

General Description

The HSBA087N15 is the highest performance SGT N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The HSBA087N15 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

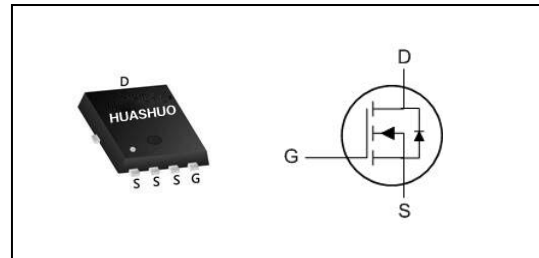
Features

- Super Low Gate Charge
- Green Device Available
- Excellent $C_{dv/dt}$ effect decline
- Advanced high cell density SGT MOS Technology

Product Summary

V_{DS}	150	V
$R_{DS(ON),typ}$	7.5	m Ω
I_D	100	A

PRPAK5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V	100	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V	71	A
I_{DM}	Pulsed Drain Current	350	A
EAS	Single Pulse Avalanche Energy ⁵	760	mJ
I_{AS}	Avalanche Current	110	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	150	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ²	---	50	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0.88	$^\circ C/W$



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	150	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V, I _D =45A	---	7.5	8.7	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	3	3.6	4.8	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =150V, V _{GS} =0V, T _J =25°C	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge	V _{DS} =75V, V _{GS} =10V, I _D =45A	---	39	---	nC
Q _{gs}	Gate-Source Charge		---	23	---	
Q _{gd}	Gate-Drain Charge		---	7	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =75V, V _{GS} =10V, I _D =45A. R _G =3 Ω	---	26	---	ns
T _r	Rise Time		---	89	---	
T _{d(off)}	Turn-Off Delay Time		---	30	---	
T _f	Fall Time		---	35	---	
C _{iss}	Input Capacitance	V _{DS} =75V, V _{GS} =0V, f=1MHz	---	2980	---	pF
C _{oss}	Output Capacitance		---	695	---	
C _{rss}	Reverse Transfer Capacitance		---	20	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _{SD}	Source - Drain Current (Body Diode) ²	---	---	---	100	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =45A, T _J =25°C	---	---	1.5	V
t _{rr}	Reverse Recovery Time	I _F =45A, dI/dt=100A/μs, T _J =25°C	---	50	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	56	---	nC

Note :

- 1.. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_J=25, V °C DD=50V, VG=10V, L=0.5mH, R_G=25Ω



Typical Characteristics

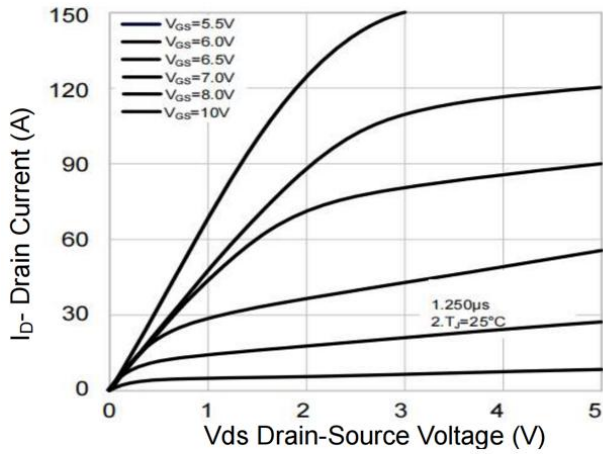


Figure 1 Output Characteristics

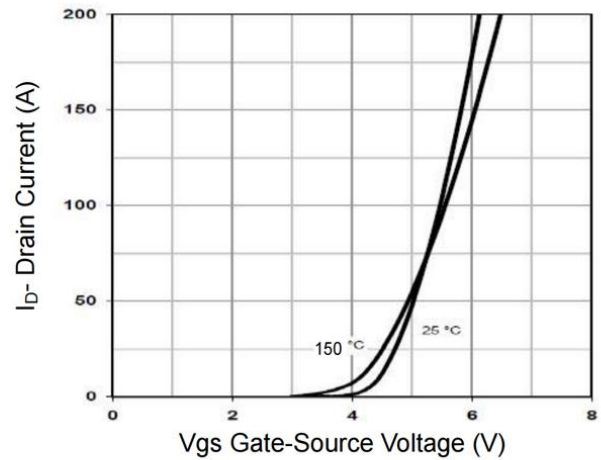


Figure 2 Transfer Characteristics

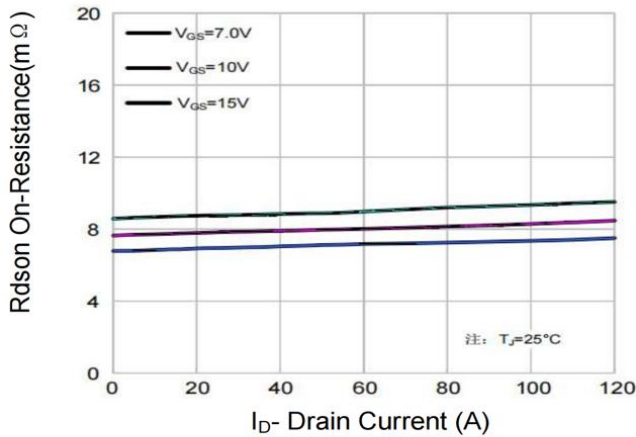


Figure 3 Rdson- Drain Current

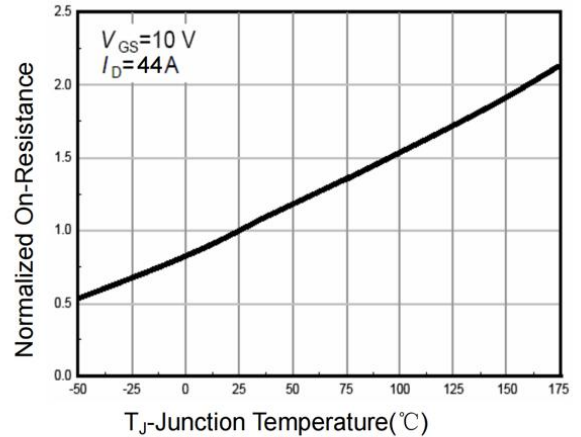


Figure 4 Rdson-Junction Temperature

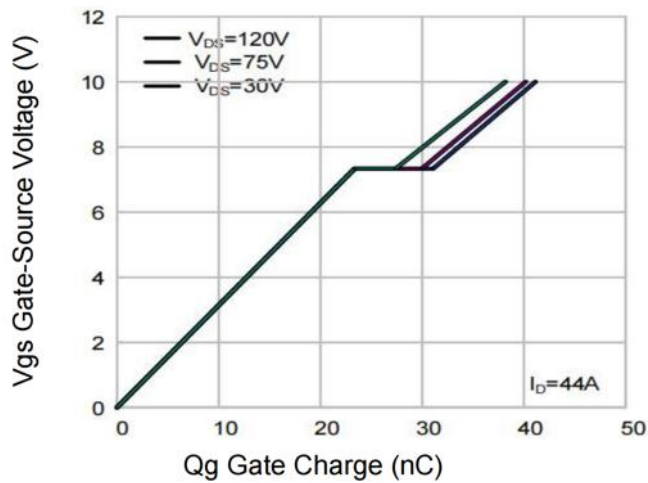


Figure.5 Gate Charge

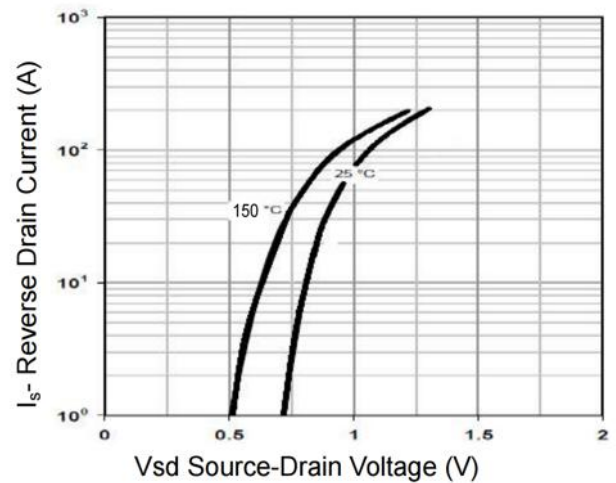


Figure.6 Source- Drain Diode Forward

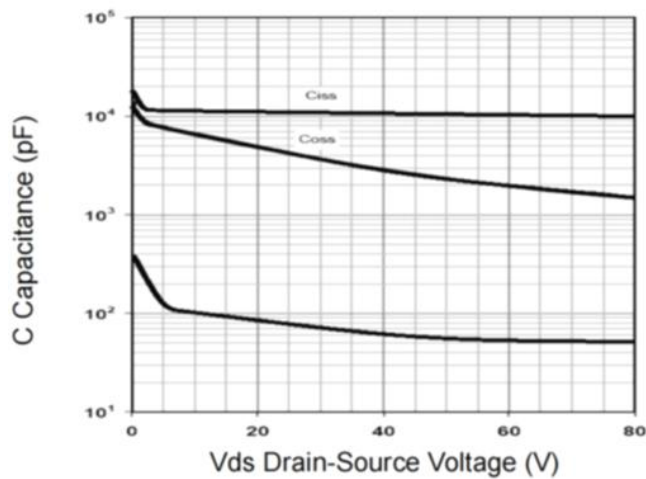


Figure.7 Capacitance vs Vds

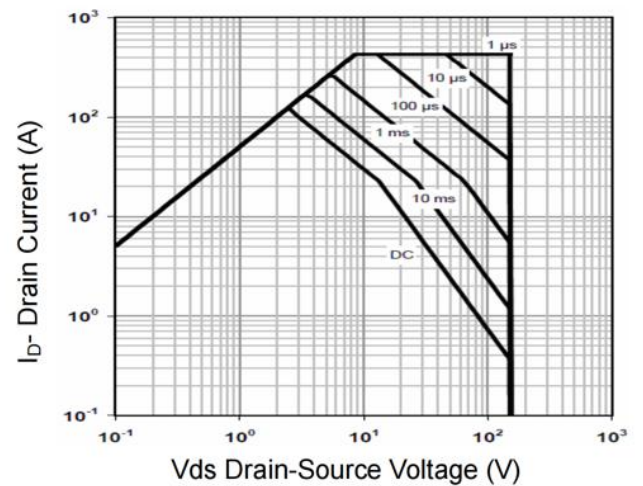


Figure.8 Safe Operation Area

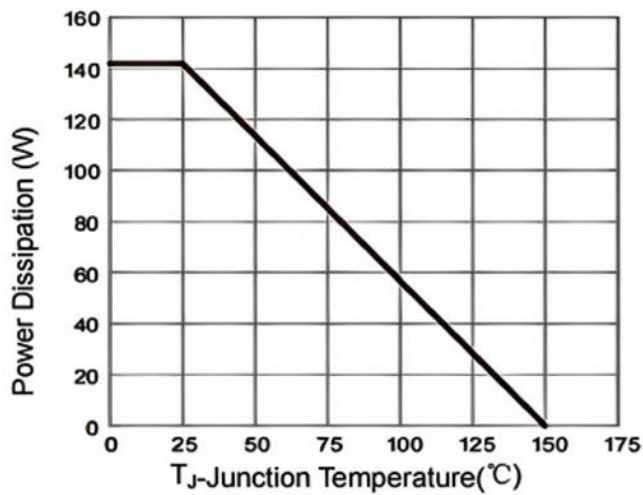


Figure.9 Power De-rating

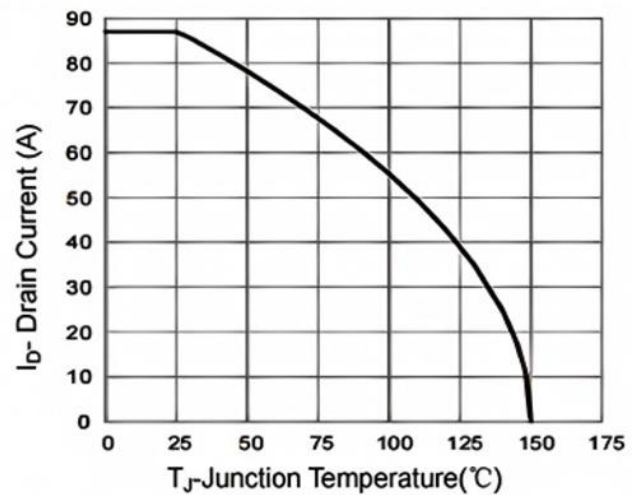


Figure.10 Current De-rating

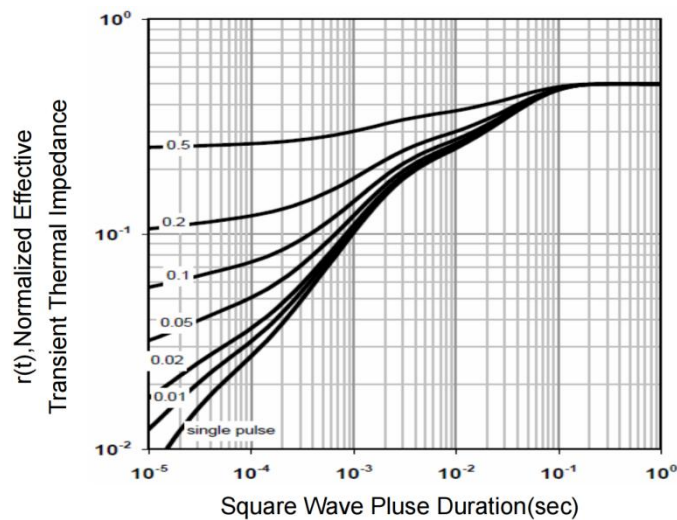


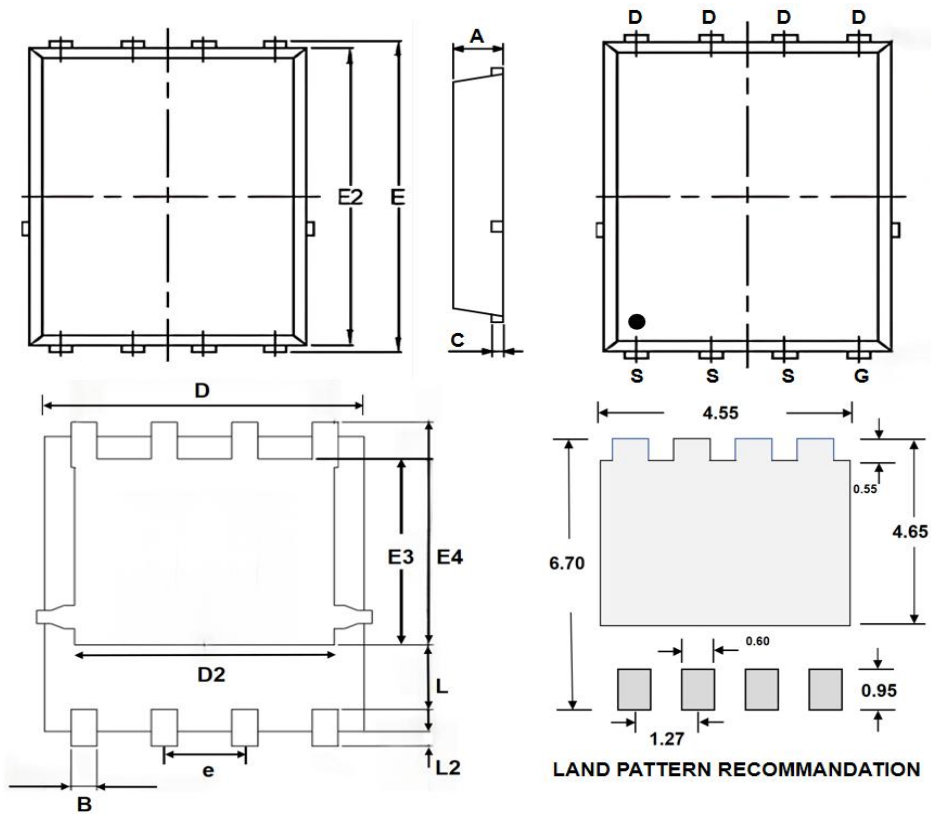
Figure.11 Normalized Maximum Transient Thermal Impedance



Ordering Information

Part Number	Package code	Packaging
HSBA087N15	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	--



HSBA087N15 Marking:

