> , <u>5/</u>	2026	n = 15 leads, c = 0				
Resistance to solvents <u>3/</u> , <u>4/</u> , <u>5/</u>	1022	n = 15 devices, c = 0				
Temp Cycling <u>3/</u> , <u>5/</u>	1051	Test condition C, 25 cycles. n = 22 devices, c = 0				
Hermetic Seal <u>5/</u> Fine leak Gross leak	1071	n = 22 devices, c = 0				
Electrical measurements <u>5/</u>		Group A, subgroup 2				
Bond strength <u>3/</u> , <u>5/</u>	2037	Precondition T _A = +250°C at t = 24 hrs or T _A = 300°C at t = 2 hrs; n = 11 wires, c = 0				
<u>Subgroup 2</u>						
Collector to emitter breakdown voltage	3011	Bias condition D; I _C = 10 mA dc pulsed (see 4.5.1)	V _{(BR)CEO}	60		V dc
Collector to base cutoff current	3036	Bias condition D; V _{CB} = 60 V dc	I _{CB01}		10	μA dc
Emitter to base cutoff current	3061	Bias condition D; V _{EB} = 6 V dc	I _{EBO1}		10	μA dc
Collector to base cutoff current	3036	Bias condition D; V _{CB} = 45 V dc	I _{CB02}		5	nA dc
Collector to emitter cutoff current	3041	Bias condition D; V _{CE} = 5 V dc	I _{CEO}		2	nA dc
Emitter to base cutoff current	3061	Bias condition D; V _{EB} = 5 V dc	I _{EBO2}		2	nA dc
Collector to emitter cutoff current	3041	Bias condition C; V _{CE} = 45 V dc	I _{CES}		5	nA dc
Forward-current transfer ratio	3076	V _{CE} = 5 V dc; I _C = 1 μA dc	h _{FE1}	45		

See footnote at end of table.

TABLE I. Group A inspection - continued.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 10 \text{ } \mu\text{A dc}$	h_{FE2}	200	500	
Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 100 \text{ } \mu\text{A dc};$	h_{FE3}	225	675	
Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 500 \text{ } \mu\text{A dc};$	h_{FE4}	250	800	
Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc};$	h_{FE5}	250	800	
Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 10 \text{ mA dc};$ pulsed (see 4.5.1)	h_{FE6}	225	800	
Collector to emitter voltage (saturated)	3071	$I_C = 1.0 \text{ mA dc};$ $I_B = 100 \text{ } \mu\text{A dc}$	$V_{CE(sat)}$		0.3	V dc
Base emitter voltage (nonsaturated)	3066	Test condition B; $V_{CE} = 5 \text{ V dc};$ $I_C = 100 \text{ } \mu\text{A dc}$	$V_{BE(ON)}$	0.5	0.7	V dc
<u>Subgroup 3</u>						
High-temperature operation		$T_A = +150^\circ\text{C}$				
Collector to base cutoff current	3036	Bias condition D; $V_{CB} = 45 \text{ V dc}$	I_{CBO3}		10	$\mu\text{A dc}$
Low-temperature operation		$T_A = -55^\circ\text{C}$				
Forward-current transfer ratio	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 10 \text{ } \mu\text{A dc}$	h_{FE7}	35		
<u>Subgroup 4</u>						
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 5 \text{ V dc};$ $I_C = 50 \text{ } \mu\text{A dc};$ $f = 5 \text{ MHz}$	$ h_{fe} 1$	3.0		
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 5 \text{ V dc};$ $I_C = 500 \text{ } \mu\text{A dc};$ $f = 30 \text{ MHz}$	$ h_{fe} 2$	2.0	7.0	

See footnote at end of table.

TABLE I. Group A inspection - continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 4</u> - Continued.						
Small-signal open-circuit output admittance	3216	$V_{CE} = 5 \text{ V dc};$ $I_C = 1.0 \text{ mA dc};$ $f = 1 \text{ kHz}$	h_{oe}		40	μmhos
Small-signal open-circuit reverse-voltage transfer ratio	3211	$V_{CE} = 5 \text{ V dc};$ $I_C = 1.0 \text{ mA dc};$ $f = 1 \text{ kHz}$	h_{re}		8.0×10^{-4}	
Small-signal short-circuit input impedance	3201	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc};$ $f = 1 \text{ kHz}$	h_{ie}	3.5	24	$\text{k}\Omega$
Small-signal short-circuit forward current transfer ratio	3206	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc};$ $f = 1 \text{ kHz}$	h_{fe}	250	900	
Open circuit output capacitance	3236	$V_{CB} = 5 \text{ V dc};$ $I_E = 0;$ $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{obo}		5.0	pF
Input capacitance (output open-circuited)	3240	$V_{EB} = 0.5 \text{ V dc};$ $I_C = 0;$ $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{ibo}		6.0	pF
Noise figure	3246	$f = 100 \text{ Hz};$ $V_{CE} = 5 \text{ V dc};$ $I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega;$	NF1		7.5	dB
Noise figure	3246	$f = 1 \text{ kHz};$ $V_{CE} = 5 \text{ V dc};$ $I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega;$	NF2		3	dB
Noise figure	3246	$f = 10 \text{ kHz};$ $V_{CE} = 5 \text{ V dc};$ $I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega;$	NF3		2	dB
Noise figure (wideband)	3246	Noise bandwidth $\Delta f = 10 \text{ Hz to } 15.7 \text{ kHz};$ $V_{CE} = 5 \text{ V dc};$ $I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega;$	NF4		3	dB

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>Subgroups 5 and 6</u>						
Not applicable						
<u>Subgroup 7</u> ^{5/}						
Decap internal visual (design verification)	2075	n = 1 device, c = 0				

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

^{2/} For resubmission of failed subgroup A1, double the sample size of the failed test or sequence of tests. A failure in group A, subgroup 1 shall not require retest of the entire subgroup. Only the failed test shall be rerun upon submission.

^{3/} Separate samples may be used.

^{4/} Not required for laser marked devices.

^{5/} Not required for JANS devices.

TABLE II. Group E inspection (all quality levels) - For qualification only

Inspection	MIL-STD-750		Qualification
	Method	Conditions	
<u>Subgroup 1</u>			12 devices c = 0
Temperature cycling (air to air)	1051	Test condition C, 500 cycles	
Hermetic seal	1071		
Fine leak			
Gross leak			
Electrical measurements		See group A, subgroup 2 and 4.5.2 herein.	
<u>Subgroup 2</u>			45 devices c = 0
Intermittent life	1037	Intermittent operation life: $V_{CB} = 10 \text{ V dc}$, 6,000 cycles, $\Delta T_J \geq +100^\circ\text{C}$; forced air cooling allowed on cooling cycle only.	
Electrical measurements		See group A, subgroup 2 and 4.5.2 herein.	
<u>Subgroup 3</u>			
Not applicable			
<u>Subgroup 4</u>			
Not applicable			
<u>Subgroup 5</u>			
Not applicable			

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.

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 should specify the following:

- a. Lead formation and finish may be specified (see 3.3.1).
- b. Type designation and product assurance level.
- c. 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 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 Products List QPL-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.

CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 17
NASA - NA

Preparing activity:

DLA - CC

(Project 5961-2048-05)

Review activities:

Army - AR, MI, SM
Navy - AS, CG, SH, MC
Air Force - 13, 19, 85

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-19500/376D

2. DOCUMENT DATE

21 August 1998

3. DOCUMENT TITLE SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, LOW-POWER TYPES 2N2484 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) 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@dscc.dla.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 Quality and Standardization Office
5203 Leesburg Pike, Suite 1403,
Falls Church, VA 22041-3466
Telephone (703) 756-2340 DSN 289-2340