

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

INCH-POUND

MIL-PRF-19500/748A  
 18 April 2014  
 SUPERSEDING  
 MIL-PRF-19500/748  
 3 October 2008

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTOR,  
 P-CHANNEL, SILICON, TYPE 2N7505T3,  
 JANTX, JANTXV AND JANS

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 an P-channel, enhancement-mode, MOSFET, power transistor. 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-257AA (T3).

1.3 Maximum ratings. (Unless otherwise specified, T<sub>A</sub> = +25°C).

Type (1)	P <sub>T</sub> (1) T <sub>C</sub> = +25°C	P <sub>T</sub> T <sub>A</sub> = +25°C	R <sub>θJC</sub> (2)	V <sub>DS</sub>	V <sub>DG</sub>	V <sub>GS</sub>	I <sub>D1</sub> (3) (4) T <sub>C</sub> = +25°C	I <sub>D2</sub> T <sub>C</sub> = +100°C	I <sub>S</sub>	I <sub>DM</sub> (5)	T <sub>J</sub> and T <sub>STG</sub>
	W	W	°C/W	V dc	V dc	V dc	A dc	A dc	A dc	A(pk)	°C
2N7505T3	75	1.56	1.67	-100	-100	±20	18	11	18	72	-55 to +150

(1) Derate linearly by 0.6 W/°C for T<sub>C</sub> > +25°C.

(2) See [figure 2](#), thermal impedance curves.

(3) The following formula derives the maximum theoretical I<sub>D</sub> limit. I<sub>D</sub> is limited to 18 A (by package and internal wires and may be limited by pin diameter):

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

(4) See [figure 3](#), maximum drain current graph.

(5) I<sub>DM</sub> = 4 X I<sub>D1</sub>; I<sub>D1</sub> as calculated by footnote (3).

\* 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](mailto: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  $T_C = +25^\circ\text{C}$ .

Type	Min $V_{(BR)DSS}$ $V_{GS} = 0$ $I_D = -0.25$ mA dc	$V_{GS(TH)}$ $V_{DS} \geq V_{GS}$ $I_D = -0.25$ mA dc	Max $I_{DSS1}$ $V_{GS} = 0$ $V_{DS} = 100$ percent of rated $V_{DS}$	Max $r_{DS(ON)}$ (1) $V_{GS} = -10$ V dc		EAS at $I_{AS}$	$I_{AS}$	
				$T_J = +25^\circ\text{C}$ at $I_{D2}$	$T_J = +150^\circ\text{C}$ at $I_{D2}$			
	<u>V dc</u>	<u>V dc</u>		<u><math>\mu\text{A dc}</math></u>	<u>ohm</u>	<u>ohm</u>	<u>mJ</u>	<u>A</u>
		Min	Max					
2N7505T3	-100	-2.0	-4.0	-25	0.117	0.234	256	-11

(1) Pulsed (see 4.5.1).

## 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 of 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 cited in the solicitation or contract.

## DEPARTMENT OF DEFENSE SPECIFICATIONS

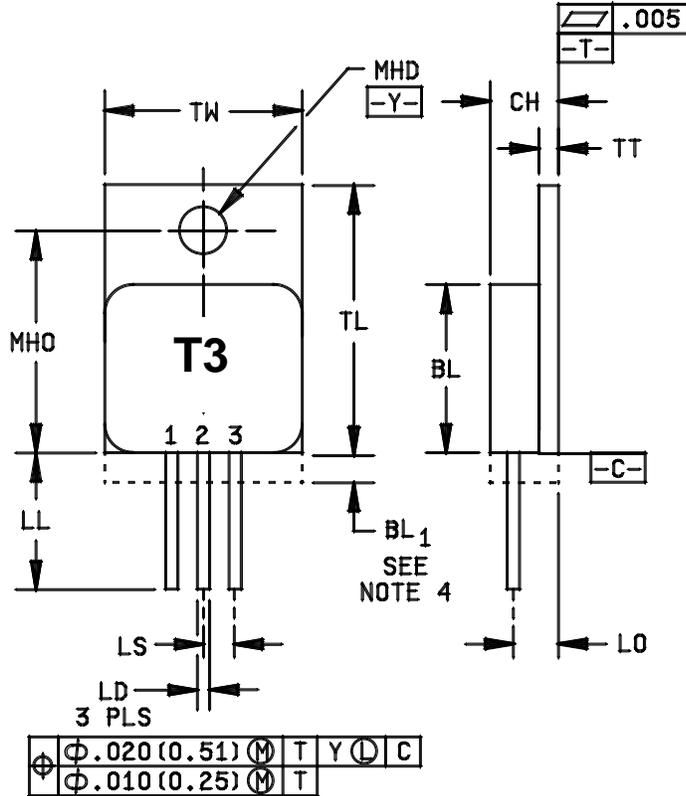
MIL-PRF-19500 - Semiconductor Devices, General Specification for.

## DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-750 - Test Methods for Semiconductor Devices.

- \* (Copies of these documents are available online at <http://quicksearch.dla.mil/>.)

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	Inches		Millimeters	
	Min	Max	Min	Max
BL	.410	.430	10.41	10.92
BL <sub>1</sub>		.033		0.84
CH	.190	.200	4.83	5.08
LD	.025	.035	0.64	0.89
LL	.600	.650	15.24	16.51
LO	.120 BSC		3.05 BSC	
LS	.100 BSC		2.54 BSC	
MHD	.140	.150	3.56	3.81
MHO	.527	.537	13.39	13.64
TL	.645	.665	16.38	16.89
TT	.035	.045	0.89	1.14
TW	.410	.420	10.41	10.67
Term 1	Drain			
Term 2	Source			
Term 3	Gate			

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. All terminals are isolated from the case.
4. This area is for the lead feed-thru eyelets (configuration is optional, but will not extend beyond this zone).
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi x$  symbology.

FIGURE 1. Physical dimensions for TO-257AA (2N7505T3).

### 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 (TO-257AA) herein.

- \* 3.4.1 Lead finish. Lead finish shall be solderable in accordance with MIL-STD-750, MIL-PRF-19500 and herein. Where a choice of finish is desired, it shall be specified in the acquisition document (see 6.2). When lead formation is performed, as a minimum, the vendor shall perform 100 percent hermetic seal in accordance with screen 14 of MIL-PRF-19500 and 100 percent dc testing in accordance with table I, subgroup 2 herein.
- \* 3.5 Marking. 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.

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

3.6.1 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 3.6).

- a. Devices should be handled on benches with conductive and grounded surface.
- 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.  $R \leq 100 \text{ k}\Omega$ , whenever bias voltage is to be applied drain to source.

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

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

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. Alternate flow is allowed for qualification inspection in accordance with MIL-PRF-19500.

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 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 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) (1) (2)	Measurement	
	JANS level	JANTX and JANTXV levels
(3)	Gate stress test (see <a href="#">4.3.1</a> )	Gate stress test (see <a href="#">4.3.1</a> )
(3) (4)	Method 3470 of MIL-STD-750 (see <a href="#">4.3.2</a> ) optional	Method 3470 of MIL-STD-750 (see <a href="#">4.3.2</a> ) optional
(3) 3c	Method 3161 of MIL-STD-750 (see <a href="#">4.3.3</a> )	Method 3161 of MIL-STD-750 (see <a href="#">4.3.3</a> )
9	$I_{GSSF1}$ , $I_{GSSR1}$ , $I_{DSS1}$ , subgroup 2 of <a href="#">table I</a> herein	Not applicable
10	Method 1042 of MIL-STD-750, test condition B	Method 1042 of MIL-STD-750, test condition B
11	Subgroup 2 of <a href="#">table I</a> herein; $I_{GSSF1}$ , $I_{GSSR1}$ , $I_{DSS1}$ , $r_{DS(on)1}$ , $V_{GS(TH)1}$ , $\Delta I_{GSSF1} = \pm 20$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta I_{GSSR1} = \pm 20$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta I_{DSS1} = \pm 25$ $\mu$ A dc or $\pm 100$ percent of initial value, whichever is greater.	Subgroup 2 of <a href="#">table I</a> herein, $I_{GSSF1}$ , $I_{GSSR1}$ , $I_{DSS1}$ , $r_{DS(on)1}$ , $V_{GS(TH)1}$
12	Method 1042 of MIL-STD-750, test condition A	Method 1042 of MIL-STD-750, test condition A
13	Subgroups 2 and 3 of <a href="#">table I</a> herein. $\Delta I_{GSSF1} = \pm 20$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta I_{GSSR1} = \pm 20$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta I_{DSS1} = \pm 25$ $\mu$ A dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta r_{DS(on)1} = \pm 20$ percent of initial value. $\Delta V_{GS(TH)1} = \pm 20$ percent of initial value.	Subgroup 2 of <a href="#">table I</a> herein. $\Delta I_{GSSF1} = \pm 20$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta I_{GSSR1} = \pm 20$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta I_{DSS1} = \pm 25$ $\mu$ A dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta r_{DS(on)1} = \pm 20$ percent of initial value. $\Delta V_{GS(TH)1} = \pm 20$ percent of initial value.
17	For TO-257AA packages: Method 1081 of MIL-STD-750 (see <a href="#">4.3.4</a> ), Endpoints: Subgroup 2 of <a href="#">table I</a> herein	For TO-257AA packages: Method 1081 of MIL-STD-750 (see <a href="#">4.3.4</a> ), Endpoints: Subgroup 2 of <a href="#">table I</a> herein

(1) At the end of the test program,  $I_{GSSF1}$ ,  $I_{GSSR1}$ , and  $I_{DSS1}$  are measured.

(2) An out-of-family program to characterize  $I_{GSSF1}$ ,  $I_{GSSR1}$ ,  $I_{DSS1}$ , and  $V_{GS(th)1}$  shall be invoked.

(3) Shall be performed anytime after temperature cycling, screen 3a; JANTX and JANTXV levels do not need to be repeated in screening requirements.

(4) Method 3470 of MIL-STD-750 is optional if performed as a sample in group A, subgroup 5.

4.3.1 Gate stress test. Apply  $V_{GS} = +24$  V minimum for  $t = 250$   $\mu$ s minimum.

4.3.2 Single pulsed unclamped inductive switching.

- a. Peak current,  $I_D$  .....  $I_{AS(max)}$ .
- b. Peak gate voltage,  $V_{GS}$  ..... -10 V, up to maximum rated  $V_{GS}$ .
- c. Gate to source resistor,  $R_{GS}$  .....  $25 \leq R_g \leq 200 \Omega$ .
- d. Initial case temperature .....  $+25^\circ\text{C}$ ,  $+10^\circ\text{C}$ ,  $-5^\circ\text{C}$ .
- e. Inductance, L .....  $\left[ \frac{2E_{AS}}{(I_{DI})^2} \right] \left[ \frac{(V_{BR} - V_{DD})}{V_{BR}} \right] \text{mH}$  minimum.
- f. Number of pulses to be applied ..... 1 pulse.
- g. Supply voltage ( $V_{DD}$ ) ..... - 25 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  $\mu$ s max. See [table II](#), group E, subgroup 4 herein.

\* 4.3.4 Dielectric withstanding voltage.

- a. Magnitude of test voltage ..... 800 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

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500. Alternate flow is allowed for conformance inspection in accordance with MIL-PRF-19500.

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 table E-VIA (JANS) and table E-VIB (JANTX and JANTXV) of MIL-PRF-19500 and as follows. 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 E-VIA (JANS) of MIL-PRF-19500.

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
B3	1051	Test condition G.
B4	1042	Condition D. No heat sink or forced-air cooling on the device shall be permitted during the on cycle. $t_{on} = 30$ seconds minimum.
B5	1042	A separate sample may be pulled for each test. Accelerated steady-state reverse bias; test condition A, $V_{DS} = \text{rated}$ , $T_A = +175^\circ\text{C}$ , $t = 120$ hours, read and record $V_{BR(DSS)}$ (pre and post) at $I_D = -1$ mA. Read and record $I_{DSS}$ (pre and post).
B5	1042	Accelerated steady-state gate stress; test condition B, $V_{GS} = \text{rated}$ , $T_A = +175^\circ\text{C}$ , $t = 24$ hours.
B5	2037	Test condition D.

\* 4.4.2.2 Group B inspection table E-VIB (JANTX and JANTXV) of MIL-PRF-19500.

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
B2	1051	Test condition G.
B3	1042	Condition D. No heat sink or forced-air cooling on the device shall be permitted during the on cycle. $t_{on} = 30$ seconds minimum.

\* 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 as follows. 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 E-VII of MIL-PRF-19500).

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
C2	2036	Test condition E.
C5	3161	$R_{\theta JC} = 1.67$ °C/W maximum. See <a href="#">4.5.2</a> .
C6	1042	Intermittent operation life, condition D. No heat sink or forced-air cooling on the device shall be permitted during the on cycle. $t_{on} = 30$ seconds minimum.

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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 II](#) 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 measurement shall be as specified in section 4 of MIL-STD-750.

4.5.2 Thermal resistance. The thermal resistance 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  $\mu$ s max. See table E-VII of MIL-PRF-19500, group E, subgroup 4.

TABLE I. Group A inspection.

Inspection <u>1</u> /	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical inspection	2071					
<u>Subgroup 2</u>						
Thermal impedance <u>2</u> /	3161	See 4.3.3	$Z_{\theta JC}$			$^{\circ}\text{C/W}$
Breakdown voltage, drain to source	3407	$V_{GS} = 0 \text{ V dc}$ , $I_D = -0.25 \text{ mA dc}$ , condition C	$V_{(BR)DSS}$	-100		V dc
Gate to source voltage (threshold)	3403	$V_{DS} \geq V_{GS}$ , $I_D = 0.25 \text{ mA dc}$	$V_{GS(th)1}$	-2.0	-4.0	V dc
Gate current	3411	$V_{GS} = -20 \text{ V dc}$ , $V_{DS} = 0$ , bias condition C	$I_{GSSF1}$		-100	nA dc
Gate current	3411	$V_{GS} = +20 \text{ V dc}$ , $V_{DS} = 0$ , bias condition C	$I_{GSSR1}$		+100	nA dc
Drain current	3413	$V_{GS} = 0 \text{ V dc}$ , $V_{DS} = 100$ percent of rated $V_{DS}$ ; bias condition C	$I_{DSS1}$		-25	$\mu\text{A dc}$
Static drain to source on-state resistance	3421	$V_{GS} = 10 \text{ V dc}$ , pulsed (see 4.5.1); condition A, $I_D = \text{rated } I_{D2}$ (see 1.3)	$r_{DS(on)1}$		0.117	$\Omega$
Forward voltage (source drain diode)	4011	Pulsed (see 4.5.1), $I_S = I_{D1}$	$V_{SD}$		-1.6	V
<u>Subgroup 3</u>						
High temperature operation:		$T_C = T_J = +125^{\circ}\text{C}$				
Gate to source voltage threshold	3403	$V_{DS} \geq V_{GS}$ , $I_D = 250 \mu\text{A dc}$	$V_{GS(th)2}$	-1.0		V dc
Gate current	3411	Bias condition C, $V_{GS} = \pm 20 \text{ Vdc}$ , $V_{DS} = 0 \text{ V dc}$	$I_{GSS2}$		$\pm 200$	nA dc
Drain current	3413	Bias condition C, $V_{GS} = 0 \text{ V dc}$ , $V_{DS} = 80$ percent of rated $V_{DS}$	$I_{DSS2}$		-0.25	mA dc
Static drain to source on-state resistance	3421	$V_{GS} = 10 \text{ V dc}$ , pulsed (see 4.5.1); $I_D = \text{rated } I_{D2}$	$r_{DS(on)2}$		0.222	$\Omega$
Low temperature operation:		$T_C = T_J = -55^{\circ}\text{C}$				
Gate to source voltage threshold	3403	$V_{DS} \geq V_{GS}$ , $I_D = 0.25 \text{ mA dc}$	$V_{GS(th)3}$		-5.0	V dc

See footnotes at end of table.

TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 4</u>						
Forward transconductance	3475	$I_D = \text{rated } I_{D2}, V_{DD} = -50 \text{ V}$ (see 4.5.1)	gFS	5.3		S
Switching time test	3472	$I_D = \text{rated } I_{D2}, V_{GS} = -10 \text{ V dc}$ , gate drive impedance = $7.5 \Omega$ $V_{DD} = 50 \text{ percent rated } V_{DS}$				
Turn-on delay time			$t_{d(\text{on})}$		29	ns
Rise time			$t_r$		135	ns
Turn-off delay time			$t_{d(\text{off})}$		87	ns
Fall time			$t_f$		84	ns
<u>Subgroup 5</u>						
Safe operating area test	3474	See figure 4; $V_{DS} = 80 \text{ percent of rated } V_{BR(DSS)}, V_{DS} \leq -200 \text{ V}$ ; $t_p = 10 \text{ ms}$				
Electrical measurements		See table I, subgroup 2				
<u>Subgroup 6</u>						
Not applicable						
<u>Subgroup 7</u>						
Gate charge	3471	Condition B, $I_D = \text{rated } I_{D2}, V_{DD} = 80 \text{ percent rated } V_{DS}$				
On-state charge			Qg(on)		109	nC
Gate to source charge			Qgs		19	nC
Gate to drain charge			Qgd		53	nC
Reverse recovery time	3473	$di/dt = 100 \text{ A}/\mu\text{s}, V_{DD} \leq -50 \text{ V}$ , $I_D = \text{rated } I_{D2}$	trr		220	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 and JANTXV).  
 Group B, subgroups 3 and 4 (JANS).  
 Group C, subgroup 2 and 6.  
 Group E, subgroup 1.

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

Inspection	MIL-STD-750		Sample plan
	Method	Conditions	
<u>Subgroup 1</u>			
Temperature cycle	1051	Condition G, 200 cycles	45 devices c = 0
Hermetic seal Fine leak Gross leak	1071		
Electrical measurements		See <a href="#">table I</a> , subgroup 2	
<u>Subgroup 2</u>			
Steady-state reverse bias	1042	Condition A, 1,000 hours	45 devices c = 0
Electrical measurements		See <a href="#">table I</a> , subgroup 2	
Steady-state gate bias	1042	Condition B, 1,000 hours, $V_{GS} = 80$ percent of rated (see <a href="#">1.3</a> )	
Electrical measurements		See <a href="#">table I</a> , subgroup 2	
<u>Subgroup 4</u>			
Thermal impedance curves		See MIL-PRF-19500	Sample size N/A
<u>Subgroup 10</u>			
Commutating diode for safe operating area test procedure for measuring dv/dt during reverse recovery of power MOSFET transistors or insulated gate bipolar transistors	3476	Test conditions shall be derived by the manufacturer	22 devices c = 0

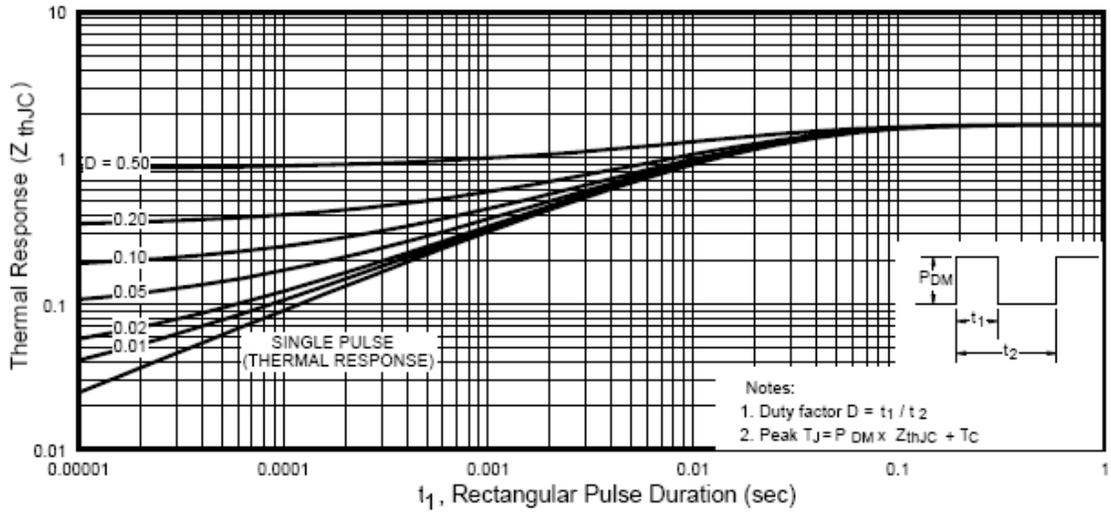


FIGURE 2. Thermal impedance curves.

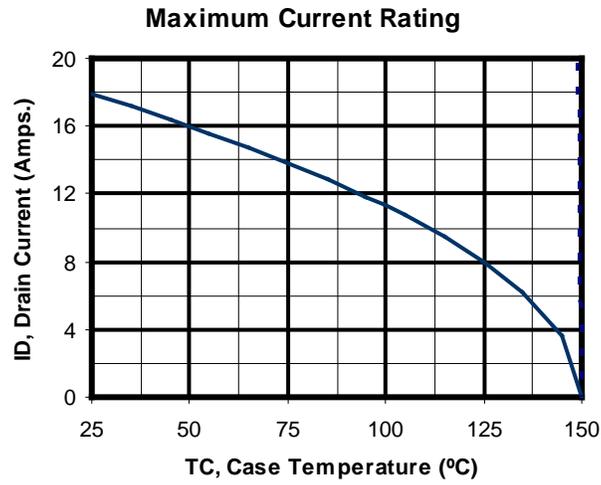


FIGURE 3. Maximum drain current versus case temperature graphs.

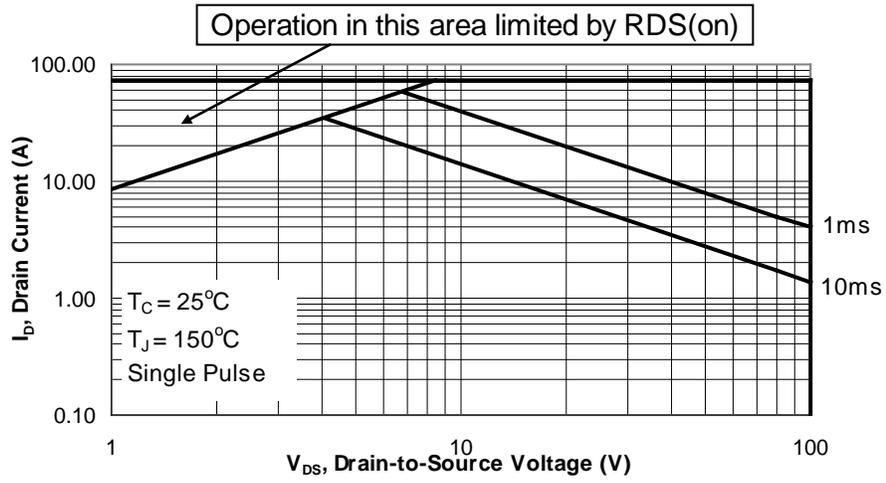


FIGURE 4. Maximum safe operating area.

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 DLA Land and Maritime, ATTN: VQE, P.O. Box 3990, Columbus, OH 43218-3990 or e-mail [vqe.chief@dla.mil](mailto: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 Cross-reference complement list. Parts from this specification may be used to supersede the following commercial Part or Identifying Number (PIN) listed below.

Preferred types	Commercial types
2N7505T3	IRF5Y9540CM

- \* 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 previous issue.

Custodians:  
Army - CR  
Navy - EC  
Air Force - 85  
NASA - NA  
DLA - CC

Preparing activity:  
DLA - CC  
(Project 5961-2014-045)

Review activity:  
Air Force - 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/>.