

## P-Channel Enhancement Mode Power MOSFET

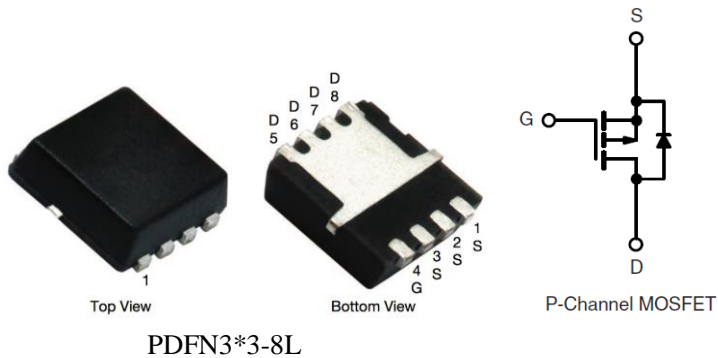
### ● Features

$V_{DS}$	$R_{DS(ON)TYP}$	$I_D$
-20V	6.5 mΩ@-4.5V	-65A
	8 mΩ@-2.5V	

### ● General Description

- load switch
- battery protection applications

### ● Pin Configurations



### ● Absolute Maximum Ratings @ $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		$V_{DSS}$	-20	V
Gate-Source Voltage		$V_{GSS}$	$\pm 12$	V
Drain Current (Continuous) *AC	$T_C=25^\circ\text{C}$	$I_D$	-65	A
	$T_C=100^\circ\text{C}$		-41	
Drain Current (Pulse) *B		$I_{DM}$	-260	A
Single Pulse Avalanche Energy *L=0.5mH, $I_{AS}=-19\text{A}$		$E_{AS}$	90	mJ
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	52	W
Operating Temperature/ Storage Temperature		$T_J/T_{STG}$	-55~150	$^\circ\text{C}$

### ● Thermal Resistance Ratings

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient	Steady State	$R_{thJC}$	2.4	$^\circ\text{C}/\text{W}$

## Electrical Characteristics

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

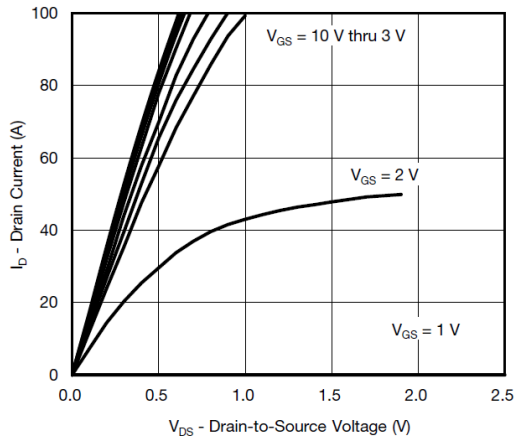
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$	--	--	-1	$\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250\mu A$	-0.3	-0.65	-1	V
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$	--	--	$\pm 100$	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -20A$	--	6.5	8	m $\Omega$
	$R_{DS(on)}$	$V_{GS} = -2.5V, I_D = -20A$	--	8	11	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$I_{SD} = -10A, V_{GS} = 0V$	--	-0.8	-1.2	V
Diode Forward Current *AC	$I_S$	$T_C = 25^{\circ}\text{C}$	--	--	-65	A
<b>Switching</b>						
Total Gate Charge	$Q_g$	$V_{GS} = -4.5V, V_{DS} = -10V, I_D = -10A$	--	57	--	nC
Gate-Source Charge	$Q_{gs}$		--	8	--	nC
Gate-Drain Charge	$Q_{gd}$		--	14	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = -10V, V_{DS} = -10V, R_L = 1\Omega, R_g = 1\Omega$	--	12	--	ns
Turn-on Rise Time	$t_r$		--	10	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	80	--	ns
Turn-Off Fall Time	$t_f$		--	10	--	ns
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -10V, V_{GS} = 0V, f = 200\text{kHz}$	--	5600	--	pF
Output Capacitance	$C_{oss}$		--	600	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	635	--	pF

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design.

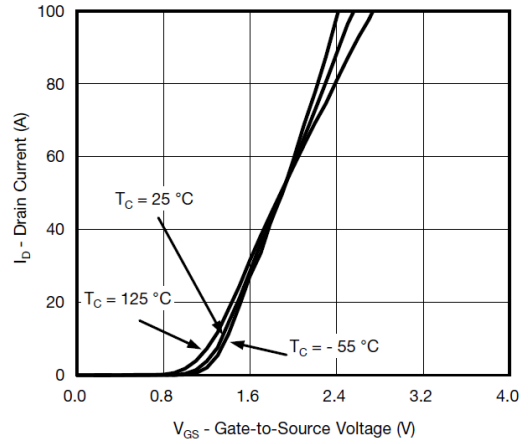
B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the  $t_s \leq 10\text{s}$  junction to ambient thermal resistance rating.

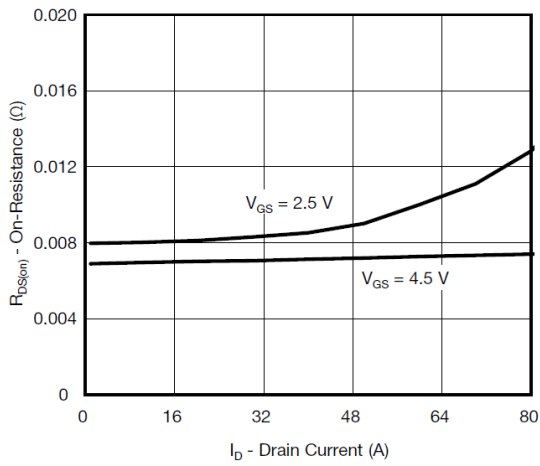
# Typical Electrical and Thermal Characteristics



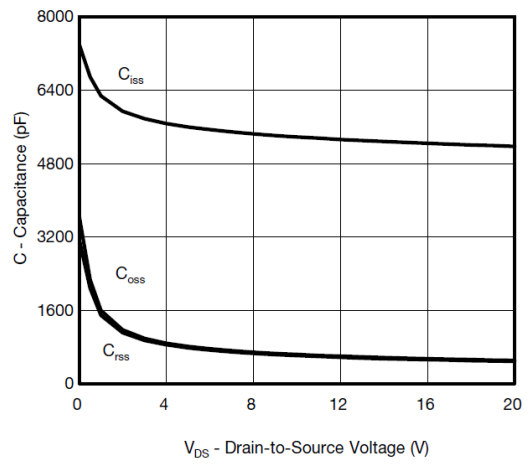
**Output Characteristics**



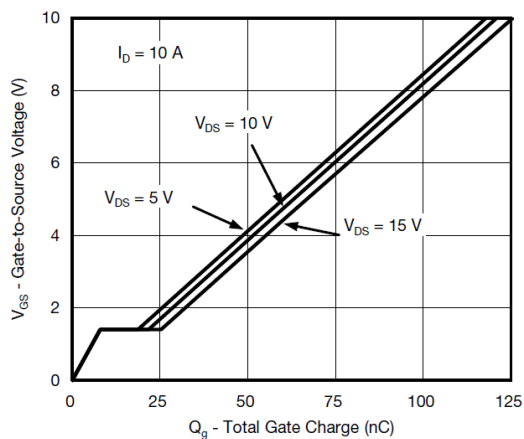
**Transfer Characteristics**



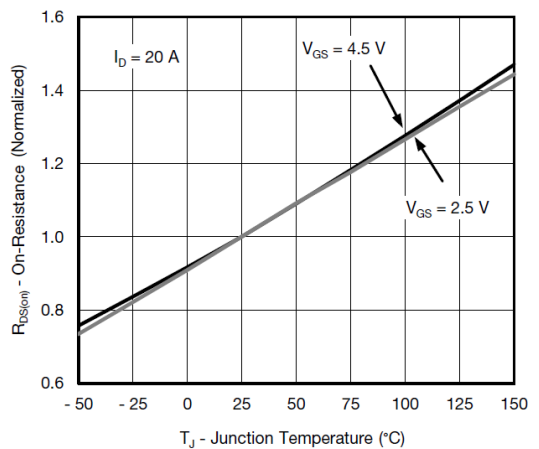
**On-Resistance vs. Drain Current and Gate Voltage**



**Capacitance**

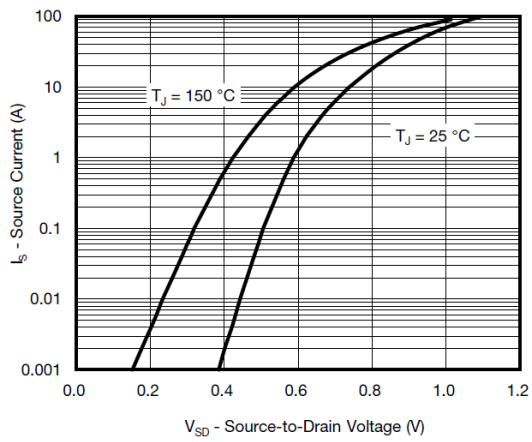


**Gate Charge**

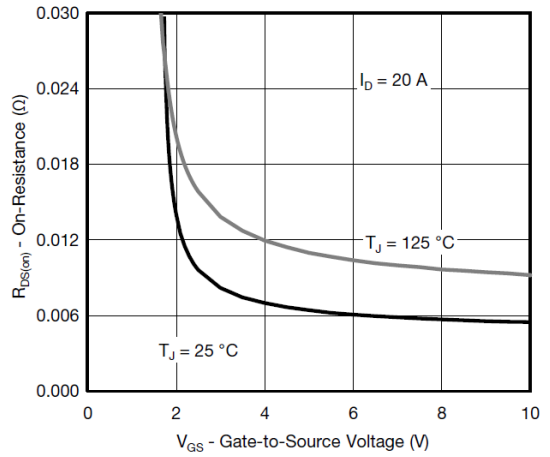


**On-Resistance vs. Junction Temperature**

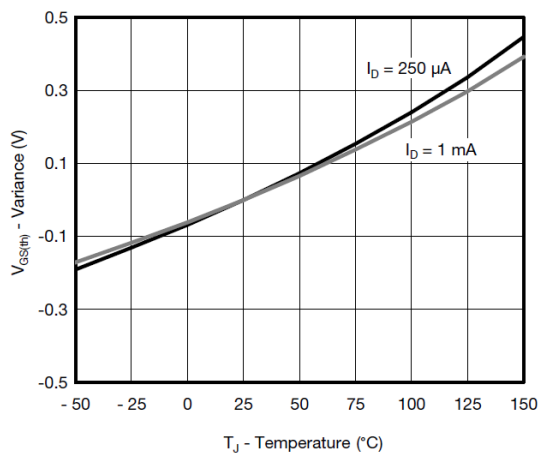
# Typical Electrical and Thermal Characteristics



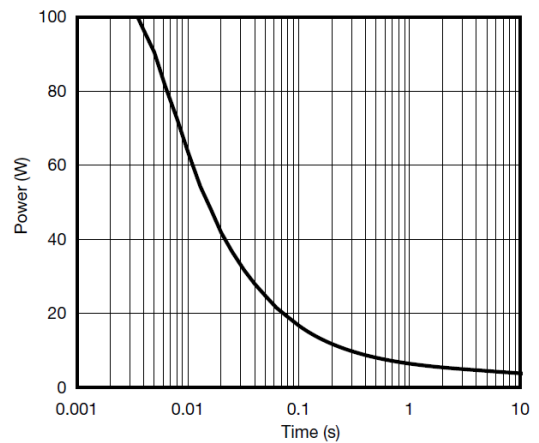
Source-Drain Diode Forward Voltage



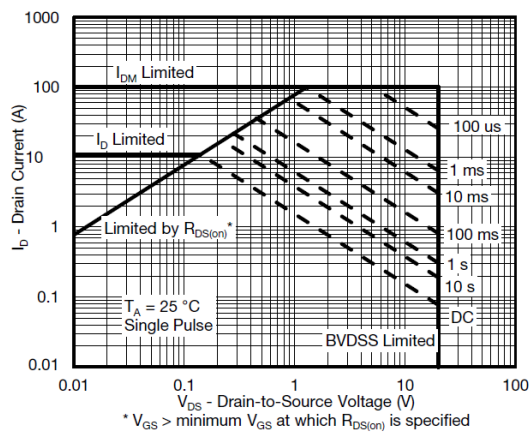
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

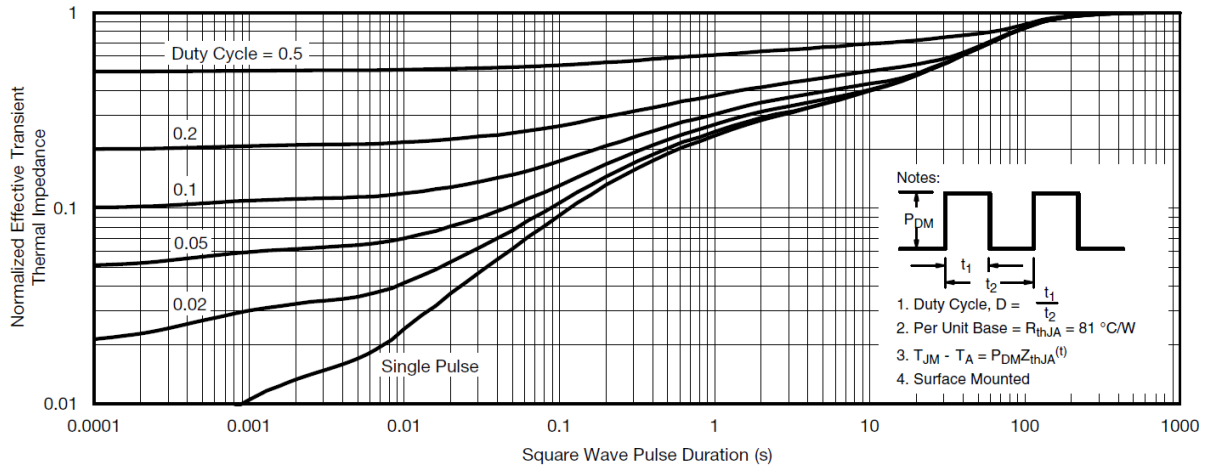


Single Pulse Power, Junction-to-Ambient

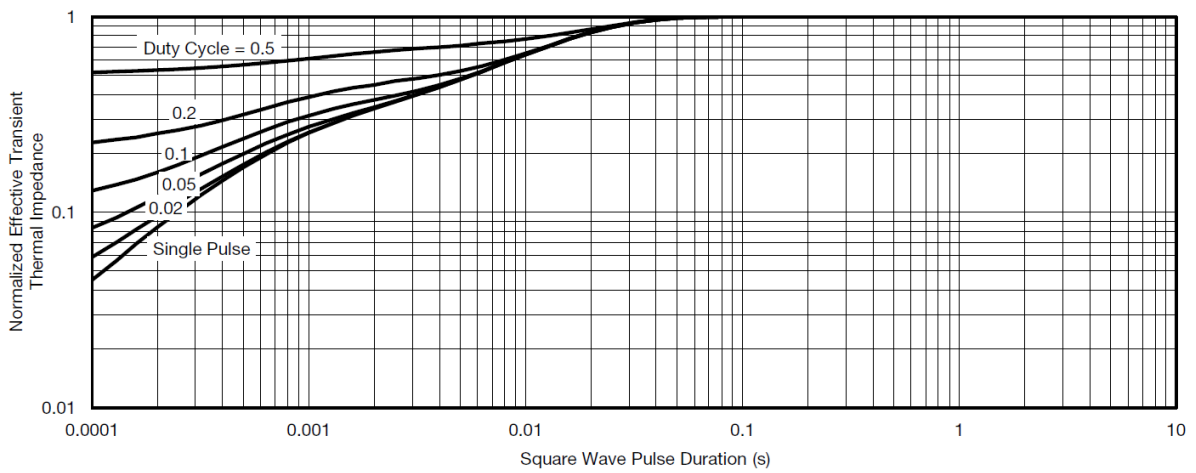


Safe Operating Area, Junction-to-Ambient

# Typical Electrical and Thermal Characteristics

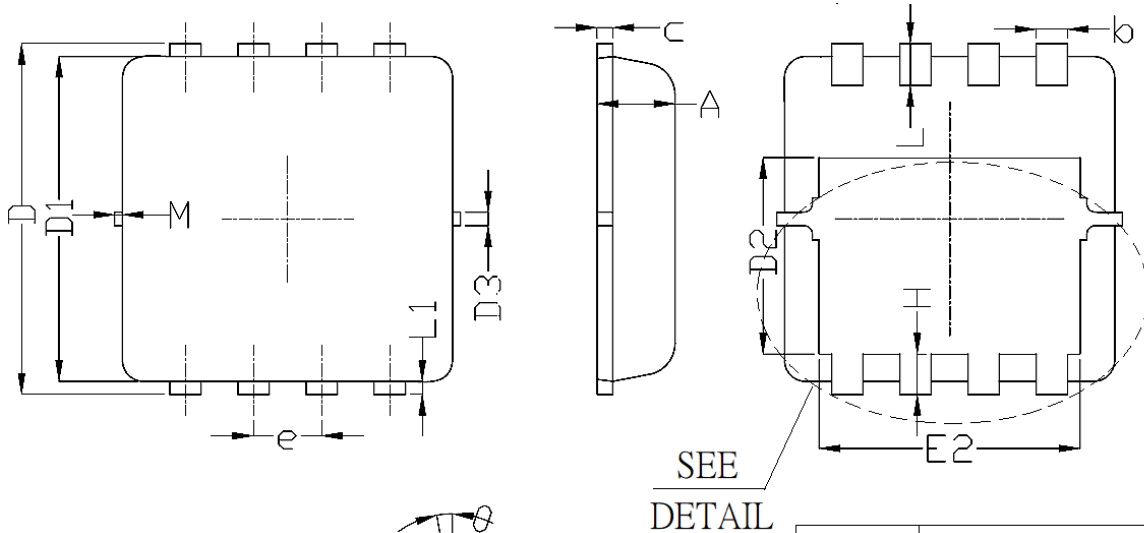


Normalized Thermal Transient Impedance, Junction-to-Ambient

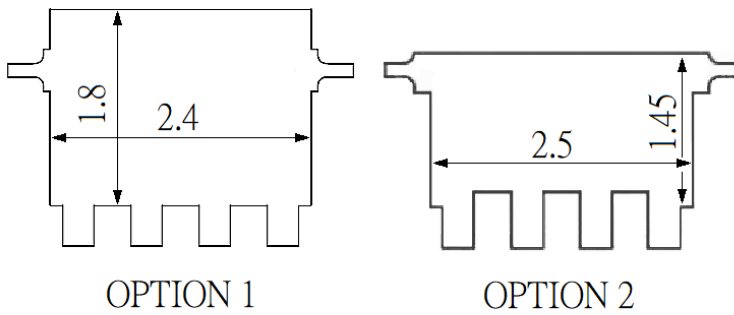
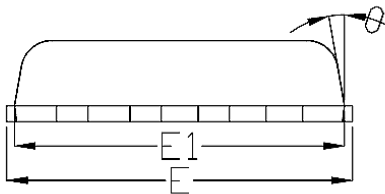


Normalized Thermal Transient Impedance, Junction-to-Case

# Package Information



SEE  
DETAIL



DETAIL

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.7	0.775	0.85
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.15	3.3	3.4
D1	2.95	3.1	3.2
D2	1.7	1.8	1.93
D3		0.13	
E	3.05	3.25	3.35
E1	2.95	3.15	3.2
E2	2.3	2.4	2.55
e	0.65 BSC		
H	0.33	0.43	0.53
L	0.3	0.4	0.5
L1	0.08	0.13	0.18
$\theta$	-	10°	12°
M	-	-	0.15