

P-Channel Enhancement Mode Power MOSFET

- Features**

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

$$I_D = -50A$$

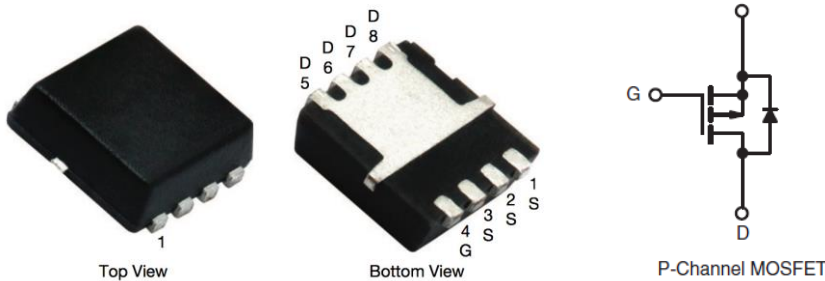
$$R_{DS(ON)} @ V_{GS} = -10V, \text{ TYP } 6m\Omega$$

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

- 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}	± 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
Static *D						
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	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250\mu A$	-1	--	-3	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 25V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -15A$	--	6	8	m Ω
	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -10A$	--	10.3	13.5	m Ω
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
Switching						
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
Dynamic						
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

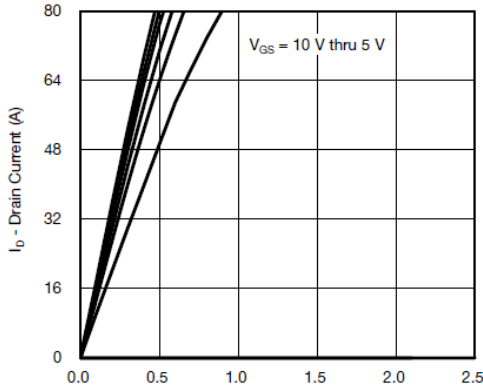
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

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.

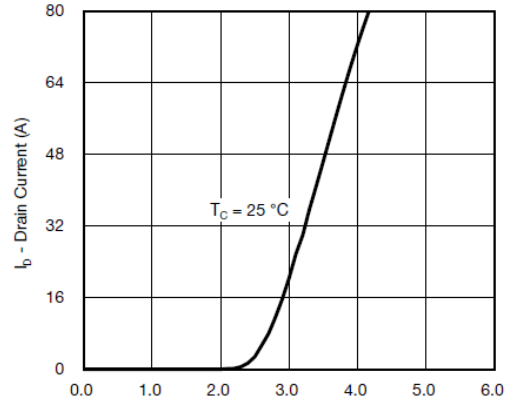
D: Pulse Test: Pulse Wide $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Typical Performance Characteristics ((T_J = 25 °C, unless otherwise noted))



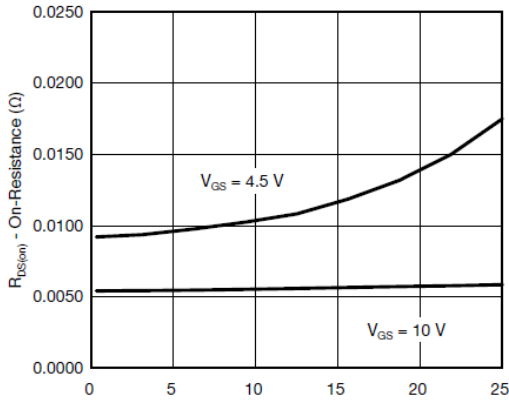
V_{DS} - Drain-to-Source Voltage (V)

Output Characteristics



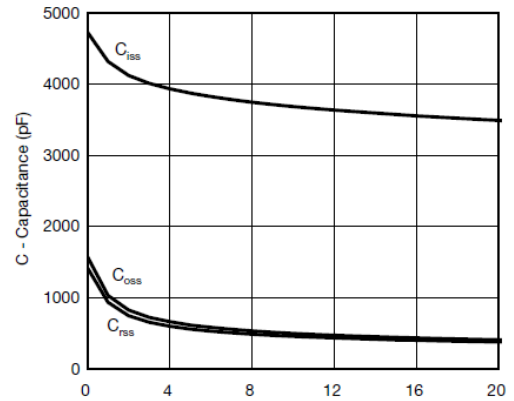
V_{GS} - Gate-to-Source Voltage (V)

Transfer Characteristics



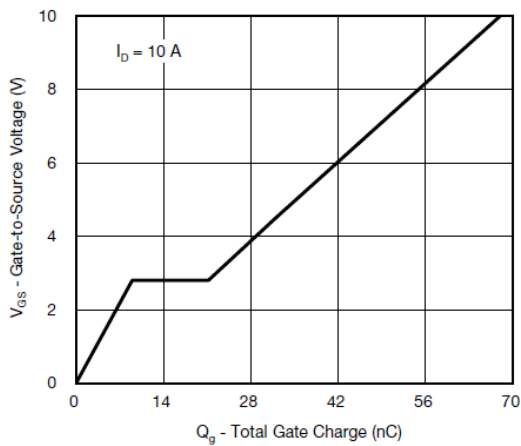
I_D - Drain Current (A)

On-Resistance vs. Drain Current

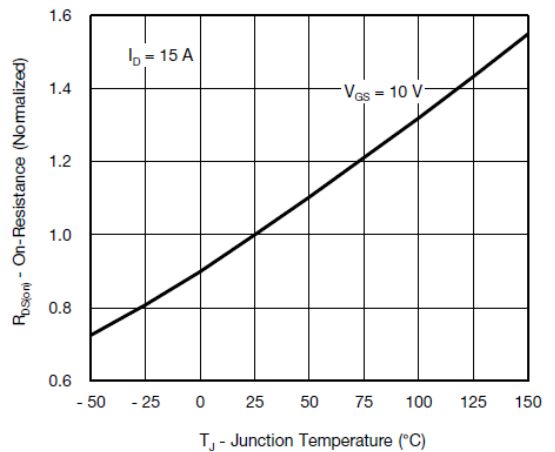


V_{DS} - Drain-to-Source Voltage (V)

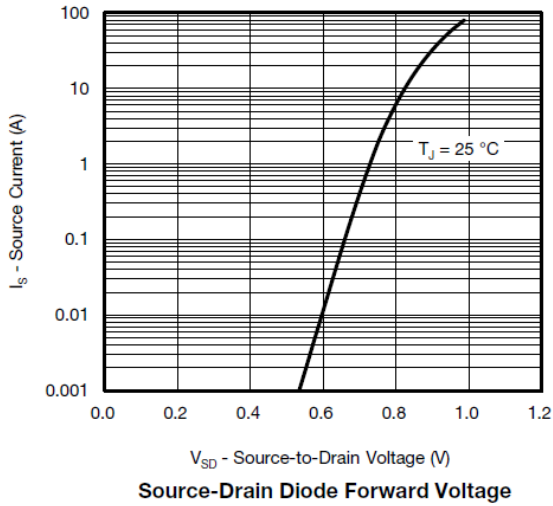
Capacitance



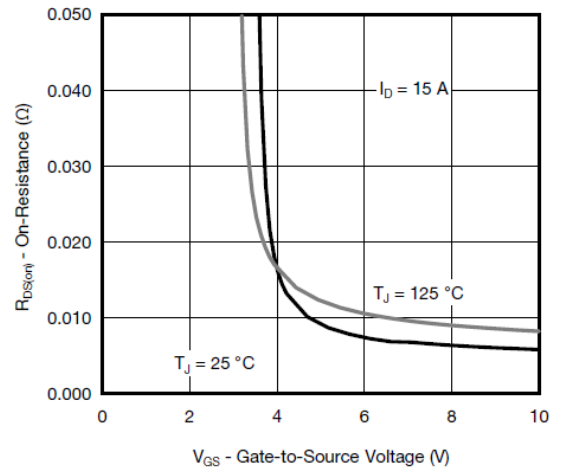
Gate Charge



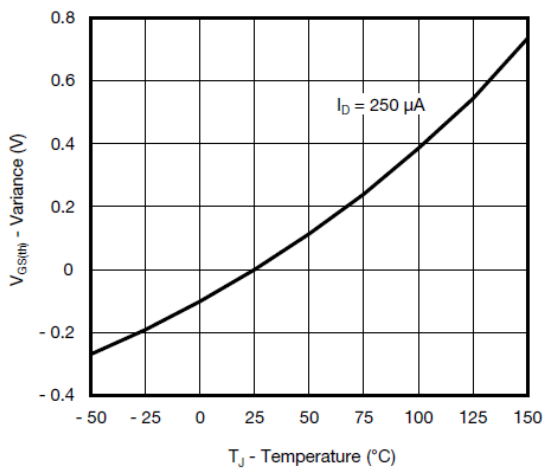
On-Resistance vs. Junction Temperature



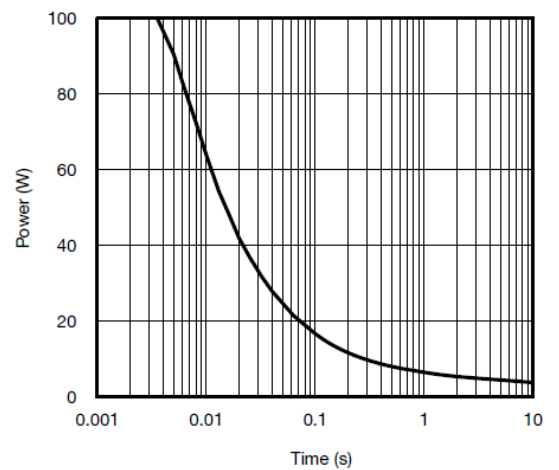
Source-Drain Diode Forward Voltage



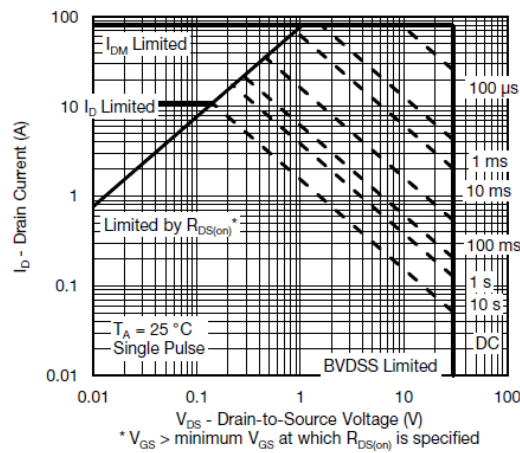
On-Resistance vs. Gate-to-Source Voltage



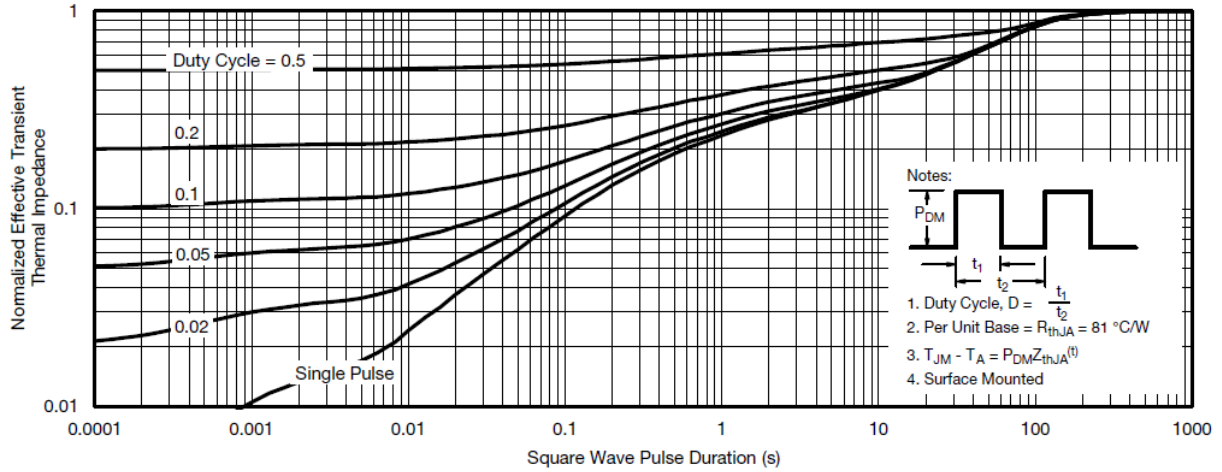
Threshold Voltage



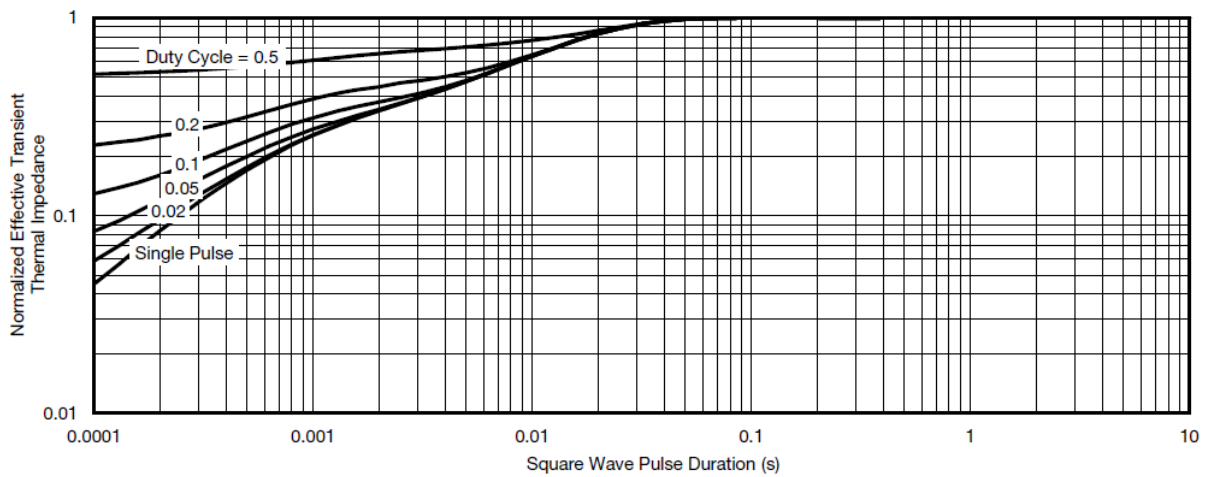
Single Pulse Power, Junction-to-Ambient



Safe Operating Area

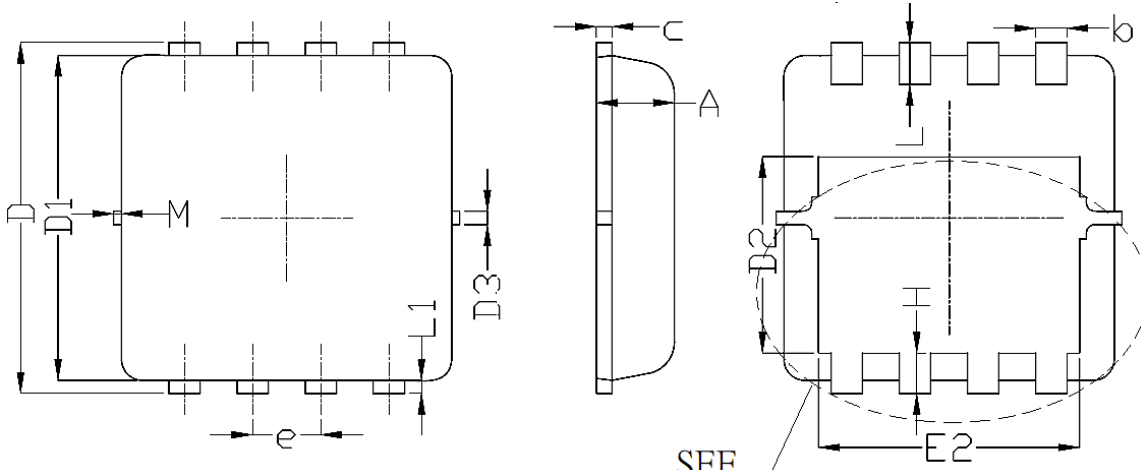


Normalized Thermal Transient Impedance, Junction-to-Ambient

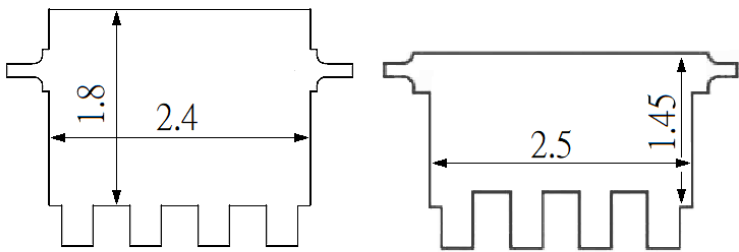
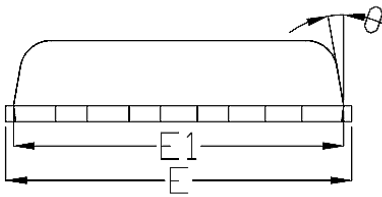


Normalized Thermal Transient Impedance, Junction-to-Case

● 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