

The documentation and process conversion measures necessary to comply with this amendment shall be completed by 23 June, 2001.

INCH-POUND

MIL-PRF-19500/453D
 23 March 2001
 SUPERSEDING
 MIL-PRF-19500/453C
 15 December 1997

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, HIGH-FREQUENCY
 TYPES 2N5109, 2N5109UB, JAN, JANTX, JANTXV, AND JANS, JANHC and JANKC

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, VHF-UHF amplifier transistors. Four levels of product assurance are provided for each device type as specified in MIL-PRF-19500. Two levels of product assurance are provided for die.

1.2 Physical dimensions. See figure 1 herein (similar to T0-39), figure 2 (2N5109UB) and figure 3 (JANHC2N5109, JANKC2N5109).

1.3 Maximum ratings.

P _T (1) (2) T _A = +25°C	V _{CB0}	V _{CEO}	I _C	V _{EBO}	T _{STG}	R _{ja}	T _J
W 1	V dc 40	V dc 20	A dc 0.4	V dc 3.0	°C -65 to +200	°C/W 175	°C +200

(1) Derate at 5.71 mW/°C above T_A > +25°C.

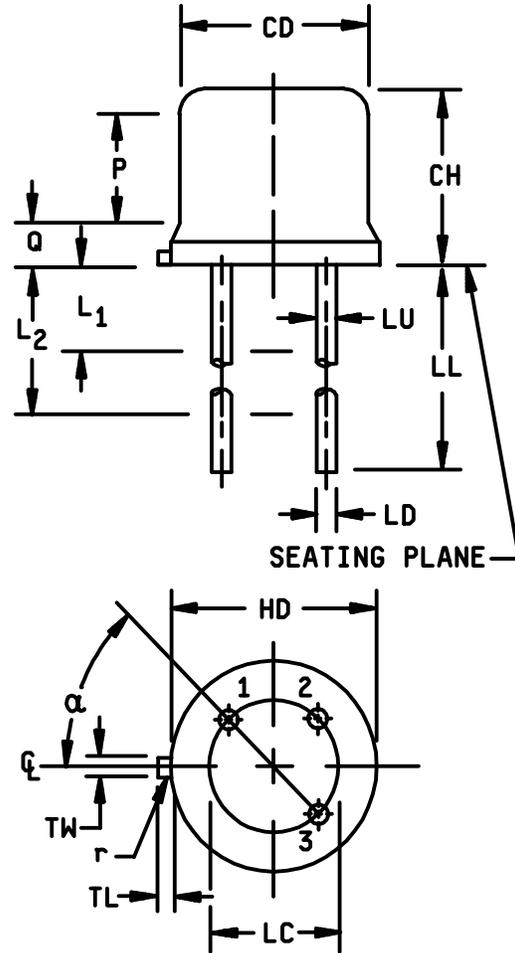
(2) P_T = 2.9 W at T_C = +25°C, derate at 16.6 mW/°C above T_C > +25°C.

1.4 Primary electrical characteristics (common to all types).

Limits	h _{FE}	V _{CE(SAT)}	C _{obo}	h _{FE}	Power gain
	V _{CE} = 15 V dc I _C = 50 mA dc	I _C = 100mA dc I _B = 10 mA dc	I _E = 0 100 kHz ≤ f ≤ 1 MHz V _{CB} = 28 V dc	V _{CE} = 15 V dc I _C = 50 mA dc f = 200 MHz	I _C = 50 mA dc f = 200 MHz Pin = -10dB V _{CE} = 15 V dc
Min	40	V dc	pF	6.0	dB
Max	150	0.5	3.5	11.0	11.0

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

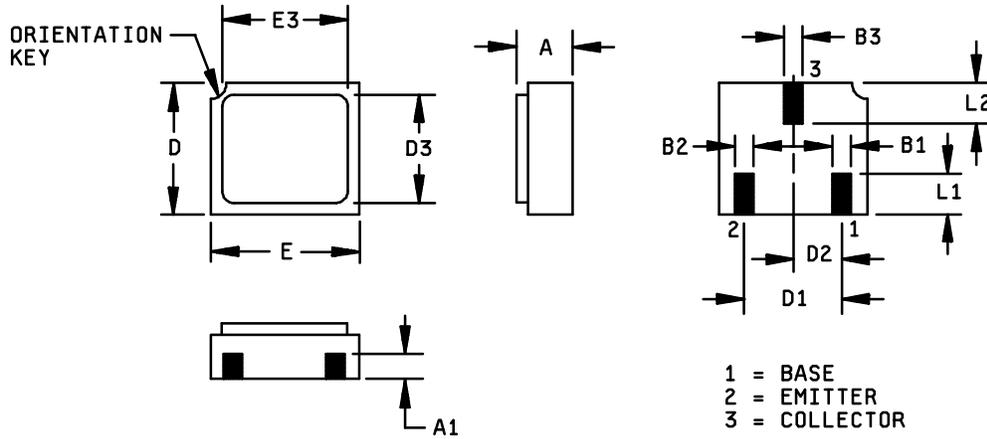
Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.305	.335	7.75	8.51	
CH	.240	.260	6.10	6.60	
HD	.335	.370	8.51	9.40	
LC	.190	.210	4.83	5.33	
LD	.016	.021	0.41	0.53	4
LL	.500	.750	12.70	19.05	4
LU	.016	.019	0.041	0.48	4
L ₁		.050		1.27	4
L ₂	.250		6.35		4
Q		.050		1.27	6
TL	.029	.045	0.74	1.14	5
TW	.028	.034	0.71	0.86	
r		.010		0.25	
α	45° TP		45° TP		
P	.100		2.54		3



NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. This zone is controlled for automatic handling. The variation in actual diameter within this zone shall not exceed .010 inch (0.254 mm).
4. (Three leads) LU applies between L₁ and L₂. LD applies between L₂ and .5 inch (12.70 mm) from seating plane. Diameter is uncontrolled in L₁ and beyond .5 inch (12.70 mm) from seating plane.
5. Measured from maximum diameter of the actual device.
6. Details of outline in this zone optional.

FIGURE 1. Physical dimensions of transistor type 2N5109 (similar to TO 39).

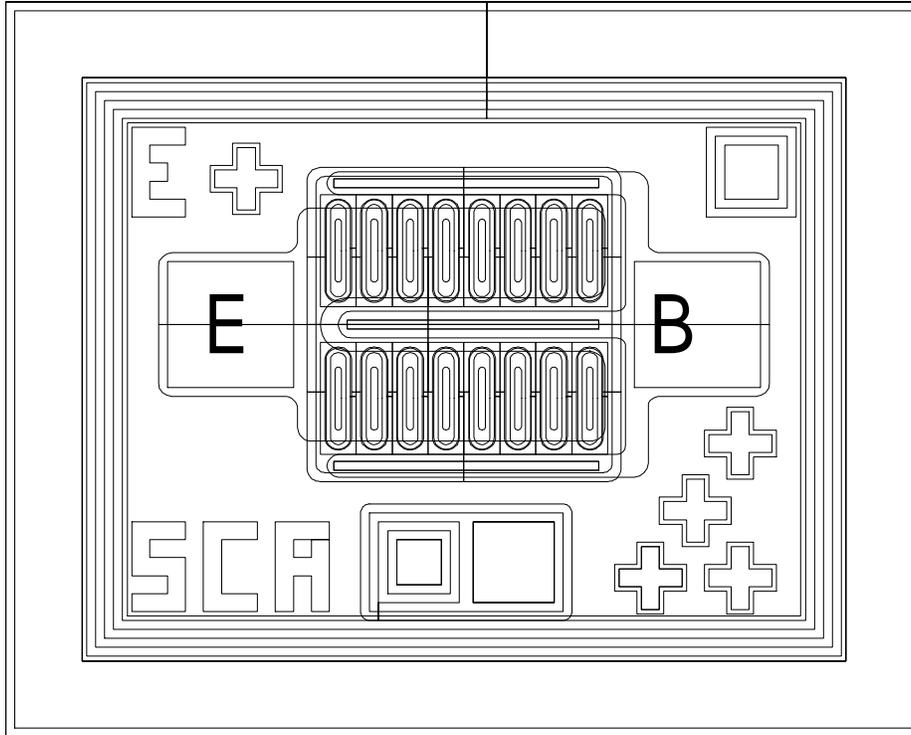


Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
A	.046	.056	0.97	1.42	
A1	.017	.035	0.43	0.89	
B1	.016	.024	0.41	0.61	
B2	.016	.024	0.41	0.61	
B3	.016	.024	0.41	0.61	
D	.085	.108	2.41	2.74	
D1	.071	.079	1.81	2.01	
D2	.035	.039	0.89	0.99	
D3	.085	.108	2.41	2.74	
E	.115	.128	2.82	3.25	
E3		.128		3.25	
L1	.022	.038	0.56	0.96	
L2	.022	.038	0.56	0.96	

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

FIGURE 2. Physical dimensions, surface mount (UB version).



Die size: .016 x .020 inches (0.4064 x 0.508 mm).
Die thickness: .008 ±.0016 inches (0.2032 ±0.04064 mm).
Base pad: .0028 x .0028 inches (0.07112 x 0.07112 mm).
Emitter pad: .0028 x .0028 inches (0.07112 x 0.07112 mm).
Back metal: Gold, 6500 ±1950 Ang
Top metal: Aluminum, 17500 ±2500 Ang
Back side: Collector
Glassivation: SiO₂, 7500 ±1500 Ang

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified tolerance is .00100 inch (0.00254 mm).

FIGURE 3. JANHC and JANKC (A-version) die dimensions.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in section 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 Document Automation and Production Services (DAPS), Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, 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 General. The requirements for acquiring the product described herein shall consist of this document and MIL-PRF-19500.

3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturer's list (QML) before contract award (see 4.2 and 6.3).

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

3.4 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-19500, and figure 1 (similar to T0-39), figure 2 (2N5109UB) and figure 3 (JANHC2N5109 and JANKC2N5109) herein.

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

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

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3.6 Electrical test requirements. The electrical test requirements shall be group A as specified herein.

3.7 Marking. Marking shall be in accordance with MIL-PRF-19500. At the option of the manufacturer, marking may be omitted from the body, but shall be retained on the initial container.

3.8 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Screening (see 4.3).
- c. Conformance inspection (see 4.4).

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 only). Screening shall be in accordance with table IV of MIL-PRF-19500, and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see table IV of MIL-PRF-19500)	Measurement	
	JANS levels	JANTX and JANTXV levels
3c	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2)
7	Hermetic seal (optional) (1)	Hermetic seal (optional) (1)
9	I_{CEO1} and h_{FE1}	Not applicable
10	48 hours minimum	48 hours minimum
11	I_{CEO1} and h_{FE1} ; ΔI_{CEO1} = 100 percent of initial value or 2 μ A dc, whichever is greater. Δh_{FE1} = \pm 20 percent.	I_{CEO1} and h_{FE1}
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_{CEO1} = 100 percent of initial value or 2 μ A dc, whichever is greater. Δh_{FE1} = 20 percent change from initial reading;	Subgroup 2 of table I herein; ΔI_{CEO1} = 100 percent of initial value or 2 μ A dc, whichever is greater. Δh_{FE1} = 20 percent change from initial reading;
14	Optional	Optional

(1) Hermetic seal test shall be performed in either screen 7 or screen 14.

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows: $V_{CB} = 10 - 30$ Vdc $T_A =$ Room ambient as defined in the general requirements of 4.5 of MIL-STD-750. Power shall be applied to the device to achieve a junction temperature, $T_J = +135^\circ\text{C}$ minimum and a minimum $P_D = 75$ percent of P_T maximum rated as defined in 1.3 herein.

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

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

The maximum limit for $Z_{\theta JX}$ under these test conditions are $Z_{\theta JX} (\text{max}) = 50^\circ\text{C/W}$

4.3.3 Screening (JANHC and JANKC). Screening of JANHC and JANKC die shall be in accordance with MIL-PRF-19500, "Discrete Semiconductor Die/Chip Lot Acceptance". Burn-in duration for the JANKC level follows JANS requirements; the JANHC follows JANTX requirements.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500 and as specified herein. If alternate screening is being performed in accordance with E.5.3.1d of 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 in accordance with 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 tests and conditions specified for subgroup testing in table VIa (JANS) and 4.4.2.1 herein. See 4.4.2.2 for JAN, JANTX, and JANTXV group B testing. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein.

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

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
B4	1037	$V_{CB} = 10 - 30$ V dc.
B5	1027	$V_{CB} = 10$ 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 $T_J = +275^\circ\text{C}$ minimum. Optionally the test may be performed for a minimum of 216 hours with P_T adjusted to achieve a $T_J = +225^\circ\text{C}$; sample size = 45, c = 0. In this case the ambient temperature shall be adjusted such that a minimum 75 percent of maximum rated P_T (see 1.3) is applied to the device under test. (NOTE: If a failure occurs, resubmission shall be at the test conditions of the original sample.)

4.4.2.2 Group B inspection, table VIb (JAN, JANTX and JANTXV). 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.

<u>Step</u>	<u>Method</u>	<u>Conditions</u>
1	1027	Steady-state life: Test condition B, 340 hours, $V_{CB} = 10 - 30$ V dc; power shall be applied to achieve $T_J = 150^\circ\text{C}$ minimum and a power dissipation of $P_D \geq 75$ percent of max rated P_T as defined in 1.3 herein shall be used. $n = 45$ devices, $c = 0$. For small lots, $n = 12$ devices, $c = 0$.
2	1027	The steady-state life test of step 1 shall be extended to 1,000 hours 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), $t = 340$ hours, $T_A = +200^\circ\text{C}$. $n = 22$, $c = 0$.

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 tests and 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) shall be in accordance with group A, subgroup 2.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
C2	2036	Test condition E.
C6	1026	1,000 hours at $V_{CB} = 10$ V dc; power shall be applied to achieve $T_J = +150^\circ\text{C}$ minimum and a power dissipation of $P_D \geq 75$ percent of max rated P_T as defined in 1.3 herein shall be applied. $n = 45$ devices, $c = 0$. For small lots, $n = 12$ devices, $c = 0$.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
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. When the final lead finish is solder or any plating prone to oxidation at high temperature, the samples for C6 life test may be pulled prior to the application of final lead finish. 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.

4.5 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 of MIL-STD-750. The following details shall apply:

- a. Collector current magnitude during power application shall be 79 mA dc minimum.
- b. Collector to emitter voltage magnitude shall be 20 V dc minimum.
- c. Reference temperature measuring point shall be the case.
- d. Reference point temperature shall be $+25^{\circ}\text{C} \leq T_R \leq +75^{\circ}\text{C}$ and recorded before the test is started.
- e. Mounting arrangement shall be with heat sink to case.
- f. Maximum limit of $R_{\theta JC}$ shall be 60°C/W .

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TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u> <u>2/</u>						
Visual and mechanical <u>3/</u> examination	2071	n = 45 devices, c = 0				
Solderability <u>3/ 4/</u>	2026	n = 15 leads, c = 0				
Resistance to <u>3/ 4/ 5/</u> Solvent	1022	n = 15 devices, c = 0				
Temp cycling <u>3/ 4/</u>	1051	Test condition C, 25 cycles. n = 22 devices, c = 0				
Hermetic seal <u>4/</u> fine leak gross leak	1071	n = 22 devices, c = 0				
Electrical measurements <u>4/</u>		Group A, subgroup 2				
Bond strength <u>3/ 4/</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>						
Breakdown voltage, collector to base	3001	Bias condition D; I _C = 100 μA dc	V _{(BR)CBO}	40		V dc
Breakdown voltage, collector to emitter	3011	Bias condition D; I _C = 5 mA dc	V _{(BR)CEO}	20		V dc
Breakdown voltage, emitter to base	3026	Bias condition D; I _C = 100 μA dc	V _{(BR)EBO}	3.0		V dc
Breakdown voltage, collector to emitter	3011	Bias condition D; I _C = 5 mA dc; R ₂ = 10	V _{(BR)CER}	40		V dc
Collector to emitter cutoff current	3041	Bias condition D; V _{CE} = 15 V dc	I _{CE01}		20	μA dc
Forward-current transfer ratio	3076	V _{CE} = 15 V dc; I _C = 50 mA dc; Pulsed (see 4.5.1)	h _{FE1}	40	150	
Collector to emitter saturated voltage	3071	I _C = 100 mA dc; I _B = 10 mA dc; Pulsed (see 4.5.1)	V _{CE(sat)1}		0.5	V dc
<u>Subgroup 3</u>						
High temperature operation:		T _C = +175°C				
Collector to emitter cutoff current	3041	Bias condition D; V _{CE} = 15 V dc	I _{CE02}		5.0	mA dc

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3 - Continued</u>						
Low temperature operation		$T_A = -55^\circ\text{C}$				
Forward-current transfer ratio	3076	$V_{CE} = 5\text{ V dc}$ $I_C = 50\text{ mA dc}$; Pulsed (see 4.5.1)	h_{FE2}	15		
<u>Subgroup 4</u>						
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}		3.5	pF
Magnitude of common-emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 15\text{ V dc}$ $f = 200\text{ MHz}$	$ h_{fe} $			
		$I_C = 25\text{ mA dc}$; $I_C = 50\text{ mA dc}$; $I_C = 100\text{ mA dc}$		5.0 6.0 5.0	10 11.0 10.5	
Power gain (narrow band) current		$V_{CC} = 15\text{ V dc}$; $I_C = 50\text{ mA dc}$; $f = 200\text{ MHz}$; $P_{in} = -10\text{ dB}$ (See figure 4)	G_{PE}	11		dB
Cross modulation		$V_{CC} = 15\text{ V dc}$; $I_C = 50\text{ mA dc}$; 54 dB output; (See figure 4)	cm		-57	dB
Noise figure		$V_{CC} = 15\text{ V dc}$; $I_C = 10\text{ mA dc}$; $f = 200\text{ MHz}$; $P_{in} = -10\text{ dB}$ (See figure 4)	NF		3.5	dB
Voltage gain (wideband)		$V_{CC} = 15\text{ V dc}$; $I_C = 50\text{ mA dc}$; $f = 50\text{ to }216\text{ MHz}$; $P_{in} = -10\text{ dB}$ (See figure 5)	G	11		dB
<u>Subgroups 5, 6, and 7</u>						
Not applicable						

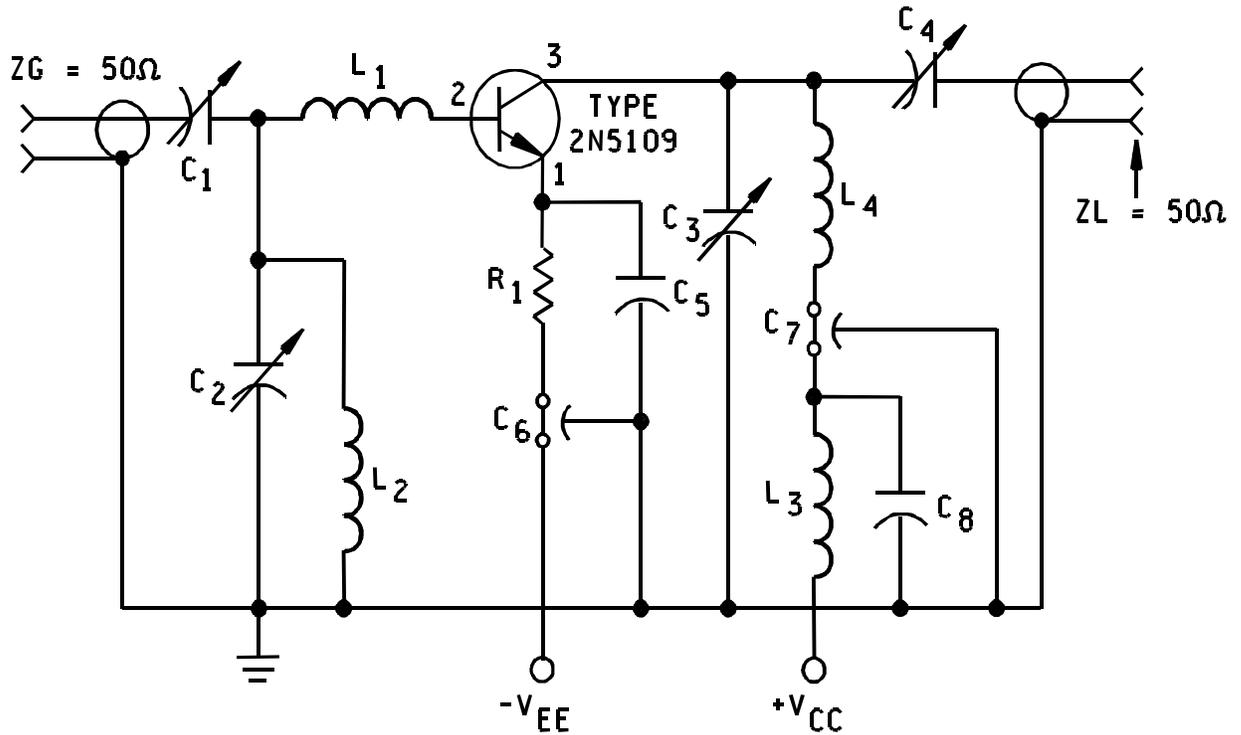
1/ For sampling plan, unless otherwise specified see MIL-PRF-19500.

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 JANS devices.

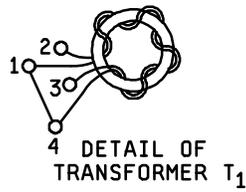
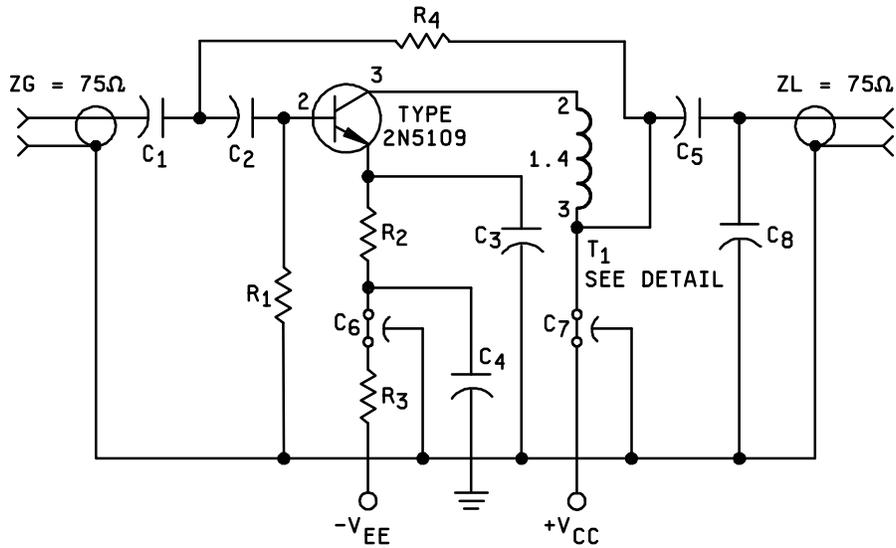
5/ Not required for laser marked devices.



C₁, C₂, C₃: 1.0 to 30 pF.
 C₄: 1.0 to 20 pF.
 C₅: 10,000 pF.
 C₆, C₇: 1,000 pF.
 C₈: .01 μF.

L₁: 4.5 turns, number 22 wire, .187 inch I. D.
 L₄: 3.5 turns, number 22 wire, .187 inch I. D.
 L₂, L₃: 0.82 μH RFC.
 R₁: 240Ω, 2 watts.

FIGURE 4. RF amplifier for power gain and noise figure tests.



C₁, C₂, C₃, C₅: 0.002 μF.
 C₄: 0.03 μF.
 C₆, C₇: 1500 pF
 C₈: 18 pF.
 R₁: 4.7 kΩ, 0.25 W.
 R₂: 6.8Ω, 0.5 W.

R₃ : 330Ω, 1W.
 R₄ : 200Ω, 0.25 W.
 T₁ : 4 turns number 30 wire.

Bifilar wound on "Indiana General".
 Core number CF-102-Q1, or equivalent.

FIGURE 5. RF amplifier for voltage gain test.

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 materiel 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

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

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

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.1).
- c. Lead finish (see 3.4.1).
- d. Product assurance level and type designator.
- e. Packaging requirements (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers' List (QML) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center, Columbus, ATTN: DSCC/VQE, P.O. Box 3990, Columbus, OH 43216-5000.

6.4 Suppliers of JANHC and JANKC die. The qualified JANHC and JANKC suppliers with the applicable letter version (example JANHCA2N5109) will be identified on the QPL.

Die ordering information				
PIN	Manufacturer			
	34156			
2N5109	JANHCA2N5109 JANKCA2N5109			

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue because of the extensiveness of the changes.

Custodians:
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2348)

Review activity:
Air Force - 19, 99

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-19500/453D	2. DOCUMENT DATE 23 February 2001
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3. DOCUMENT TITLE
SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, HIGH-FREQUENCY TYPES 2N5109, 2N5109UB, JAN, JANTX, JANTXV, AND JANS, JANHC, AND JANKC

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
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c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) COMMERCIAL DSN FAX EMAIL	7. DATE SUBMITTED
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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
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c. ADDRESS Defense Supply Center Columbus ATTN: DSCC-VAC P.O. Box 3990 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 427-6888
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