

The documentation and process conversion measures necessary to comply with this document shall be completed by 18 February 2014.

INCH-POUND

MIL-PRF-19500/710C
 18 December 2013
 SUPERSEDING
 MIL-PRF-19500/710B
 15 September 2011

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, POWER,
 TYPES 2N6674T1, 2N6674T3, 2N6675T1, AND 2N6675T3,
 JAN, JANTX, AND JANTXV

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and [MIL-PRF-19500](#).

1. SCOPE

1.1 Scope. This specification covers the performance requirements for NPN, silicon, power transistors for use in high-speed power-switching applications. Three levels of product assurance are provided for each device type as specified in [MIL-PRF-19500](#).

1.2 Physical dimensions. See [figure 1](#) (TO-254AA) and [figure 2](#) (TO-257AA).

1.3 Maximum ratings. Unless otherwise specified, $T_A = +25^\circ\text{C}$.

Type	P_T (1)		$R_{\theta JC}$ T1 only (1)	$R_{\theta JC}$ T3 only (1)	V_{CBO} and V_{CEX}	V_{CEO}	V_{EBO}	I_B	I_C	T_J and T_{STG}
	$T_A = +25^\circ\text{C}$	$T_C = +25^\circ\text{C}$								
	<u>W</u>	<u>W</u>	<u>$^\circ\text{C/W}$</u>	<u>$^\circ\text{C/W}$</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>A dc</u>	<u>A dc</u>	<u>$^\circ\text{C}$</u>
2N6674T1	6	(2) 175	1.0		450	300	7	5	15	-65 to +200
2N6674T3	4	(2) 175		1.3	450	300	7	5	15	
2N6675T1	6	(2) 175	1.0		650	400	7	5	15	
2N6675T3	4	(2) 175		1.3	650	400	7	5	15	

- (1) For derating, see [figures 3](#) and [4](#). For thermal impedance curves, see [figures 5](#) and [6](#).
 (2) For TO-257 devices, ratings at 125W and 1.3 $^\circ\text{C/W}$ only.

* Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, ATTN: VAC, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to Semiconductor@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil/>.

1.4 Primary electrical characteristics at $T_C = +25^\circ\text{C}$.

Limit	$V_{BE(sat)}$ $I_C = 10 \text{ A dc}$ $I_B = 2 \text{ A dc}$	$V_{CE(sat)}$ $I_C = 10 \text{ A dc}$ $I_B = 2 \text{ A dc}$	C_{obo} $V_{CB} = 10 \text{ V dc}$ $I_E = 0 \text{ A dc}$ $100 \text{ kHz} < f < 1 \text{ MHz}$	$ h_{fe} $ $V_{CE} = 10 \text{ V dc}$ $I_C = 1 \text{ A dc}$ $f = 5 \text{ MHz}$
Min	<u>V dc</u>	<u>V dc</u>	<u>pF</u>	
Max	1.5	1.0	500	10

Limit	h_{FE1} $V_{CE} = 3 \text{ V dc}$ $I_C = 1 \text{ A dc}$	h_{FE2} $V_{CE} = 2 \text{ V dc}$ $I_C = 10 \text{ A dc}$ (1)	Switching parameters				
			t_d	t_r	t_s	t_f	t_c
Min	15	8	μs	μs	μs	μs	μs
Max	40	20	0.1	0.6	2.5	0.5	0.5

(1) Pulsed (see 4.5.1).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 of documents cited in sections 3, 4, or 5 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 cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

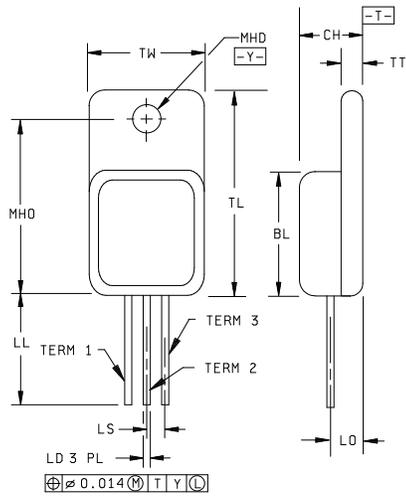
[MIL-PRF-19500](#) - Semiconductor Devices, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

[MIL-STD-750](#) - Test Methods for Semiconductor Devices.

* (Copies of these documents are available online at <http://quicksearch.dla.mil/> or <https://assist.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

* 2.3 Order of precedence. Unless otherwise noted herein or in the contract, 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.

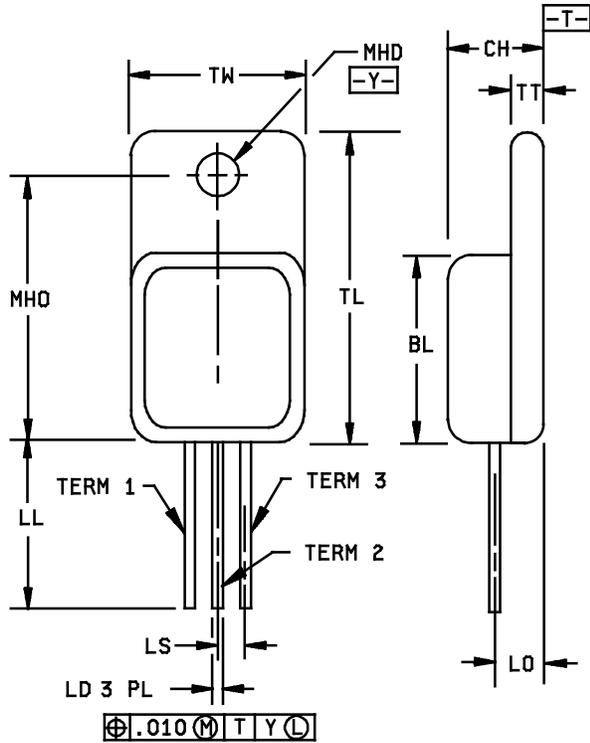


Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.535	.545	13.59	13.84
CH	.249	.260	6.32	6.60
LD	.035	.045	0.89	1.14
LL	.510	.570	12.94	14.48
LO	.150 BSC		3.81 BSC	
LS	.150 BSC		3.81 BSC	
MHD	.139	.149	3.53	3.78
MHO	.665	.685	16.89	17.40
TL	.790	.800	20.07	20.32
TT	.040	.050	1.02	1.27
TW	.535	.545	13.59	13.84
Term 1	Base			
Term 2	Collector			
Term 3	Emitter			

NOTES:

1. Dimensions are in inches. Millimeters equivalents are given for general information only.
2. All terminals are isolated from case.
3. Methods used for electrical isolation of the terminals feedthroughs shall employ materials that contain a minimum of 90 percent AL₂O₃ (ceramic).
4. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 1. Dimensions and configuration 2N6674T1 and 2N6675T1 (TO-254AA).



Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.410	.430	10.41	10.92
CH	.190	.200	4.83	5.08
LD	.025	.035	0.64	0.89
LL	.500	.750	12.70	19.05
LO	.120 BSC		3.05 BSC	
LS	.100 BSC		2.54 BSC	
MHD	.140	.150	3.56	3.81
MHO	.527	.537	13.39	13.63
TL	.645	.665	16.38	16.89
TT	.035	.045	0.89	1.14
TW	.410	.420	10.41	10.67
Term 1	Base			
Term 2	Collector			
Term 3	Emitter			

NOTES:

1. Dimensions are in inches. Millimeters equivalents are given for general information only.
2. Methods used for electrical isolation of the terminals feedthroughs shall employ materials that contain a minimum of 90 percent AL₂O₃ (ceramic).
3. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 2. Dimensions and configuration for 2N6674T3 and 2N6675T3 (TO-257AA).

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 [6.3](#)).

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. Interface and physical dimensions shall be as specified in [MIL-PRF-19500](#), and on [figure 1](#) and [figure 2](#).

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](#).

3.6 Electrical test requirements. The electrical test requirements shall be [table I](#), group A as specified 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](#), and [tables I, II, and III](#)).

4.2 Qualification inspection. Qualification inspection shall be in accordance with [MIL-PRF-19500](#) and as specified herein.

4.2.1 Group E qualification. Group E qualification shall be performed herein for qualification or requalification only. In case qualification was awarded to a prior revision of the associated specification that did not request the performance of [table III](#) tests, the tests specified in a [table III](#) herein shall be performed by the first inspection lot to this revision to maintain qualification.

* 4.3 Screening (JANTX, and JANTXV levels only). Screening shall be in accordance with table E-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 E-IV of MIL-PRF-19500)	Measurement
	JANTX and JANTXV levels
(1) 3c	Thermal impedance, method 3131 of MIL-STD-750 (see 4.3.2)
9	I_{CEX1}
11	I_{CEX1} and h_{FE2} ; ΔI_{CEX1} = 100 percent of initial value or 50 μ A dc, whichever is greater
12	See 4.3.1
13a	Subgroup 2 of table I herein; ΔI_{CEX1} = 100 percent of initial value or 50 μ A dc, whichever is greater; h_{FE2} = \pm 20 percent of initial value
* 17	For TO-254AA packages: Method 1081 of MIL-STD-750 (see 4.3.3), Endpoints: Subgroup 2 of table I herein.

(1) Shall be performed any time after temperature cycling, screen 3a; and does not need to be repeated in screening requirements.

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows: T_J = +175°C minimum; V_{CB} = 100 V dc; $T_A \leq +35^\circ\text{C}$.

4.3.2 Thermal impedance. The thermal impedance measurements shall be performed in accordance with method 3131 of MIL-STD-750 using the guidelines in that method for determining I_M , I_H , t_H , t_{SW} , (and V_H where appropriate). Measurement delay time (t_{MD}) = 70 μ s max. See table III, group E, subgroup 4 herein.

* 4.3.3 Dielectric withstanding voltage.

- a. Magnitude of test voltage.....900 V dc.
- b. Duration of application of test voltage.....15 seconds (min).
- c. Points of application of test voltage.....All leads to case (bunch connection).
- d. Method of connection.....Mechanical.
- e. Kilovolt-ampere rating of high voltage source.....1,200 V/1.0 mA (min).
- f. Maximum leakage current.....1.0 mA.
- g. Voltage ramp up time.....500 V/second.

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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 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 table E-VIB (JAN, JANTX, and JANTXV) and in 4.4.2.1 herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein. Delta requirements shall be in accordance with table II herein.

<u>Subgroup</u>	<u>Method</u>	<u>Inspection</u>
B3	1027	For eutectic die attach: $V_{CB} \geq 100$ V dc; adjust P_T to achieve $T_J = +175^\circ$ C minimum; $T_A \leq +35^\circ$ C.
* B3	1037	For solder die attach: $V_{CB} \geq 100$ V dc.
B5	3131	See thermal impedance curves figures 5 and 6.

* 4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-VII of MIL-PRF-19500 and herein. Electrical measurements (end-points) shall be in accordance with group A, subgroup 2 herein. Delta requirements shall be in accordance with table II herein.

<u>Subgroup</u>	<u>Method</u>	<u>Inspection</u>
C2	2036	Test condition A; weight = 10 pounds; time = 15 s.
C2	2036	Test condition D1; torque = 6 inch-ounce; time = 15 s.
C6	1027	For eutectic die attach: $V_{CB} \geq 100$ V dc; adjust P_T to achieve $T_J = +175^\circ$ C minimum, $T_A \leq +35^\circ$ C.
* C6	1037	For solder die attach: $V_{CB} \geq 100$ V dc.

4.4.4 Group E inspection. Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-IX of MIL-PRF-19500 and as specified in table III herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein.

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

4.5.1 Pulse measurements. Conditions for pulse measurement shall be as specified in section 4 of MIL-STD-750.

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TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Collector to base breakdown voltage	3011	Bias condition D, $I_C = 200$ mA dc; pulsed (see 4.5.1)	$V_{(BR)CEO}$	300 400		V dc
2N6674T1, 2N6674T3 2N6675T1, 2N6675T3						
Collector to emitter cutoff current	3041	Bias condition D; $V_{BE} = -1.5$ V dc $V_{CE} = 450$ V dc $V_{CE} = 650$ V dc	I_{CEX1}		0.1	mA dc
2N6674T1, 2N6674T3 2N6675T1, 2N6675T3						
Collector to base cutoff current	3036	Bias condition D $V_{CB} = 450$ V dc $V_{CB} = 650$ V dc	I_{CBO}		1.0	mA dc
2N6674T1, 2N6674T3 2N6675T1, 2N6675T3						
Emitter-base cutoff current	3061	Bias condition D, $V_{EB} = 7$ V dc	I_{EBO}		2.0	mA dc
Base emitter voltage	3066	Test condition A; $I_C = 10$ A dc; pulsed (see 4.5.1); $I_B = 2$ A dc	$V_{BE(sat)}$		1.5	V dc
Collector to emitter saturated voltage	3071	$I_C = 10$ A dc; pulsed (see 4.5.1); $I_B = 2$ A dc	$V_{CE(sat)1}$		1.0	V dc
Collector to emitter saturated voltage	3071	$I_C = 15$ A dc; pulsed (see 4.5.1); $I_B = 5$ A dc	$V_{CE(sat)2}$		5.0	V dc
Forward-current transfer ratio	3076	$V_{CE} = 3$ V dc; $I_C = 1$ A dc; pulsed (see 4.5.1)	h_{FE1}	15	40	
Forward-current transfer ratio	3076	$V_{CE} = 2$ V dc; $I_C = 10$ A dc; pulsed (see 4.5.1)	h_{FE2}	8	20	

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection <u>1</u> /	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u>						
High-temperature operation:		$T_A = +125^\circ\text{C}$				
Collector to emitter cutoff current	3041	Bias condition A; $V_{BE} = -1.5\text{ V dc}$	I_{CEX2}			
2N6674T1, 2N6674T3		$V_{CE} = 450\text{ V dc}$			1.0	mA dc
2N6675T1, 2N6675T3		$V_{CE} = 650\text{ V dc}$			1.0	mA dc
Collector to emitter cutoff current	3041	$T_A = +125^\circ\text{C}$, bias condition A	I_{CEO}			
2N6674T1, 2N6674T3		$V_{CE} = 300\text{ V dc}$			90	μA
2N6675T1, 2N6675T3		$V_{CE} = 400\text{ V dc}$			90	μA
Collector to emitter saturated voltage	3071	$I_C = 10\text{ A dc}$; $I_B = 2\text{ A dc}$; pulsed (see 4.5.1)	$V_{CE(sat)2}$		2.0	V dc
Switching parameters:		$T_A = +125^\circ\text{C}$				
Pulse delay time		See figure 7	t_d		0.1	μs
Pulse rise time		See figure 7	t_r		1.0	μs
Pulse storage time		See figure 7	t_s		4.0	μs
Pulse fall time		See figure 7	t_f		1.0	μs
Cross over time		See figure 7	t_c		0.8	μs
Low-temperature operation:		$T_A = -55^\circ\text{C}$				
Forward-current transfer ratio	3076	$V_{CE} = 2\text{ V dc}$; $I_C = 10\text{ A dc}$; pulsed (see 4.5.1)	h_{FE3}	4		
<u>Subgroup 4</u>						
Magnitude of common emitter small-signal short-circuit forward-current transfer ratio	3306	$V_{CE} = 10\text{ V dc}$; $I_C = 1\text{ A dc}$; $f = 5\text{ MHz}$	$ h_{fe} $	3	10	
Open capacitance (open circuit)	3236	$V_{CB} = 10\text{ V dc}$; $I_E = 0$; $100\text{ kHz} \leq f \leq 1.0\text{ MHz}$	C_{obo}	150	500	pF
Switching parameters:		$T_A = +125^\circ\text{C}$				
Pulse delay time		See figure 7	t_d		0.1	μs

See footnote at end of table.

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TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 4</u> - Continued						
Pulse rise time		See figure 7	t_r		0.6	μs
Pulse storage time		See figure 7	t_s		2.5	μs
Pulse fall time		See figure 7	t_f		0.5	μs
Cross over time		See figure 7	t_c		0.5	μs
<u>Subgroup 5</u>						
Safe operating area	3051	$T_C = +25^\circ\text{C}$ $t = 1 \text{ s}; 1 \text{ cycle};$ (see figure 8)				
<u>Test 1</u> 2N6674T1, 2N6674T3 2N6675T1, 2N6675T3		$V_{CE} = 11.7 \text{ V dc}; I_C = 15 \text{ A dc}$				
<u>Test 2</u> 2N6674T1, 2N6674T3 2N6675T1, 2N6675T3		$V_{CE} = 30 \text{ V dc}; I_C = 5.9 \text{ A dc}$				
<u>Test 3</u> 2N6674T1, 2N6674T3 2N6675T1, 2N6675T3		$V_{CE} = 100 \text{ V dc}; I_C = 0.25 \text{ A dc}$				
<u>Test 4</u> 2N6674T1, 2N6674T3 2N6675T1, 2N6675T3		$V_{CE} = 300 \text{ V dc}; I_C = 20 \text{ mA dc}$ $V_{CE} = 400 \text{ V dc}; I_C = 10 \text{ mA dc}$				
Safe operating area	3053	$T_A = +25^\circ\text{C}; V_{CC} = 15 \text{ V dc};$ (see figure 8); load condition B; $V_{BB2} = 5.0 \text{ V}; R_{BB1} = 5 \Omega; R_{BB2} = 1.5 \Omega;$ $L = 50 \mu\text{H}; R \text{ of inductor} = 0.05 \Omega;$ $R_{load} = R \text{ of inductor}$				
2N6674T1, 2N6674T1		Clamp voltage = 350 V dc; $I_C = 15 \text{ A dc}$				
2N6675T1, 2N6675T1		Clamp voltage = 450 V dc; $I_C = 15 \text{ A dc}$				
Electrical measurements		Table I , subgroup 2 herein.				
<u>Subgroups 6 and 7</u>						
Not applicable						

1/ For sampling plan see [MIL-PRF-19500](#).

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

Steps	Inspection 3/	MIL-STD-750		Symbol	Limits		Unit
		Method	Conditions		Min	Max	
1.	Collector to emitter cutoff current 2N6674T1, T3 2N6675T1, T3	3041	Bias condition A; $V_{BE} = -1.5$ V dc $V_{CE} = 450$ V dc $V_{CE} = 650$ V dc	ΔI_{CEX1} 4/	100 percent of initial value or 50 μ A whichever is greater.		
2.	Forward - current transfer ratio	3076	$V_{CE} = 3$ V dc; $I_C = 15$ A dc; pulsed (see 4.5.1)	Δh_{FE2}	± 25 percent change from initial reading.		
3.	Collector to emitter voltage (saturated)	3071	$I_C = 15$ A dc; $I_B = 3$ A dc, pulsed (see 4.5.1)	$\Delta V_{CE(sat)1}$	± 100 mV change from previously measured value.		

1/ The delta electrical measurements for table E-VIB (JAN, JANTX ,and JANTXV) of MIL-PRF-19500 are as follows:

- a. Subgroup 3, see table II herein, steps 1 and 2.
- b. Subgroup 6, see table II herein, step 2.

2/ The delta electrical measurements for table E-VII of MIL-PRF-19500 are as follows:

- a. Subgroup 2, see table II herein, step 1.
- b. Subgroup 3, see table II herein, step 1.
- c. Subgroup 6, see table II herein, steps 1, 2, and 3.

3/ See MIL-PRF-19500 for sampling plan.

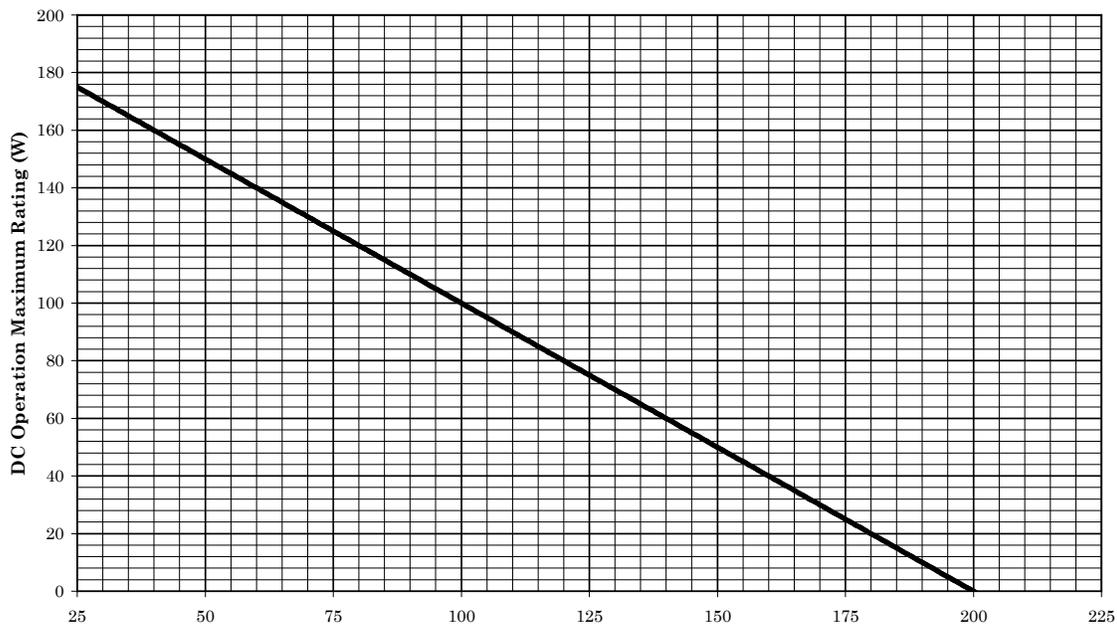
4/ Devices which exceed the group A limits for this test shall not be acceptable.

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TABLE III. Group E inspection (all quality levels) - for qualification and requalification 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 table I , subgroup 2 herein.	
<u>Subgroup 2</u>			
Intermittent life	1037	Intermittent operation life: $V_{CB} = 10$ V dc, 6,000 cycles.	45 devices c = 0
Electrical measurements		See table I , subgroup 2 herein.	
<u>Subgroup 4</u>			
Thermal impedance curves		See MIL-PRF-19500	
<u>Subgroup 5</u>			
Barometric pressure (reduced)	1001	Test condition C, see 1.3. Unless otherwise specified, the device shall be subjected to the maximum voltage it would be subjected to under rated operating conditions.	12 devices, c = 0
<u>Subgroups 6 and 7</u>			
Not applicable			
<u>Subgroup 8</u>			
Reverse stability	1033	Condition A for devices ≥ 400 V, condition B for devices < 400 V	45 devices c = 0

Temperature-power derating curves
TO-254AA



DC operation Case temperature
Thermal resistance junction to case ($R_{\theta JC}$) = 1.0°C/W
NOTE: Maximum finish-alloy temperature = 175°C for lead tin solder alloys.

FIGURE 3. Derating for TO-254AA types.

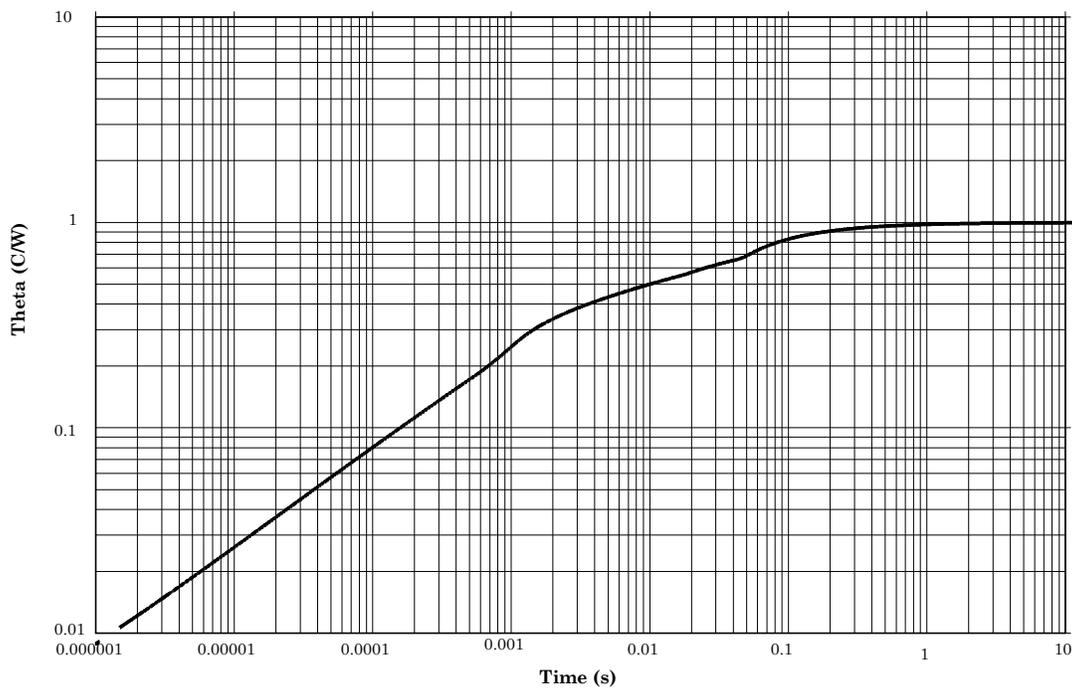
Maximum-power derating curve
TO-257AA



DC operation Case temperature
Thermal resistance junction to case ($R_{\theta JC}$) = 1.3°C/W
NOTE: Maximum finish-alloy temperature = +175°C for lead tin solder alloys.

FIGURE 4. Derating for TO-257AA types.

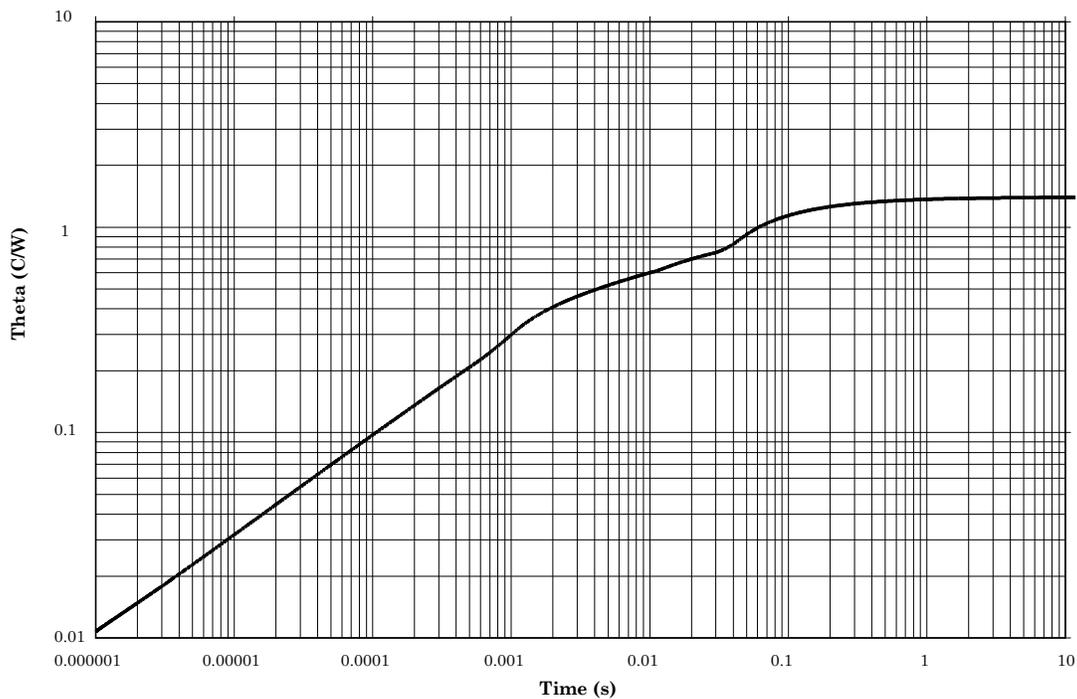
Maximum thermal impedance
TO-254 package, T_c=25°C



$R_{\theta JC} = 1^{\circ}\text{C/W}$

FIGURE 5. Thermal impedance graph for 2N6674T1 and 2N6675T1 (TO-254).

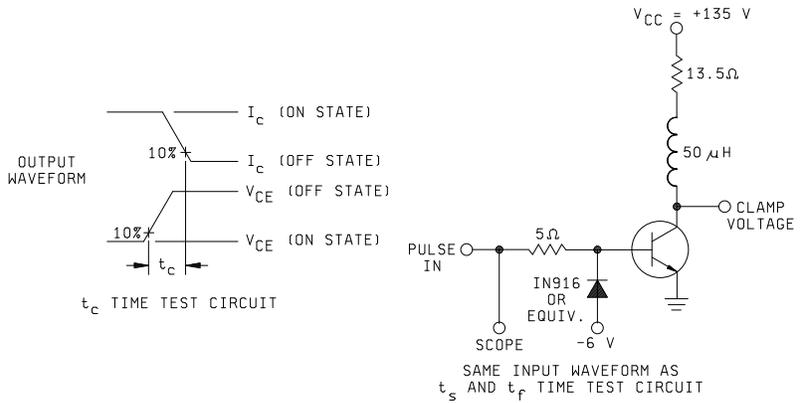
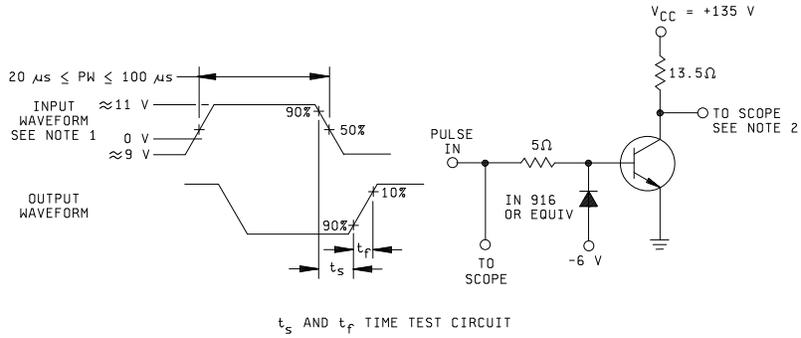
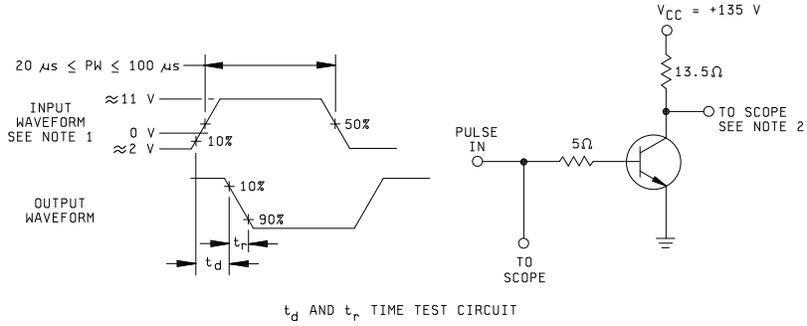
Maximum thermal impedance
TO-257 Package, TC = +25°C



$$R_{\theta JC} = 1.3^{\circ}\text{C/W}$$

FIGURE 6. Thermal impedance graph for 2N6674T3 and 2N6675T3 (TO-257).

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NOTES:

1. The rise time (t_r) of the applied pulse shall be ≤ 20 ns; duty cycle ≤ 2 percent; generator source impedance shall be 500 Ω .
2. Output sampling oscilloscope: $Z_{in} \geq 10$ k Ω ; $C_{in} \leq 13$ pF; rise time ≤ 20 ns.

FIGURE 7. Pulse response test circuit.

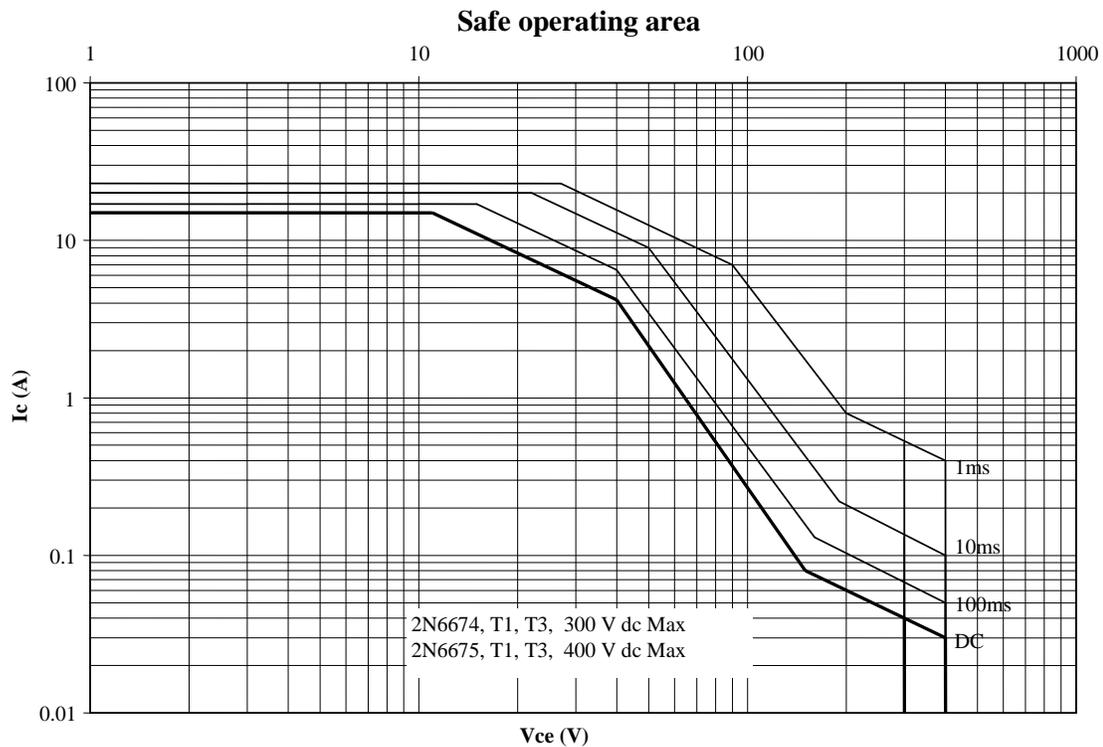


FIGURE 8. Safe operating area curve for all devices at $T_{(case)} = +25^{\circ}C$.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When 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. The notes specified in [MIL-PRF-19500](#) are applicable to this specification.)

6.1 Intended use. Semiconductors conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Packaging requirements (see 5.1).
- c. Lead finish (see [3.4.1](#)).
- d. Product assurance level and type designator.

* 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 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 DLA Land and Maritime, ATTN: VQE, P.O. Box 3990, Columbus, OH 43218-3990 or e-mail vqe.chief@dla.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.dla.mil>.

6.4 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 - 85
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2014-027)

Review activities:
Army - AR, AV, MI
Air Force - 19, 70, 99

* NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/>.