HSH120N85

N-Ch 85V Fast Switching MOSFETs

General Description

The HSH120N85 is the high cell density SGT N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The HSH120N85 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

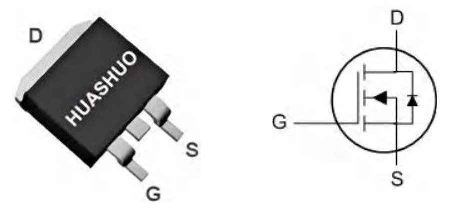
Product Summary

V_{DS}	85	V
$R_{DS(ON),TYP}$	4.6	mΩ
I_D	120	A

Features

- 100% EAS Guaranteed
- Motor Drives
- SR(Synchronous rectification)
- DC/DC Converter
- Advanced high cell density SGT MOS Technology

TO-263 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25˚C	Continuous Drain Current, V_{GS} @ 10V[1,6]	120	A
I_D@T_C=100˚C	Continuous Drain Current, V_{GS} @ 10V[1,6]	100	A
I_{DM}	Pulsed Drain Current[2]	480	A
EAS	Single Pulse Avalanche Energy[3]	145	mJ
P_D@T_C=25˚C	Total Power Dissipation[4]	220	W
T_{STG}	Storage Temperature Range	-55 to 175	˚C
T_J	Operating Junction Temperature Range	-55 to 175	˚C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	62	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.7	˚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	85	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	4.6	5.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	3	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25˚C	---	---	1	uA
		V_{DS}=64V , V_{GS}=0V , T_J=25˚C	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	80	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	3.1	---	Ω
Qg	Total Gate Charge (10V)	V_{DD}=40V , V_{GS}=10V , I_D=20A	---	48	---	nC
Qgs	Gate-Source Charge		---	15	---	
Qgd	Gate-Drain Charge		---	13	---	
Td(on)	Turn-On Delay Time	V_{DD}=40V , V_{GS}=10V , R_G=6Ω, I_D=20A	---	20	---	ns
Tr	Rise Time		---	39	---	
Td(off)	Turn-Off Delay Time		---	44	---	
Tf	Fall Time		---	22	---	
Ciss	Input Capacitance	V_{DS}=40V , V_{GS}=0V , f=1MHz	---	3600	---	pF
Coss	Output Capacitance		---	1050	---	
Crss	Reverse Transfer Capacitance		---	31	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	120	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=50A , T_J=25˚C	---	---	1.4	V
t_{rr}	Reverse Recovery Time	I_F=20A , dI/dt=500A/μs , T_J=25˚C	---	60	---	nS
Q_{rr}	Reverse Recovery Charge		---	340	---	nC

Figure 1. Typ. Output Characteristics (Tj=25℃)

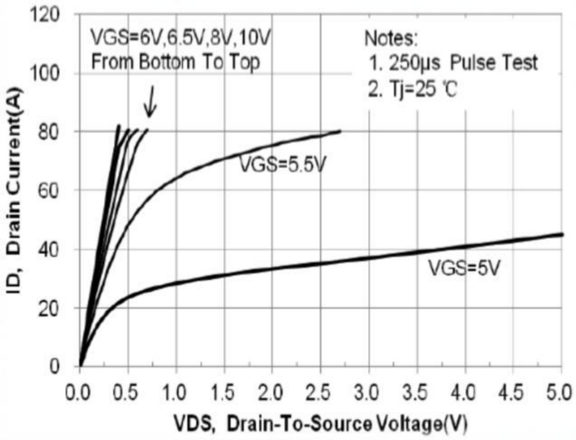


Figure 2. Transfer Characteristics (Junction Temperature)

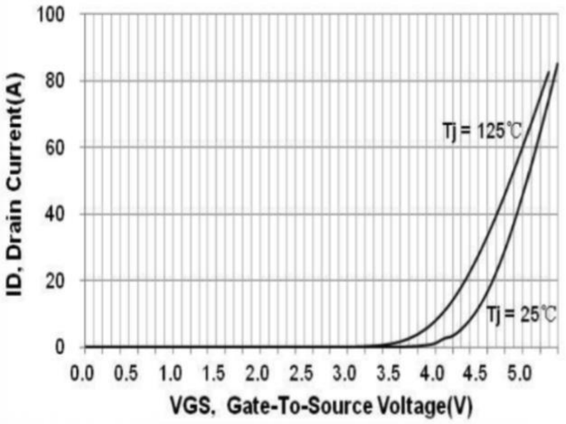


Figure 5. On-Resistance vs. Gate-Source Voltage (Junction Temperature)

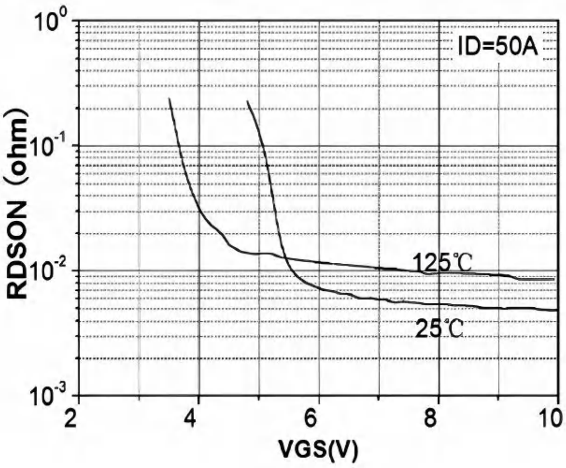


Figure 6. Body-Diode Characteristics (Junction Temperature)

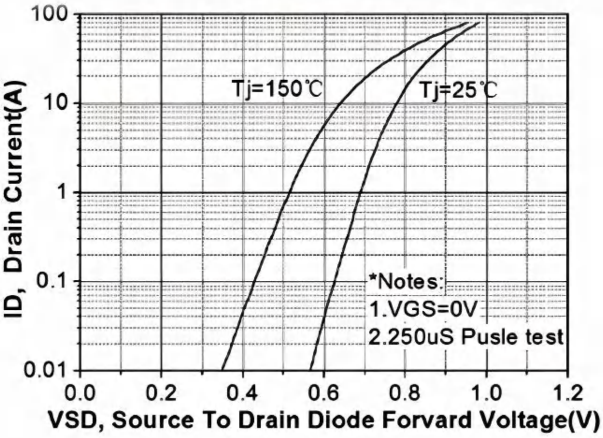


Figure 5. On-Resistance vs. Gate-Source Voltage (Junction Temperature)

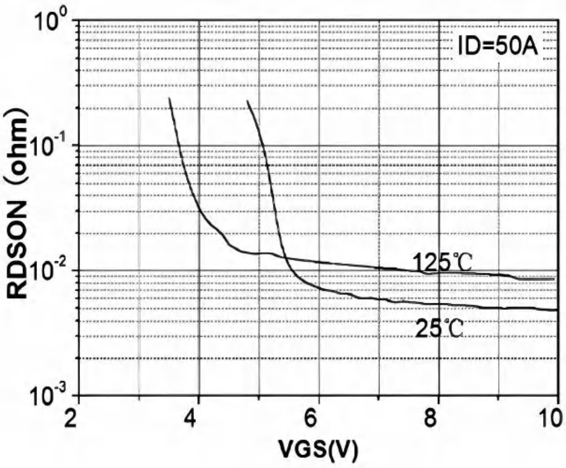


Figure 6. Body-Diode Characteristics (Junction Temperature)

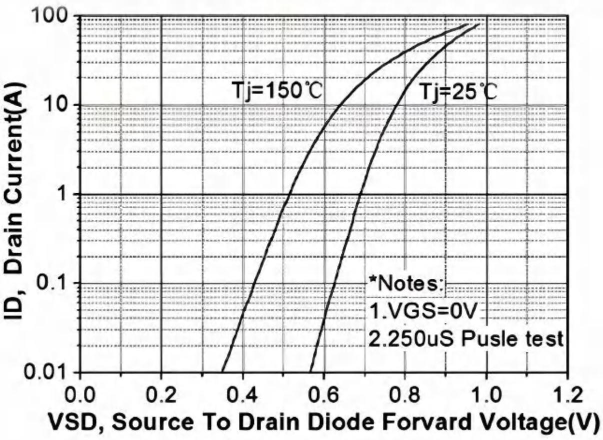


Figure 7. Gate-Charge Characteristics

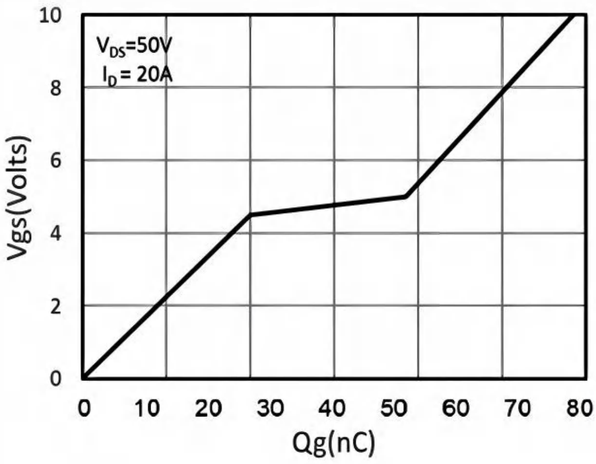


Figure 8. Capacitance Characteristics

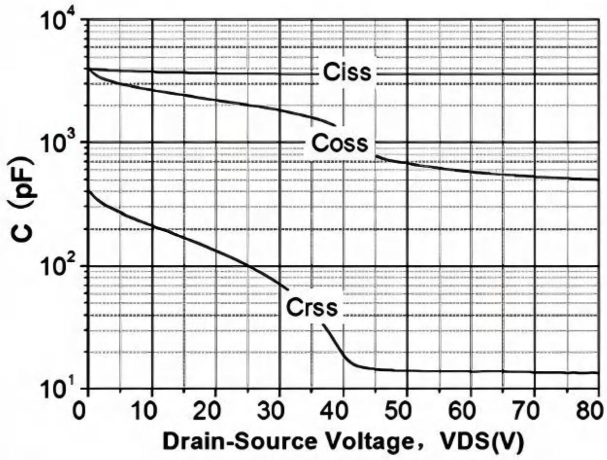


Figure 9: Normalized Maximum Transient Thermal Impedance (R_{thJC})

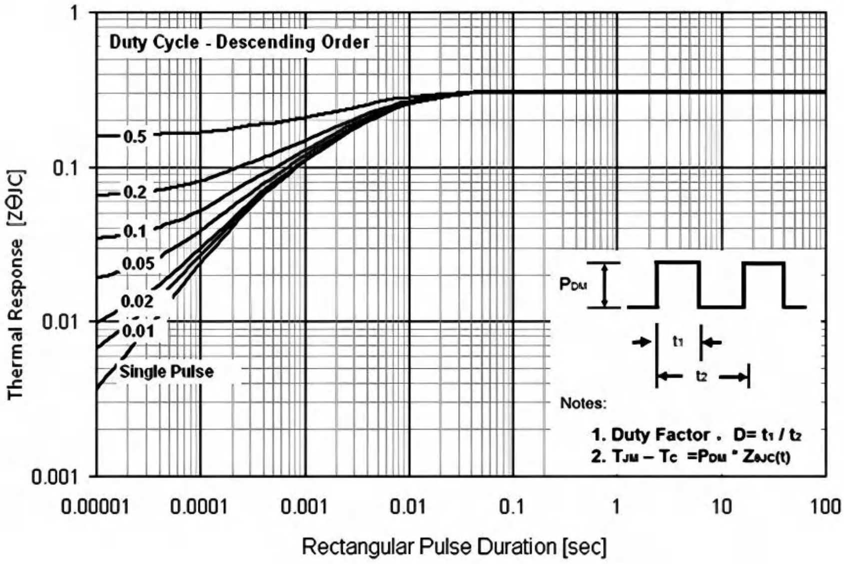
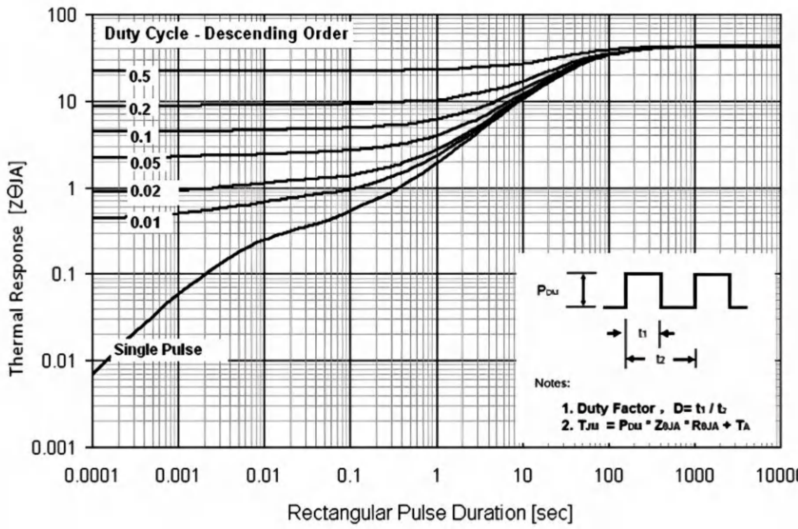


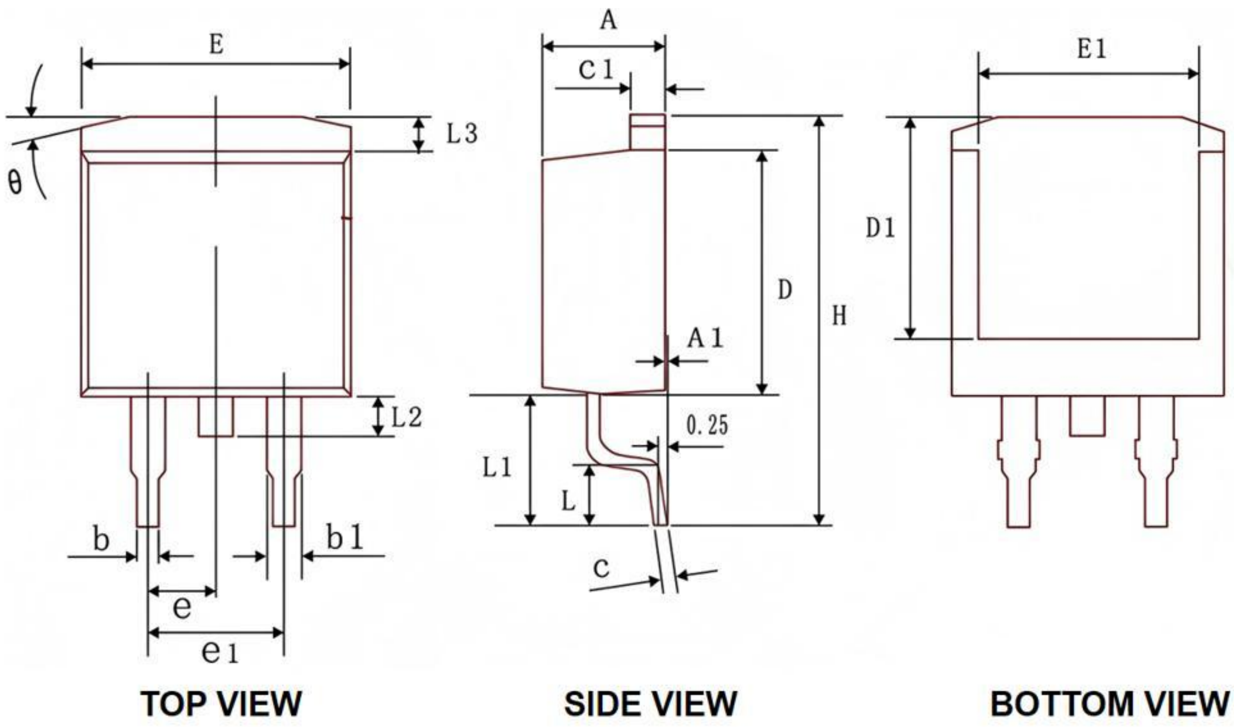
Figure 10: Normalized Maximum Transient Thermal Impedance (R_{thJA})



Ordering Information

Part Number	Package code	Packaging
HSH120N85	TO-263	800/Tape&Reel

TO-263 Package Outline



COMMON DIMENSIONS(UNIT OF MEASURE - MM)

SYMBOL	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	0.00	-	0.25
b	0.70	0.83	0.96
b1	1.00	1.24	1.47
C	0.35	0.45	0.55
C1	1.25	1.30	1.35
D	8.50	8.90	9.30
D1	7.50	8.00	8.50
H	14.7	15.20	15.7
E	9.80	10.08	10.4
E1	7.35	7.80	8.25
e1	4.93	5.08	5.23
L	2.00	2.30	2.60
L1	4.50	4.75	5.00
L2	1.30	1.53	1.75
L3	1.10	1.29	1.47
e	2.54 BSC		
θ	13°TYP		