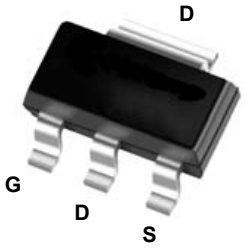
GOOD-ARK SEMICONDUCTOR

GSFL3409

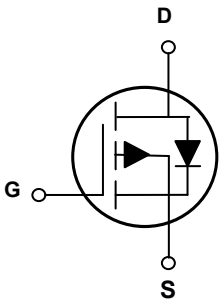
30V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	45mΩ (Max.)
I_D	-7.8A



SOT-223



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 GSFL3409 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_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_A=25°C)[1]	I_D	-7.8	A
Continuous Drain Current, @ Steady-State (T_A=100°C)		-4.6	A
Pulsed Drain Current[2]	I_{DM}	-31.2	A
Power Dissipation (T_C=25°C)	P_D	16	W
Linear Derating Factor		0.128	W/°C
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[3]	$R_{\theta JA}$	62	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A=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	-30	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	-	-	-1	μA
		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=-4.1A	-	37	45	mΩ
		V_{GS}=-4.5V, I_D=-3.5A	-	46	66	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.0	-1.6	-2.9	V
Forward Transconductance	gfs	V_{DS}=-5V, I_D=-3.0A	-	11	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz	-	580	-	pF
Output Capacitance	C_{oss}		-	98	-	
Reverse Transfer Capacitance	C_{rss}		-	74	-	
Total Gate Charge	Q_g	I_D=-4.1A, V_{DS}=-15V, V_{GS}=-10V	-	6.8	-	nC
Gate-to-Source Charge	Q_{gs}		-	1.0	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	1.4	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, I_D=-1A, R_{GEN}=2.5Ω	-	14	-	nS
Rise Time	t_r		-	61	-	
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	
Fall Time	t_f		-	10	-	
Gate Resistance	R_g	f=1MHz	-	4.2	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	-5.8	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	-31	A
Diode Forward Voltage	V_{SD}	I_S=-4.1A, V_{GS}=0V	-	-0.8	-1.2	V

Notes:
1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulsed width limited by max. junction temperature.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

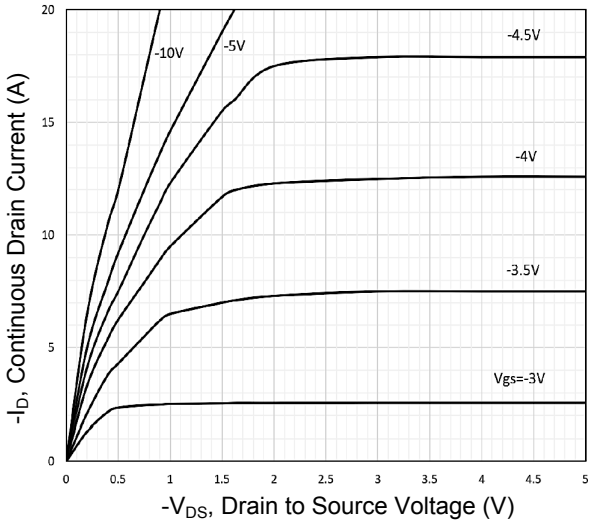


Figure 1. Output Characteristics

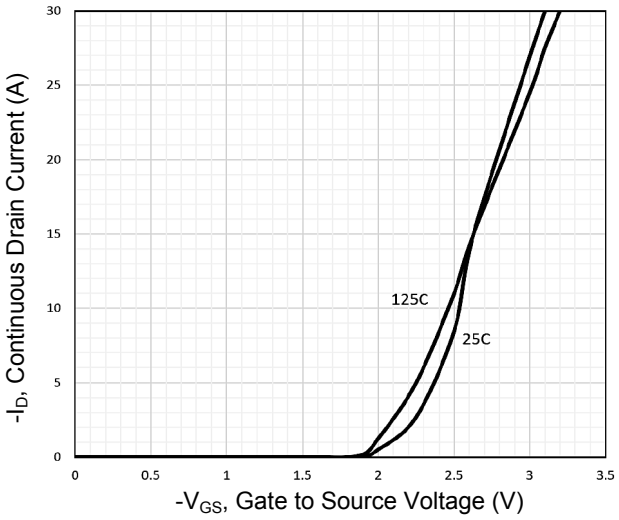


Figure 2. Transfer Characteristics

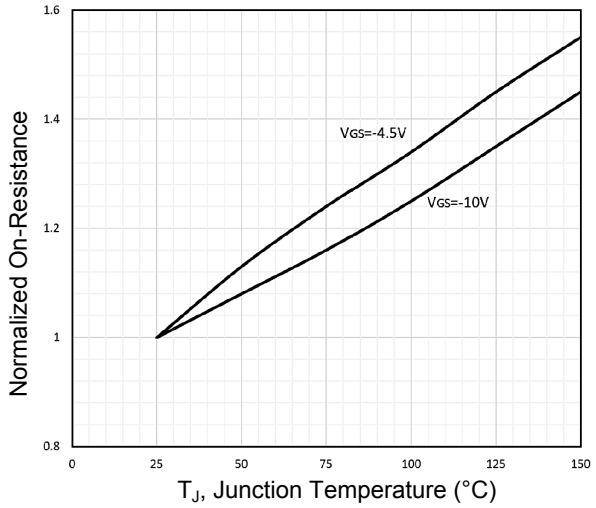


Figure 3. Normalized $R_{DS(ON)}$ vs. T_J

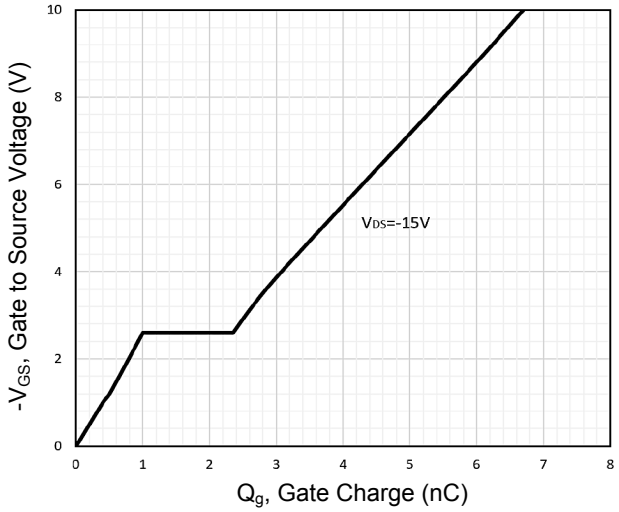


Figure 4. Gate Charge

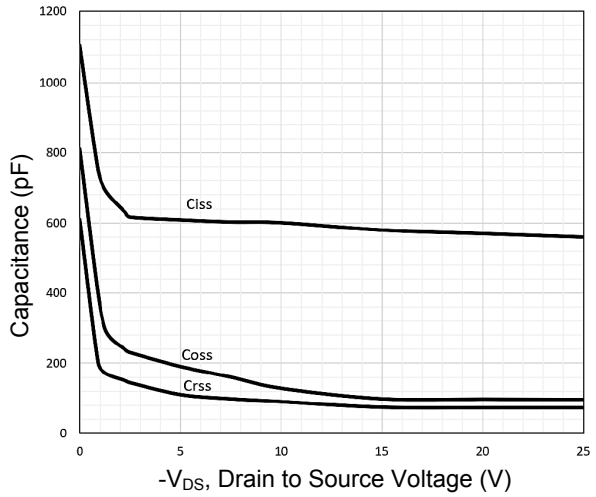


Figure 5. Capacitance Characteristics

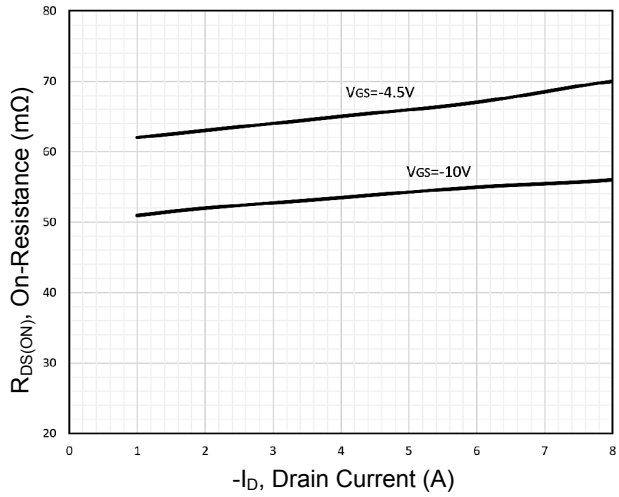
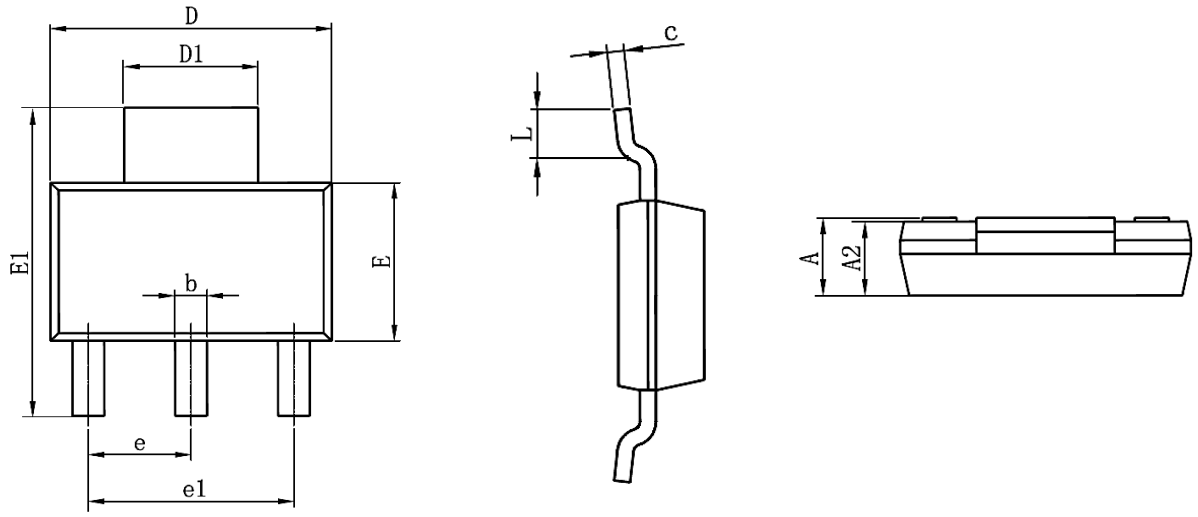


Figure 6. Typical $R_{DS(ON)}$ vs. I_D

Package Outline Dimensions (SOT-223)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.50	1.80	0.059	0.071
A2	1.45	1.80	0.057	0.071
b	0.60	0.84	0.024	0.033
c	0.20	0.35	0.008	0.014
D	6.20	6.70	0.244	0.264
D1	2.90	3.10	0.114	0.122
E	3.30	3.70	0.130	0.146
E1	6.70	7.30	0.264	0.287
e	2.30 TYP		0.091 TYP	
e1	4.40	4.70	0.173	0.185
L	0.70	1.10	0.028	0.043

Order Information

Device	Package	Marking	Packaging	SPQ
GSFL3409	SOT-223	L3409	Tape & Reel	3,000 Pcs / Reel