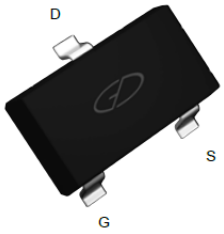
GOOD-ARK SEMICONDUCTOR

GSF3407

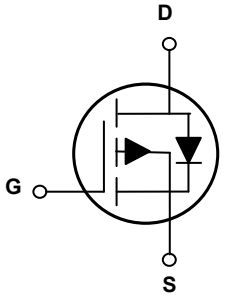
30V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	55mΩ
I_D	-4.1A



SOT-23



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

RoHS Compliant

Description

The GSF3407 utilizes the latest techniques to achieve ultral high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in battery protection, load switch, power management and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State	I_D @ T_A = 25°C	-4.1	A
Continuous Drain Current, @ Steady-State	I_D @ T_A = 70°C	-3.2	A
Pulsed Drain Current [1]	I_{DM}	-15	A
Power Dissipation	P_D @T_A = 25°C	1.2	W
Junction-to-Ambient (PCB Mounted, Steady-State) [2]	$R_{\theta JA}$	105	°C/W
Operating Junction and Storage Temperature Range	T_J T_{STG}	-55 to + 150	°C

Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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	-	40	55	mΩ
		V_{GS}=-4.5V, I_D =-3.5A		53	68	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D =-250μA	-1.0	-1.5	-2.4	V
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} =-10 V	-	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, R_L=15Ω, R_{GEN}=2.5Ω I_D=-1A	-	14	-	nS
Rise Time	t_r		-	61	-	
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	
Fall Time	t_f		-	10	-	
Source-Drain Ratings and Characteristics						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	-4.1	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	-15	A
Diode Forward Voltage	V_{SD}	I_S=5.6A, V_{GS}=0V	-	-0.8	-1.2	V

Notes

1. Pulse test: Pulse Width≤300us, Duty cycle ≤2%.
2. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

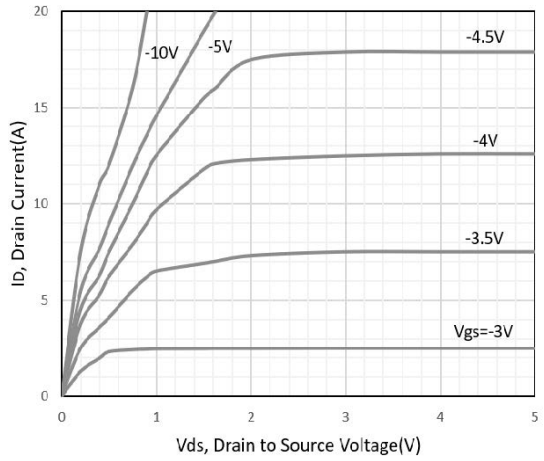


Figure 1. Typical Output Characteristics

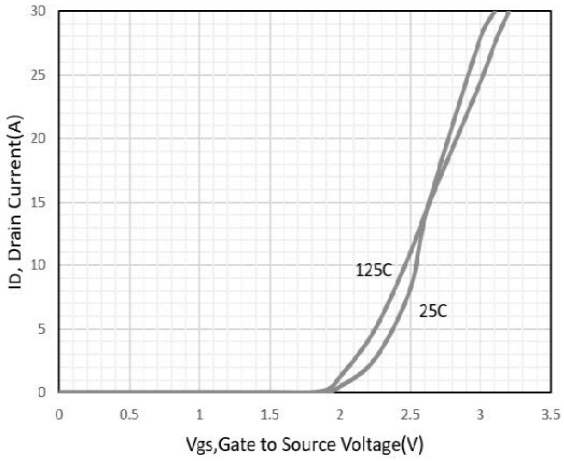


Figure 2. Transfer Characteristics

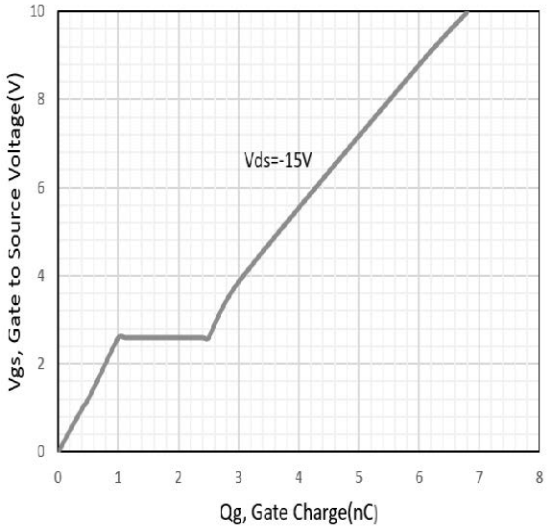


Figure 3. Gate Charge.

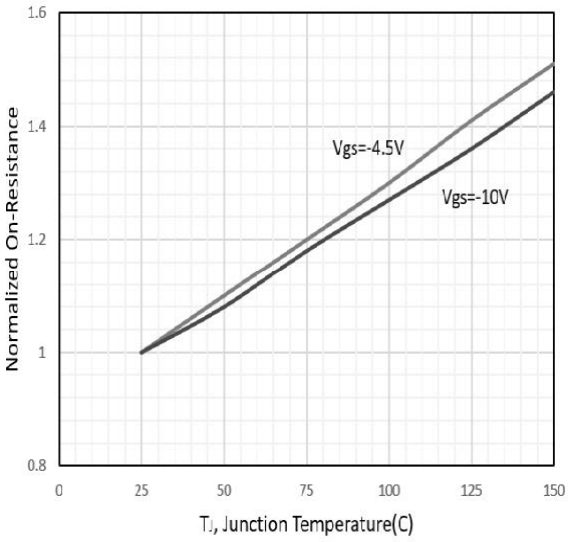


Figure 4. Normalized On-Resistance Vs. Case Temperature

Typical Electrical and Thermal Characteristic Curves

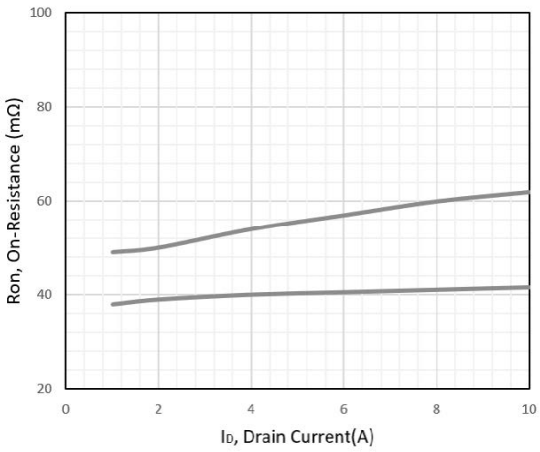


Figure 5. Drain-Source On-Resistance

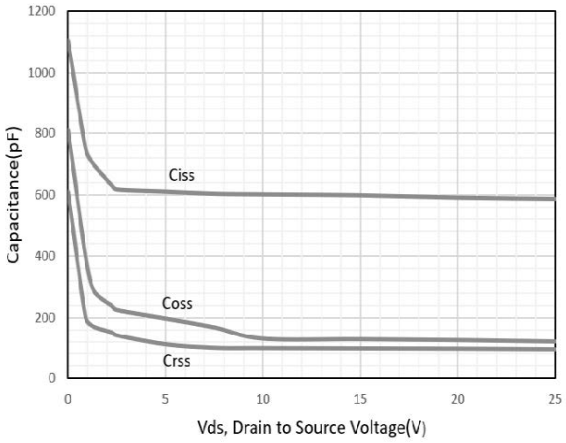


Figure 6. Typical Capacitance Vs. Drain-to-Source Voltage

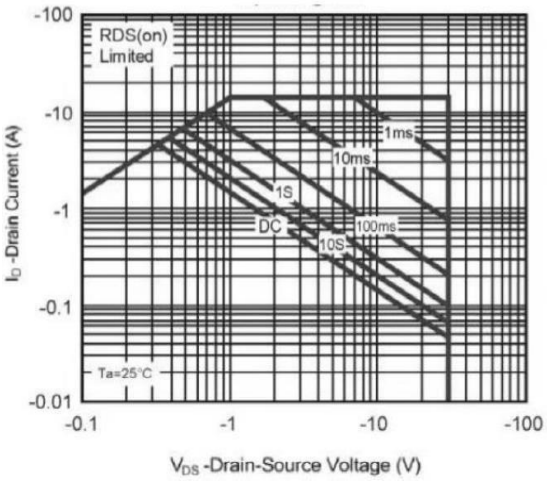


Figure 7. Safe Operation Area

Test Circuit & Waveform

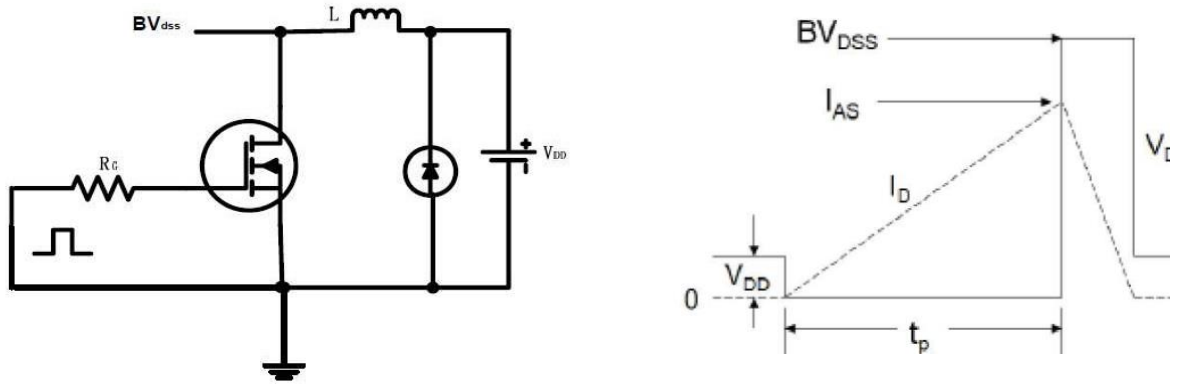


Figure 8. Unclamped Inductive Switching Test Circuit & Waveforms

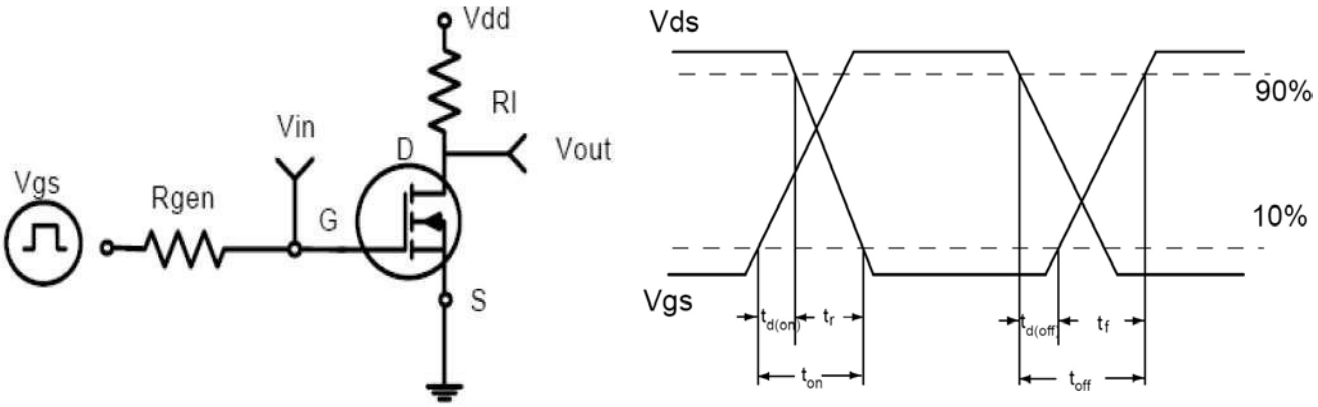


Figure 9. Resistive Switching Test Circuit & Waveforms

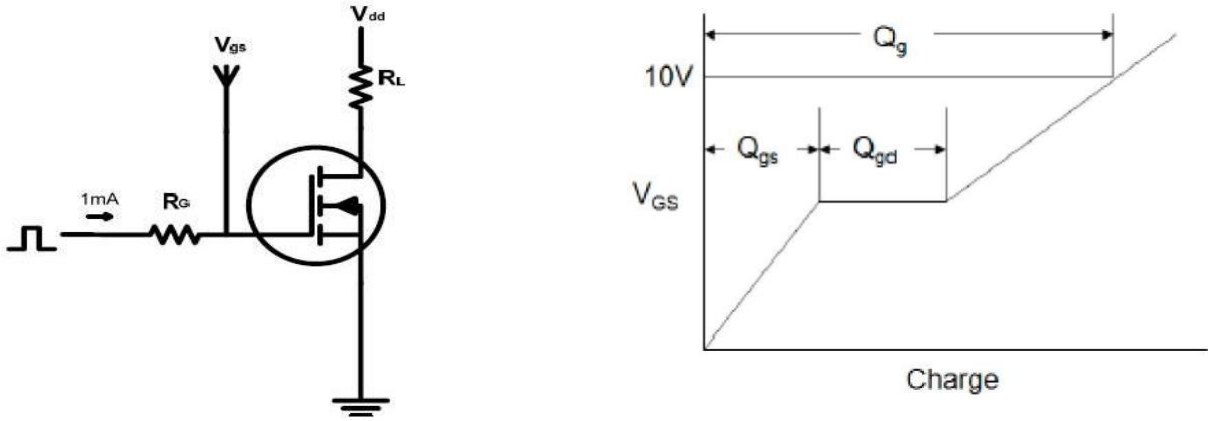
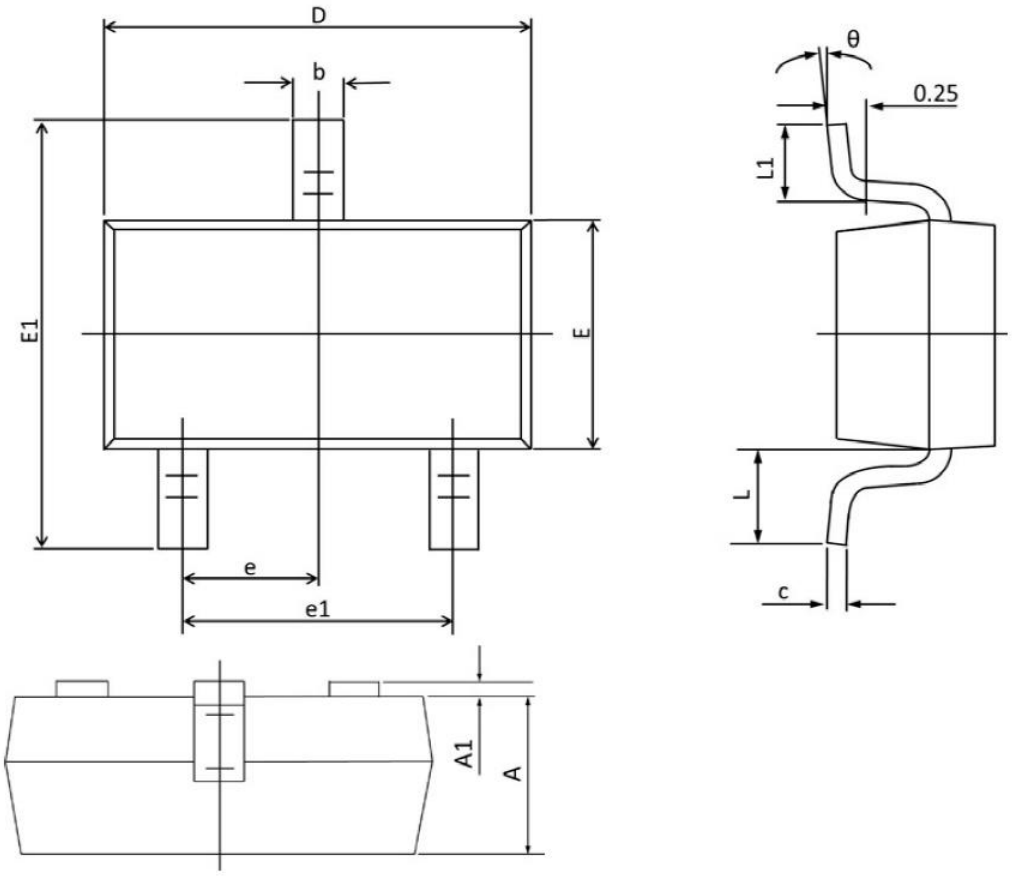


Figure 10. Gate Charge Test Circuit & Waveform

Package Outline Dimensions SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°