HUASHUO SEMICONDUCTOR

HSH1502

N-Ch 150V Fast Switching MOSFETs

Features

- 100% EAS Guaranteed
- Green Device Available
- Super Low RDS(ON)
- Advanced high cell density SGT Technology

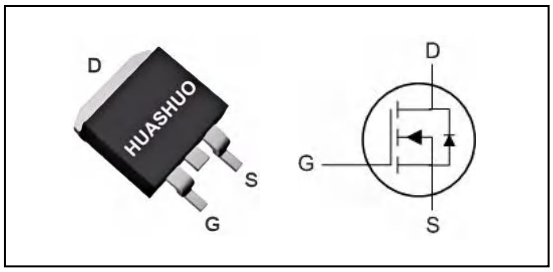
Product Summary

V_{DS}	150	V
$R_{DS(ON),typ}$	4.0	mΩ
I_D	190	A

Applications

- MOTOR Driver.
- UPS.
- Power Tools.
- Synchronous Rectiffcation in SMPS.

TO-263 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℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	190	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	135	A
I_{DM}	Pulsed Drain Current[2]	760	A
EAS	Single Pulse Avalanche Energy[3]	890	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	410	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 [1]	---	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.36	℃/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	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	4.0	5.0	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=120V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=120V , V_{GS}=0V , T_J=55℃	---	---	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	---	4.9	---	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=75V , V_{GS}=10V , I_D=20A	---	128	---	nC
Q_{gs}	Gate-Source Charge		---	83	---	
Q_{gd}	Gate-Drain Charge		---	44	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=75V , V_{GS}=10V , R_G=4.5Ω, RL=1Ω, I_D=20A	---	33	---	ns
T_r	Rise Time		---	68	---	
$T_{d(off)}$	Turn-Off Delay Time		---	85	---	
T_f	Fall Time		---	41	---	
C_{iss}	Input Capacitance	V_{DS}=75V , V_{GS}=0V , f=1MHz	---	8660	---	pF
C_{oss}	Output Capacitance		---	720	---	
C_{rss}	Reverse Transfer Capacitance		---	28	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=50A , T_J=25℃	---	---	1.1	V
t_{rr}	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , T_J=25℃	---	118	---	nS
Q_{rr}	Reverse Recovery Charge		---	431	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The Power Dissipation is limited by 150℃ junction temperature.
4.The EAS data shows Max. rating . The test condition is V_{DD}=75V,V_{GS}=10V,L=0.3mH,I_{AS}=75A
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
6.Package limitation Current.

Typical Characteristics

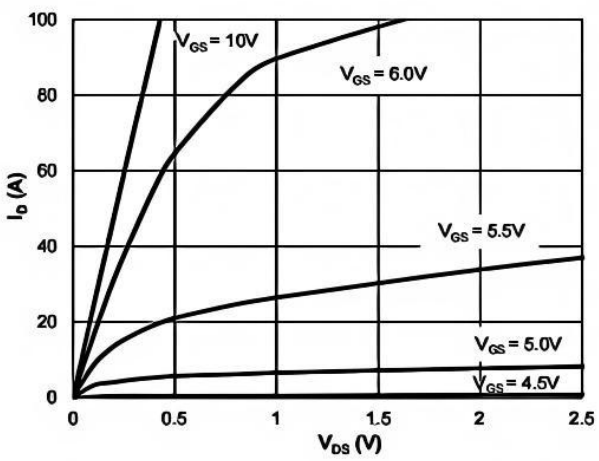


Figure 1: Saturation Characteristics

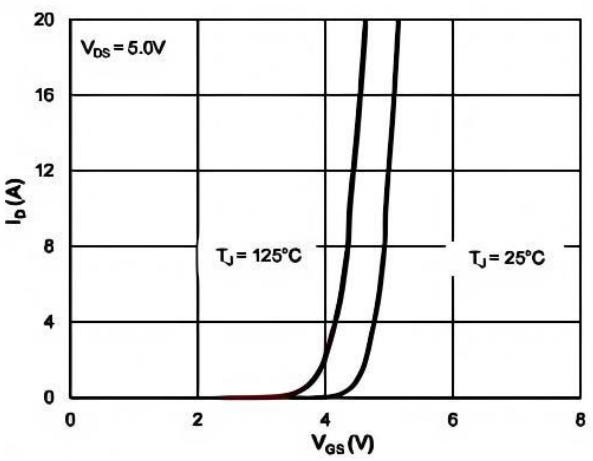


Figure 2: Transfer Characteristics

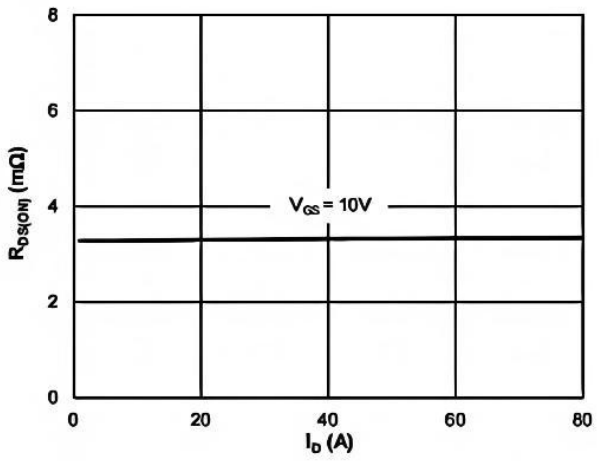


Figure 3: $R_{DS(ON)}$ vs. Drain Current

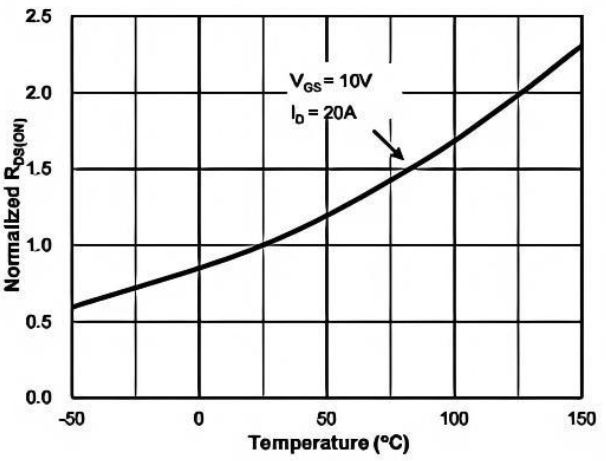


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

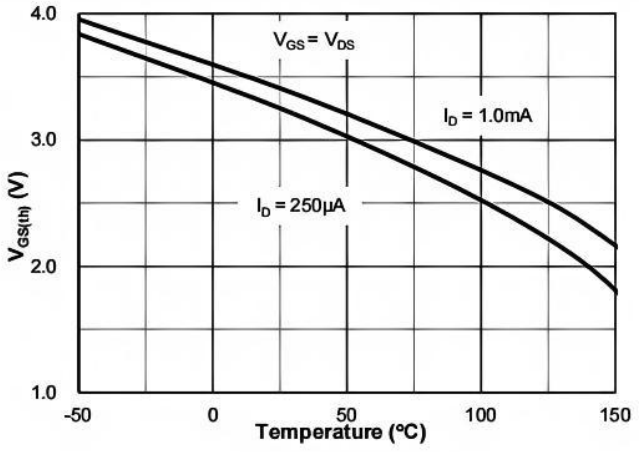


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

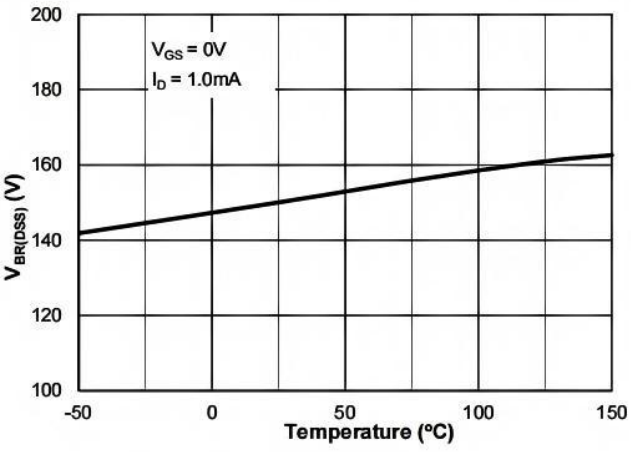


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

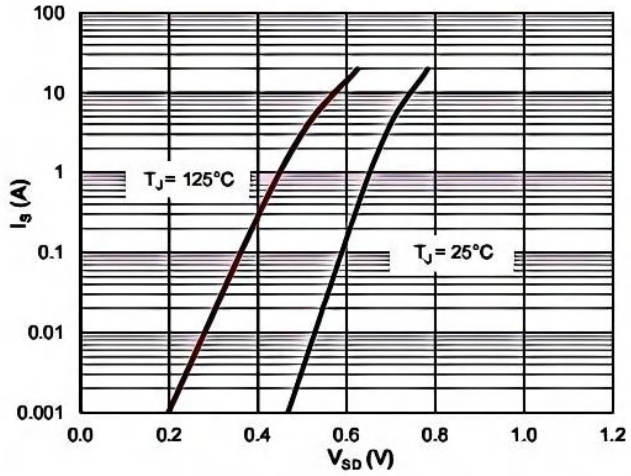


Figure 7: Body-Diode Characteristics

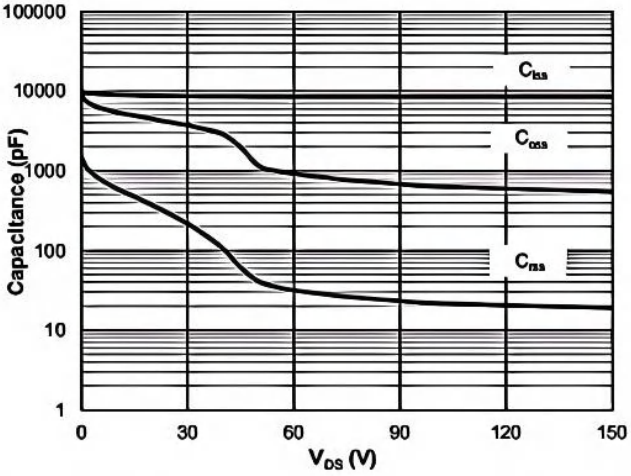


Figure 8: Capacitance Characteristics

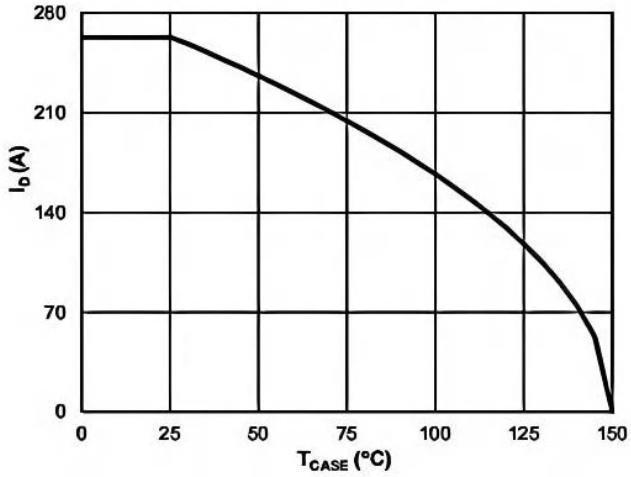


Figure 9: Current De-rating

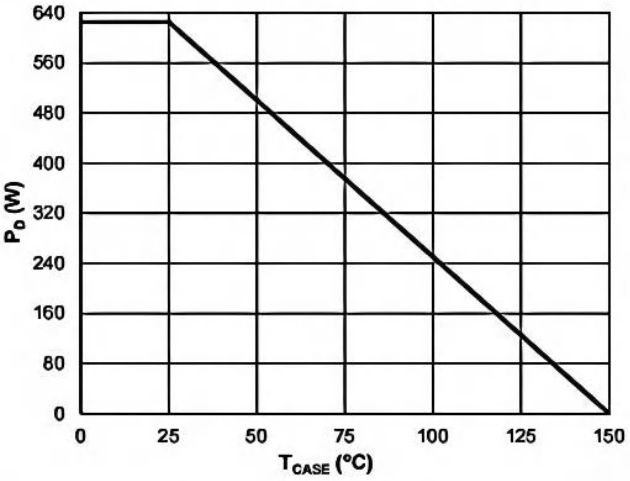


Figure 10: Power De-rating

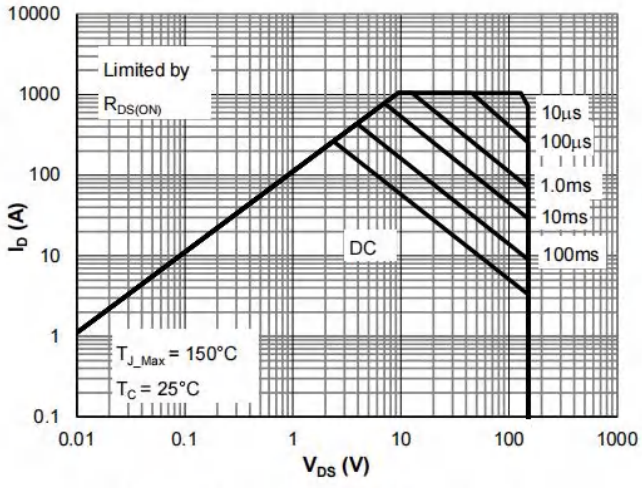


Figure 11: Maximum Safe Operating Area

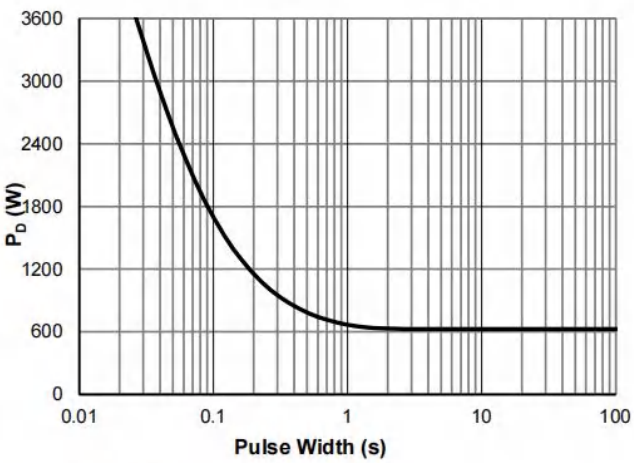


Figure 12: Single Pulse Power Rating, Junction-to-Case

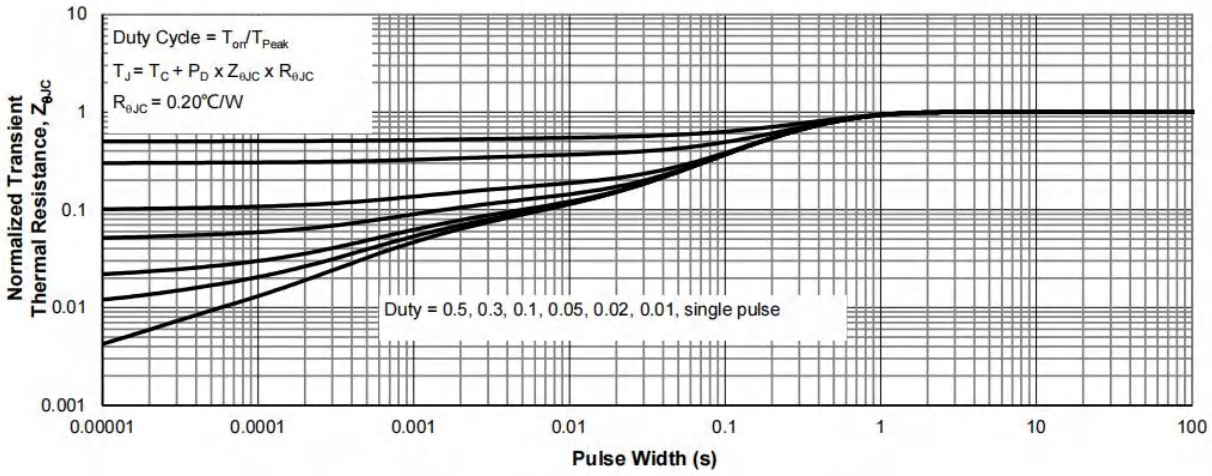
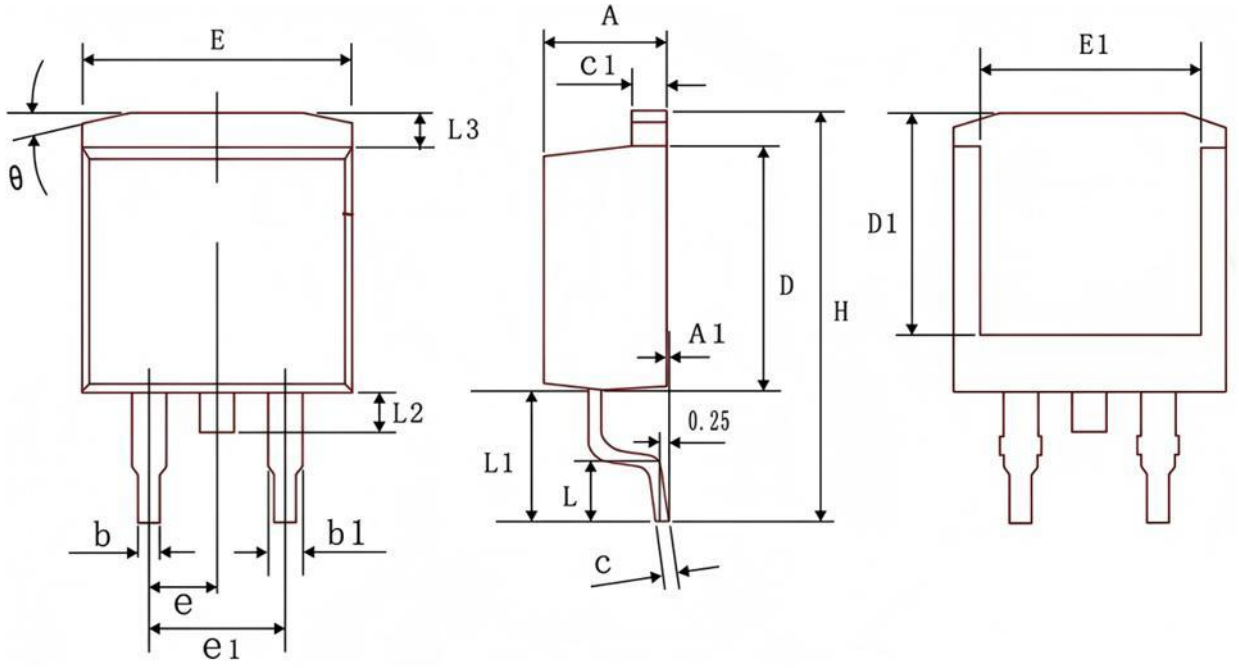


Figure 13: Normalized Maximum Transient Thermal Impedance

Ordering Information

Part Number	Package code	Packaging
HSH1502	TO-263	800/Tape&Reel

TO-263 Package Outline



TOP VIEW SIDE VIEW BOTTOM VIEW

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		

HSH1502 Marking: