NOTES:
1. Derate linearly by 1.2 W/ºC for T_C > +25 ºC.
2. The following formula derives the maximum theoretical I_D limit. I_D is limited by package and internal wires and may also be limited by pin diameter:

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

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 also 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

JAN 2N6764 (e3)

Reliability Level
JAN = JAN Level
JANTX = JANTX Level
JANTXV = JANTXV Level
Blank = Commercial

JEDEC type number
(see Electrical Characteristics table)

RoHS Compliance
e3 = RoHS compliant (available on commercial grade only)
Blank = non-RoHS compliant

SYMBOLS & DEFINITIONS

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

ELECTRICAL CHARACTERISTICS @ T_A = +25 °C, unless otherwise noted

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage					
V_{GS} = 0 V, I_D = 1.0 mA	2N6764	$V_{(BR)DSS}$	100		V
	2N6766		200		
	2N6768		400		
	2N6770		500		
Gate-Source Voltage (Threshold)					
$V_{DS} \geq V_{GS}$, I_D = 0.25 mA		$V_{GS(th)1}$	2.0	4.0	V
$V_{DS} \geq V_{GS}$, I_D = 0.25 mA, T_J = +125 °C		$V_{GS(th)2}$	1.0		
$V_{DS} \geq V_{GS}$, I_D = 0.25 mA, T_J = -55 °C		$V_{GS(th)3}$		5.0	
Gate Current					
V_{GS} = ± 20 V, V_{DS} = 0 V		I_{GSS1}		±100	nA
V_{GS} = ± 20 V, V_{DS} = 0 V, T_J = +125 °C		I_{GSS2}		±200	
Drain Current					
V_{GS} = 0 V, V_{DS} = 80 V	2N6764	I_{DSS1}		25	µA
V_{GS} = 0 V, V_{DS} = 160 V	2N6766				
V_{GS} = 0 V, V_{DS} = 320 V	2N6768				
V_{GS} = 0 V, V_{DS} = 400 V	2N6770				
Drain Current					
V_{GS} = 0 V, V_{DS} = 100 V, T_J = +125 °C	2N6764	I_{DSS2}		1.0	mA
V_{GS} = 0 V, V_{DS} = 200 V, T_J = +125 °C	2N6766				
V_{GS} = 0 V, V_{DS} = 400 V, T_J = +125 °C	2N6768				
V_{GS} = 0 V, V_{DS} = 500 V, T_J = +125 °C	2N6770				
Drain Current					
V_{GS} = 0 V, V_{DS} = 80 V, T_J = +125 °C	2N6764	I_{DSS3}		0.25	mA
V_{GS} = 0 V, V_{DS} = 160 V, T_J = +125 °C	2N6766				
V_{GS} = 0 V, V_{DS} = 320 V, T_J = +125 °C	2N6768				
V_{GS} = 0 V, V_{DS} = 400 V, T_J = +125 °C	2N6770				
Static Drain-Source On-State Resistance					
V_{GS} = 10 V, I_D = 24.0 A pulsed	2N6764	$r_{DS(on)1}$		0.055	Ω
V_{GS} = 10 V, I_D = 19.0 A pulsed	2N6766			0.085	
V_{GS} = 10 V, I_D = 9.0 A pulsed	2N6768			0.3	
V_{GS} = 10 V, I_D = 7.75 A pulsed	2N6770			0.4	
Static Drain-Source On-State Resistance					
V_{GS} = 10 V, I_D = 38.0 A pulsed	2N6764	$r_{DS(on)2}$		0.065	Ω
V_{GS} = 10 V, I_D = 30.0 A pulsed	2N6766			0.09	
V_{GS} = 10 V, I_D = 14.0 A pulsed	2N6768			0.4	
V_{GS} = 10 V, I_D = 12.0 A pulsed	2N6770			0.5	
Static Drain-Source On-State Resistance					
T_J = +125 °C					
V_{GS} = 10 V, I_D = 24.0 A pulsed	2N6764	$r_{DS(on)3}$		0.094	Ω
V_{GS} = 10 V, I_D = 19.0 A pulsed	2N6766			0.153	
V_{GS} = 10 V, I_D = 9.0 A pulsed	2N6768			0.66	
V_{GS} = 10 V, I_D = 7.75 A pulsed	2N6770			0.88	
Diode Forward Voltage					
V_{GS} = 0 V, I_D = 38.0 A pulsed	2N6764	V_{SD}		1.9	V
V_{GS} = 0 V, I_D = 30.0 A pulsed	2N6766			1.9	
V_{GS} = 0 V, I_D = 14.0 A pulsed	2N6768			1.7	
V_{GS} = 0 V, I_D = 12.0 A pulsed	2N6770			1.7	

ELECTRICAL CHARACTERISTICS @ T_A = +25 °C, unless otherwise noted (continued)

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Gate Charge:					
On-State Gate Charge		$Q_{g(on)}$			nC
V_{GS} = 10 V, I_D = 38.0 A, V_{DS} = 50 V	2N6764			125	
V_{GS} = 10 V, I_D = 30.0 A, V_{DS} = 100 V	2N6766			115	
V_{GS} = 10 V, I_D = 14.0 A, V_{DS} = 200 V	2N6768			110	
V_{GS} = 10 V, I_D = 12.0 A, V_{DS} = 250 V	2N6770			120	
Gate to Source Charge		Q_{gs}			nC
V_{GS} = 10 V, I_D = 38.0 A, V_{DS} = 50 V	2N6764			22	
V_{GS} = 10 V, I_D = 30.0 A, V_{DS} = 100 V	2N6766			22	
V_{GS} = 10 V, I_D = 14.0 A, V_{DS} = 200 V	2N6768			18	
V_{GS} = 10 V, I_D = 12.0 A, V_{DS} = 250 V	2N6770			19	
Gate to Drain Charge		Q_{gd}			nC
V_{GS} = 10 V, I_D = 38.0 A, V_{DS} = 50 V	2N6764			65	
V_{GS} = 10 V, I_D = 30.0 A, V_{DS} = 100 V	2N6766			60	
V_{GS} = 10 V, I_D = 14.0 A, V_{DS} = 200 V	2N6768			65	
V_{GS} = 10 V, I_D = 12.0 A, V_{DS} = 250 V	2N6770			70	

SWITCHING CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Turn-on delay time		$t_{d(on)}$		35	ns
I_D = 38.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 50 V	2N6764				
I_D = 30.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 100 V	2N6766				
I_D = 14.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 200 V	2N6768				
I_D = 12.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 250 V	2N6770				
Rise time		t_r		190	ns
I_D = 38.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 50 V	2N6764				
I_D = 30.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 100 V	2N6766				
I_D = 14.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 200 V	2N6768				
I_D = 12.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 250 V	2N6770				
Turn-off delay time		$t_{d(off)}$		170	ns
I_D = 38.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 50 V	2N6764				
I_D = 30.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 100 V	2N6766				
I_D = 14.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 200 V	2N6768				
I_D = 12.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 250 V	2N6770				
Fall time		t_f		130	ns
I_D = 38.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 50 V	2N6764				
I_D = 30.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 100 V	2N6766				
I_D = 14.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 200 V	2N6768				
I_D = 12.0 A, V_{GS} = 10 V, R_G = 2.35 Ω, V_{DD} = 250 V	2N6770				
Diode Reverse Recovery Time		t_{rr}			ns
di/dt = 100 A/µs, V_{DD} ≤ 30 V, I_D = 38.0 A	2N6764			500	
di/dt = 100 A/µs, V_{DD} ≤ 30 V, I_D = 30.0 A	2N6766			950	
di/dt = 100 A/µs, V_{DD} ≤ 30 V, I_D = 14.0 A	2N6768			1200	
di/dt = 100 A/µs, V_{DD} ≤ 30 V, I_D = 12.0 A	2N6770			1600	

GRAPHS

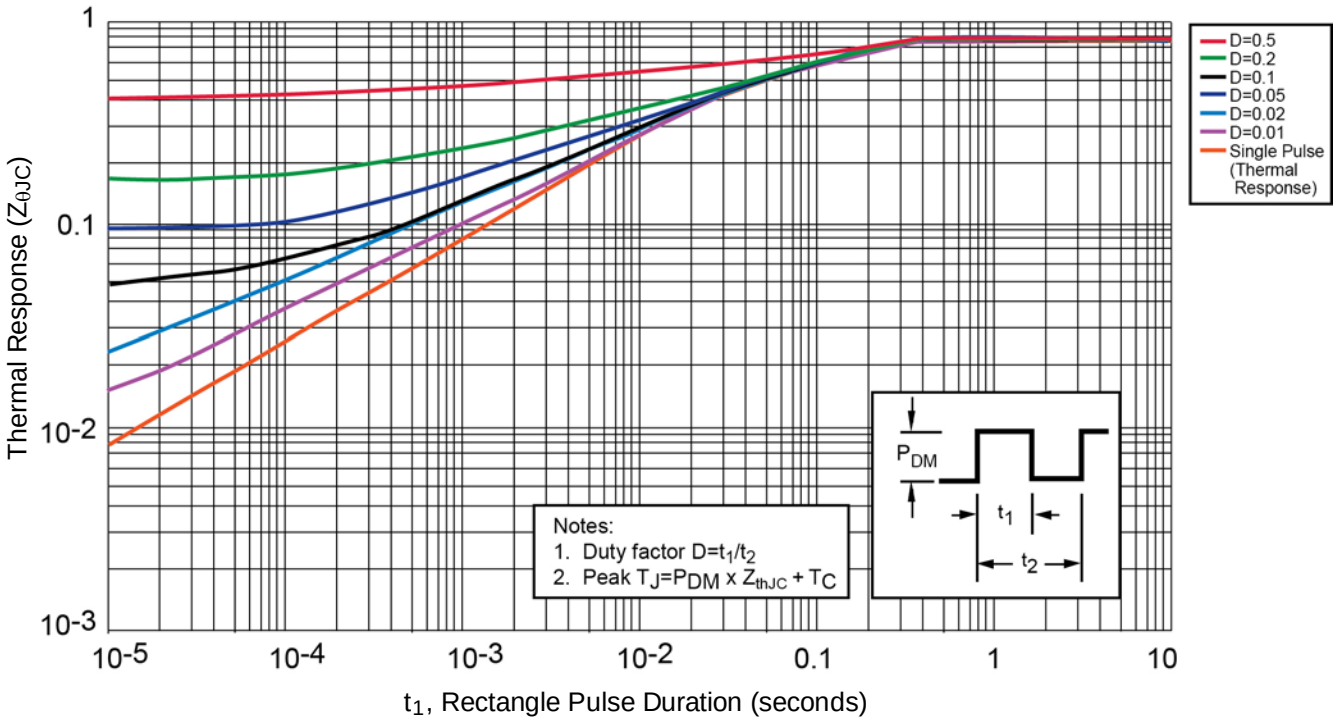
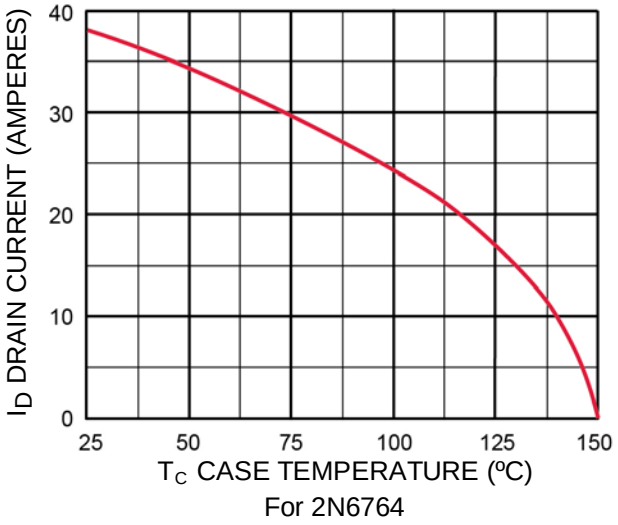


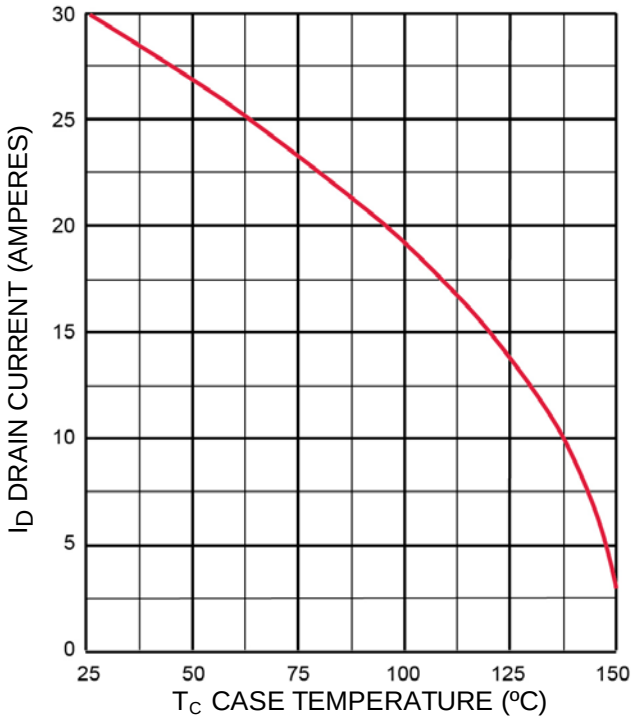
FIGURE 1
Thermal Response Curves

GRAPHS (continued)

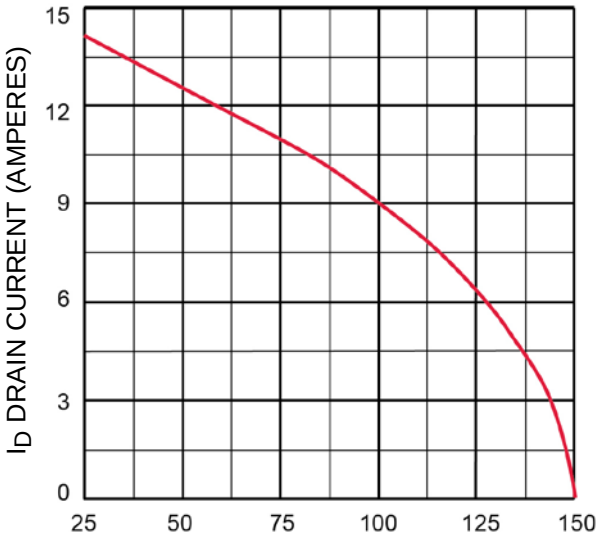
FIGURE 2 – Maximum Drain Current vs Case Temperature Graphs



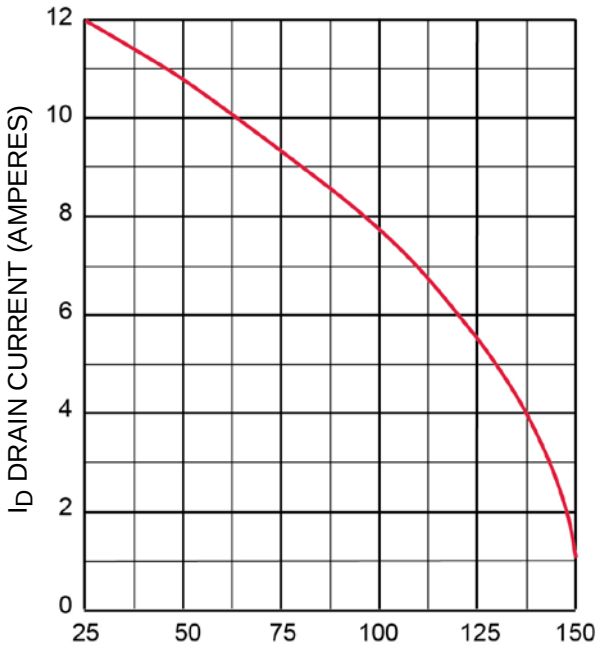
For 2N6764



For 2N6766



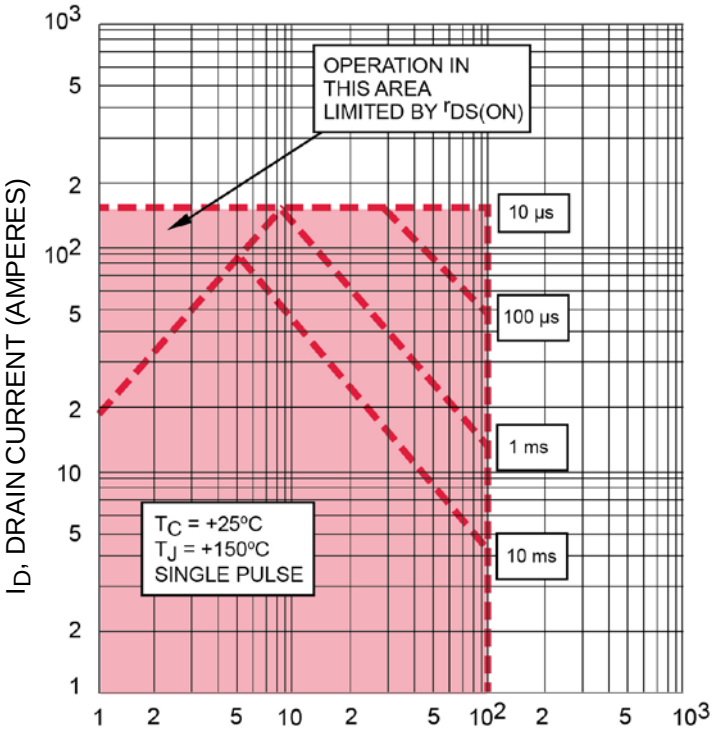
For 2N6768

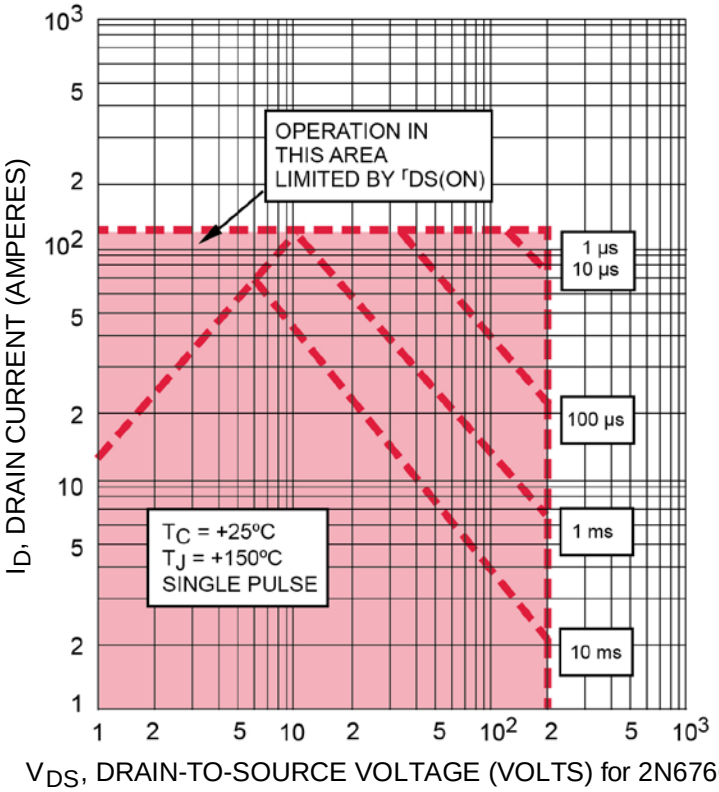


For 2N6770

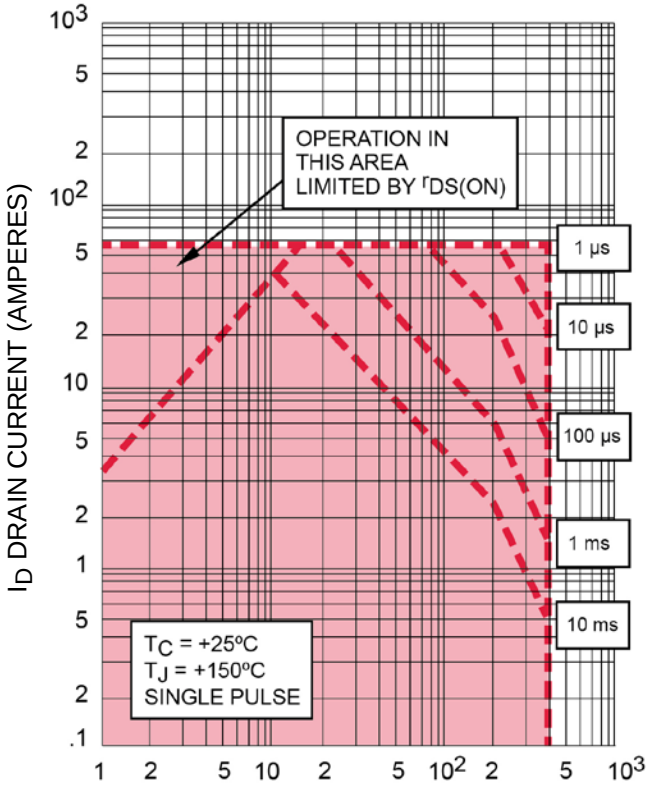
GRAPHS (continued)

FIGURE 3 – Maximum Safe Operating Area

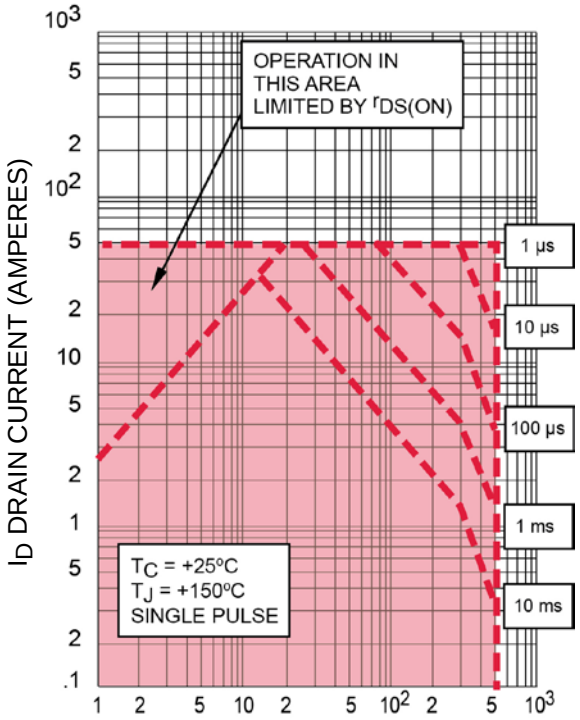




GRAPHS (continued)

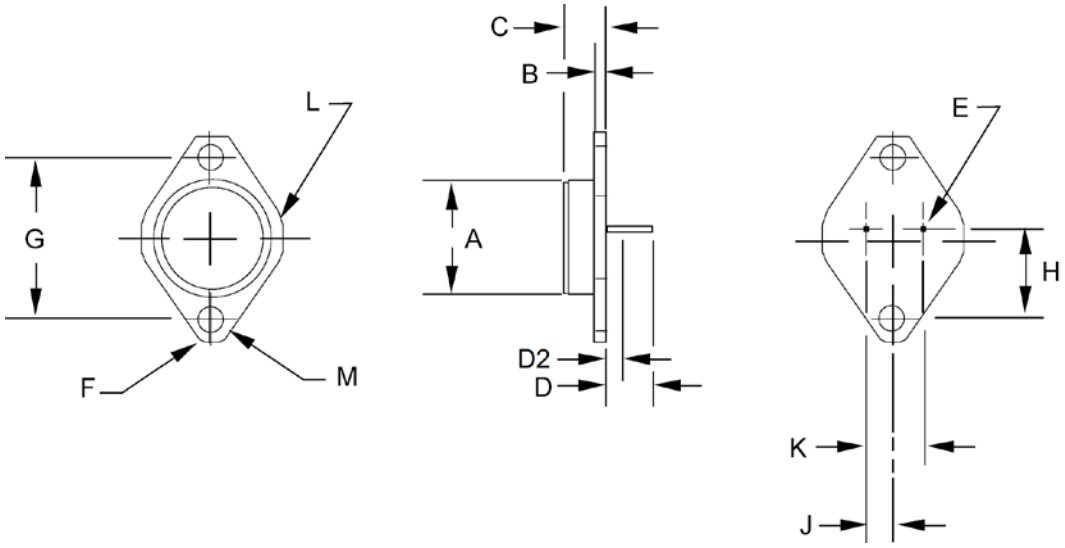


for 2N6768



for 2N6770

PACKAGE DIMENSIONS



NOTE:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. These dimensions should be measured at points .050 inch (1.27 mm) and .055 inch (1.40 mm) below the seating plane. When gauge is not used measurement will be made at the seating plane.
4. 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.
5. These dimensions pertain to the 2N6764 and 2N6766 types.
6. These dimensions pertain to the 2N6768 and 2N6770 types.
7. Mounting holes shall be deburred on the seating plane side.
8. Drain is electrically connected to the case.
9. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

DIM	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.875	-	22.23	
B	0.060	0.135	1.52	3.43	
C	0.250	0.360	6.35	9.15	
D	0.312	0.500	7.92	12.70	
D2	-	0.050	-	1.27	(3)
E	0.057 0.038	0.063 0.043	1.45 0.97	1.60 1.10	DIA. (5) DIA. (6)
F	0.131	0.188	3.33	4.78	Radius
G	1.177	1.197	29.90	30.40	
H	0.655	0.675	16.64	17.15	
J	0.205	0.225	5.21	5.72	
K	0.420	0.440	10.67	11.18	
L	0.495	0.525	12.57	13.3	Radius
M	0.151	0.161	3.84	4.09	DIA. (7)

SCHEMATIC