

## P-Channel Enhancement Mode Power MOSFET

- Features**

$$V_{DS} = -30V,$$

$$I_D = -50A$$

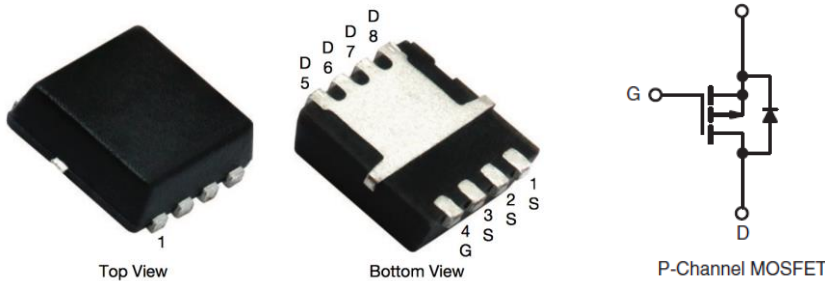
$$R_{DS(ON)} @ V_{GS} = -10V, \text{ TYP } 6m\Omega$$

$$R_{DS(ON)} @ V_{GS} = -4.5V, \text{ TYP } 10.3m\Omega$$

- General Description**

- DC/DC Converters in Computing, Servers, and POL
- Isolated DC/DC Converters in Telecom and Industrial

- Pin Configurations**



PDFN3\*3-8L

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DSS}$	-30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 25$	V
Drain Current (Continuous) *AC	$I_D$	$T_C=25^\circ\text{C}$	-50
		$T_C=70^\circ\text{C}$	-50
Drain Current (Pulse) *B	$I_{DM}$	200	A
Power Dissipation	$P_D$	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	$R_{thJA}$	33	$^\circ\text{C/W}$
Maximum Junction-to-Case (Drain)	$R_{thJC}$	2.4	

**● Electrical Characteristics @ $T_A=25^\circ\text{C}$  unless otherwise noted**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static *D</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -30V, V_{GS} = 0V$	--	--	-1	$\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250\mu A$	-1	--	-3	V
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 25V, V_{DS} = 0V$	--	--	$\pm 100$	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -15A$	--	6	8	m $\Omega$
	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -10A$	--	10.3	13.5	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$I_{SD} = -1A, V_{GS} = 0V$	--	--	-1.2	V
Diode Forward Current *AC	$I_S$	$T_C = 25^\circ\text{C}$	--	--	-43.3	A
<b>Switching</b>						
Total Gate Charge	$Q_g$	$V_{GS} = -10V, V_{DS} = -4.5V,$ $I_D = -10A$	--	32	--	nC
Gate-Source Charge	$Q_{gs}$		--	9	--	nC
Gate-Drain Charge	$Q_{gd}$		--	12	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = -10V, V_{DS} = -10V,$ $R_L = 1.5\Omega, R_{GEN} = 1\Omega$	--	12	--	ns
Turn-on Rise Time	$t_r$		--	10	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	39	--	ns
Turn-Off Fall Time	$t_f$		--	8	--	ns
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=-15V, f=1\text{MHz}$	--	3594	--	pF
Output Capacitance	$C_{oss}$		--	441	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	409	--	pF

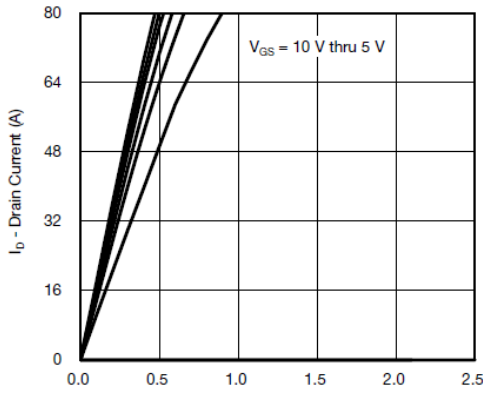
A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

B: Pulse width limited by max. junction temperature.

C: The current rating is based on the  $t_s \leq 10s$  junction to ambient thermal resistance rating, Package Limited 50A.

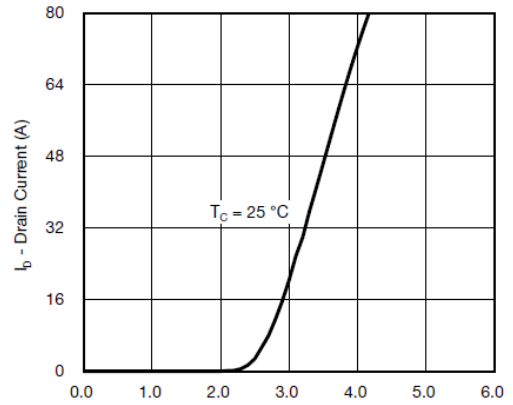
D: Pulse Test: Pulse Wide  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

Typical Performance Characteristics ((T<sub>J</sub> = 25 °C, unless otherwise noted))



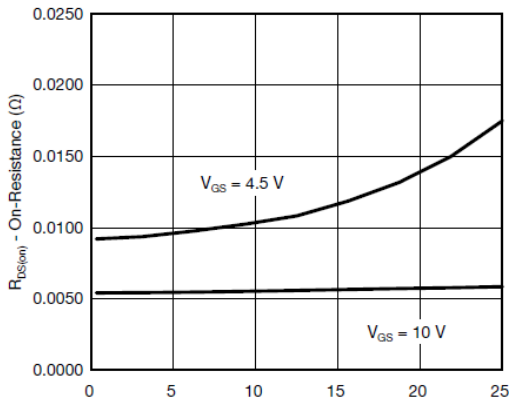
V<sub>DS</sub> - Drain-to-Source Voltage (V)

Output Characteristics



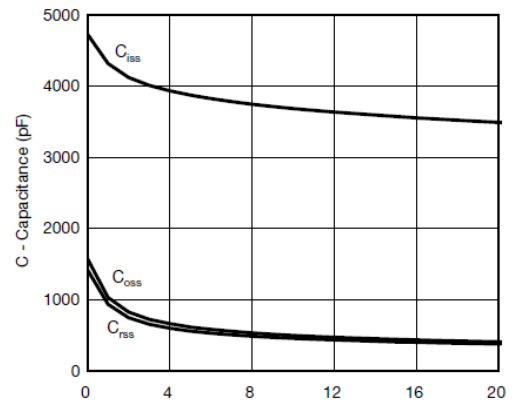
V<sub>GS</sub> - Gate-to-Source Voltage (V)

Transfer Characteristics



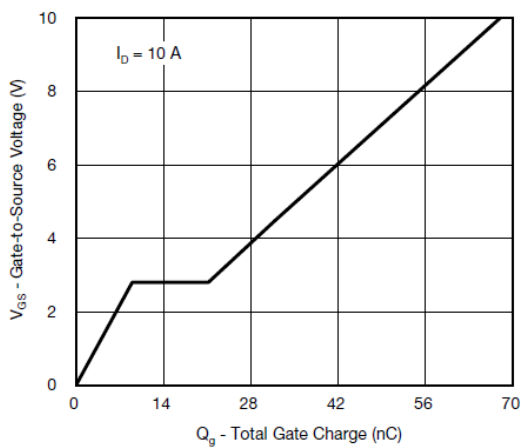
I<sub>D</sub> - Drain Current (A)

On-Resistance vs. Drain Current



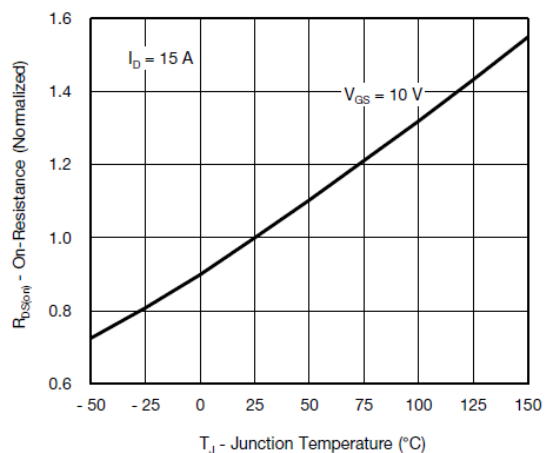
V<sub>DS</sub> - Drain-to-Source Voltage (V)

Capacitance



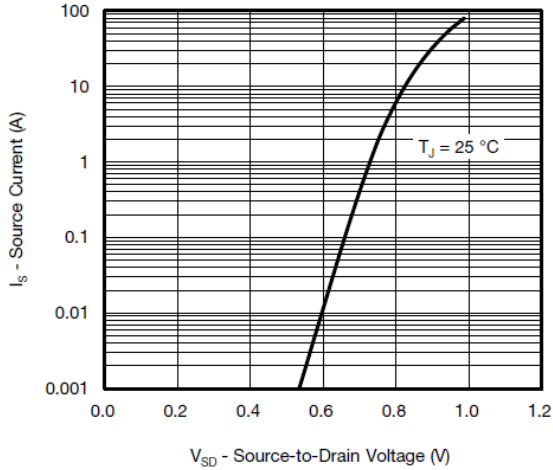
Q<sub>g</sub> - Total Gate Charge (nC)

Gate Charge

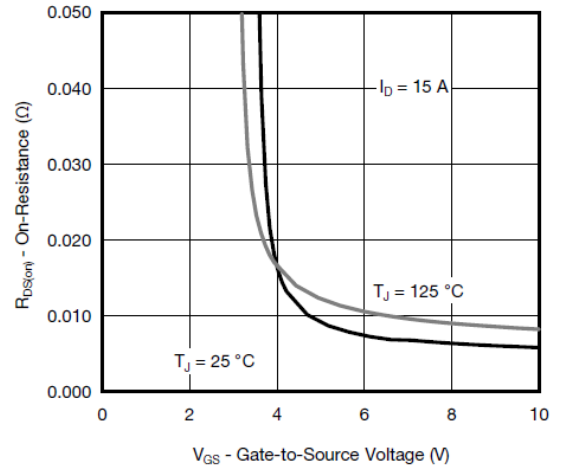


T<sub>J</sub> - Junction Temperature (°C)

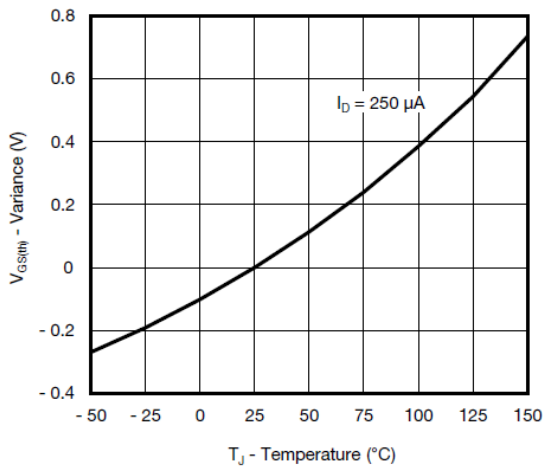
On-Resistance vs. Junction Temperature



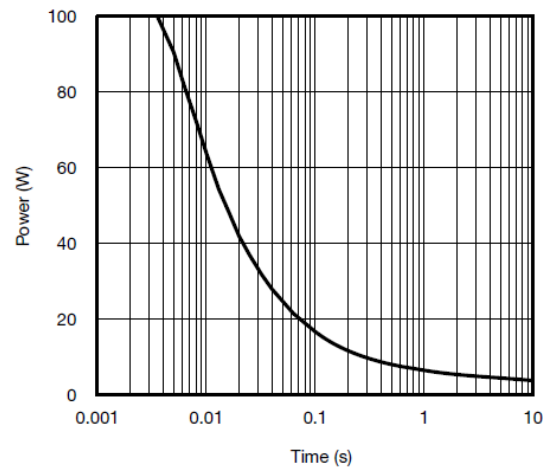
Source-Drain Diode Forward Voltage



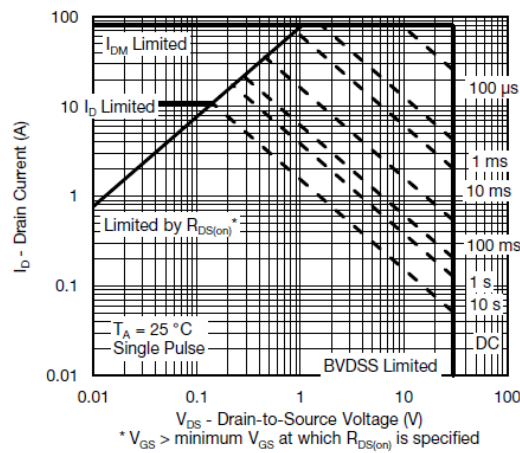
On-Resistance vs. Gate-to-Source Voltage



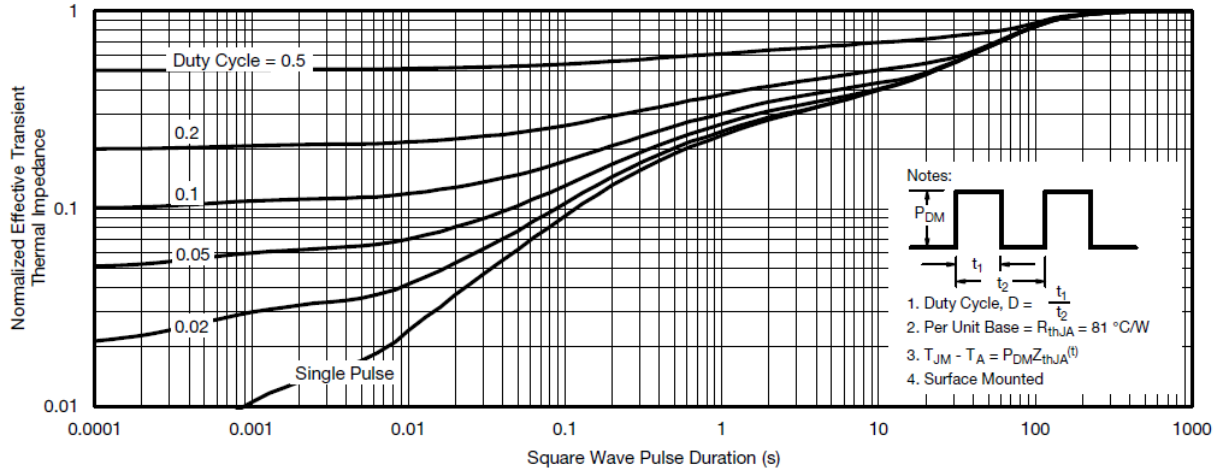
Threshold Voltage



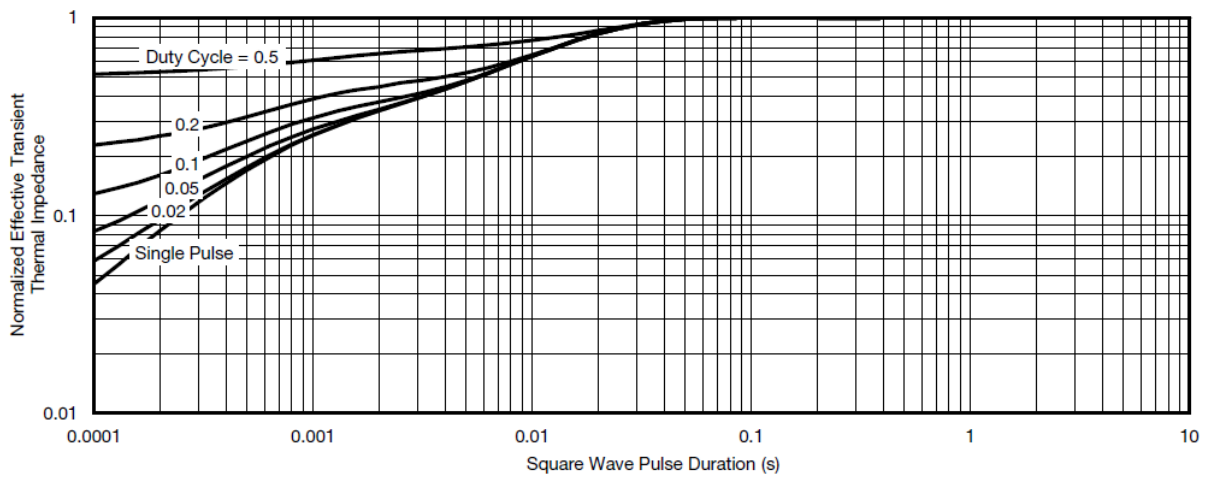
Single Pulse Power, Junction-to-Ambient



Safe Operating Area

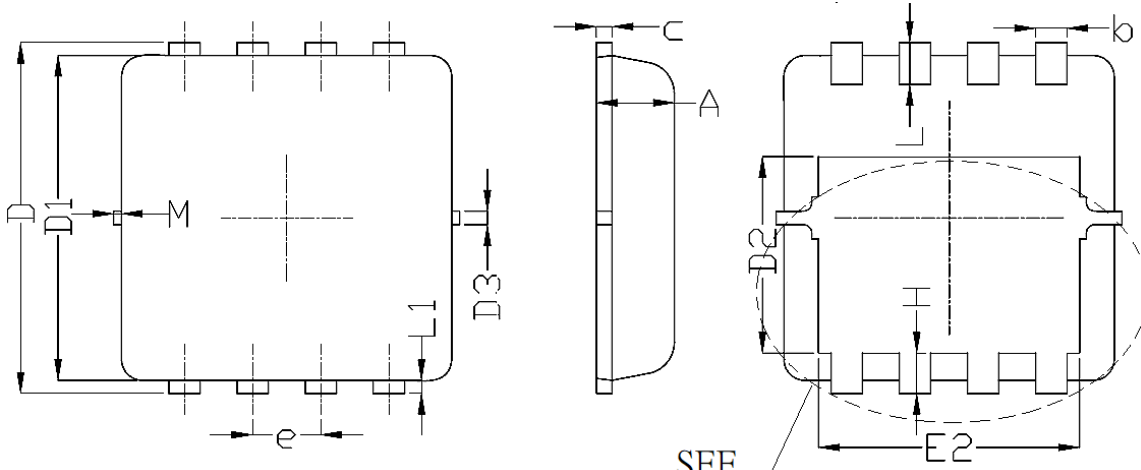


Normalized Thermal Transient Impedance, Junction-to-Ambient

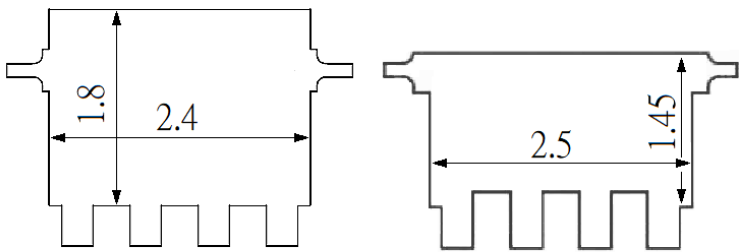
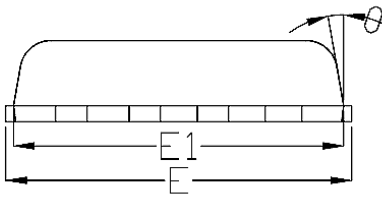


Normalized Thermal Transient Impedance, Junction-to-Case

● Package Information



SEE  
DETAIL



OPTION 1

OPTION 2

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
θ	-	10°	12°
M	-	-	0.15

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