

The documentation and process conversion measures necessary to comply with this document shall be completed by 5 April 2002.

INCH-POUND
MIL-PRF-19500/354H
5 March 2002
SUPERSEDING
MIL-PRF-19500/354G
23 April 2001

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, TRANSISTOR, PNP, SILICON, LOW-POWER
TYPES 2N2604, 2N2604UB, 2N2605 AND 2N2605UB
JAN, JANTX, JANTXV, AND JANS, JANHC, 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 PNP, silicon, low-power transistors for use in low noise-level amplifier applications. Four levels of product assurance are provided for each encapsulated device type and two levels for each unencapsulated device type as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (TO-46), figure 2 (UB), and figures 3 and 4 die.

1.3 Maximum ratings.

Type	P_T (1) $T_A = +25^\circ\text{C}$	V_{CBO}	V_{EBO}	V_{CEO}	I_C	T_J and T_{STG}	$R_{\theta JA}$
	<u>MW</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>mA dc</u>	<u>°C</u>	<u>°C/W</u>
2N2604, UB	400	80	6	60	30	-65 to +200	437
2N2605, UB	400	70	6	60	30	-65 to +200	437

(1)Derate linearly at 2.28 mW/°C above $T_A = +25^\circ\text{C}$.

1.4 Primary electrical characteristics.

	h_{FE1}		h_{fe}		$ h_{fe} $	C_{obo}	$V_{BE(sat)}$	$V_{CE(sat)}$
	$V_{CE}=5\text{ V dc}$ $I_C=10\ \mu\text{ dc}$		$V_{CE}=5\text{ V dc}$ $I_C=1\text{ mA dc}$ $f=1\text{ kHz}$		$V_{CE}=5\text{ V dc}$ $I_C=500\ \mu\text{A dc}$ $f=30\text{ MHz}$	$V_{CB}=5\text{ V dc}$ $I_E=0$ $100\text{ kHz} \leq f \leq 1\text{ MHz}$	$I_C=10\text{ mA dc}$ $I_B=500\ \mu\text{A dc}$	$I_C=10\text{ mA dc}$ $I_B=500\ \mu\text{A dc}$
	<u>2N2604</u>	<u>2N2605</u>	<u>2N2604</u>	<u>2N2605</u>		<u>PF</u>	<u>V dc</u>	<u>V dc</u>
Min	40	100	60	150	1		0.7	
Max	120	300	180	450	8	6	0.9	0.3

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.

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

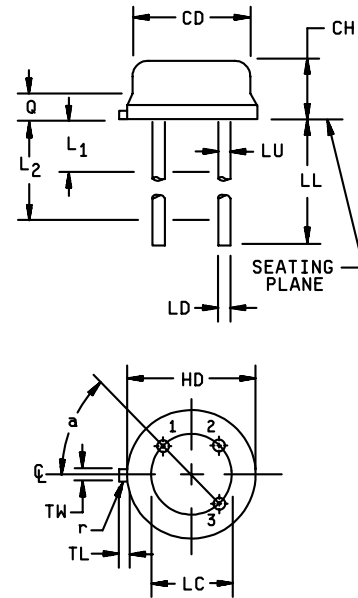
3.1 General. The requirements for acquiring the product described herein shall consist of this document and MIL-PRF-19500.

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).

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 on figure 1 (TO-46), figure 2 (UB), and on figures 3 and 4 die.

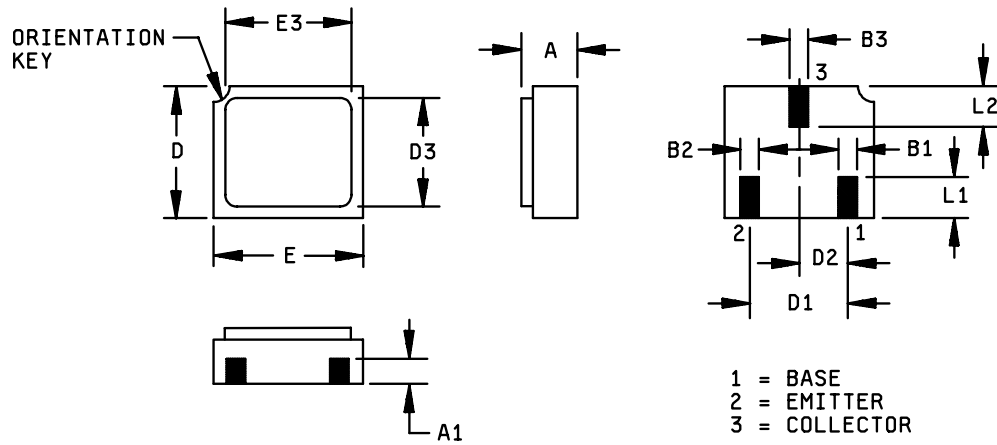
Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.065	.085	1.65	2.16	
HD	.209	.230	5.31	5.84	
LC	.100 TP		2.54 TP		5
LD	.016	.021	0.41	0.53	6
LL	.500	1.750	12.70	44.45	6
LU	.016	.019	0.41	0.48	6
L1		.050		1.27	6
L2	.250		6.35		6
Q		.040		1.02	4
TL	.028	.048	0.71	1.22	3, 8
TW	.036	.046	0.91	1.17	3, 8
r		.010		0.25	9
α	45° TP		45° TP		5



NOTES:

1. Dimensions are in inches. Lead 1 is emitter, lead 2 is base, and lead 3 is collector.
2. Metric equivalents are given for general information only.
3. Symbol TL is measured from HD maximum.
4. Details of outline in this zone are optional.
5. 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. The device may be measured by direct methods or by the gauge and gauging procedure.
6. Symbol LU applies between L_1 and L_2 . Dimension LD applies between L_2 and LL minimum.
7. Lead number three is electrically connected to case.
8. Beyond r maximum, TW shall be held for a minimum length of $.011$ inch (0.28 mm).
9. Symbol r applied to both inside corners of tab.
10. In accordance with ANSI Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 1. Physical dimensions - TO-46.

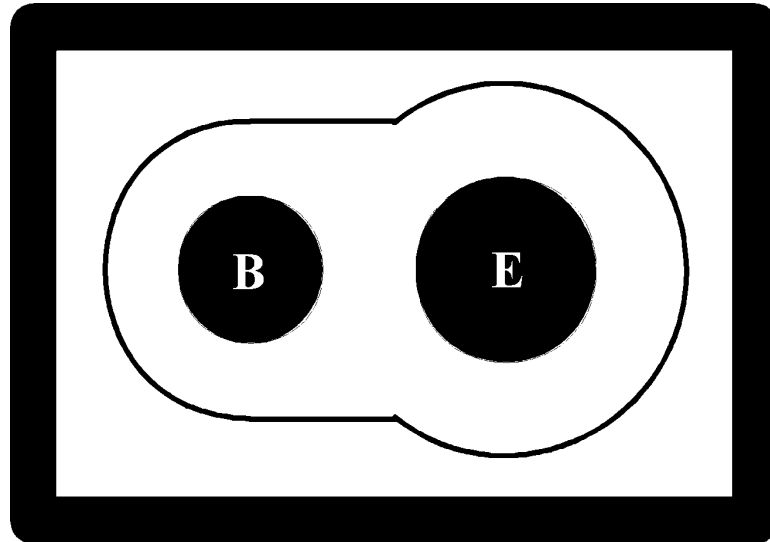


Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
A	.046	.056	0.97	1.42	
A1	.017	.035	0.43	0.89	
B1	.016	.024	0.41	0.61	
B2	.016	.024	0.41	0.61	
B3	.016	.024	0.41	0.61	
D	.085	.108	2.41	2.74	
D1	.071	.079	1.81	2.01	
D2	.035	.039	0.89	0.99	
D3	.085	.108	2.41	2.74	
E	.115	.128	2.82	3.25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

NOTES:

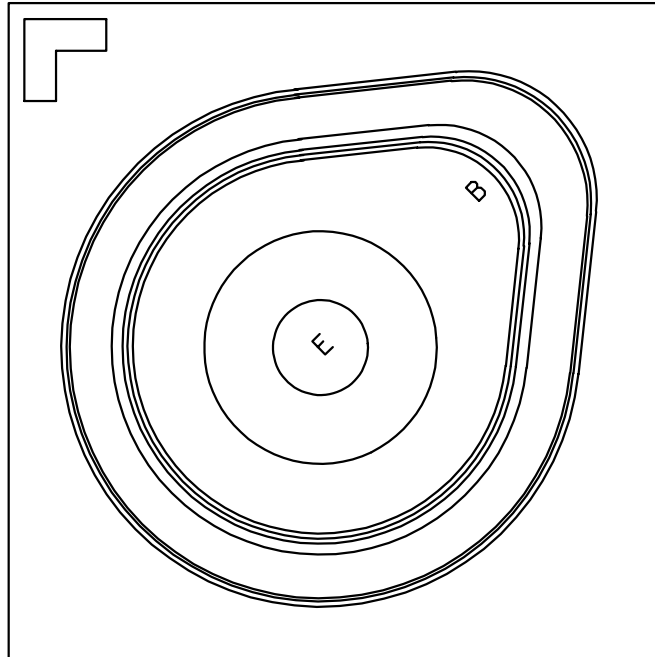
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

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



- | | |
|-------------------|---|
| 1. Chip size | .015 x .019 inch \pm .001 inch, (0.381 x 0.483 \pm 0.0254 mm). |
| 2. Chip thickness | .010 \pm .0015 inch, (0.254 \pm 0.381). |
| 3. Top metal | Aluminum 15,000Å minimum, 18,000Å nominal. |
| 4. Back metal | A. Gold 2,500Å minimum, 3,000Å nominal.
B. Eutectic Mount - No Gold. |
| 5. Backside | Collector. |
| 6. Bonding pad | B = .003 inch, (0.076 mm), E = .004 inch, (0.102 mm) diameter. |
| 7. Passivation | Si ₃ N ₄ (Silicon Nitride) 2kÅ min, 2.2kÅ nom. |

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



Die size:	.018 x .018 inch (0.457 x 0.457 mm).
Die thickness:	.008 ±.0016 inch (0.203 ±0.406 mm).
Base pad:	.0025 inch (0.0635 mm) diameter.
Emitter pad:	.003 inch (0.076 mm) diameter.
Back metal:	Gold, 6500 ±1950 Ang.
Top metal:	Aluminum, 19500 ±2500 Ang.
Back side:	Collector.
Glassivation:	SiO ₂ , 7500 ±1500 Ang.

FIGURE 4. JANHC and JANKC B-version die dimensions.

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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 paragraph 1.3, 1.4, and table I.

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

3.7 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.

* 4.2.2 Group E qualification. Group E inspection shall be performed herein for qualification or requalification only. In case qualification was rewarded to a prior revision of the associated specification that did not request the performance of table II tests, the tests specified in table II herein shall be performed by the first inspection lot processed to this revision to maintain qualification.

* 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 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}	Not applicable
10	24 hours minimum	24 hours minimum
11	I_{CBO1} ; h_{FE2} ; ΔI_{CBO1} = 100 percent or 2 nA dc, whichever is greater; Δh_{FE2} = ± 15 percent change of initial value.	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 or 2 nA dc, whichever is greater; Δh_{FE2} = ± 15 percent change of initial value.	Subgroup 2 of table I herein; ΔI_{CBO1} = 100 percent or 2 nA dc, whichever is greater; Δh_{FE2} = ± 25 percent change of initial value.

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, P_T = 400 mW see 1.3 herein.

4.3.2 Screening (JANHNC 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.

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) of MIL-PRF-19500 and 4.4.2.1 herein. Electrical measurements (end-points) and delta requirements shall be in accordance with group A, subgroup 2 and 4.5.3 herein, delta requirements only apply to subgroups B4, and B5. See 4.4.2.2 herein 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 herein and shall be in accordance with group A, subgroup 2 and 4.5.3 herein.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
* B4	1037	$V_{CB} = 10$ V dc, 2,000 cycles.
* B5	1027	(Note: If a failure occurs, resubmission shall be at the test conditions of the original sample.) $V_{CB} = 10$ V dc, $P_D \geq 100$ percent of maximum rated P_T (see 1.3). Option 1: 96 hours minimum, sample size in accordance with table VIa of MIL-PRF-19500, adjust T_A or P_D to achieve $T_J = +275^\circ\text{C}$ minimum. Option 2: 216 hours minimum, sample size = 45, $c = 0$; adjust T_A or P_D to achieve $T_J = +225^\circ\text{C}$ minimum.

4.4.2.2 Group B inspection, (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>Condition</u>
1	1039	Steady-state life: Test condition B, 340 hours minimum, $V_{CB} = 10 - 30$ V dc, power shall be applied to achieve $P_T \geq 400$ mW, $n = 45$ devices, $c = 0$
2	1039	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:

- 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 4.5.3 herein; delta requirements only apply to subgroup C6.

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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 (not applicable to UB).
C6	1026	1,000 hours at $V_{CB} = 10 - 30$ V dc; power shall be applied $P_T \geq 400$ mW.

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, not applicable for UA and UB devices.
* C5	3131	$R_{\theta JC}$ (see 1.3).
C6		Not applicable.

4.4.4 Group E Inspection. Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table IX of MIL-PRF-19500 and as specified herein. Electrical measurements (end-points) and delta measurements shall be in accordance with the applicable steps of 4.5.3 and table I, subgroup 2 herein; except, $Z_{\theta JX}$ need not be performed.

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 measurements shall be as specified in section 4 of MIL-STD-750.

4.5.2 Noise figure. The noise figure shall be measured using commercially available test equipment and its associated standard test procedures.

4.5.3 Delta requirements. Delta requirements shall be as specified below:

Step	Inspection	MIL-STD-750		Symbol	Limit	Unit
		Method	Conditions			
1	Collector-base cutoff current	3036	Bias condition D, $V_{CB} = 50$ V dc	ΔI_{CB01} (1)	100 percent of initial value or 5 nA dc, whichever is greater.	
2	Forward current transfer ratio	3076	$V_{CE} = 5$ V dc; $I_C = 500$ uA dc; pulsed see 4.5.1	Δh_{FE2} (1)	± 25 percent change from initial reading.	

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

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TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u> <u>2/</u> Visual and mechanical examination <u>3/</u>	2071	n = 45 devices, c = 0				
Solderability <u>3/ 4/</u>	2026	n = 15 leads, c = 0				
Resistance to solvents <u>3/ 4/ 5/</u>	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>						
Collector - base leakage current 2N2604 2N2605	3036	Bias condition D; V _{CB} = 80 V dc V _{CB} = 70 V dc	I _{CB02}		10	μA dc
Collector - emitter breakdown voltage	3011	Bias condition D; I _C = 10 mA dc; pulsed (see 4.5.1)	V _{(BR)CEO}	60		V dc
Emitter - base cutoff current	3061	Bias condition D; V _{EB} = 6 V dc	I _{EBO2}		10	μA dc
Collector - base cutoff current	3036	Bias condition D; V _{CB} = 50 V dc	I _{CB01}		10	NA dc
Emitter - base cutoff current	3061	Bias condition D; V _{EB} = 5 V dc	I _{EBO}		2	NA dc

See footnotes at end of table.

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TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 2</u> - Continued.						
Collector - emitter cutoff current	3041	Bias condition C; $V_{CE} = 50 \text{ V dc}$	I_{CES}		10	nA dc
Forward current transfer ratio 2N2604 2N2605	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 10 \mu\text{A dc}$	h_{FE1}	40 100	120 300	
Forward current transfer ratio 2N2604 2N2605	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 500 \mu\text{A dc}$	h_{FE2}	60 150	180 450	
Forward current transfer ratio 2N2604 2N2605	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 10 \text{ mA dc}$	h_{FE3}	40 100	160 400	
Base - emitter voltage (saturated)	3066	Test condition A; $I_C = 10 \text{ mA dc};$ $I_B = 500 \mu\text{A dc}$	$V_{BE(sat)}$	0.7	0.9	V dc
Collector - emitter voltage (saturated)	3071	$I_C = 10 \text{ mA dc};$ $I_B = 500 \mu\text{A dc}$	$V_{CE(sat)}$		0.3	V dc
<u>Subgroup 3</u>						
High-temperature operation:		$T_A = +150^\circ\text{C}$				
Collector - base cutoff current	3036	Bias condition D; $V_{CB} = 50 \text{ V dc}$	I_{CBO2}		5	$\mu\text{A dc}$
Low-temperature operation:		$T_A = -55^\circ\text{C}$				
Forward current transfer ratio 2N2604 2N2605	3076	$V_{CE} = 5 \text{ V dc};$ $I_C = 10 \mu\text{A dc}$	h_{FE4}	15 30		

See footnotes 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>						
Small-signal short-circuit input impedance 2N2604 2N2605	3201	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc}; f = 1 \text{ kHz}$	h_{ie}	1 2	10 20	$k\Omega$ $k\Omega$
Small-signal open-circuit reverse-voltage transfer ratio	3211	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc};$ $f = 1 \text{ kHz}$	h_{re}		10×10^{-4}	
Small-signal open-circuit output admittance 2N2604 2N2605	3216	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc}; f = 1 \text{ kHz}$	h_{oe}		40 60	μmhos μmhos
Small-signal short-circuit forward-current transfer ratio 2N2604 2N2605	3206	$V_{CE} = 5 \text{ V dc};$ $I_C = 1 \text{ mA dc}; f = 1 \text{ kHz}$	h_{fe}	60 150	180 450	
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 5 \text{ V dc};$ $I_C = 0.5 \text{ mA dc};$ $f = 30 \text{ MHz}$	$ h_{fe} $	1	8	
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}		6	PF
Noise figure	3246	$V_{CE} = 5 \text{ V dc}; I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega; f = 100 \text{ Hz}$	F_1		5	dB
Noise figure	3246	$V_{CE} = 5 \text{ V dc}; I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega; f = 1 \text{ kHz}$	F_2		3	dB
Noise figure	3246	$V_{CE} = 5 \text{ V dc}; I_C = 10 \mu\text{A dc};$ $R_g = 10 \text{ k}\Omega; f = 10 \text{ kHz}$	F_3		3	dB

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.

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

Inspection	MIL-STD-750		Qualification
	Method	Conditions	
* <u>Subgroup 1</u>			
Temperature cycling (air to air)	1051	Test condition C, 500 cycles	45 devices c = 0
Hermetic seal	1071		
Fine leak Gross leak			
Electrical measurements		See group A, subgroup 2 herein.	
* <u>Subgroup 2</u>			45 devices c = 0
Intermittent life	1037	V _{CB} = 10 V dc, 6,000 cycles.	
Electrical measurements		See group A, subgroup 2 herein.	
<u>Subgroups 3, 4, 5, 6, and 7</u>			
Not applicable			
* <u>Subgroup 8</u>			45 devices c = 0
Reverse stability	1033	Condition A for devices ≥ 400 V dc. Condition B for devices < 400 V dc.	

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 specified issue of individual documents referenced (see 2.2.1).
- c. Lead finish (see 3.4.1).
- d. Type designation and product assurance level.
- 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 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 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, JANHCA2N2604) will be identified on the QPL.

JANC ordering information		
PIN	Manufacturer	
	43611	34156
2N2604 2N2605	JANHCA2N2604, JANKCA2N2604 JANHCA2N2605, JANKCA2N2605	JANHCB2N2604, JANKCB2N2604 JANHCB2N2605, JANKCB2N2605

* 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

Preparing activity:

DLA - CC

(Project 5961-2568)

Review activities:

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

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
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-19500/354H	2. DOCUMENT DATE 5 March 2002
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3. DOCUMENT TITLE
SEMICONDUCTOR DEVICE, TRANSISTOR, PNP, SILICON, LOW-POWER, TYPES 2N2604, 2N2604UB, 2N2605 AND 2N2605UB JAN, JANTX, JANTXV, AND JANS, JANHC, 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 DSN FAX EMAIL 614-692-0510 850-0510 614-692-6939 alan.barone@dsc.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		