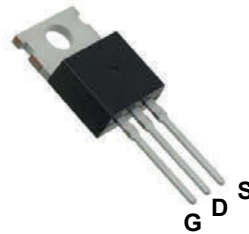
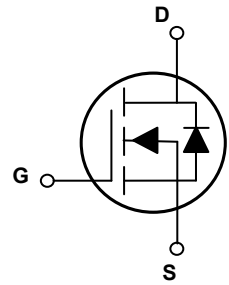


## Main Product Characteristics

$V_{(BR)DSS}$	200V
$R_{DS(ON)}$	0.16Ω (Max.)
$I_D$	18A



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 GSFH2016 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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	200	V
Gate-to-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, @ Steady-State (T <sub>C</sub> =25°C) <sup>1</sup>	I <sub>D</sub>	18	A
Continuous Drain Current, @ Steady-State (T <sub>C</sub> =100°C)		11	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	72	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	150	W
Linear Derating Factor (T <sub>C</sub> =25°C)		1.2	W/°C
Single Pulse Avalanche Energy <sup>3</sup>	E <sub>AS</sub>	635	mJ
Junction-to-Case	R <sub>θJC</sub>	0.84	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>	R <sub>θJA</sub>	620	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> /T <sub>STG</sub>	-55 to +150	°C

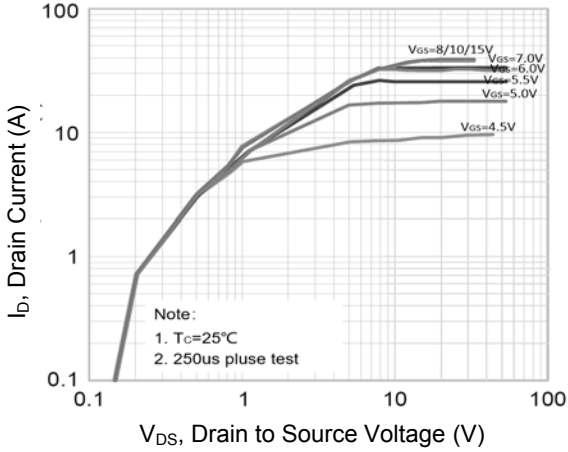
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=200V, V_{GS}=0V$	-	-	1	$\mu A$
		$T_J=125^\circ C$	-	-	50	
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=9A$	-	0.12	0.16	$\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.1	3	3.9	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V$ $f=1MHz$	-	1108	-	pF
Output Capacitance	$C_{oss}$		-	160	-	
Reverse Transfer Capacitance	$C_{rss}$		-	34	-	
Total Gate Charge	$Q_g$	$I_D=11A, V_{DS}=160V,$ $V_{GS}=10V$	-	41	-	nC
Gate-to-Source Charge	$Q_{gs}$		-	6	-	
Gate-to-Drain ("Miller") Charge	$Q_{gd}$		-	20	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=100V,$ $I_D=11A, R_G=2.5\Omega$	-	15	-	nS
Rise Time	$t_r$		-	47	-	
Turn-Off Delay Time	$t_{d(off)}$		-	110	-	
Fall Time	$t_f$		-	36	-	
Gate Resistance	$R_g$	$f=1MHz$	-	6.6	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse-p-n junction diode.	-	-	18	A
Pulsed Source Current (Body Diode)	$I_{SM}$		-	-	72	A
Diode Forward Voltage	$V_{SD}$	$I_S=11A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	$T_{rr}$	$T_J=25^\circ C, I_F=11A,$ $di/dt=100A/\mu s$	-	160	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	0.98	-	$\mu C$

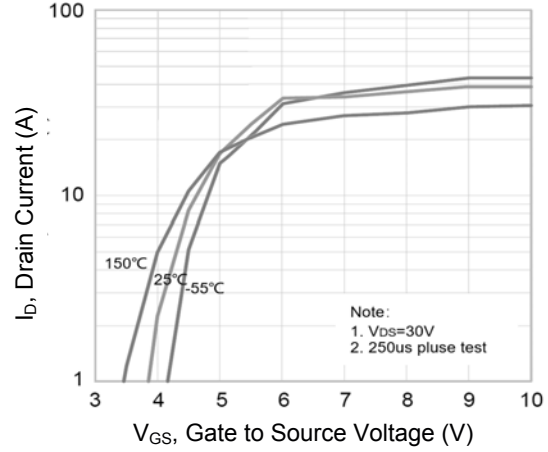
Notes:

1. Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $L=30mH, V_{DD}=100V, T_J=25^\circ C$ .
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

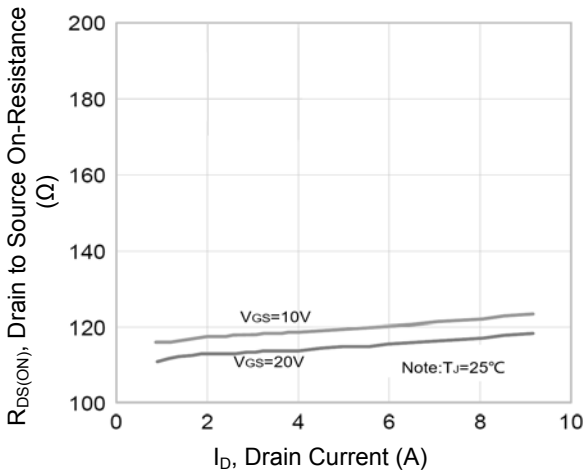
**Typical Electrical and Thermal Characteristic Curves**



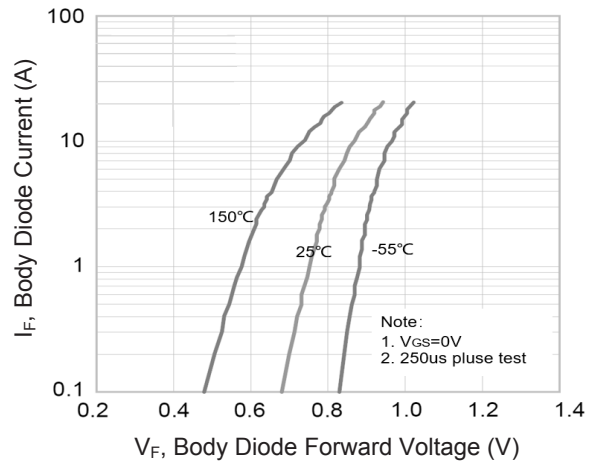
**Figure 1. Typical Output Characteristics**



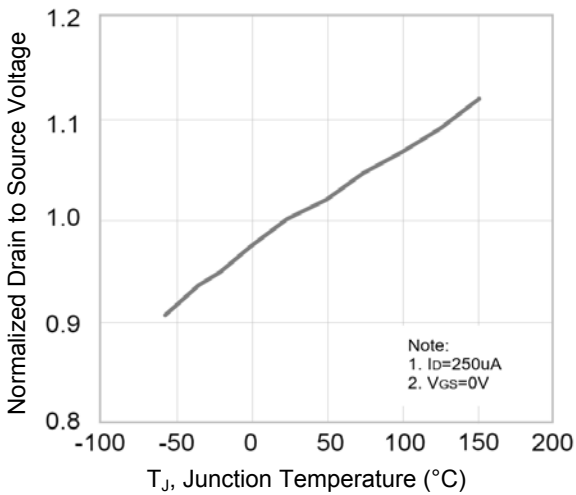
**Figure 2. Transfer Characteristics**



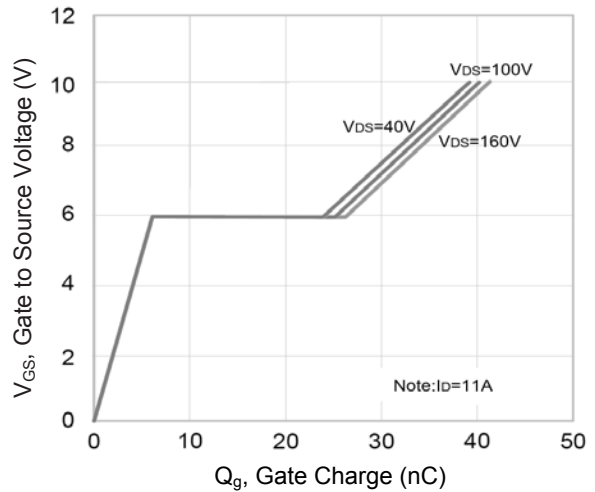
**Figure 3. On-Resistance vs. Drain Current**



**Figure 4. Body Diode Characteristics**

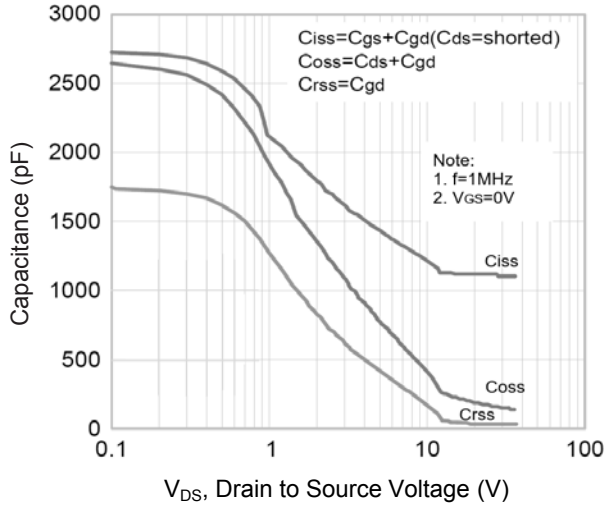


**Figure 5. Normalized  $BV_{DSS}$  vs.  $T_J$**

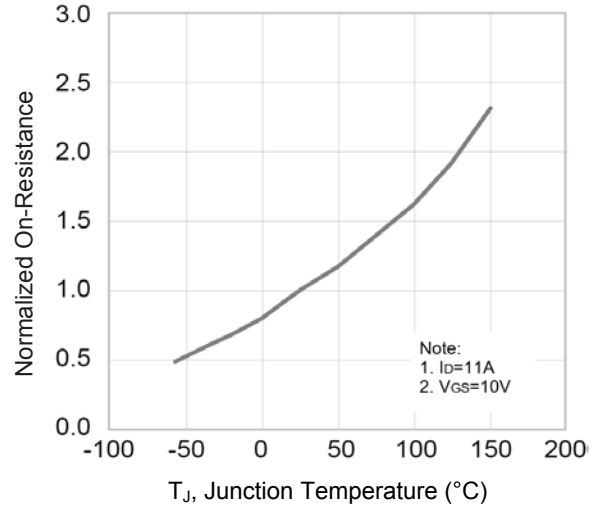


**Figure 6. Gate Charge**

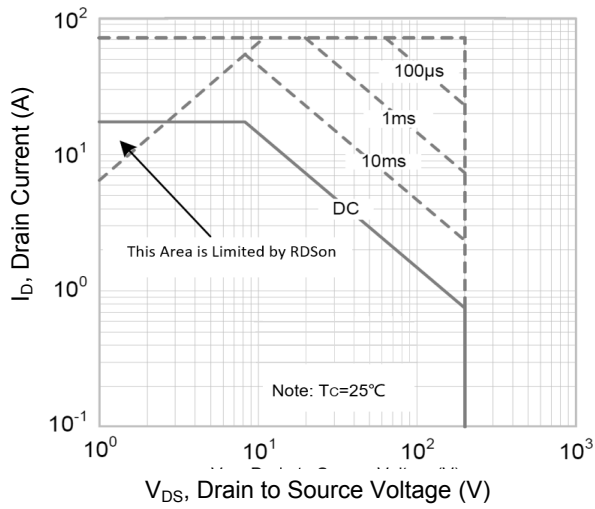
**Typical Electrical and Thermal Characteristic Curves**



**Figure 7. Capacitance Characteristics**

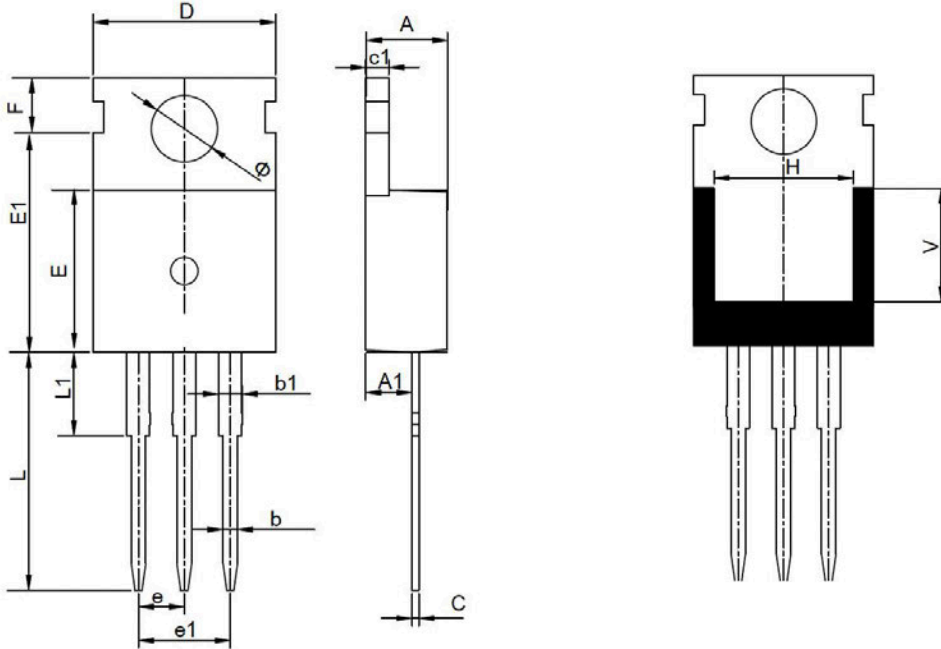


**Figure 8. Normalized  $R_{DS(on)}$  vs.  $T_J$**



**Figure 9. Safe Operation Area**

## Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.700	0.089	0.106
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	8.9500	9.750	0.352	0.384
E1	12.650	13.000	0.498	0.512
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
L	12.900	13.400	0.508	0.528
L1	2.680	3.250	0.106	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

## Order Information

Device	Package	Marking	Carrier	Quantity
GSFH2016	TO-220	H2016	Tube	50 Pcs / Tube

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)