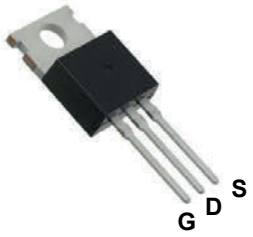
GOOD-ARK SEMICONDUCTOR

GSFH7R210

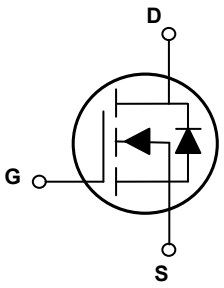
100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	7.2mΩ (Max.)
I_D	90A



TO-220



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 GSFH7R210 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}	100	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)[1]	I_D	90	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		58	A
Pulsed Drain Current[2]	I_{DM}	360	A
Power Dissipation	P_D	120	W
Linear Derating Factor		0.95	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	272	mJ
Junction-to-Case	$R_{\theta JC}$	1.04	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	50	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	100	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	20	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=50A	-	6.4	7.2	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.1	2.9	3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	3460	-	pF
Output Capacitance	C_{oss}		-	456	-	
Reverse Transfer Capacitance	C_{rss}		-	14	-	
Total Gate Charge	Q_g	I_D=25A, V_{DS}=50V, V_{GS}=10V	-	50	-	nC
Gate-to-Source Charge	Q_{gs}		-	23	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	7.7	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=50V, I_D=25A, R_{GEN}=1.6Ω	-	24.2	-	nS
Rise Time	t_r		-	66.4	-	
Turn-Off Delay Time	$t_{d(off)}$		-	40.3	-	
Fall Time	t_f		-	12.6	-	
Gate Resistance	R_g	f=1MHz	-	2.0	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	90	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	360	A
Diode Forward Voltage	V_{SD}	I_S=50A, V_{GS}=0V	-	1	1.2	V
Reverse Recovery Time	T_{rr}	T_J=25°C, I_F=25A, di/dt=100A/μs	-	60.2	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.13	-	uc

Note:

1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, V_{DD}=80V, I_{AS}=33.2A, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

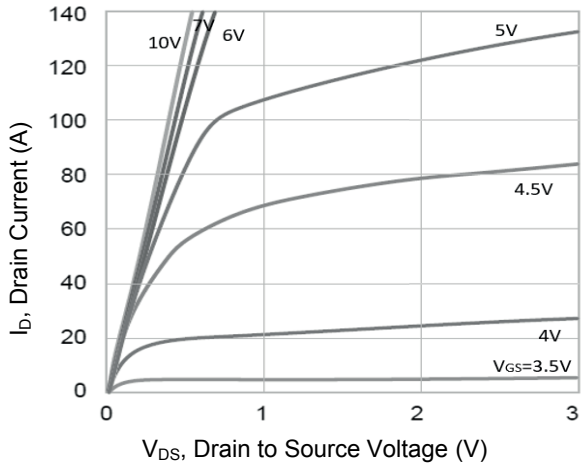


Figure 1. Output Characteristics

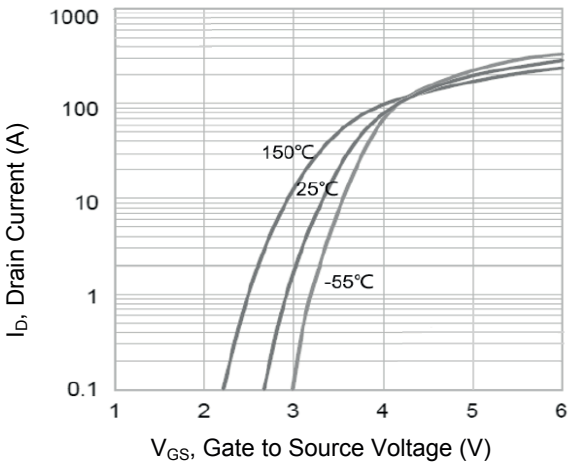


Figure 2. Transfer Characteristics

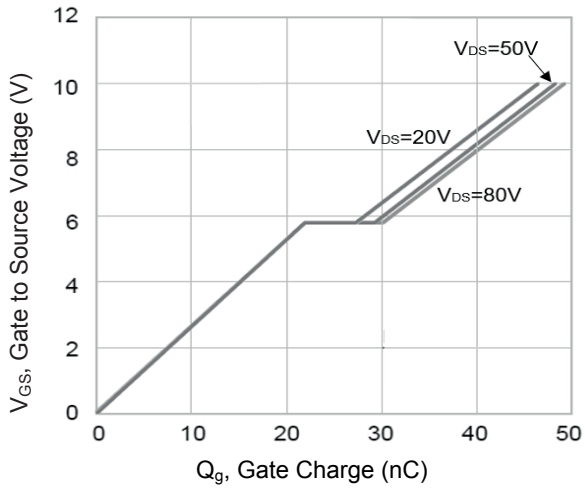


Figure 3. Gate Charge

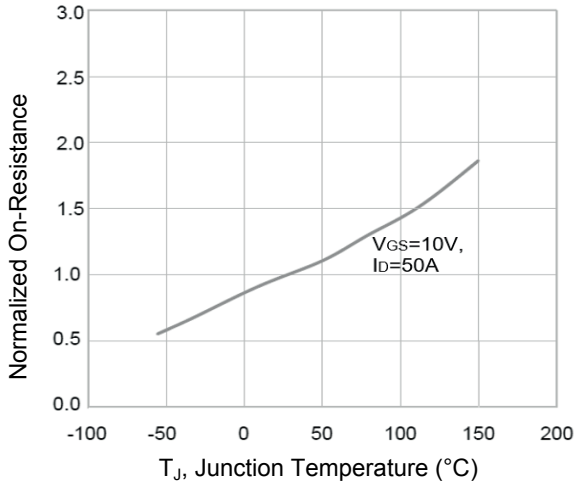


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

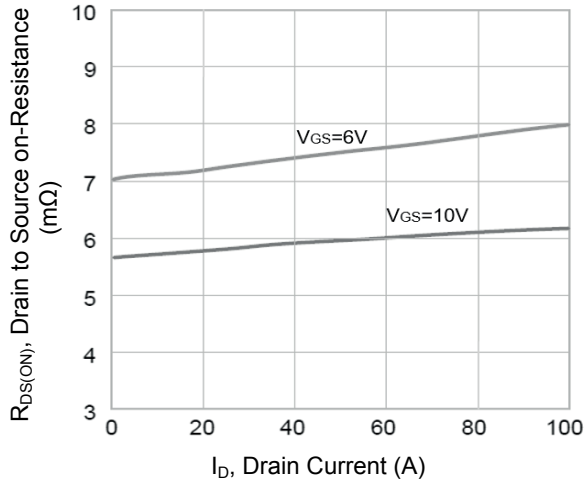


Figure 5. $R_{DS(ON)}$ vs. Drain Current

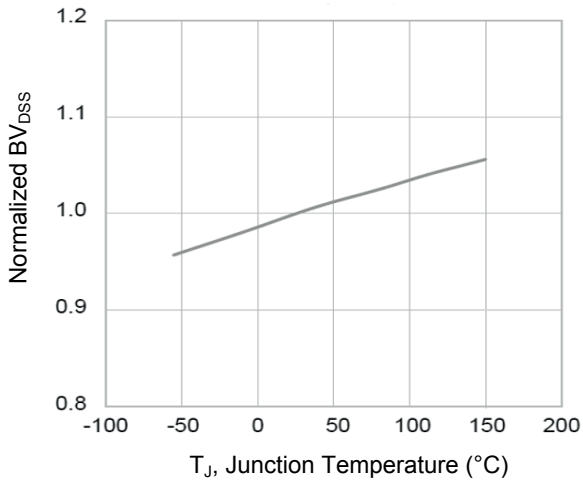


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

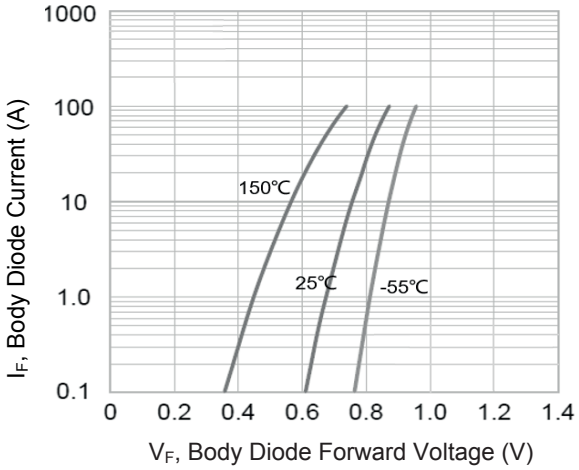


Figure 7. Body Diode Characteristics

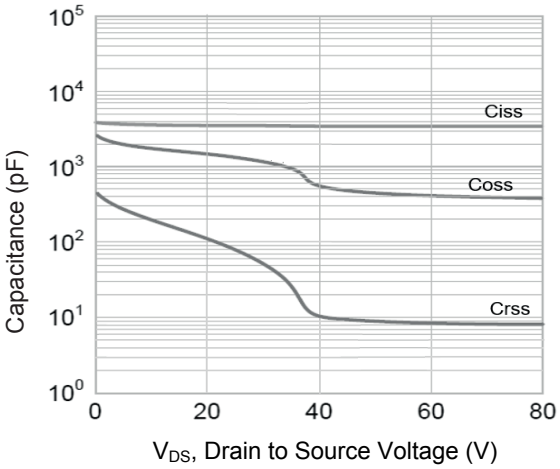


Figure 8. Capacitance Characteristics

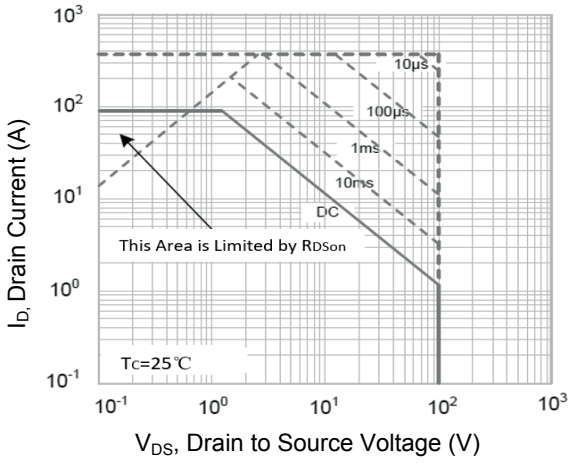
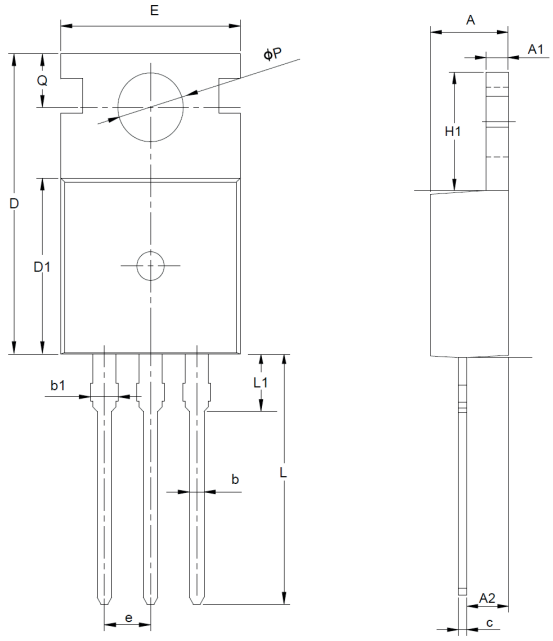


Figure 9. Safe Operation Area

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.700	0.169	0.185
A1	1.000	1.500	0.039	0.059
A2	1.800	2.800	0.071	0.110
b	0.600	1.000	0.024	0.039
b1	1.000	1.600	0.039	0.063
c	0.300	0.700	0.012	0.028
D	15.100	16.100	0.594	0.634
D1	8.100	10.000	0.319	0.394
E	9.600	10.400	0.378	0.409
e	2.540 BSC		0.100 BSC	
H1	6.100	7.000	0.240	0.276
L	12.600	13.600	0.496	0.535
L1	-	3.950	-	0.156
ΦP	3.400	3.900	0.134	0.154
Q	2.600	3.200	0.102	0.126

Order Information

Device	Package	Marking	Carrier	Quantity
GSFH7R210	TO-220	H7R210	Tube	50 pcs / Tube