HUASHUO SEMICONDUCTOR

HSBL020N08

N-Ch 80V Fast Switching MOSFETs

Description

The HSBL020N08 is the high cell density SGT N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous rectification applications.

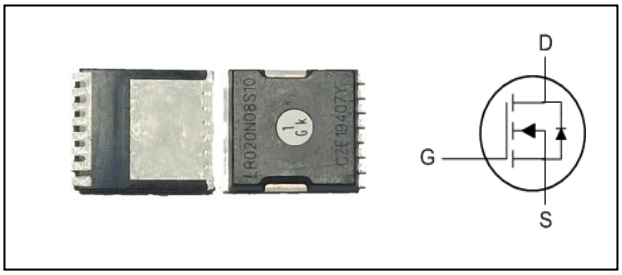
The HSBL020N08 meet the RoHS and Halogen-Free compliant product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary

V_{DS}	80	V
$R_{DS(ON),typ}$	1.4	mΩ
I_D	240	A

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

TOLL 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℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	240	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	100	A
I_{DM}	Pulsed Drain Current[2]	730	A
EAS	Single Pulse Avalanche Energy[3]	2500	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	225	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]	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.54	℃/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	80	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=50A	---	1.4	2.0	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℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=125℃	---	---	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	---	2	---	Ω
Qg	Total Gate Charge (10V)	V_{DS}=40V , V_{GS}=10V , I_D=50A	---	204	---	nC
Qgs	Gate-Source Charge		---	54	---	
Qgd	Gate-Drain Charge		---	47	---	
Td(on)	Turn-On Delay Time	V_{DD}=40V , V_{GS}=10V , R_L=3Ω, I_D=20A	---	39	---	ns
Tr	Rise Time		---	136	---	
Td(off)	Turn-Off Delay Time		---	121	---	
Tf	Fall Time		---	156	---	
Ciss	Input Capacitance	V_{DS}=45V , V_{GS}=0V , f=1MHz	---	13650	---	pF
Coss	Output Capacitance		---	20100	---	
Crss	Reverse Transfer Capacitance		---	580	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=50A , T_J=25℃	---	0.85	1.2	V
Trr	Body Diode Reverse Recovery Time	If=30A, DI/dt=500A/us	---	112	---	ns
Qrr	Body Diode Reverse Recovery charge	If=30A, DI/dt=500A/us	---	313	---	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 data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
5.The maximum current rating is package limited.

Typical Characteristics

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

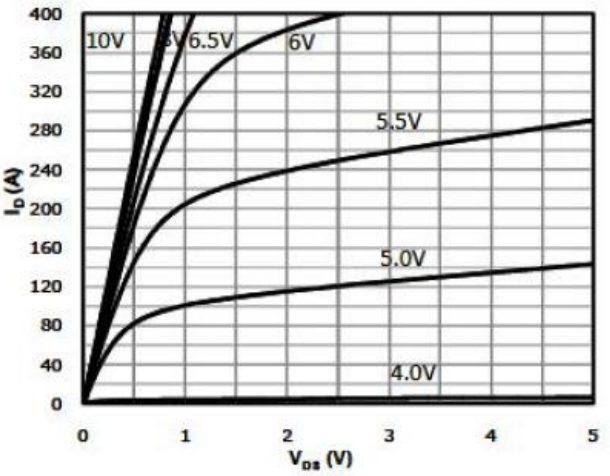


Figure 2. Transfer Characteristics (Junction Temperature)

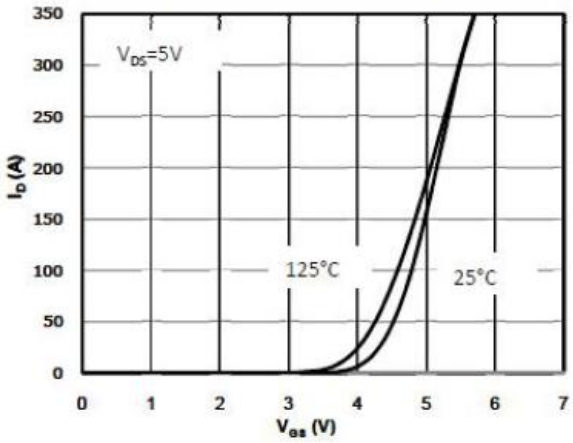


Figure 3. On-Resistance vs. Drain Current Junction and Gate Voltage Figure

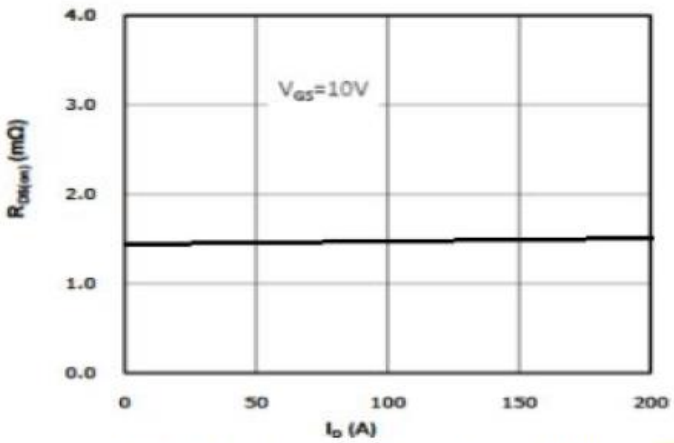


Figure 4. On-Resistance vs. Temperature

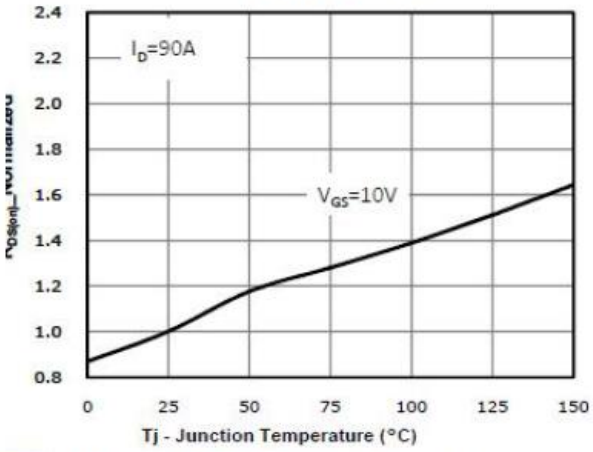


Figure 5. On-Resistance vs. Gate-Source Voltage (Junction Temperature)

Figure 6. Body-Diode Characteristics (Junction Temperature)

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

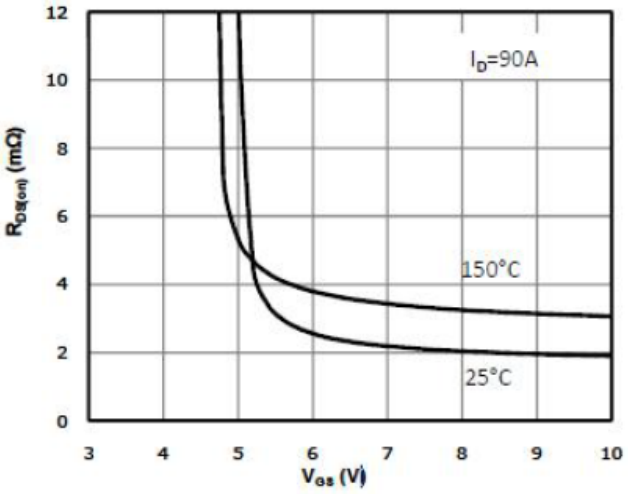


Figure 6. Body-Diode Characteristics (Junction Temperature)

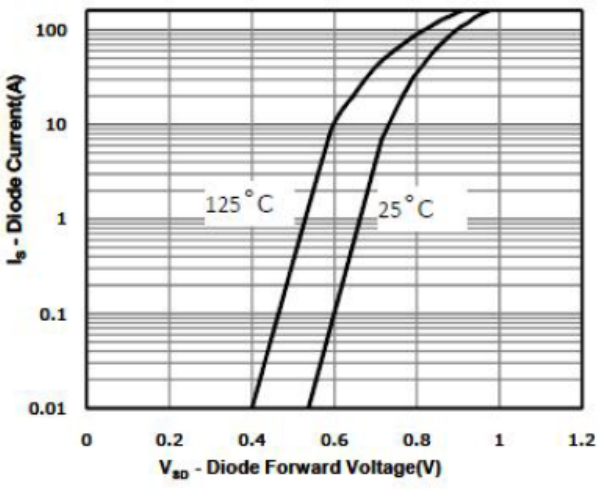


Figure 7. Gate-Charge Characteristics

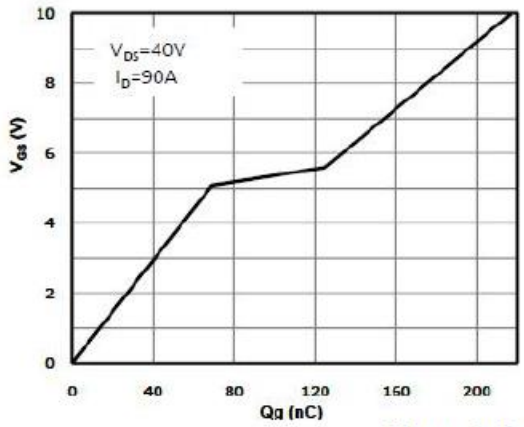


Figure 8. Drain Current Derating

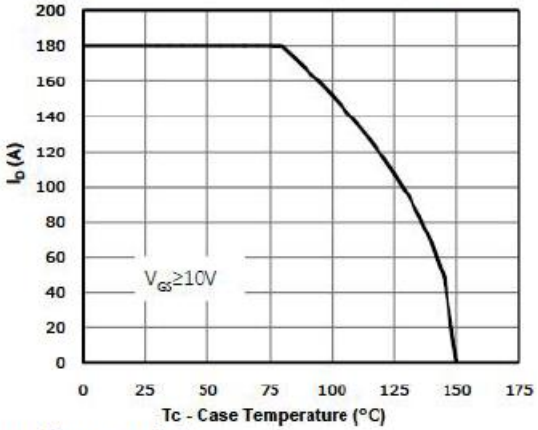


Figure 9. Capacitance Characteristics

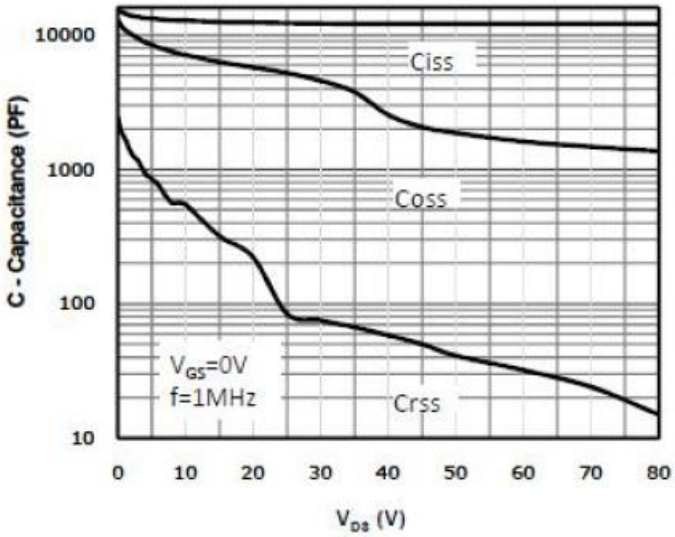
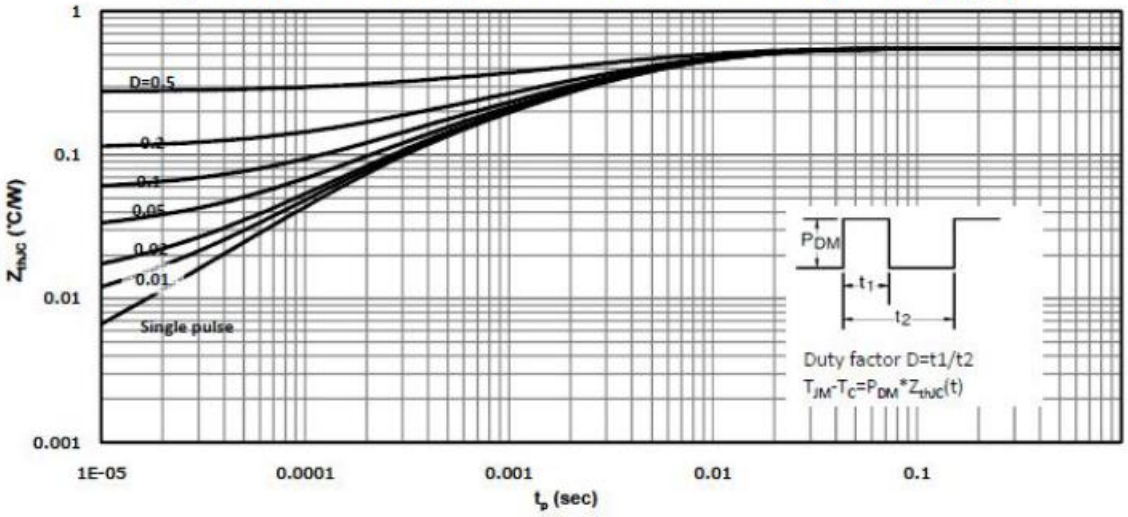
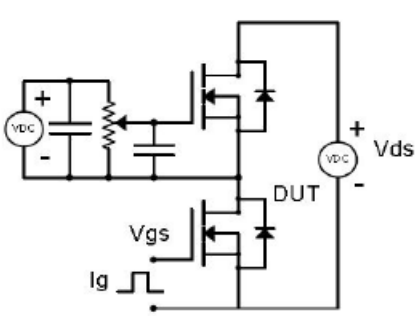


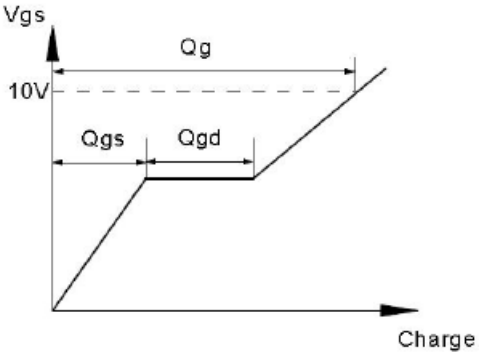
Figure 10. Normalized Maximum Transient Thermal Impedance (R_{thJC})



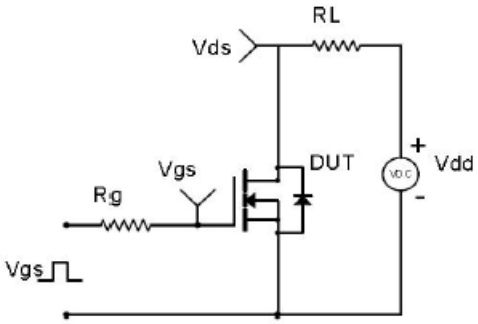
Test Circuit & Waveform

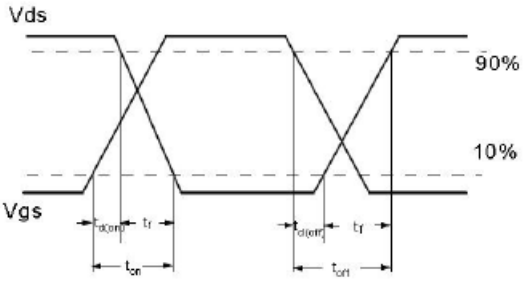
Gate Charge Test Circuit & Waveform



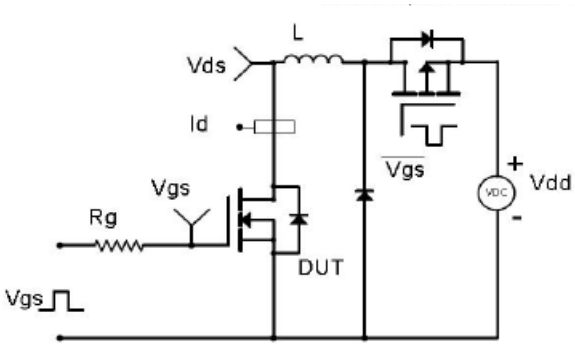


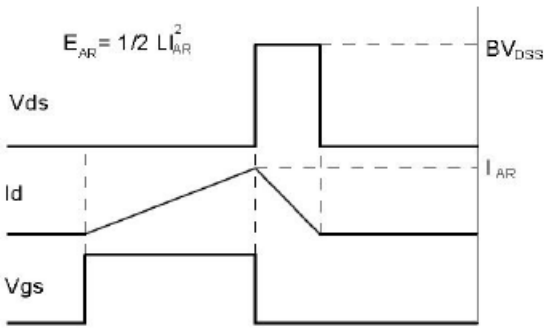
Resistive Switching Test Circuit & Waveforms



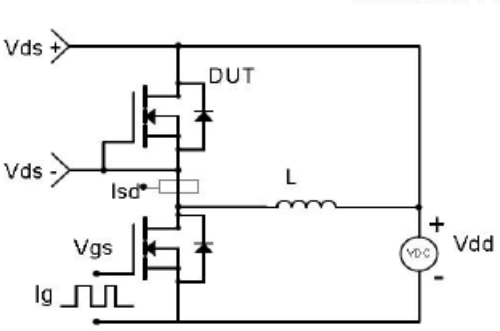


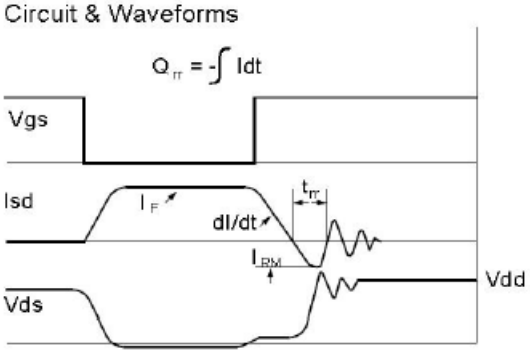
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





Package Outline: TOLL