



## N-CHANNEL MOSFET

**Qualified per MIL-PRF-19500/542**

Qualified Levels:  
JAN, JANTX, and  
JANTXV

### DESCRIPTION

This family of 2N6756, 2N6758, 2N6760 and 2N6762 switching transistors are military qualified up to the JANTXV level for high-reliability applications. Microsemi also offers numerous other transistor products to meet higher and lower power ratings with various switching speed requirements in both through-hole and surface-mount packages.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- JEDEC registered 2N6756, 2N6758, 2N6760 and 2N6762 number series.
- JAN, JANTX, and JANTXV qualifications are available per MIL-PRF-19500/542. (See [part nomenclature](#) for all available options.)
- RoHS compliant versions available (commercial grade only).

### APPLICATIONS / BENEFITS

- Low-profile metal can design.
- Military and other high-reliability applications.

### MAXIMUM RATINGS @ T<sub>A</sub> = +25°C unless otherwise stated

Parameters / Test Conditions	Symbol	Value	Unit
Operating & Storage Junction Temperature Range	T <sub>J</sub> & T <sub>stg</sub>	-55 to +150	°C
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	1.67	°C/W
Total Power Dissipation	P <sub>T</sub>	4 75	W
		@ T <sub>A</sub> = +25 °C	
		@ T <sub>C</sub> = +25 °C <sup>(1)</sup>	
Drain-Source Voltage, dc	V <sub>DS</sub>	100 200 400 500	V
		2N6756	
		2N6758	
		2N6760	
		2N6762	
Gate-Source Voltage, dc	V <sub>GS</sub>	± 20	V
Drain Current, dc @ T <sub>C</sub> = +25 °C <sup>(2)</sup>	I <sub>D1</sub>	14.0 9.0 5.5 4.5	A
		2N6756	
		2N6758	
		2N6760	
		2N6762	
Drain Current, dc @ T <sub>C</sub> = +100 °C <sup>(2)</sup>	I <sub>D2</sub>	9.0 6.0 3.5 3.0	A
		2N6756	
		2N6758	
		2N6760	
		2N6762	
Off-State Current (Peak Total Value) <sup>(3)</sup>	I <sub>DM</sub>	56 36 22 18	A
		2N6756	
		2N6758	
		2N6760	
		2N6762	
Source Current	I <sub>S</sub>	14.0 9.0 5.5 4.5	A
		2N6756	
		2N6758	
		2N6760	
		2N6762	



**TO-204AA (TO-3)  
Package**

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Notes featured on next page.

- NOTES:**
1. Derated linearly by 0.6 W/°C for  $T_C > +25\text{ }^\circ\text{C}$ .
  2. The following formula derives the maximum theoretical ID limit. ID is limited by package and internal wires and may be limited by pin diameter:

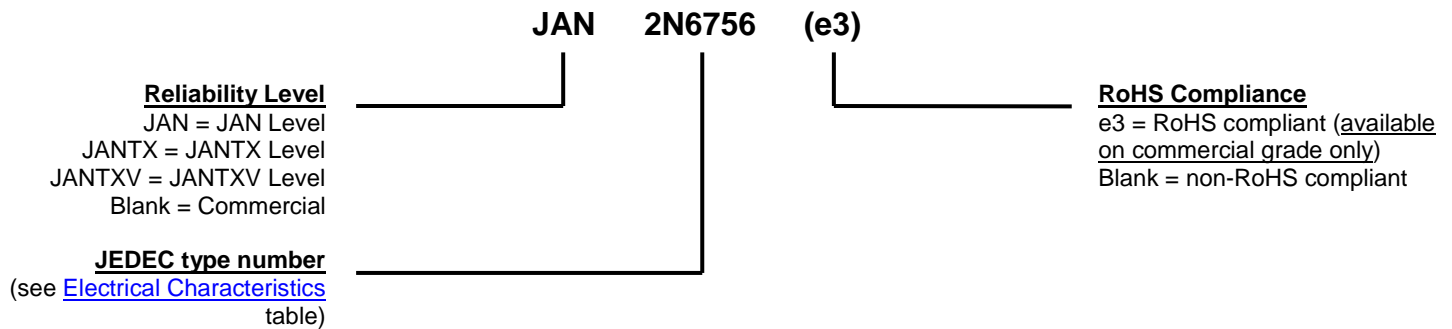
$$I_D = \sqrt{\frac{T_J(\text{max}) - T_C}{R_{\theta JC} \times R_{DS(on)} @ T_J(\text{max})}}$$

3.  $I_{DM} = 4 \times I_{D1}$  as calculated in note 2.

### MECHANICAL and PACKAGING

- CASE: TO-3 metal can.
- TERMINALS: Solder dipped (Sn63/Pb37) over nickel plated alloy 52. RoHS compliant matte-tin plating is available on commercial grade only.
- MARKING: Manufacturer's ID, part number, date code.
- WEIGHT: Approximately 12.7 grams.
- See [Package Dimensions](#) on last page.

### PART NOMENCLATURE



### SYMBOLS & DEFINITIONS

Symbol	Definition
di/dt	Rate of change of diode current while in reverse-recovery mode, recorded as maximum value.
$I_D$	Drain current
$I_F$	Forward current
$R_G$	Gate drive impedance
$T_C$	Case Temperature
$V_{DD}$	Drain supply voltage
$V_{DS}$	Drain source voltage
$V_{GS}$	Gate source voltage

**ELECTRICAL CHARACTERISTICS @  $T_A = +25^\circ\text{C}$ , unless otherwise noted**

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Drain-Source Breakdown Voltage $V_{GS} = 0\text{ V}, I_D = 1.0\text{ mA}$	2N6756 2N6758 2N6760 2N6762 $V_{(BR)DSS}$	100 200 400 500		V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}, I_D = 0.25\text{ mA}$ $V_{DS} \geq V_{GS}, I_D = 0.25\text{ mA}, T_J = +125^\circ\text{C}$ $V_{DS} \geq V_{GS}, I_D = 0.25\text{ mA}, T_J = -55^\circ\text{C}$	$V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	2.0 1.0	4.0 5.0	V
Gate Current $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$ $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}, T_J = +125^\circ\text{C}$	$I_{GSS1}$ $I_{GSS2}$		$\pm 100$ $\pm 200$	nA
Drain Current $V_{GS} = 0\text{ V}, V_{DS} = 80\text{ V}$ $V_{GS} = 0\text{ V}, V_{DS} = 160\text{ V}$ $V_{GS} = 0\text{ V}, V_{DS} = 320\text{ V}$ $V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}$	2N6756 2N6758 2N6760 2N6762 $I_{DSS1}$		25	$\mu\text{A}$
Drain Current $V_{GS} = 0\text{ V}, V_{DS} = 100\text{ V}, T_J = +125^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 200\text{ V}, T_J = +125^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}, T_J = +125^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 500\text{ V}, T_J = +125^\circ\text{C}$	2N6756 2N6758 2N6760 2N6762 $I_{DSS2}$		1.0	mA
Drain Current $V_{GS} = 0\text{ V}, V_{DS} = 80\text{ V}, T_J = +125^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 160\text{ V}, T_J = +125^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 320\text{ V}, T_J = +125^\circ\text{C}$ $V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}, T_J = +125^\circ\text{C}$	2N6756 2N6758 2N6760 2N6762 $I_{DSS3}$		0.25	mA
Static Drain-Source On-State Resistance $V_{GS} = 10\text{ V}, I_D = 9.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 6.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.5\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.0\text{ A pulsed}$	2N6756 2N6758 2N6760 2N6762 $r_{DS(on)1}$		0.18 0.40 1.00 1.50	$\Omega$
Static Drain-Source On-State Resistance $V_{GS} = 10\text{ V}, I_D = 14.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 9.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 5.5\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 4.5\text{ A pulsed}$	2N6756 2N6758 2N6760 2N6762 $r_{DS(on)2}$		.21 .49 1.22 1.80	$\Omega$
Static Drain-Source On-State Resistance $T_J = +125^\circ\text{C}$ $V_{GS} = 10\text{ V}, I_D = 9.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 6.0\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.5\text{ A pulsed}$ $V_{GS} = 10\text{ V}, I_D = 3.0\text{ A pulsed}$	2N6756 2N6758 2N6760 2N6762 $r_{DS(on)3}$		0.34 0.8 2.2 3.3	$\Omega$
Diode Forward Voltage $V_{GS} = 0\text{ V}, I_D = 14.0\text{ A pulsed}$ $V_{GS} = 0\text{ V}, I_D = 9.0\text{ A pulsed}$ $V_{GS} = 0\text{ V}, I_D = 5.5\text{ A pulsed}$ $V_{GS} = 0\text{ V}, I_D = 4.5\text{ A pulsed}$	2N6756 2N6758 2N6760 2N6762 $V_{SD}$		1.8 1.6 1.5 1.4	V

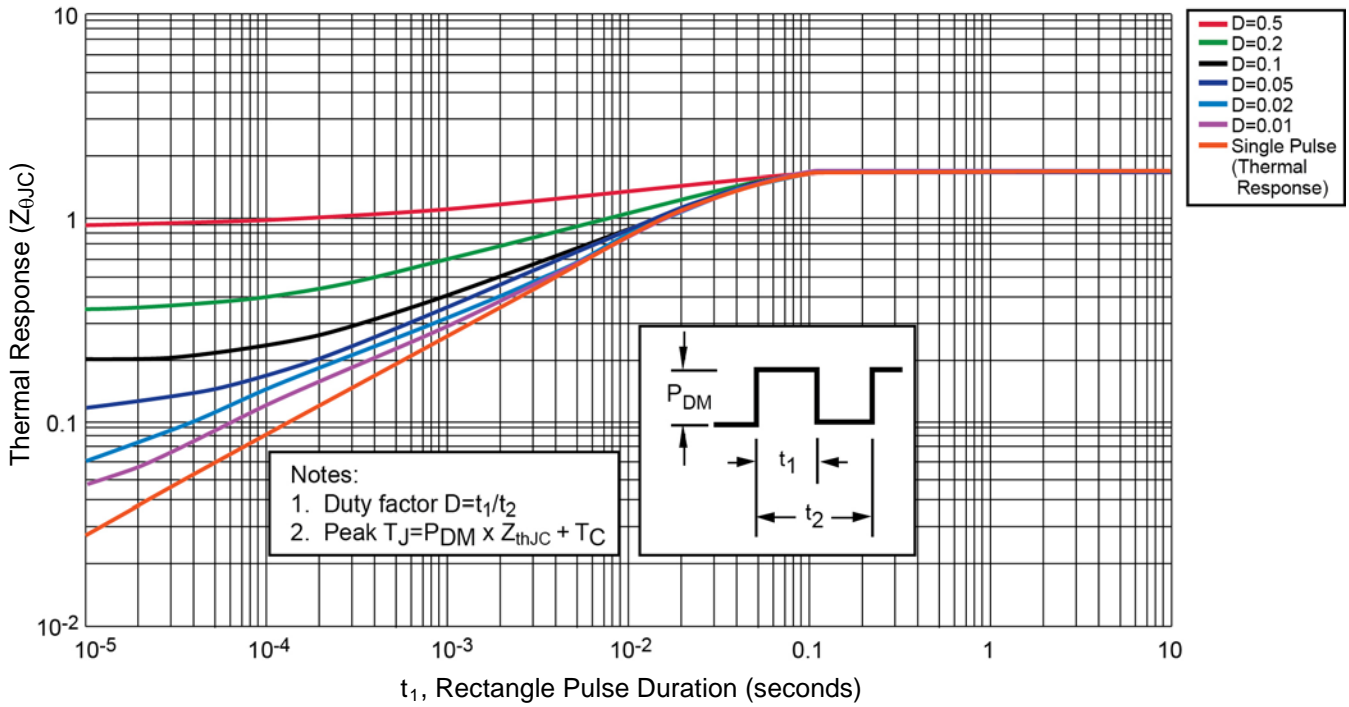
**ELECTRICAL CHARACTERISTICS @  $T_A = +25\text{ }^\circ\text{C}$ , unless otherwise noted (continued)**
**DYNAMIC CHARACTERISTICS**

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>Gate Charge:</b>				
On-State Gate Charge				
$V_{GS} = 10\text{ V}, I_D = 14.0\text{ A}, V_{DS} = 80\text{ V}$ 2N6756	$Q_{g(on)}$		35	nC
$V_{GS} = 10\text{ V}, I_D = 9.0\text{ A}, V_{DS} = 160\text{ V}$ 2N6758			39	
$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}, V_{DS} = 320\text{ V}$ 2N6760			39	
$V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}, V_{DS} = 400\text{ V}$ 2N6762			40	
Gate to Source Charge				
$V_{GS} = 10\text{ V}, I_D = 14.0\text{ A}, V_{DS} = 80\text{ V}$ 2N6756	$Q_{gs}$		10	nC
$V_{GS} = 10\text{ V}, I_D = 9.0\text{ A}, V_{DS} = 160\text{ V}$ 2N6758			5.7	
$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}, V_{DS} = 320\text{ V}$ 2N6760			6.0	
$V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}, V_{DS} = 400\text{ V}$ 2N6762			6.0	
Gate to Drain Charge				
$V_{GS} = 10\text{ V}, I_D = 14.0\text{ A}, V_{DS} = 80\text{ V}$ 2N6756	$Q_{gd}$		15	nC
$V_{GS} = 10\text{ V}, I_D = 9.0\text{ A}, V_{DS} = 160\text{ V}$ 2N6758			20	
$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}, V_{DS} = 320\text{ V}$ 2N6760			20	
$V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}, V_{DS} = 400\text{ V}$ 2N6762			20	

**SWITCHING CHARACTERISTICS**

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>Turn-on delay time</b>				
$I_D = 14.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 50\text{ V}$ 2N6756	$t_{d(on)}$		35	ns
$I_D = 9.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 100\text{ V}$ 2N6758			35	
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 200\text{ V}$ 2N6760			30	
$I_D = 4.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 250\text{ V}$ 2N6762			30	
<b>Rinse time</b>				
$I_D = 14.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 50\text{ V}$ 2N6756	$t_r$		80	ns
$I_D = 9.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 100\text{ V}$ 2N6758			80	
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 200\text{ V}$ 2N6760			40	
$I_D = 4.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 250\text{ V}$ 2N6762			40	
<b>Turn-off delay time</b>				
$I_D = 14.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 50\text{ V}$ 2N6756	$t_{d(off)}$		60	ns
$I_D = 9.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 100\text{ V}$ 2N6758			60	
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 200\text{ V}$ 2N6760			80	
$I_D = 4.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 250\text{ V}$ 2N6762			80	
<b>Fall time</b>				
$I_D = 14.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 50\text{ V}$ 2N6756	$t_f$		45	ns
$I_D = 9.0\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 100\text{ V}$ 2N6758			40	
$I_D = 5.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 200\text{ V}$ 2N6760			35	
$I_D = 4.5\text{ A}, V_{GS} = +10\text{ V}, R_G = 7.5\text{ }\Omega, V_{DD} = 250\text{ V}$ 2N6762			30	
<b>Diode Reverse Recovery Time</b>				
$di/dt = 100\text{ A}/\mu\text{s}, V_{DD} \leq 30\text{ V}, I_D = 14.0\text{ A}$ 2N6756	$t_{rr}$		300	ns
$di/dt = 100\text{ A}/\mu\text{s}, V_{DD} \leq 30\text{ V}, I_D = 9.0\text{ A}$ 2N6758			500	
$di/dt = 100\text{ A}/\mu\text{s}, V_{DD} \leq 30\text{ V}, I_D = 5.5\text{ A}$ 2N6760			700	
$di/dt = 100\text{ A}/\mu\text{s}, V_{DD} \leq 30\text{ V}, I_D = 4.5\text{ A}$ 2N6762			900	

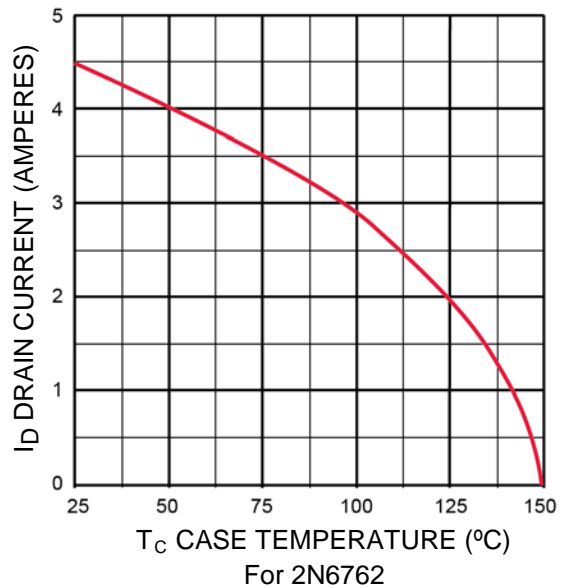
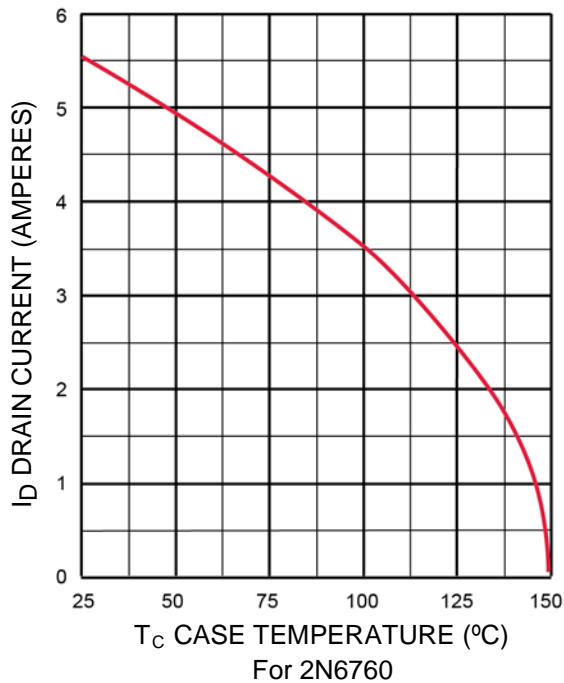
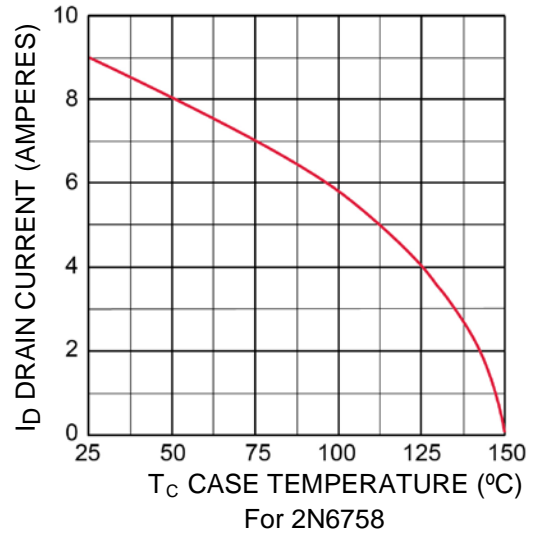
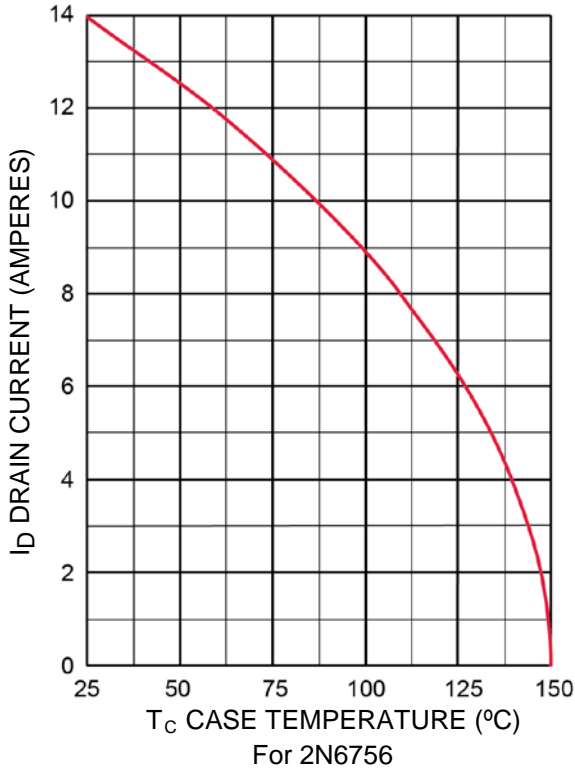
GRAPHS



**FIGURE 1**  
Thermal Response Curves

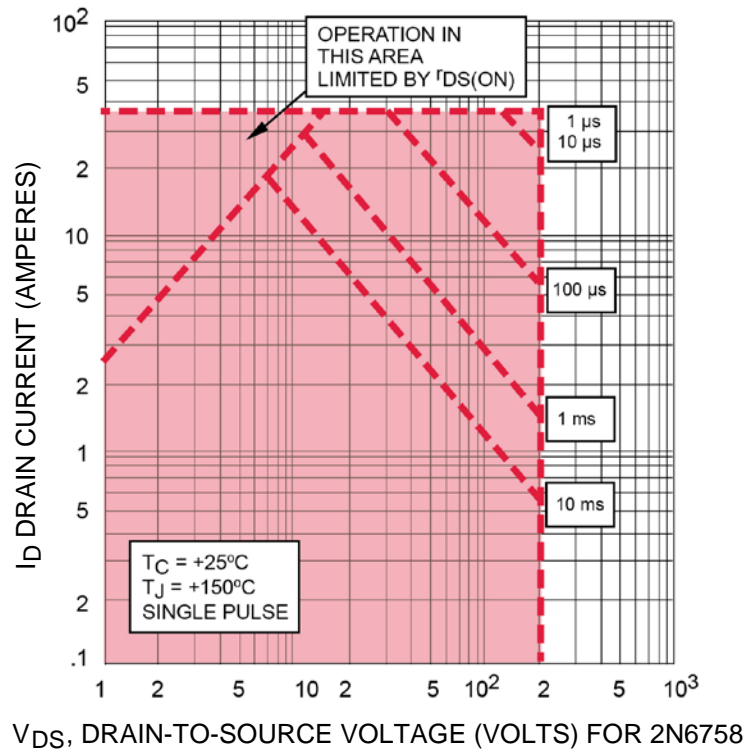
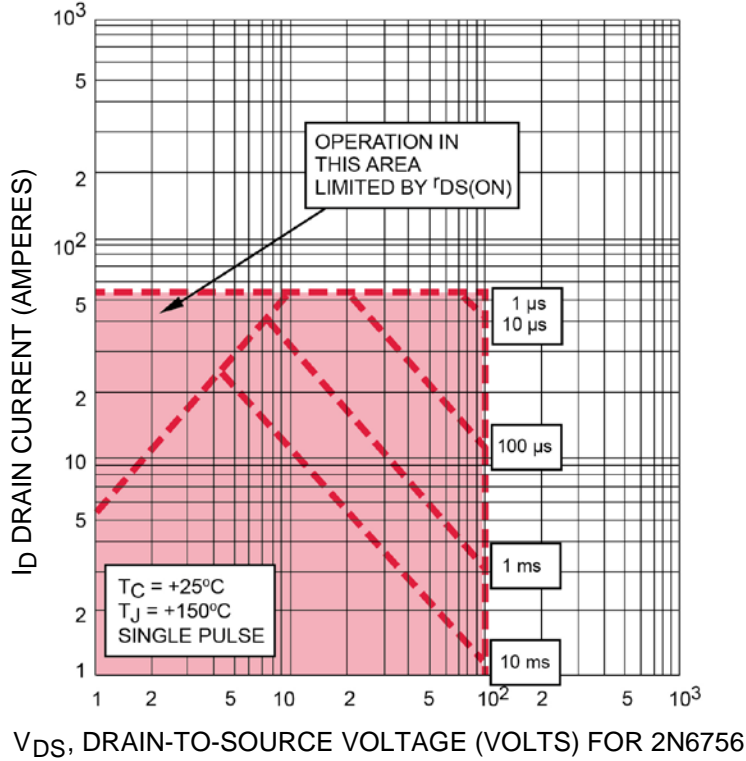
**GRAPHS (continued)**

**FIGURE 2**  
Maximum Drain Current vs Case Temperature



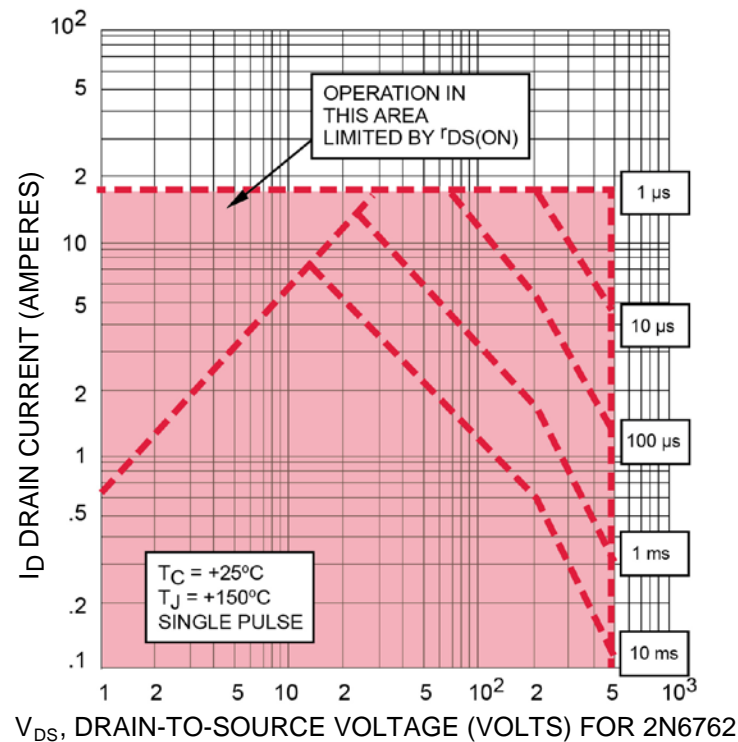
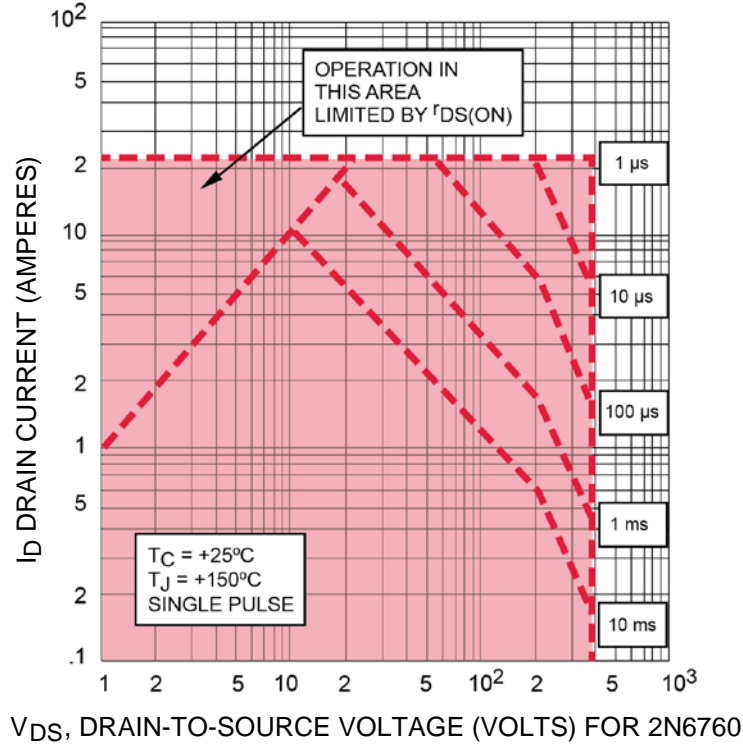
GRAPHS (continued)

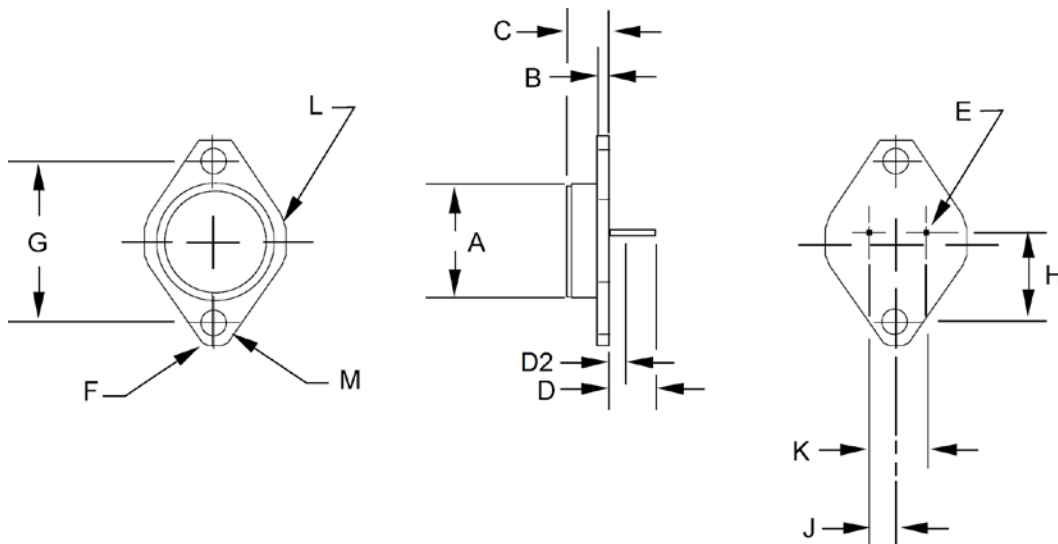
**FIGURE 3**  
Safe Operating Area



GRAPHS (continued)

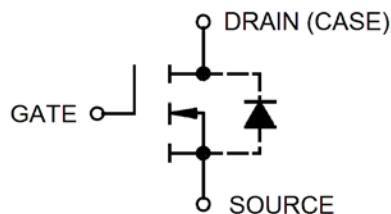
**FIGURE 3**  
Safe Operating Area



**PACKAGE DIMENSIONS**

**NOTE:**



- Dimensions are in inches.
- Millimeters are given for general information only.
- These dimensions should be measured at points .050 inch (1.27 mm) and .055 inch (1.40 mm) below seating plane. When gauge is not used measurement will be made at the seating plane.
- The seating plane of the header shall be flat within .001 inch (0.03 mm) concave to .004 inch (0.10 mm) convex inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.
- Mounting holes shall be deburred on the seating plane side.
- Drain is electrically connected to the case.
- In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.

DIM	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
<b>A</b>	-	.875	-	22.23	
<b>B</b>	.060	.135	1.52	3.43	
<b>C</b>	.250	.360	6.35	9.14	
<b>D</b>	.312	.500	7.92	12.70	
<b>D2</b>	-	.050	-	1.27	
<b>E</b>	.038	.043	0.97	1.09	DIA.
<b>F</b>	.131	.188	3.33	4.78	Radius
<b>G</b>	1.177	1.197	29.90	30.40	
<b>H</b>	.655	.675	16.64	17.15	
<b>J</b>	.205	.225	5.21	5.72	3, 5
<b>K</b>	.420	.440	10.67	11.18	3, 5
<b>L</b>	.495	.525	12.57	13.34	Radius
<b>M</b>	.151	.161	3.84	4.09	DIA.

**SCHEMATIC**


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