



**Applications**

- SMPS Synchronous Rectification
- DC/DC Converters
- Or-ing

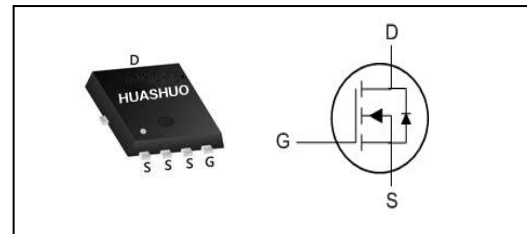
**Product Summary**

$V_{DS}$	40	V
$R_{DS(ON),TYP}$	1.6	m $\Omega$
$I_D$	130	A

**Features**

- Advanced Trench MOS Technology
- Low  $R_{DSon}$
- 100% EAS Guaranteed
- Green Device Available

**PRPAK3X3 Pin Configuration**



**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current <sup>1,6</sup>	130	A
$I_D@T_C=100^\circ C$	Continuous Drain Current <sup>1,6</sup>	81	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	520	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	362	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	60	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	65	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	2.1	$^\circ C/W$



**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	40	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	1.6	2.2	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	---	2.2	2.9	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	---	2.5	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	5	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ± 20V, V <sub>DS</sub> =0V	---	---	± 100	nA
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	1.8	---	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	35	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	6	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	8	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, R <sub>G</sub> =1Ω I <sub>D</sub> =1A	---	8	---	ns
T <sub>r</sub>	Rise Time		---	9.6	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	32	---	
T <sub>f</sub>	Fall Time		---	15	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz	---	2290	---	pF
C <sub>oss</sub>	Output Capacitance		---	913	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	88	---	

**Diode Characteristics**

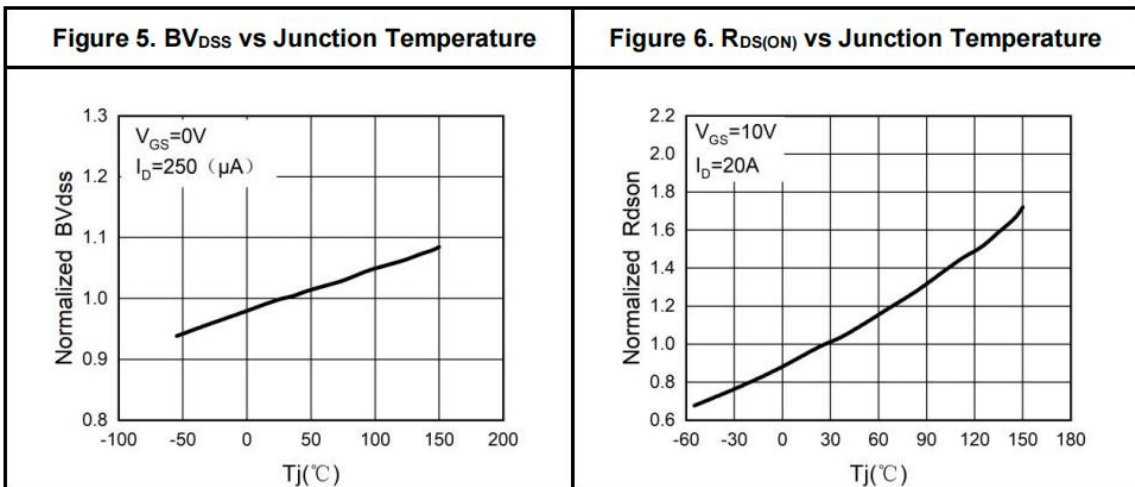
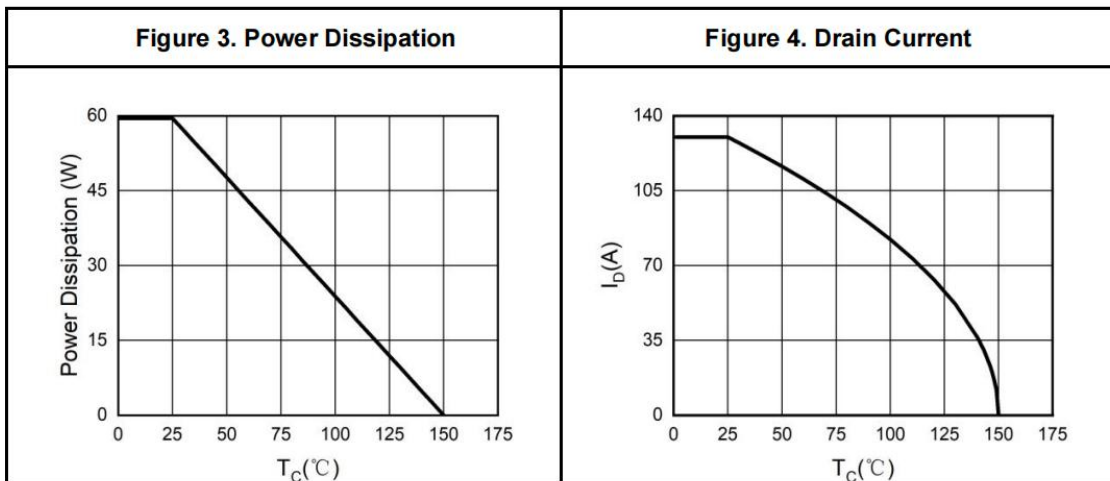
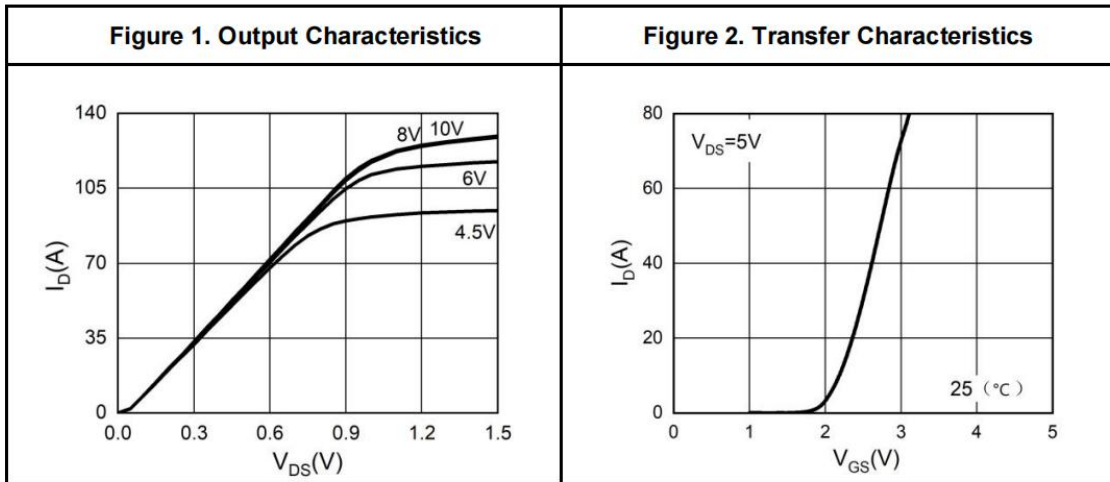
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	130	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>f</sub> =20A, dI/dt=100A/us	---	41	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>f</sub> =20A, dI/dt=100A/us	---	26	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

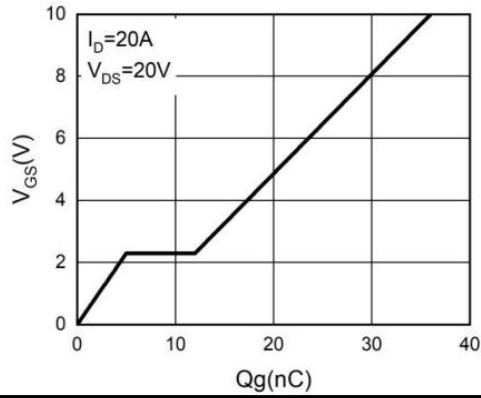


Typical Characteristics

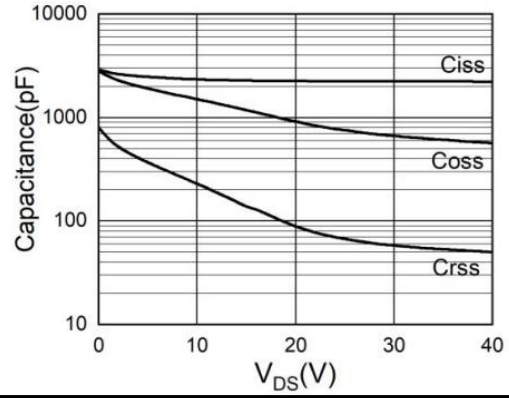




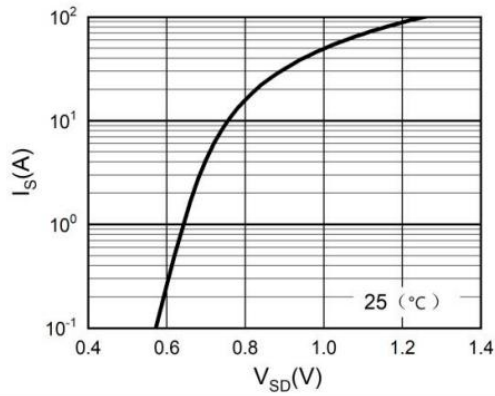
**Figure 7. Gate Charge Waveforms**



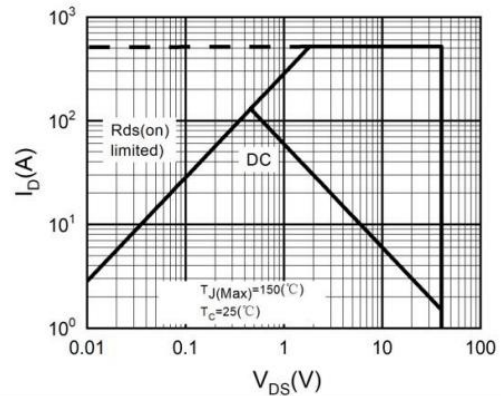
**Figure 8. Capacitance**



**Figure 9. Body-Diode Characteristics**



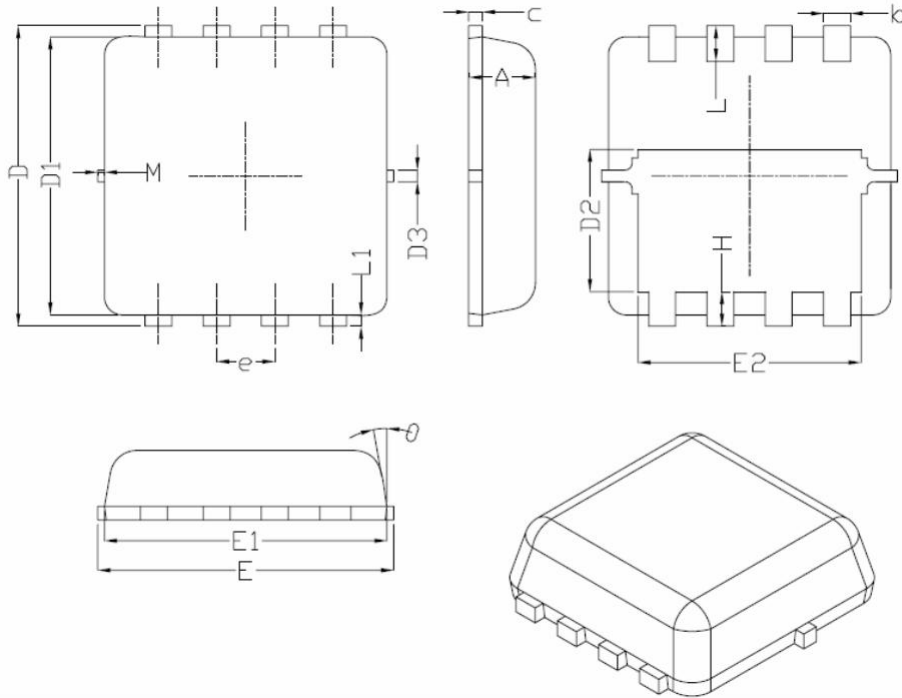
**Figure 10. Maximum Safe Operating Area**





**Ordering Information**

Part Number	Package code	Packaging
HSBB4076	PRPAK3*3	3000/Tape&Reel



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.15	3.30	3.45
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°