

The documentation and process conversion measures necessary to comply with this document shall be completed by 30 April 2026.

INCH-POUND

MIL-PRF-19500/467C
w/AMENDMENT 3
30 December 2025
SUPERSEDING
MIL-PRF-19500/467C
w/AMENDMENT 2
26 May 2023

PERFORMANCE SPECIFICATION SHEET

LIGHT EMITTING DIODE, RED, THROUGH-HOLE MOUNT, TYPE 1N5765, QUALITY LEVELS JAN AND JANTX

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 hermetically-sealed, red light emitting diodes (LED). Two levels of product assurance (JAN and JANTX) are provided for each device type as specified in [MIL-PRF-19500](#).

1.2 Package outline. The device package outline for this specification sheet is a TO-46 in accordance with [figure 1](#).

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

B_V	I_F (1)	P_T	I_p (2)	T_{OP} and T_{STG}	T_J
<u>V dc</u>	<u>mA dc</u>	<u>mW</u>	<u>A (pk)</u>	<u>$^{\circ}\text{C}$</u>	<u>$^{\circ}\text{C}$</u>
4	50	150	3.0	-65 to +100	-65 to +120

- (1) Derate 0.67 mA dc/ $^{\circ}\text{C}$ for T_A above 25°C .
(2) 1 μs pulse width, 300 pps.

1.4 Characteristics, radiometric (physical) and photometric (visual).

Limits	I_{V1} $I_F = 20 \text{ mA dc}$ $\Theta = 0 \text{ degrees}$	I_{V2} $I_F = 20 \text{ mA dc}$ $\Theta = 30 \text{ degrees}$	V_F $I_F = 20 \text{ mA dc}$	I_R $V_R = 3 \text{ V}$	C $V_R = 0$ $f = 1 \text{ MHz}$	λ_V (wave length)	Color
	<u>mcd</u>	<u>mcd</u>	<u>V dc</u>	<u>$\mu\text{A dc}$</u>	<u>pF</u>	<u>nm</u>	Red
Min	0.5	0.3	---	1	---	630	Red
Max	3.0		2.0		300	700	

Comments, suggestions, or questions on this document should be addressed to DLA Weapons Support, 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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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. 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" and "JANTX".

1.5.2 Device type. The designation system for the device types 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 symbol for the LEDs covered by this specification sheet is "5765".

1.5.3 Suffix symbols. Suffix symbols are not applicable for this specification sheet.

1.5.4 Lead finish. The lead finishes applicable to this specification sheet are listed on [QML-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.

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

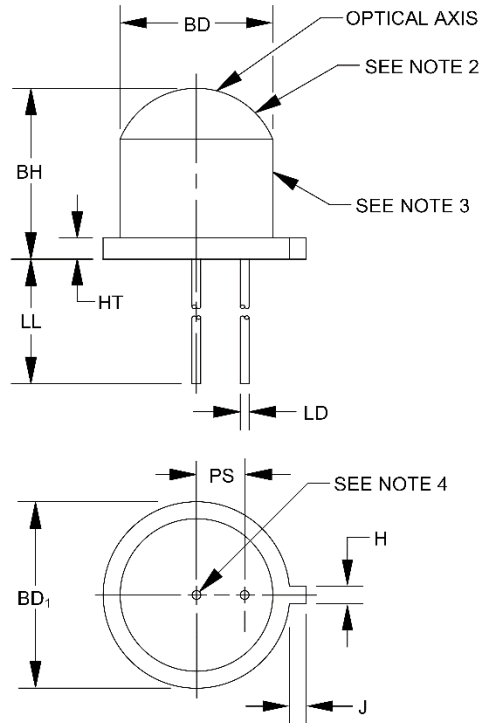
DEPARTMENT OF DEFENSE STANDARDS

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

(Copies of these documents are available online at <https://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.

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Symbol	Dimensions			
	Inch	Inch	mm	mm
	Min	Max	Min	Max
BD	.176	.190	4.47	4.83
BD ₁	.200	.220	5.08	5.59
BH	.180	.225	4.57	5.72
H	.035	.045	0.89	1.14
HT	.013	.024	0.33	0.61
J	.032	.042	0.81	1.07
LD	.016	.019	0.41	0.48
LL	.970	1.030	24.64	26.16
PS	.045	.055	1.14	1.40

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Red colored glass lens.
3. Glass/metal hermetic can.
4. Cathode lead; both leads isolated from case.

FIGURE 1. Physical dimensions for modified TO-46.

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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 (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 herein.

I_P	Peak operating forward pulse current.
I_{ptr}	Peak transient forward current.
I_v	Luminous intensity (the subscript V is used to designate a photometric or visual quantity to differentiate from I as used herein for current).
λ_v	Peak radiometric wavelength of diode light emission.
mcd	Milli-candela; the candela is a unit of luminous intensity defined such that the luminance of a blackbody radiator at the temperature of solidification of platinum is 60 candelas per square centimeter.
Θ	The angle at or off the axis of symmetry of a light source at which luminous intensity is measured.

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

3.4.1 Lead finish. Lead finish shall be solderable as defined in [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 Terminal lead length. Terminal lead lengths other than that specified on [figure 1](#) may be furnished when so stipulated in the acquisition document (see [6.2](#)) where the devices covered herein are required directly for particular equipment-circuit installation or for automatic-assembly-technique programs.

3.4.3 Wire bonds. The use of bi-metallic (e.g. gold-aluminum) bonds on the die shall be acceptable for devices compliant to this specification sheet. For devices having bi-metallic bonds, the post-bonding bake requirements of [MIL-PRF-19500](#) (see D.3.9.5.b of [MIL-PRF-19500](#)) shall apply.

3.5 Marking. Devices shall be marked as specified in [MIL-PRF-19500](#).

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 the subgroups specified in [table I](#) herein.

3.8 Workmanship. LEDs 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.

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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](#).

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 (quality level 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 JANTX level
2	As given, except condition shall be 24 hours minimum at maximum rated storage temperature.
3a	See 4.5.2 .
7	See 4.5.3 .
9 and 10	Not applicable.
11	I_{V1} , V_F
12	$I_F = 50$ mA dc; $T_A = +25^\circ\text{C}$, $t = 96$ hours.
13	Subgroup 2 of table I herein. $\Delta I_{V1} = -20$ percent of initial readings. $\Delta V_F = \pm 50$ mV dc.

4.4 Conformance inspection. Conformance inspection shall be in accordance with [MIL-PRF-19500](#) and herein. The following details shall apply:

- a. If the manufacturer chooses the following option for group C testing, the sample units that are to be used in group C inspection shall be designated as such, prior to conducting the referenced group B tests.
- b. Moreover, the number of failed diodes to be counted for lot acceptance or rejected as a result of group C test shall be equal to all failed diodes of the test in group B inspection, which were predesignated for use in group C inspection, plus any additional failures occurring group C testing.
- c. For each life test in group C inspection, the manufacturer has the option of using all, or a portion of, the sample already subjected to 340 hours of group B life testing for an additional 660 hours of testing to meet the 1,000 hour requirement.

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.

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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 table E-VIB of [MIL-PRF-19500](#) and herein.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B2	1051	See 4.5.2 .
B2	1071	See 4.5.3 .
B3	1027	I _F = 50 mA dc; T _A = +25°C; t = 340 hours + 72, -24 hours (see 4.4.a).

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	1056	Test condition A.
C2	2036	Test condition E.
C2	1071	See 4.5.3 .
C3	2016	Nonoperating; 1,500 G's; t = 0.5 ms; 5 blows in each orientation: X1, Y1, and Z1.
C3	2056	Nonoperating.
C3	2006	Nonoperating; 20,000 G's; X1, Y1, and Z1, one minute in each orientation.
C6	1026	I _F = 50 mA dc; T _A = +25°C, 1,000 hours.
C7		Peak forward pulse current (transient); t _P = 1 μs, pps = 300, total test time = 5 s, I _{prt} = 1.0 A (pk)
C8		t _P = 0.5 ms, P _{FM} ≤ 150 mW, T _A = +25°C, I _P = 60 mA, 500 hours.

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

4.5.1 Axial luminous intensity. This measurement is made with a photometer.

4.5.2 Temperature cycling. The test for temperature cycling shall be performed in accordance with test method 1051 of [MIL-STD-750](#) using, test condition A with the following exceptions:

- a. The hot temperature shall be +100°C, +10°C / -0°C.
- b. The number of cycles for group B shall be 25. The number of cycles for group E shall be 20.

4.5.3 Hermetic seal. The test for hermetic seal shall be performed in accordance with test method 1071 of [MIL-STD-750](#) with the following exceptions for screening and groups B and C conformance inspection:

- a. Fine leak: Test conditions G or H. For condition H, leak testing shall be completed no later than 2 hours after pressurization.
- b. Gross leak: Test conditions A, E, J, or K. For condition J, the leak indicator fluid shall be maintained at +100°C ±5°C. For condition K, the purge and test chambers shall be maintained at +100°C ±5°C.

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TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limit	Limit	Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical inspection	2071					
<u>Subgroup 2</u>						
Luminous intensity		$\Theta = 0$ degrees (see 4.5.1) $I_F = 20$ mA dc	I_{V1}	0.5	3.0	mcd
Luminous intensity		$\Theta = 30$ degrees; $I_F = 20$ mA dc	I_{V2}	0.3		mcd
Reverse current	4016	Condition A or B; $V_R = 3$ V dc	I_R		1.0	μ A dc
Forward voltage	4011	Condition A; $I_F = 20$ mA dc	V_F		2.0	V dc
<u>Subgroup 3</u>						
High temperature:		$T_A = +100^\circ\text{C}$				
Luminous intensity		$\Theta = 0$ degrees, $I_F = 20$ mA dc	I_{V1}	0.45	3.0	mcd
<u>Subgroup 4</u>						
Capacitance	4001	$V_R = 0$; $f = 1$ MHz	C		300	pF
<u>Subgroup 7</u>						
Solderability <u>2/</u>	2026	15 devices, $c = 0$				
Resistance to solvents	1022	Solutions A and B only. 15 devices, $c = 0$				

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

2/ The sample size for solderability test applies to the number of leads inspected except in no case shall less than three leads be used to provide the number of leads required.

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TABLE II. Group E inspections (all quality levels) for qualification and requalification only.

Inspections	MIL-STD-750		Sample plan
	Method	Conditions	
<u>Subgroup 1</u>			45 devices, c = 0
Temperature cycling	1051	See 4.5.2.	
Hermetic seal	1071	Fine and gross leak, see 4.5.3.	
Electrical measurements		See table I, subgroup 2.	
<u>Subgroup 2</u>			45 devices, c = 0
Intermittent operating life	1037	For all devices with organic material.	
Electrical measurements		See table I, subgroup 2.	
<u>Subgroups 5 and 6</u>			
Not applicable			

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.

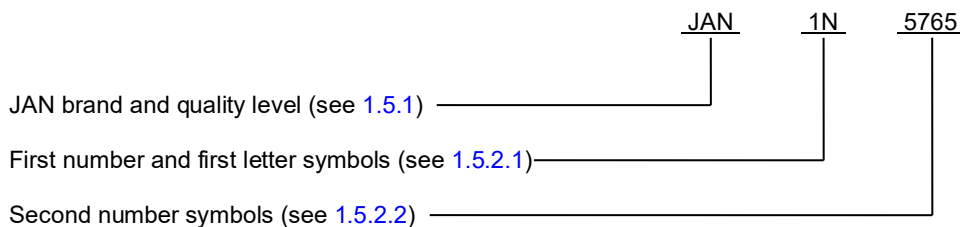
6.2 Acquisition requirements. Acquisition documents should specify the following:

- Title, number, and date of this specification.
- Packaging requirements (see 5.1).
- Lead finish (see 3.4.1).
- The complete PIN, see 1.5 and 6.4.

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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 Weapons Support, 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 <http://qpldocs.dla.mil>.

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



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

PINs for types 1N5765
JAN1N5765
JANTX1N5765

6.6 Applications. These light emitting diodes are primarily intended for use as visible indicators (ON or OFF) of status. The modulation rate capability can be high enough to accommodate video signals. Diodes may be operated in either direct current or pulsed mode depending upon current availability. Pulsed operation is desirable as a means of linear control of average intensity or of improving the average efficiency (ratio of average intensity to average current).

6.7 Operating considerations. Under normal ambient light conditions (300 to 1,000 lux), a typical forward current of 6 mA is required to produce an adequate on-state luminous intensity. This current level is directly compatible with TTL devices, and only simple buffering is needed when operating from LSTTL, LTTL, or CMOS. No consideration of inrush current or keep-alive voltage is necessary.

6.8 Reliability considerations. There is a correlation between LED luminous intensity degradation and operating current levels. To lengthen the useful life of this device, drive current should be held to a minimum consistent with use conditions: Luminous intensity would have to change by more than 50 percent before becoming apparent to the causal observer.

6.9 Request for new types and configurations. Requests for new device types or configurations for inclusions in this specification sheet should be submitted to: DLA Weapons Support, ATTN: VAC, Post Office Box 3990, Columbus, OH 43218-3990 or by electronic mail at Semiconductor@dla.mil.

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6.10 Amendment notations. The margins of this specification are marked with vertical lines 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.

Custodians:
Army – CR
Air Force – 85
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Preparing activity:
DLA – CC
(Project 5980-2026-001)

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