Maplesemi

LEAD FREE Pb RoHS

SLB120N08G2/SLP120N08G2
85V N -Channel MOSFET

General Description

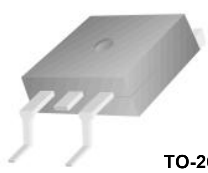
This Power MOSFET is produced using Maple semi's advanced planar stripe SGT technology.
This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

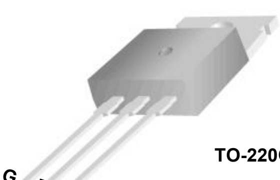
Features

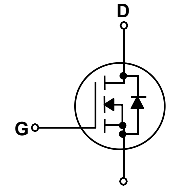
- N-Channel:85V 120A
  $R_{DS(on)Typ}$= 4.5mΩ@V_{GS} = 10 V
- Very Low On-resistance RDS(ON)
- LowCrss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Application

- Motor Drives
- DC/DC convertion
- Power Management







Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	SLB120N08G2/SLP120N08G2	Units
V_{DSS}	Drain-Source Voltage	85	V
I_D	Drain Current - Continuous (T_C = 25℃)	120	A
	- Continuous (T_C = 100℃)	100	A
I_{DM}	Drain Current - Pulsed (Note 1)	480	A
V_{GSS}	Gate-Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy	60	mJ
P_D	Power Dissipation (T_C = 25℃)	220	W
$R_{θJC}$	Thermal Resistance, Junction to Case	60	℃/W
$R_{θJA}$	Thermal Resistance, Junction to ambient	0.7	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	℃

* Drain current limited by maximum junction temperature.

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	85	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =85 V, V_{GS} = 0 V	--	--	1	uA
		V_{DS} = 85V, T_C = 125℃	--	5	-	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 20V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -20 V, V_{DS} = 0 V	--	--	-100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 uA	2.0	3.0	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 50A	--	4.5	5.5	mΩ
gfs	Transconductance	VDS =5V,I D =50A	-	80	-	S
R_G	Gate Resistance	V GS =0V,V DS =0V F=1MHz	-	1.5	-	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C_{iss}	Input Capacitance	V_{DS} = 40 V, V_{GS} = 0 V, f = 1.0 MHz	--	4030	-	pF
C_{oss}	Output Capacitance		--	545	-	pF
C_{rss}	Reverse Transfer Capacitance		--	35	-	pF

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$t_{d(on)}$	Turn-On Delay Time	V_{GS}= 10 V, V_{DS}=40 V, R_L = 3 Ω ,Tj=25℃	--	20	--	ns
t_r	Turn-On Rise Time		--	38	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	45	--	ns
t_f	Turn-Off Fall Time		--	20	--	ns
Q_g	Total Gate Charge	V_{DS} = 40 V, I_D =25A, V_{GS} = 10V	--	65	--	nC
Q_{gs}	Gate-Source Charge		--	25	--	nC
Q_{gd}	Gate-Drain Charge		--	14	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Min	Typ	Max	Units
I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	120	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	480	A
V_{SD}	Drain to Source Diode Forward Voltage,V GS = 0V, I SD =50A,T J = 25℃	--	0.95	14	V
T_{rr}	Reverse recovery time,I F =20A DI F /dt=500A/μs		60		ns
Q_{rr}	Reverse recovery charge,I F =20A DI F /dt=500A/μs		340		nC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T J =25℃, V DD =15V, V G =10V, R G =25Ω, L=0.5mH, I AS =50A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

N- Channel Typical Characteristics

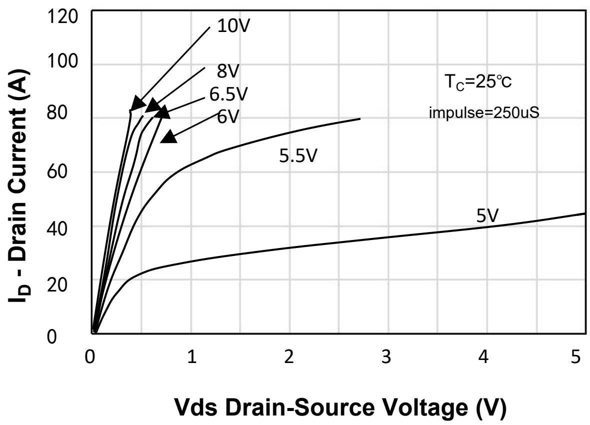


Figure 1. On-Region Characteristics

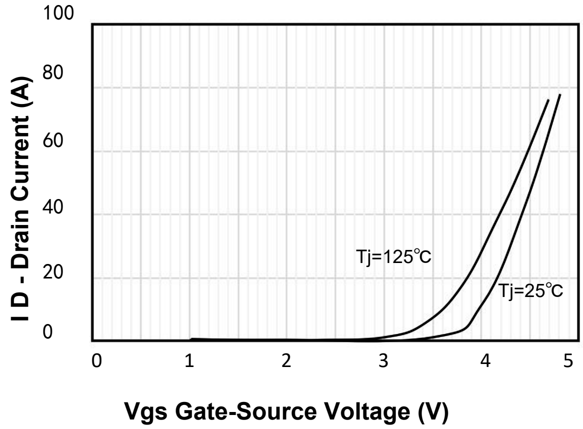


Figure 2. Transfer Characteristics

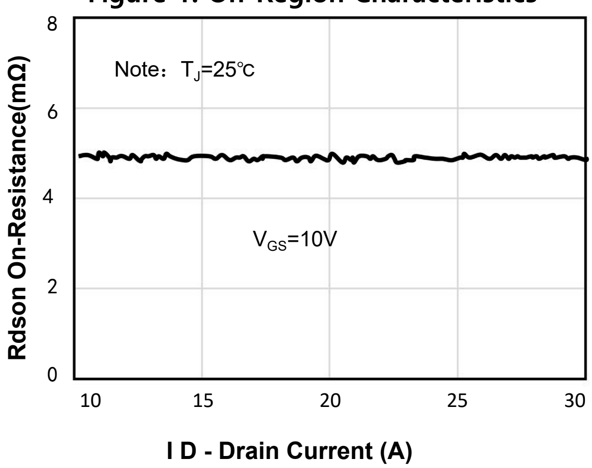


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

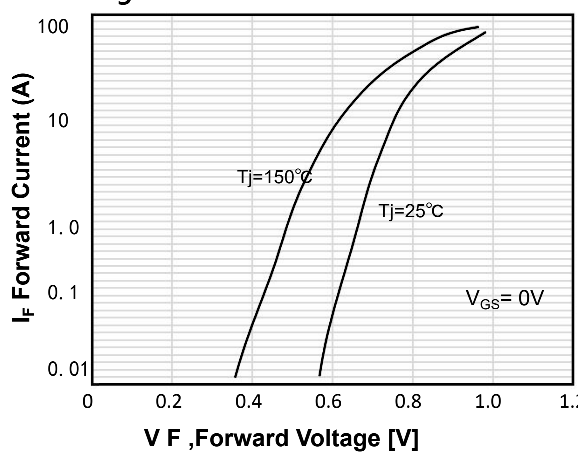


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

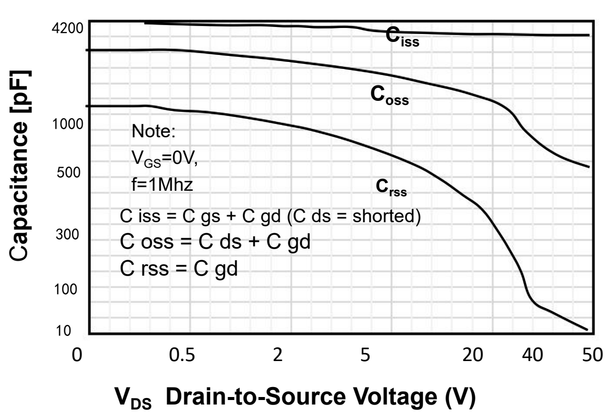


Figure 5. Capacitance Characteristics

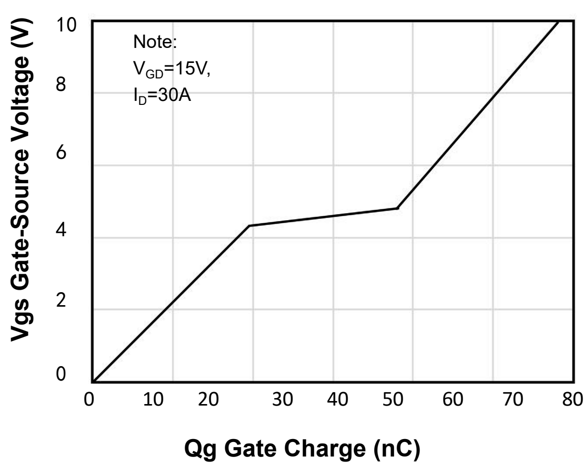


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

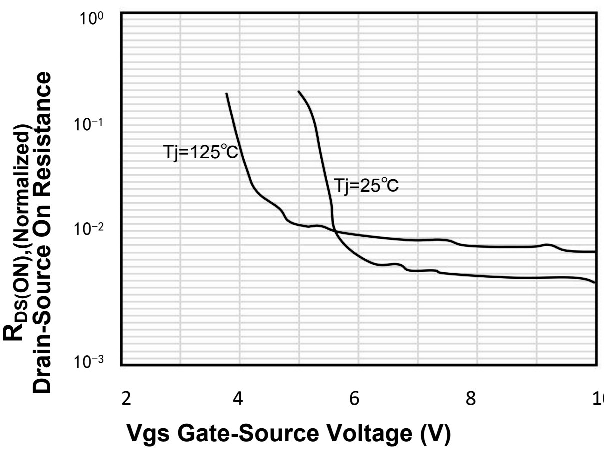


Figure 7. Breakdown Voltage Variation vs Temperature

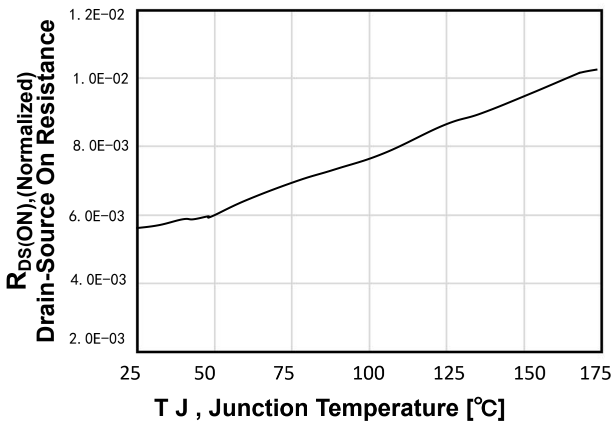


Figure 8. On-Resistance Variation vs Temperature

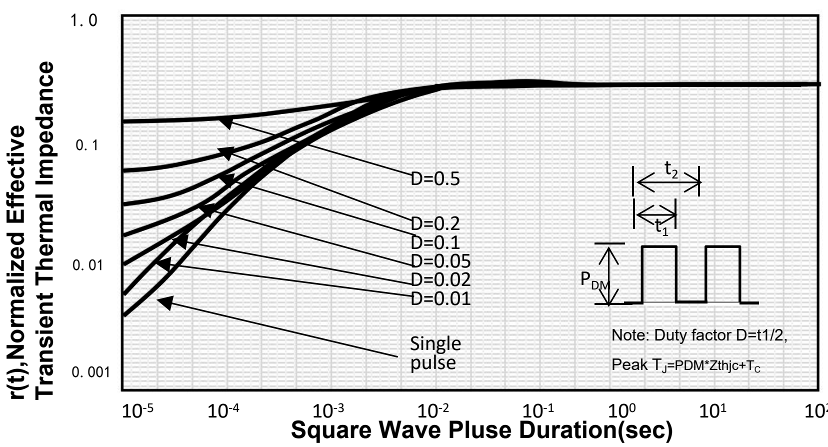


Figure 9.1 Transient Thermal Response Curve（R_{thJC}）

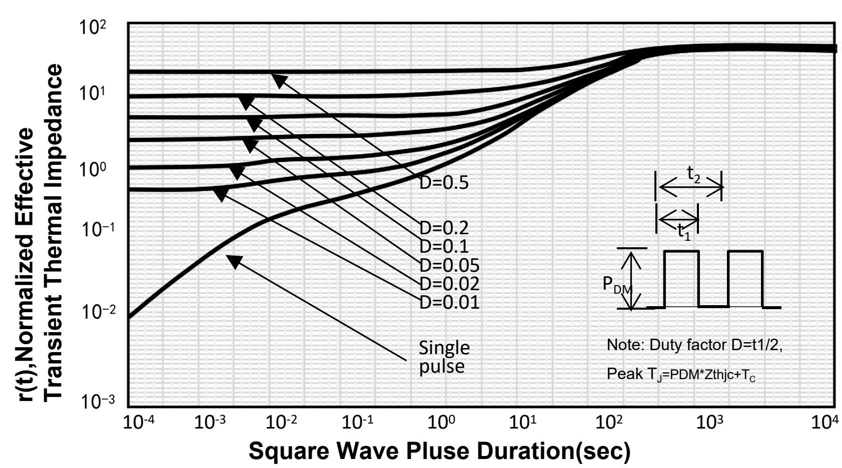
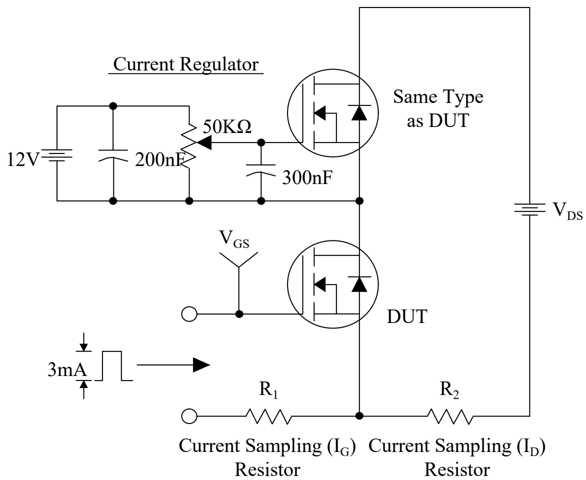
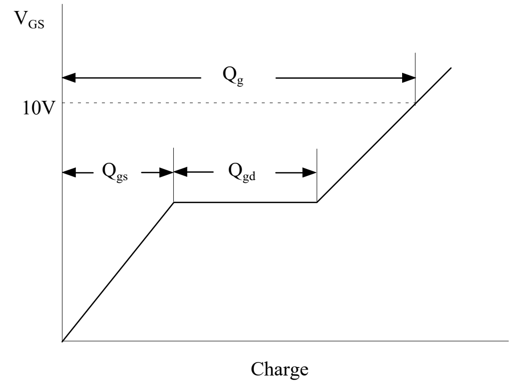


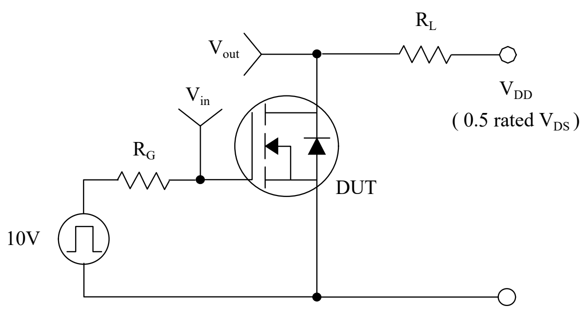
Figure 9.2. Transient Thermal Response Curve(R_{thJA})

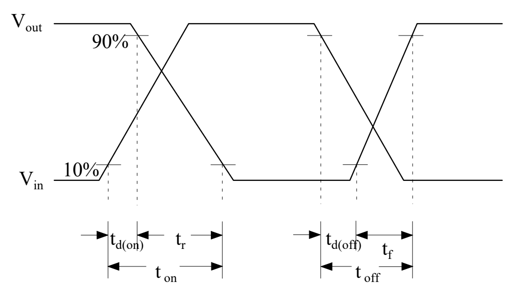
Gate Charge Test Circuit & Waveform



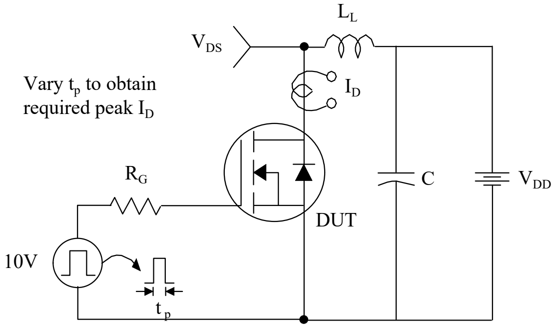


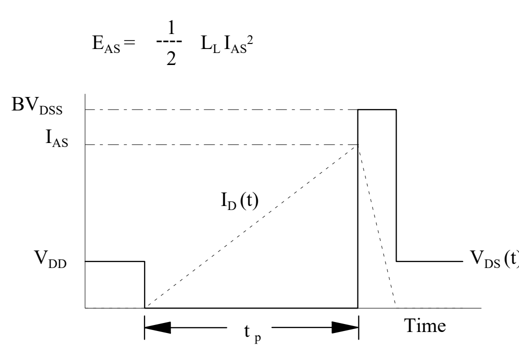
Resistive Switching Test Circuit & Waveforms





Unclamped Inductive Switching Test Circuit & Waveforms





Peak Diode Recovery dv/dt Test Circuit & Waveforms