

Features

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

Product Summary

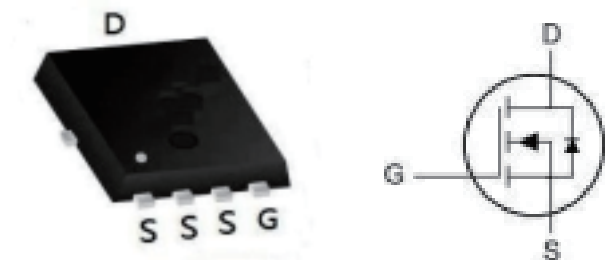
RoHS

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 _{DSS}	Drain-Source Voltage	100	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current	T _C = 25°C 50 T _C = 100°C 29	A A
I _{DM}	Pulsed Drain Current ^{note1}	184	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}	80	mJ
P _D	Power Dissipation	T _C = 25°C 71.4	W
R _{θJA}	Thermal Resistance from Junction-to-Ambient ³	52	°C/W
R _{θJC}	Thermal Resistance, Junction to Case	1.75	°C/W
T _J , T _{STG}	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
Static Characteristics							
V _{(BR)DSS}	Drain-Source Breakdown Voltage		V _{GS} = 0V, I _D = 250μA	80	-	-	V
I _{GSS}	Gate-body Leakage current		V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	T _J =25°C	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
		T _J =100°C		-	-	100	
V _{GS(th)}	Gate-Threshold Voltage		V _{DS} = V _{GS} , I _D = 250μA	1	1.7	2.5	V
R _{DS(on)}	Drain-Source on-Resistance ⁴		V _{GS} = 10V, I _D = 20A	-	12	17	mΩ
			V _{GS} = 4.5V, I _D = 10A	-	14.5	20	
g _{fs}	Forward Transconductance ⁴		V _{DS} = 10V, I _D = 20A	-	54	-	S
Dynamic Characteristics ⁵							
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	-	Ω
Switching Characteristics ⁵							
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 = 3Ω, 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/μs	-	30	-	nC
Q _{rr}	Body Diode Reverse Recovery Charge			-	42	-	
Drain-Source Body Diode Characteristics							
V _{SD}	Diode Forward Voltage ⁴		I _S = 20A, V _{GS} = 0V	-	-	1.2	V
I _S	Continuous Source Current	T _C = 25°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 $V_{DD} = 25V, V_{GS} = 10V, L = 0.4\text{mH}, I_{AS} = 40A$.
- 3.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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)

Figure1: Output Characteristics

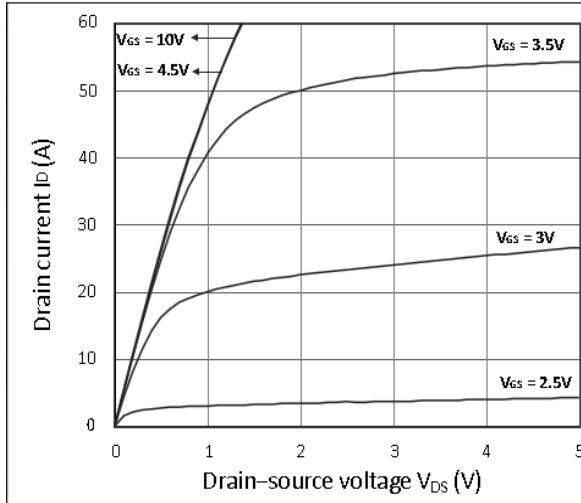


Figure 2: Typ. Transfer Characteristics

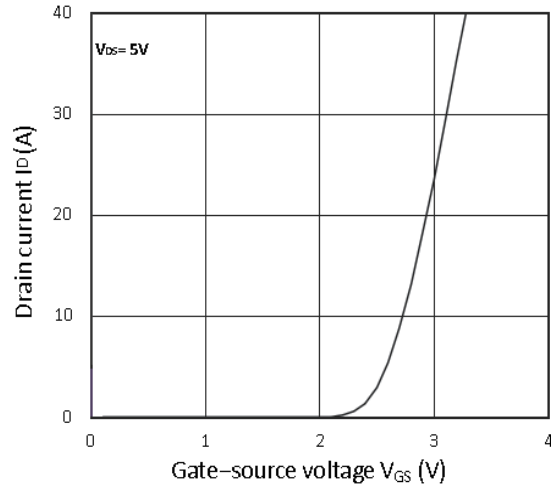


Figure 3: Forward Characteristics of Reverse

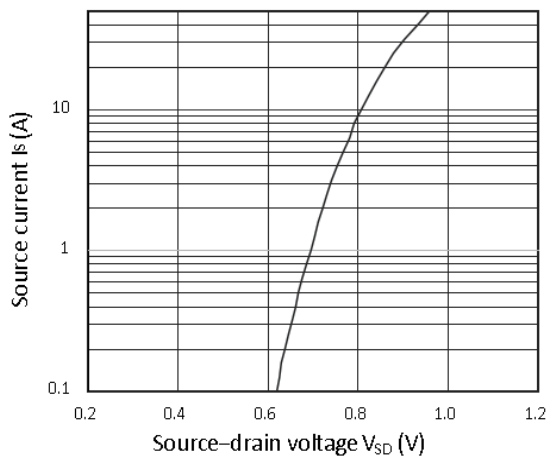


Figure 4: RDS(ON) vs. VGS

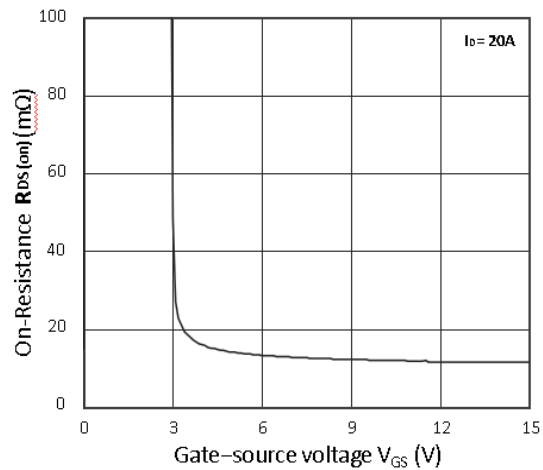


Figure 5: RDS(ON) vs. ID

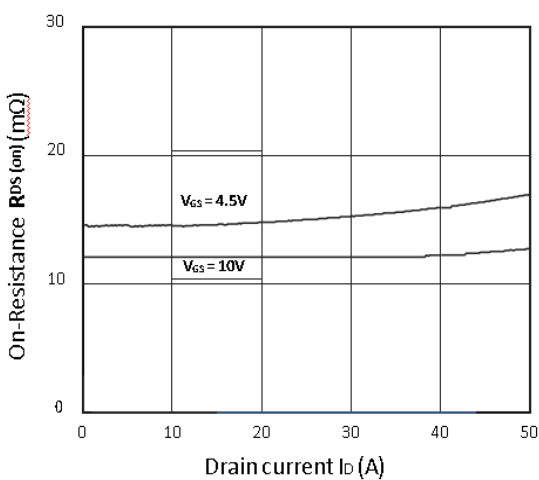
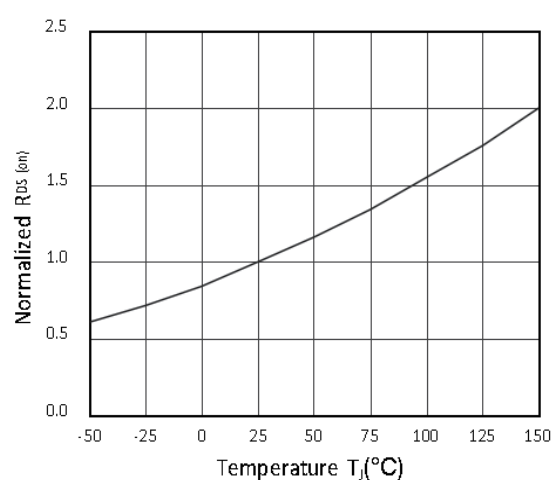


Figure 6: Normalized RDS(on) vs. Temperature



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

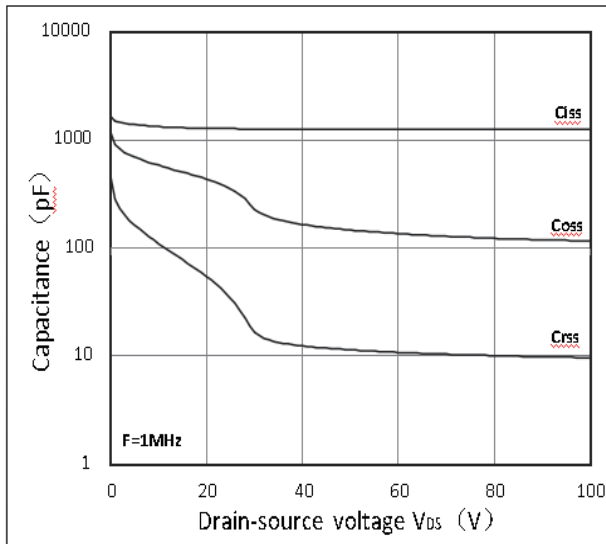


Figure 8: Gate Charge Characteristics

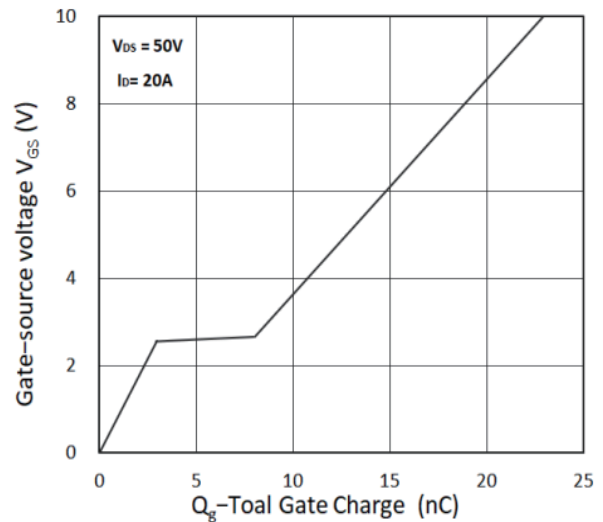


Figure 9: Power Dissipation

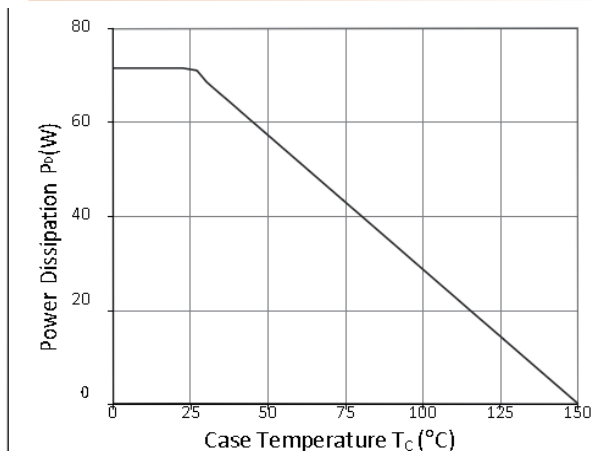


Figure 10: Safe Operating Area

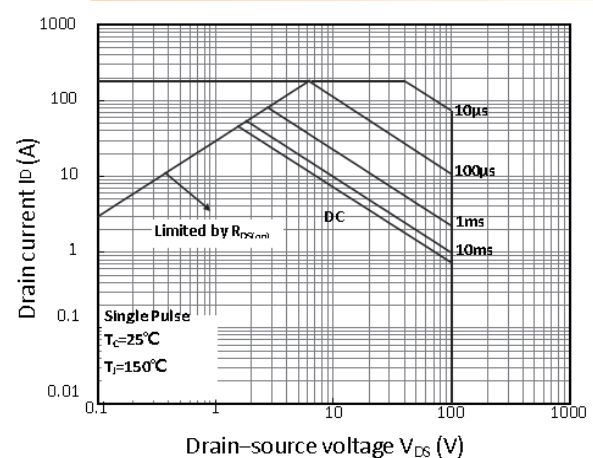
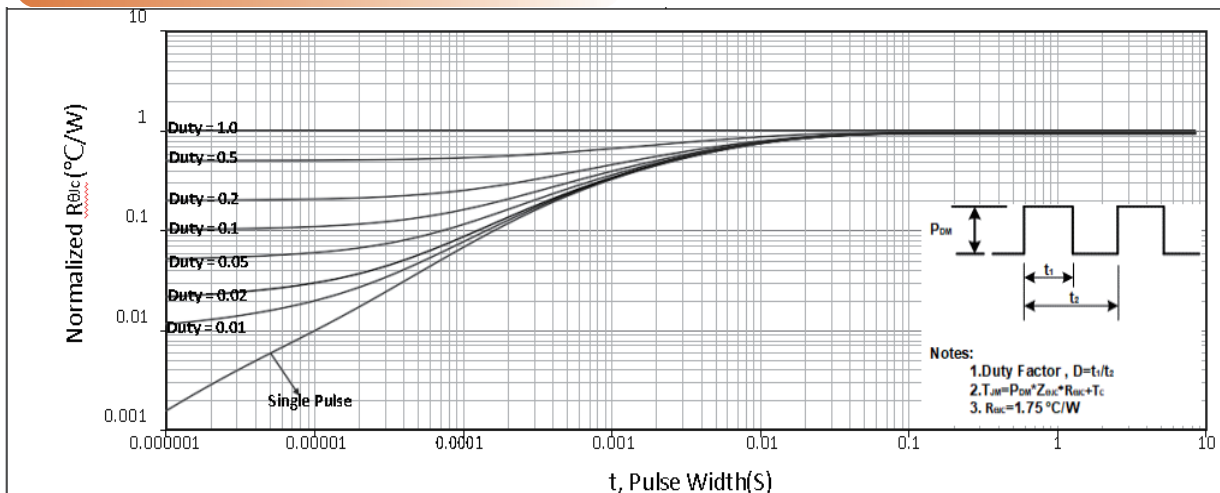


Figure 11: Normalized Maximum Transient Thermal Impedance



Test Circuit and Waveform

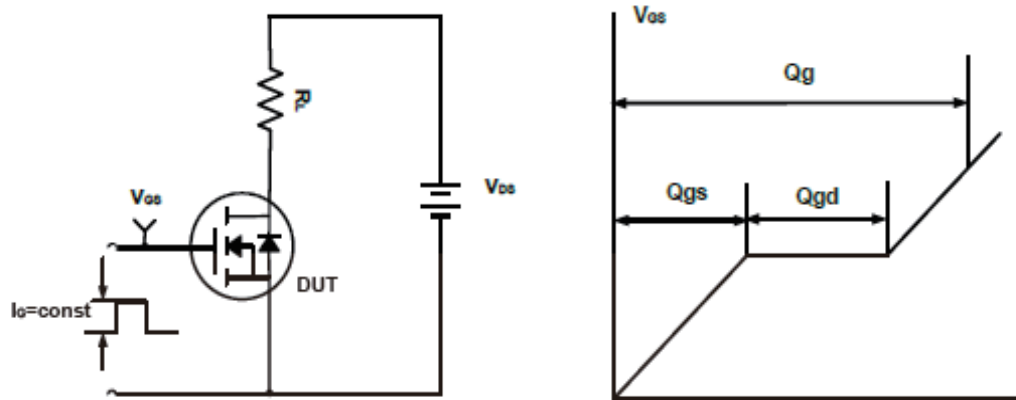


Figure A. Gate Charge Test Circuit & Waveforms

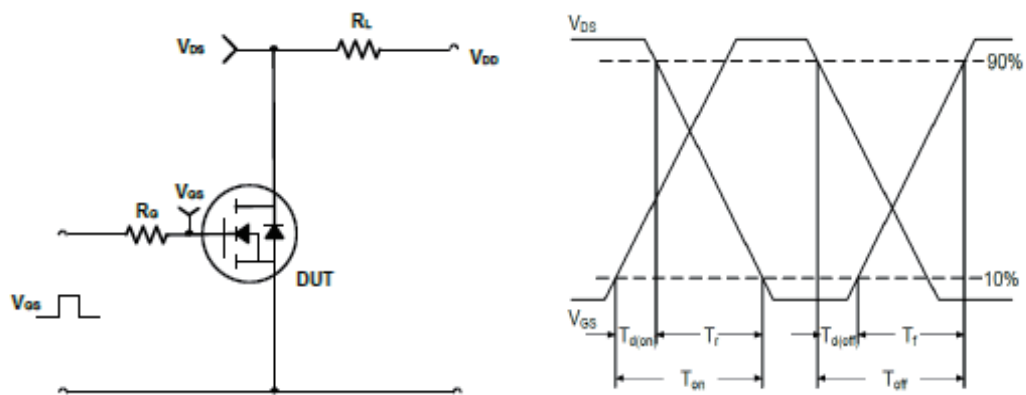


Figure B. Switching Test Circuit & Waveforms

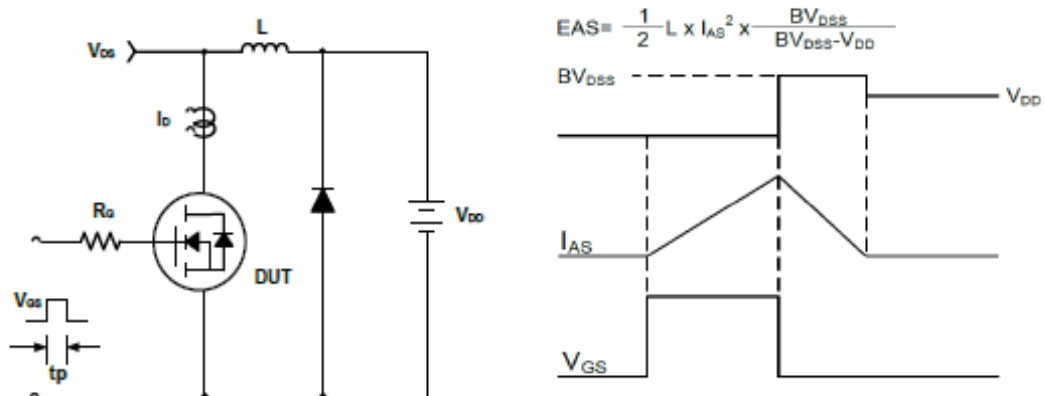
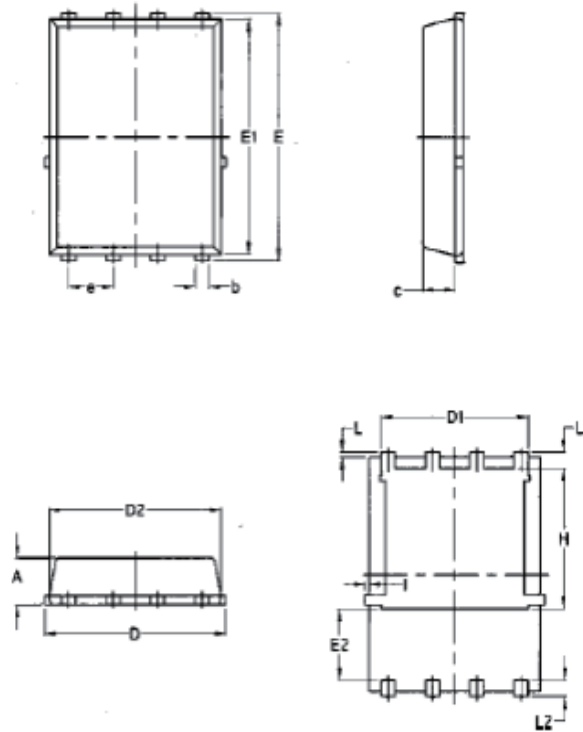


Figure C. Unclamped Inductive Switching Circuit & Waveforms

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