

The documentation and process conversion measures necessary to comply with this revision shall be completed by 15 October 2014.

INCH-POUND

MIL-PRF-19500/772A
15 July 2014
SUPERSEDING
MIL-PRF-19500/772
17 April 2013

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, DIODE SILICON, UNIPOLAR TRANSIENT VOLTAGE SUPPRESSOR, TYPES 1N8036 THROUGH 1N8072, 1N8073 THROUGH 1N8109, 1N8110 THROUGH 1N8146, 1N8036US THROUGH 1N8072US, 1N8073US THROUGH 1N8109US, AND 1N8110US THROUGH 1N8146US, JAN, 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 150 watt, 500 watt and 1,500 watt peak pulse power unipolar silicon transient voltage suppressor diodes. Four levels of product assurance are provided for each device type as specified in [MIL-PRF-19500](#).

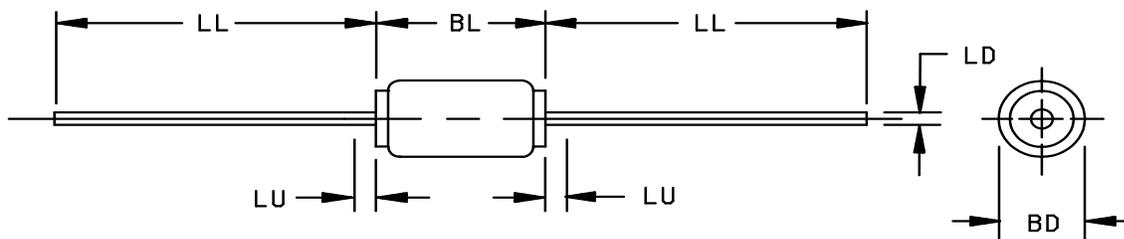
1.2 Physical dimensions. See [figure 1](#) and [figure 2](#) (US) herein.

1.3 Maximum ratings. Maximum ratings are as shown in columns 4, 6, and 7 of the electrical characteristics table herein and as follows:

- a. $P_{M(AV)} = 1$ W (for 150 W peak pulse power devices), 2 W (for 500 W peak pulse power devices), and 3 W (for 1,500 W peak pulse power devices) at $T_A = +25^\circ\text{C}$ (see [figures 3](#), [4](#), and [5](#) for derating).
- b. $P_{PP} = 150$ W (1N8036 through 1N8072 (including US suffix versions)), $P_{PP} = 500$ W (1N8073 through 1N8109 (including US suffix versions)), and $P_{PP} = 1,500$ W (1N8110 through 1N8146 (including US suffix versions)) at $t_p = 1$ ms (see [figure 6](#)).
- c. $P_{M(AV)} = 1.5$ W (for 150 W peak pulse power devices), $P_R = 3$ W (for 500 W peak pulse power devices) and 5 W (for 1,500 W peak pulse power devices) at $T_L = +75^\circ\text{C}$ for $L = 0.375$ inch (9.53 mm).
- d. $I_{FSM} = 25$ amps (for 150 W peak pulse power devices), 80 amps (for 500 W peak pulse power devices), and 130 amps (for 1,500 W peak pulse power devices) at $t_p = 8.33$ ms ($T_A = +25^\circ\text{C}$).
- e. $-55^\circ\text{C} \leq T_J \leq +175^\circ\text{C}$, $-55^\circ\text{C} \leq T_{STG} \leq +175^\circ\text{C}$ (ambient temperatures).

1.4 Primary electrical characteristics. Primary electrical characteristics are as shown in columns 2, 5, and 6 of the electrical characteristics table herein.

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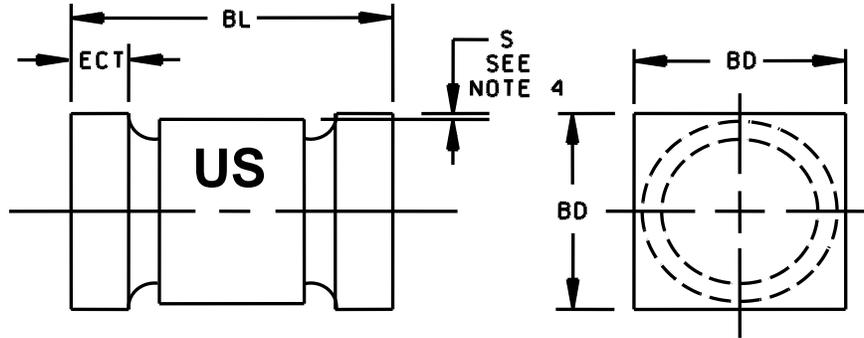
Ltr	Dimensions				Notes
	1N8036 through 1N8072				
	Inches		Millimeters		
	Min	Max	Min	Max	
BD	.060	.085	1.52	2.16	3
BL	.106	.160	2.69	4.06	
LD	.028	.032	0.71	0.81	
LL	.800	1.300	20.32	33.02	
LU		.050		1.27	4

Ltr	Dimensions								Notes
	1N8073 through 1N8109				1N8110 through 1N8146				
	Inches		Millimeters		Inches		Millimeters		
	Min	Max	Min	Max	Min	Max	Min	Max	
BD	.085	.140	2.16	3.56	.135	.185	3.43	4.70	3
BL	.140	.185	3.56	4.70	.140	.195	3.56	4.95	
LD	.036	.042	0.91	1.07	.036	.042	0.91	1.07	
LL	0.900	1.30	22.86	33.02	0.900	1.30	22.86	33.02	
LU		.050		1.27		.050		1.27	4

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension BD shall be measured at the largest diameter.
4. Dimension LU lead diameter uncontrolled in this area.
5. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

FIGURE 1. Physical dimensions, 1N8036 through 1N8072, 1N8073 through 1N8109, and 1N8110 through 1N8146.



Ltr	Dimensions			
	1N8036US through 1N8072US			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	.091	.103	2.31	2.62
BL	.168	.200	4.28	5.08
ECT	.019	.028	0.48	0.71
S	.003		0.08	

Ltr	Dimensions							
	1N8073US through 1N8109US				1N8110US through 1N8146US			
	Inches		Millimeters		Inches		Millimeters	
	Min	Max	Min	Max	Mini	Max	Min	Max
BD	.137	.148	3.48	3.76	.183	.202	4.65	5.13
BL	.200	.225	5.08	5.72	.205	.245	5.21	6.22
ECT	.019	.028	0.48	0.71	.019	.028	0.48	0.71
S	.003		0.08		.003		0.08	

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Minimum clearance of glass body to mounting surface on all orientations.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

FIGURE 2. Physical dimensions 1N8036US through 1N8072US, 1N8073US through 1N8109US and 1N8110US through 1N8146US.

2. APPLICABLE DOCUMENTS

* 2.1 General. The documents listed in this section are specified in sections 3 or 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 or 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.

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 manufacturers list 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.

$I_{(BR)}$	Reverse breakdown current at the specified condition.
PPP	Peak pulse power.
$P_{M(AV)}$	Rated average power dissipation. This is comparable to the dc power rating of the device.
V_C	Clamping voltage. The maximum peak voltage appearing across the device when subjected to the peak pulse current I_{pp} in the reverse direction
V_{CF}	Forward clamping voltage. The maximum peak voltage appearing across the device when subjected to the peak pulse current I_{pp} in the forward direction.
$\alpha_{V(BR)}$	Temperature coefficient of $V_{(BR)}$.

3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in [MIL-PRF-19500](#) and herein.

3.4.1 Metallurgical bond construction. Devices shall be metallurgically bonded, thermally matched, non-cavity, double-plug construction in accordance with the requirements of category I (see [MIL-PRF-19500](#)), and herein. The "US" version shall be structurally identical to the axial lead type except for lead configuration.

3.4.2 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](#).

3.5.1 Marking of US devices. At the option of the manufacturer, US version devices may include laser marking on an end-cap, to include part number and lot date code for all levels. JANS levels shall also include serialization. The prefixes JAN, JANTX, JANTXV, or JANS may be abbreviated as J, JX, JV, or JS, respectively. (For example: The part number may be reduced to JSxxxx). All marking which is omitted from the body of the device shall appear on the initial container. All device marking, except for polarity and serial numbers, shall also appear on the unit package used as the initial protection for delivery.

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in [1.3](#) and [1.4](#), [table I](#) and [II](#).

3.7 Electrical test requirements. The electrical test requirements shall be the subgroups specified in [tables I](#) and [II](#).

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](#). A separate qualification shall be required for the 150-watt, 500-watt, and 1,500-watt peak pulse power device, respectively.

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 require the performance of [table III](#) tests, the tests specified in [table III](#) 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 (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)	Measurement	
	JANS level	JANTX and JANTXV levels
5	Not applicable	Not applicable
9, 10, 11	Not applicable	Not applicable
12	See 4.5.1	See 4.5.1
13	Interim electrical, delta, and group A, subgroup 2, electrical parameters not applicable for this screen (performed in screen 12).	Interim electrical, delta, and group A, subgroup 2, electrical parameters not applicable for this screen (performed in screen 12).

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein. A separate quality conformance inspection shall be required for the 100-watt, 500-watt, and 1,500-watt peak pulse power devices, respectively.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500 and table I herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-VIA (JANS) and table E-VIB (JAN, JANTX, and JANTXV) of MIL-PRF-19500, and as follows.

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B4		Not applicable.
B5	1027	$T_A = +100^\circ\text{C}$ minimum (see 4.5.2 and 4.5.3).

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	1027	See 4.5.1.
B5		Not applicable.
B6		Delta limits: $\Delta I_{D1} \leq 100$ percent of initial reading or 20 percent of column 5 of table II, whichever is greater; $\Delta V_{(BR)1} \leq 5$ percent of initial value.

* 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.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
C2	2036	Axial devices – Tension: Condition A; weight = 10 pounds (4.54 kg); t = 15 seconds minimum for 1N8036 through 1N8072; Condition A; weight = 12 pounds (5.44 kg); t = 15 seconds minimum for 1N8073 through 1N8109; Condition A; weight = 20 pounds (9.1 kg); t = 15 seconds minimum for 1N8110 through 1N8146. Fatigue: Condition E for all types.
* C2	2038	US devices - Condition B, 10 pounds (4.54 kg), t = 15s for 1N8036 through 1N8072; Condition B; weight = 12 pounds (5.44 kg); t = 15 seconds minimum for 1N8073 through 1N8109; Condition B; weight = 20 pounds (9.1 kg); t = 15 seconds minimum for 1N8110 through 1N8146. (Lead fatigue is not applicable to US diodes).
C6	1026	See 4.5.1 and 4.5.3.
C7	4071	$I_{(BR)} =$ column 3 of table II, $T_1 = +25^\circ\text{C} \pm 3^\circ\text{C}$, $T_2 = T_1 + 100^\circ\text{C}$; sampling plan shall be 45 devices, $c = 0$; $\alpha V_{(BR)} =$ column 8 of table II.

* 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 E-IX of MIL-PRF-19500 and as specified herein.

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

4.5.1 Power burn-in and steady-state operation life test conditions. The test shall be conducted with the devices subjected to test conditions in the following order of events:

- a. Pulse in accordance with 4.5.3 20 times (screening and group B) and 100 times (group C) at $T_A = +25^\circ\text{C}$.
- b. Read and record I_D and $V_{(BR)1}$ at $T_A = +25^\circ\text{C}$, remove defective devices and record number of failures.
- c. Apply the working peak voltage (V_{WM}) (column 4 of table II) at $T_A = +125^\circ\text{C}$ as follows:
 - (1) For 96 hours (JANTX and JANTXV) and 240 hours (JANS) for the screening test.
 - (2) For 340 hours (JAN, JANTX, and JANTXV) for group B steady-state operation life test.
 - (3) For 1000 hours for group C steady-state operation life test.
- d. Read I_D at $T_A = +25^\circ\text{C}$. Devices with $\Delta I_D > 50$ percent (100 percent for steady-state operation life) of the initial reading or 20 percent of column 5 of table II, whichever is greater, shall be considered defective. Remove defective devices and record the number of failures.

4.5.1.1 Group C steady-state operation life test (alternate procedure). When the group B 340-hour life test is continued on test to 1,000 hours to satisfy the group C life test requirements, the test shall be performed as given in 4.5.1 with the following exceptions: 4.5.1.d shall be repeated at the end of 1,000 hours.

4.5.2 Accelerated steady-state operation life. This test shall be conducted with the devices subjected to the breakdown current ($I_{(BR)2}$) specified in column 10 of [table II](#) in the reverse polarity for 96 +8, -4 hours. At the beginning of the test and at the end of the time period, the devices shall be temperature stabilized at $T_A = +25^\circ\text{C}$ and subjected to pulse conditions at the rate of one pulse per minute (max) for ten pulses each, in accordance with 4.5.3 as specified.

4.5.3 Maximum peak pulse current (I_{pp}). The peak pulse currents specified in column 7 of [table II](#) shall be applied simultaneously maintaining a bias voltage, not less than the applicable voltage in column 4 of [table II](#), in the same polarity as the peak pulse current. The clamping voltage (V_c) shall be as specified in 4.5.4. The peak pulse current shall be applied with a current versus time waveform (1 pulse per minute maximum) such that the pulse current shall reach 100 percent of I_p at $t \leq 10 \mu\text{s}$ and decay to 50 percent of I_p at $t \geq 1 \text{ ms}$ for $t_p = 1 \text{ ms}$ (see [figure 6](#)). NOTE: Tolerance on time (t) shall be +10 -0 percent.

4.5.4 Clamping voltage. The peak pulse clamping voltage shall be measured across the diode in a 1 ms time interval. The response detector shall demonstrate equipment accuracy of ± 3 percent.

TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u> Visual and mechanical examination	2071					
<u>Subgroup 2</u> Reverse current leakage	4016	DC method, $V_R = V_{WM}$ (column 4 of table II herein)	I_{D1}		Column 5 of table II	$\mu\text{A dc}$
Breakdown voltage	4022	$t_p \leq 300$ ms, duty cycle ≤ 2 percent $I_{(BR)1}$ = column 3 of table II herein	$V_{(BR)1}$	Column 2 of table II		V dc
<u>Subgroup 3</u> High temperature operation		$T_A = +150^\circ\text{C}$				
Reverse current leakage	4016	DC method, $V_R = V_{WM}$ (column 4 of table II herein)	I_{D2}		Column 9 of table II	$\mu\text{A dc}$
<u>Subgroup 4</u> Clamping voltage maximum (pulsed)		$t_p = 1$ ms (see 4.5.3 and 4.5.4), I_p = column 7 of table II herein	V_C		Column 6 of table II	V (pk)
<u>Subgroups 5</u> Not applicable						
<u>Subgroup 6</u> Forward surge current	4066	One pulse, half-sine wave (8.3 ms), $I_F = 0$; $V_{WM} = 0$; $T_A = 25^\circ\text{C}$				
1N8036, US through 1N8072, US		$I_{FSM} = 25$ A (pk)				
1N8073, US through 1N8109, US		$I_{FSM} = 80$ A (pk)				
1N8110, US through 1N8146, US		$I_{FSM} = 130$ A (pk)				
<u>Subgroup 7</u> Forward clamping voltage (see 4.5.4)		$t_p = 1.0$ ms (see 4.5.3) at I_{PP} except use forward direction current without prior bias voltage	V_{CF}		2.5	V(pk)

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

TABLE II. Electrical characteristics and ratings (for 150 W, 500 W and 1,500 W series)

Column 1			Column 2	Column 3	Column 4	Column 5			Column 6	Column 7			Column 8	Column 9			Column 10		
Series type			V _{(BR)1} breakdown voltage at I _{(BR)1}	I _{(BR)1} Test current	V _{WM} Working peak voltage	I _{D1} Maximum reverse current			V _C Maximum clamping voltage at I _{pp}	I _{pp} Maximum peak pulse current t _p = 1 ms			αV _(BR) Maximum temp. Coeff. of V _(BR)	I _{D2} Maximum reverse current at T _A = +125°C			I _{(BR)2} Breakdown current		
150 W	500 W	1,500 W	<u>Min V</u> 1/	<u>mA</u> 1/	<u>V</u> 1/	<u>μA</u> 2/	<u>μA</u> 3/	<u>μA</u> 4/	<u>V (pk)</u> 1/	<u>A (pk)</u> 2/	<u>A (pk)</u> 3/	<u>A (pk)</u> 4/	<u>%/°C</u> 1/	<u>μA</u> 2/	<u>μA</u> 3/	<u>μA</u> 4/	<u>mA</u> 2/	<u>mA</u> 3/	<u>mA</u> 4/
1N8036	1N8073	1N8110	5.60	10	5.0	500	1000	2000	9.5	15.7	52.6	157	.045	1000	2,000	4,000	90	175	175
1N8037	1N8074	1N8111	6.46	10	5.8	100	300	1000	10.8	13.8	46.2	138	.057	250	750	2000	90	175	175
1N8038	1N8075	1N8112	7.13	10	6.4	20	50	300	11.3	13.2	44.2	132	.061	100	250	1500	90	175	175
1N8039	1N8076	1N8113	7.79	10	6.9	10	20	100	12.1	12.4	41.3	124	.065	60	150	600	75	150	150
1N8040	1N8077	1N8114	8.65	1	7.8	10	20	100	13.4	11.2	37.3	112	.068	60	150	600	75	150	150
1N8041	1N8078	1N8115	9.50	1	8.5	5	20	50	14.5	10.3	34.5	103	.073	20	100	200	65	125	125
1N8042	1N8079	1N8116	10.4	1	9.0	1	5	20	15.6	9.62	32.0	96.2	.075	20	100	200	65	125	125
1N8043	1N8080	1N8117	11.4	1	10.0	1	5	20	16.9	8.88	29.6	88.8	.078	20	100	200	50	100	100
1N8044	1N8081	1N8118	12.4	1	11.0	1	5	20	18.2	8.24	27.5	82.4	.081	20	100	200	50	100	100
1N8045	1N8082	1N8119	13.8	1	12.0	1	5	20	20.2	7.42	24.7	74.2	.084	20	100	200	38	75	75
1N8046	1N8083	1N8120	15.2	1	13.0	0.5	1	5	22.3	6.73	22.4	67.3	.086	20	100	200	38	75	75
1N8047	1N8084	1N8121	17.1	1	15.0	0.5	1	5	25.1	5.98	19.9	59.8	.088	20	100	200	33	65	65
1N8048	1N8085	1N8122	19.0	1	17.0	0.5	1	5	27.7	5.42	18.0	54.2	.090	20	100	200	33	65	65
1N8049	1N8086	1N8123	20.9	1	18.0	0.5	1	5	30.5	4.92	16.4	49.2	.092	20	100	200	25	50	50
1N8050	1N8087	1N8124	22.8	1	20.0	0.5	1	5	33.3	4.50	15.0	45.0	.094	20	100	200	25	50	50
1N8051	1N8088	1N8125	25.7	1	22.0	0.5	1	5	37.4	4.01	13.4	40.1	.096	20	100	200	25	50	50
1N8052	1N8089	1N8126	28.5	1	25.0	0.5	1	5	41.6	3.60	12.0	36.0	.097	20	100	200	20	40	40
1N8053	1N8090	1N8127	31.4	1	28.0	0.5	1	5	45.7	3.28	10.9	32.8	.098	20	100	200	20	40	40
1N8054	1N8091	1N8128	34.2	1	30.0	0.5	1	5	49.9	3.01	10.0	30.1	.099	20	100	200	15	30	30
1N8055	1N8092	1N8129	37.1	1	33.0	0.5	1	5	53.6	2.80	9.3	28.0	.100	20	100	200	15	30	30
1N8056	1N8093	1N8130	40.9	1	36.0	0.5	1	5	59.1	2.54	8.5	25.4	.101	20	100	200	15	30	30
1N8057	1N8094	1N8131	44.7	1	40.0	0.5	1	5	64.6	2.32	7.7	23.2	.101	20	100	200	13	25	25
1N8058	1N8095	1N8132	48.5	1	43.0	0.5	1	5	70.1	2.14	7.1	21.4	.102	20	100	200	13	25	25
1N8059	1N8096	1N8133	53.2	1	47.0	0.5	1	5	77.0	1.95	6.5	19.5	.103	20	100	200	10	20	20
1N8060	1N8097	1N8134	58.9	1	53.0	0.5	1	5	85.3	1.76	5.9	17.6	.104	20	100	200	10	20	20
1N8061	1N8098	1N8135	64.6	1	58.0	0.5	1	5	93.7	1.60	5.3	16.0	.104	20	100	200	10	20	20
1N8062	1N8099	1N8136	71.3	1	64.0	0.5	1	5	103.0	1.45	4.8	14.5	.105	20	100	200	10	20	20
1N8063	1N8100	1N8137	77.9	1	70.0	0.5	1	5	113.0	1.32	4.4	13.2	.105	20	100	200	8	15	15
1N8064	1N8101	1N8138	86.5	1	75.0	0.5	1	5	125.0	1.20	4.0	12.0	.105	20	100	200	8	15	15
1N8065	1N8102	1N8139	95.0	1	82.0	0.5	1	5	137.0	1.09	3.6	10.9	.106	20	100	200	6	12	12

See footnotes at end of table.

TABLE II. Electrical characteristics and ratings (for 150 W, 500 W and 1,500 W series) - Continued.

Column 1			Column 2	Column 3	Column 4	Column 5			Column 6	Column 7			Column 8	Column 9			Column 10		
Series type			V(BR)1 breakdown voltage at I(BR)1	I(BR)1 Test current	V _{WM} Working peak voltage	I _{D1} Maximum reverse current			V _C Maximum clamping voltage at I _{PP}	I _{PP} Maximum peak pulse current t _p = 1 ms			α V(BR) Maximum temp. Coeff. of V(BR)	I _{D2} Maximum reverse current at T _A = +125°C			I(BR)2 Breakdown current		
150 W	500 W	1,500 W	Min V 1/	mA 1/	V 1/	μA 2/	μA 3/	μA 4/	V (pk) 1/	A (pk) 2/	A (pk) 3/	A (pk) 4/	%/°C 1/	μA 2/	μA 3/	μA dc 4/	mA 2/	mA 3/	mA 4/
1N8066	1N8103	1N8140	104.0	1	94.0	0.5	1	5	152.0	0.98	3.2	9.8	.107	20	100	200	6	12	12
1N8067	1N8104	1N8141	114.0	1	100.0	0.5	1	5	168.0	0.89	2.9	8.9	.107	20	100	200	5	10	10
1N8068	1N8105	1N8142	124.0	1	110.0	0.5	1	5	183.0	0.82	2.7	8.2	.107	20	100	200	5	10	10
1N8069	1N8106	1N8143	138.0	1	120.0	0.5	1	5	208.0	0.72	2.4	7.2	.108	20	100	200	4	8	8
1N8070	1N8107	1N8144	148.0	1	130.0	0.5	1	5	225.0	0.67	2.2	6.7	.108	20	100	200	4	8	8
1N8071	1N8108	1N8145	171.0	1	150.0	0.5	1	5	261.0	0.57	1.9	5.7	.108	20	100	200	3	5	5
1N8072	1N8109	1N8146	190.0	1	170.0	0.5	1	5	294.0	0.51	1.7	5.1	.108	20	100	200	3	5	5

1/ Applies to 150 W, 500 W and 1,500 W series.

2/ Applies to only 150 W series

3/ Applies to only 500 W series.

4/ Applies to only 1,500 W series.

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

Inspection	MIL-STD-750		Sampling plan
	Method	Conditions	
<u>Subgroup 1</u>	1051	500 cycles, condition C, -55°C to +175°C.	n = 45 devices, c = 0
Temperature cycling			
Electrical measurements		See table I , subgroup 2.	
<u>Subgroup 2</u>		1,000 hours. See 4.5.1 .	n = 45 devices, c = 0
Life test			
Electrical measurements		See table I , subgroup 2.	
<u>Subgroups 4, 5, and 6</u>			
Not applicable			
<u>Subgroup 7</u>	2031	Condition A and (B or C).	n = 3 devices, c = 0
Soldering heat			
<u>Subgroup 8</u>			
* Peak pulse current		See 4.5.3 . I _{pp} shall be characterized by the supplier and this data shall be available to the Government. Test shall be performed on each low and high voltage device for each structurally identical grouping. Test to failure. (See figures 7 and 8).	n = 45 devices, c = 0
Electrical measurements		See table I , subgroup 2.	

Temperature-Power Derating Curve 1N8036 through 1N8072

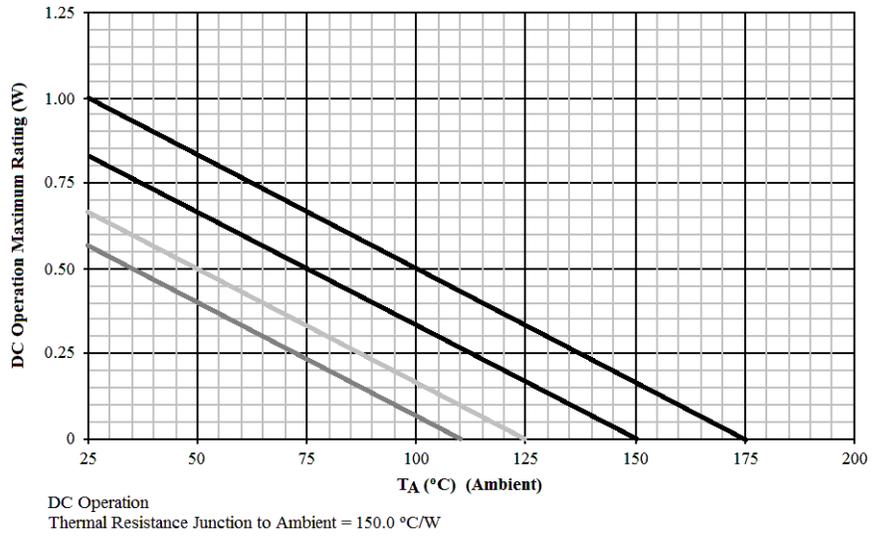


FIGURE 3. Maximum dc power derating versus lead temperature.

Temperature-Power Derating Curve 1N8073 through 1N8109

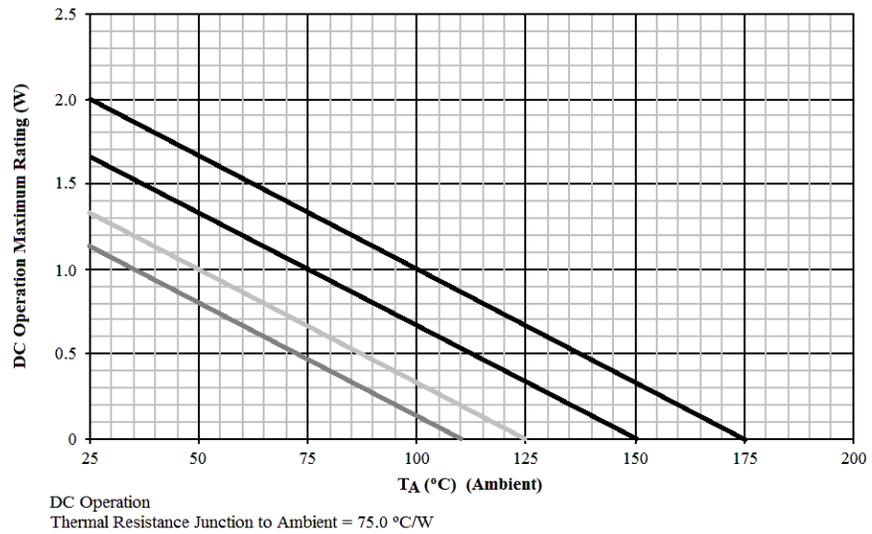


FIGURE 4. Maximum dc power derating versus lead temperature - Continued.

Temperature-Power Derating Curve
1N8110 through 1N8146

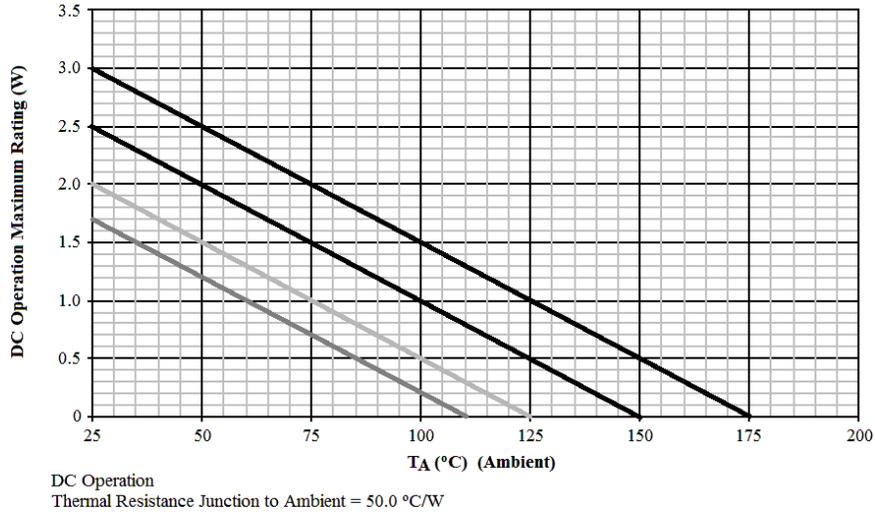


FIGURE 5. Maximum dc power derating versus lead temperature - Continued.

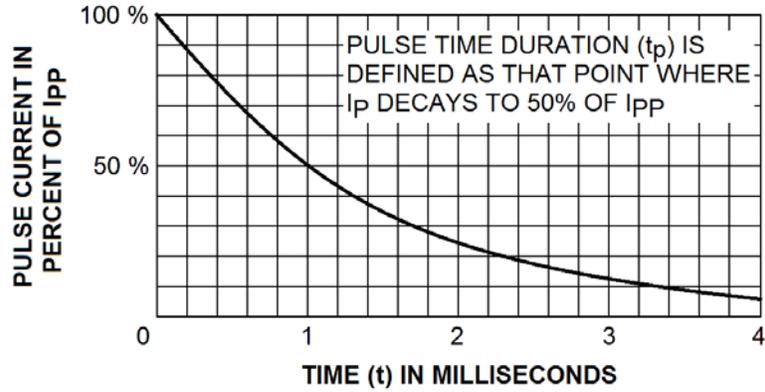


FIGURE 6. Pulse waveform.

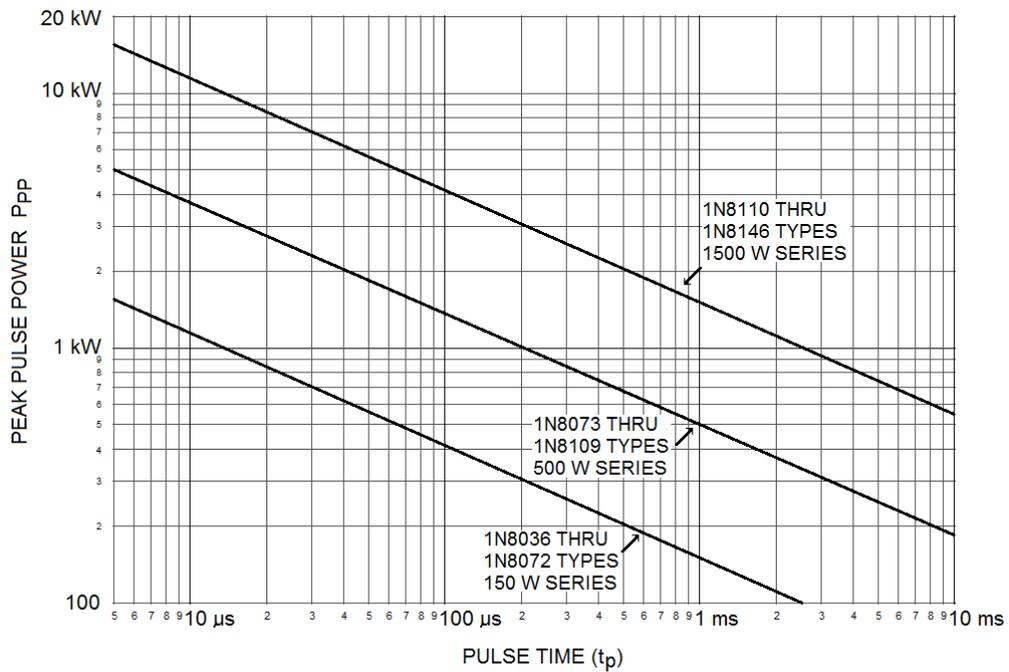
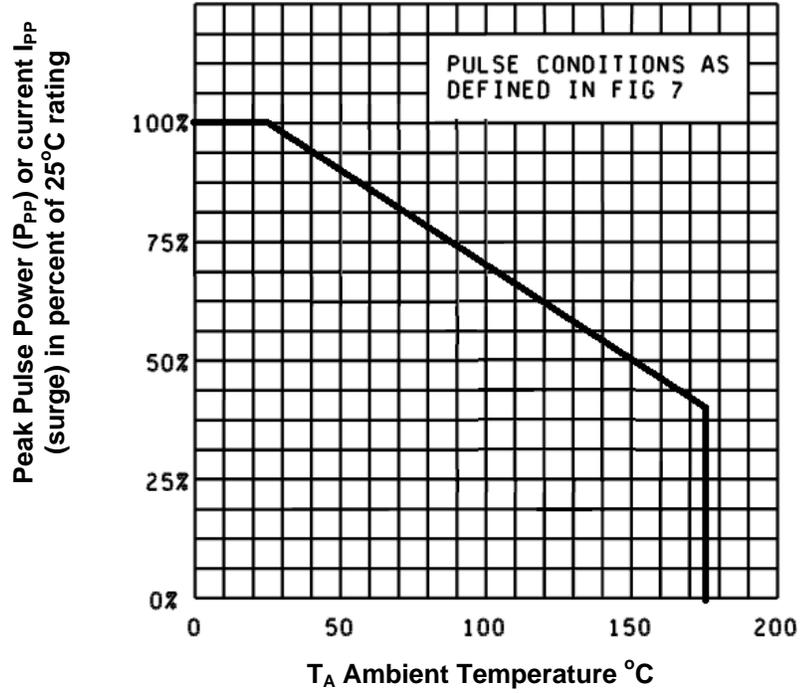


FIGURE 7. Peak pulse power versus pulse time.



The pulse derating curve of maximum peak pulse power versus junction temperature has been included for reference purposes only.

FIGURE 8. Pulse derating curve.

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 [3.4.2](#)).
- * d. The complete Part or Identifying Number (PIN), see title and section 1.
- e. Destructive physical analysis when requested.

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
NASA - NA
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2014-097)

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> .