

General Description

The HSBA20P20A uses advanced trench MOSFET technology to provide excellent $R_{DS(ON)}$ and gate charge for use in a wide variety of other applications.

The HSBA20P20A meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

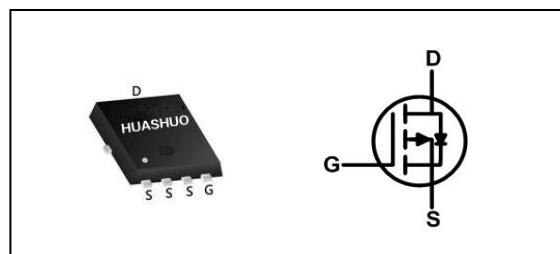
Product Summary

V_{DS}	-200	V
$R_{DS(ON),typ}$	205	m Ω
I_D	-20	A

Features

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density SGT Technology

PRPAK5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-200	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-20	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-10	A
I_{DM}	Pulsed Drain Current ¹	-63	A
EAS	Single Pulse Avalanche Energy	360	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	135	W
$P_D@T_C=75^\circ C$	Total Power Dissipation	64	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
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.5	$^\circ C/W$



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-200	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-15A$	---	205	255	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-2.0	-2.6	-4.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-200V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	-1	μA
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-200V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	-100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
gfs	Forward Transconductance	$V_{DS}=-10V$, $I_D=-10A$	---	25	---	S
Rg	Gate Resistance	$V_{GS}=0V$, $V_{DS}=0V$, $f=1.0\text{MHz}$	---	1.8	---	Ω
Q_g	Total Gate Charge	$V_{DS}=-100V$, $V_{GS}=-10V$, $I_D=-10A$	---	80	---	nC
Q_{gs}	Gate-Source Charge		---	15	---	
Q_{gd}	Gate-Drain Charge		---	28	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-100V$, $V_{GS}=-10V$, $R_G=3\Omega$, $R_L=10\Omega$	---	17	---	ns
T_r	Rise Time		---	4.3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	50	---	
T_f	Fall Time		---	28	---	
C_{iss}	Input Capacitance	$V_{DS}=-100V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2520	---	pF
C_{oss}	Output Capacitance		---	85	---	
C_{rss}	Reverse Transfer Capacitance		---	77	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-20	A
V_{SD}	Diode Forward Voltage ³	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	$IF=-10A$, $dI/dt=-100A/\mu s$	---	64	---	ns
Q_{rr}	Reverse Recovery Charge		---	195	---	nC

Note :

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2..EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=50V$, $V_G=-10V$, $R_G=25\Omega$, $L=0.5\text{mH}$.
- 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics

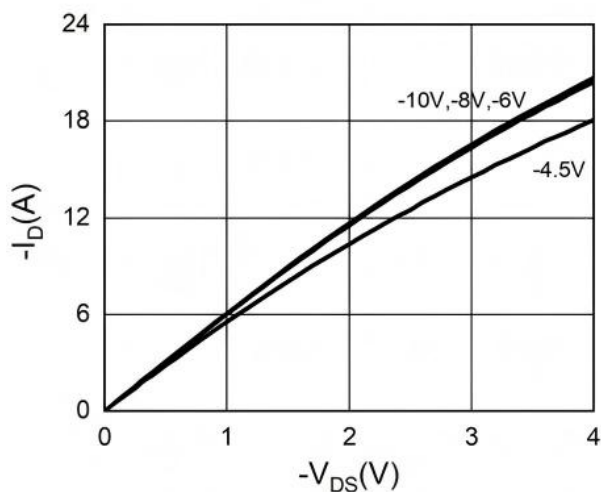


Figure 1. Output Characteristics

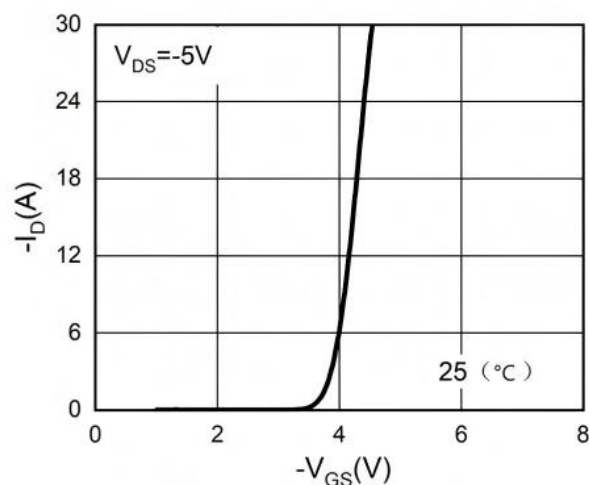


Figure 2. Transfer Characteristics

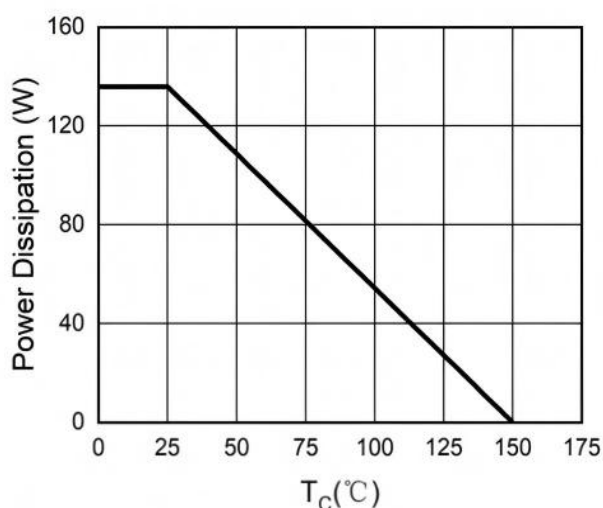


Figure 3. Power Dissipation

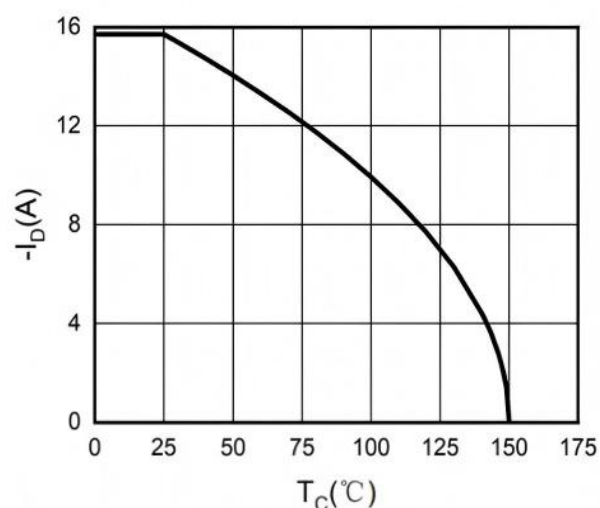


Figure 4. Drain Current

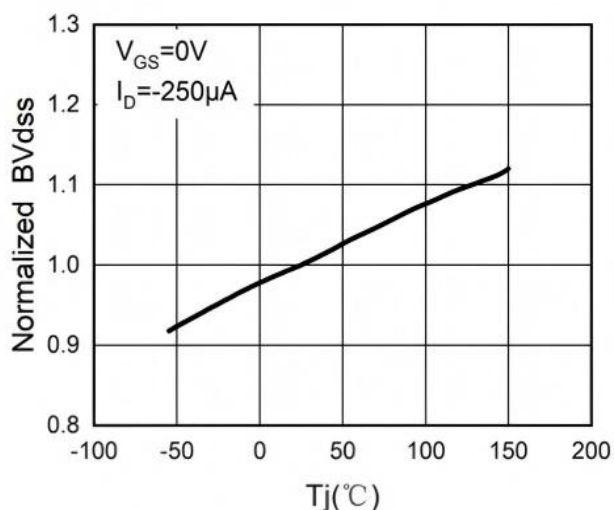


Figure 5. BV_{DS} vs Junction Temperature

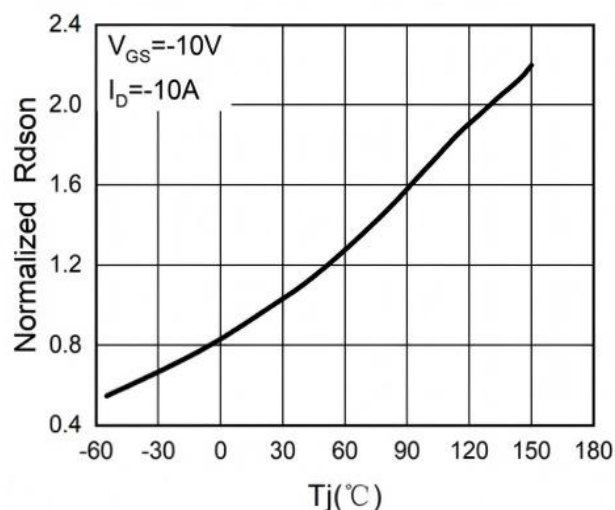


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



P-Ch 200V Fast Switching MOSFETs

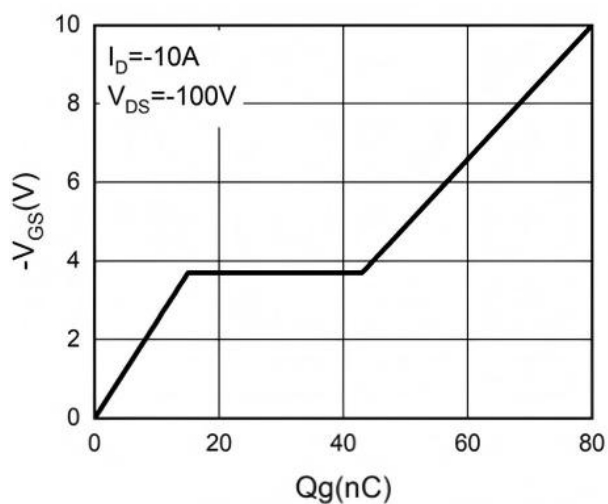


Figure 7. Gate Charge Waveforms

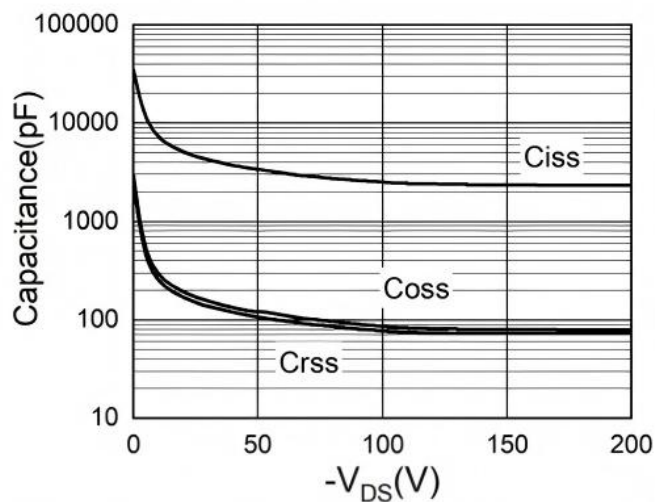


Figure 8. Capacitance

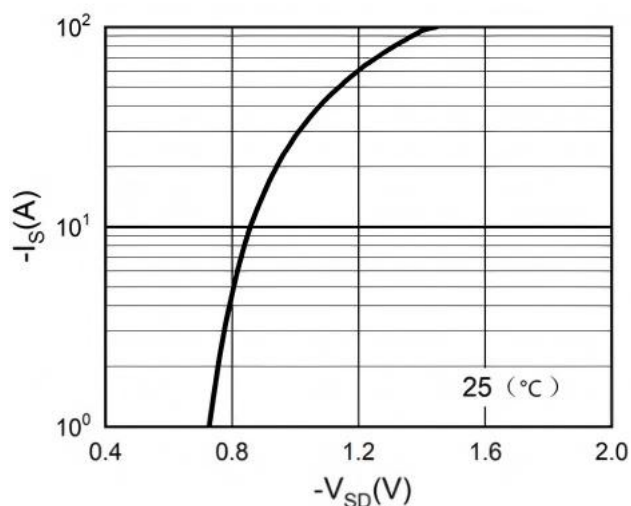


Figure 9. Body-Diode Characteristics

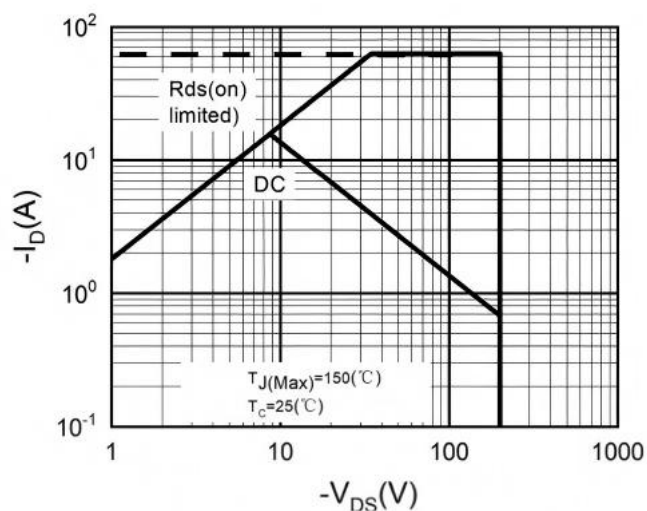
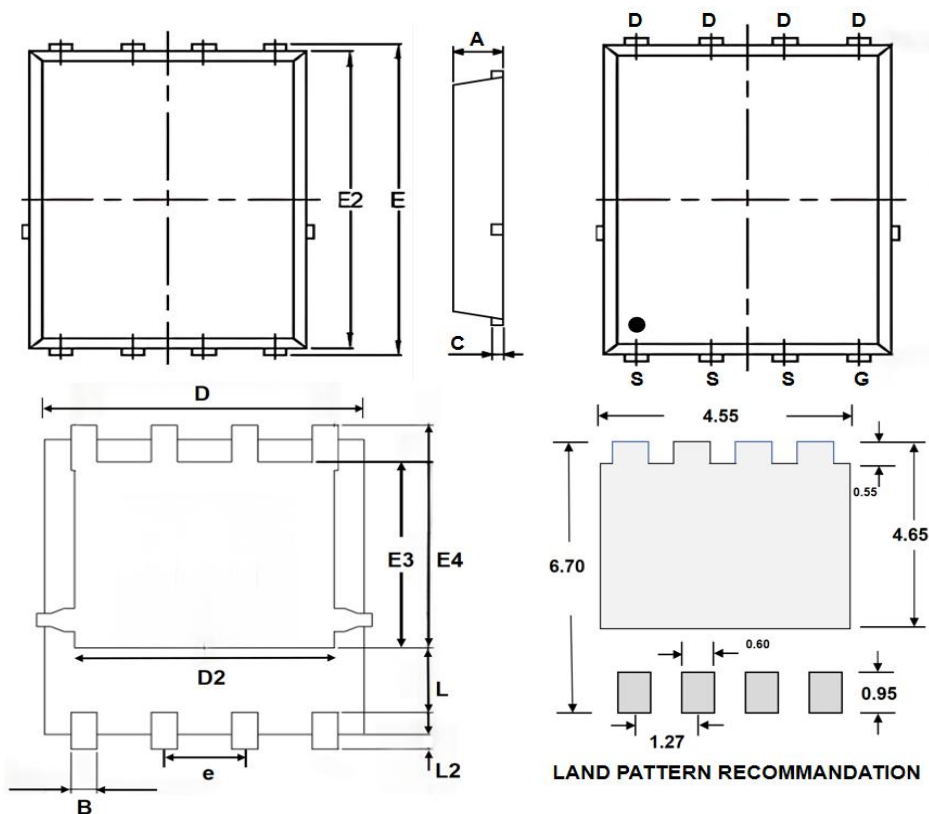


Figure 10. Maximum Safe Operating Area

Ordering Information

Part Number	Package code	Packaging
HSBA20P20A	PRPAK5*6	3000/Tape&Reel

PRPAK5*6 Package Outline



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.25	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.45	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	--	6.06	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	--

HSBA20P20A Marking:

