The documentation and process conversion measures necessary to comply with this revision shall be completed by 18 July 2003.

INCH-POUND

MIL-PRF-19500/461E
18 April 2003
SUPERSEDING
MIL-PRF-19500/461D
14 June 2001

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, TRANSISTOR, PNP, SILICON, HIGH-POWER
TYPE 2N6211, 2N6212, 2N6213, 2N6213A, JAN, JANTX, JANTXV, 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 PNP silicon, high-voltage. 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 each unencapsulated device type.

1.2 Physical dimensions. See figure 1 (TO-66), and figure 2, JANHC and JANKC (die) dimensions.

* 1.3 Maximum ratings. Unless otherwise specified, T_C = +25°C.

Type	P_T (1) T_A = +25°C	P_T (2) T_C = +25°C	V_{CBO}	V_{CEO}	V_{EBO}	I_B	I_C	T_J and T_{STG}	$R_{\theta JC}$ (max)	$Z_{\theta JX}$
	W	W	V dc	V dc	V dc	A dc	A dc	°C	°C/W	°C/W
2N6211	3.0	35	275	225	6.0	1.0	2.0	-65 to +200	5.0	1.75
2N6212	3.0	35	350	300	6.0	1.0	2.0	-65 to +200	5.0	1.75
2N6213	3.0	35	400	350	6.0	1.0	2.0	-65 to +200	5.0	1.75
2N6213A	3.0	35	500	450	6.0	1.0	2.0	-65 to +200	5.0	1.75

(1) Derate linearly at 17.1 mW/°C for T_A > +25°C.
(2) Derate linearly at 200 mW/°C for T_C > +25°C.

* 1.4 Primary electrical characteristics. Unless otherwise specified, T_C = +25°C.

Limit	h_{FE1} (1)	$V_{CE(SAT)}$ (1)			C_{obo}	$\|h_{fe}\|$		Pulse response	
	V_{CE} = 5 V dc	I_C = 1.0 A dc, I_B = -0.125 A dc			100 kHz ≤ f ≤ 1 MHz, V_{CB} = 10 V dc	f = 5 MHz, I_C = 0.2 A dc, V_{CE} = 10 V dc		t_{on}	t_{off}
	I_C = 1 A dc	2N6211	2N6212	2N6213, 2N6213A	I_E = 0	2N6211, 2N6212, 2N6213	2N6213A		
		V dc	V dc	V dc	pF			µs	µs
Minimum	30					4	1.5		
Maximum	175	1.4	1.6	2.0	220	20	10	0.6	3.1

(1) Pulsed (see 4.5.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: 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.

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 individual item requirements shall be as specified in MIL-PRF-19500 and as modified herein.

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 6.4).

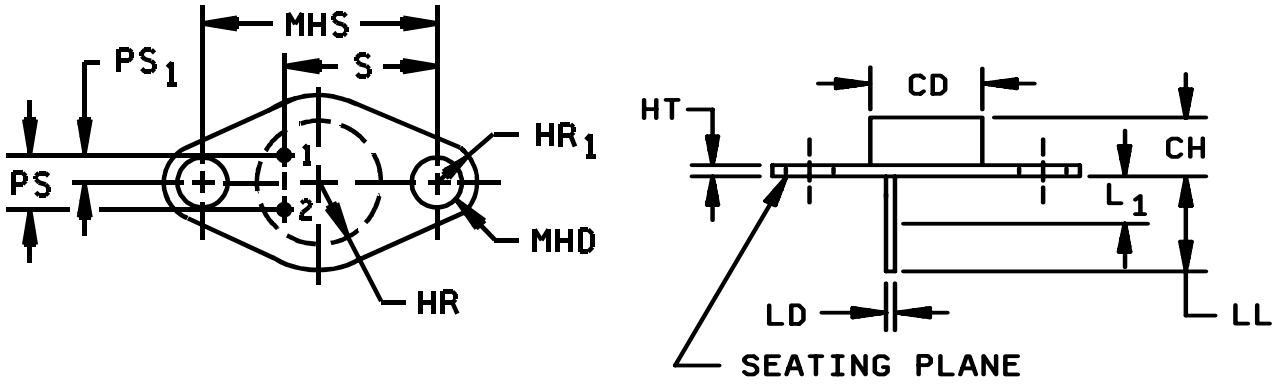
3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in MIL-PRF-19500, and on figure 1 (T0-66) and 2 (die) 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 Marking. Marking shall be in accordance with MIL-PRF-19500.

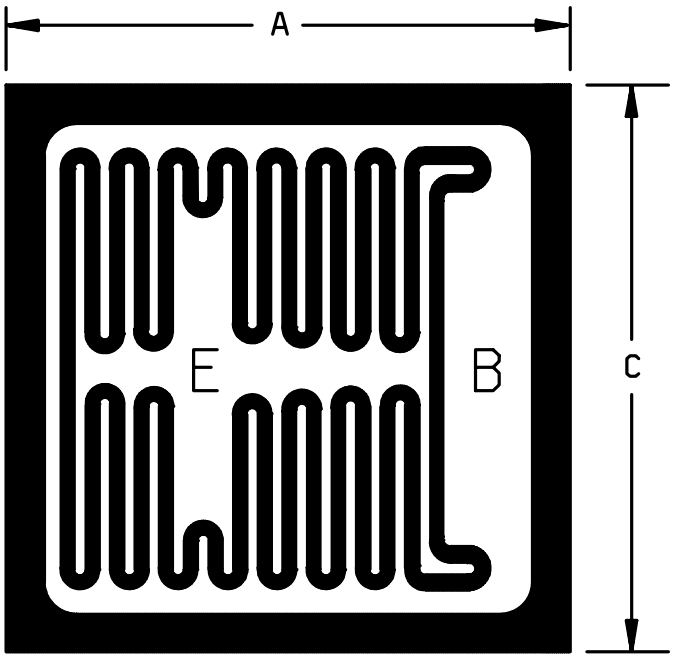
3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I.



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CH	.250	.340	6.35	8.64	
LD	.028	.034	0.71	0.86	7,9
CD	.470	.500	11.94	12.70	2
PS	.190	.210	4.83	5.33	3
PS_1	.093	.107	2.36	2.72	3
HT	.050	.075	1.27	1.91	2, 5
LL	.360	.500	9.14	12.70	7
L_1		.050		1.27	4, 9
MHD	.142	.152	3.61	3.86	
MHS	.958	.962	24.33	24.43	
HR		.350		8.89	
HR_1	.115	.145	2.92	3.68	
S	.570	.590	14.48	14.99	3

NOTES:
1. Dimensions are in inches. Metric equivalents are given for general information only.
2. Body contour is optional within zone defined by CD.
3. These dimensions shall be measured at points .050 inch (1.27 mm) to .055 inch (1.40 mm) below seating plane. When gauge is not used, measurement shall be made at seating plane.
4. Within this zone the lead diameter may vary to allow for lead finishes and irregularities.
5. HT dimension does not include sealing flanges.
6. The seating plane of header shall be flat within .001 inch (0.025 mm), concave to .004 inch (0.101 mm), convex inside a .520 inch (13.20 mm) diameter circle on the center of the header, and flat within .001 inch (0.025 mm), concave to .006 inch (0.152 mm), convex overall.
7. Both terminals.
8. The collector shall be electrically connected to the case.
9. LD applies between L_1 and LL. Diameter is uncontrolled in L_1.
10. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

* FIGURE 1. Physical dimensions.



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
A	.119	.125	3.02	3.18	
B	.119	.125	3.02	3.18	

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. The physical characteristics of the die are:
   Thickness: .006 inch (0.15 mm) to .012 inch (0.30 mm).
   Top metal: Aluminum 50,000 Å nominal, 37,500 Å minimum.
   Back metal: Gold 3,000 Å nominal.
   Back side: Collector.
   Bonding pad: B = .015 inch (0.38 mm) x .072 inch (1.83 mm).
   E = .015 inch (0.38 mm) x .060 inch (1.52 mm).
4. Junctions passivated with thermal silicon dioxide.

FIGURE 2. JANHC and JANKC (A-version) die dimensions.

* 3.7 Electrical test requirements. The electrical test requirements shall be table I as specified herein.

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 table II herein.

* 4.2.1 Group E qualification. 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 II tests, the tests specified in table II herein shall be performed by the first inspection lot of 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 (see 4.3.4)	Thermal impedance (see 4.3.4)
9	h_{FE1} and I_{CEX}	
11	h_{FE1} and I_{CEX}; ΔI_{CEX} = ±100 percent of initial value or 5 μA dc, whichever is greater. Δh_{FE1} = ±15 percent.	h_{FE1} and I_{CEX}
12	Burn-in (see 4.3.1)	Burn-in (see 4.3.1)
13	Subgroups 2 and 3 of table I herein; ΔI_{CEX} = 100 percent of initial value or 5 μA dc, whichever is greater. Δh_{FE1} = ±15 percent	Subgroup 2 of table I herein; ΔI_{CEX} = 100 percent of initial value or 0.1 mA dc, whichever is greater. Δh_{FE1} = ±25 percent.

* 4.3.1 Power burn-in conditions. Power burn-in conditions are as follows: Method 1039 of MIL-STD-750, test condition B. T_A = room ambient as defined in the general requirements in 4.5 of MIL-STD-750; $V_{CB} \geq$ 20 V dc, P_T = 3.0 W. NOTE: No heat sink or forced air cooling on the devices shall be permitted.

* 4.3.2 JANHC and JANKC screening. Screening of die shall be in accordance with MIL-PRF-19500. Test limits and conditions shall be chosen by the supplier to demonstrate compliance with electrical characteristics herein. Probe test shall be performed 100 percent by the supplier on the entire die lot.

4.3.3 JANHC and JANKC die. Qualification shall be in accordance with MIL-PRF-19500.

4.3.4. 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_M measurement current----------10 mA.

b. I_H forward heating current ----------1.2 mA (min).

c. t_H heating time ----------100 ms.

d. t_{md} measurement delay time -------50-60 µs max.

e. V_{CE} collector-emitter voltage -------20 V dc minimum

The maximum limit for $Z_{\theta JX}$ under these test conditions are $Z_{\theta JX}$ (max) = 1.75°C/W.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

* 4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500 and table I herein. Electrical measurements (end-points) shall be in accordance with the inspections of table I, subgroup 2 herein.

* 4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in tables VIa (JANS) and VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500. Electrical measurements (end-points) shall be in accordance with the inspections of table I, subgroup 2 herein.

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

Subgroup	Method	Conditions
B4	1037	$V_{CB} \geq 10$ V dc, forced air cooling on the devices shall be permitted only during the t_{off} time.
B5	1027	$V_{CE} \geq 10$ V dc, $T_A \leq +125°C$, adjust T_A and power to achieve a $T_J \geq +275°C$, t = 96 hours. P_T = 3 W minimum.
B6	3131	See 4.5.2.

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

Subgroup	Method	Conditions
B3	1037	$V_{CB} \geq 10$ V dc, forced air cooling on the devices shall be permitted only during the t_{off} time.

* 4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500. Electrical measurements (end-points) shall be in accordance with the inspections of table I, subgroup 2 herein.

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

Subgroup	Method	Conditions
C2	2036	Test condition A, weight = 10 pounds, t = 15 seconds.
C6	1037	$V_{CB} \geq 10$ V dc, forced air cooling on the devices shall be permitted only during the t_{off} time.

* 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) shall be in accordance with table I, subgroup 2 herein.

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 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 applications shall be 1.0 A dc.

b. Collector to emitter voltage magnitude shall be ≥ 10 V dc.

c. Reference temperature measuring point shall be the case.

d. Reference point temperature shall be $+25°C \leq T_R \leq +75°C$ and recorded before the test is started.

e. Mounting arrangement shall be with heat sink to header.

f. Maximum limit shall be $R_{\theta JC} = 5.0°C/W$.

* TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical examination	2071	n = 45 devices, c = 0				
Subgroup 2						
Collector to emitter breakdown voltage	3011	Bias condition D, I_C = 200 mA dc, pulsed (see 4.5.1), (or L = 10 mH, f = 30-60 Hz)	$V_{(BR)CEO}$			
2N6211				225		V dc
2N6212				300		V dc
2N6213				350		V dc
2N6213A				450		V dc
Collector to emitter breakdown voltage	3011	Bias condition D, I_C = 200 mA dc, pulsed (see 4.5.1), (or L = 10 mH, f = 30-60 Hz) R_{BE} = 50 Ω	$V_{(BR)CER}$		10	µA dc
2N6211				250		V dc
2N6212				325		V dc
2N6213				375		V dc
2N6213A				475		dc
Collector to emitter breakdown voltage	3011	Bias condition D, I_C = 200 mA dc, pulsed (see 4.5.1), (or L = 10 mH, f = 30-60 Hz) R_{BE} = 50 Ω, V_{BE} = 1.5 V dc	$V_{(BR)CEX}$		10	µA dc
2N6211				275		V dc
2N6212				350		V dc
2N6213				400		V dc
2N6213A				500		V dc
Collector to emitter cutoff current	3041	Bias condition C; V_{CE} = 150 V dc	I_{CEO}		5.0	mA dc
Collector to emitter cutoff current	3041	Bias condition C; V_{BE} = 1.5 V dc	I_{CEX1}		0.5	mA dc
2N6211		V_{CE} = 250 V dc				
2N6212		V_{CE} = 315 V dc				
2N6213		V_{CE} = 360 V dc				
2N6213A		V_{CE} = 400 V dc				

See footnote at end of table.

* TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
Subgroup 2 - Continued.						
Emitter to base cutoff current	3061	Bias condition D; V_{EB} = 6 V dc	I_{EBO}		0.5	mA dc
Collector to base cutoff current	3036	Bias condition D	I_{CBO}		15	mA dc
2N6211		V_{CB} = 275 V dc				
2N6212		V_{CB} = 350 V dc				
2N6213		V_{CB} = 400 V dc				
2N6213A		V_{CB} = 500 V dc				
Forward-current transfer ratio	3076	I_C = 1 A dc, pulsed (see 4.5.1)	h_{FE1}	10	100	
2N6211		V_{CE} = 2.8 V dc				
2N6212		V_{CE} = 3.2 V dc				
2N6213		V_{CE} = 4.0 V dc				
2N6213A		V_{CE} = 4.0 V dc				
Forward-current transfer ratio	3076	V_{CE} = 5 V dc, I_C = 1 A dc, pulsed (see 4.5.1)	h_{FE2}			
2N6211				30	175	
2N6212				30	175	
2N6213				30	150	
2N6213A				30	150	
Collector to emitter saturated voltage	3071	I_C = 1 A dc, I_B = 0.125 A dc, pulsed (see 4.5.1)	$V_{CE(sat)}$			
2N6211					1.4	V dc
2N6212					1.6	V dc
2N6213					2.0	V dc
2N6213A					2.0	
Base to emitter saturated voltage	3066	Test condition A, I_C = 1 A dc, I_B = 0.125 A dc, pulsed (see 4.5.1)	$V_{BE(sat)}$		1.4	V dc
Subgroup 3						
High temperature operation:		T_A = +100°C				
Collector to emitter cutoff current	3041	Bias condition A, V_{BE} = 1.5 V dc	I_{CEX2}		5	mA dc
2N6211		V_{CE} = 250 V dc				
2N6212		V_{CE} = 315 V dc				
2N6213		V_{CE} = 360 V dc				
2N6213A		V_{CE} = 400 V dc				
Low temperature operation:		T_A = -55°C				
Forward-current transfer ratio	3076	V_{CE} = 5.0 V dc, I_C = 1 A dc, pulsed (see 4.5.1)	h_{FE3}	10		

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
Subgroup 4						
Pulse response	3251	Test condition A, except test circuit and pulse requirements in accordance with figure 3 herein.				
Turn-on time		V_{CC} = 200 V dc ±10 V dc, I_C =1 A dc, I_{B1} = -0.125 A dc	t_{on}		0.6	µs
Turn-off time		V_{CC} = 200 V dc ±10 V dc, I_C =1 A dc, I_{B1} = -0.125 A dc; I_{B2} = 0.125 A dc	t_{off}		3.1	µs
Small-signal short-circuit forward-current transfer ratio	3306	V_{CE} = 10 V dc, I_C = 0.2 A dc, f = 5 MHz	$\|h_{fe}\|$			
2N6211, 2N6212, 2N6213 2N6213A				4 1.5	20 10	
Open circuit output capacitance	3236	V_{CB} = 10 V dc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{obo}		220	pF
Subgroup 5						
Safe operating area (continuous dc)	3051	T_C = +25°C, t = 1 s, 1 cycle (see figure 4)				
Test 1 (all device types)		I_C = 2.0 A dc, V_{CE} = 17.5 V dc				
Test 2 (all device types)		I_C = 0.875 A dc, V_{CE} = 40 V dc				
Test 3 2N6211 only		I_C = 0.034 A dc, V_{CE} = 225 V dc				
Test 4 2N6212 only		I_C = 0.02 A dc, V_{CE} = 300 V dc				
Test 5 2N6213 and A only		I_C = 0.015 A dc, V_{CE} = 350 V dc				
Electrical measurements		See table I, subgroup 2				

See footnote at end of table.

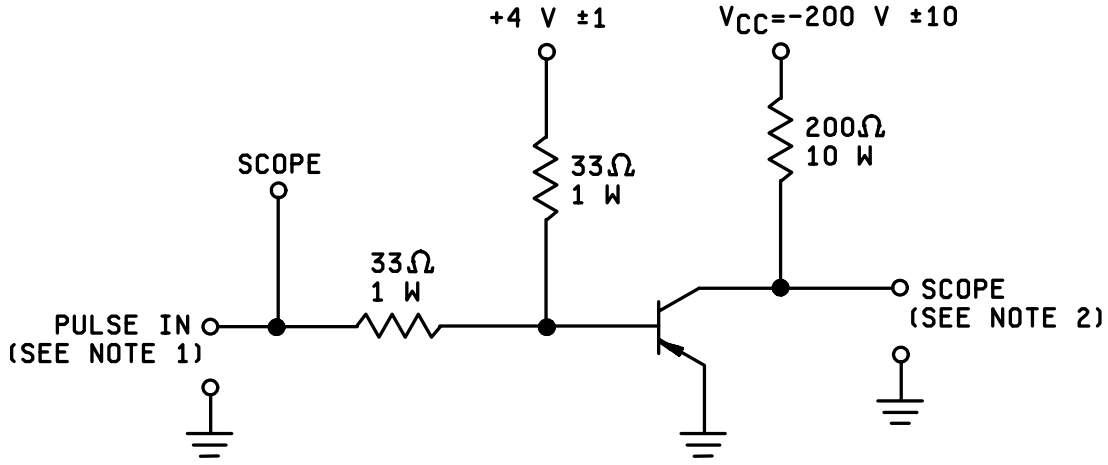
TABLE I. Group A inspection - Continued.

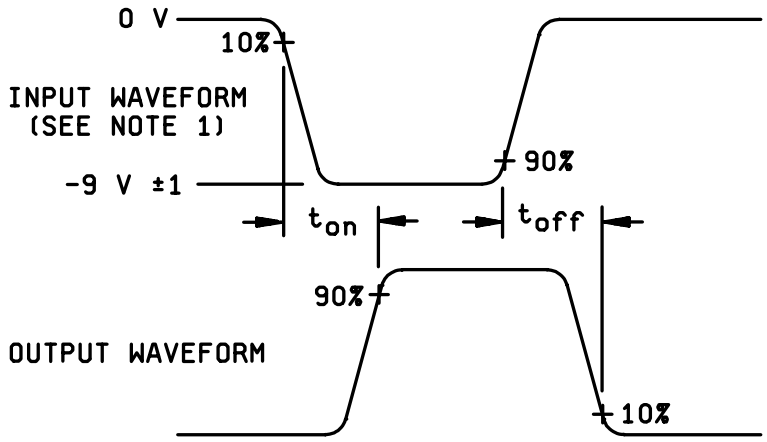
Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
Subgroup 5 - Continued.						
Safe operating area (switching)	3053	Load condition C (unclamped inductive load) (see figure 5) T_C = +25°C, duty cycle ≤ 10 percent				
Test 1		$t_p \approx 15$ ms, $R_{BB1} = 20\ \Omega$, $V_{BB1} = 10$ V dc maximum, $R_{BB2} = 20\ \Omega$, $V_{BB2} = 1.5$ V dc, $V_{CC} = 10$ V dc, $I_C = 2$ A dc, L = 25 µH, $R_S = 0.1\Omega$				
Test 2		$t_p \approx 15$ ms, $R_{BB1} = 50\ \Omega$, $V_{BB1} = 10$ V dc maximum, $R_{BB2} = 20\ \Omega$, $V_{BB2} = 1.5$ V dc, $V_{CC} = 10$ V dc, $I_C =$ 0.25 A dc, L = 3.0 mH, $R_S = 1.0\ \Omega$				
Electrical measurements		See table I, subgroup 2				
Safe operating area (switching)	3053	Load condition B, (clamped inductive load) see figure 6, T_C = +25°C, duty cycle ≤ 10 percent, $t_p \approx 15$ ms, $R_S = 0.1\ \Omega$, $R_{BB1} = 20\ \Omega$, $R_{BB2} = 20\ \Omega$, $R_{BB2} = 20\ \Omega$, $V_{BB1} = 10$ V dc maximum, $V_{BB2} = 1.5$ V, $I_C =$ 2.0 A dc (clamped voltage must be reached)				
2N6211 2N6212 2N6213, 2N6213A		$V_{CC} = 225$ V dc, $R_L \leq 112.5\ \Omega$ $V_{CC} = 300$ V dc, $R_L \leq 150\ \Omega$ $V_{CC} = 350$ V dc, $R_L \leq 175\ \Omega$, L = 250µH, CR = 1N1190A				
2N6211 2N6212 2N6213, 2N6213A		Clamp voltage = 225, +0, -5 V dc Clamp voltage = 300, +0, -5 V dc Clamp voltage = 350, +0, -5 V dc				
Electrical measurements		See table I, subgroup 2				

1/ For sampling plan see MIL-PRF-19500.

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

Inspection	MIL-STD-750		Qualification
	Method	Conditions	
Subgroup 1			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 table I, subgroup 2 herein.	
Subgroup 2			45 devices c = 0
Intermittent life	1037	Intermittent operation life: V_{CB} = 10 V dc, 6,000 cycles	
Electrical measurements		See table I, subgroup 2 herein.	
Subgroup 3			3 devices c = 0
DPA	2102		
Subgroup 4			22 devices c = 0
Thermal resistance	3131	See 4.5.2	
Subgroup 5			15 devices c = 0
Barometric pressure 2N6211 2N6212 2N6213 2N6213A	1001	Test condition C. V_{CE} = 250 V dc V_{CE} = 315 V dc V_{CE} = 360 V dc V_{CE} = 400 V dc	
Subgroup 6			
Not applicable			

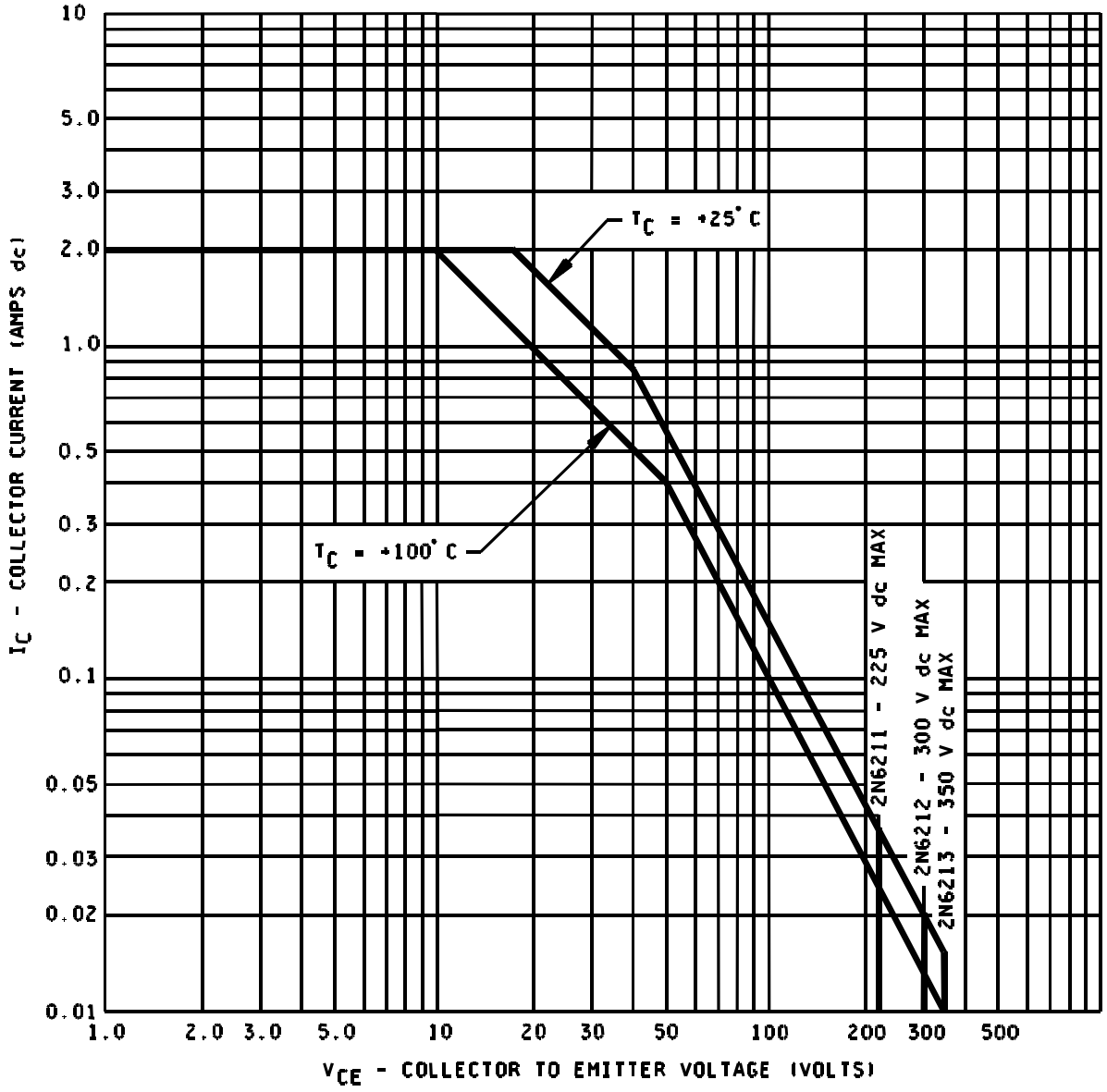




NOTES:

1. The rise time (t_r) and fall time (t_f) of the applied pulse shall be each ≤ 20 ns, duty cycle ≤ 2 percent, generator source impedance shall be 50 Ω; pulse width = 20 μs.
2. Output sampling oscilloscope: Z_{in} ≥ 100 kΩ, C_{in} ≤ 50 pF, rise time ≤ 20 ns.

FIGURE 3. Pulse response test circuit.



NOTE: Electrical characteristics for 2N6213A are identical to the 2N6213 unless otherwise noted.

* FIGURE 4. Maximum safe operating graph (continuous dc).

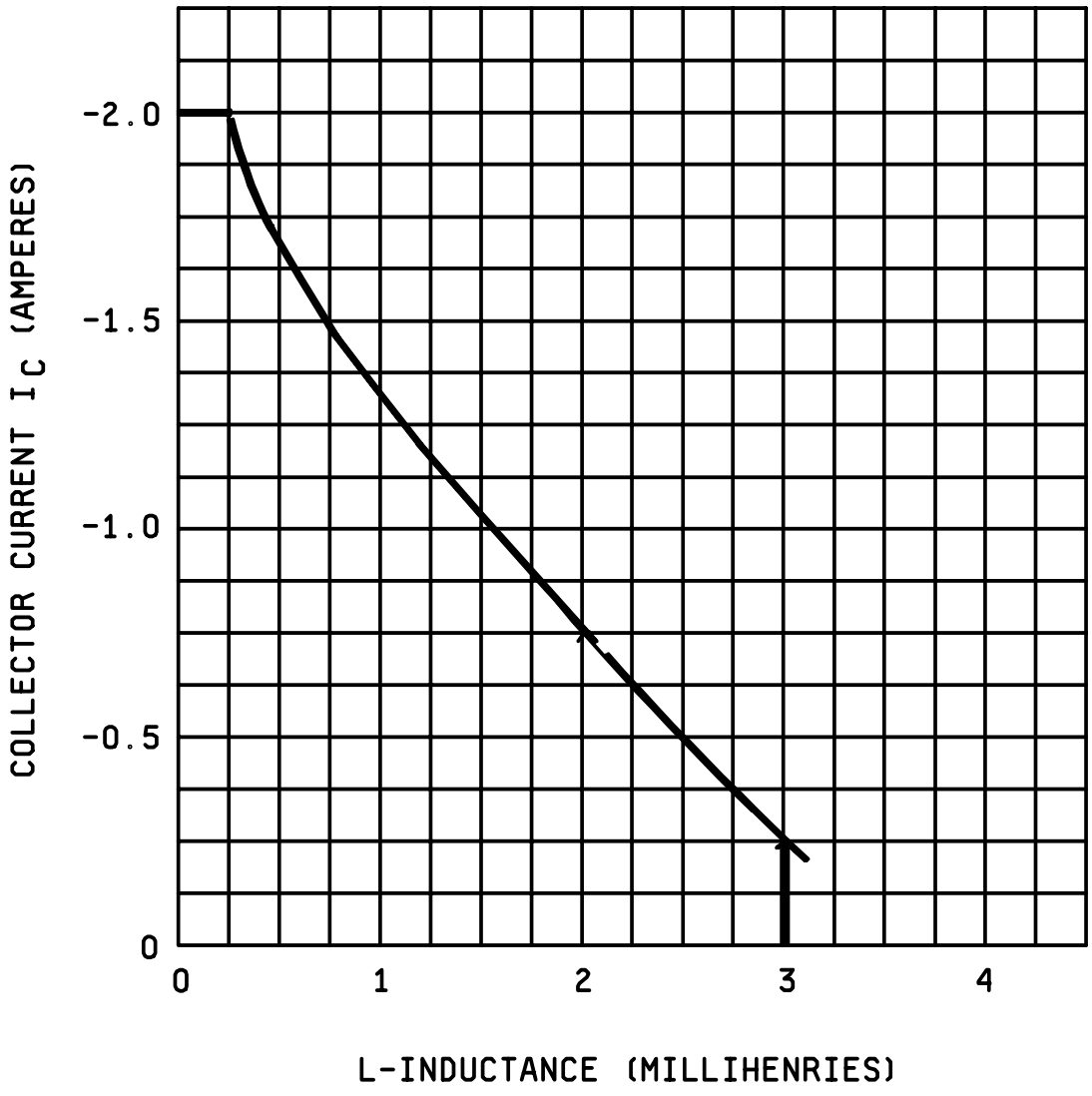
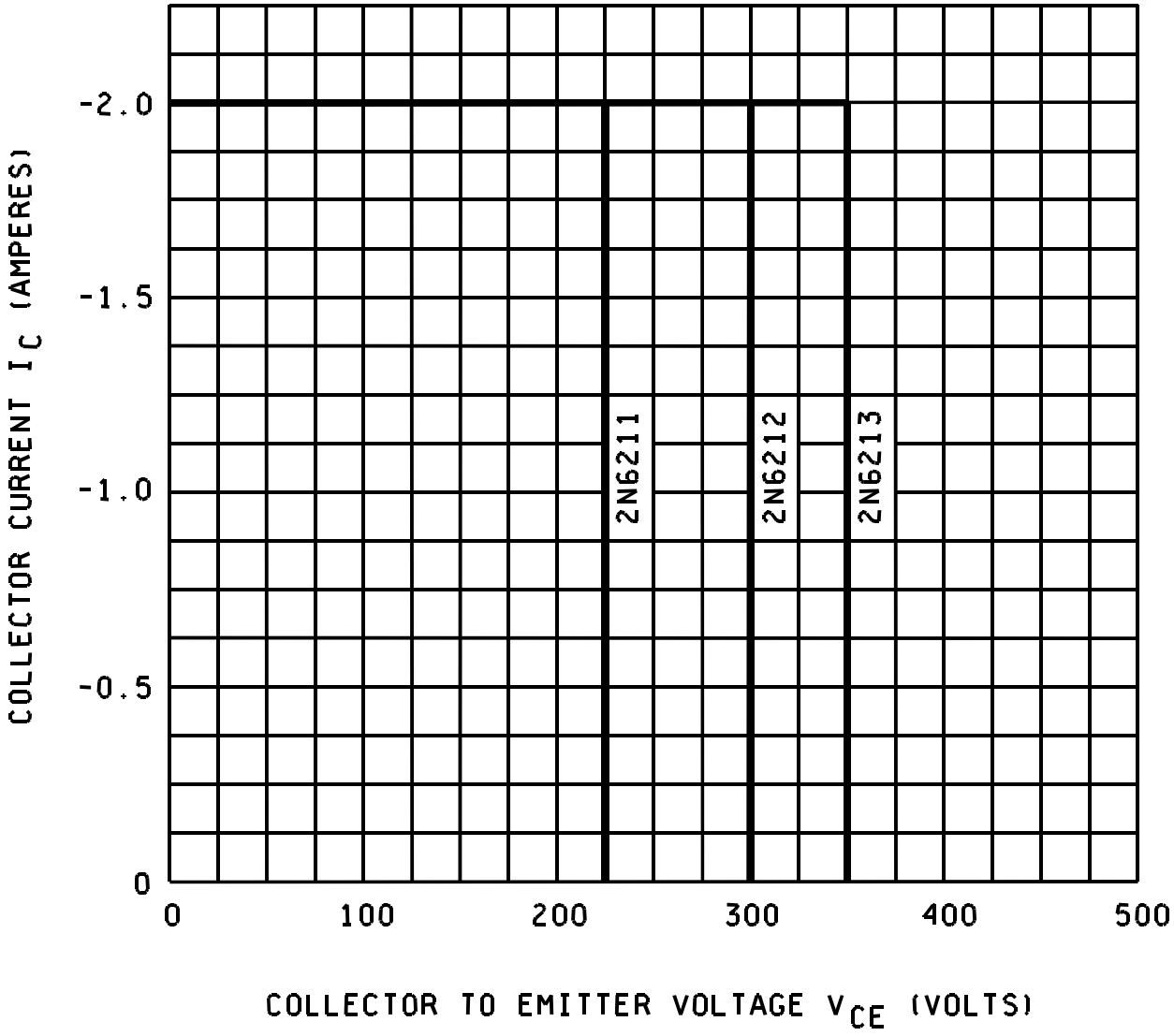


FIGURE 5. Safe operating area for switching between saturation and cutoff (unclamped inductive load).



NOTE: Electrical characteristics for 2N6213A are identical to the 2N6213 unless otherwise noted.

* FIGURE 6. Safe operating area for switching between saturation and cutoff (clamped inductive load).

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 Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's 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).

c. Packaging requirements (see 5.1).

d. Lead finish (see 3.4.1).

6.3 Suppliers of JANHC and JANKC die. The qualified die suppliers with the applicable letter version (example, JANHCA2N6211) will be identified on the QML.

JANC ordering information	
PIN	Manufacturer
	33178
2N6211	JANHCA2N6211 JANKCA2N6211
2N6212	JANHCA2N6212 JANKCA2N6212
2N6213	JANHCA2N6213 JANKCA2N6213

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 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.

* 6.5 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

Reviewing activities:
Army - AV
Air Force - 19, 99

Preparing activity:
DLA- CC

(Project 5961-2735)

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.

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-19500/461E	2. DOCUMENT DATE 18 April 2003

3. **DOCUMENT TITLE** SEMICONDUCTOR DEVICE, TRANSISTOR, PNP, SILICON, HIGH-POWER TYPE 2N6211, 2N6212, 2N6213, 2N6213A, JAN, JANTX, JANTXV, 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 DSN FAX EMAIL 614-692-0510 850-0510 614-692-6939 alan.barone@dla.mil
c. ADDRESS Defense Supply Center Columbus, ATTN: DSCC-VAC P.O. Box 3990 Columbus, OH 43213-1199	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