

## Features

- ★ Split Gate Trench MOSFET technology
- ★ Excellent package for heat dissipation
- ★ High density cell design for low RDS(ON)

## Product Summary

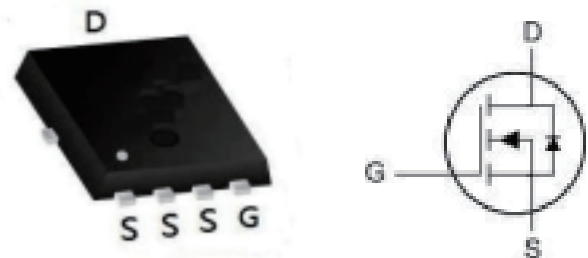
RoHS

BVDSS	RDSON	ID
100V	12m Ω	50A

## Description

- ★ DC-DC Converters
- ★ Power management functions
- ★ Synchronous-rectification applications

## PDFN5\*6 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Max.	Unit	
V <sub>DSS</sub>	Drain-Source Voltage	100	V	
V <sub>GSS</sub>	Gate-Source Voltage	±20	V	
I <sub>D</sub>	Continuous Drain Current	T <sub>c</sub> = 25°C	50	A
		T <sub>c</sub> = 100°C	29	A
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	184	A	
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	80	mJ	
P <sub>D</sub>	Power Dissipation	T <sub>c</sub> = 25°C	71.4	W
R <sub>θJA</sub>	Thermal Resistance from Junction-to-Ambient <sup>3</sup>	52	°C/W	
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	1.75	°C/W	
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C	

Electrical Characteristics ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
<b>Static Characteristics</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	80	-	-	V
$I_{GSS}$	Gate-body Leakage current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	-	-	1	$\mu A$
		$T_J = 100^\circ\text{C}$	-	-	100	
$V_{GS(th)}$	Gate-Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.7	2.5	V
$R_{DS(on)}$	Drain-Source on-Resistance <sup>4</sup>	$V_{GS} = 10V, I_D = 20A$	-	12	17	m $\Omega$
		$V_{GS} = 4.5V, I_D = 10A$	-	14.5	20	
$g_{fs}$	Forward Transconductance <sup>4</sup>	$V_{DS} = 10V, I_D = 20A$	-	54	-	S
<b>Dynamic Characteristics<sup>5</sup></b>						
$C_{iss}$	Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1MHz$	-	1208	-	pF
$C_{oss}$	Output Capacitance		-	144	-	
$C_{rss}$	Reverse Transfer Capacitance		-	11.3	-	
$R_g$	Gate Resistance	$f = 1MHz$	-	1.8	-	$\Omega$
<b>Switching Characteristics<sup>5</sup></b>						
$Q_g$	Total Gate Charge	$V_{GS} = 10V,$ $V_{DS} = 50V, I_D = 20A$	-	22.7	-	nC
$Q_{gs}$	Gate-Source Charge		-	3	-	
$Q_{gd}$	Gate-Drain Charge		-	5	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 10V,$ $V_{DD} = 50V, R_G = 3\Omega,$ $I_D = 20A$	-	9.2	-	ns
$t_r$	Rise Time		-	3.6	-	
$t_{d(off)}$	Turn-off Delay Time		-	25.6	-	
$t_f$	Fall Time		-	4.4	-	
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F = 20A,$ $dI/dt = 100A/\mu s$	-	30	-	nC
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	42	-	
<b>Drain-Source Body Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage <sup>4</sup>	$I_S = 20A, V_{GS} = 0V$	-	-	1.2	V
$I_S$	Continuous Source Current	$T_C = 25^\circ\text{C}$	-	-	50	A

## Notes:

- 1.Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)} = 150^\circ\text{C}$ .
- 2.The EAS data shows Max. rating . The test condition is  $V_{DD} = 25V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 40A$ .
- 3.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
- 4.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
- 5.This value is guaranteed by design hence it is not included in the production test.

Typical Electrical and Thermal Characteristics (Curves)

Figure 1: Output Characteristics

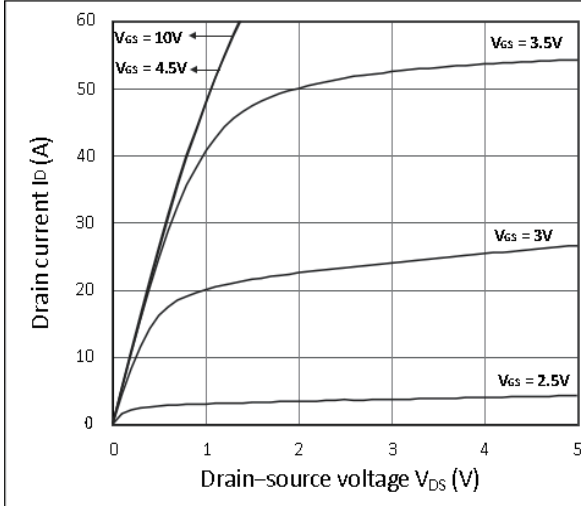


Figure 2: Typ. Transfer Characteristics

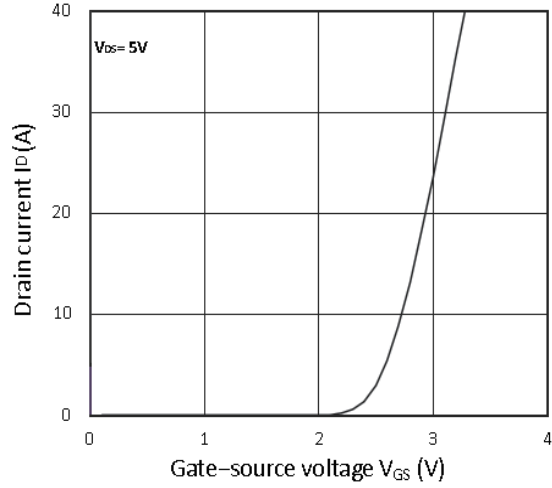


Figure 3: Forward Characteristics of Reverse

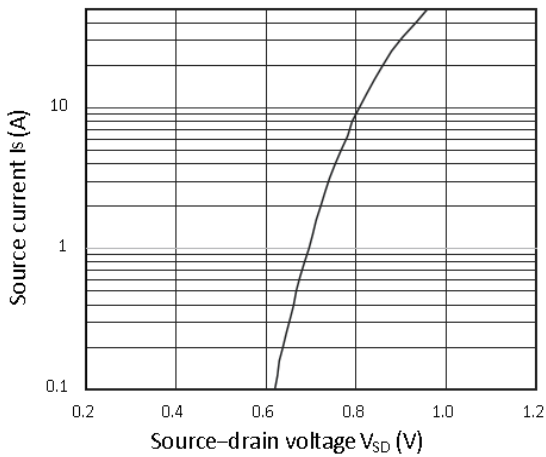


Figure 4: RDS(ON) vs. VGS

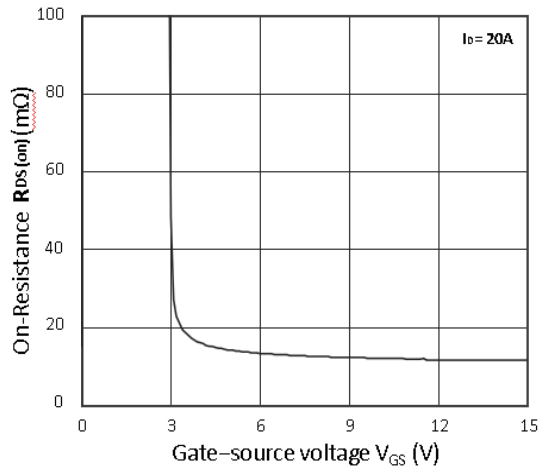


Figure 5: RDS(ON) vs. ID

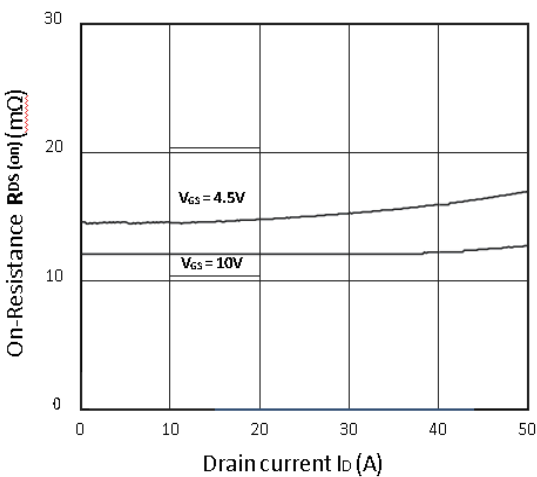
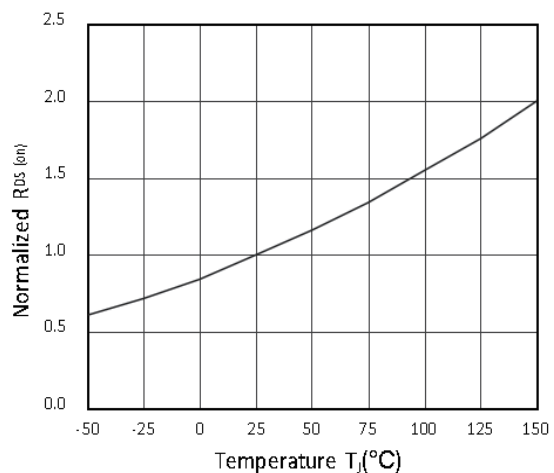


Figure 6: Normalized RDS(on) vs. Temperature



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

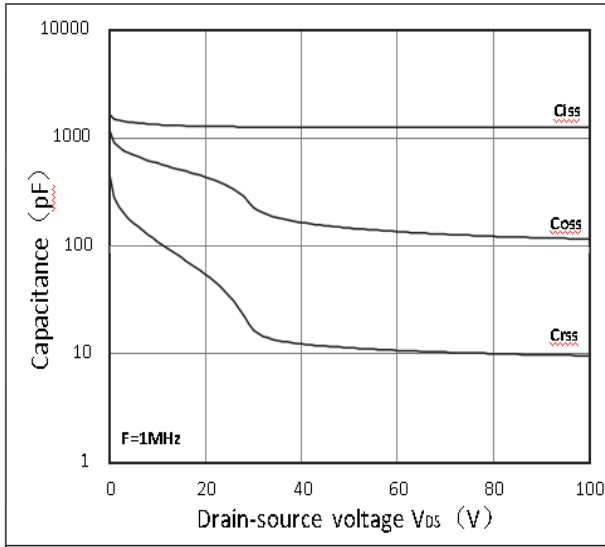


Figure 8: Gate Charge Characteristics

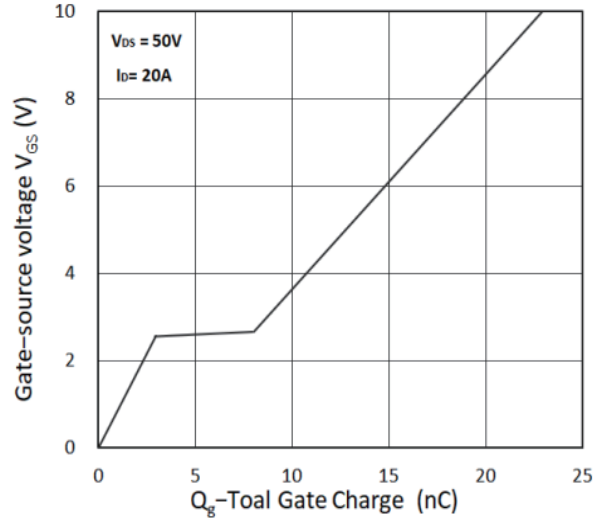


Figure 9: Power Dissipation

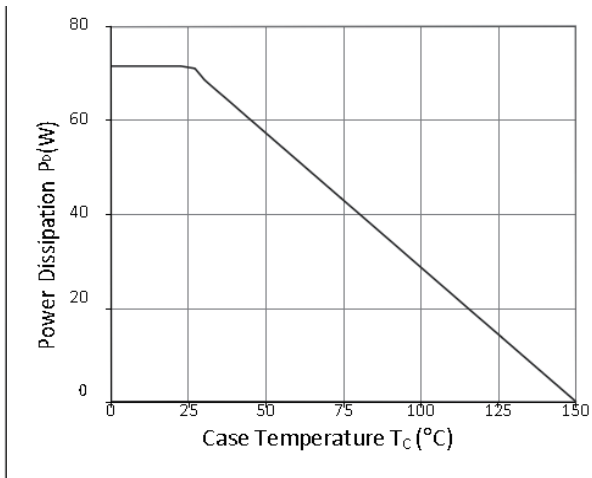


Figure 10: Safe Operating Area

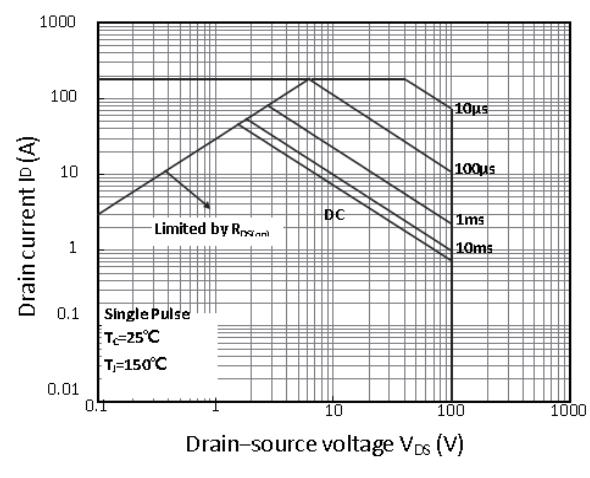
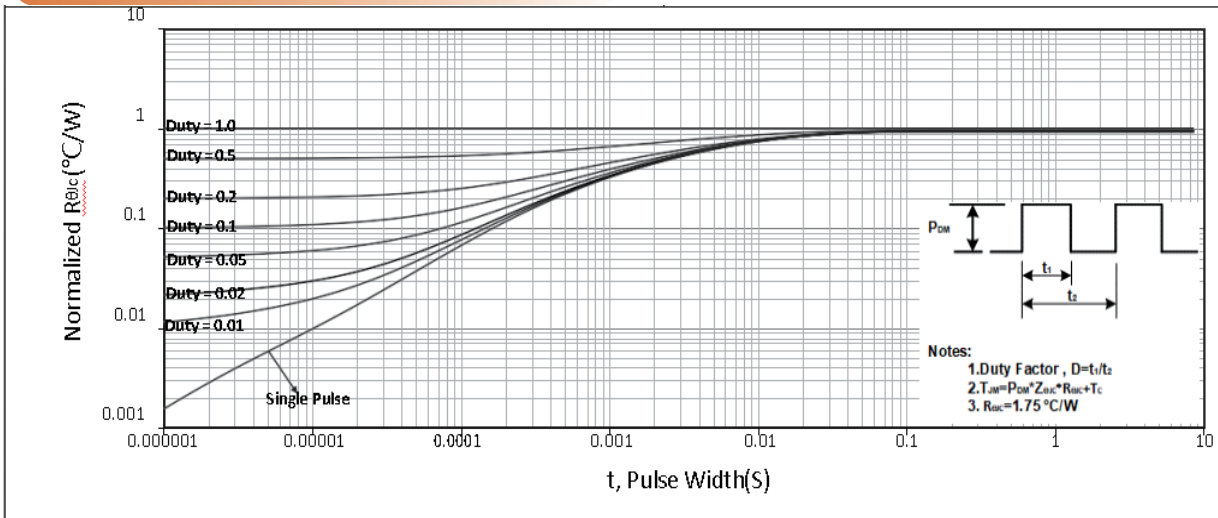


Figure 11: Normalized Maximum Transient Thermal Impedance



Test Circuit and Waveform

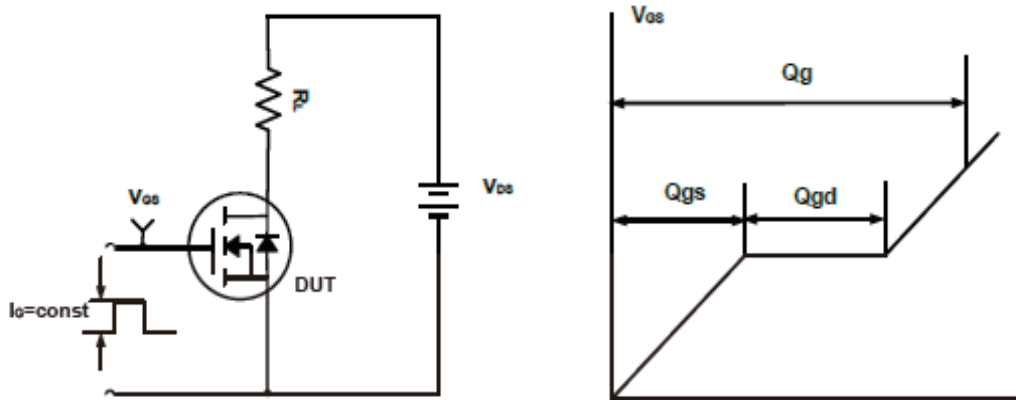


Figure A. Gate Charge Test Circuit & Waveforms

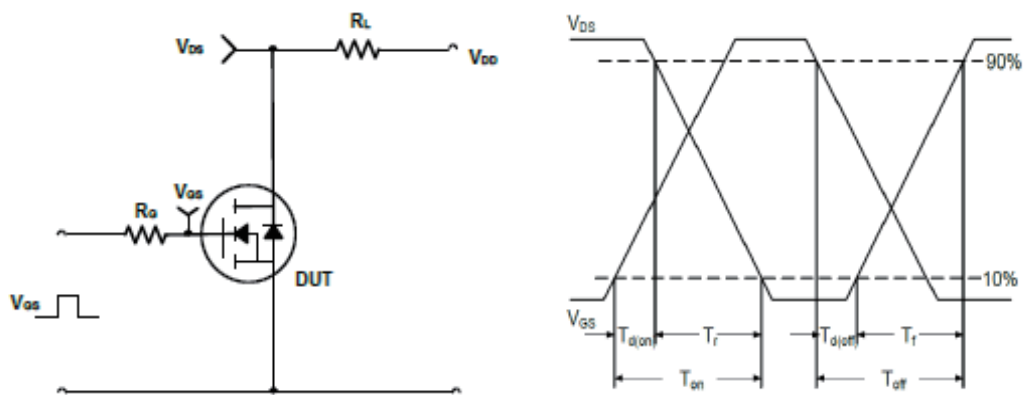


Figure B. Switching Test Circuit & Waveforms

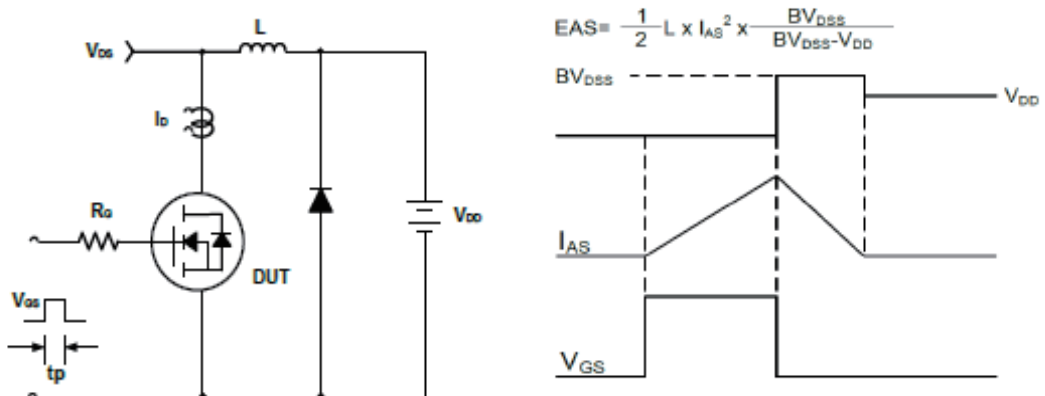
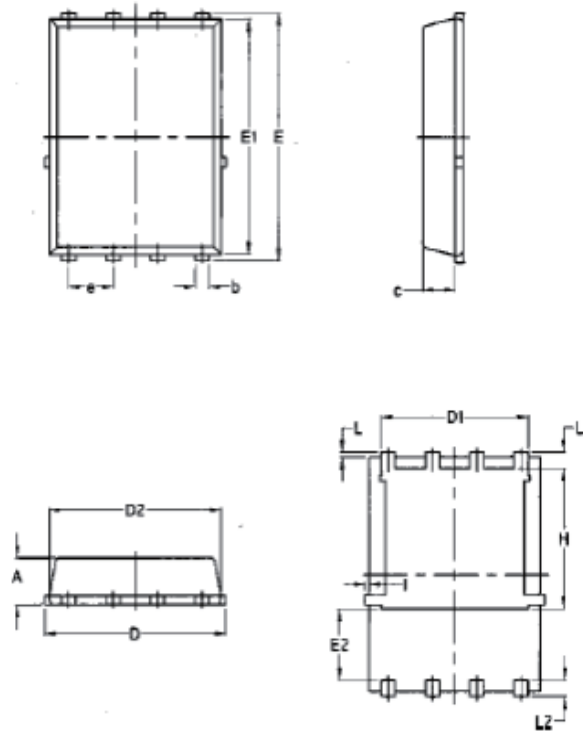


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Package Mechanical Data-DFN5\*6-8L-Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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