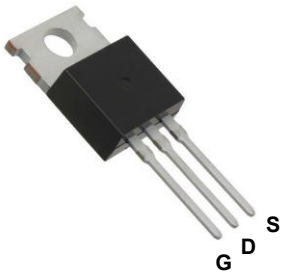
GSGH7R515

150V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	150V
$R_{DS(ON)}$	5.4mΩ (TYP)
I_D	175A



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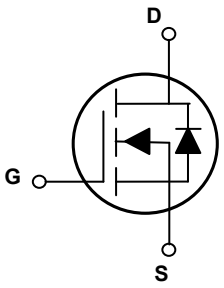


Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The GSGH7R515 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)[1]	I_D	175	A
Drain Current-Continuous (T_C=100°C)		124	
Drain Current-Pulsed[2]	I_{DM}	690	A
Single Pulse Avalanche Energy[3]	E_{AS}	803	mJ
Power Dissipation (T_A=25°C)	P_D	376	W
Linear Derating Factor (T_A=25°C)		2.5	W/°C
Junction-to-Case	$R_{\theta JC}$	0.4	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.5	°C/W
Operating Junction Temperature Range	T_J	-55 To +175	°C
Storage Temperature Range	T_{STG}	-55 To +175	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	150	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=150V, V_{GS}=0V, T_J=125°C	-	-	50	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=100A	-	5.4	7.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	2.1	3.0	3.9	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=120V, I_D=100A V_{GS}=10V	-	81	-	nC
Gate-Source Charge	Q_{gs}		-	29	-	
Gate-Drain Charge	Q_{gd}		-	15	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=75V, R_G=2.5Ω V_{GS}=10V, I_D=80A	-	16.5	-	nS
Rise Time	t_r		-	106.3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	60.6	-	
Fall Time	t_f		-	104.6	-	
Input Capacitance	C_{lss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	5400	-	pF
Output Capacitance	C_{oss}		-	3300	-	
Reverse Transfer Capacitance	C_{rss}		-	80	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	4.3	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode	-	-	175	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	690	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=80A	-	1	1.2	V
Reverse Recovery Time	t_{rr}	I_F=80A, di/dt=100A/μs, T_J=25°C	-	110	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.36	-	uC

Note:

1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating: Pulsed width limited by maximum junction temperature.
3. V_{DD}=50V, L=0.3mH, R_G=25Ω, starting T_J=25°C.
4. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062inch.

Typical Electrical and Thermal Characteristic Curves

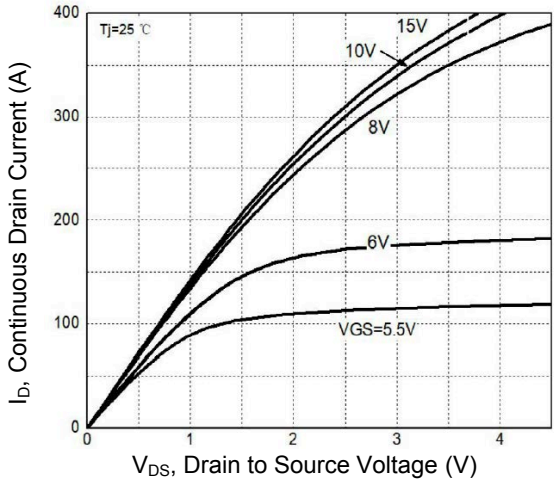


Figure 1. Typical Output Characteristics

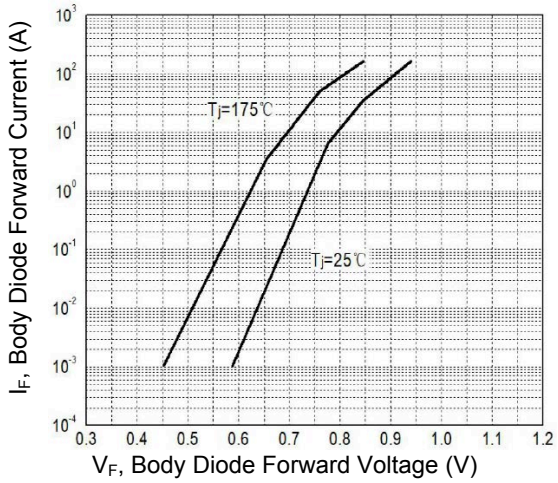


Figure 2. Body Diode Characteristics

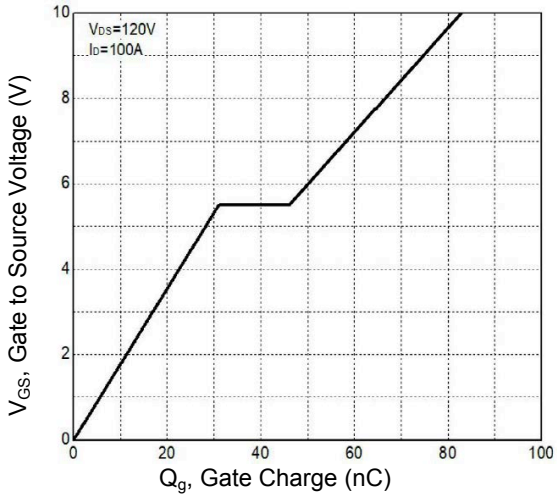


Figure 3. Gate Charge Characteristics

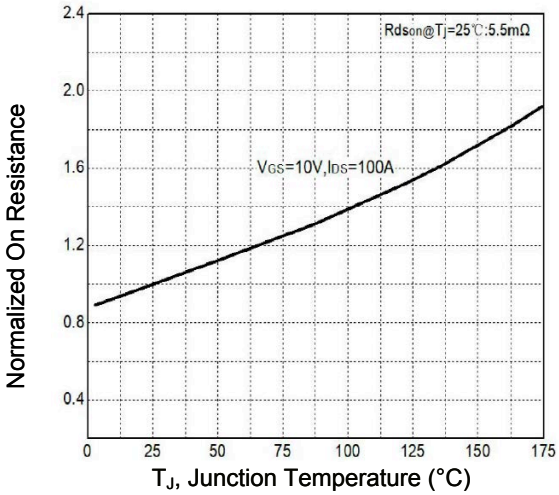


Figure 4. Normalized On-Resistance vs. T_J

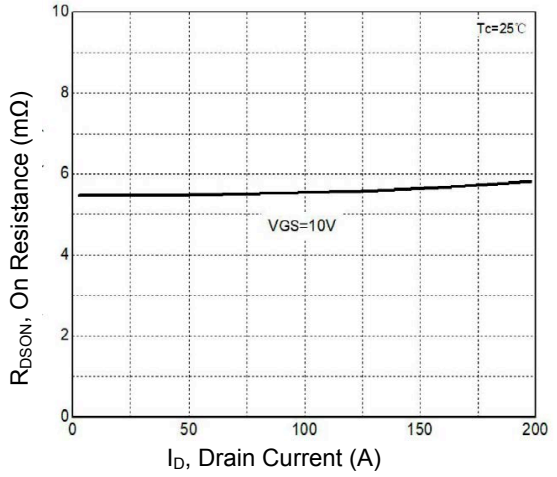


Figure 5. Drain-Source On-Resistance

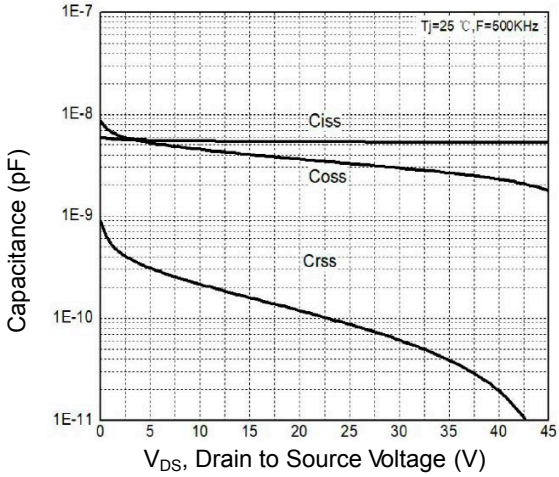


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

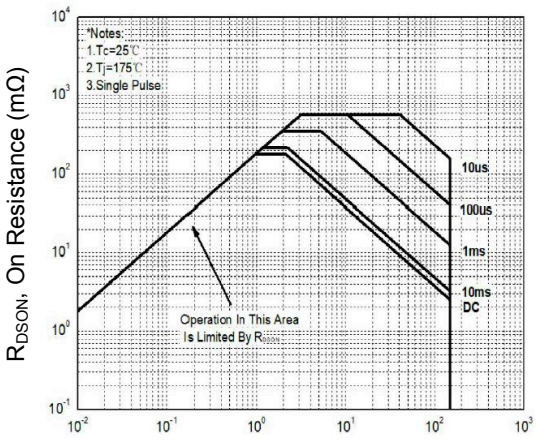


Figure 7. Maximum Safe Operation Area

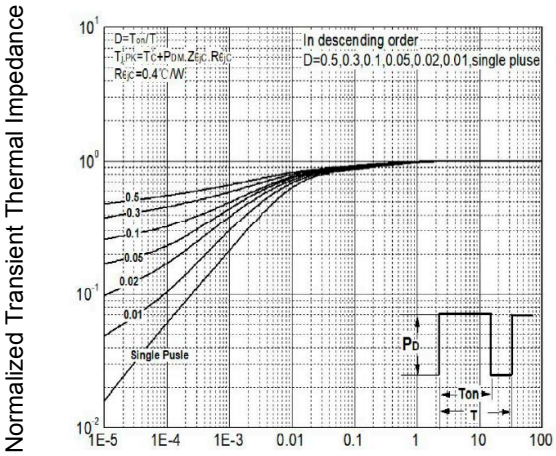
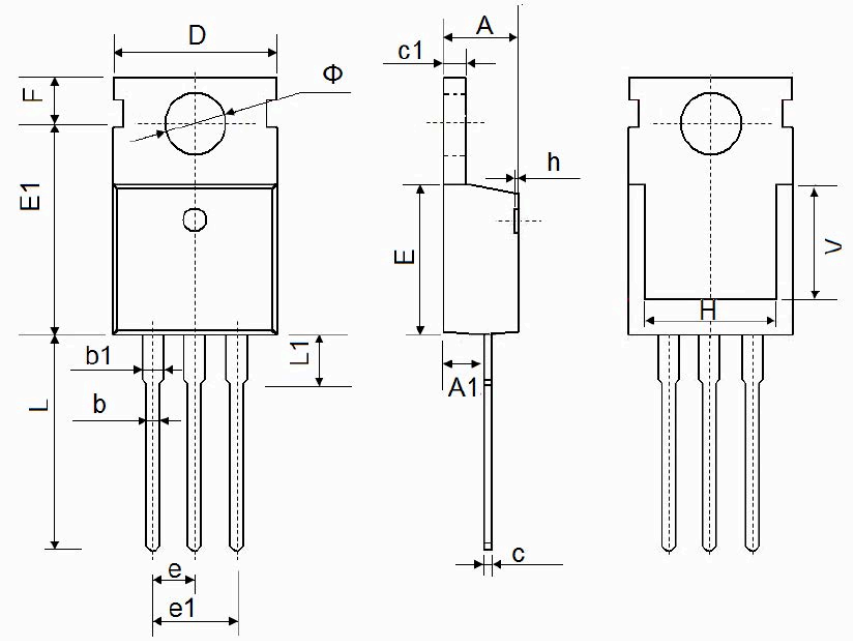


Figure 8. Thermal Transient Impedance

Package Outline Dimensions TO-220



Symbol	Dimesnions in Millimeters		Dimesnions in Inches	
	Min	Max	Min	Max
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150