

Features

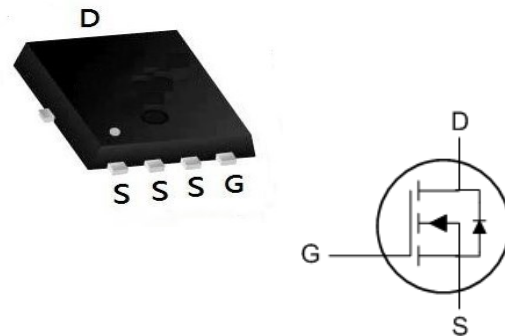
- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$


Product Summary

BVDSS	RDSON	ID
100V	3.7mΩ	130A

Applications

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

PRPAK5X6 Pin Configuration

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	I_D	130	A
	$T_C=100^\circ\text{C}$		76	
Pulsed Drain Current ¹		I_{DM}	480	A
Single Pulse Avalanche Energy ²		EAS	320	mJ
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	131.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	48	$^\circ\text{C/W}$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.95	$^\circ\text{C/W}$

N-Ch100V Fast Switching MOSFETs
Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V_{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	-	-	V
Gate-body Leakage current	I_{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C		-	-	100	
Gate-Threshold Voltage	V_{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ⁴	R_{DS(on)}	V _{GS} = 10V, I _D = 20A	-	3.7	4.5	mΩ
Forward Transconductance ⁴	g_{fs}	V _{DS} = 10V, I _D = 20A	-	62	-	S
Dynamic Characteristics⁵						
Input Capacitance	C_{iss}	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz	-	6865	-	pF
Output Capacitance	C_{oss}		-	740	-	
Reverse Transfer Capacitance	C_{rss}		-	21	-	
Gate Resistance	R_g	f = 1MHz	-	1.3	-	Ω
Switching Characteristics⁵						
Total Gate Charge	Q_g	V _{GS} = 10V, V _{DS} = 50V, I _D =20A	-	112.5	-	nC
Gate-Source Charge	Q_{gs}		-	30.5	-	
Gate-Drain Charge	Q_{gd}		-	27.3	-	
Turn-on Delay Time	t_{d(on)}	V _{GS} = 10V, V _{DD} = 50V, R _G = 3Ω, I _D = 20A	-	33	-	ns
Rise Time	t_r		-	39	-	
Turn-off Delay Time	t_{d(off)}		-	67.1	-	
Fall Time	t_f		-	32	-	
Body Diode Reverse Recovery Time	t_{rr}	I _F = 20A, di/dt=100A/μs	-	58.7	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	97.3	-	nC
Drain-Source Body Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	I _F = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C I_s	-	-	-	120	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°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 inch2 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 ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test..

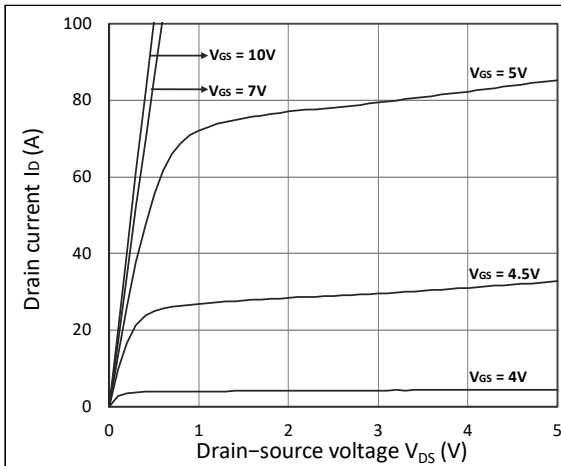
Typical Characteristics


Figure 1. Output Characteristics

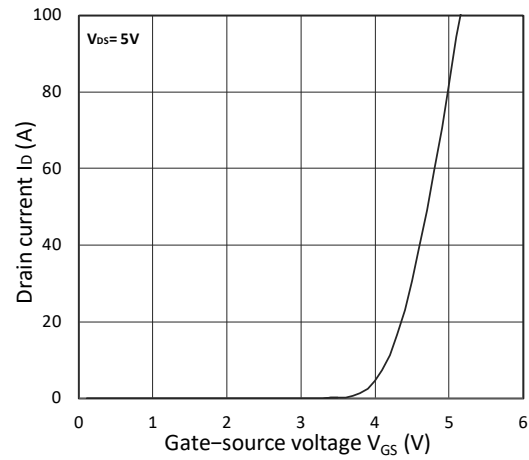


Figure 2. Transfer Characteristics

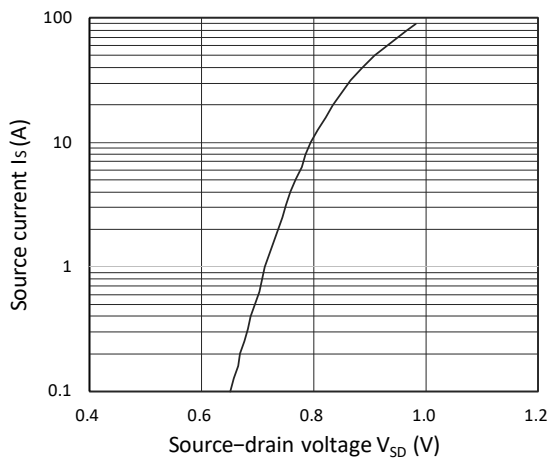
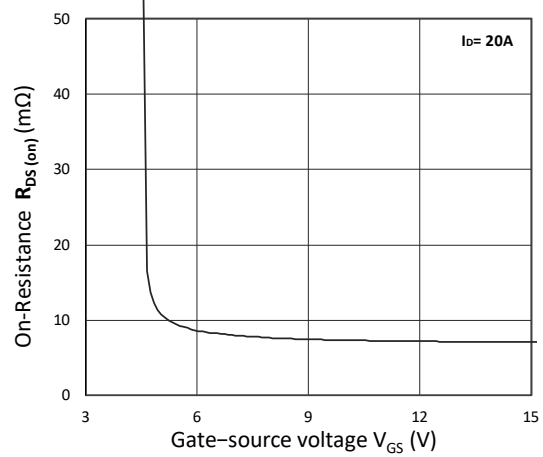
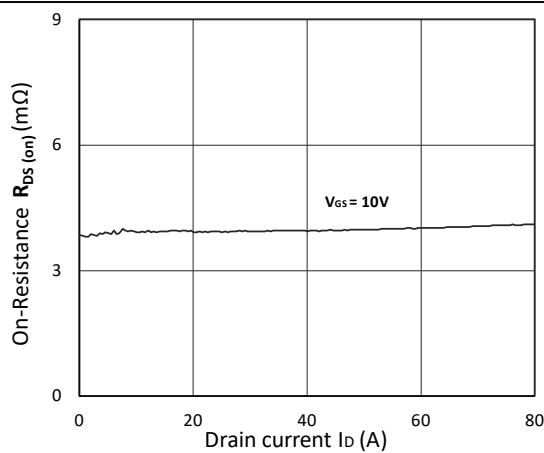
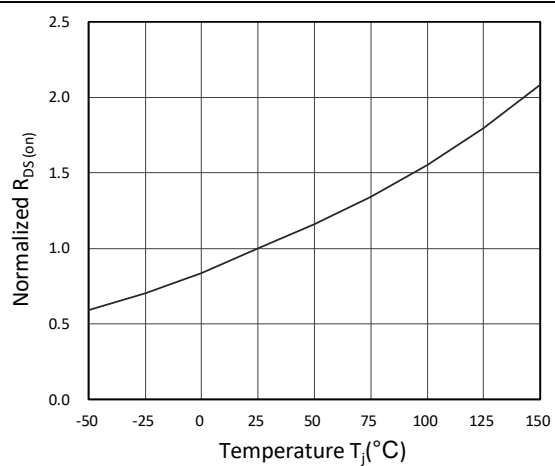


Figure 3. Forward Characteristics of Reverse


 Figure 4. $R_{DS(on)}$ vs. V_{GS}

 Figure 5. $R_{DS(on)}$ vs. I_D

 Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

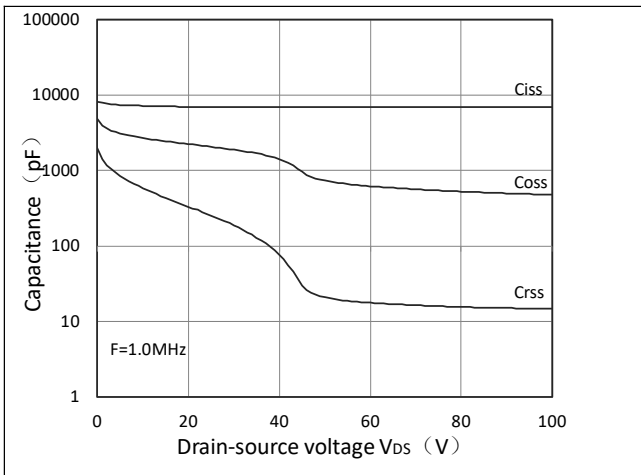


Figure 7. Capacitance Characteristics

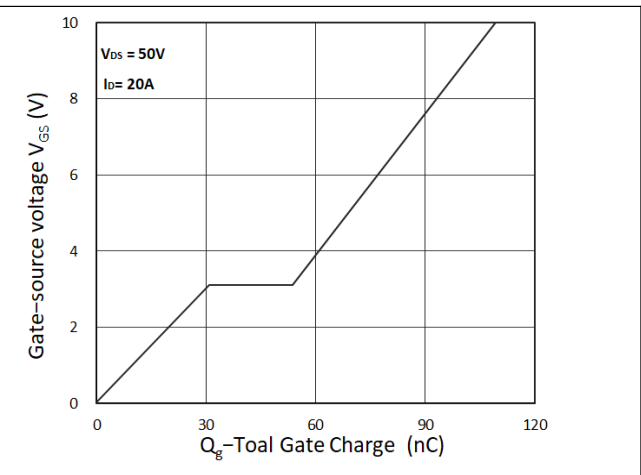


Figure 8. Gate Charge Characteristics

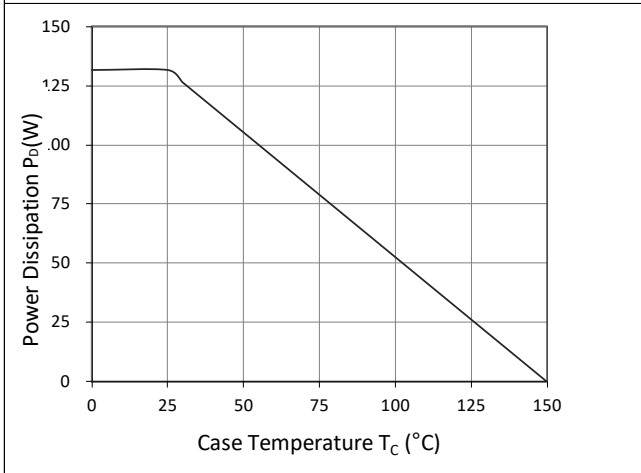


Figure 9. Power Dissipation

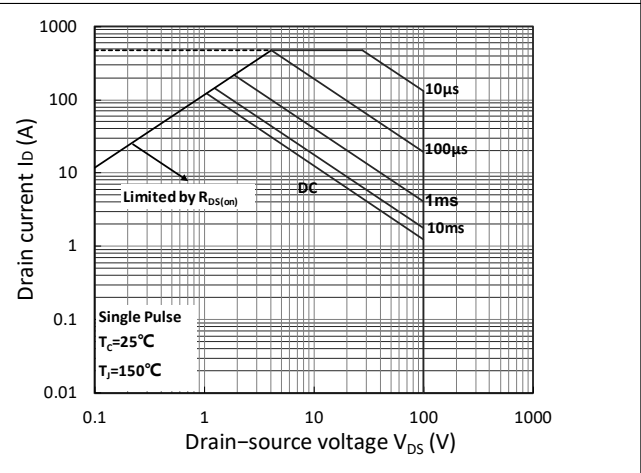


Figure 10. Safe Operating Area

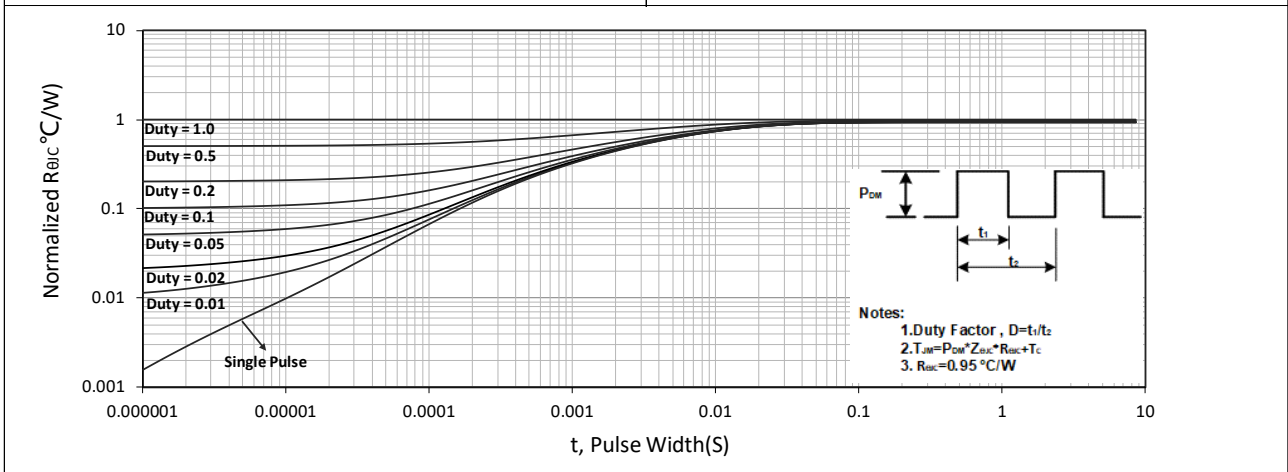


Figure 11. Normalized Maximum Transient Thermal Impedance

■ Test circuits and waveforms

N-Ch100V Fast Switching MOSFETs

Figure A: Gate Charge Test Circuit & Waveforms

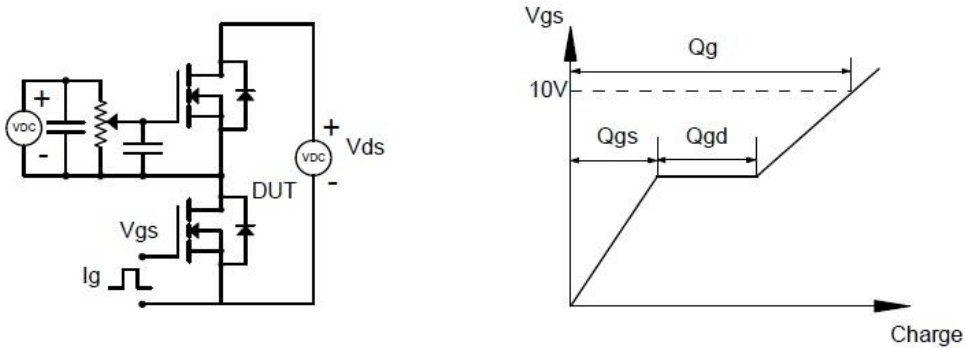


Figure B: Resistive Switching Test Circuit & Waveforms

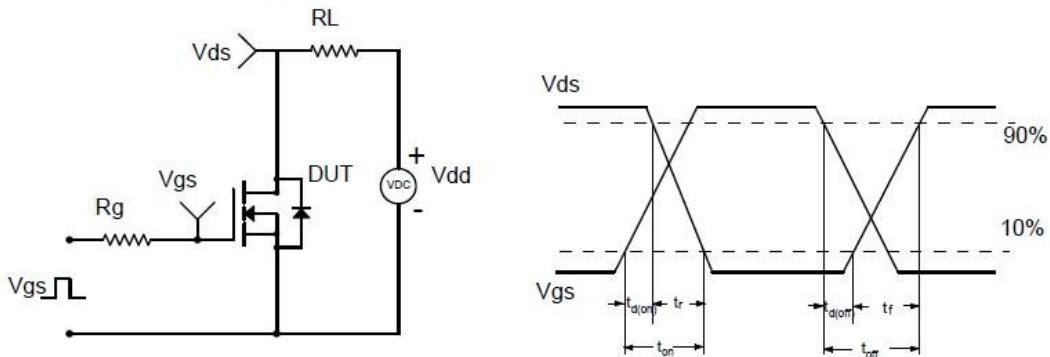


Figure C: Unclamped Inductive Switching (UIS) Test

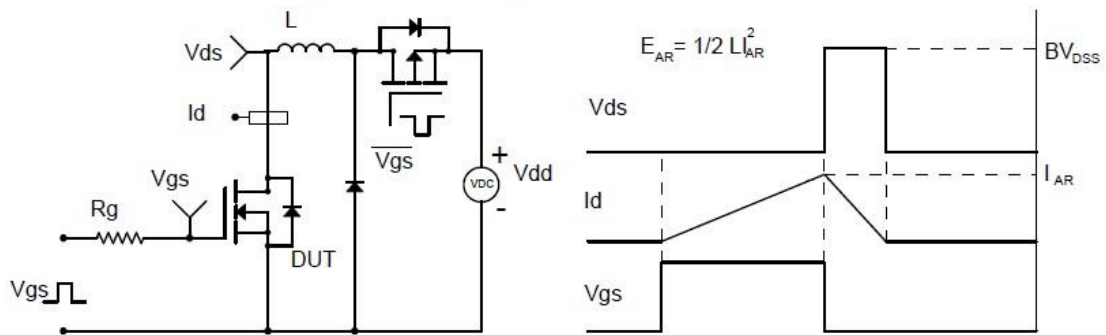
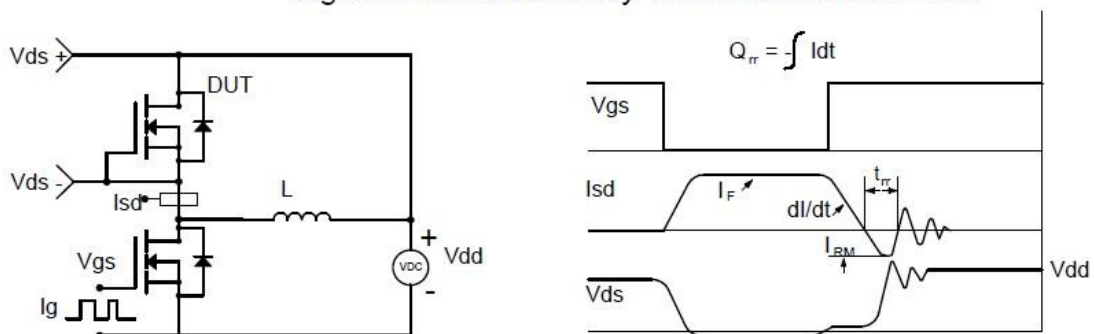
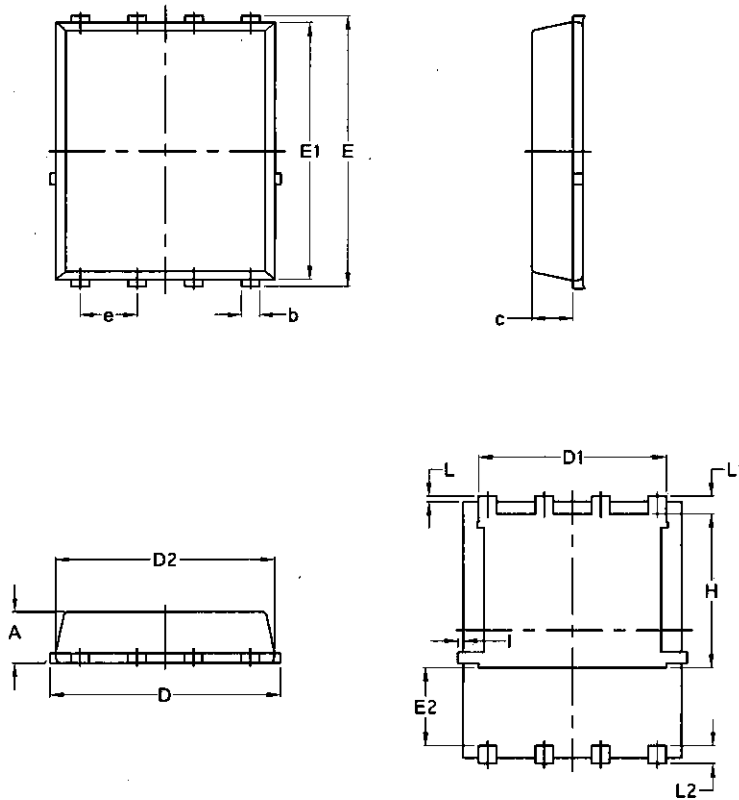


Figure D: Diode Recovery Test Circuit & Waveforms



Package Mechanical Data-DFN5*6-8L-JQ 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