

General Description

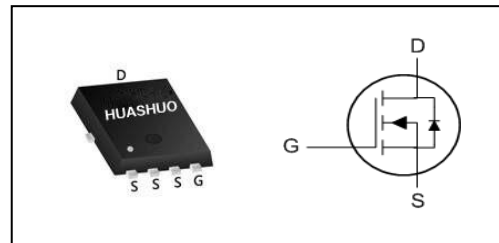
- 100% UIS Tested
- Super Trench Technology
- Surface-mounted package
- MSL1
- T_j max 175°C

Applications

- Motor drivers
- DC/DC Converters
- Or-ing

Product Summary

V _{DS}	40	V
R _{DS(ON),max}	0.55	mΩ
I _D	189	A

PRPAK5X6 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ^{1,6}	189	A
I _{DM}	Pulsed Drain Current ²	756	A
EAS	Single Pulse Avalanche Energy ³	1200	mJ
I _S @T _C =25°C	Diode Forward Current	189	A
P _D @T _C =25°C	Total Power Dissipation ⁴	35	W
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹	---	62.5	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	3.5	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	40	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =30A	---	0.5	0.55	mΩ
		V _{GS} =4.5V, I _D =20A	---	0.85	0.95	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	---	2	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =32V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =32V, V _{GS} =0V, T _J =85°C	---	---	30	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _D =30A	---	145	---	nC
Q _{gs}	Gate-Source Charge		---	29	---	
Q _{gd}	Gate-Drain Charge		---	26	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =20V, V _{GS} =10V, R _G =4.5Ω, R _L =0.66Ω, I _D =30A	---	15	---	ns
T _r	Rise Time		---	74	---	
T _{d(off)}	Turn-Off Delay Time		---	140	---	
T _f	Fall Time		---	92	---	
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	8358	---	pF
C _{oss}	Output Capacitance		---	2819	---	
C _{rss}	Reverse Transfer Capacitance		---	117	---	

Diode Characteristics

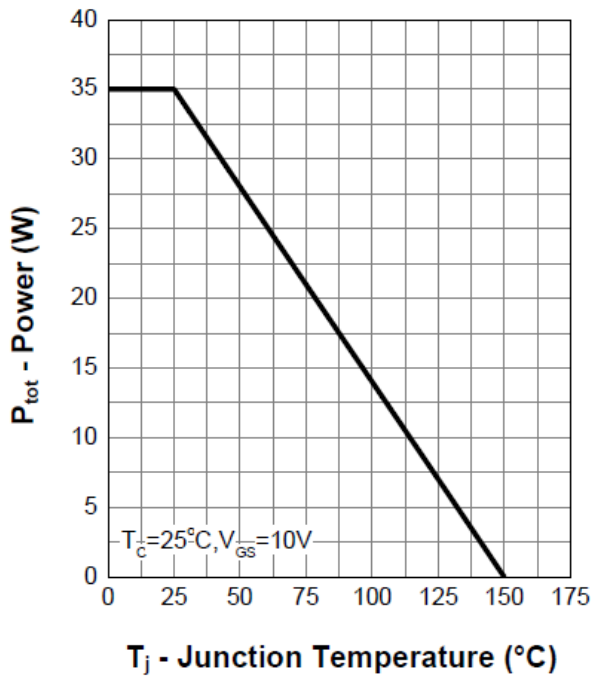
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t _{rr}	Reverse Recovery Time	I _s =30A, dI _s /dt=100A/us	---	87	---	nS
Q _{rr}	Reverse Recovery Charge		---	127	---	nC
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =30A, T _J =25°C	---	---	1.3	V

Note :

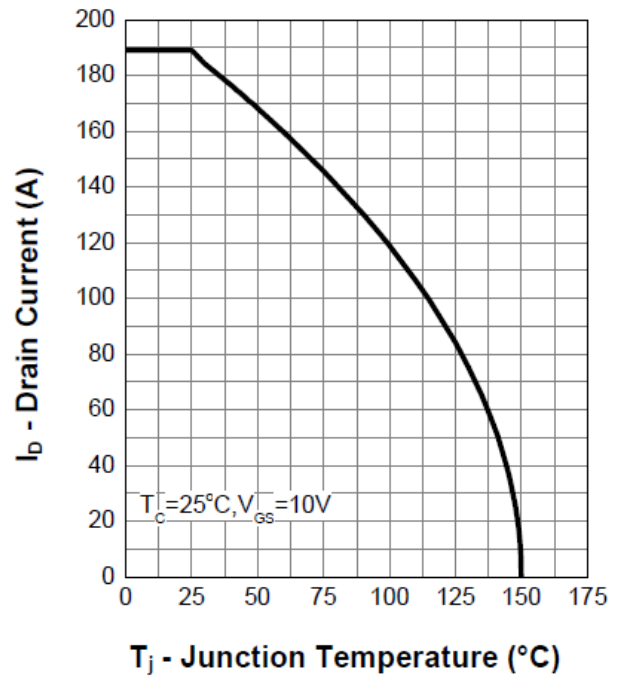
- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

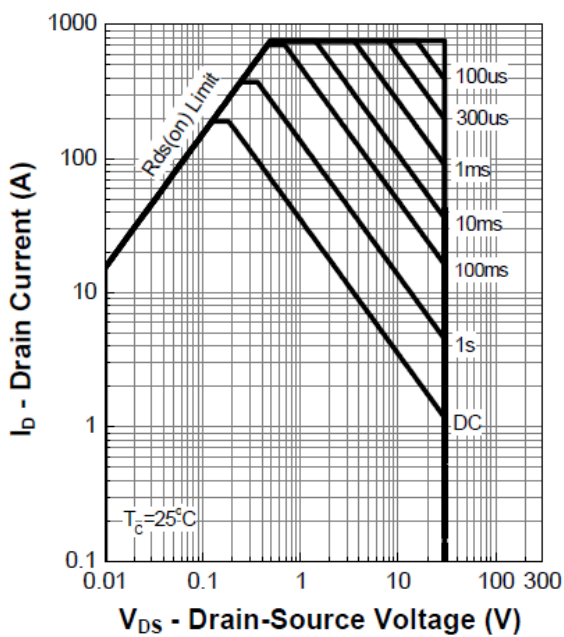
Power Capability



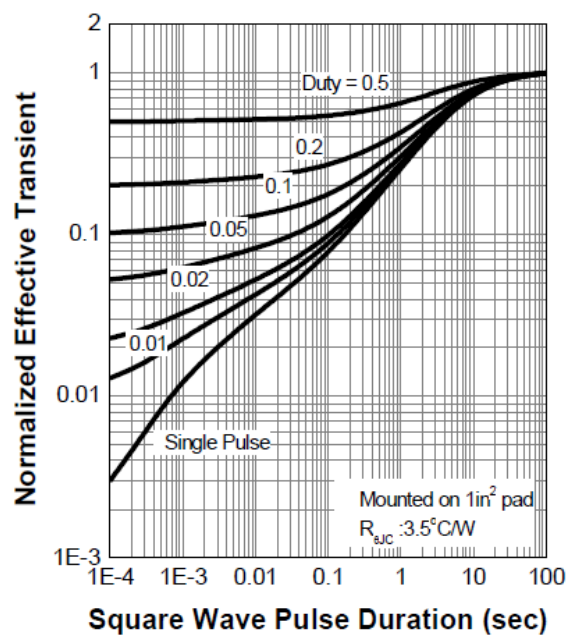
Current Capability



Safe Operation Area

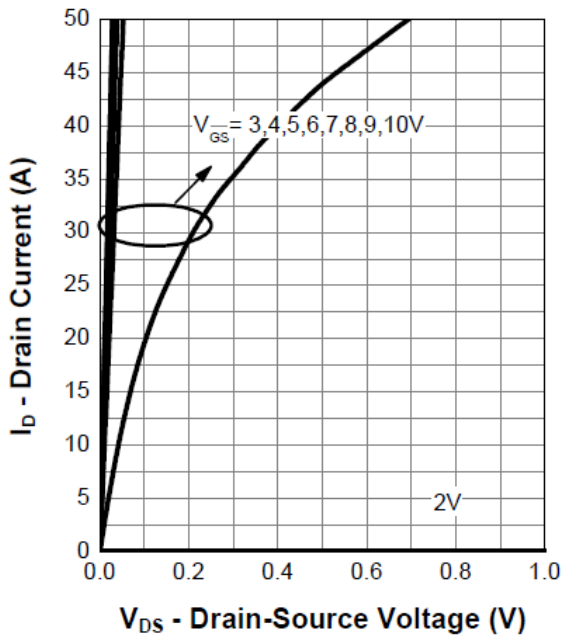


Transient Thermal Impedance

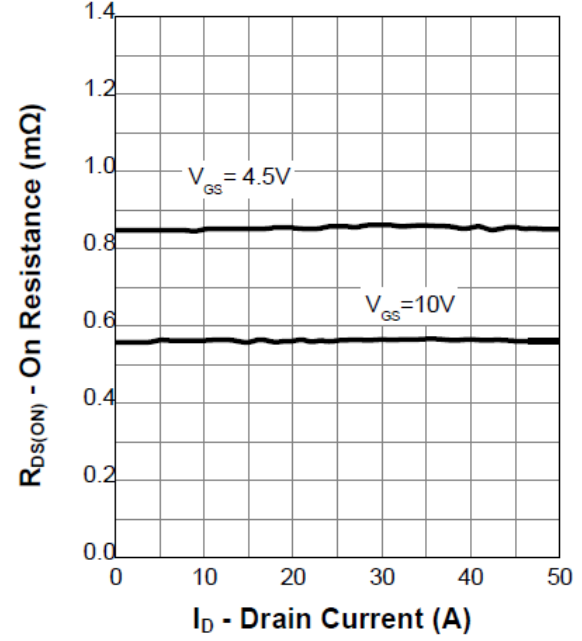




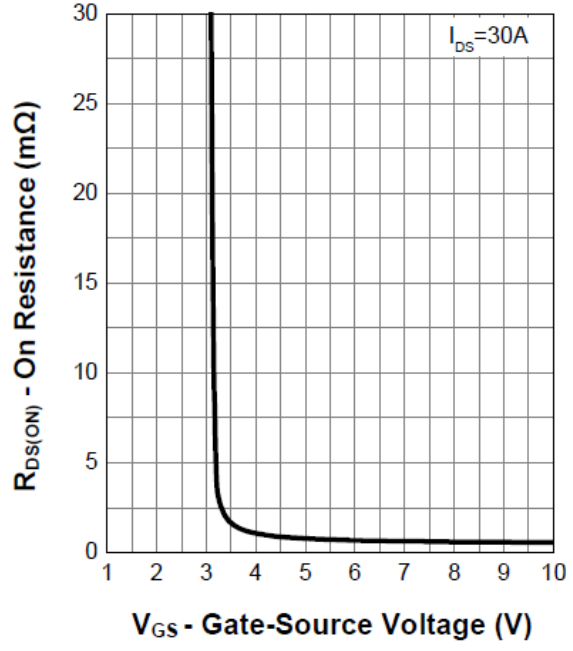
Output Characteristics



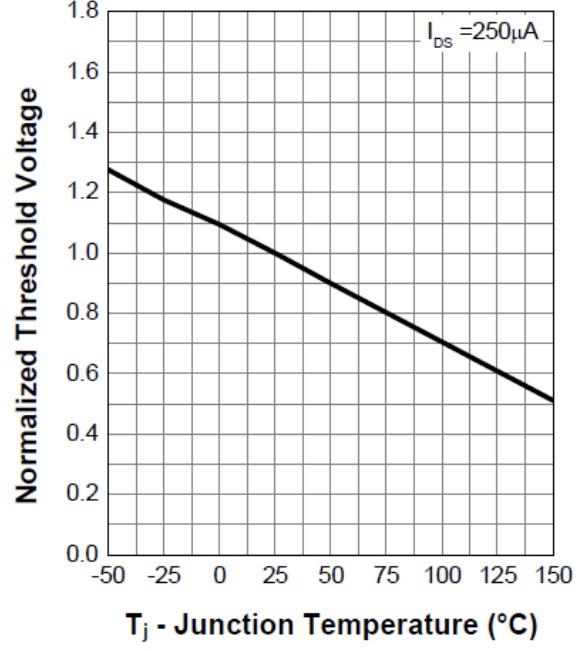
On Resistance



Transfer Characteristics

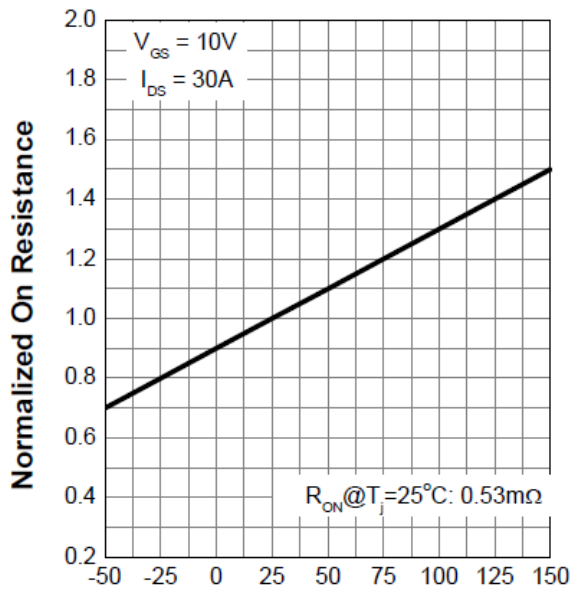


Normalized Threshold Voltage



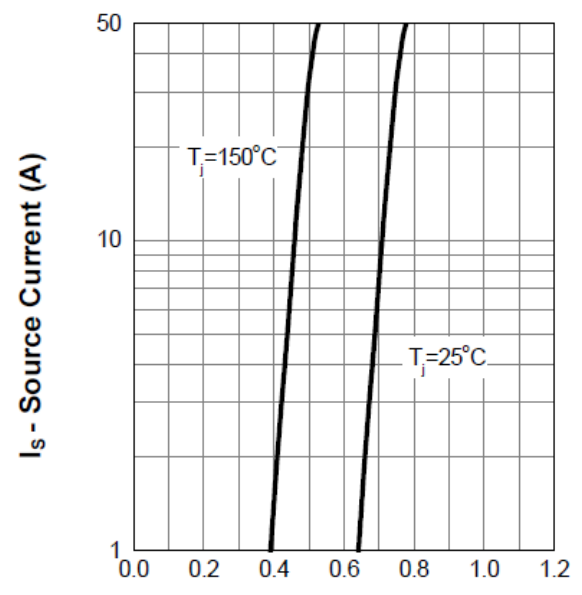


Normalized On Resistance



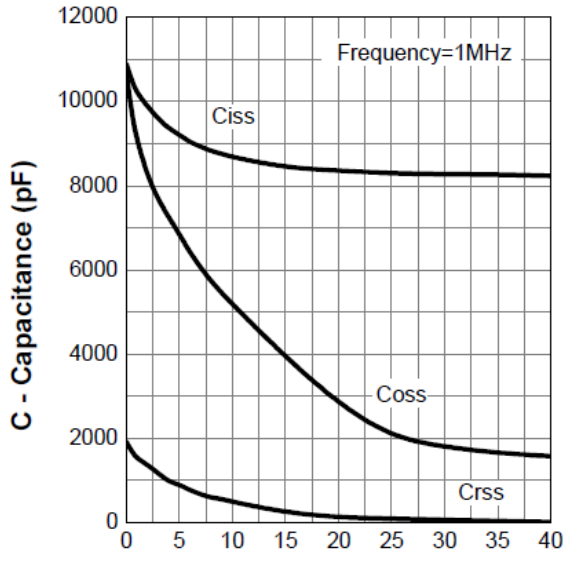
T_j - Junction Temperature ($^{\circ}\text{C}$)

Diode Forward Current



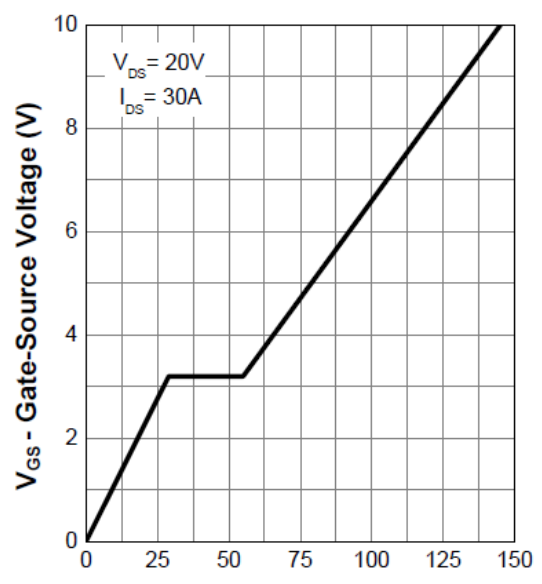
V_{SD} - Source-Drain Voltage (V)

Capacitance



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

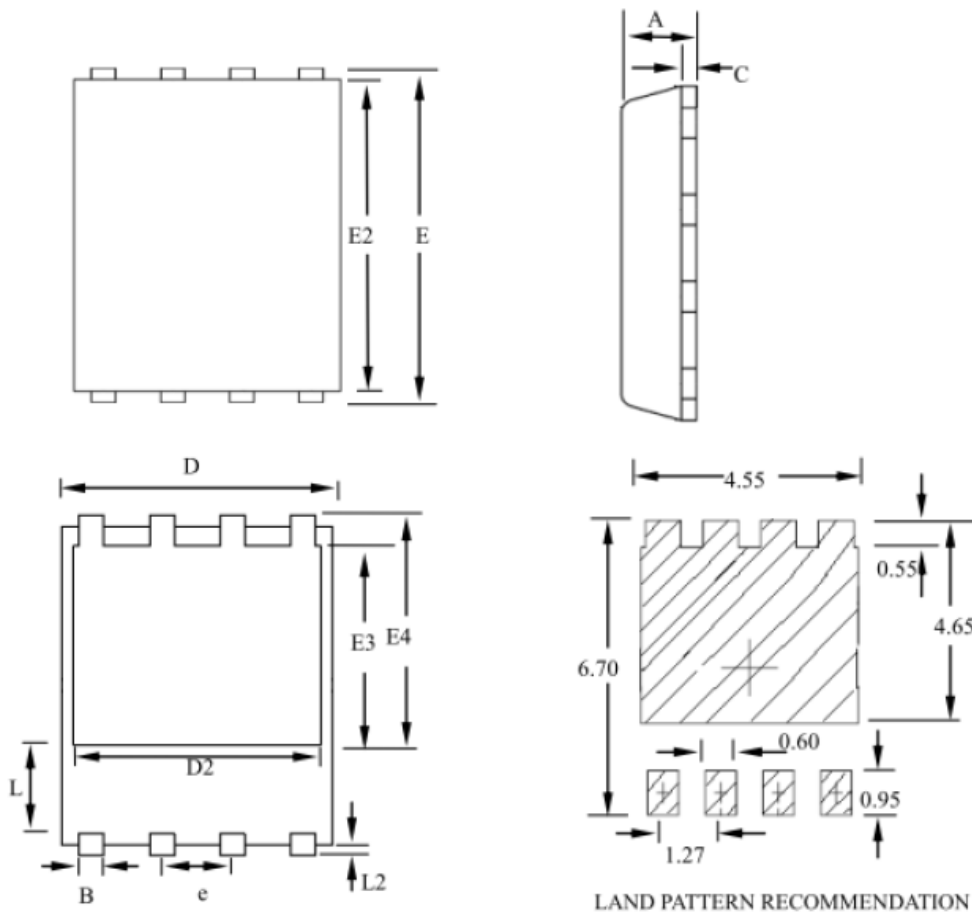
Gate Charge



Q_G - Gate Charge (nC)



PRPAK5X6 Package Outline Dimensions



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.30	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.30	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	5.90	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--