

The documentation and process conversion measures necessary to comply with this document shall be completed by 31 January 2024.

INCH-POUND

MIL-PRF-19500/731C
w/AMENDMENT 2
31 October 2023
SUPERSEDING
MIL-PRF-19500/731C
w/AMENDMENT 1
15 December 2022

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICES, DIODE, SILICON, SCHOTTKY,
DUAL DIE TYPES 1N7058CCU3, 1N7058CCU3C,
AND SINGLE DIE TYPE 1N7038U3,
QUALITY LEVELS 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 silicon, Schottky, dual and single die, power rectifier diodes for use in high frequency switching power supplies and resonant power converters. Four levels of product assurance (JAN, JANTX, JANTXV, and JANS) are provided for each encapsulated device.

1.2 Package outlines. The device package outlines are a metal lid (U3) or a ceramic lid (U3C) surface mount TO-276AA (SMD .5) package in accordance with [figure 1](#) for all encapsulated device types.

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

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	
Types	V_{RWM}	I_o (1) (2) $T_C = +100^\circ\text{C}$	I_{FSM} $t_p = 8.3\text{ ms}$ $T_C = +25^\circ\text{C}$	$R_{\theta JC}$ (2)	$R_{\theta JC}$ (3)	T_{STG} and T_J
	<u>V_{dc}</u>	<u>A_{dc}</u>	<u>$A_{(pk)}$</u>	<u>$^\circ\text{C/W}$</u>	<u>$^\circ\text{C/W}$</u>	<u>$^\circ\text{C}$</u>
1N7038U3	150	30	140 (2)	1.82		-65 to +150
1N7058CCU3	150	30	130 (2)	1.75	3.5	
1N7058CCU3C						

- (1) See temperature-current derating curves in [figures 2](#) and [3](#).
- (2) Entire package.
- (3) Each diode.

1.4 Primary electrical characteristics.

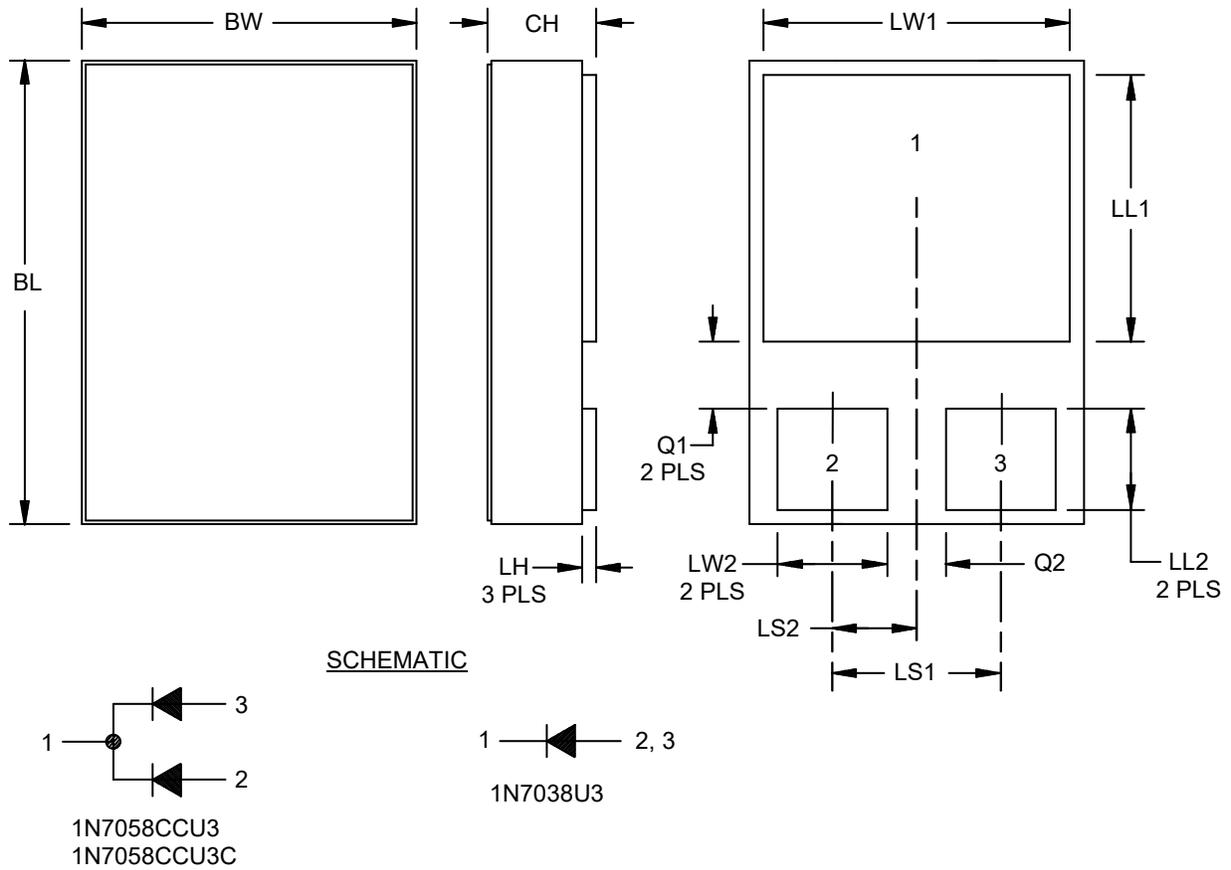
- a. $R_{\theta JC} = 1.82^\circ\text{C/W}$ maximum for 1N7038U3 ([figure 4](#)).
- b. $R_{\theta JC} = 1.75^\circ\text{C/W}$ maximum entire package for 1N7058CCU3 and 1N7058CCU3C ([figure 5](#));
 $R_{\theta JC} = 3.5^\circ\text{C/W}$ maximum each diode.

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>.

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Symbol	Dimensions				Symbol	Dimensions			
	Inches	Inches	mm	mm		Inches	Inches	mm	mm
	Min	Max	Min	Max		Min	Max	Min	Max
BL	.395	.405	10.03	10.29	LS1	.150	BSC	3.81	BSC
BW	.291	.301	7.39	7.65	LS2	.075	BSC	1.91	BSC
CH (2)	.108	.124	2.74	3.15	LW1	.281	.291	7.14	7.39
CH (3)	.1195	.1335	3.035	3.390	LW2	.090	.100	2.29	2.54
LH	.010	.020	0.25	0.51	Q1	.030		0.76	
LL1	.220	.230	5.59	5.84	Q2	.030		0.76	
LL2	.115	.125	2.92	3.18					

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Dimension CH for metal lid TO-276AA (U3) packages.
3. Dimension CH for ceramic lid TO-276AA (U3C) packages.

FIGURE 1. Dimensions and configuration for TO-276AA (U3) package.

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1.5 Part or Identifying Number (PIN). The PIN is in accordance with [MIL-PRF-19500](#), and as specified herein. See [6.4](#) for PIN construction example and [6.5](#) for a list of available PINs.

1.5.1 JAN certification mark and quality level for encapsulated devices. The quality level designators for encapsulated devices that are applicable for this specification sheet from the lowest to the highest level are as follows: "JAN", "JANTX", "JANTXV" and "JANS".

1.5.2 Device type. The designation system for the device types of diodes covered by this specification sheet are as follows.

1.5.2.1 First number and first letter symbols. The diodes of this specification sheet use the first number and letter symbols "1N".

1.5.2.2 Second number symbols. The second number symbols for the diodes covered by this specification sheet are as follows: "7038" and "7058".

1.5.3 Suffix symbols. The following suffix letters are incorporated in the PIN for this specification sheet.

1.5.3.1 Internal circuit. The suffix symbols (or lack thereof) that designate the internal circuit for the devices covered by this specification sheet are as follows:

Blank	No designator (blank) identifies a single die internal circuit configuration (type 1N7038 only).
CC	This designator identifies a dual die, common cathode internal circuit configuration (type 1N7058 only).

1.5.3.2 Package type. All devices are packaged in a TO-276AA (SMD .5) package of [figure 1](#). The suffix symbols for the package types are as follows:

U3	The suffix symbols "U3" are used to designate device types that have a metal lid.
U3C	The suffix symbols "U3C" are used to designate device types that have a ceramic lid (1N7058 only).

1.5.4 Lead finish. The lead finishes applicable to this specification sheet are listed on [QPDSIS-19500](#).

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.
* [MIL-STD-883](#) - Test Method Standard for Microcircuits

(Copies of these documents are available online at <https://quicksearch.dla.mil>.)

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

3.4.1 Polarity. Polarity and terminal configuration shall be in accordance with [figure 1](#) herein.

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 finish is desired, it shall be specified in the acquisition document (see [6.2](#)).

* 3.4.3 Silicone die coating. The use of a silicone die coat requires a successful completion of method 5011 of [MIL-STD-883](#), on each lot of silicon die coating for its intended applications.

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

3.6 Electrical test requirements. The electrical test requirements shall be as specified in tables I and II herein.

3.7 Marking. Marking shall be in accordance with [MIL-PRF-19500](#) and herein.

3.8 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see [4.2](#)).
- b. Screening (see [4.3](#)).
- c. Conformance inspection (see [4.4](#) and [tables I and II](#) herein).

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

4.2.1 Group E inspection. 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 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.

* 4.2.2 Silicone die coating. When silicon die coating is used, method 5011 of [MIL-STD-883](#) shall be performed on that coating in the full [MIL-PRF-19500](#) qualification process.

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4.3 Screening (quality levels JANS, JANTXV, and JANTX 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	Measurements for JANS level	Measurements for JANTX and JANTXV levels
3b (1) (2)	Surge current (4.3.4)	Surge current (4.3.4)
3c (2)	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2)
3d	Avalanche energy test (see 4.3.3)	Avalanche energy test (see 4.3.3)
5	Method 2052 of MIL-STD-750, PIND (see MIL-PRF-19500 and 4.3.5)	Not applicable
9, 10	Not applicable	Not applicable
11	V_{F1} and I_{R1}	V_{F1} and I_{R1}
12	See 4.3.1	See 4.3.1
13	Subgroup 2, of table I herein excluding thermal impedance; V_{F1} and I_{R1} ; $\Delta V_{F1} = \pm 50$ mV (pk); $\Delta I_{R1} = \pm 100$ percent from the initial value or $\pm 100\mu A$, whichever is greater.	Subgroup 2, of table I herein excluding thermal impedance; V_{F1} and I_{R1} ; $\Delta V_{F1} = \pm 50$ mV (pk); $\Delta I_{R1} = \pm 100$ percent from the initial value or $\pm 100\mu A$, whichever is greater.

- * (1) Surge testing shall precede thermal impedance.
(2) Thermal impedance and surge current shall be performed any time after screen 3a and before screen 13. Quality levels JANTX and JANTXV levels do not need to be repeated in screening verifications.

4.3.1 Power burn-in conditions. Burn-in shall be in accordance with test condition A of method 1038 of MIL-STD-750. The following conditions shall apply: $V_R = 120$ V dc; $T_J = +125$ °C.

4.3.2 Thermal impedance. The thermal impedance measurements shall be performed in accordance with method 3101 or 4081 of MIL-STD-750 using the guidelines in that method for determining I_M , I_H , t_H , t_{MD} . See table III, subgroup 4 herein.

4.3.3 Avalanche energy test. The avalanche energy test shall be performed in accordance with method 4064 of MIL-STD-750 using the circuit as shown on figure 6 or equivalent. The Schottky rectifier under test shall be capable of absorbing the reverse energy, as follows: $I_{RM} = 170$ mA, $V_{RSM} = 150$ V minimum.

4.3.4 Surge current. The surge current test shall be performed in accordance with condition A of method 4066 of MIL-STD-750. The following details shall apply: $I_O = 0$; $V_{RM(w)} = 0$; $I_{FSM} =$ see 1.3, column 4.

* 4.3.5 PIND. Not applicable in screening when devices are processed using alternative method and flow requirements approved by the qualifying activity, that includes incorporating the use of certified clean processing and silicone die coat. Instead, the PIND test performance shall be performed in group B3 and group C3, on a lot sample basis. PIND failures detected in group B or C will represent lot jeopardy and shall be evaluated for root cause and lot integrity.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with table E-V of MIL-PRF-19500, and table I herein. Electrical measurements (end-points) and delta requirements shall be in accordance with the applicable steps of table II herein.

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4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in 4.4.2.1 for quality level JANS and 4.4.2.2 for quality levels JAN, JANTX, and JANTXV and as follows. Electrical measurements (end-points) shall be in accordance with [table I](#), subgroup 2, forward voltage test (V_{F1}) and reverse leakage test (I_{R1}) herein. Delta measurements shall be in accordance with [table II](#) herein.

4.4.2.1 Quality level JANS (table E-VIA of MIL-PRF-19500).

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
* B3	2052	PIND, required if not performed in screening. (22 devices, c = 0 for large lots, 12 devices, c = 0 for small lots).
B4	1037	$I_F = 2$ A minimum for 2,000 cycles; $\Delta T_C = +85$ °C.
B5	1038	Condition A, $V_R = 120$ V dc, $T_J = +125$ °C, t = 340 hours min; heat sinking allowed. This test shall be extended to 1000 on each JANS wafer lot.
B6	4081	Limit for thermal resistance for 1N7038U3 is 1.82 °C/W. Limit for thermal resistance for 1N7058CCU3 is 3.5 °C/W for each diode. Limit for thermal resistance for 1N7058CCU3C is 3.5 °C/W for each diode.

4.4.2.2 Quality levels JAN, JANTX, and JANTXV (table E-VIB of MIL-PRF-19500).

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	1037	$I_F = 2$ A minimum for 2,000 cycles; $\Delta T_C = +85$ °C.

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](#). Electrical measurements (end-points) shall be in accordance with [table I](#), subgroup 2, forward voltage test (V_{F1}) and reverse leakage test (I_{R1}) herein. Delta measurements shall be in accordance with [table II](#) herein.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
C2	2036	Not required.
* C3	2052	PIND, required if not performed in screening. (JANS only, 22 devices, c = 0 for large lots, 12 devices, c = 0 for small lots).
C6	1037	$I_F = 2$ A minimum for 6,000 cycles; $\Delta T_C = +85$ °C.
C6	1038	Condition A, $V_R = 120$ Vdc, $T_J = +125$ °C, t = 1000 hours minimum; (heat sinking allowed), for TX, TXV only.

4.4.4 Group E inspection. Group E inspection shall be conducted in accordance with the tests and conditions specified for subgroup testing in table E-IX of [MIL-PRF-19500](#), and [table III](#) herein. Delta measurements shall be in accordance with [table II](#) herein.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables 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 Dielectric withstanding voltage (DWV). The test for DWV shall be performed in accordance with test method 1016 of [MIL-STD-750](#). The following details shall apply: $V_R = 500$ V dc; all leads shorted; measure from leads to case; the sample shall be n = 116, c = 0.

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TABLE I. Group A inspection.

Inspection <u>1/</u> <u>2/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical examination	2071					
Subgroup 2						
Thermal impedance <u>3/</u>	3101	See 4.3.2	Z _{θJC}			°C/W
Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C	4011	Condition B; pulsed test (see 4.5.1) I _F = 15A (pk) I _F = 7.5A (pk) I _F = 7.5A (pk)	V _{F1}		.96 1.05 1.05	V dc V dc V dc
Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C	4011	Condition B; pulsed test (see 4.5.1) I _F = 30 A (pk) I _F = 15 A (pk) I _F = 15 A (pk)	V _{F2}		1.18 1.20 1.20	V dc V dc V dc
Reverse current 1N7038U3 1N7058CCU3 1N7058CCU3C	4016	Condition A or B V _R = 150 V V _R = 150 V V _R = 150 V	I _{R1}		.12 .02 .02	mA dc mA dc mA dc
Subgroup 3						
High temperature operation:		T _C = +125 °C				
Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C	4011	Condition B; pulsed test (see 4.5.1) I _F = 15A (pk) I _F = 7.5A (pk) I _F = 7.5A (pk)	V _{F3}		.75 .72 .72	V dc V dc V dc
Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C	4011	Condition B; pulsed test (see 4.5.1) I _F = 30 A (pk) I _F = 15 A (pk) I _F = 15 A (pk)	V _{F4}		.92 .85 .85	V dc V dc V dc
Reverse current 1N7038U3 1N7058CCU3 1N7058CCU3C	4016	Condition A or B V _R = 150 V V _R = 150 V V _R = 150 V	I _{R2}		6.0 7.0 7.0	mA dc mA dc mA dc

See footnotes at end of table.

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TABLE I. Group A inspection – Continued.

Inspection <u>1/</u> <u>2/</u>	MIL-STD-750		Symbol	Limits		Unit	
	Method	Conditions		Min	Max		
<u>Subgroup 3</u> - continued							
* Low temperature operation: Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C	4011	T _C = -55 °C	V _{F5}				
		Condition B, pulsed test (see 4.5.1)					
		I _F = 15A (pk)			1.07	V dc	
		I _F = 7.5A (pk)			1.06	V dc	
		I _F = 7.5A (pk)			1.06	V dc	
		4011	Condition B, pulsed test (see 4.5.1)	V _{F6}			
		I _F = 30 A (pk)			1.26	V dc	
		I _F = 15 A (pk)			1.23	V dc	
		I _F = 15 A (pk)			1.23	V dc	
<u>Subgroup 4</u>							
* Junction capacitance 1N7038U3 1N7058CCU3 1N7058CCU3C	4001	V _R = 5 V dc, f = 1 MHz, V _{SIG} = 50 mV (p-p)	C _J				
						405	pF
						130	pF
						130	pF
<u>Subgroup 5</u>							
Not applicable							
<u>Subgroup 6</u>							
Surge current	4066	See 1.3, column 4 herein, ten surges each diode. 60 seconds between surges, (see 4.5.1).					
Electrical measurements		See table I, subgroup 2 herein.					
<u>Subgroup 7</u>							
Dielectric withstanding voltage <u>4/</u>	1016	See 4.5.2.	I _{RES}		10	μA	
Scope display evaluation	4023	Condition A, stable only.					
Electrical measurements		See table I, subgroup 2 herein.					

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

2/ Electrical characteristics apply to all package styles and polarities.

3/ For end-point measurements, this test is required for the following subgroups:

Group B, subgroups 3 and 4 (JANS).

Group B, subgroups 2 and 3 (JAN, JANTX, JANTXV).

Group C, subgroups 2 and 6.

Group E, subgroup 1.

4/ Not required for 1N7058CCU3C.

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TABLE II. Delta measurements for groups B, C, and E. 1/ 2/ 3/ 4/ 5/ 6/

Step	Inspection	MIL-STD-750		Symbol	Limits	Limits	Unit
		Method	Conditions		Min	Max	
1.	Forward voltage 1N7038U3 1N7058CCU3 1N7058CCU3C	4011	Condition B, pulsed (see 4.5.1) I _F = 15 A (pk) I _F = 7.5 A (pk)	ΔV _{F1}	±50 mV dc from initial reading.		
2.	Reverse current	4016	Condition A or B V _R = 150 V	ΔI _{R1}	±100 percent from initial reading or ±100μA whichever is greater.		

*

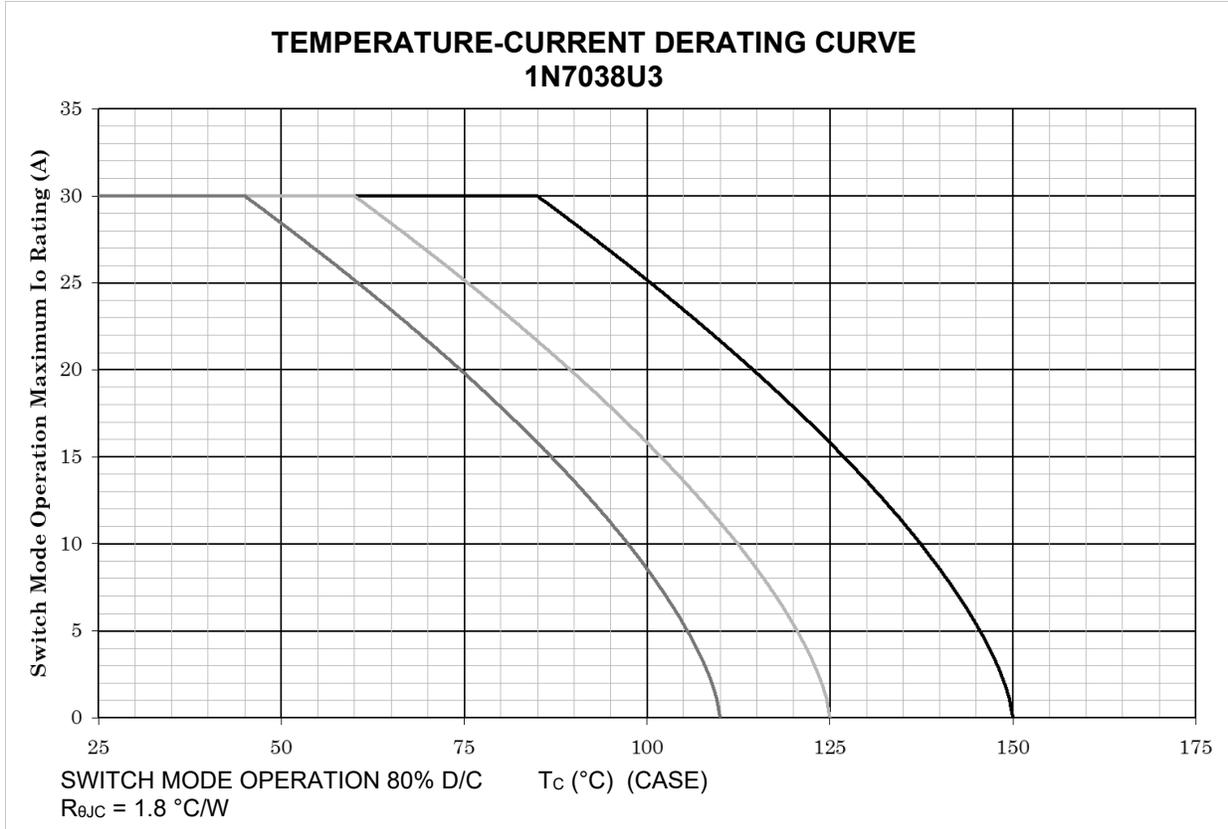
- 1/ Each individual diode.
- 2/ The delta measurements taken during group B inspection for quality level JANS (table E-VIA of MIL-PRF-19500) shall be as follows:
 - a. In addition to the measurements specified for subgroup 4, the measurements of steps 1, and 2 of this table shall also be taken.
 - b. In addition to the measurements specified for subgroup 5, the measurements of steps 1 and 2 of this table shall also be taken.
- 3/ The delta measurements taken during group B inspection for quality levels JAN, JANTX, and JANTXV (table E-VIB of MIL-PRF-19500) shall be as follows:
 - a. In addition to the measurements specified for subgroup 2, the measurements of steps 1, and 2 of this table shall also be taken.
 - b. In addition to the measurements specified for subgroup 3, the measurements of steps 1, and 2 of this table shall also be taken.
 - c. In addition to the measurements specified for subgroup 6, the measurements of steps 1 and 2 of this table shall also be taken.
- 4/ The delta measurements taken during group C inspection for all quality levels (table E-VII of MIL-PRF-19500) shall be as follows:
 - a. In addition to the measurements specified for subgroups 2 and 3, the measurements of steps 1, and 2 of this table shall also be taken for all levels.
 - b. In addition to the measurements specified for subgroup 6, the measurements of steps 1, and 2 of this table shall also be taken for all levels.
- 5/ The delta measurements taken during group E inspection for all quality levels (table E-IX of MIL-PRF-19500) shall be as follows:
 - a. In addition to the measurements specified for subgroup 1, the measurements of steps 1, and 2 of this table shall also be taken.
 - b. In addition to the measurements specified for subgroup 2, the measurements of steps 1 and 2 of this table shall also be taken.
- 6/ Devices which exceed the table I limits for this test shall not be accepted.

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TABLE III. Group E inspection (all quality levels) – for qualification and requalification only.

Inspection	MIL-STD-750		Sample plan
	Method	Conditions	
<u>Subgroup 1</u>			45 devices, c = 0
Temperature cycling (air to air)	1051	Test condition G, 500 cycles, -55 °C to +150 °C.	
Hermetic seal	1071	Fine and gross leak.	
Electrical measurements		See table I , subgroup 2 and table II herein.	
<u>Subgroup 2</u>			45 devices, c = 0
Life test	1048	t = 1,000 hours, T _J = +125 °C, V _R = 80 percent rated voltage (see 1.3, column 2 herein).	
Electrical measurements		See table I subgroup 2 and table II herein.	
<u>Subgroup 4</u>			
Thermal impedance curves	3101	See MIL-PRF-19500 .	
<u>Subgroup 10 ^{1/}</u>			n = 5, c = 0
Surge current	4066	Condition A, 100 surges of 8.3 ms superimposed on I _O . V _R = 0; I _O = 0 A pk half sine wave, continuous, T _A = +25 °C.	
1N7038U3 1N7058CCU3, 1N7058CCU3C		I _{FSM} = 140 A I _{FSM} = 130 A	
Electrical measurements		See table I subgroup 2 (V _F and I _R only).	

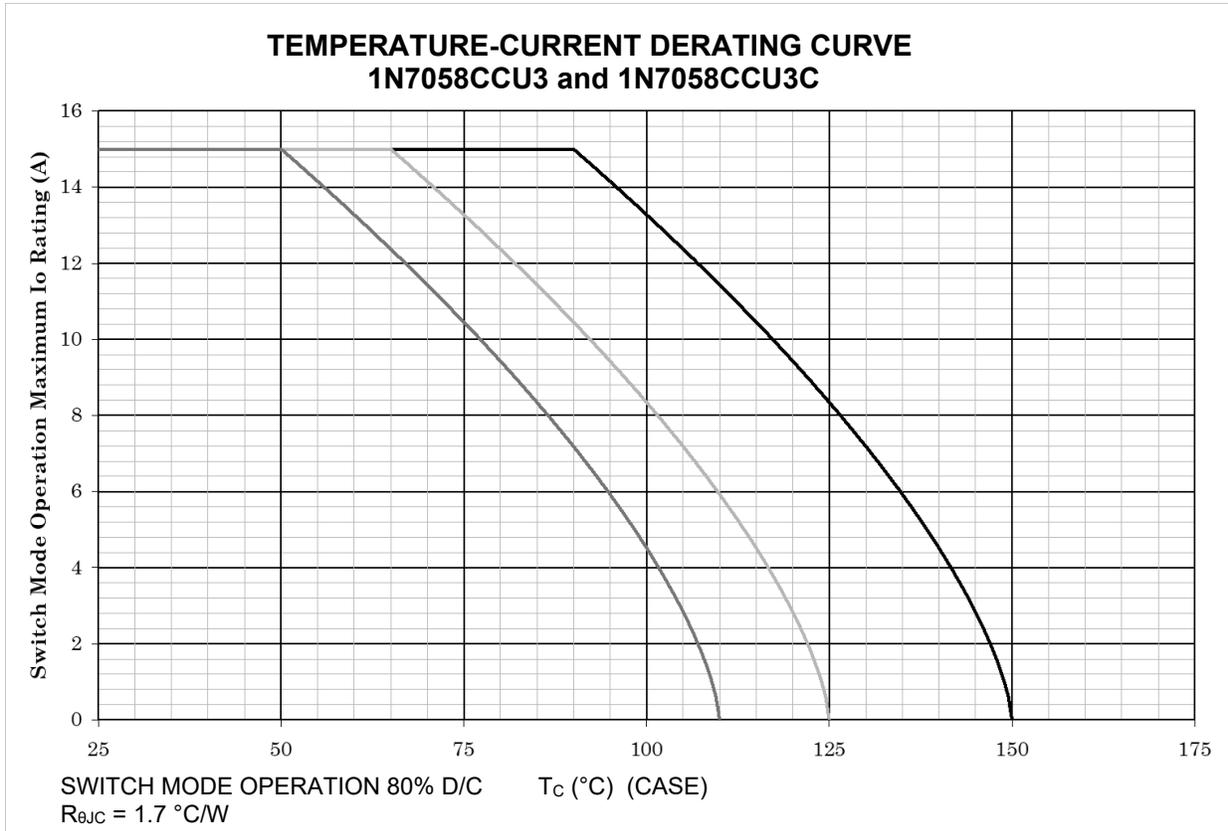
^{1/} Each individual diode.



NOTES:

1. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperature ($T_J \leq 150^\circ\text{C}$) and current rating specified (see 1.3 herein).
3. Derate design curve chosen at $T_J \leq 125^\circ\text{C}$, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at $T_J \leq 125^\circ\text{C}$, and 110°C to show current rating where most users want to limit T_J in their application.

FIGURE 2. Temperature-current derating curve (entire package) 1N7038U3.



NOTES:

1. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperature ($T_J \leq 150$ °C) and current rating specified (see 1.3 herein).
3. Derate design curve chosen at $T_J \leq 125$ °C, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at $T_J \leq 125$ °C, and 110 °C to show current rating where most users want to limit T_J in their application.

FIGURE 3. Temperature-current derating curve (for each leg) for 1N7058CCU3. and1N7058CCU3C.

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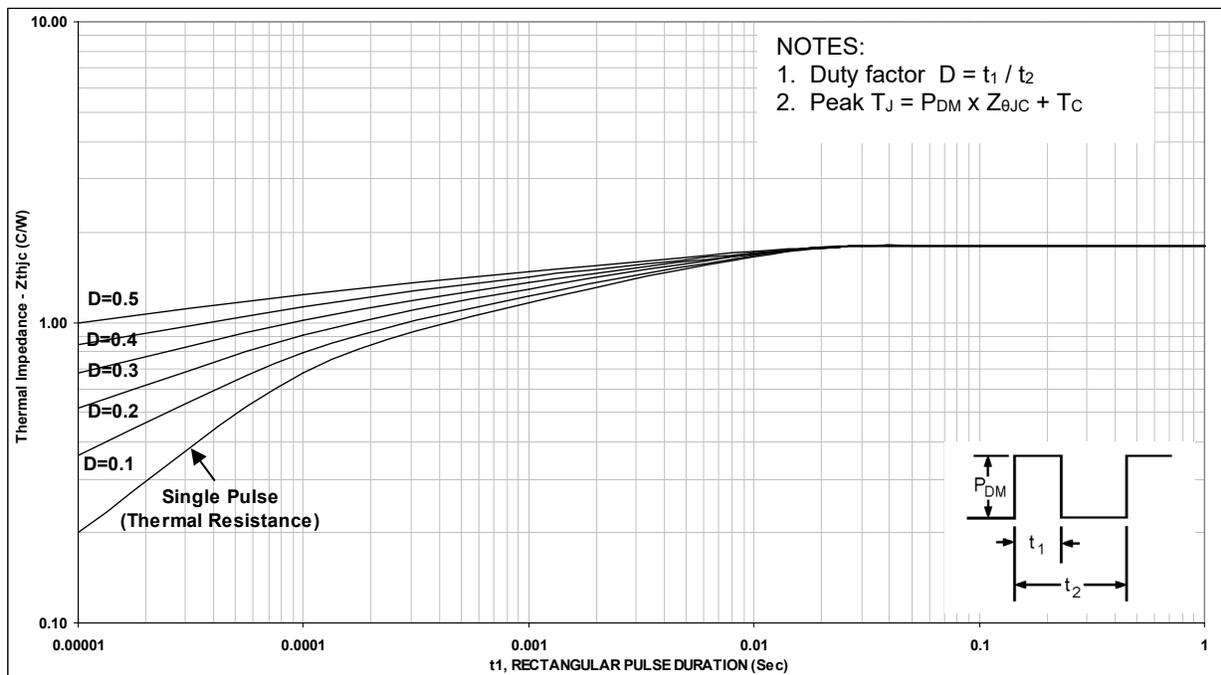


FIGURE 4. Thermal impedance 1N7038U3.

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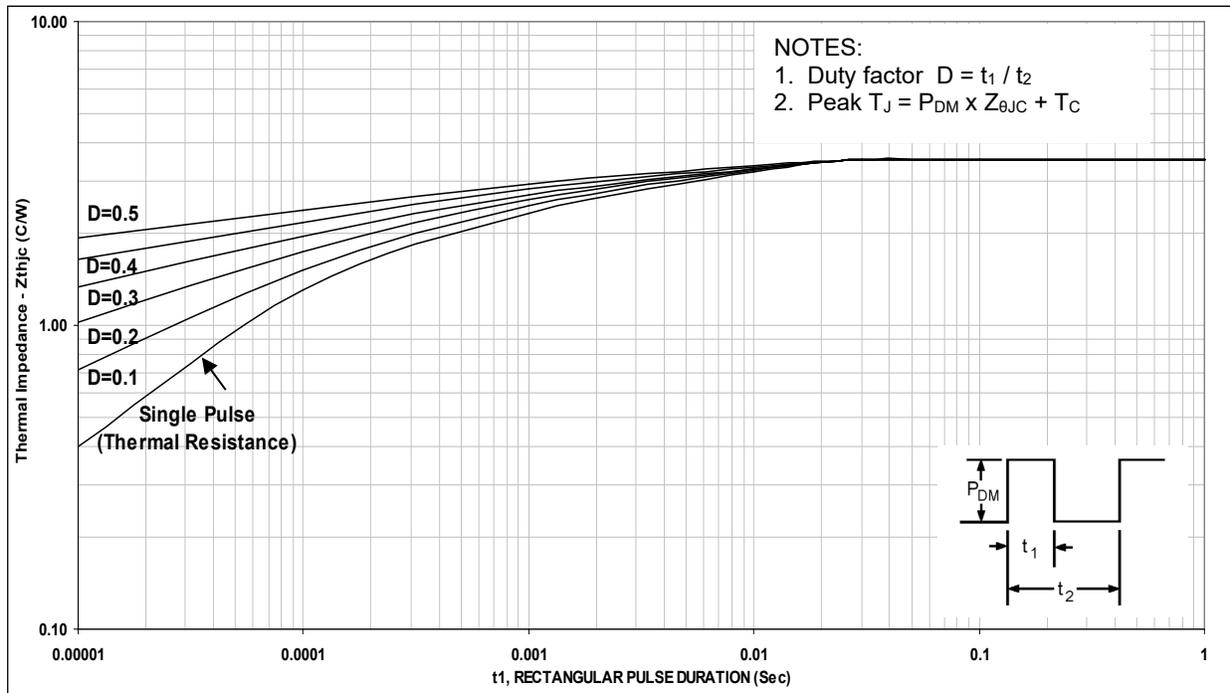
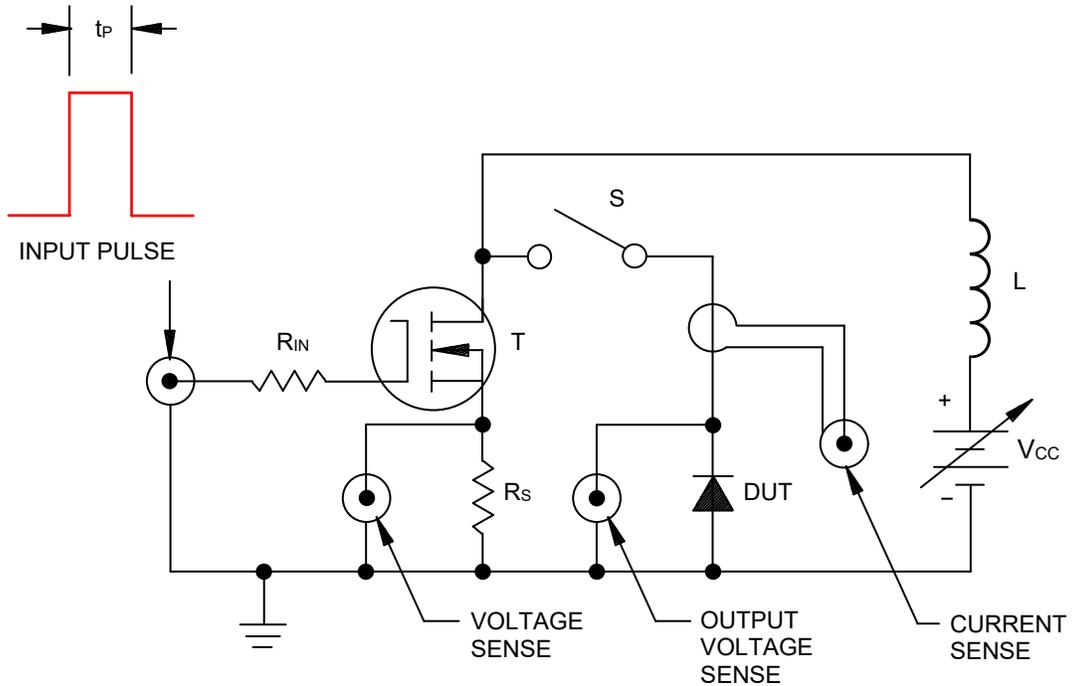


FIGURE 5. Thermal impedance (for each leg), 1N7058CCU3 and 1N7058CCU3C.



PROCEDURE:

1. With S open, adjust pulse width to test current of 1 amps across R_S .
2. Close S , verify test current with current sense.
3. Read peak output voltage (see 4.3.3).

NOTES:

1. The following input pulse details shall apply: $V_G = 10$ Volts, duty cycle ≤ 1 percent.
2. The following test circuit component values shall apply: $L = 150$ mH, $Z_G = 50$ ohms, $R_{in} = 50$ ohms, 1 watt, $R_S = 0.1$ ohms, 1 watt, $T = 2N6768$ (IRF350 or equivalent).
3. The supply voltage $V_{CC} \approx 10$ volts.

FIGURE 6. Avalanche energy test circuit.

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.)

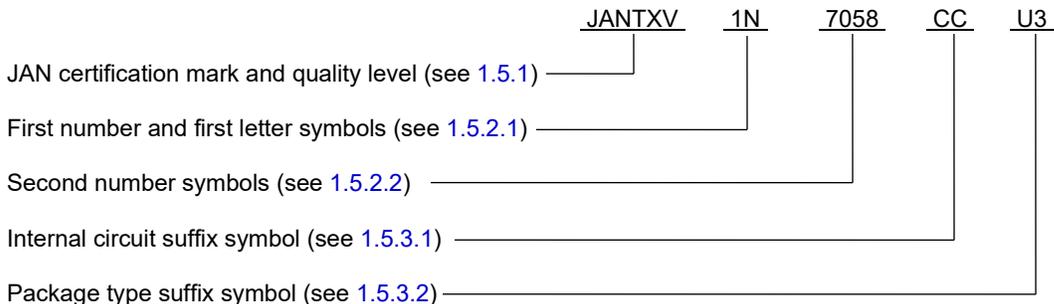
6.1 Intended use. Semiconductors conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

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 PIN, see 1.5 and 6.5.

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 ([QPDSIS-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://qpldocs.dla.mil>.

6.4 PIN construction example. The PINs for encapsulated devices are constructed using the following form.



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6.5 List of PINs for encapsulated devices. The following is a list of possible PINs for encapsulated devices available on this specification sheet.

PINs for devices of the base quality level	PINs for devices of the "TX" quality level	PINs for devices of the "TXV" quality level	PINs for devices of the "S" quality level
JAN1N7038U3	JANTX1N7038U3	JANTXV1N7038U3	JANS1N7038U3
JAN1N7058CCU3	JANTX1N7058CCU3	JANTXV1N7058CCU3	JANS1N7058CCU3
JAN1N7058CCU3C	JANTX1N7058CCU3C	JANTXV1N7058CCU3C	JANS1N7058CCU3C

6.6 Cross reference substitution list. A PIN for PIN replacement listing follows, and these devices are directly interchangeable.

Preferred PIN	Non-preferred PIN
JANS, JANTXV, JANTX, JAN1N7038U3	30LJQ150
JANS, JANTXV, JANTX, JAN1N7058CCU3	30CLJQ150
JANS, JANTXV, JANTX, JAN1N7058CCU3C	30CLJCQ150

6.7 Amendment notations. The margins of this specification are marked with asterisks to indicate modifications generated by this amendment. 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 - SH
Air Force – 85
NASA – NA
DLA – CC

Preparing activity:
DLA – CC
(Project 5961-2023-090)

Review activity:
Air Force – 19

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>.