

N-Ch 200V Fast Switching MOSFETs Product Summary

General Description

The HSH80N20 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.

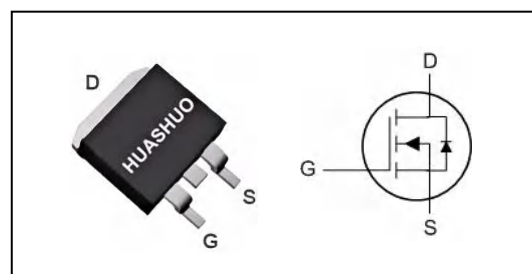
The HSH80N20 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

V_{DS}	200	V
$R_{DS(ON),typ}$	20	m Ω
I_D	80	A

Features

- Power Switching application
- Green Device Available
- Excellent $C_{dv/dt}$ effect decline
- Advanced high cell density Trench MOS Technology

TO-263 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	80	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	55	A
I_{DM}	Pulsed Drain Current ²	280	A
EAS	Single Pulse Avalanche Energy ³	400	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ³	370	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.45	$^\circ\text{C/W}$

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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	200	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =30A	---	20	24	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	3.3	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =200V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =200V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.1	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =100V, V _{GS} =10V, I _D =30A	---	115	---	nC
Q _{gs}	Gate-Source Charge		---	32	---	
Q _{gd}	Gate-Drain Charge		---	20.3	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =100V, V _{GS} =10V, R _G =2.5Ω I _D =30A	---	27	---	ns
T _r	Rise Time		---	38	---	
T _{d(off)}	Turn-Off Delay Time		---	22	---	
T _f	Fall Time		---	23	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	7490	---	pF
C _{oss}	Output Capacitance		---	267	---	
C _{rss}	Reverse Transfer Capacitance		---	37	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	80	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	280	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =30A, T _J =25°C	---	---	1.2	V

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 ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.5mH
- 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.

Typical Characteristics



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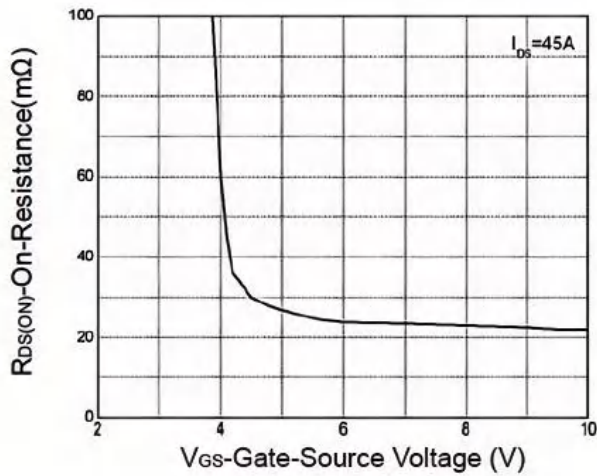


Fig.1 Gate-Source Vs.On-Resistance

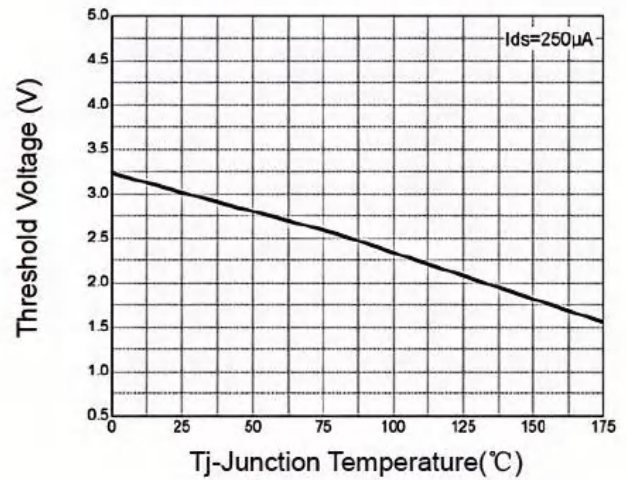


Fig.2 Gate-Source Forward

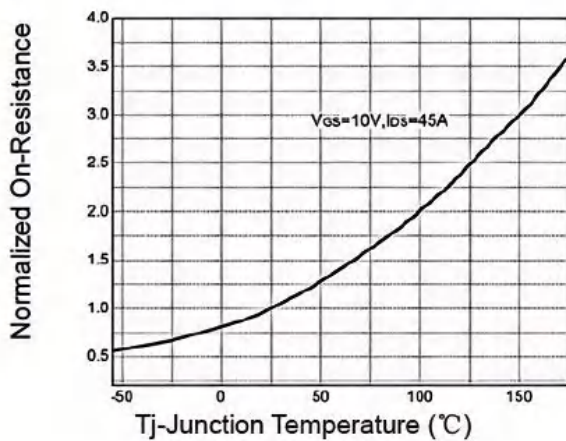


Fig.3 On-Resistance VS.Temperature

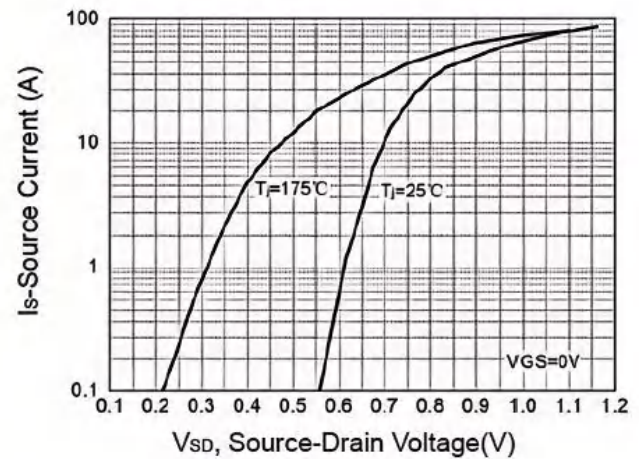


Fig.4 Source-Drain Diode Forward

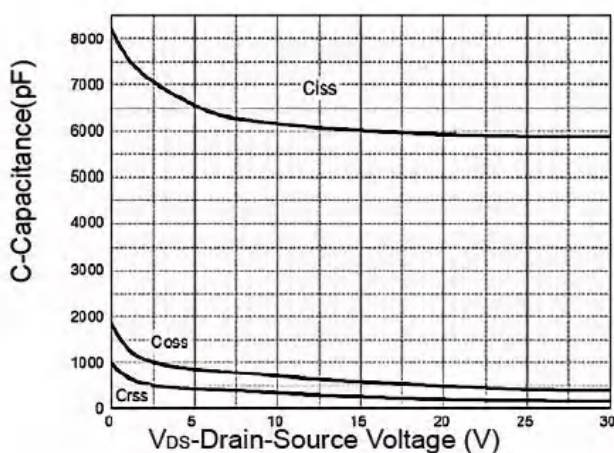


Fig.5 Capacitance Characteristics

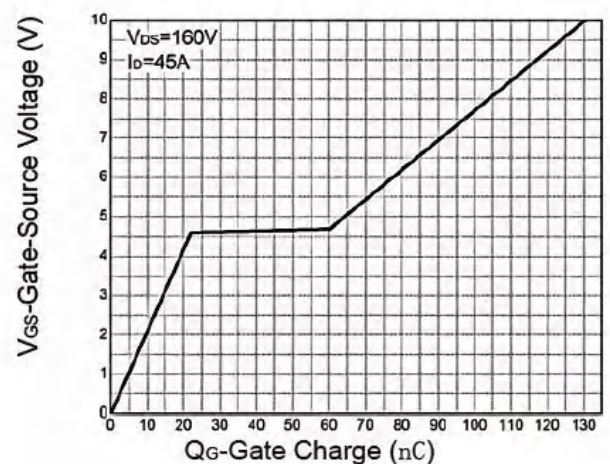


Fig.6 Gate Charge Characteristics



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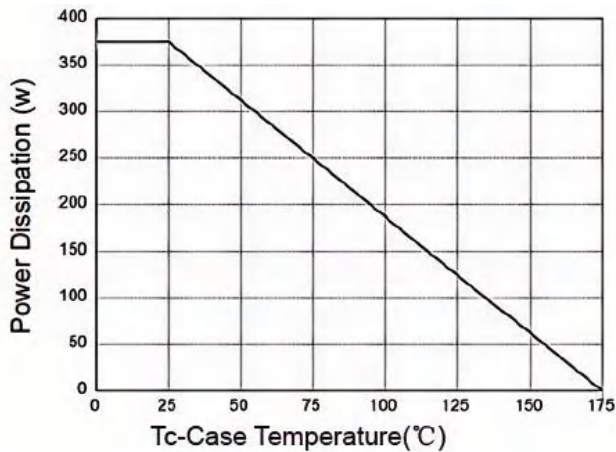


Fig.7 Power Dissipation

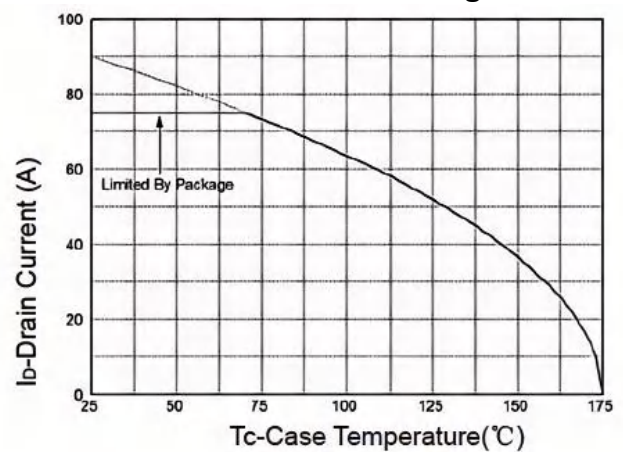


Fig.8 Drain Current

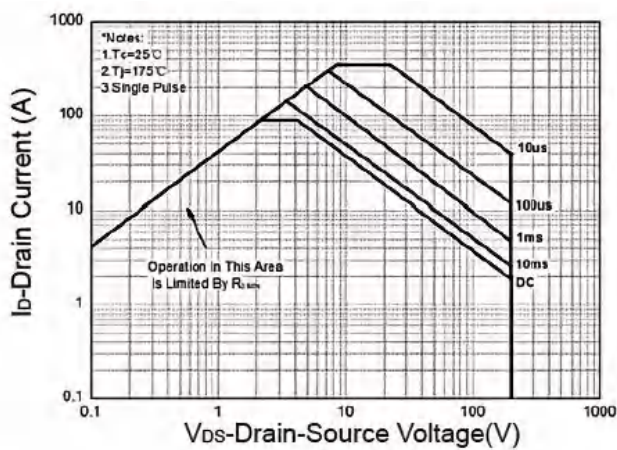


Fig.9 Safe Operation Area

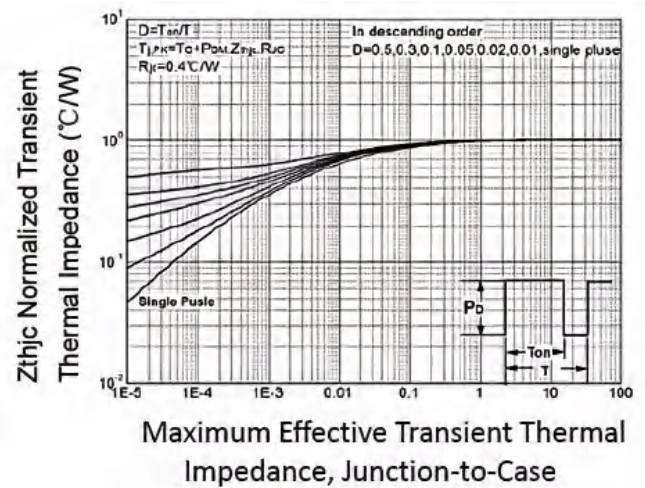


Fig.10 Thermal Transient Impedance

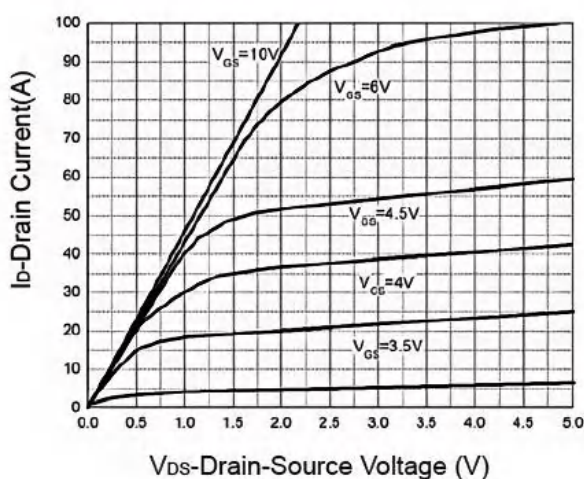


Fig.11 Output Characteristics

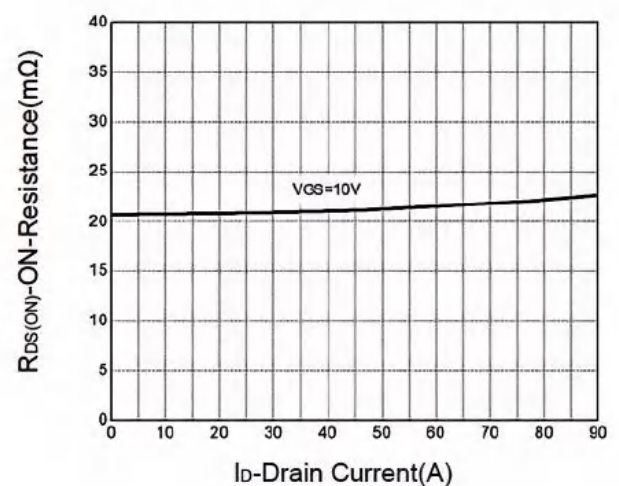


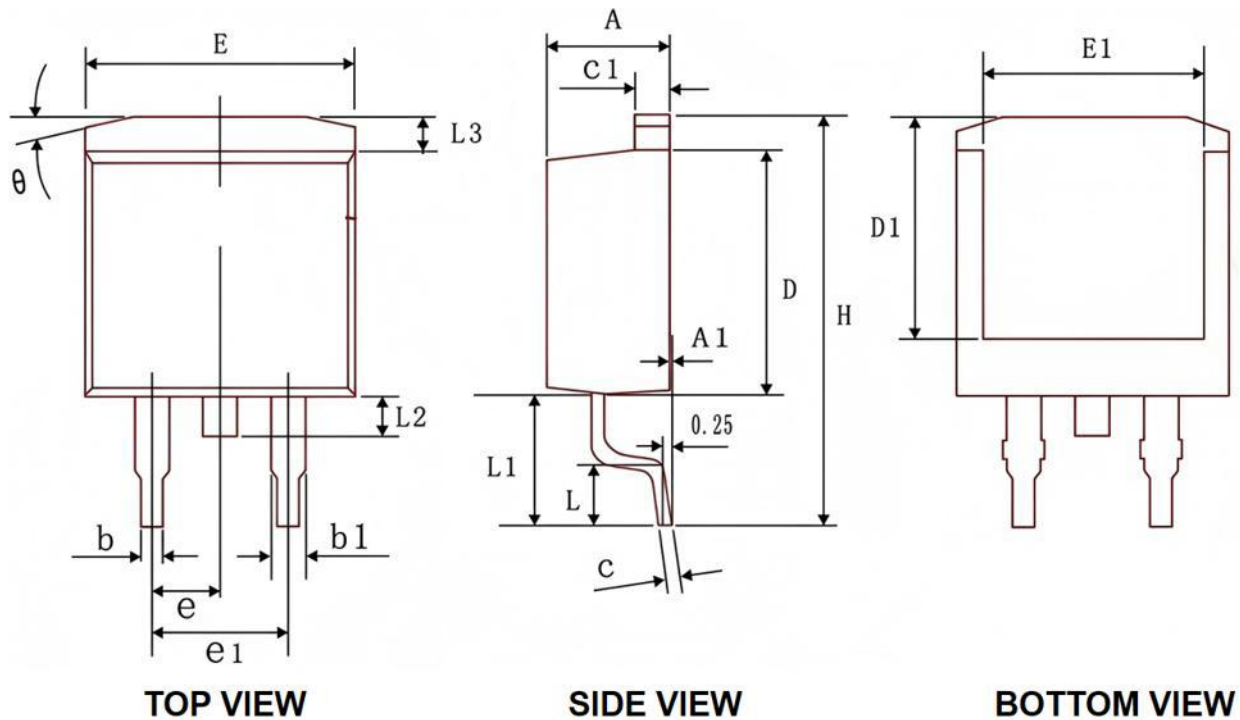
Fig.12 Drain-Source On Resistance



Ordering Information

Part Number	Package code	Packaging
HSH80N20	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		



HSH80N20 Marking:

