The documentation and process conversion measures necessary to comply with this document shall be completed by 16 May, 2002.

INCH-POUND

MIL-PRF-19500/301F
16 February, 2002
SUPERSEDING
MIL-PRF-19500/301E
4 October 2000

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN SILICON, LOW-POWER
TYPE 2N918 AND 2N918UB
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 detail requirements for NPN, silicon, ultra-high frequency transistors. Four levels of product assurance are provided for each device type as specified in MIL-PRF-19500 and two levels of product assurance are provided for unencapsulated devices.

1.2 Physical dimensions. See figure 1 (TO - 72), figure 2 for UB and figure 3 (JANHC and JANKC).

1.3 Maximum ratings.

Types	P_T 1/ T_A = +25°C	V_{CBO}	V_{CEO}	V_{EBO}	I_C	T_{STG} and T_J
	mW	V dc	V dc	V dc	mA dc	°C
2N918	200	30	15	3.0	50	-65 to +200
2N918UB	200	30	15	3.0	50	

1/ Derate linearly, 1.14 mW/°C above T_A= 25°C

1.4 Primary electrical characteristics at T_A = +25°C.

Limit	$\|h_{FE}\|$ V_{CE} = 10 V dc I_C = 4 mA dc f = 100 MHz	$r_b' C_c$ V_{CB} = 10 V dc I_E = -4.0 mA dc f = 79.8 MHz	C_{obo} V_{CB} = 10 V dc I_E = 0 mA dc 100 kHz ≤f≤1 MHz	NF V_{CE} = 6 V dc I_C = 1 mA dc f = 60 MHz g_s = 2.5 mmho	G_{pe} V_{CB} = 12 V dc I_C = 6.0 mA dc f = 200 MHz
		ps	pF	DB	dB
Minimum	6.0				15
Maximum	18.0	25	1.7	6.0	

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, P.O. 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.

AMSC N/A FSC 5961

1.4 Primary electrical characteristics at T_A = +25°C - Continued.

Limit	h_{FE1} V_{CE} = 10 V dc I_C = 500 µA dc	h_{FE2} V_{CE} = 1.0 V dc I_C = 3.0 mA dc	h_{FE3} V_{CB} = 10 V dc I_C = 10 mA dc
Minimum Maximum	10	20 200	20

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 Document Automation and Production Services (DAPS), Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

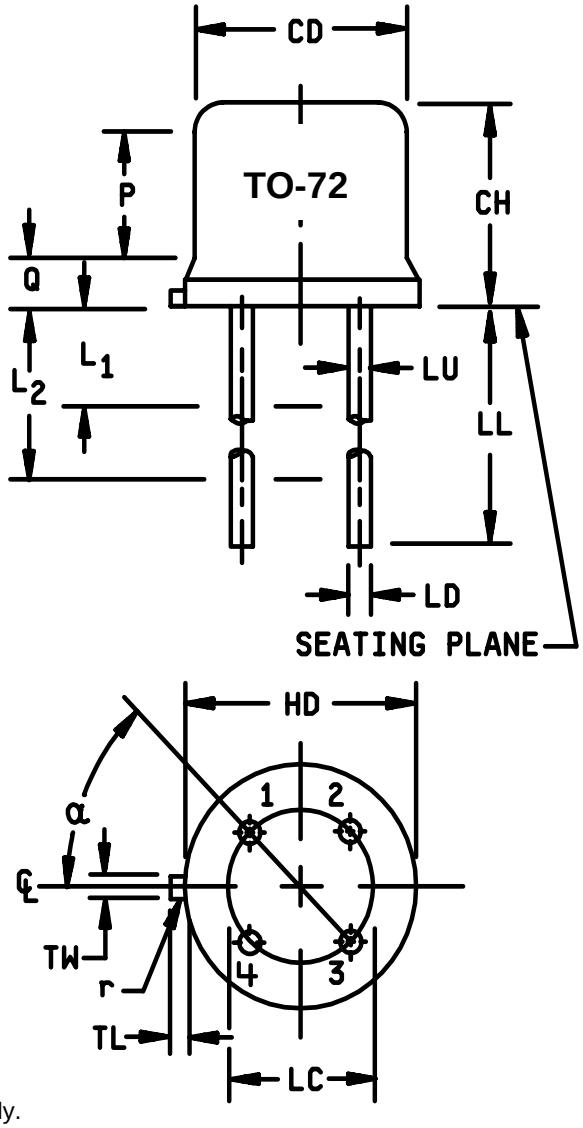
2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 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).

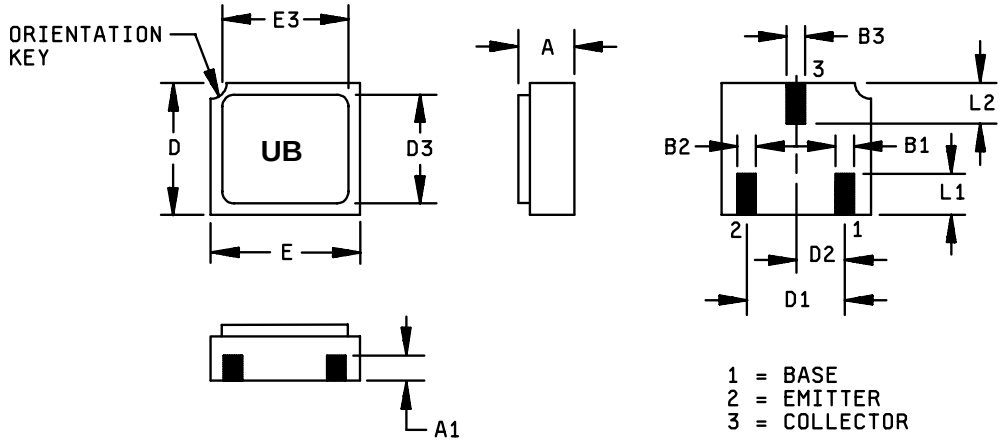
Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	5
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	5
LC	.100 TP		2.54 TP		7,8
LD	.016	.021	.406	.533	7,8
LL	.500	.750	12.70	19.05	7,8
LU	.016	.019	.41	.48	
L1		.050		1 .27	
L2	.250		6.35		
P	.100		2.54		
Q		.040		1.02	5
TL	.028	.048	.71	1.22	
TW	.036	.046	.91	1.17	
r		.007		.18	
α	45° TP				



NOTES:

1. Dimension are in inches.
2. Metric equivalents are given for general information only.
3. Beyond r (radius) maximum, TH 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 (0.18mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC. The device may be measured by direct methods or by the gauge and gauging procedure shown in figure 2.
7. Dimension LU applies between L_1 and L_2. Dimension LD applies between L_2 and LL minimum. Diameter is uncontrolled in L_1 and beyond LL minimum.
8. All four leads.
9. Dimension r (radius) applies to both inside corners of tab.
10. In accordance with ANSI Y14.5M, diameters are equivalent to Φx symbology.
11. Lead 1 = emitter, lead 2 = base, lead 3 = collector, lead 4 = case (electrically connected).

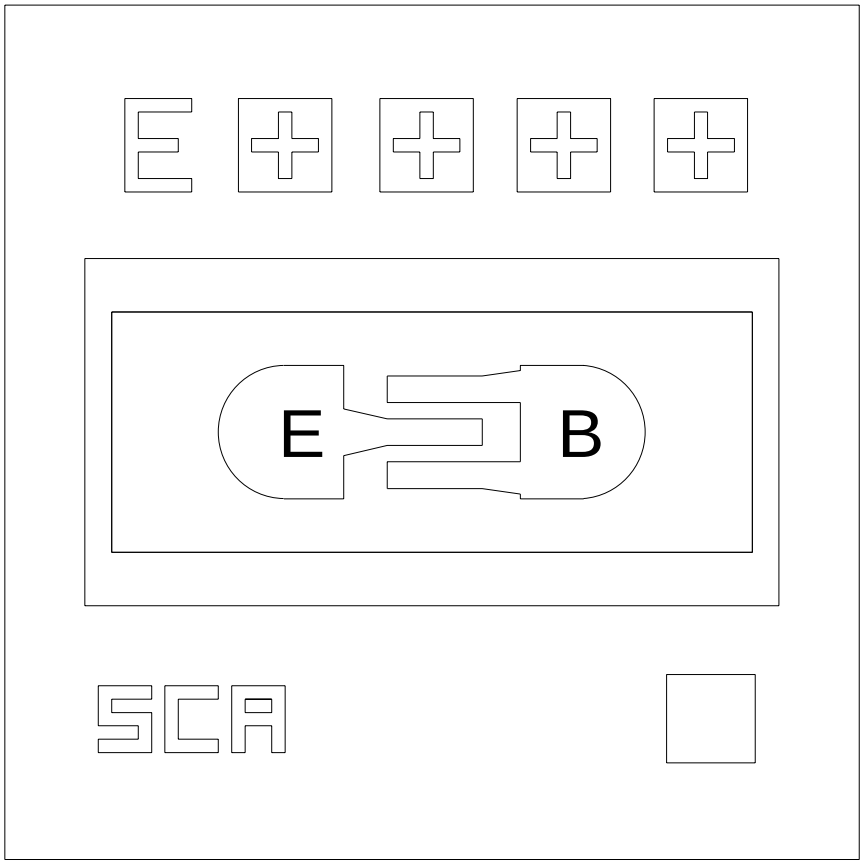
FIGURE 1. Physical dimensions for 2N918, (T0-72).



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 for 2N918UB, surface mount.



Die size--------- .016 x .016 inches, (0.406 mm X 0.406mm).
Die thickness--- .008 ± .0016 inches, (0.203 mm X 0.406mm).
Base pad-------- .0027 x .0027 inches, (0.069 mm X 0.069 mm).
Emitter pad----- .0027 x .0027 inches, (0.069 mm X 0.069 mm).
Back metal----- Gold, 6500 ± 1950 Ang
Top metal------ Aluminum, 17500 ± 2500 Ang
Back side------ Collector
Glassivation--- SiO_2, 7500 ± 1500 Ang

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

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

g_s ..... Noise source conductance.
P_o..... Oscillator, power output.
R_{BE}..... External resistance, base to emitter.

3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in MIL-PRF-19500, and figures 1, 2, and 3 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 herein.

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

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

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.

* 4.2.1 JANHC and JANKC qualification. JANHC and JANKC qualification inspection shall be in accordance with MIL-PRF-19500.

4.3 Screening. 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 level	JANTX and JANTXV levels
*3c	Thermal impedance, method 3131 of MIL-STD-750.	Thermal impedance, method 3131 of MIL-STD-750.
9	I_{CBO1} and h_{FE2}	
11	I_{CBO1} and h_{FE2} ΔI_{CBO1} = 100 percent of initial value or 5 nA dc, whichever is greater; Δh_{FE2} = ±15 percent.	I_{CBO1} and h_{FE2}
12	See 4.3.1	See 4.3.1
13	Subgroups 2 and 3 of table I herein; ΔI_{CBO1} = 100 percent of initial value or 5 nA dc, whichever is greater; Δh_{FE2} = ±15 percent.	Subgroup 2 of table I herein; ΔI_{CBO1} = 100 percent of initial value or 5 nA dc, whichever is greater; Δh_{FE2} = ±20 percent.

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

2N918, UB.....V_{CB} = 5 - 15 V dc, P_T = 200 mW at T_A = room ambient as defined in the general requirements of paragraph 4.5 in MIL-STD-750.

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

4.3.2. 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. Group A inspection shall be performed on each sublot.

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 table VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500 and 4.4.2.1 and 4.4.2.2 herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein. Delta measurements shall be in accordance with table II herein.

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

	Subgroup	Method	Conditions
	B3	2037	Test condition A. All internal leads for each device shall be pulled separately.
*	B4	1037	V_{CB} = 10 V dc, 2,000 cycles.
*	B5	1027	V_{CB} = 10 V dc; 1,000 hours maximum rated power shall be applied and ambient temperature adjusted to achieve T_J = +150°C minimum. N = 45, c = 0.

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.

Step	Method	Conditions
1	1027	Steady-state life: test condition B, 340 hours, V_{CB} = 10 V dc; maximum rated power shall be applied and ambient temperature adjusted to achieve T_J = +150°C minimum. 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°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:

a. 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.

b. 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) and delta requirements shall be in accordance with group A, subgroup 2 and table II herein.

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

Subgroup	Method	Conditions
C2	2036	Test condition E., not applicable to UB.
C6	1026	V_{CB} = 10 V dc, 1,000 hours; maximum rated power shall be applied and ambient temperature adjusted to achieve T_J = +150°C minimum. 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.

Subgroup	Method	Condition
C2	2036	Test condition E; not applicable for UB devices.
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.

* 4.4.4 Group E inspection. Group E inspection shall be performed for qualification or re-qualification only. In case qualification was awarded to a prior revision of the associated specification that did not request the performance of table III herein must be performed to maintain qualification.

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

4.5.1 Input capacitance. This test shall be conducted in accordance with method 3240 of MIL-STD-750 except that the output capacitor shall be omitted.

4.5.2 Disposition of case lead during electrical measurements. Unless otherwise specified all electrical measurements and operating life test shall be performed with the case lead connected to the emitter.

4.5.3 Noise figure. The noise figure shall be measured using commercially available test equipment and its associated standard test procedures (see figure 4).

4.5.4 Collector-base time constant. This parameter may be determined by applying an rf signal voltage of 1.0 volt (rms) across the collector-base terminals, and measuring the ac voltage drop (V_{eb}) with a high-impedance rf voltmeter across the emitter-base terminals. With f = 79.8 MHz used for the 1.0 volt signal, the following computation applies:

$r_b' C_c$: (psec) = 2 x V_{eb} (millivolts)

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1 2/						
Visual and mechanical examination 3/	2071	n = 45 devices, c = 0				
Solderability 3/ 4/	2026	n = 15 leads, c = 0				
Resistance to solvents 3/ 4/ 5/	1022	n = 15 devices, c = 0				
Temp cycling 3/ 4/	1051	Test condition C, 25 cycles. n = 2 devices, c = 0				
Heremetic seal 4/ Fine leak Gross leak	1071	n = 22 devices, c = 0				
Electrical measurements 4/		Group A, subgroup 2				
Bond strength 3/ 4/	2037	Precondition T_A = +250°C at t = 24 hrs or T_A = +300°C at t = 2 hrs n = 11 wires, c = 0				
Subgroup 2						
Breakdown voltage, collector to base	3036	Bias condition D, V_{CBO}= 30V	I_{CBO2}		1	µA dc
Breakdown voltage, collector to emitter	3011	Bias condition D, I_C = 3.0 mA dc	$V_{(BR)CEO}$	15		V dc
Breakdown voltage, emitter to base	3061	Bias condition D, V_{EB}= 3V	I_{EBO2}		10	µA dc
Collector to base cutoff current	3036	Bias condition D, V_{CB} = 25 V dc	I_{CBO1}		10	nA dc
Emitter to base cutoff current	3061	Bias condition D, V_{EB} = 2.5 V dc	I_{EBO1}		10	nA dc
Forward-current transfer ratio	3076	V_{CE} = 10 V dc; I_C = 500 µA dc;	h_{FE1}	10		
Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 3.0 mA dc;	h_{FE2}	20	200	
Forward-current transfer ratio	3076	V_{CE} = 10 V dc; I_C = 10 mA dc;	h_{FE3}	20		
Collector to emitter voltage (saturated)	3071	I_C = 10 mA dc; I_B = 1.0 mA dc;	$V_{CE(sat)}$		0.4	V dc
Base to emitter voltage (saturated)	3066	Test condition A; I_C = 10 mA dc; I_B = 1.0 mA dc	$V_{BE(sat)}$		1.0	V dc

See footnotes at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 3						
High temperature operation	3036	T_A = +150°C				
Collector to base cutoff current		Bias condition D, V_{CB} = 25 V dc	I_{CBO2}		1.0	µA dc
Low-temperature operation	3076	T_A = -55°C V_{CE} = 1.0 V dc; I_C = 3.0 mA dc	h_{FE4}	10		
Forward-current transfer ratio	3306	V_{CE} = 10 V dc; I_C = 4.0 mA dc; f = 100 MHz	$\|h_{FE}\|$	6.0	18	
Noise figure		V_{CE} = 6 V dc; I_C = 1.0 mA dc; f = 60 MHz; g_s = 2.5 mmho (see 4.5.2, 4.5.3, and figure 4)	NF		6.0	dB
Small-signal power gain	3256	V_{CB} = 12 V dc; I_C = 6.0 mA dc; f = 200 MHz; (see figure 5)	G_{pe}	15		dB
Collector-base time constant		V_{CB} = 10 V dc; I_E = -4.0 mA dc; f = 79.8 MHz (see 4.5.2 and 4.5.4)	$r_b' C_c$		25	ps
Oscillator power output		V_{CB} = 15 V dc; I_C = 8.0 mA dc; f = 500 MHz (see figure 6)	P_o	30		mW
Collector efficiency		V_{CB} = 15 V dc; I_C = 8.0 mA dc; f = 500 MHz (see figure 6)	η		25	%
Subgroup 5						
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.

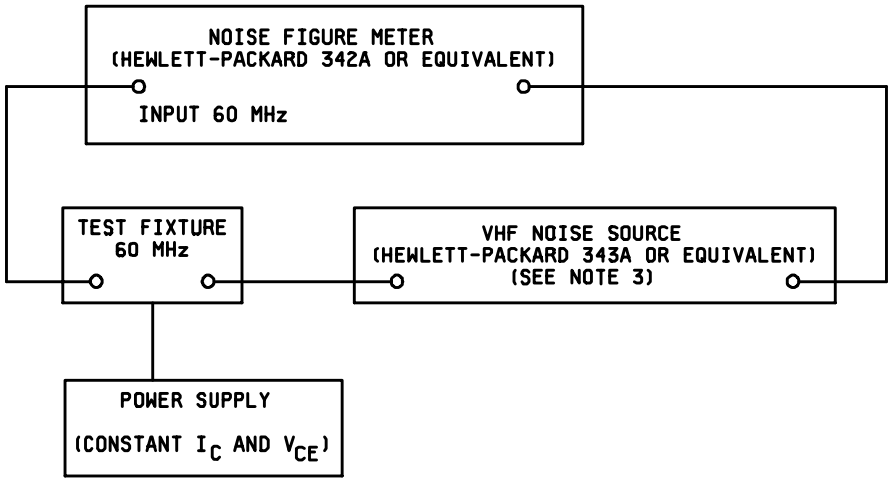
TABLE II. Groups B and C delta electrical measurements. 1/ 2/ 3/

Step	Inspection	MIL-STD-750		Symbol	Limits		Unit
		Method	Conditions		Min	Max	
1.	Collector-base cutoff current	3036	Bias condition D; V_{CB} = 25 V dc	ΔI_{CBO1} 3/	100 percent of initial value or 5 nA dc, whichever is greater.		
2.	Forward-current transfer ratio	3076	V_{CE} = 1.0 V dc; I_C = 3.0 mA dc	Δh_{FE2} 3/	± 25 percent change from initial reading		
3.	Collector-emitter voltage (saturated)	3071	I_C = 10 mA dc; I_B = 1.0 mA dc	$\Delta V_{CE(sat)}$ 3/	± 50 mV dc change from previously measured value.		

1/ The delta electrical measurements for table VIa (JANS) of MIL-PRF-19500 are as follows:
   a. Subgroup 4, see table II herein, step 3.
   b. Subgroup 5, see table II herein, steps 1, 2 and 3.
2/ The delta electrical measurements for table VII of MIL-PRF-19500 are as follows: subgroup 6, see table II herein, steps 1, 2 and 3 for JANS level.
3/ Devices which exceed the group A limits for this test shall not be acceptable."

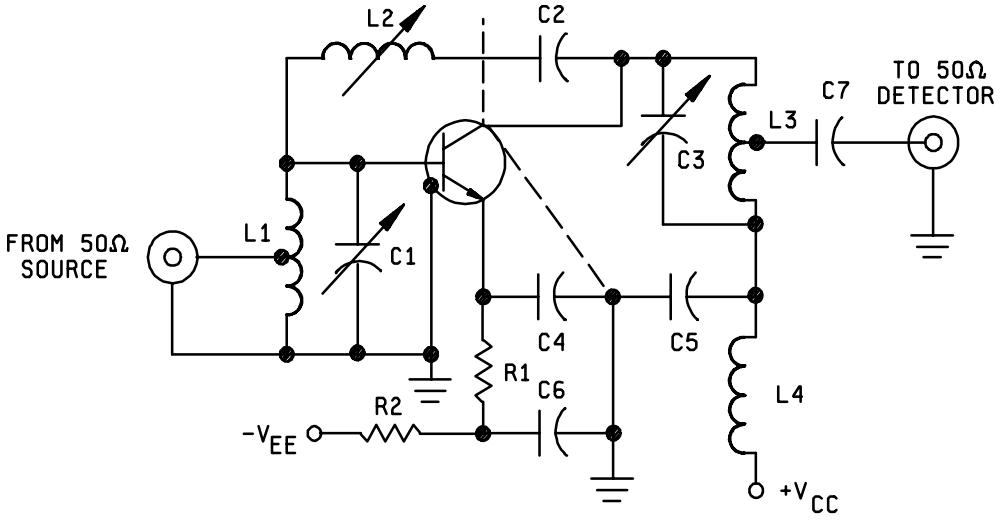
*TABLE III. Group E inspection (all quality levels) – for qualification only.

Inspection	MIL-STD-750		Qualification
	Method	Conditions	
Subgroup 1			45 devices c = 0
Temperature cycling (air to air)	1051	Test condition C, 500 cycles.	
Hermetric seal	1071		
Fine leak Gross leak			
Electrical measurements		See group A, subgroup 2 and table II herein.	
Subgroup 2			45 devices c = 0
Intermittent life	1037	Intermittent operation life: VCB = 10 V dc; 6,000 cycles.	
Electrical measurements		See group A, subgroup 2 and table II herein.	
Subgroup 3, 4, 5, 6, and 7			
Not applicable			
Subgroup 8			45 devices c = 0
Reverse stability	1033	Condition A ≥ 400 V Condition B < 400 V	



NOTES:
1. The test fixture shall consist of a 60 MHz tuned amplifier and suitable biasing circuits. It should be constructed utilizing very high-frequency design techniques.
2. The effective source susceptance should be tuned for each device being tested to obtain minimum noise figure.
3. The HP-343A has a 50-ohm output resistance, therefore a suitable impedance transformer must be used to obtain an effective source conductance of 2.5 mmho at the transistor with minimum losses.

FIGURE 4. Block diagram for noise-figure test.



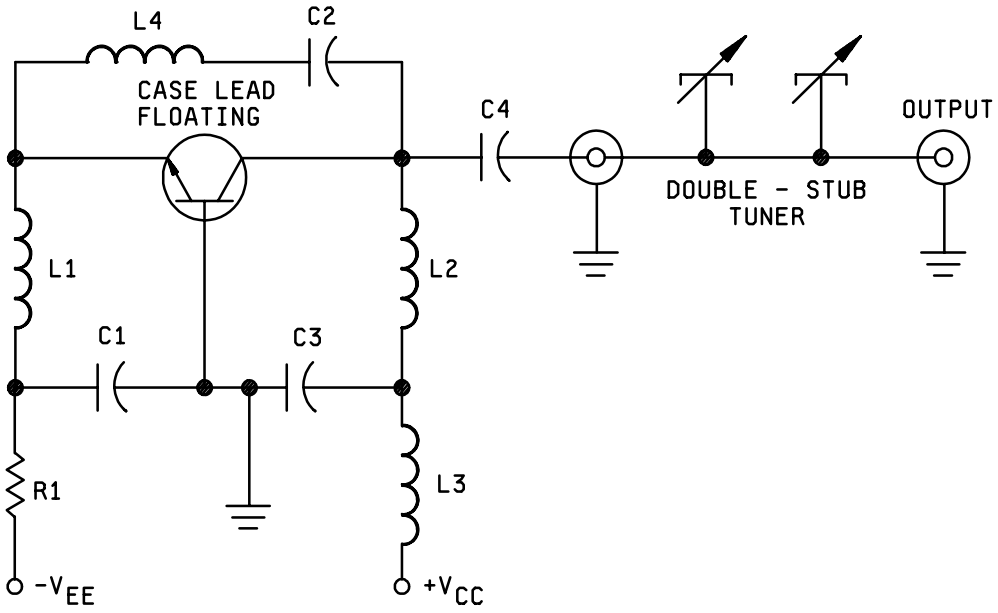
NEUTRALIZATION PROCEDURE:

a. Connect a 200 MHz signal generator (with a 50 ohm output impedance) to the input terminals of the amplifier, and connect a 50 ohm rf voltmeter to the output terminals of the amplifier.
b. Apply V_{EE} and V_{CC} to obtain the specified test conditions.
c. Adjust the output of the signal generator to approximately 10 millivolts and tune C_1 and C_3 for maximum output.
d. Interchange the connections to the signal generator and rf voltmeter and with sufficient signal applied at the output terminals, tune L_2 for a minimum indication on the rf voltmeter.
e. Repeat this sequence until optimum settings are obtained for all variables.

CIRCUIT-COMPONENT INFORMATION:

C1:	3-12 pF
C2 and C7:	1000 pF
C3:	1.5 - 7.5 pF
C4 and C5:	0.01 µF
C6:	0.05 µF
L1:	3½ T No. 16 AWG 5/16" ID, 7/16" length, Turns ratio ≅ 2 to 1
L2:	0.4 - 0.65 µh, Miller No. 4303 (or equal)
L3:	8 T No. 16 AWG, 1/8" ID, 7/8" length, Turns ratio ≅ 8 to 1
L4:	200 MHz RFC
R1:	100Ω
R2:	1 kΩ

FIGURE 5. Small-signal power gain.



OSCILLATOR ADJUSTMENT PROCEDURE:
Measurement of P_o shall be made in this circuit or a suitable equivalent. The circuit adjustment procedure is as follows:

a. Set V_{CC} and V_{EE} to obtain the specified test conditions.
b. Adjust the stub tuner to obtain the maximum output at the specified frequency of oscillation.
c. Check I_C and reset if necessary.
d. Read P_o.

Note 1. Collector efficiency (η), may be determined as follows:

$$\eta \text{ in } \% \frac{P_o}{120} \times 100$$ Where P_o is in milliwatts

CIRCUIT-COMPONENT INFORMATION:

C1 and C3:	1000 pF
C2:	50 pF
C4:	75 pF
R1:	2.2 kΩ
L1 and L3:	500 mC RFC
L2:	2 turns No. 16 AWG, 3/8" OD, 1¼" length
L4:	9 turns No. 22 AWG, 3/16" OD, ½" length

Double-stub tuner consists of the following commercially available components:
2 GR Type 874 TEE (or equivalent)
1 GR Type 874-D20 Adjustable Stub (or equivalent)
1 GR Type 874-LA Adjustable Line (or equivalent)
1 GR Type 874-WN3 Short-Circuit Termination (or equivalent)

FIGURE 6. Oscillator power output.

5. 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 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 2.2.1).

c. Packaging requirements (see 5.1).

d. Lead finish (see 3.4.1).

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 JANHCA2N918) will be identified on the QPL.

Die ordering information	
PIN	Manufacturer
	34156
2N918 2N918	JANHCA2N918 JANKCA2N918

* 6.5 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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

Review activities:
Army - AR, MI
Navy - AS, MC, SH
Air Force - 19, 99

Preparing activity:
DLA - CC

(Project 5961-2556)

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-19500/301F	2. DOCUMENT DATE 16 February 2002

3. **DOCUMENT TITLE** SEMICONDUCTOR DEVICE, TRANSISTOR, NPN SILICON, LOW-POWER TYPE 2N918 and 2N918UB 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	
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 614-692-0510	DSN 850-0510	FAX 614-692-6939	EMAIL alan.barone@dscc.dla.mil
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			