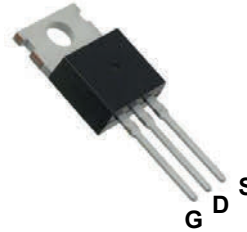
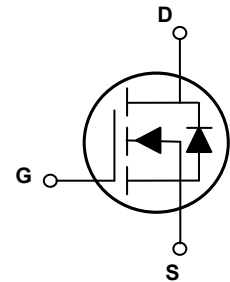


## Main Product Characteristics

$V_{(BR)DSS}$	85V
$R_{DS(ON)}$	5.5m $\Omega$ (Max.)
$I_D$	120A



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 GSGH5R585 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>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	85	V
Gate-to-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current, @ Steady-State (T <sub>A</sub> =25°C) <sup>1</sup>	$I_D$	120	A
Continuous Drain Current, @ Steady-State (T <sub>A</sub> =100°C)		90	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	480	A
Power Dissipation (T <sub>A</sub> =25°C)	$P_D$	160	W
Linear Derating Factor (T <sub>A</sub> =25°C)		1.28	W/°C
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	400	mJ
Junction-to-Case	$R_{\theta JC}$	0.78	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>	$R_{\theta JA}$	62.5	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> /T <sub>STG</sub>	-55 to +150	°C

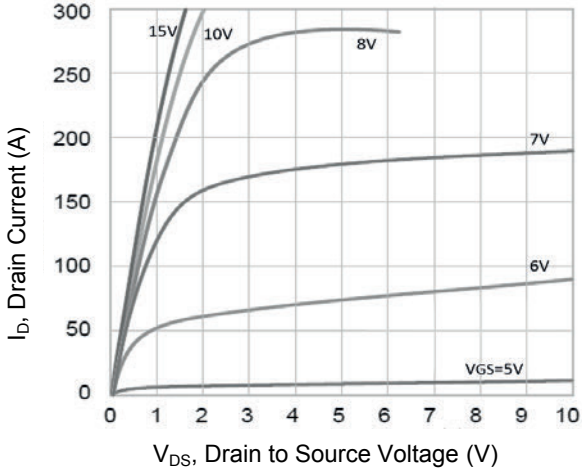
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	85	92.5	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=85V, V_{GS}=0V$	-	-	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$	-	4.5	5.5	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.2	3	3.9	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=40V$ $f=1MHz$	-	4284	-	pF
Output Capacitance	$C_{oss}$		-	668	-	
Reverse Transfer Capacitance	$C_{rss}$		-	18	-	
Total Gate Charge	$Q_g$	$I_D=50A, V_{DS}=40V,$ $V_{GS}=10V$	-	69	-	nC
Gate-to-Source Charge	$Q_{gs}$		-	30	-	
Gate-to-Drain ("Miller") Charge	$Q_{gd}$		-	16	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=40V,$ $R_{GEN}=24\Omega, I_D=13.2A$	-	59	-	nS
Rise Time	$t_r$		-	82	-	
Turn-Off Delay Time	$t_{d(off)}$		-	126	-	
Fall Time	$t_f$		-	72	-	
Gate Resistance	$R_g$	$f=1MHz$	-	1.7	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	120	A
Pulsed Source Current (Body Diode)	$I_{SM}$		-	-	480	A
Diode Forward Voltage	$V_{SD}$	$I_S=50A, V_{GS}=0V$	-	1	1.2	V
Reverse Recovery Time	$T_{rr}$	$T_J=25^\circ C, I_F=20A,$	-	53	-	nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt=100A/\mu s$	-	0.31	-	$\mu C$

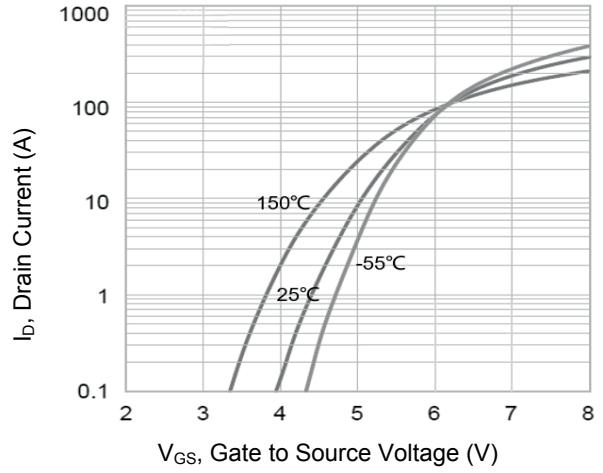
Note:

1. Pulse test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; Pulse width limited by max. junction temperature.
3.  $L=0.5mH, I_{AS}=40A, V_{DD}=72V, T_J=25^\circ C$ .
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

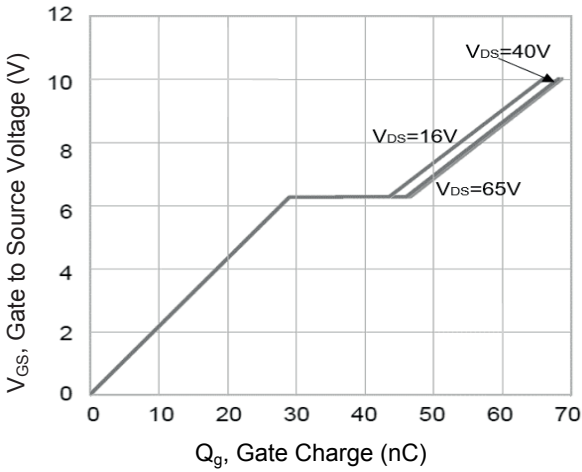
### Typical Electrical and Thermal Characteristic Curves



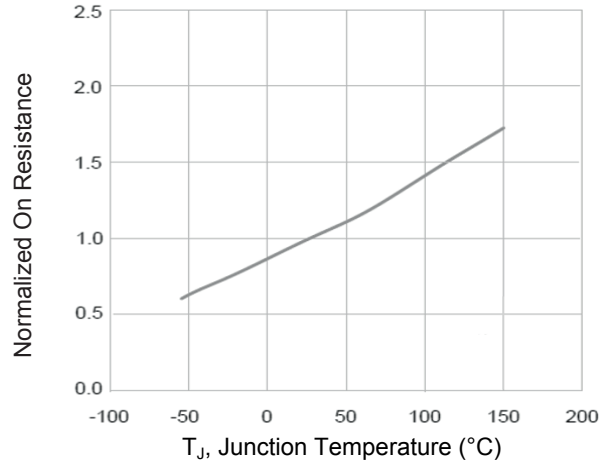
**Figure 1. Typical Output Characteristics**



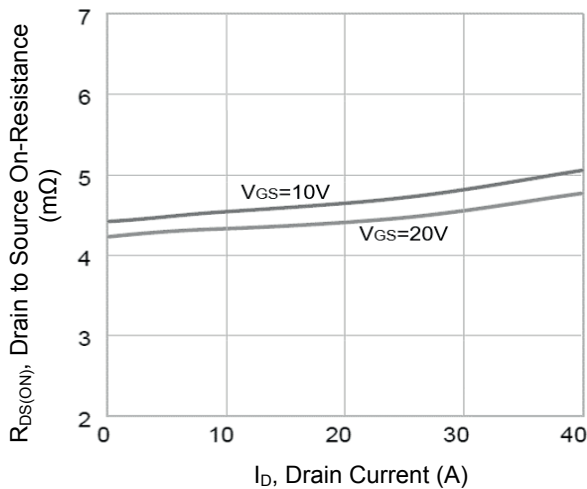
**Figure 2. Transfer Characteristics**



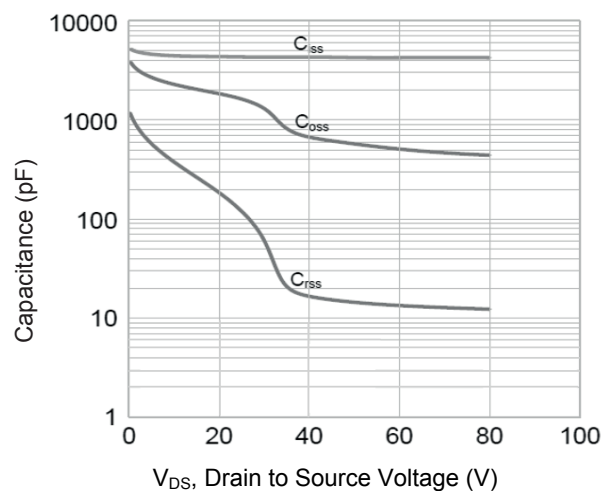
**Figure 3. Gate Charge**



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

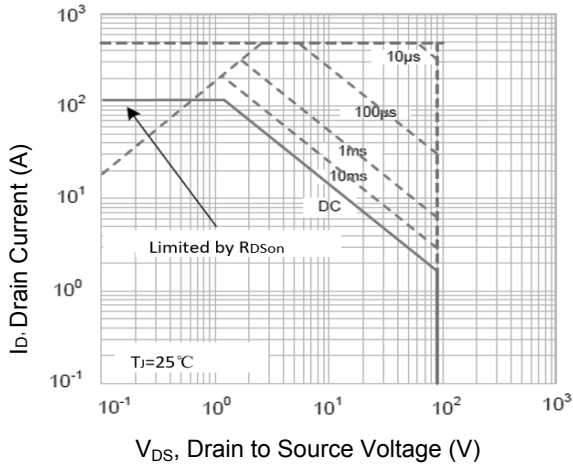


**Figure 5. On-Resistance vs. Drain Source**

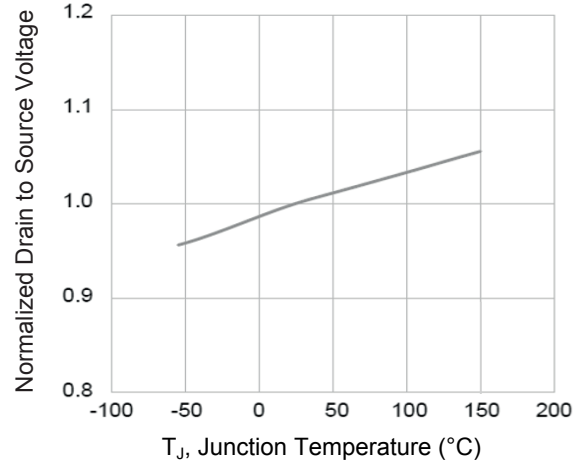


**Figure 6. Typical Capacitance vs. Drain to Source Voltage**

**Typical Electrical and Thermal Characteristic Curves**

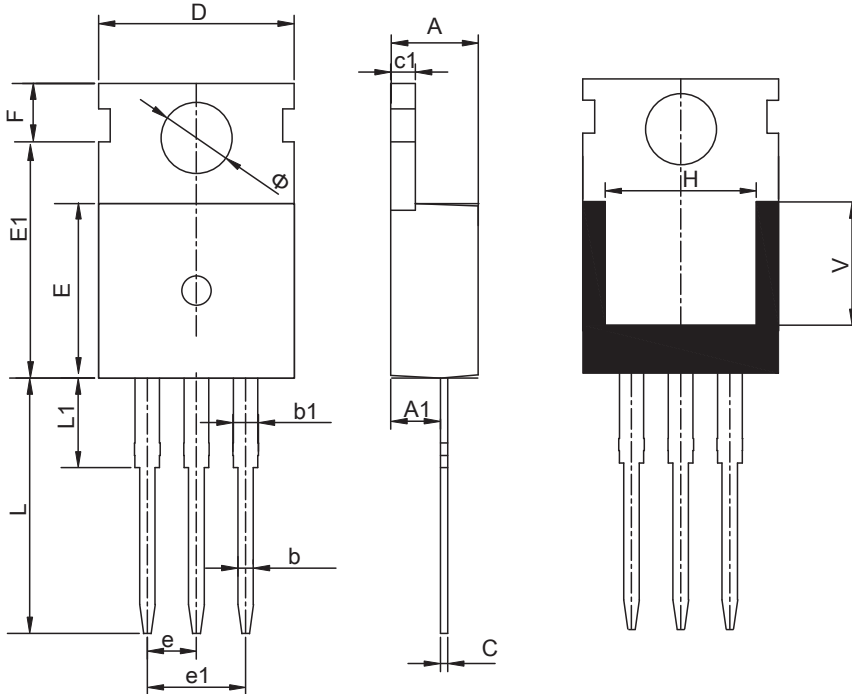


**Figure 7. Safe Operation Area**



**Figure 8. Normalized  $V_{DS}$  vs.  $T_J$**

### 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
GSGH5R585	TO-220	H5R585	Tube	50pcs / Tube

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