Maplesemi

LEAD FREE RoHS COMPLIANT

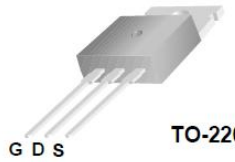
MSF540S / MSP540S
100V N-Channel Power MOSFET

General Description

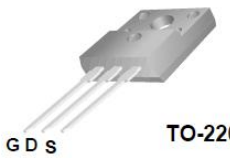
This Power MOSFET is produced using Maple semi's advanced planar stripe DMOS technology.
This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology

Features

- 33A, 100V, $R_{DS(on)\ typ.}$ = 33mΩ@V_{GS} = 10 V
- Extended Safe Operating Area
- Ease of Paralleling
- Fast Switching
- 100% avalanche tested
- 100% Single Pulse avalanche energy Test



TO-220



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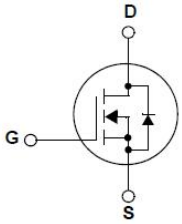

Absolute Maximum Ratings

Symbol	Parameter	MSF540S	MSP540S	Units
V_{DSS}	Drain-to-Source Breakdown Voltage	100		V
I_D	Drain Current - Continuous (T_C = 25℃)	33		A
	Drain Current - Continuous (T_C = 100℃)	23		A
I_{DM}	Drain Current - Pulsed	110		A
V_{GS}	Gate-Source Voltage	±20		V
Ptot	Power Dissipation (T_C = 25℃)	83	130	W
T_J,	Operating Junction Temperature Range	-55 to +150		℃
EAS	Single Pulsed Avalanche Energy (Note 2)	695		mJ

Electrical Characteristics @ TJ=25℃(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VDS	Drain-source Voltage	VGS =0V, ID=250μA	100			V
RDS(on)	Static Drain-to-Source on-Resistance	VGS =10V, ID=20A		33	44	mΩ
VGS(th)	Gated Threshold Voltage	VDS= VGS, ID=250μA	2.0	3.0	4.0	V

IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS = 0V			2.5	μA
IGSS(F)	Gated Body Leakage Current	VGS = +20V,			100	nA
IGSS(R)	Gated Body Leakage Current	VGS = -20V,			-100	nA
Ciss	Input Capacitance	VGS =0V, VDS=25V, f=1.0MHZ		1239		pF
Coss	Output Capacitance			247		pF
Crss	Reverse Transfer Capacitance			44		pF
Q_g	Total Gate Charge	V_{DS}=80V I_D=16A V_{GS}=10V		46.7		nC
Q_{gs}	Gate-Source Charge			8.7		nC
Q_{gd}	Gate-Drain Charge			17.0		nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,I_D=16A V_{GS}=10V,R_G=5.1Ω		10		nS
t_r	Turn-on Rise Time			4		nS
$t_{d(off)}$	Turn-off Delay Time			46		nS
t_f	Turn-off Fall Time			13		nS

Source-Drain Diode Maximum Ratings and Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	S-D Current(Body Diode)				33	A
I_{SDM}	Pulsed S-D Current(Body Diode)				110	A
VSD	Diode Forward Voltage	VGS =0V, IDS=16A			1.2	V
t_{rr}	Reverse Recovery Time	T_J=25℃,I_F=16Adi/dt=100 A/us		98		nS
Q_{rr}	Reverse Recovery Charge			0.4		nC
	*Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%					

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
RθJC	Junction-to-Case	0.96	1.55	℃/W
RθJA	Junction-to-Ambient	62.5	80.0	℃/W

Typical Characteristics

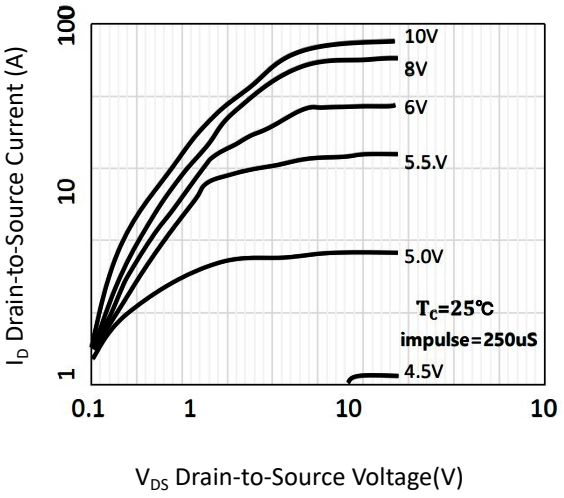

Figure 1. Typical Output Characteristics

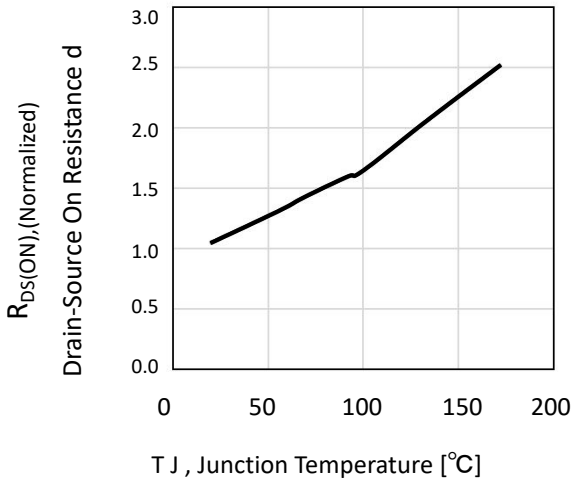

Figure 2. Typical Output Characteristics

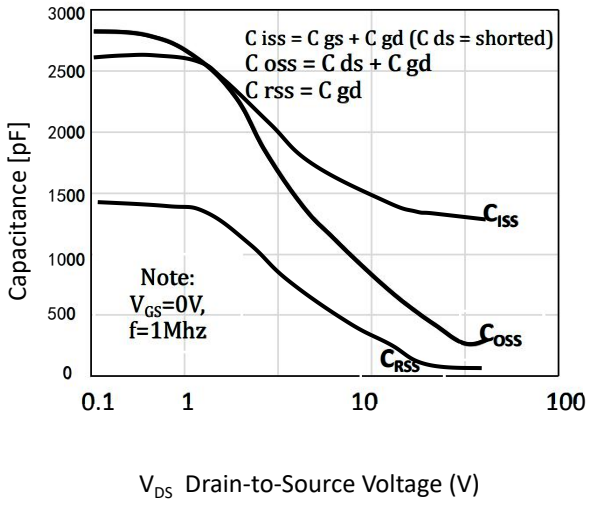

Figure3. Typical Capacitance Vs Drain-Source Voltage

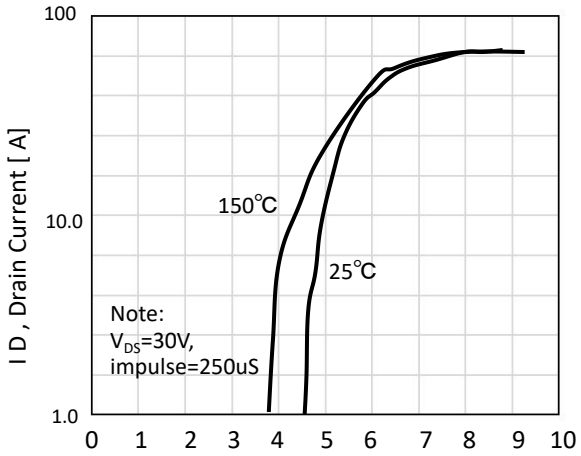

Figure 4. On-Resistance Vs Drain Current

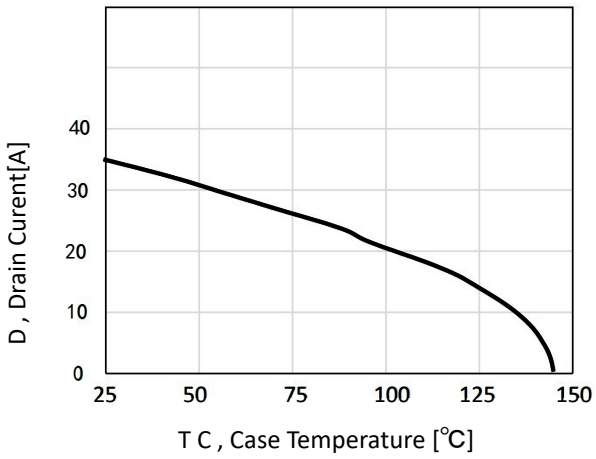

Figure 5. Maximum Drain Current Vs Temperature

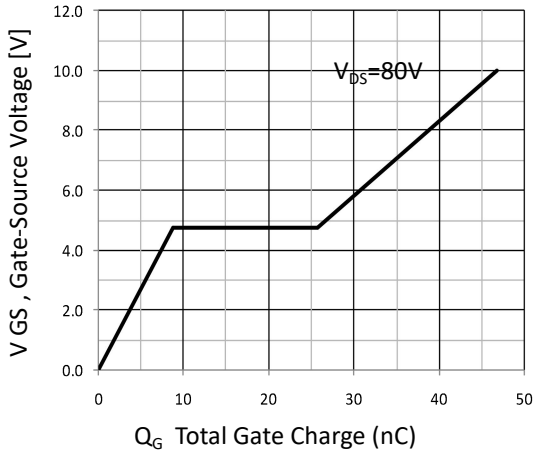

Figure 6. Typical Gate Charge Vs Gate-Source Voltage

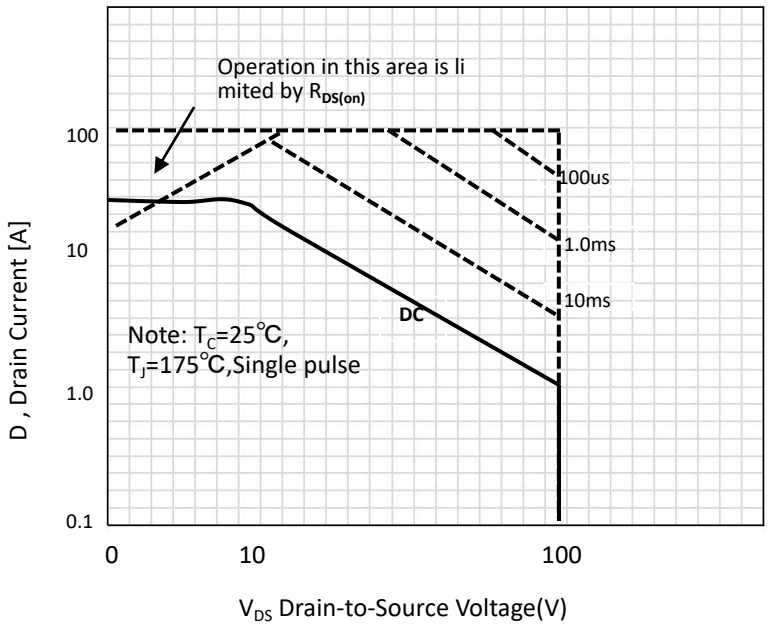

Figure 7. Maximum Safe Operating Area

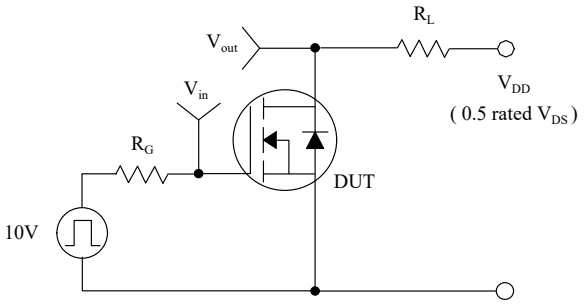

Figure 8 a. Switching Time Test Circuit

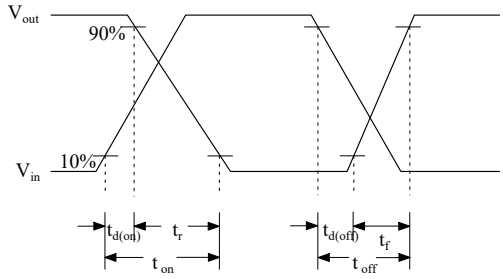

Figure 8 b. Switching Time Waveforms

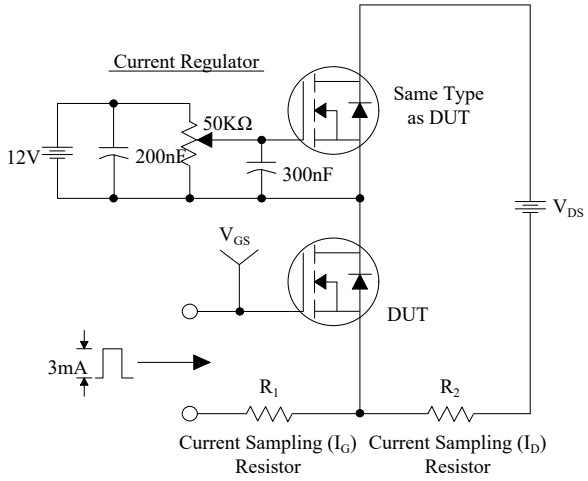

Figure 9 a. Gate Charge Test Circuit

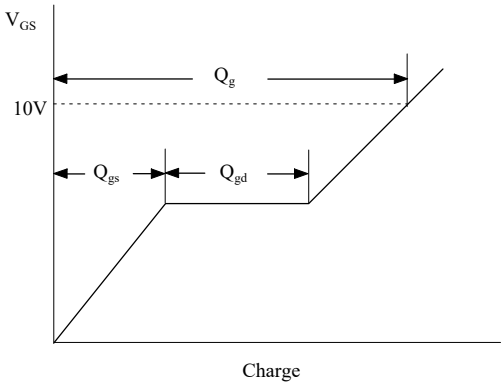

Figure 9 b. Basic Gate Charge Waveforms

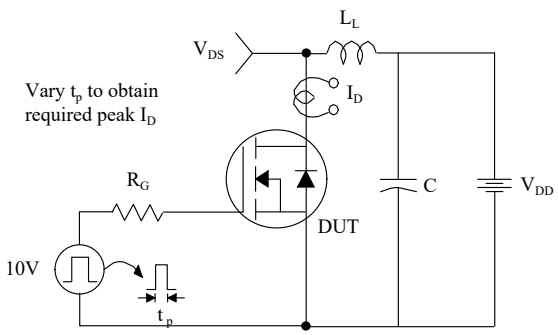

Figure 10 a. Unclamped Inductive Switching Test Circuit

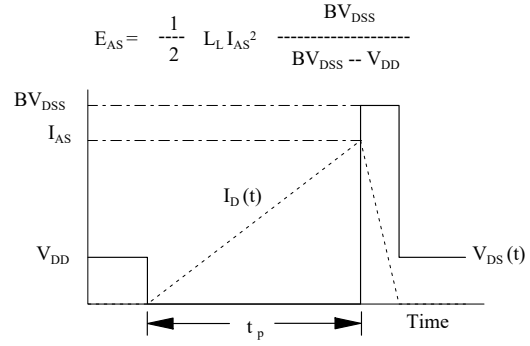

Figure 10 b.witching Test Waveforms