

N-Ch 80V Fast Switching MOSFETs
Description

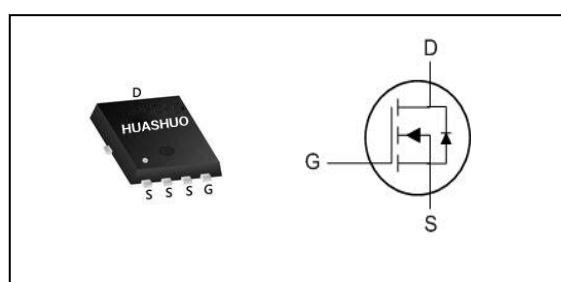
The HSBA8076A is the high cell density SGT N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous rectification applications.

The HSBA8076A meet the RoHS and Halogen-Free compliant product requirement, 100% EAS guaranteed with full function reliability approved.

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

Product Summary

V_{DS}	80	V
$R_{DS(ON),typ}$	2	mΩ
I_D	170	A

PRPAK5X6 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	170	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	105	A
$I_D@T_A=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	22	A
$I_D@T_A=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	14	A
I_{DM}	Pulsed Drain Current ²	540	A
EAS	Single Pulse Avalanche Energy ³	155	mJ
I_{AS}	Avalanche Current	55	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	126	W
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ⁴	2.3	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	55	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1	°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	$V_{GS}=0V$, $I_D=250\mu A$	80	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=20A$	---	2	2.5	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	2.9	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=64V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=64V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.4	---	Ω
Q_g	Total Gate Charge (10V)	$V_{DS}=40V$, $V_{GS}=10V$, $I_D=30A$	---	101	---	nC
Q_{gs}	Gate-Source Charge		---	26	---	
Q_{gd}	Gate-Drain Charge		---	27	---	
$T_d(on)$	Turn-On Delay Time	$V_{DD}=40V$, $V_{GS}=10V$, $R_G=3.3\Omega$, $I_D=30A$	---	22	---	ns
T_r	Rise Time		---	49	---	
$T_d(off)$	Turn-Off Delay Time		---	54	---	
T_f	Fall Time		---	41	---	
C_{iss}	Input Capacitance	$V_{DS}=40V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	6560	---	pF
C_{oss}	Output Capacitance		---	1051	---	
C_{rss}	Reverse Transfer Capacitance		---	115	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	100	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=30A$, $dI/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	76	---	nS
Q_{rr}	Reverse Recovery Charge		---	173	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=55A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 6.The maximum current rating is package limited.



Typical Characteristics

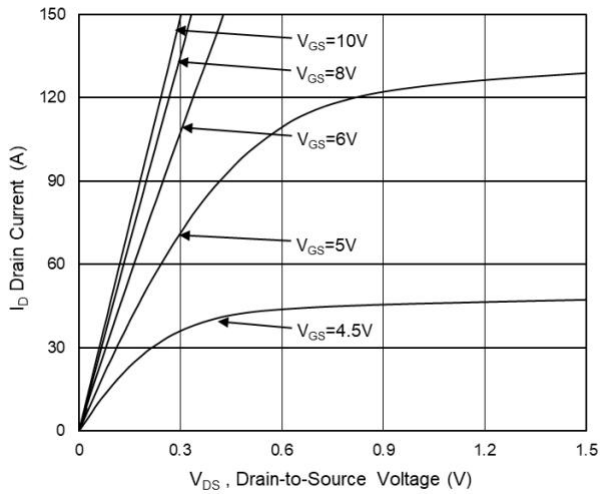


Fig.1 Typical Output Characteristics

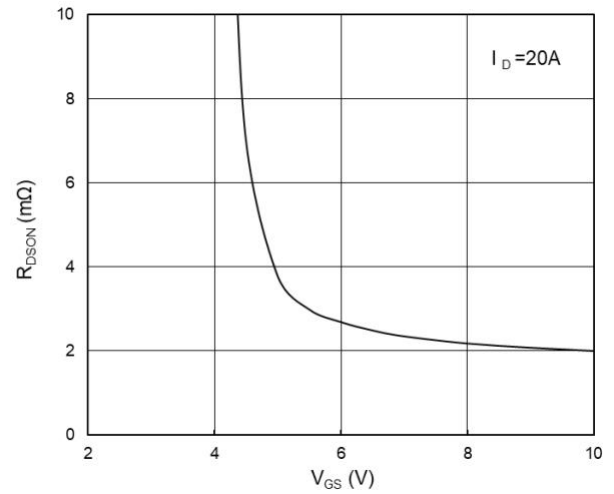


Fig.2 On-Resistance vs G-S Voltage

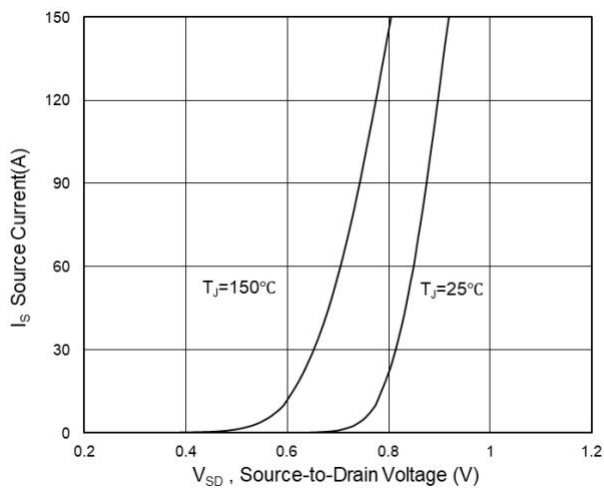


Fig.3 Source Drain Forward Characteristics

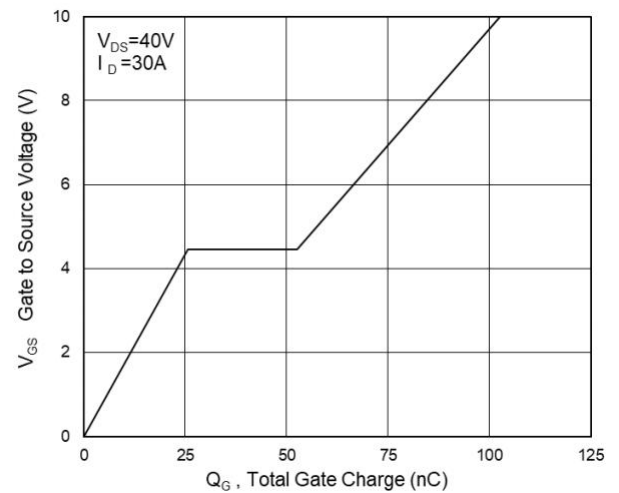


Fig.4 Gate-Charge Characteristics

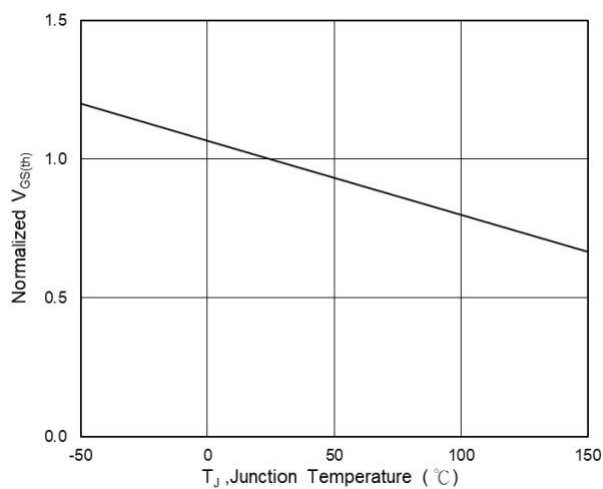


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

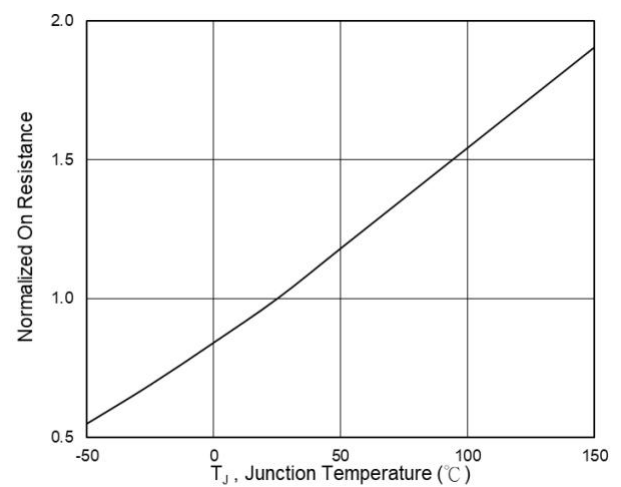


Fig.6 Normalized $R_{DS(on)}$ vs. T_J



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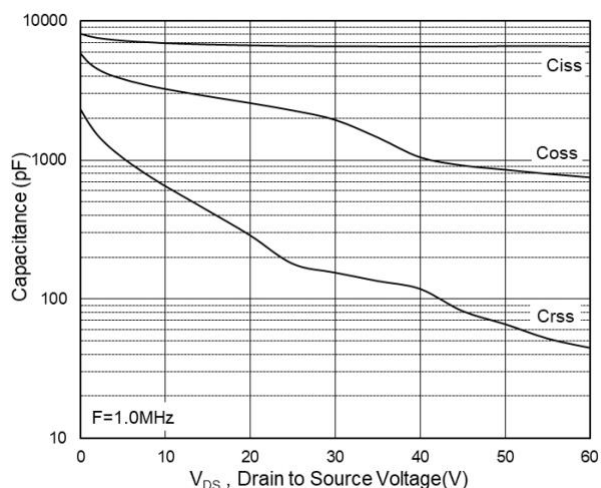


Fig.7 Capacitance

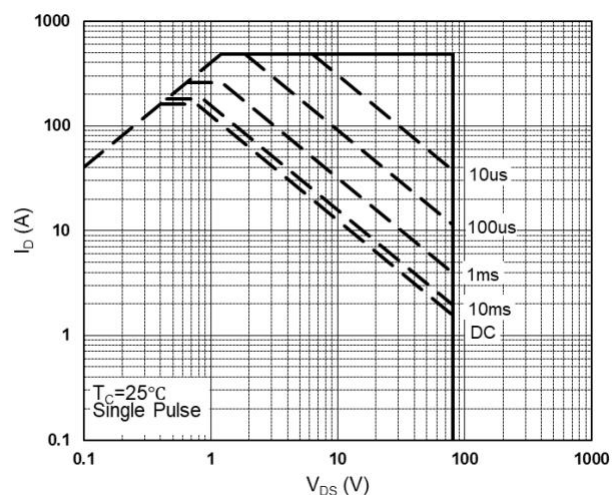


Fig.8 Safe Operating Area

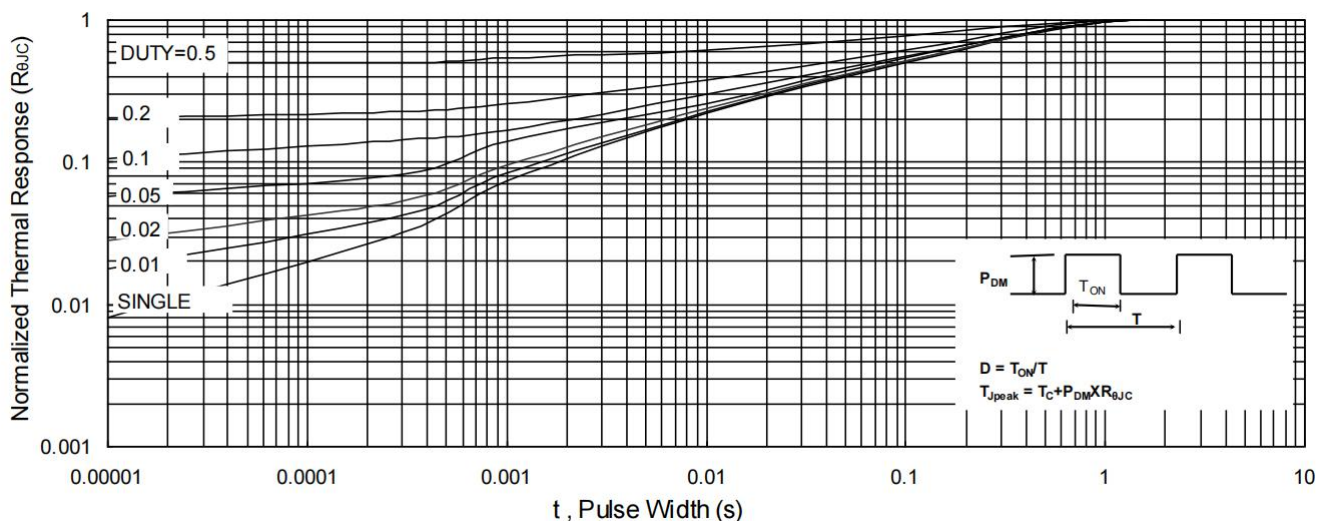


Fig.9 Normalized Maximum Transient Thermal Impedance

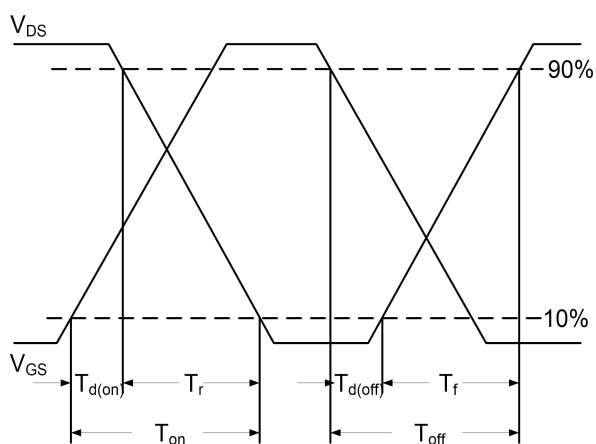


Fig.10 Switching Time Waveform

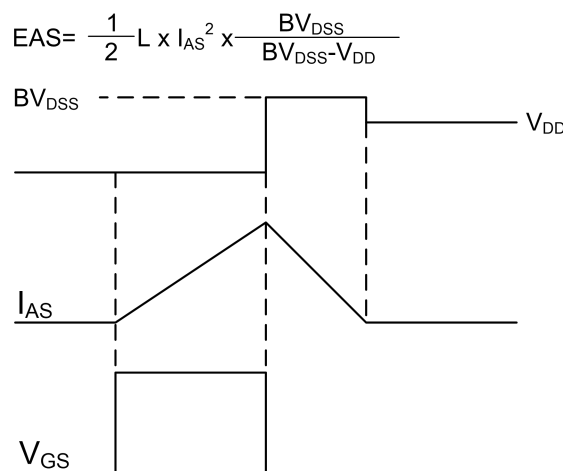
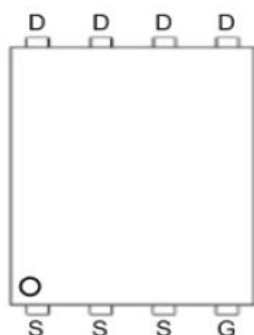
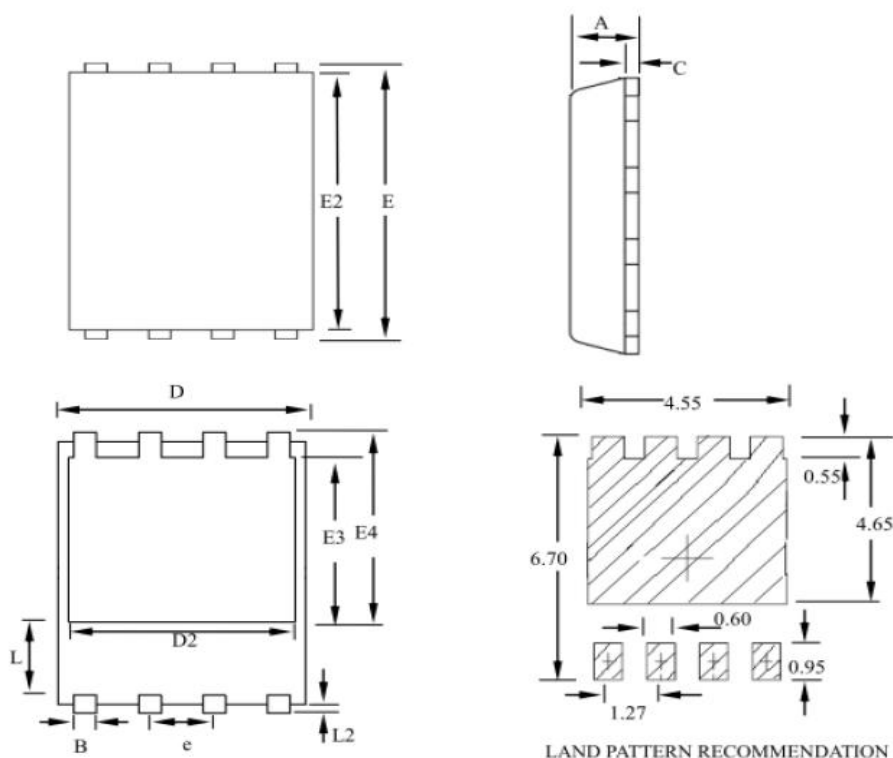


Fig.11 Unclamped Inductive Switching Waveform

Ordering Information

Part Number	Package code	Packaging
HSBA8076A	PRPAK5*6	3000/Tape&Reel



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	--