

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
80V	9mΩ@10V	80A

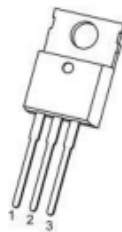
## Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

## Applications

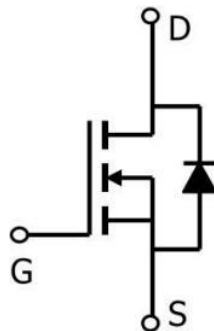
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

## Package

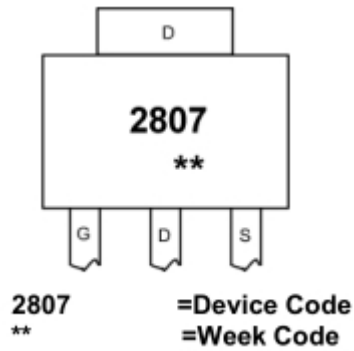


TO-220-3L-C(G:1 D:2 S:3)

## Circuit diagram



## Marking



## Absolute maximum ratings

( $T_a=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	80	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current <sup>1</sup> ( $T_C=25^\circ\text{C}$ )	$I_D$	80	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	320	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	1280	
Total Power Dissipation( $T_C=25^\circ\text{C}$ )	$P_D$	230	W
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	0.54	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_J$	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_{STG}$	-55 to 150	$^\circ\text{C}$

## Electrical characteristics

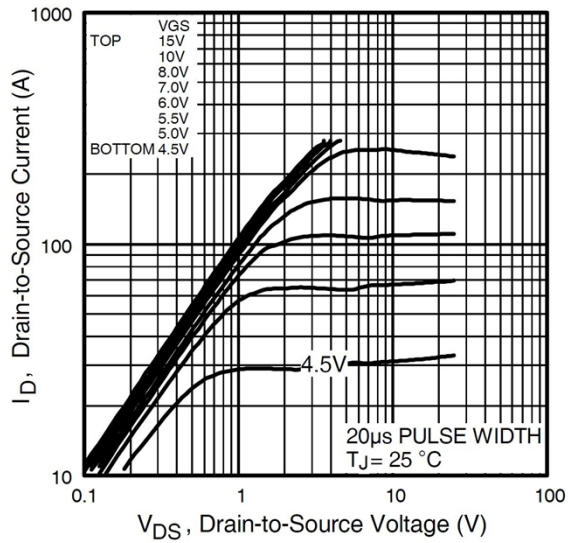
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	80			V
Bvdss Temperature Coefficient	$\Delta BV_{DSS}/\Delta T$	$I_D = 250\mu A$ , Reference $25^{\circ}C$		0.074		V/ $^{\circ}C$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V, T_J = 25^{\circ}C$			3	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 25V, V_{DS} = 0V$			$\pm 100$	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Static Drain-Source on-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		9	13	m $\Omega$
Dynamic Characteristics <sup>4)</sup>						
Input capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V$ , f=1MHz		3620		pF
Output capacitance	$C_{oss}$			620		
Reverse transfer capacitance	$C_{rss}$			126		
Switching Characteristics <sup>4)</sup>						
Total gate charge	$Q_g$	$V_{DS} = 40V, V_{GS} = 10V$ , $I_D = 80A$		176		nC
Gate-source charge	$Q_{gs}$			23		
Gate-drain charge	$Q_{gd}$			52		
Turn-on Delay Time	$T_{d(on)}$	$V_{DD} = 180V$ , $V_{GS} = 10V, R_{GEN} = 10\Omega, I_D = 20A$		28		nS
Turn-on Rise Time	$T_r$			47		
Turn-Off Delay Time	$T_{d(off)}$			57		
Turn-Off Fall Time	$t_f$			40		

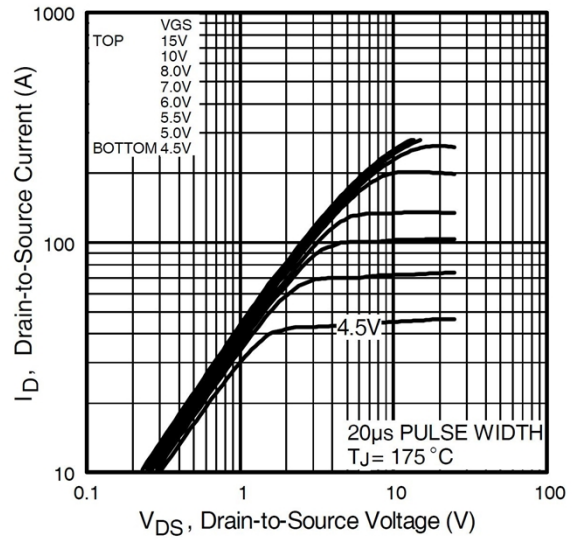
### Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZcopper.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is  $V_{DD}=40V, R_G = 25\Omega, L=0.5mH$

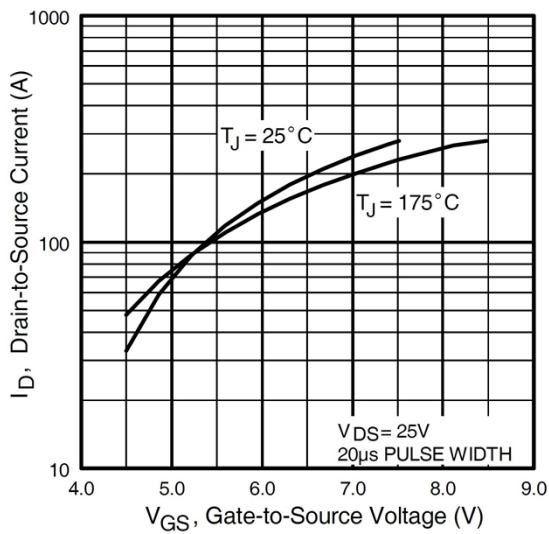
## Typical Characteristics



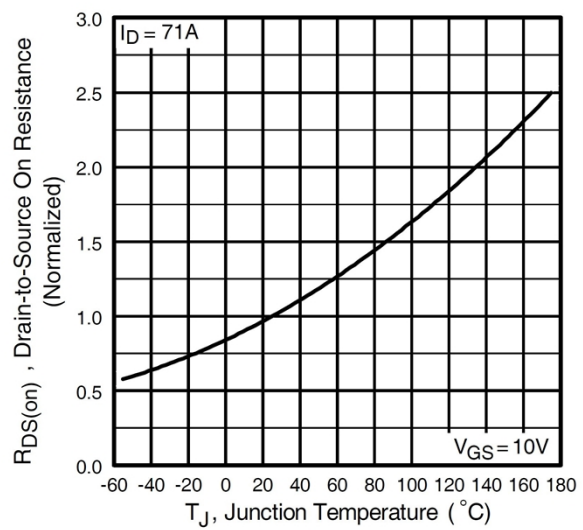
Typical Output Characteristics



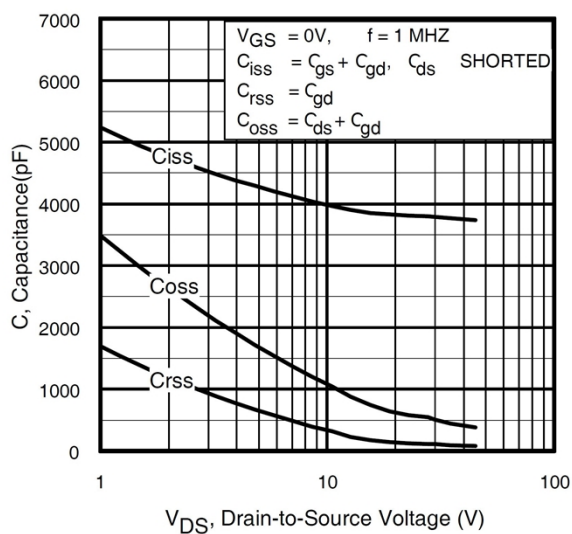
Typical Output Characteristics



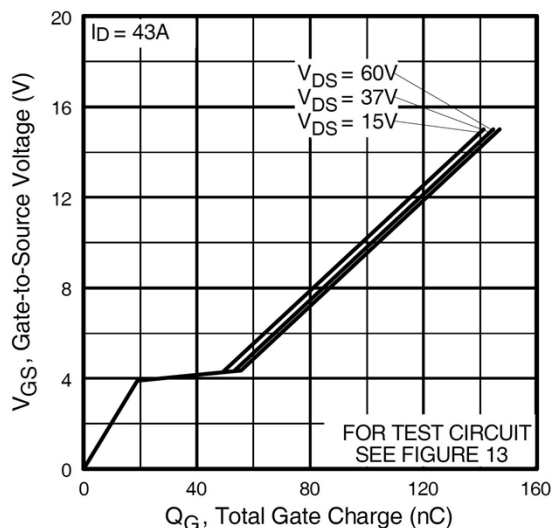
Typical Transfer Characteristics



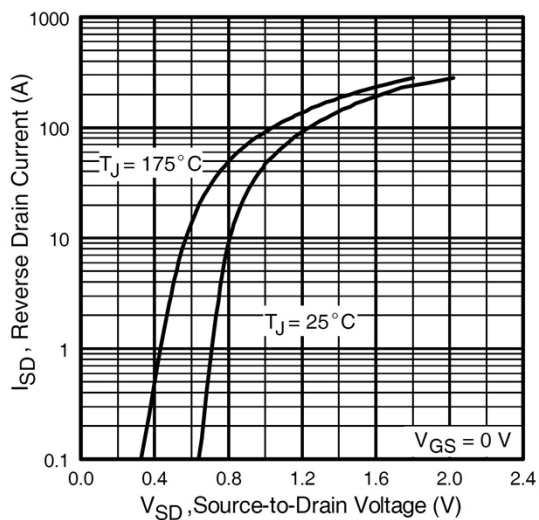
Normalized On-Resistance Vs. Temperature



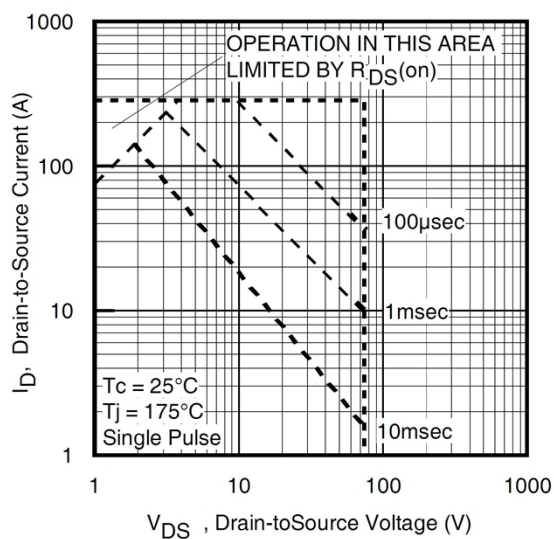
**Typical Capacitance Vs. Drain-to-Source Voltage**



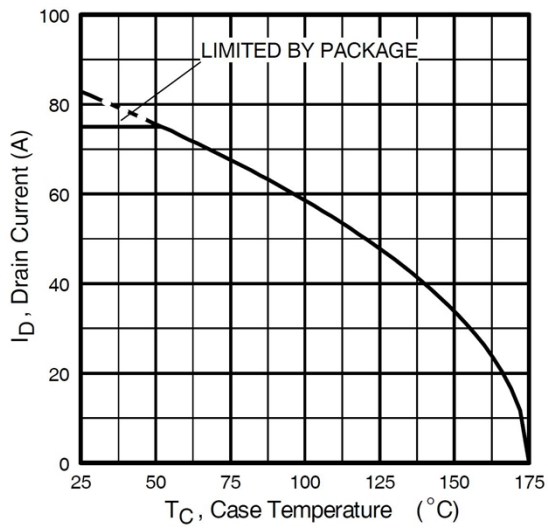
**Typical Gate Charge Vs. Gate-to-Source Voltage**



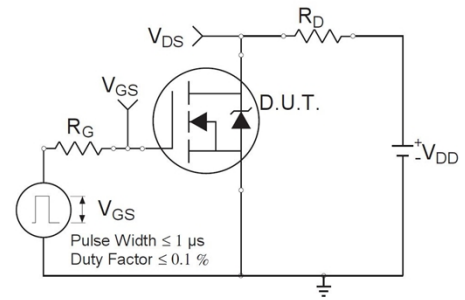
**Typical Source-Drain Diode Forward Voltage**



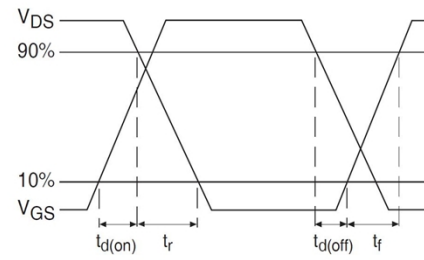
**Maximum Safe Operating Area**



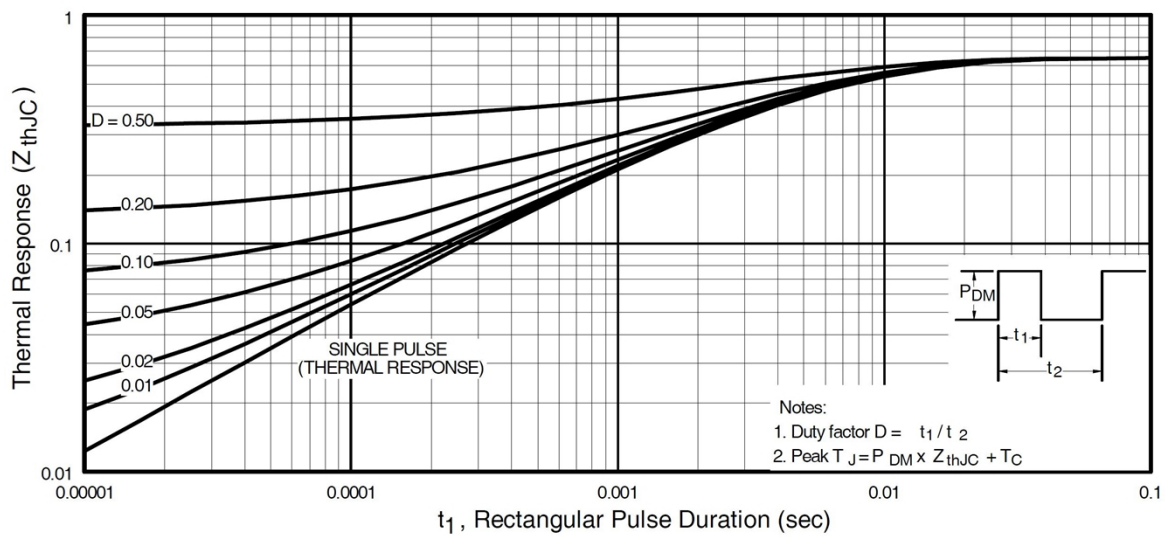
**Maximum Drain Current Vs. Case Temperature**



**Fig 10a. Switching Time Test Circuit**

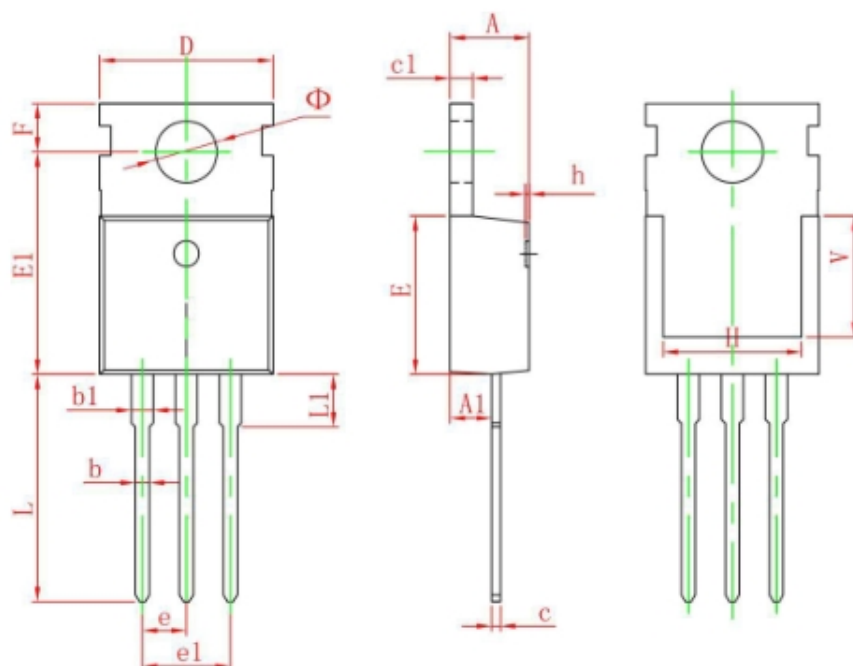


**Switching Time Waveforms**



**Maximum Effective Transient Thermal Impedance, Junction-to-Case**

## TO-220-3L-C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150