

General Description

The HSH8004 is the high cell density SGT N-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The HSH8004 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

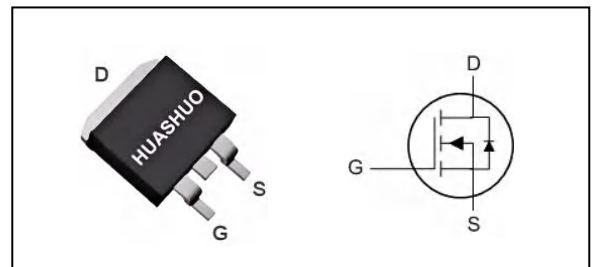
Features

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

Product Summary

V_{DS}	80	V
$R_{DS(ON),TYP}$	3.1	m Ω
I_D	175	A

TO-263 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	175	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	123	A
I_{DM}	Pulsed Drain Current ²	440	A
EAS	Single Pulse Avalanche Energy ³	378	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	192	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

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	---	0.65	$^\circ\text{C/W}$



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	80	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =20A	---	3.1	3.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.8	2.5	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
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =30A	---	50	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.2	---	Ω
Q _g	Total Gate Charge (10V)	V _{DD} =40V, V _{GS} =10V, I _D =20A	---	80	---	nC
Q _{gs}	Gate-Source Charge		---	15	---	
Q _{gd}	Gate-Drain Charge		---	16	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =40V, V _{GS} =10V, R _G =6Ω, I _D =20A	---	17	---	ns
T _r	Rise Time		---	32	---	
T _{d(off)}	Turn-Off Delay Time		---	50	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	V _{DS} =40V, V _{GS} =0V, f=1MHz	---	4450	---	pF
C _{oss}	Output Capacitance		---	800	---	
C _{rss}	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	175	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =A, T _J =25°C	---	---	1.5	V
t _{rr}	Reverse Recovery Time	I _F =20A, dI/dt=100A/μs,	---	40	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	45	---	nC



Typical Electrical Characteristic

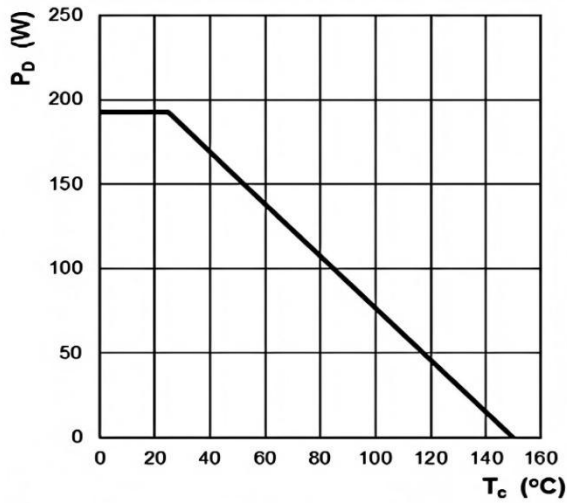


Figure 1: Power Dissipation

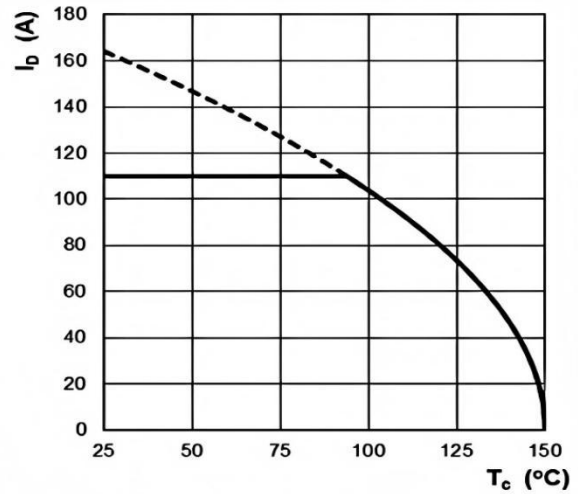


Figure 2: Continuous Drain Current vs. T_c

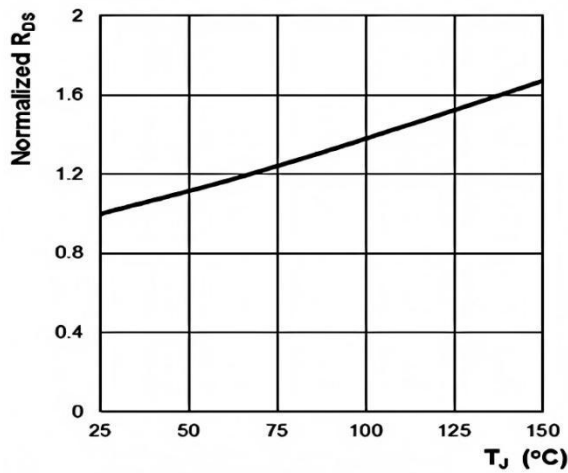


Figure 3: Normalized $R_{DS(on)}$ vs. T_j

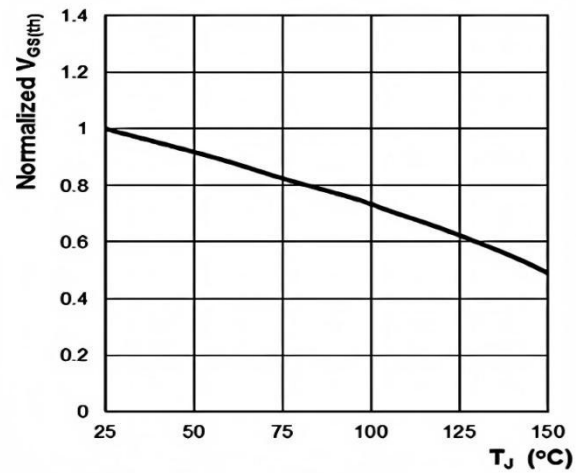


Figure 4: Normalized BV_{DS} vs. T_j

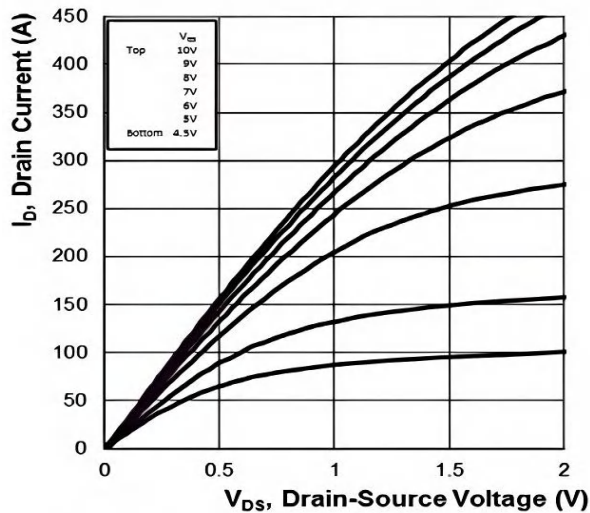


Figure 5: On-Region Characteristics

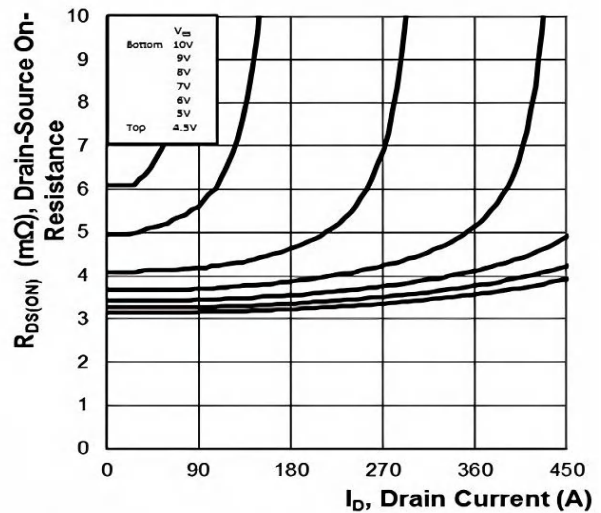


Figure 6: Typ. R_{DS} Variation vs. I_D and V_{GS}



N-Ch 80V Fast Switching MOSFETs

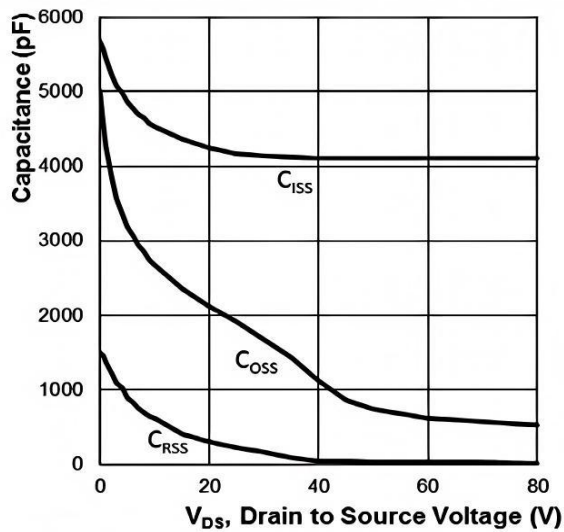


Figure 7: Typ. Capacitance Characteristics

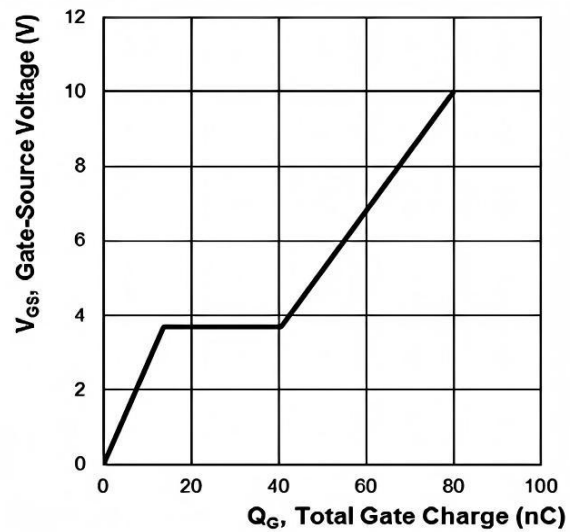


Figure 8: Typ. Gate Charge Characteristics

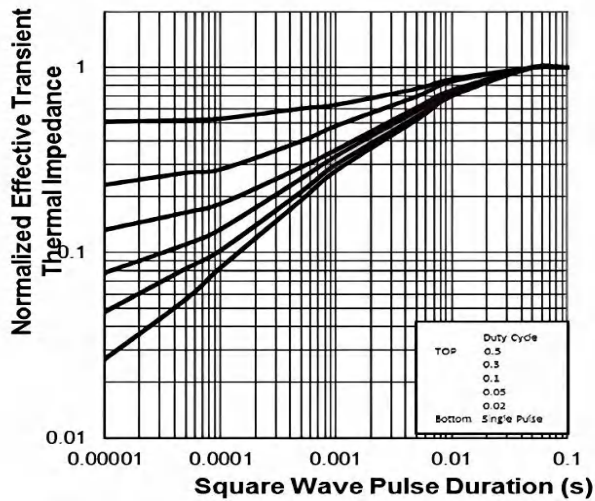


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

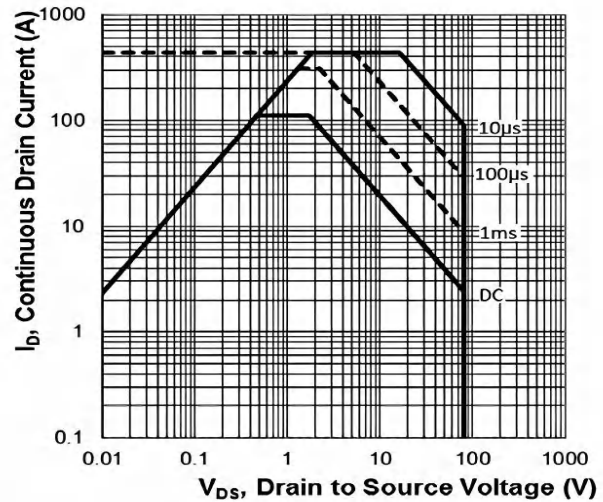


Figure 10: Maximum Safe Operation Area

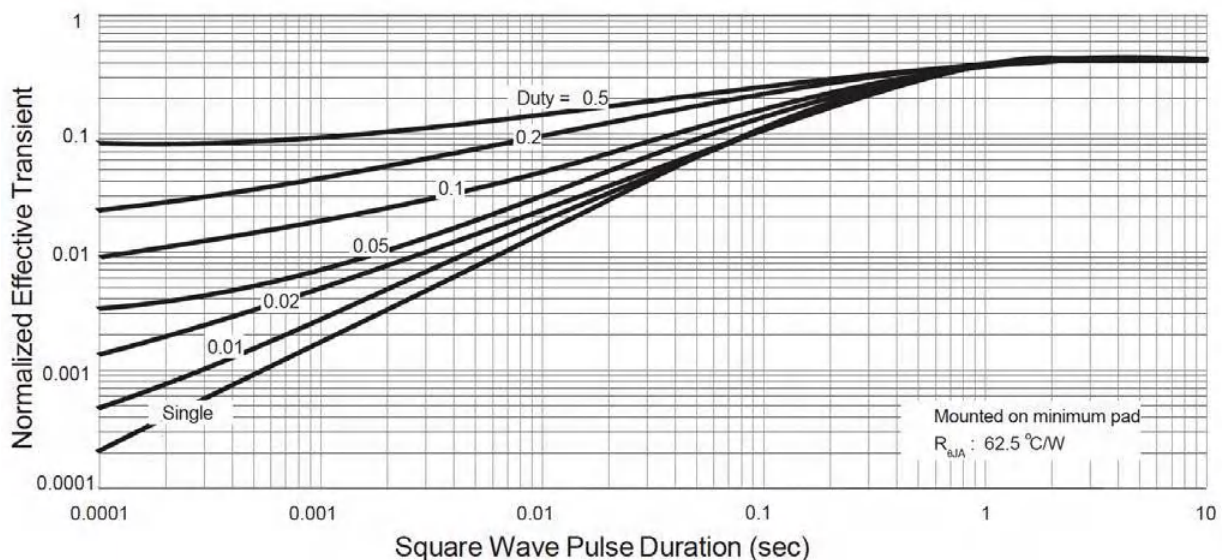


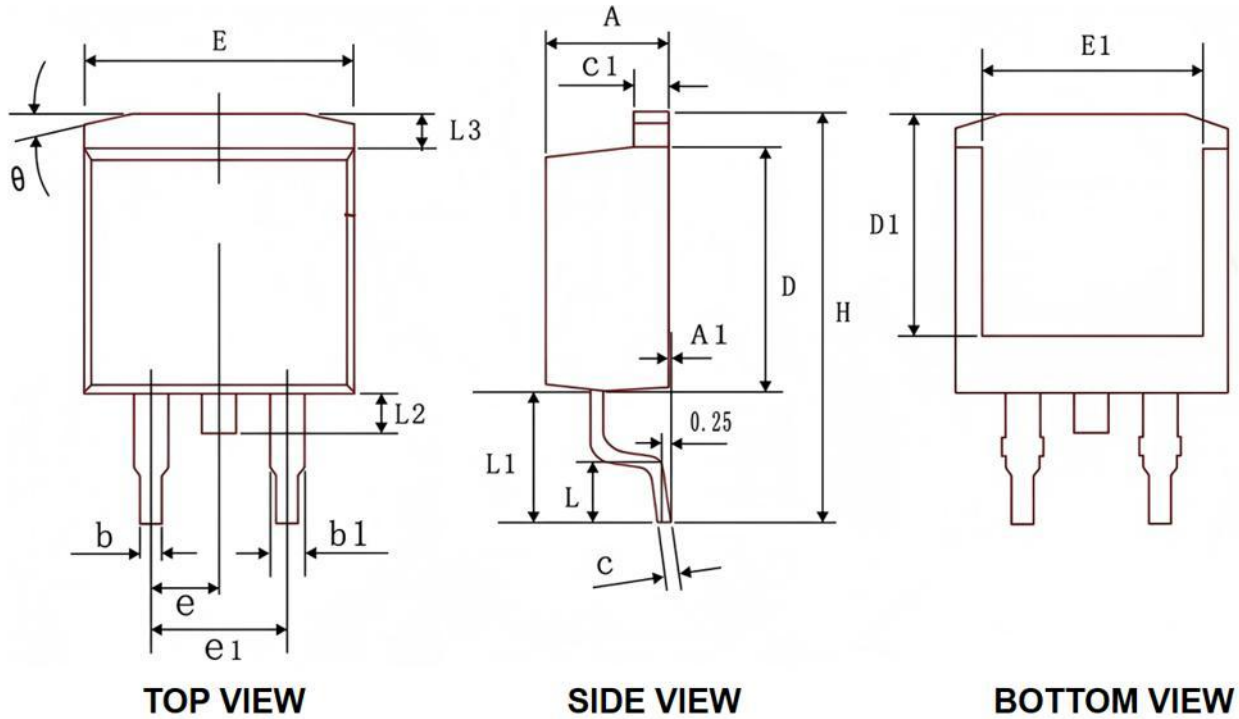
Fig.11 Normalized Maximum Transient Thermal Impedance



Ordering Information

Part Number	Package code	Packaging
HSH8004	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		