The documentation and process conversion measures necessary to comply with this revision shall be completed by 20 May 2009.

INCH-POUND

MIL-PRF-19500/696A
20 February 2009
SUPERSEDING
MIL-PRF-19500/696
22 November 2001

* PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTOR, PLASTIC, N-CHANNEL, SILICON, TYPE 2N7537, 2N7537A, JAN AND JANTX

Device types 2N7537 and 2N7537A are inactive for new design.

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 two plastic N-channel, enhancement-mode, MOSFET, power transistors. Two levels of product assurance are provided for each device type as specified in MIL-PRF-19500.

* 1.2 Physical dimensions. See figure 1 and figure 2 (TO-220AB).

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

Types	P_T (1) T_C = +25°C	P_T T_A = +25°C	$R_{\theta JC}$ (2)	V_{DS}	V_{DG}	V_{GS}	I_{D1} T_C =+25°C (3)	I_{D2} T_C = +100°C (3)	I_S	I_{DM} (4)	T_J and T_{STG}	V_{ISO} 70,000 ft. altitude
	W	W	°C/W	V dc	V dc	V dc	A dc	A dc	A dc	A dc	°C	V dc
2N7537	125		1.0	500	500	±30	8.0	5.1	8.0	32	-55	500
2N7537A	125		1.0	500	500	±30	8.0	5.1	8.0	32	to	500
2N7552	125	2.0	1.0	60	60	±20	72 (5)	51 (5)	72	288	+150	500
2N7553	167	2.0	0.75	100	100	±20	75 (5)	53 (5)	75	300		500
2N7554	250	2.0	0.50	200	200	±20	44 (5)	32 (5)	44	175		500

(1) Derate linearly by 1.0 W/°C (2N7537, 2N7537A), 1.0 W/°C (2N7552), 1.33 W/°C (2N7553), 2.0 W/°C (2N7554), for T_C > +25°C.
(2) See figure 3, thermal impedance curves.
(3) The following formula derives the maximum theoretical I_D limit. I_D is limited by package and internal construction.

$$I_D = \sqrt{\frac{T_{JM} - T_C}{(R_{\theta JC}) \times (R_{DS}(on) \text{ at } T_{JM})}}$$

(4) I_{DM} = 4 X I_{D1} as calculated in note (3).
(5) See figure 4, maximum drain current graphs.

* Comments, suggestions, or questions on this document should be addressed to Defense Supply Center, Columbus, ATTN: DSCC-VAC, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to Semiconductor@dscc.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at http://assist.daps.dla.mil/.

* 1.4 Primary electrical characteristics at T_C = +25°C.

Type	Min $V_{(BR)DSS}$ V_{GS} = 0	$V_{GS(TH)}$ $V_{DS} \geq V_{GS}$		Max I_{DSS1} V_{GS} = 0 V_{DS} = rated V_{DS}	Max $r_{DS(ON)}$ (1) V_{GS} = 10 V dc	E_{AS} at I_{D1}	I_{AS}
	V dc	V dc		µA dc	ohm	mJ	A
		Min	Max				
2N7537	500	2.0	4.0	25	2.125	510	8.0
2N7537A	500	2.0	4.0	25	2.125	510	8.0
2N7552	60	2.0	4.0	25	0.012	165	72
2N7553	100	3.5	5.5	1	0.014	192	45
2N7554	200	3.0	5.0	25	0.054	315	44

(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.

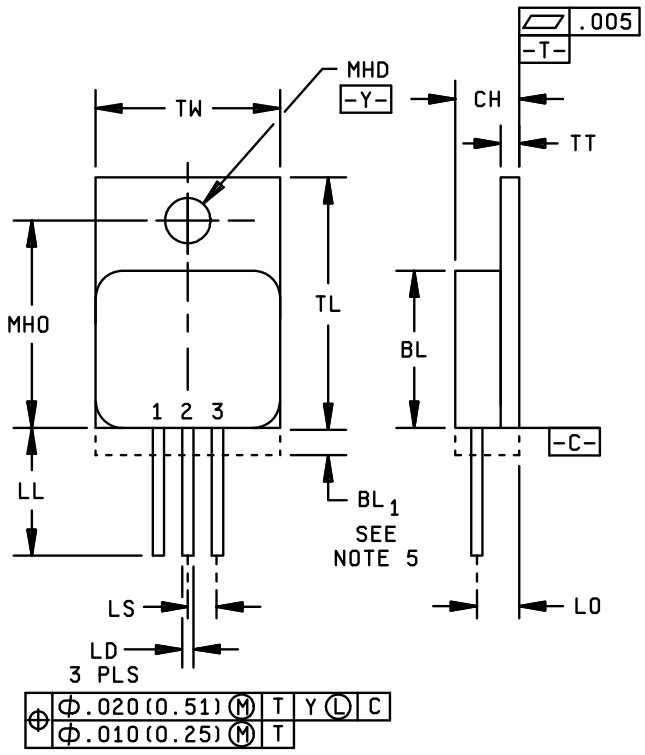
* (Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or http://assist.daps.dla.mil/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

* 2.3 Non-Government publications. The following documents 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.

JESD22-A101	Steady State Temperature Humidity Bias Life Test.
JESD22-A102	Accelerated Moisture Resistance - Unbiased Autoclave.
JESD22-A113	Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing

(Copies of these documents are available from http://www.jedec.org/default.cfm or the Electronics Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834.)

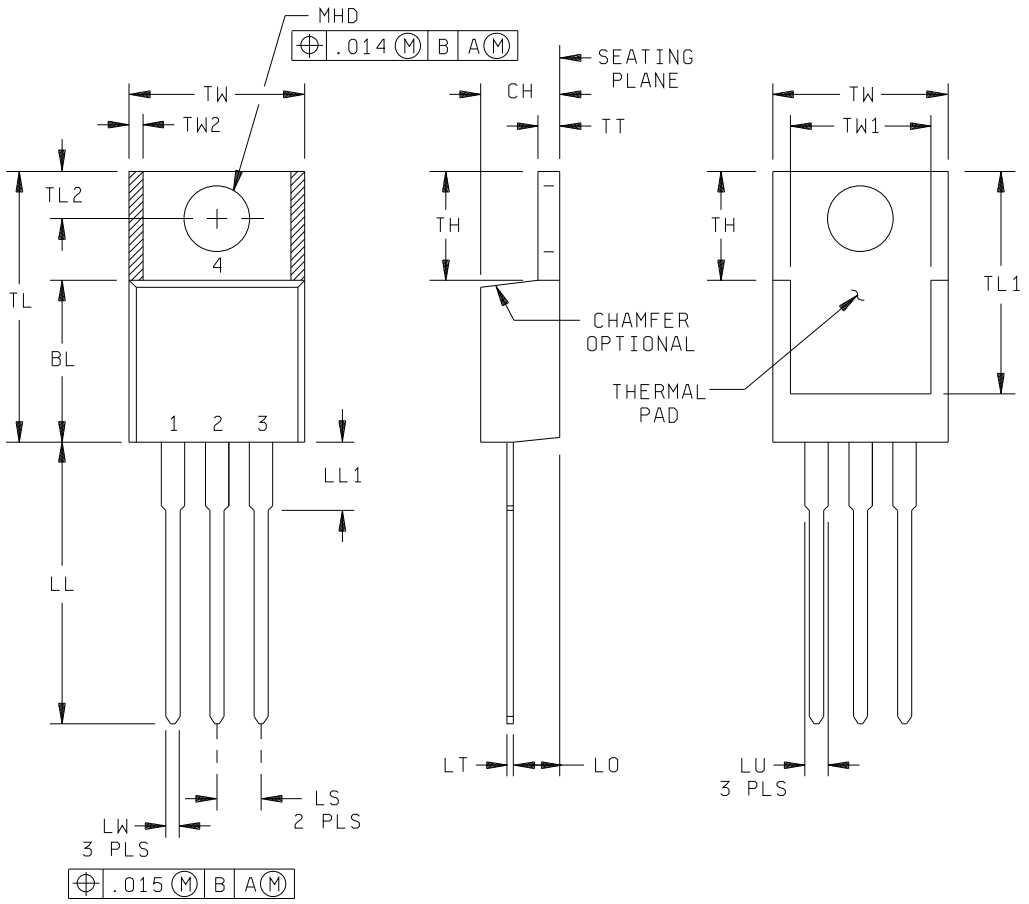
2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.



Ltr	Inches		Millimeters	
	Min	Max	Min	Max
BL	.240	.255	6.10	6.47
BL_1	.140	.160	3.55	4.06
CH	.165	.185	4.20	4.69
LD	.045	.055	1.15	1.40
LL	.530	.555	13.47	14.09
LO	.104	.115	2.64	2.92
LS	.100 BSC		2.54 BSC	
MHD	.139	.149	3.54	3.78
MHO	.584	.600	14.83	15.24.
TL	.584	.600	14.83	15.24
TT	.048	.052	1.22	1.32
TW	.405	.415	10.29	10.54
Term 1	Gate			
Term 2	Drain			
Term 3	Source			

NOTES:
1. Dimensions are in inches.
* 2. Millimeters are given for general information only.
3. The US Government preferred system of measurement is the metric SI system. However, this item was originally designed using inch-pound units of measurement. In the event of a conflict between the metric and inch-pound units, the inch-pound units shall take precedence.
4. All terminals are isolated from the case.
5. This area is for the lead feed-thru eyelets (configuration is optional, but will not extend beyond this zone).

* FIGURE 1. Physical dimensions for 2N7537 and 2N7537A.



* FIGURE 2. Physical dimensions for 2N7552, 2N7553, 2N7554.

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BL	.330	.355	8.38	9.02	
CH	.140	.190	3.56	4.83	
LL	.500	.580	12.70	14.73	
LL1		.250		6.35	
LO	.080	.115	2.03	2.92	
LS	.100 BSC		2.54 BSC		
LT	.014	.024	0.35	0.61	
LU	.045	.070	1.14	1.78	
LW	.015	.040	0.38	1.02	
MHD	.139	.161	3.53	4.09	
TH	.230	.270	5.84	6.86	6
TL	.560	.650	14.23	16.51	5, 6
TL1	.480	.507	12.19	12.88	6
TL2	.100	.135	2.54	3.43	
TT	.020	.051	0.51	1.30	6
TW	.380	.420	9.65	10.67	5, 6
TW1	.270	.350	6.86	8.89	
TW2		.030		0.76	
Term 1	Gate				
Term 2	Drain				
Term 3	Source				
Term 4	Drain				

NOTES:
1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Bottom tab is electrically connected to drain.
4. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.
5. Dimensions TL and TW do not include mold flash. Mold flash shall not exceed .005 inch (0.13 mm) for each side. These dimensions are measured at the outermost extreme of the plastic body.
6. Dimensions for heat-sink tab and lead exclude burs.

* FIGURE 2. Physical dimensions for 2N7552, 2N7553, 2N7554 - Continued.

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 and as follows.

I_{AS} ..... Rated avalanche current, nonrepetitive
nC ..... nano Coulomb.

* 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).

3.4.2 Internal construction. Multiple chip construction is not permitted to meet the requirements of this specification.

3.5 Electrostatic discharge protection. The devices covered by this specification require electrostatic discharge protection.

3.5.1 Handling. MOS devices must be handled with certain precautions to avoid damage due to the accumulation of static charge. However, the following handling practices are recommended (see 3.5).

a. Devices should be handled on benches with conductive handling devices.

b. Ground test equipment, tools, and personnel handling devices.

c. Do not handle devices by the leads.

d. Store devices in conductive foam or carriers.

e. Avoid use of plastic, rubber, or silk in MOS areas.

f. Maintain relative humidity above 50 percent if practical.

g. Care should be exercised during test and troubleshooting to apply not more than maximum rated voltage to any lead.

* h. Gate must be terminated to source, $R \leq 100$ kΩ, whenever bias voltage is to be applied drain to source.

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

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

3.8 Marking. Marking shall be in accordance with MIL-PRF-19500, except as specified herein.

3.8.1 JAN brand. The "J" denotes the JAN brand. Refer to the certificate of conformance or unit packaging for quality assurance level.

3.9 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 table I).

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 inspection shall be performed for qualification or re-qualification only. In case qualification was awarded to a prior revision of the specification sheet that did not request the performance of table II tests, the tests specified in table II herein that were not performed in the prior revision shall be performed on the first inspection lot of this revision to maintain qualification.

* 4.3 Screening (JANTX). For appendix D qualified suppliers, 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 Level
(1)	Gate stress test (see 4.3.1)
(1)	Method 3470 of MIL-STD-750, E_{AS} test (see 4.3.2)
1a	Not applicable
1b	Method 2069 of MIL-STD-750 required, pre-cap internal visual
2	Not required
3a	Method 1051 of MIL-STD-750, temperature cycling required
3b	Not required
(1) 3c	Method 3161 of MIL-STD-750, thermal impedance (see 4.3.3)
4	Not required
5	Not applicable
6	Not required
7a	Not applicable
7b	Not applicable
8	Not applicable
9	Not required
10	Method 1042 of MIL-STD-750, test condition B required, V_{GS} = 16 V dc
11	Subgroup 2 of table I herein
12	Method 1042 of MIL-STD-750, test condition A required
13a	Subgroup 2 of table I herein ΔI_{GSSF1} = ±20 nA dc or ±100 percent of initial value, whichever is greater. ΔI_{GSSR1} = ±20 nA dc or ±100 percent of initial value, whichever is greater. ΔI_{DSS1} = ±10 μA dc (±0.5 μA dc for 2N7553) or ±100 percent of initial value, whichever is greater. $\Delta r_{DS(on)1}$ = ±20 percent of initial value $\Delta V_{GS(TH)1}$= ±20 percent of initial value.
13b	Not applicable
14a	Not applicable
14b	Not applicable
15	Not applicable
16	Not applicable

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

* 4.3.1 Gate stress test. Apply V_{GS} = 35 V minimum for t = 250 μs minimum.

* 4.3.2 Single pulse avalanche energy (E_{AS}).

a. Peak current (I_{AS}). ..... I_{AS}(max).

b. Peak gate voltage (V_{GS}) ..... 10 V.

c. Gate to source resistor (R_{GS}) ..... $25\Omega \leq R_{GS} \leq 200\Omega$.

d. Initial case temperature (T_C) ..... +25°C +10°C, -5°C.

e. Inductance (L) ..... $\left[\frac{2E_{AS}}{(I_{D1})^2}\right]\frac{[(V_{BR} - V_{DD})]}{V_{BR}}$ *mH minimum*

f. Number of pulses to be applied ..... 1 pulse minimum.

g. Supply voltage (V_{DD}) ..... 50 V.

* 4.3.3 Thermal impedance. The thermal impedance measurements shall be performed in accordance with method 3161 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 μs max. See table II, group E, subgroup 4 herein.

* 4.4 Conformance inspection. For appendix D qualified suppliers, 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) for JAN and JANTX shall be as specified table I, subgroup 2.

* 4.4.2 Group B inspection, JAN and JANTX. Group B inspection shall be conducted in accordance with the conditions specified in 4.4.2.1 for JAN and JANTX and as follows. Electrical measurements (end-points) for JAN and JANTX shall be as specified table I, subgroup 2, herein. Separate samples may be used for each subgroup, n = 45, c = 0.

Subgroup	Method	Condition
B1	2026 1022	Solderability. Resistance to solvents (not required for laser marked devices).
B1	JESD22-A113 (1)	Pre conditioning to level 1 for the following sequential tests:
B1	JESD22-A102 (1)	Autoclave: condition C, 96 hours
B1	1051	Temp cycle 168 cycles condition G.
B2	1056	Thermal shock: 10 cycles, condition A.
B3	1042	High temperature reverse bias: Condition B, 80 percent (minimum) of rated V_{GS}\.
B3	1042	Intermittent operation life: Condition D, 2,000 cycles. The heating cycle shall be 30 seconds minimum.
B4	2075	Decap internal visual.
B4	2031	T = 260°C, 10 sec., n = 20, c = 0.

(1) Non-government standard document, see 2.3.

* 4.4.2.1 Group B sample selection. Samples for subgroups in group B shall be in accordance with MIL-PRF-19500 and as specified herein. Separate samples may be used for each subgroup. 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.

* 4.4.3 Group C inspection. Group C inspection shall be as specified in 4.4.3.1 and shall include tests which are performed periodically. Electrical measurements (end-points) for JAN and JANTX shall be as specified in table I, subgroup 2 herein. Separate samples may be used for each subgroup. For rules on resubmission for failed subgroups, see MIL-PRF-19500.

* 4.4.3.1 Group C inspection (JAN and JANTX) of MIL-PRF-19500. Separate samples may be used for each step, n = 77, c = 0

Subgroup	Method	Condition
C1	JESD22-A113 (1)	Pre conditioning to level 1
C1	2066	Physical dimensions: In accordance with figure 1 herein.
C2	1056	Thermal shock: condition B.
		Electrical measurements.
C2	1051	Temp. cycle: condition G, 500 cycles.
C3	JESD22-A101 (1)	High temperature reverse bias: 500 hours, (85/85 biased): 80 percent V; max of 100 V.
C4	1042	High temperature reverse bias: Condition B, 80 percent (minimum) of rated $V_{GS\backslash}$.
C4	1042	Intermittent operation life: Condition D, 5,000 cycles. The heating cycle shall be 30 seconds minimum.
C5	3161	Thermal resistance: $R_{\theta JC}$(max) = rated $R_{\theta JC}$.

(1) Non-government standard document, see 2.3.

4.4.3.2 Group C sample selection. Samples for subgroups in group C shall be in accordance with MIL-PRF-19500.

4.4.4 Group E inspection. Group E inspection shall be performed for qualification or re-qualification only. The tests specified in table II herein must be performed to maintain qualification. Separate samples may be used for each subgroup.

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.

* TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical inspection	2071					
Subgroup 2						
Thermal impedance 2/	3161	See 4.3.3	$Z_{\theta JC}$			°C/W
Breakdown voltage, drain to source	3407	V_{GS} = 0 V dc, I_D = 0.25 mA dc, bias condition C	$V_{(BR)DSS}$			
2N7537, 2N7537A				500		V dc
2N7552				60		V dc
2N7553				100		V dc
2N7554				200		V dc
Gate to source voltage (threshold)	3403	$V_{DS} \geq V_{GS}$, I_D = 0.25 mA dc	$V_{GS(TH)1}$			
2N7537, 2N7537A				2.0	4.0	V dc
2N7552				2.0	4.0	V dc
2N7553				3.5	5.5	V dc
2N7554				3.0	5.0	V dc
Gate current	3411	V_{GS} = +20 V dc and -20 V dc, bias condition C, V_{DS} = 0	$I_{GSS(TH)1}$		±100	nA dc
Drain current	3413	V_{GS} = 0 V dc, bias condition C, V_{DS} = rated.	I_{DSS1}			
2N7537, 2N7537A, 2N7552					25	μA dc
2N7553					1	μA dc
2N7554					25	μA dc
Static drain to source on-state resistance	3421	V_{GS} = 10 V dc, condition A, pulsed (see 4.5.1)ǂ	$r_{DS(on)1}$			
2N7537, 2N7537A		I_D = 4.8 A dc			0.85	Ω
2N7552		I_D = 43 A dc			0.012	Ω
2N7553		I_D = 45 A dc			0.014	Ω
2N7554		I_D = 26 A dc			0.054	Ω
Forward voltage	4011	Pulsed (see 4.5.1) V_{GS} = 0 V dc	V_{SD}			
2N7537, 2N7537A		$I_D = I_{D1}$			2.0	V dc
2N7552		I_D = 72 A dc			2.0	V dc
2N7553		I_D = 45 A dc			1.3	V dc
2N7554		I_D = 26 A dc			1.5	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		$T_C = T_J = +125°C$				
Gate current	3411	V_{GS} = +20 V dc and -20 V dc, bias condition C, V_{DS} = 0	I_{GSS2}		±200	nA dc
Drain current	3413	V_{GS} = 0 V dc, bias condition C, V_{DS} = 80 percent of rated V_{DS}	I_{DSS2}		0.25	mA dc
Static drain to source on-state resistance	3421	V_{GS} = 10 V dc, pulsed (see 4.5.1)	$r_{DS(on)3}$			
2N7537, 2N7537A		I_D = 4.8 A dc			1.92	Ω
2N7552		I_D = 43 A dc			0.024	Ω
2N7553		I_D = 45 A dc			0.031	Ω
2N7554		I_D = 26 A dc			0.122	Ω
Gate to source voltage (thresholds)	3403	$V_{DS} \geq V_{GS}$, I_D = 0.25 mA dc	$V_{GS(TH)2}$			
2N7537, 2N7537A				1.0		V dc
2N7552				1.0		V dc
2N7553				2.5		V dc
2N7554				2.0		V dc
Low-temperature operation:		$T_C = T_J = -55°C$				
Gate to source voltage (threshold)	3403	$V_{DS} \geq V_{GS}$, I_D = 0.25 mA dc	$V_{GS(TH)3}$			
2N7537, 2N7537A					5.0	V dc
2N7552					5.0	V dc
2N7553					6.5	V dc
2N7554					6.0	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 4						
Forward transconductance	3475	$V_{DD} \geq 15$ V (see 4.5.1)	g_{FS}			
2N7537		I_D = 4.8 A dc		4.9		S
2N7537A		I_D = 4.8 A dc		3.7		S
2N7552		I_D = 43 A dc		35		S
2N7553		I_D = 45 A dc		35		S
2N7554		I_D = 26 A dc		17		S
Subgroup 5						
Safe operating area test (high voltage)	3474	See figure 5; t_p = 10 ms minimum, V_{DS} = 80% rated voltage max 200 V dc				
Electrical measurements		See table I, subgroup 2.				
Subgroup 6						
Not applicable						
Subgroup 7						
Gate charge	3471	Condition B				
On-state gate charge			$Q_{G(on)}$			
2N7537		$I_D = I_{D1}$			63	nC
2N7537A		$I_D = I_{D1}$			38	nC
2N7552		I_D = 72 A dc			110	nC
2N7553		I_D = 45 A dc			170	nC
2N7554		I_D = 26 A dc			91	nC
Gate to source charge			Q_{GS}			
2N7537		$I_D = I_{D1}$			9.3	nC
2N7537A		$I_D = I_{D1}$			9	nC
2N7552		I_D = 72 A dc			29	nC
2N7553		I_D = 45 A dc			65	nC
2N7554		I_D = 26 A dc			25	nC
Gate to drain charge			Q_{GD}			
2N7537		$I_D = I_{D1}$			32	nC
2N7537A		$I_D = I_{D1}$			18	nC
2N7552		I_D = 72 A dc			36	nC
2N7553		I_D = 45 A dc			60	nC
2N7554		I_D = 26 A dc			42	nC
Reverse recovery time	3473	$d_i / d_t \leq 100$ A/µs, $V_{DD} \leq 30$ V,	t_{rr}			
2N7537		$I_D = I_{D1}$			970	ns
2N7537A		$I_D = I_{D1}$			633	ns
2N7552		I_D = 72 A dc			100	ns
2N7553		I_D = 45 A dc			110	ns
2N7554		I_D = 26 A dc			240	ns

1/ For sampling plan see MIL-PRF-19500.
2/ This test required for the following end-point measurements only:
Group B, subgroups 2 and 3 (JANTX); group C, subgroup 2 and 6; group E, subgroup 1.

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

Inspection	MIL-STD-750 (unless otherwise noted)		Sample plan
	Method	Conditions	
Subgroup 1			
Temperature cycling (air to air)	1051	Test condition G, 500cycles	n = 77, c = 0
Electrical measurements		See table I, subgroup 2.	
Subgroup 2 1/			n = 77, c = 0
Steady state operation life	1042	1,000 hours, condition B. VGS = 16 V dc	
Electrical measurements		See table I, subgroup 2.	
Subgroup 2a 1/			n = 77, c = 0
HTRB	1042	1,000 hours, condition A.	
Electrical measurements		See table I, subgroup 2.	
Subgroup 3			n = 45, c = 0
Switching time test	3472	I_D = below, V_{GS}= 10 V dc, R_G = 9.1Ω,	
2N7552		Typical measurements: I_D = 72 A, V_{DD} = 48 V $t_{d(on)}$ = 7.6 ns; t_r = 200 ns; $t_{d(off)}$ = 157 ns; t_f = 166 ns	
2N7553		I_D = 45 A,V_{DD}=50V $t_{d(on)}$ = 35 ns; t_r = 130 ns; $t_{d(off)}$ = 41 ns; t_f = 38 ns	
2N7554		I_D = 26 A, V_{DD} = 100 V $t_{d(on)}$ = 16 ns; t_r = 95 ns; $t_{d(off)}$ = 29 ns; t_f = 47 ns	
Subgroup 4			n = 77, c = 0
Moisture resistance	JESD22-A101 1/ 2/	1,000 hours	
Electrical measurements		See table I, subgroup 2.	
Subgroup 4a			n = 22, c = 0
Autoclave	JESD22-A102 1/ 2/	96 hours	
Electrical measurements		See table I, subgroup 2.	

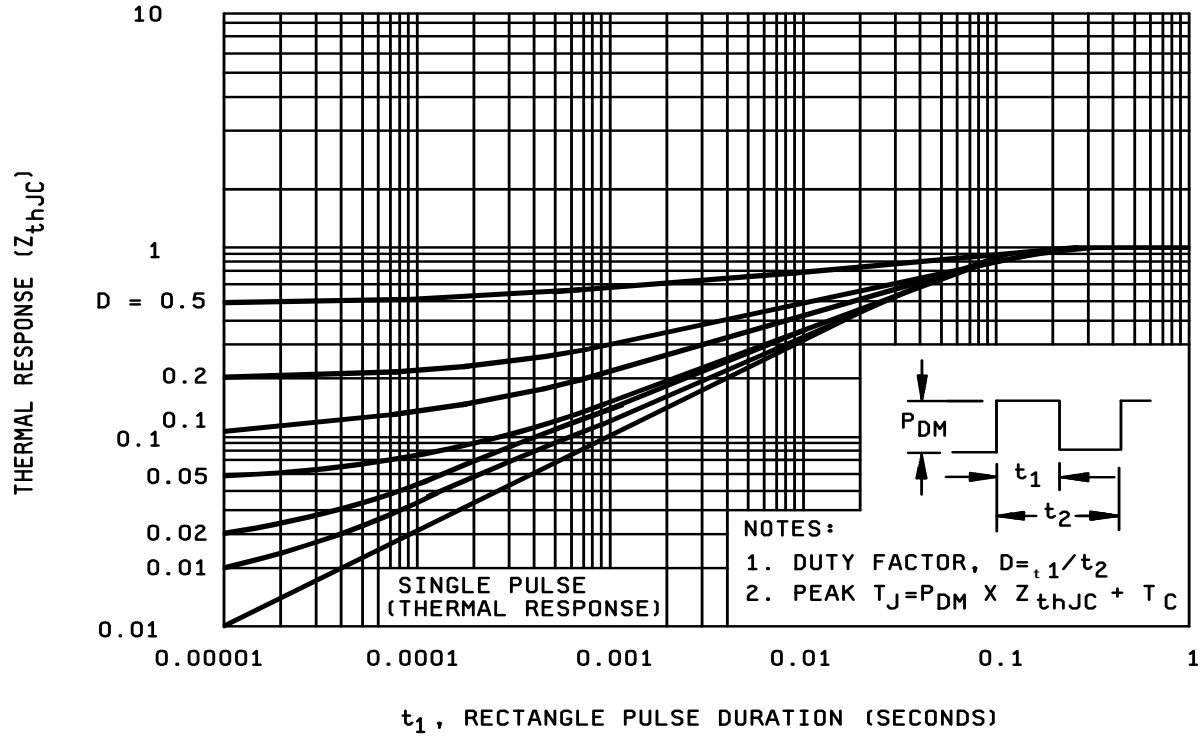
See footnotes at end of table.

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

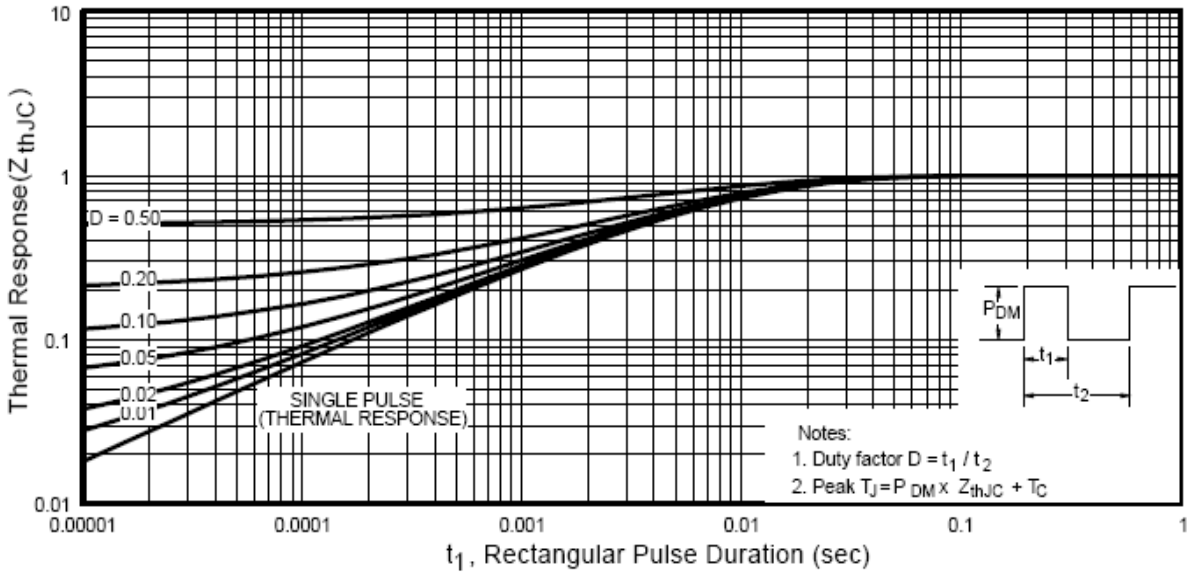
Inspection	MIL-STD-750 (unless otherwise noted)		Sample plan
	Method	Conditions	
Subgroup 4b			n = 10, c = 0
Thermal resistance	3161	See MIL-PRF-19500.	
Subgroup 5			n = 12, c = 0
Barometric pressure (reduced)	1001	VDS = rated I(ISO) < 0.25 mA dc	
Subgroup 6			n = 12, c = 0
ESD	1020		

1/ Subgroups 2, 2a, and 4, 4a and 4b do not need to be performed sequentially.
2/ Non-government standard document, see 2.3.

2N7537, 2N7537A

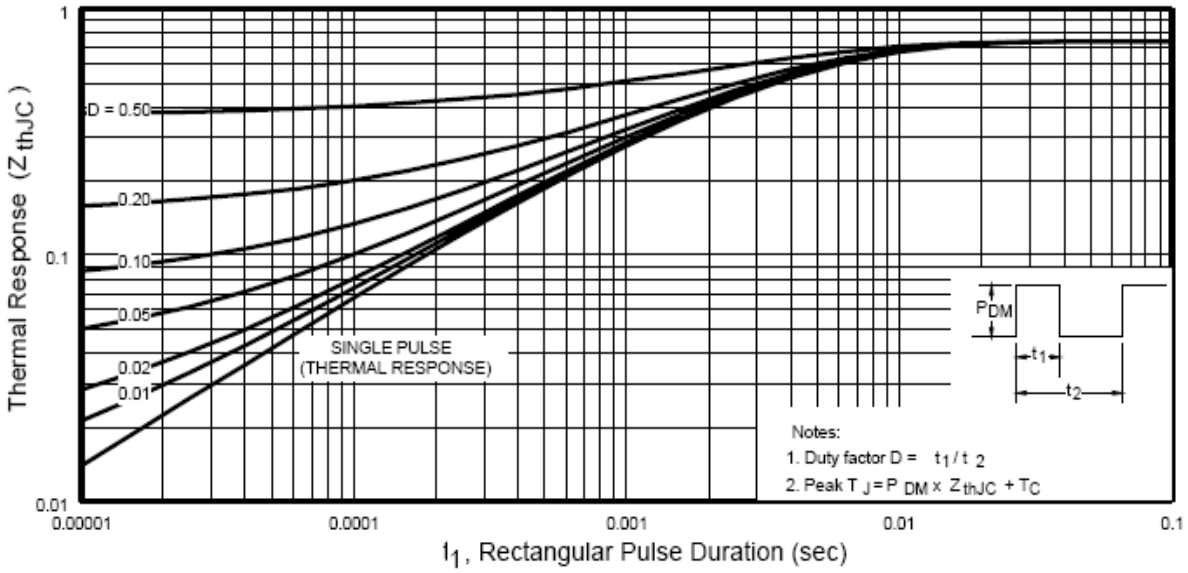


2N7552

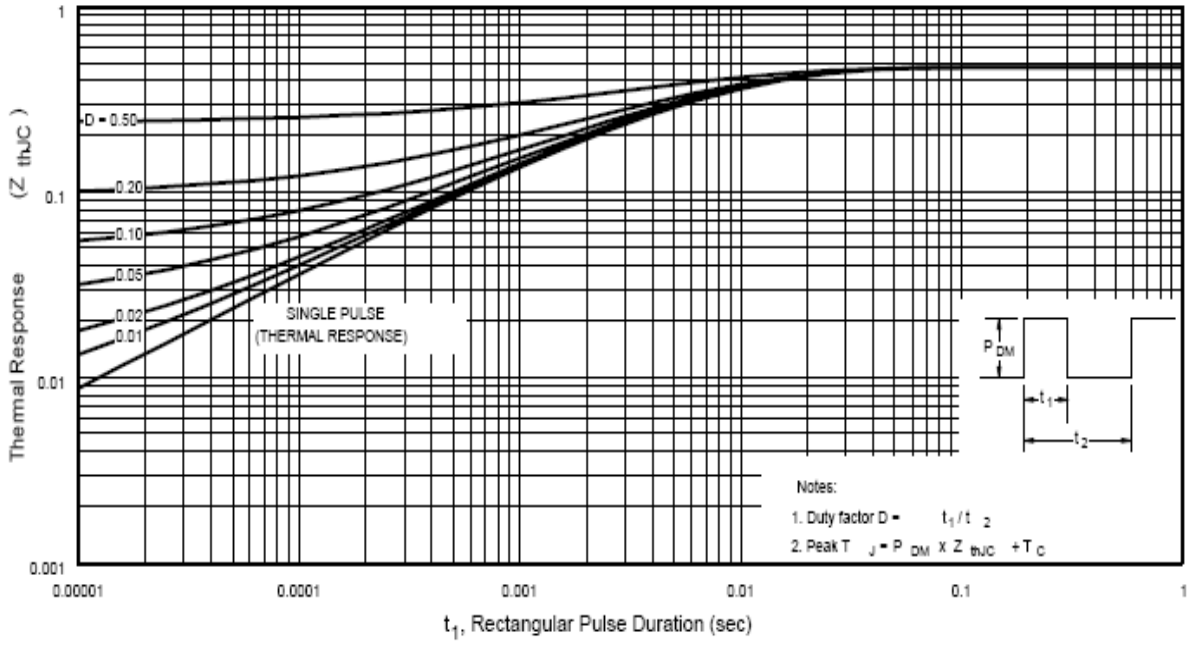


* FIGURE 3. Thermal impedance curves, junction to case.

2N7553

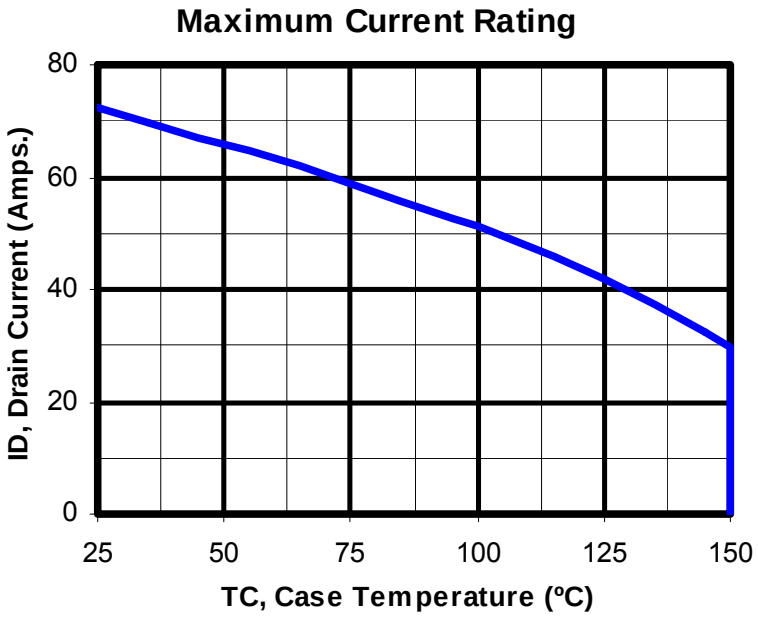


2N7554

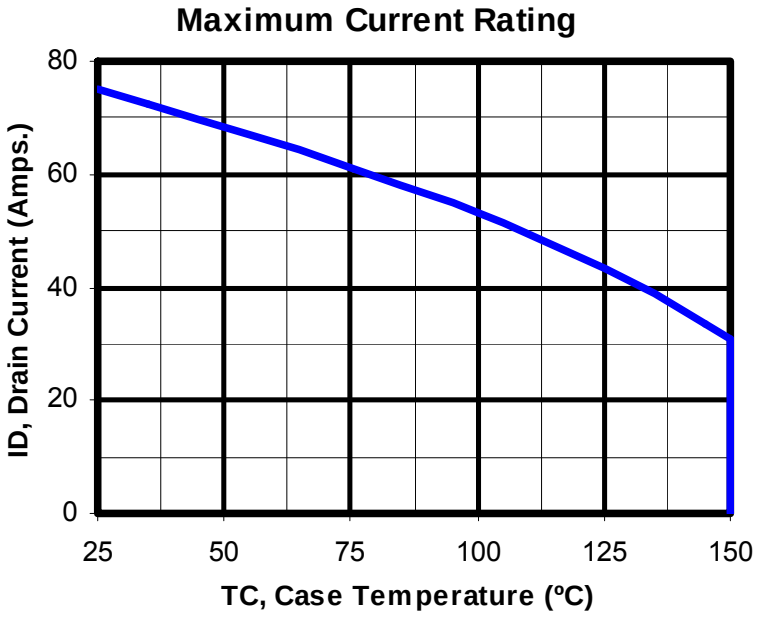


* FIGURE 3. Thermal impedance curves, junction-to-case - Continued.

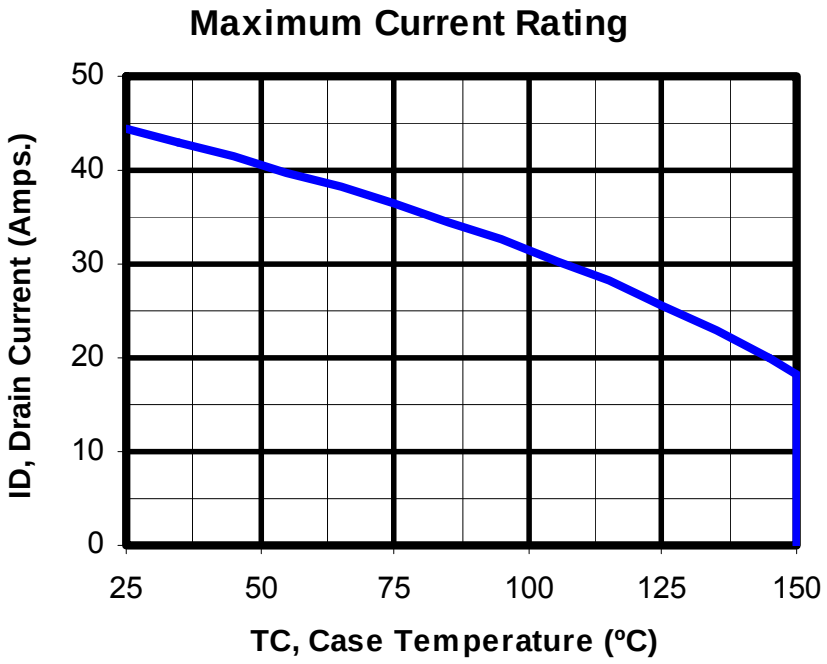
2N7552



2N7553



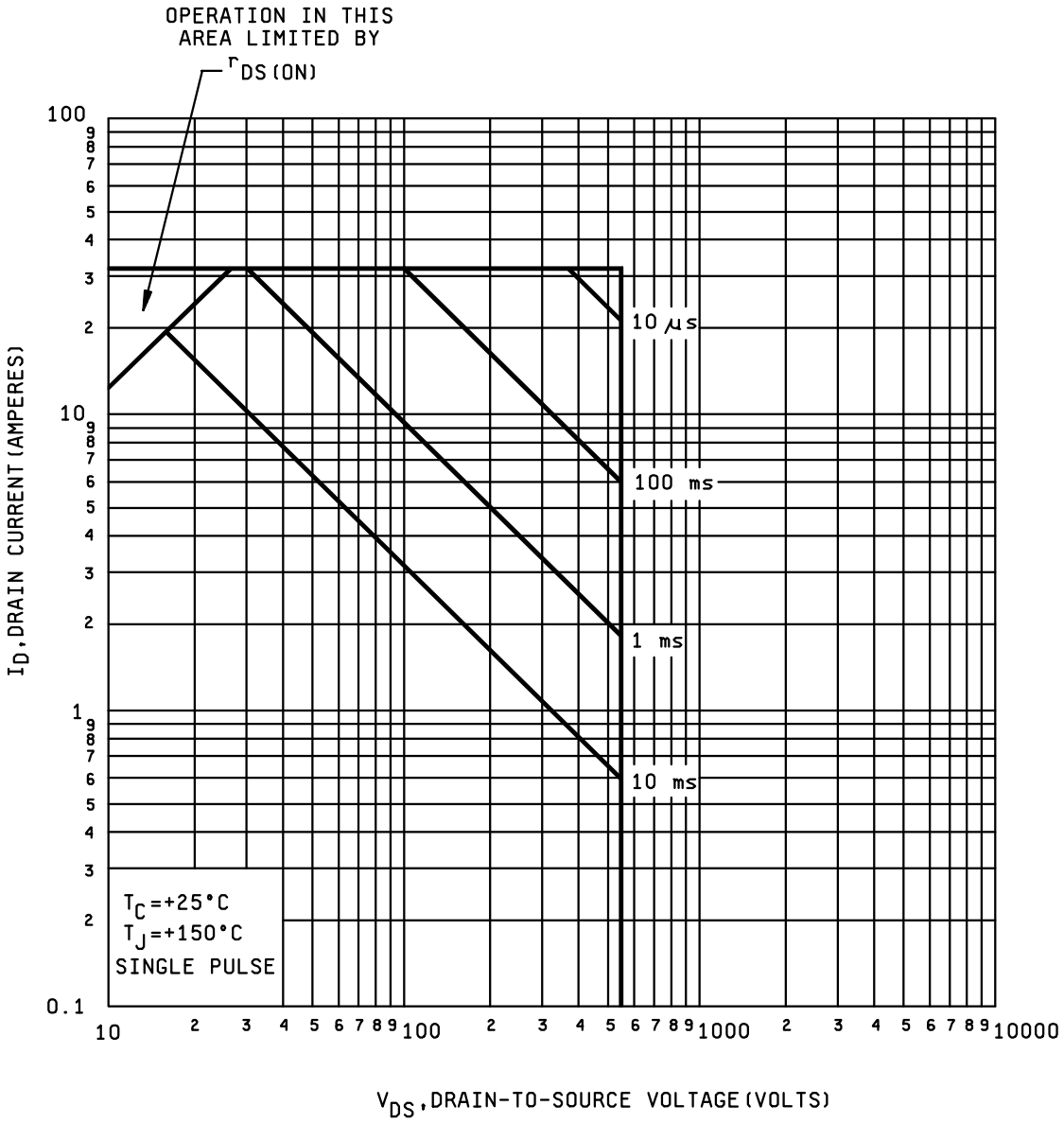
* FIGURE 4. Maximum drain current vs case temperature graphs.



2N7554

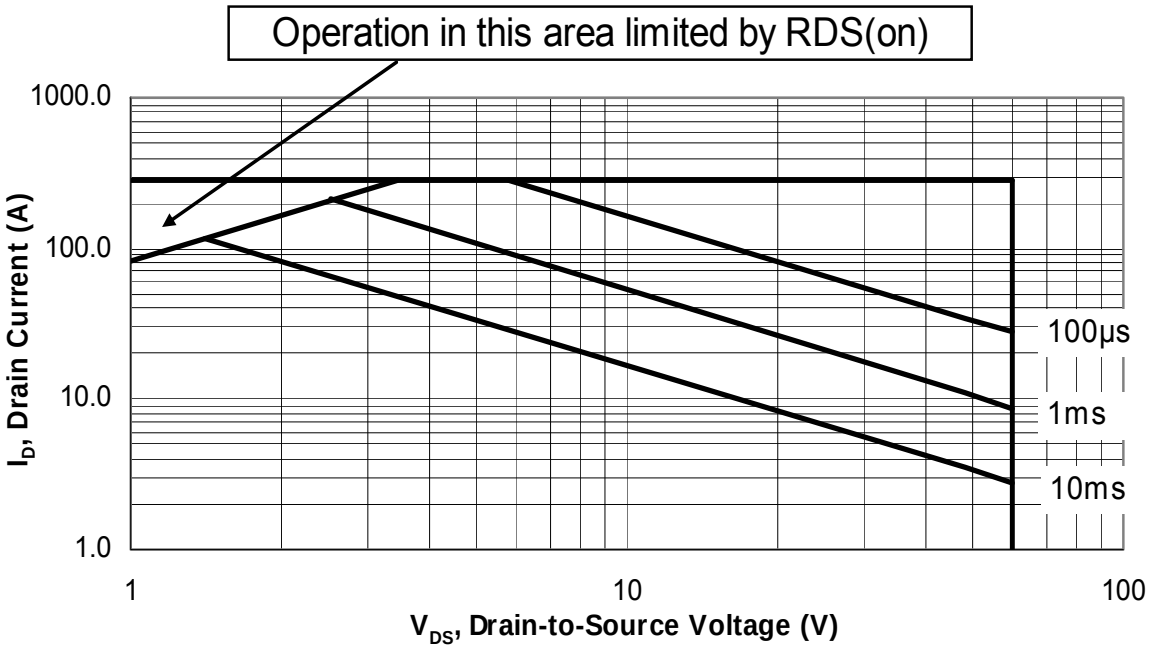
* FIGURE 4. Maximum drain current vs case temperature graphs - Continued.

2N7537, 2N7537A

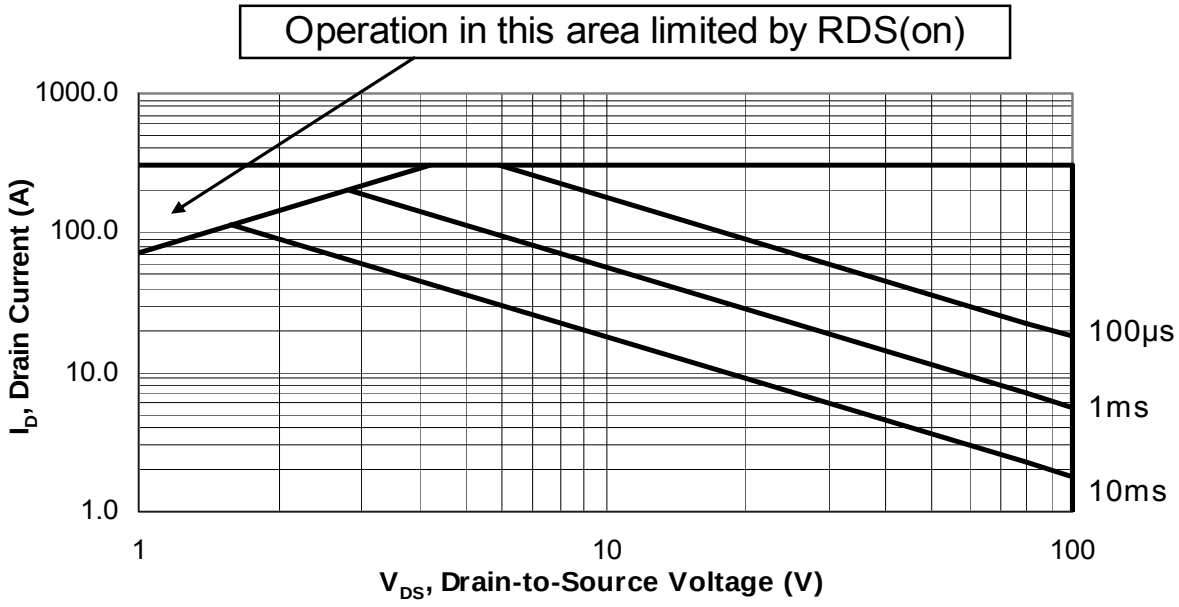


* FIGURE 5. Safe operating area graphs.

2N7552

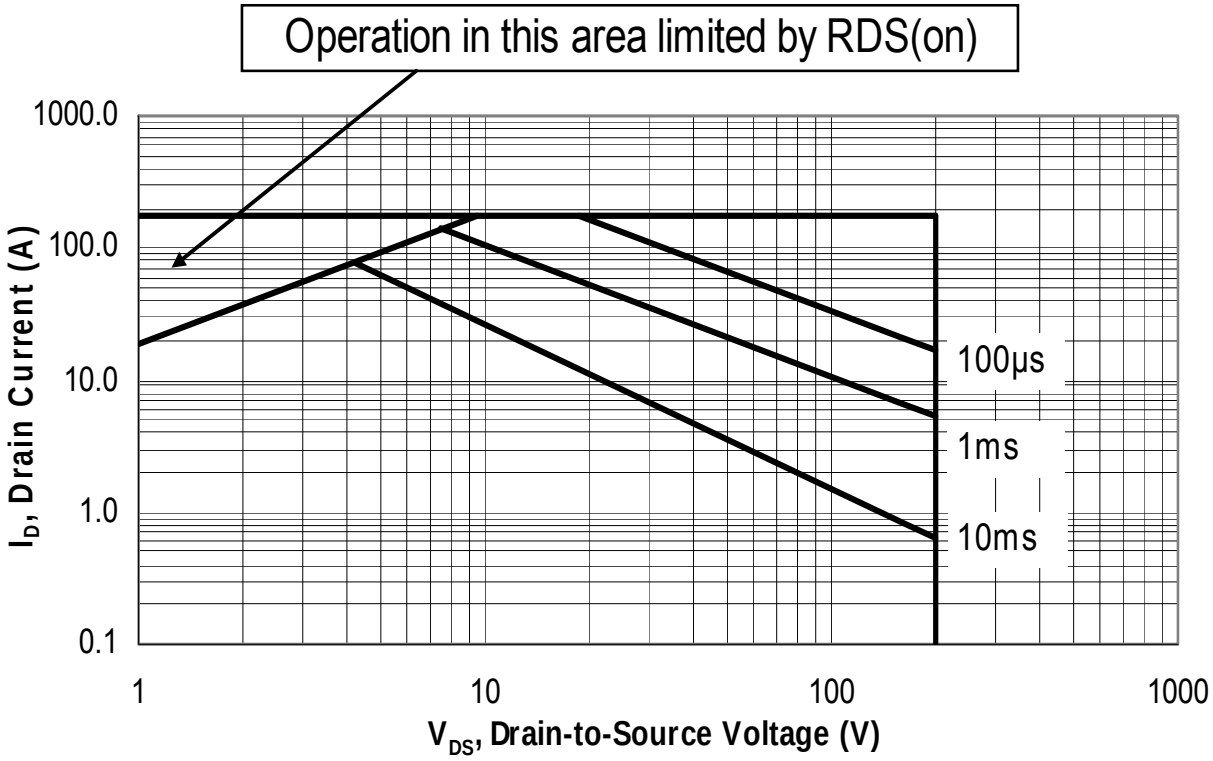


2N7553



* FIGURE 5. Safe operating area graphs - Continued.

2N7554



* FIGURE 5. Safe operating area graphs - Continued.

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 or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. 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 Defense Supply Center, Columbus, ATTN: DSCC/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 http://assist.daps.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
NASA - NA
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2007-090)

* 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 http://assist.daps.dla.mil/ .