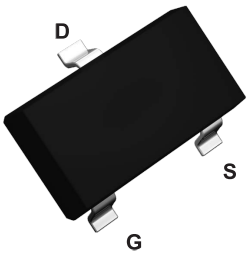
GOOD-ARK SEMICONDUCTOR

GSFC0609M

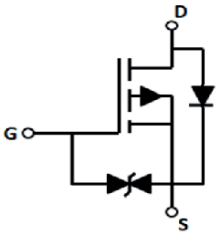
60V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-60V
$R_{DS(ON)}$	5.9Ω (Max)
I_D	-0.20A



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

Description

The GSFC0609M 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	Max.	Unit
Drain-source Voltage		V_{DS}	-60	V
Gate-source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	-0.20	A
	T_A=70°C		-0.16	A
Pulsed Drain Current[1]		I_{DM}	-0.8	A
Total Power Dissipation @ T_A=25°C[2]		P_D	357	mW
Thermal Resistance Junction-to-Ambient[2]		$R_{\theta JA}$	350	°C/W
Junction and Storage Temperature Range		T_J/T_{STG}	-55 to +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V, T_C=25°C	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1	-	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-0.5A	-	4.9	5.9	Ω
		V_{GS}=-4.5V, I_D=-0.25A	-	5.3	6.9	
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-25V, V_{GS}=0V, F=1MHz	-	23.5	-	pF
Output Capacitance	C_{oss}		-	10.6	-	
Reverse Transfer Capacitance	C_{rss}		-	4.9	-	
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-30V, I_D=-0.2A	-	0.75	-	nC
Gate Source Charge	Q_{gs}		-	0.15	-	
Gate Drain Charge	Q_{gd}		-	0.11	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=-10V, V_{DD}=-30V, I_D=-0.2A, R_{GEN}=3Ω	-	2.1	-	nS
Turn-on Rise Time	t_r		-	2.41	-	
Turn-off Delay Time	$t_{d(off)}$		-	29.9	-	
Turn-off Fall Time	t_f		-	16.3	-	
Source-Drain Ratings and Characteristics						
Diode Forward Voltage	V_{SD}	I_S=-0.2A, V_{GS}=0V	-	-0.9	-1.2	V
Maximum Body-Diode Continuous Current	I_S	-	-	-	-0.2	A

Note:

1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. With 2oz Copper, t≤10s.

Typical Electrical and Thermal Characteristic Curves

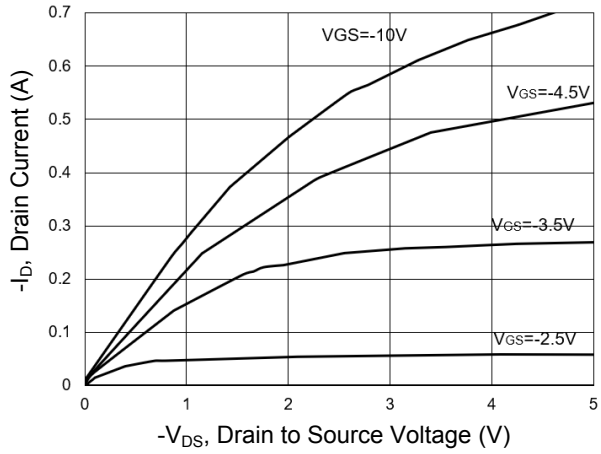


Figure 1. Output Characteristics

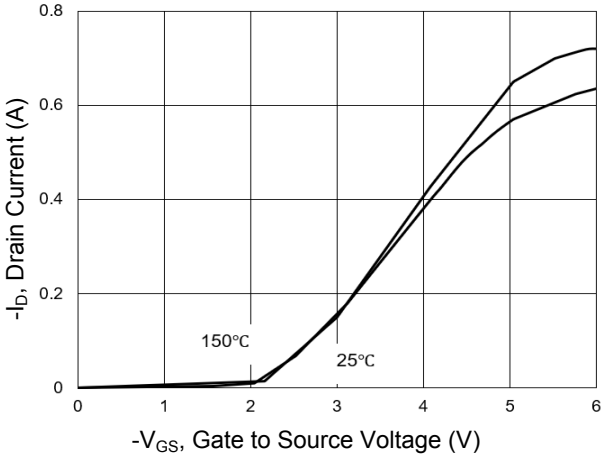


Figure 2. Transfer Characteristics

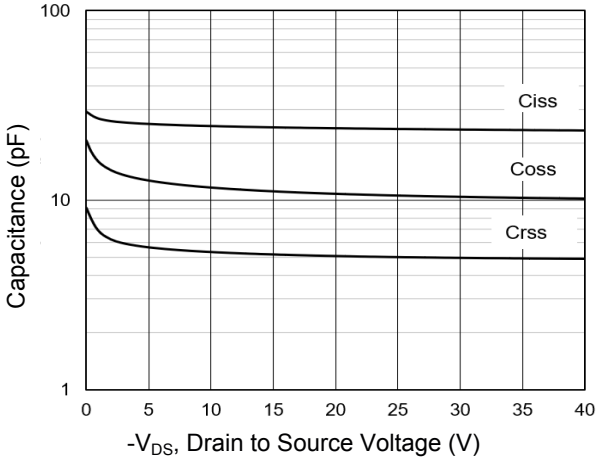


Figure 3. Capacitance Characteristics

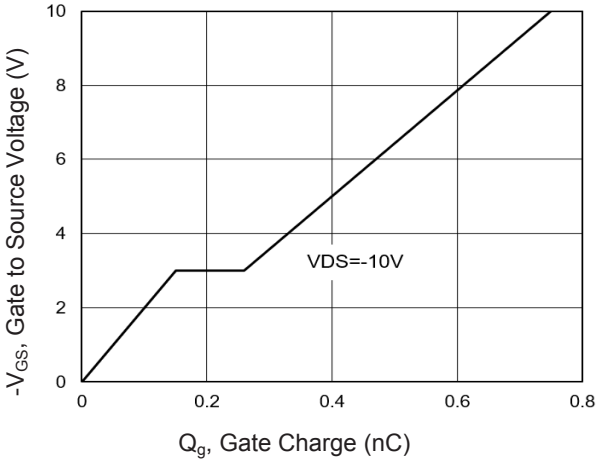


Figure 4. Gate Charge

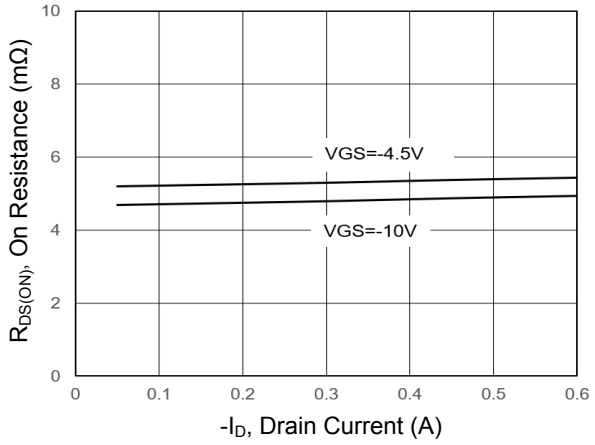


Figure 5. Drain to Source on Resistance

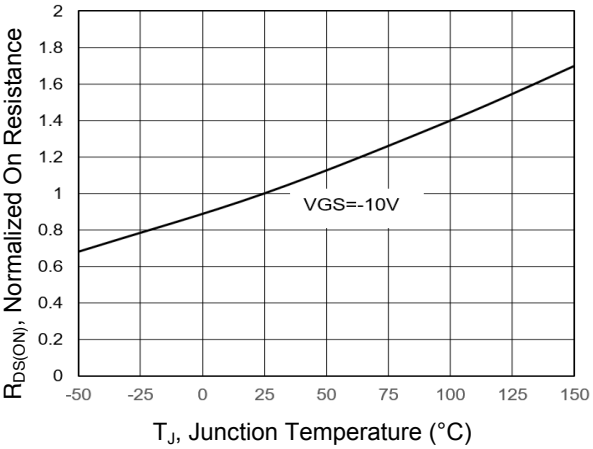


Figure 6. Normalized $R_{DS(ON)}$ vs. T_J

Typical Electrical and Thermal Characteristic Curves

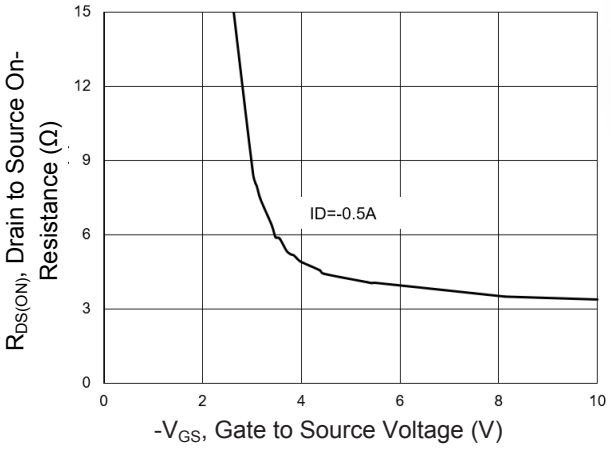


Figure 7. Typical Drain to Source ON Resistance vs. Gate Voltage and Drain Current

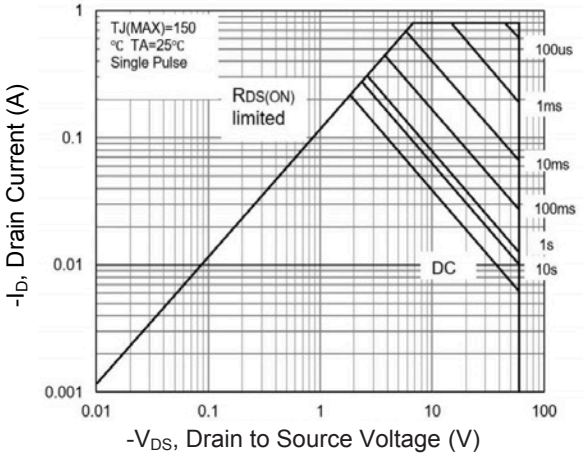


Figure 8. Safe Operation Area

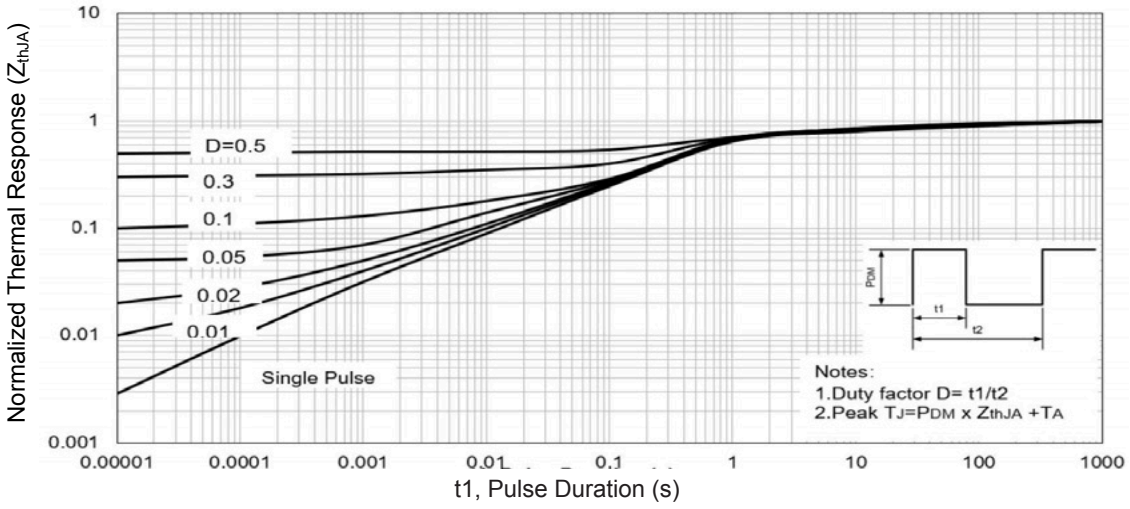
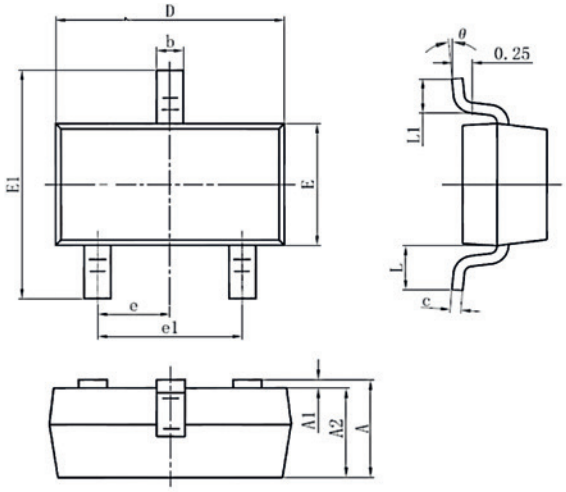


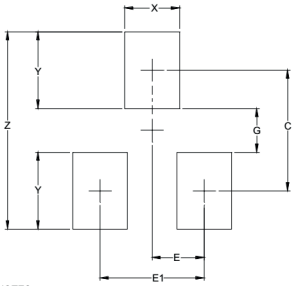
Figure 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.95TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.55REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°

Recommended Pad Layout



Symbol	Dimensions	
	Inches	Millimeters
C	0.087	2.20
E	0.037	0.95
E1	0.075	1.90
G	0.031	0.80
X	0.039	1.00
Y	0.055	1.40
Z	0.141	3.60

Order Information

Device	Package	Marking	Packaging	SPQ
GSFC0609M	SOT-23	9M* (*varied by lots)	Tape & Reel	3,000pcs / Reel