HUASHUO SEMICONDUCTOR

HSBA009N03

N-Ch 30V Fast Switching MOSFETs

Applications

- Power Management in Desktop Computer or DC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial.

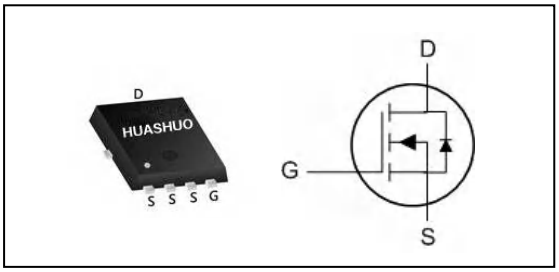
Product Summary

V_{DS}	30	V
$R_{DS(ON),typ}$	0.92	mΩ
I_D	255	A

Features

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

PRPAK5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	255	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	160	A
I_{DM}	Pulsed Drain Current[1]	1020	A
EAS	Single Pulse Avalanche Energy[7]	256	mJ
P_D@T_C=25℃	Total Power Dissipation[2]	130	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[3]	---	50	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0.96	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	---	0.92	1.15	mΩ
		V_{GS}=4.5V , I_D=15A	---	1.25	1.7	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.3	1.8	2.3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
R_g	Gate Resistance	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	1.3	---	Ω
Q_g	Total Gate Charge[5]	V_{DS}=15V , V_{GS}=4.5V , I_D=20A	---	40	---	nC
Q_{gs}	Gate-Source Charge[5]		---	23	---	
Q_{gd}	Gate-Drain Charge[5]		---	9.9	---	
$T_{d(on)}$	Turn-On Delay Time[5]	V_{DD}=20V , V_{GS}=4.5V , R_G=3.0Ω I_D=15A	---	43	---	ns
T_r	Rise Time[5]		---	80	---	
$T_{d(off)}$	Turn-Off Delay Time[5]		---	52	---	
T_f	Fall Time[5]		---	32	---	
C_{iss}	Input Capacitance[5]	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	5903	---	pF
C_{oss}	Output Capacitance[5]		---	3216	---	
C_{rss}	Reverse Transfer Capacitance[5]		---	204	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[3]	V_G=V_D=0V , Force Current	---	---	255	A
V_{SD}	Diode Forward Voltage[6]	V_{GS}=0V , I_S=10A , T_J=25℃	---	---	1.4	V
Trr	Reverse Recovery Time[4]	Is=IF, dI/dt=100A/us,Tj=25℃	---	67	---	nS
Qrr	Reverse Recovery Charge		---	90	---	nC

Note :
1.Repetitive Rating: Pulse width limited by maximum junction temperature. Ratings are based on low frequency and duty cycles to keep initial TJ =25° C.
2.The power dissipation PD is based on TJ(MAX)= 150℃, using junction-to-case thermal resistance.
3.Surface Mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.
4.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
5.Guaranteed by design, not subject to production.
6.The maximum current limited by package.
7.EAS condition : Tj=25℃,VDD=15V,VG= 10V,L=0.5mH,Rg=25Ω.

Typical Characteristics

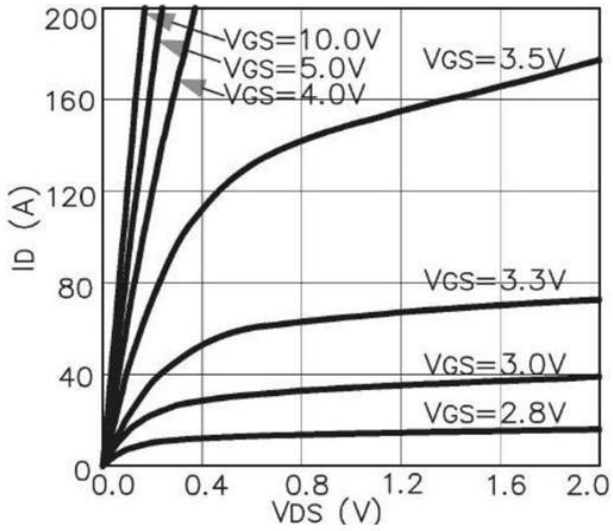


Fig.1 Typical Output Characteristics

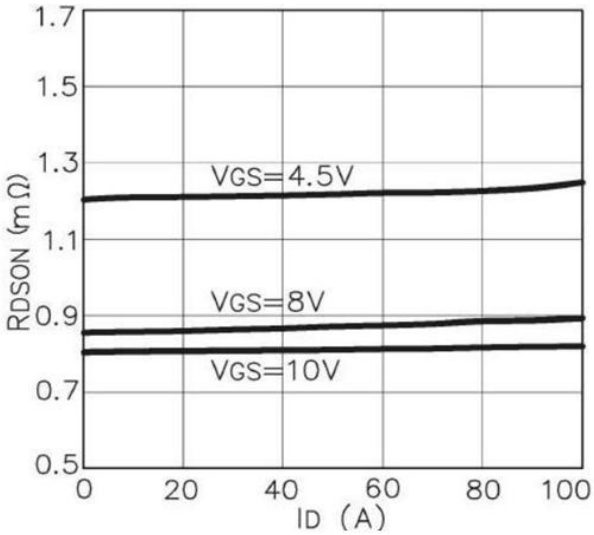


Fig.2 Rdson- Drain Current

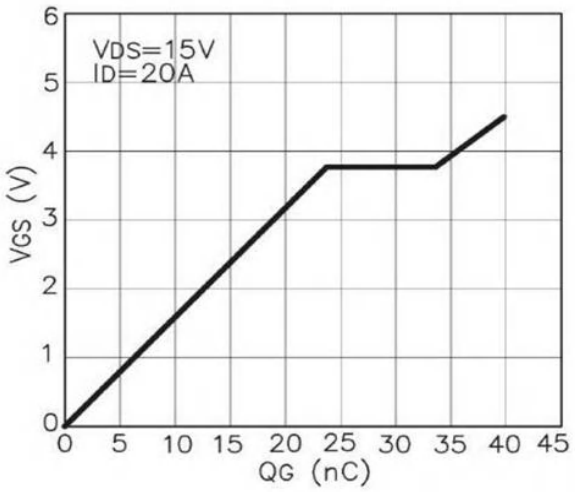


Fig.3 Gate Charge

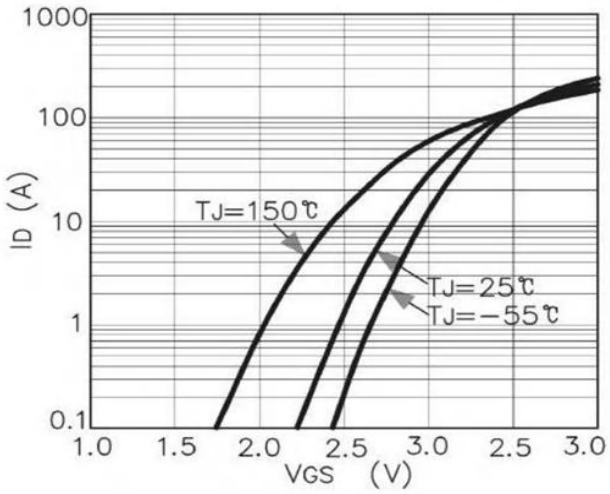


Fig.4 Transfer Characteristics

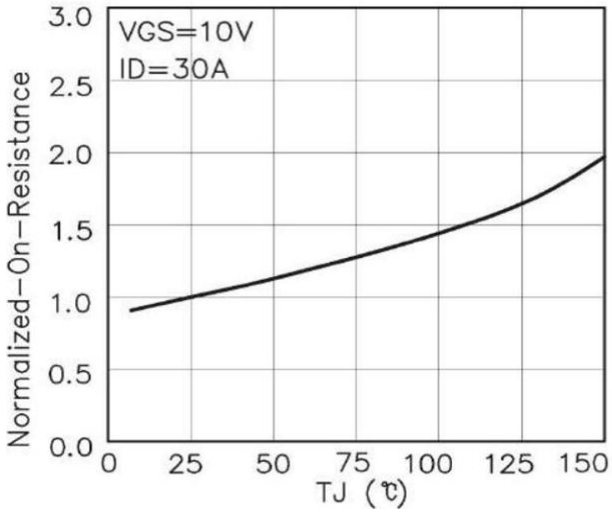


Fig.5 Rdson-JunctionTemperature

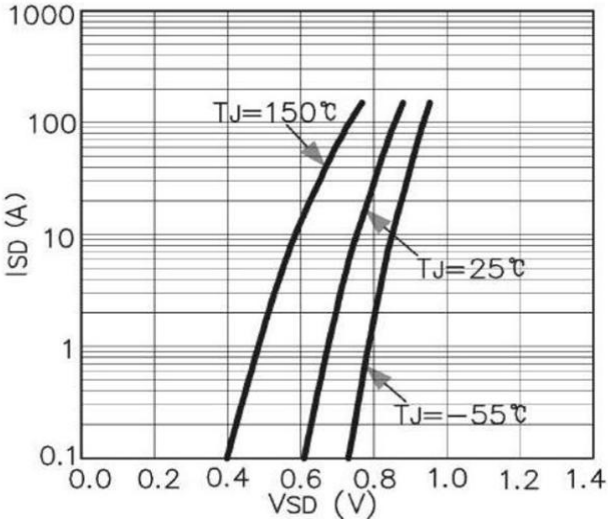


Fig.6 Source- Drain Diode Forward

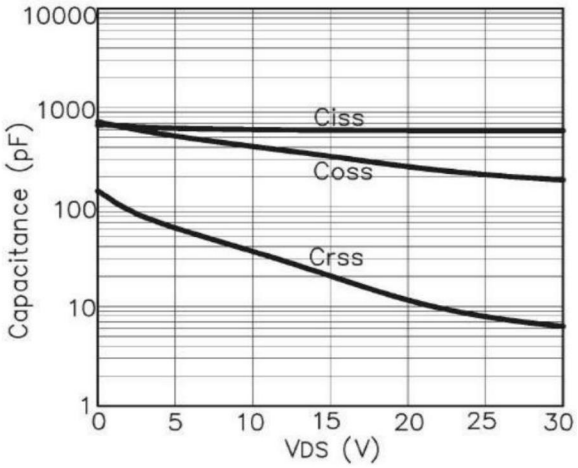


Fig.7 Capacitance vs VDS

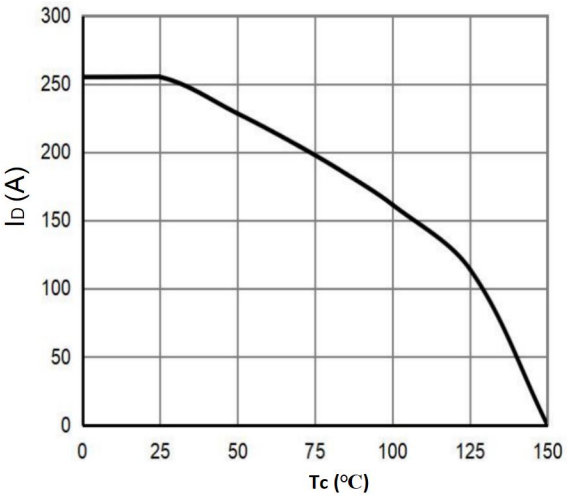


Fig.8 Current De-rating

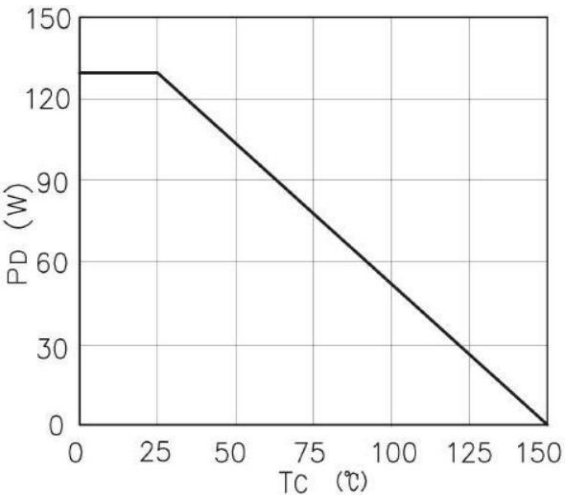


Fig.9 Power De-rating

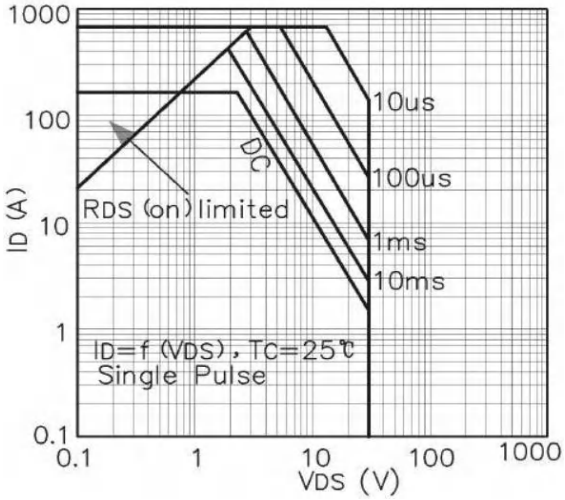


Fig.10 Safe Operation Area

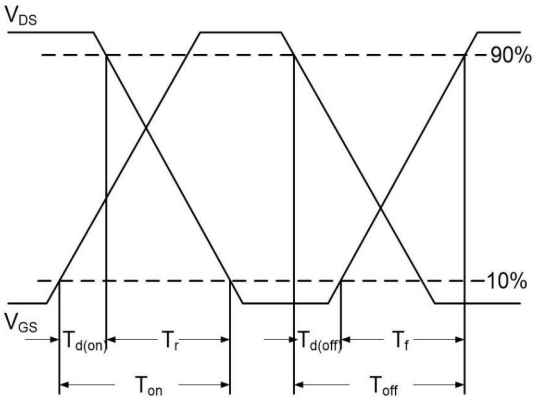


Fig.11 Switching Time Waveform

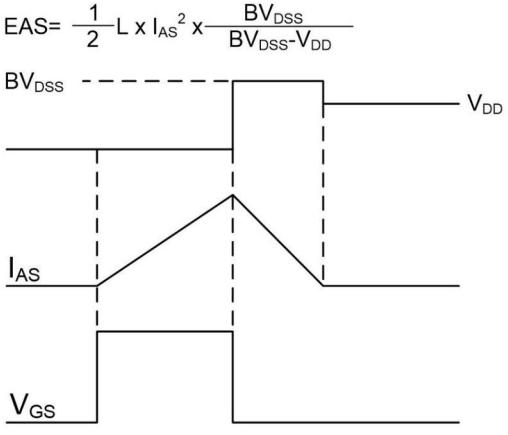
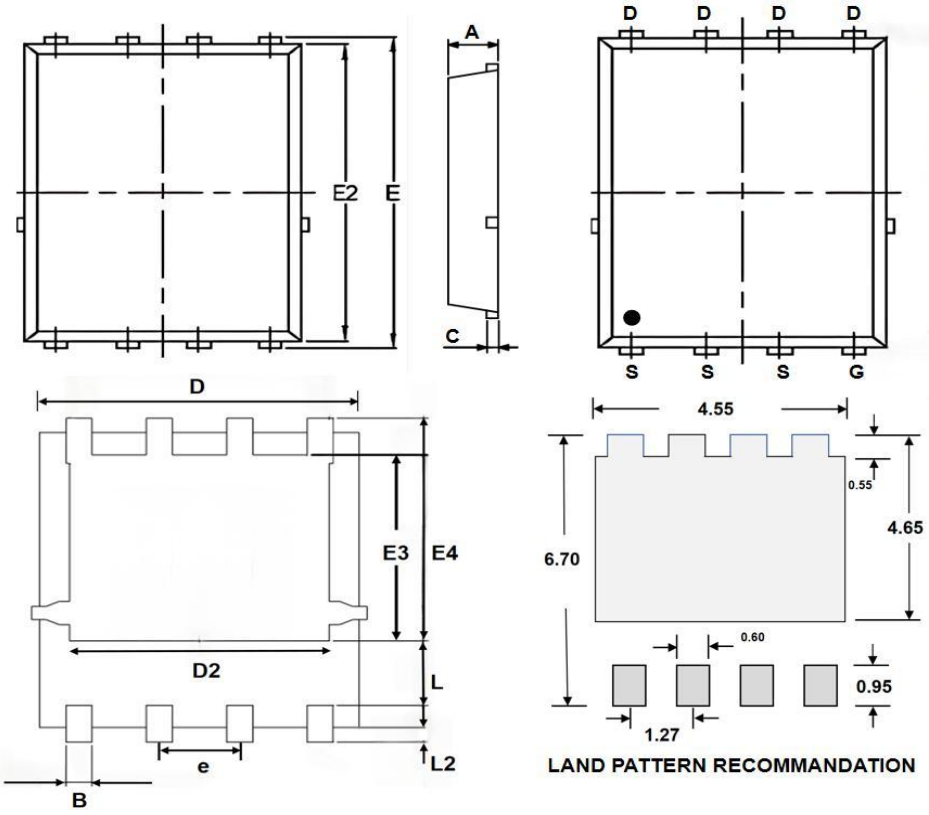


Fig.12 Unclamped Inductive Switching Waveform

Ordering Information

Part Number	Package code	Packaging
HSBA009N03	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	--

HSBA009N03 Marking: