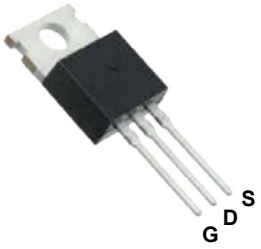
GOOD-ARK SEMICONDUCTOR

GSFH10125

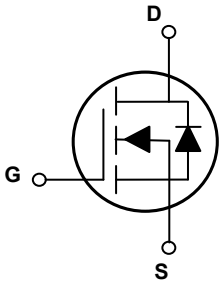
250V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	250V
$R_{DS(ON)}$	100mΩ (Max.)
I_D	20A



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 GSFH10125 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	Value	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State @ T_C=25°C[1]	I_D	20	A
Continuous Drain Current, @ Steady-State @ T_C=100°C		14	A
Pulsed Drain Current[2]	I_{DM}	80	A
Power Dissipation @ T_A=25°C	P_D	125	W
Linear Derating Factor		0.83	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	180	mJ
Max. Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.2	°C/W
Max. Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.5	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	°C

Electrical Characteristics (T_J=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	250	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=250V, V_{GS}=0V	-	-	1	μA
		V_{DS}=250V, V_{GS}=0V, T_J=125°C	-	-	50	
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=10A	-	85	100	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.5	3.4	4.5	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=125V, f=1MHz	-	1476	-	pF
Output Capacitance	C_{oss}		-	72	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge	Q_g	I_D=10A, V_{DS}=125V, V_{GS}=10V	-	19	-	nC
Gate-to-Source Charge	Q_{gs}		-	7.0	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	4.0	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=125V, I_D=10A, R_{GEN}=2.35Ω	-	16.8	-	nS
Rise Time	t_r		-	4.0	-	
Turn-Off Delay Time	$t_{d(off)}$		-	23.6	-	
Fall Time	t_f		-	4.5	-	
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode	-	-	20	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	80	A
Diode Forward Voltage	V_{SD}	I_S=10A, V_{GS}=0V	-	1	1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=10A, di/dt=100A/μs	-	163	-	nS
Reverse Recovery Charge	Q_{rr}		-	516	-	nC

Note:

1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=1mH, R_G=25Ω, V_{DD}=50V, 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

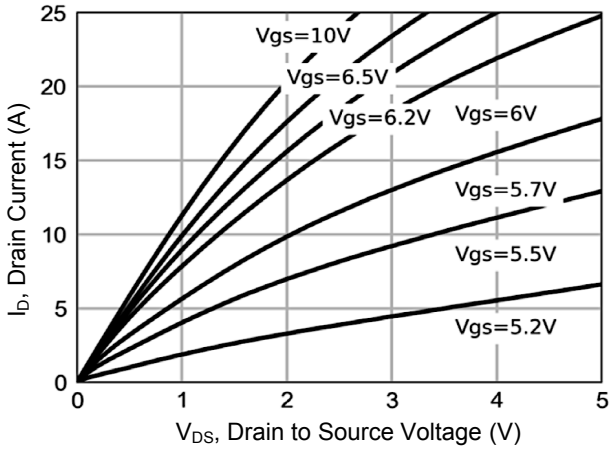


Figure 1. Output Characteristics

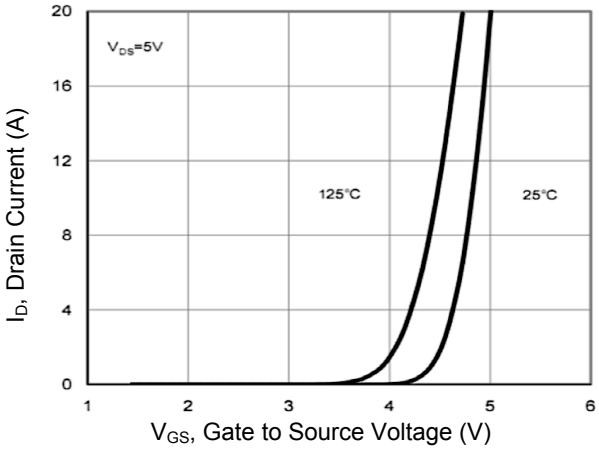


Figure 2. Transfer Characteristics

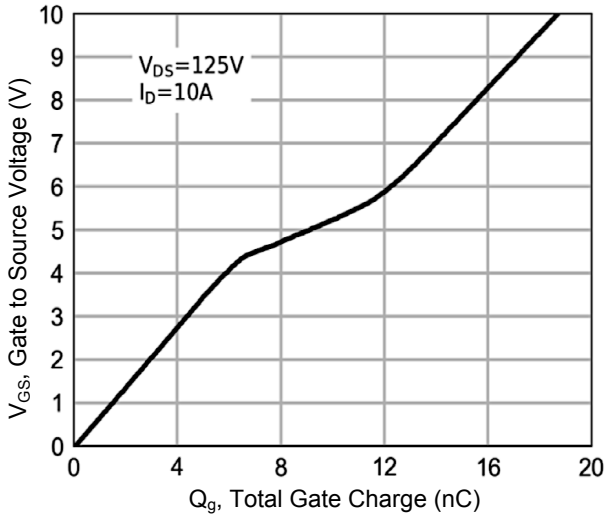


Figure 3. Gate Charge Characteristics

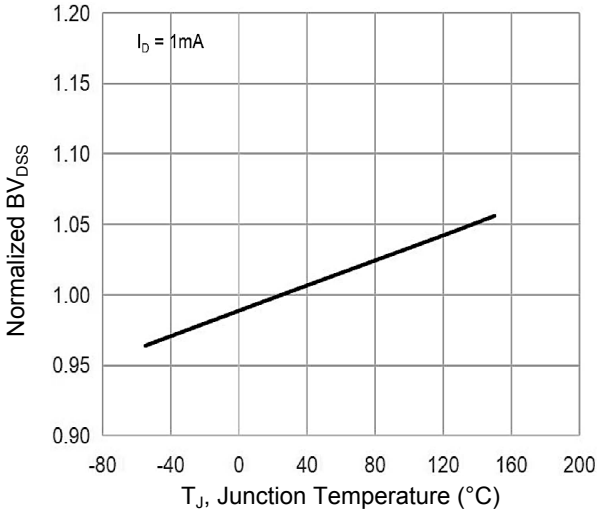


Figure 4. Normalized BV_{DSS} vs. T_J

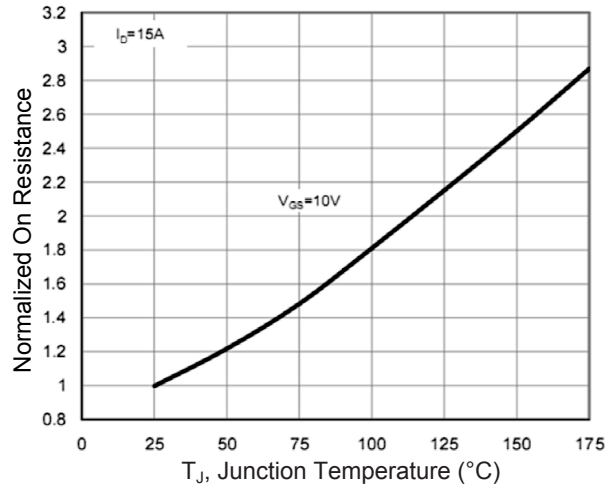


Figure 5. Normalized On Resistance vs. T_J

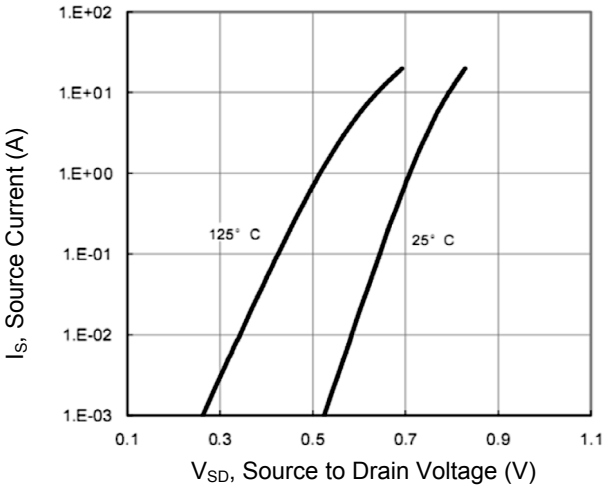


Figure 6. Body Diode Characteristics

Typical Electrical and Thermal Characteristic Curves

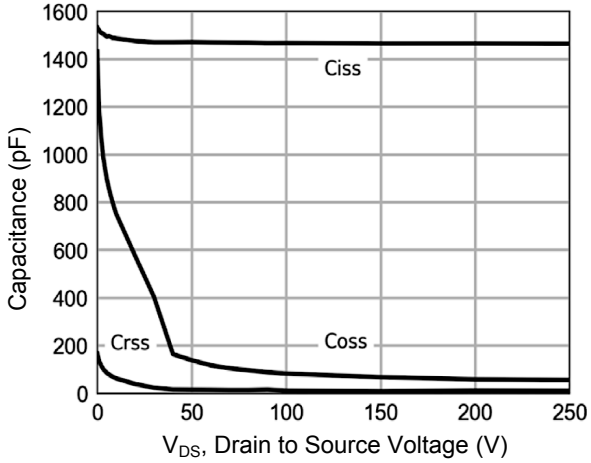


Figure 7. Capacitance Characteristics

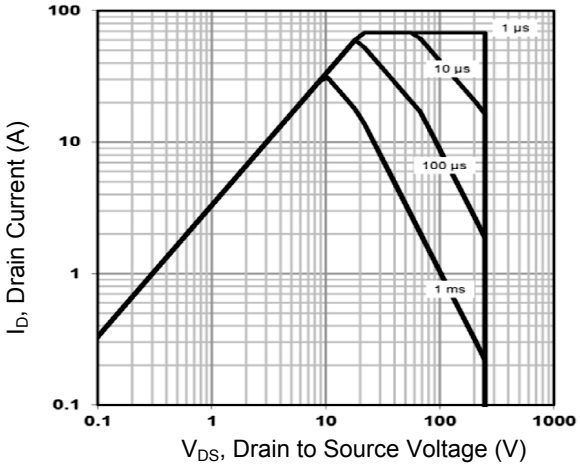
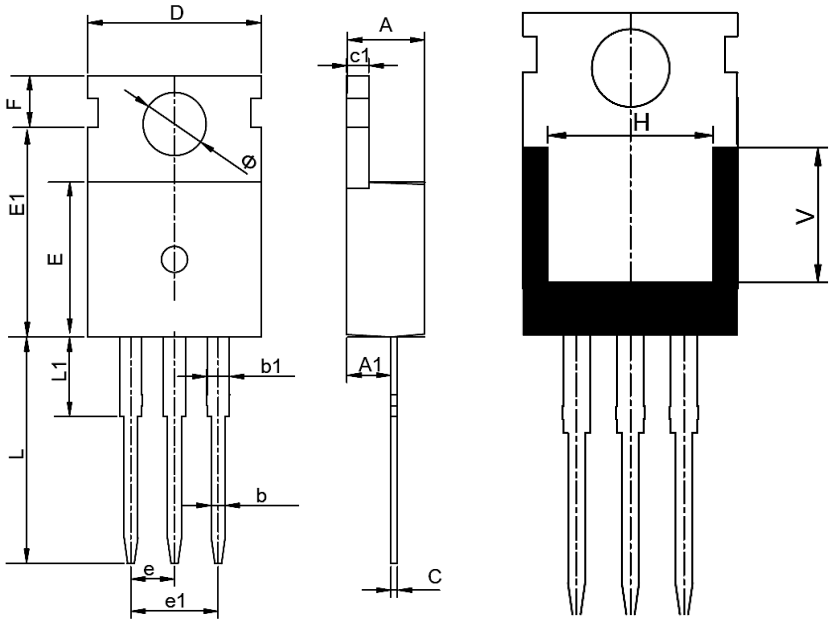


Figure 8. Safe Operating Area

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
A1	2.25	2.70	0.089	0.106
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
C	0.33	0.65	0.013	0.026
c1	1.20	1.40	0.047	0.055
D	9.91	10.25	0.390	0.404
E	8.95	9.75	0.352	0.384
E1	12.65	13.00	0.498	0.512
e	2.54 TYP		0.100 TYP	
e1	4.98	5.18	0.196	0.204
F	2.65	2.95	0.104	0.116
H	7.90	8.10	0.311	0.319
L	12.90	13.40	0.508	0.528
L1	2.68	3.25	0.106	0.128
V	6.90 REF		0.272 REF	
Φ	3.40	3.80	0.134	0.150

Order Information

Device	Package	Marking	Packaging	SPQ
GSFH10125	TO-220	H10125	Tube	50 Pcs / Tube