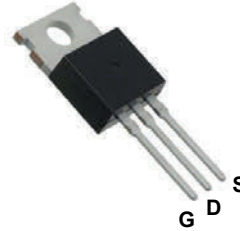
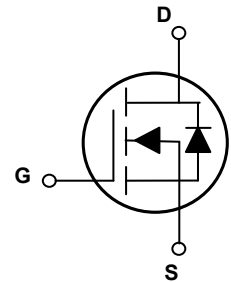


Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	4.4m Ω (max.)
I_D	180A



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 GSFH10120 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, at Steady-State, ($T_C=25^\circ\text{C}$) ¹	I_D	180	A
Drain Current-Continuous, at Steady-State, ($T_C=100^\circ\text{C}$)		130	
Drain Current-Pulsed ²	I_{DM}	720	A
Single Pulse Avalanche Energy ³	E_{AS}	780	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	208	W
Linear Derating Factor ($T_C=25^\circ\text{C}$)		1.7	
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.6	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
		$T_J=125^\circ\text{C}$	-	-	50	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$	-	3.6	4.4	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.2	3	3.9	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=50V, I_D=20A, V_{GS}=10V$	-	152	-	nC
Gate-Source Charge	Q_{gs}		-	45.5	-	
Gate-Drain ("Miller") Charge	Q_{gd}		-	45.2	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=50V, R_{GEN}=3\Omega, V_{GS}=10V, R_L=1\Omega$	-	40	-	nS
Rise Time	t_r		-	66	-	
Turn-Off Delay Time	$t_{d(off)}$		-	101	-	
Fall Time	t_f		-	41	-	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	-	8402	-	pF
Output Capacitance	C_{oss}		-	890	-	
Reverse Transfer Capacitance	C_{rss}		-	34	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	1.8	-	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.	-	-	180	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	720	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=50A$	-	1	1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=50A, di/dt=100A/\mu s$	-	82	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.24	-	μC

Note:

1. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Repetitive rating: Pulsed width limited by maximum junction temperature.
3. $L=0.5\text{mH}, V_{DD}=80V, T_J=25^\circ\text{C}$.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

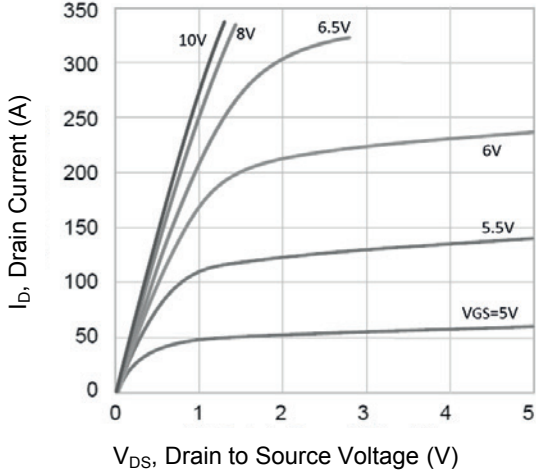


Figure 1. Typical Output Characteristics

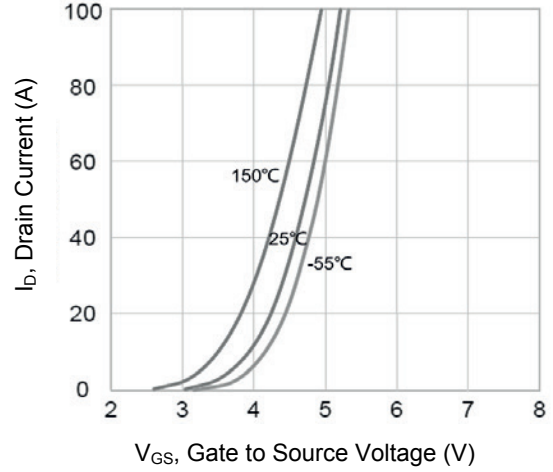


Figure 2. Transfer Characteristics

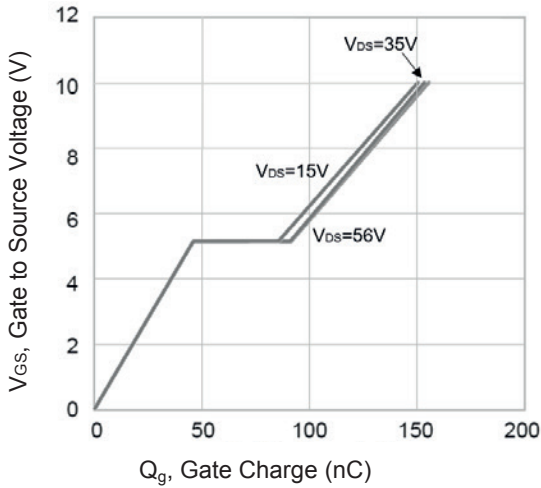


Figure 3. Gate Charge

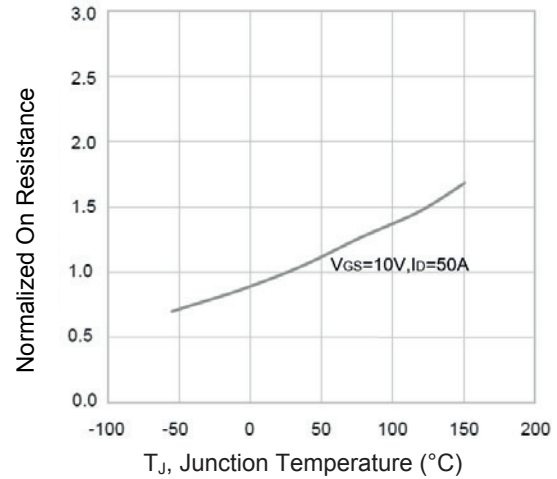


Figure 4. Normalized On-Resistance vs. Junction Temperature

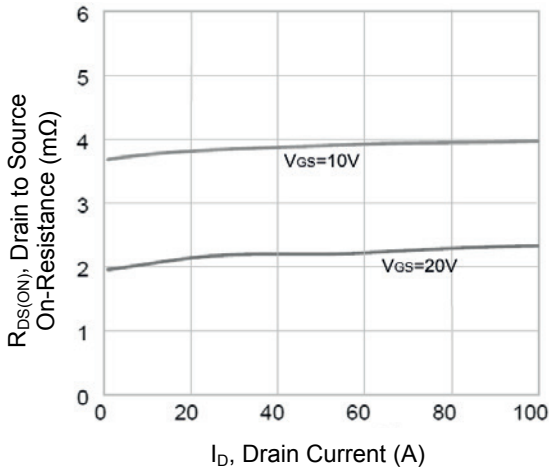


Figure 5. $R_{DS(ON)}$ vs. Drain Current

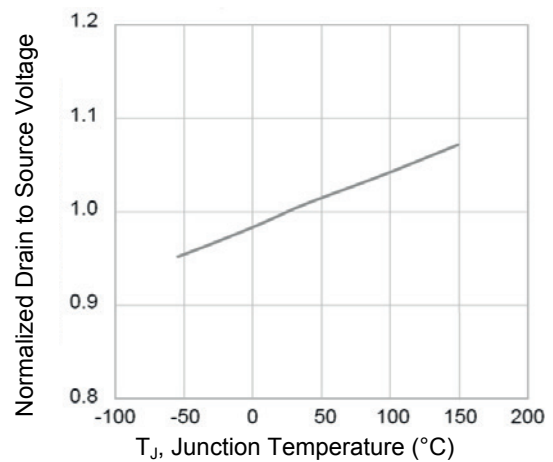


Figure 6. Normalized BV_{DSS} vs. Junction Temperature

Typical Electrical and Thermal Characteristic Curves

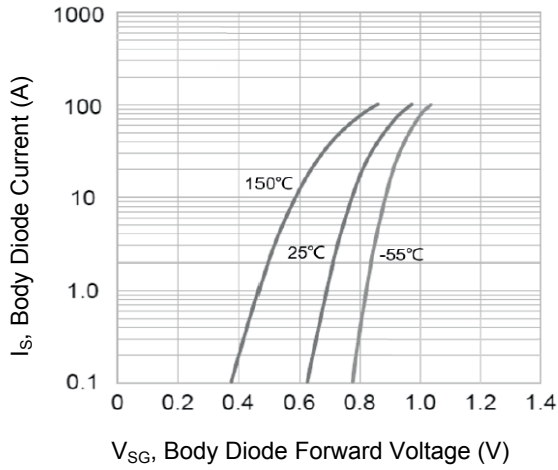


Figure 7. Body Diode Characteristics

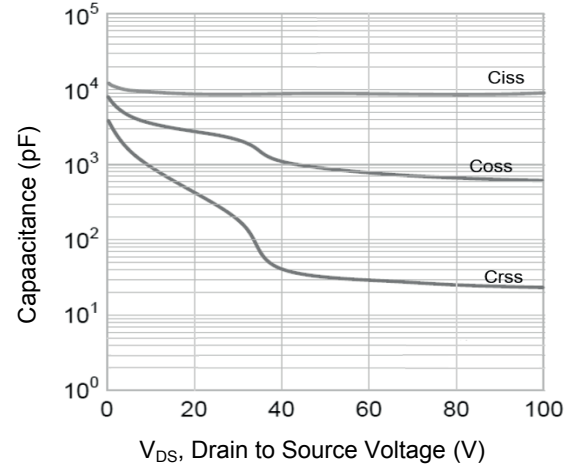


Figure 8. Capacitance Characteristics

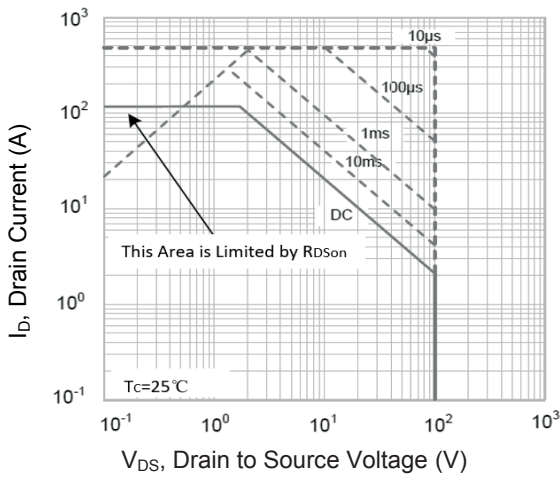
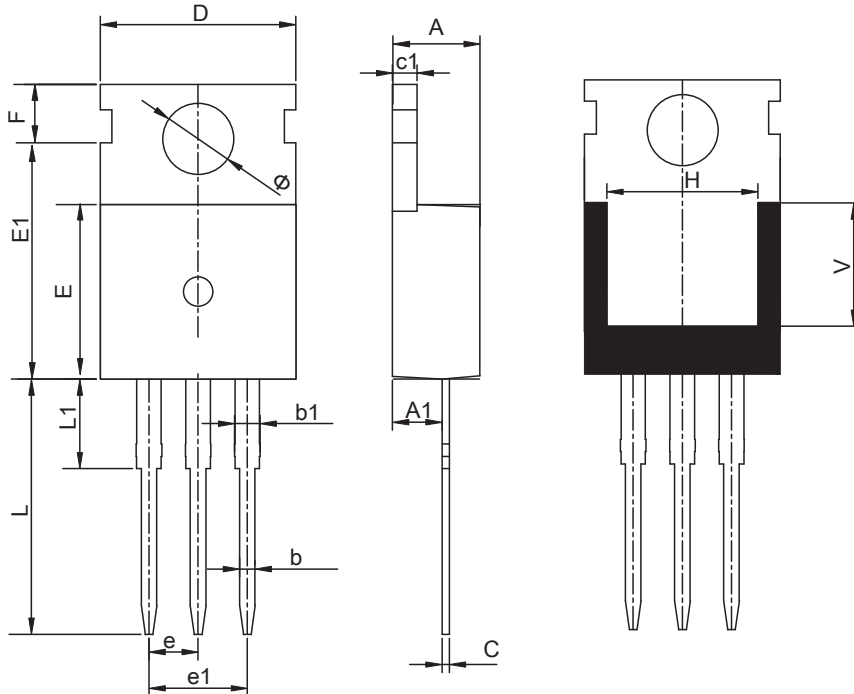


Figure 9. Safe Operation Area

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.40	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	Carrier	Quantity
GSFH10120	TO-220	H4R410	Tube	50pcs / Tube

For more information, please contact us at: inquiry@goodarksemi.com