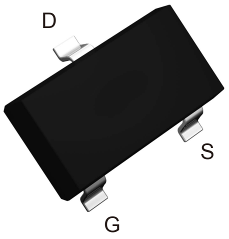
GSFC6002M

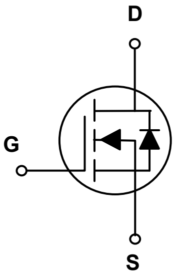
60V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	2.0Ω (Max.)
I_D	0.34A



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 GSFC6002M 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}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	0.34	A
Drain Current-Continuous (T=70°C)		0.28	
Pulsed Drain Current[1]	I_{DM}	1.36	A
Maximum Power Dissipation	P_D	920	mW
Thermal Resistance, Junction-to-Ambient[2]	$R_{\theta JA}$	310	°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	Condition	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	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±5V, V_{DS}=0V	-	-	100	nA
		V_{GS}=±10V, V_{DS}=0V	-	-	100	nA
		V_{GS}=±20V, V_{DS}=0V	-	-	100	nA
Gate-Source Breakdown Voltage	BV_{GSO}	V_{DS}=0V, I_G=±250uA	±20	-	-	V
Gate Threshold Voltage[3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.7	1.1	1.5	V
Drain-Source On-State Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.3A	-	0.85	2	Ω
		V_{GS}=4.5V, I_D=0.2A	-	1.0	3.6	
Forward Transconductance[3]	gfs	V_{DS}=10V, I_D=0.2A	0.09	-	-	S
Dynamic and Switching Characteristics						
Input Capacitance[4]	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1.0MHz	-	30	-	pF
Output Capacitance[4]	C_{oss}		-	6.1	-	
Reverse Transfer Capacitance[4]	C_{rss}		-	3.1	-	
Turn-On Delay Time[4]	$t_{d(on)}$	V_{DD}=30V, V_{GS}=10V, R_{GEN}=6Ω, I_D=0.3A	-	4.0	-	nS
Rise Time[4]	t_r		-	2.7	-	
Turn-Off Delay Time[4]	$t_{d(off)}$		-	9.4	-	
Fall Time[4]	t_f		-	33	-	
Total Gate Charge[4]	Q_g	V_{DS}=10V, I_D=0.3A, V_{GS}=10V	-	1.6	-	nC
Gate to Source Charge[4]	Q_{gs}		-	0.3	-	
Gate to Drain Charge[4]	Q_{gd}		-	0.45	-	
Drain-Source Ratings and Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V, I_S=0.2A	-	-	1.3	V
Reverse Recovery Time	t_{rr}	I_F=0.5A, dI/dt=100A/us, V_R=10V	-	8.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	3.2	-	nC

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Surface mounted on FR4 board, t ≤10 sec.
3. Pulse test: pulse width ≤300uS, duty cycle ≤2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristic Curves

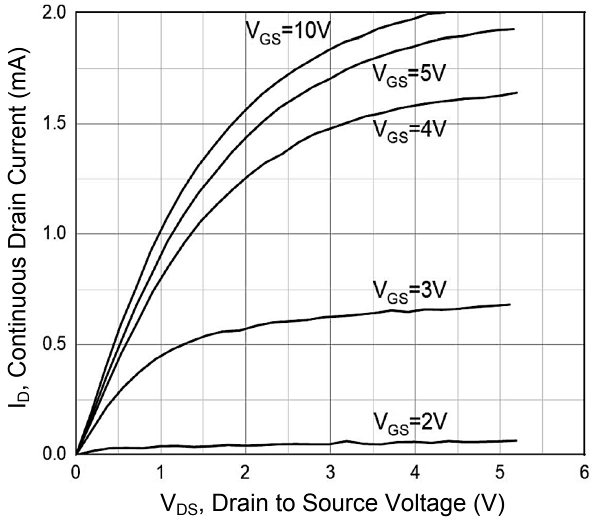


Figure 1. Typical Output Characteristics

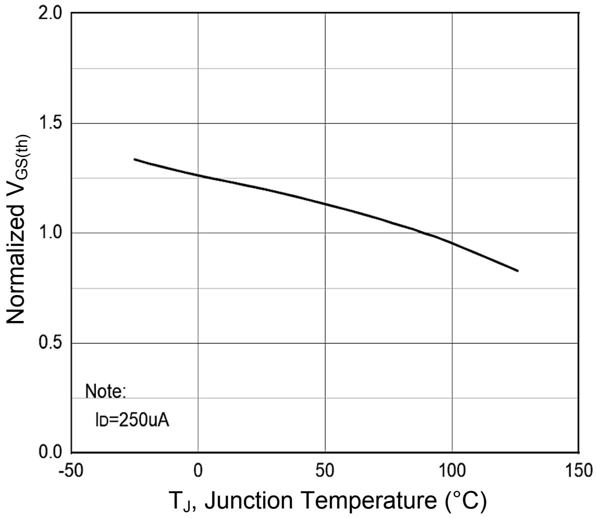


Figure 2. Normalized $V_{GS(th)}$ vs. T_J

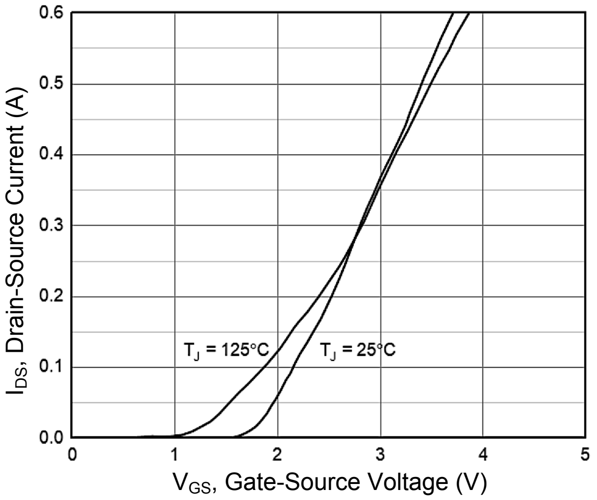


Figure 3. Typical Transfer Characteristics

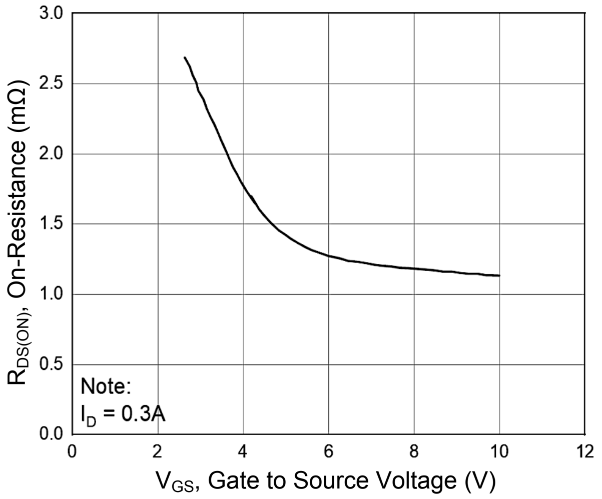


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

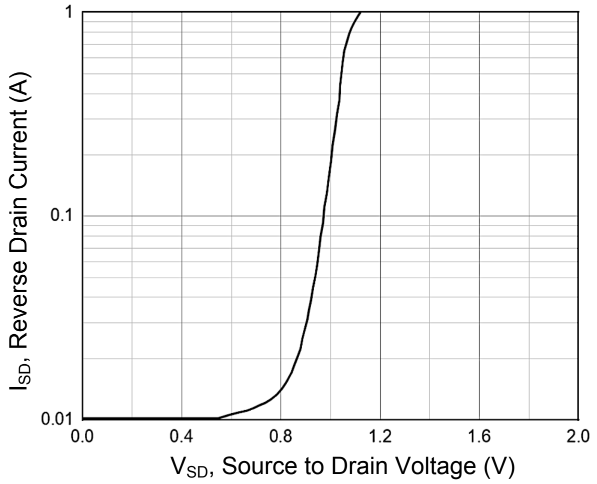


Figure 5. Typical Source-Drain Diode Forward Voltage

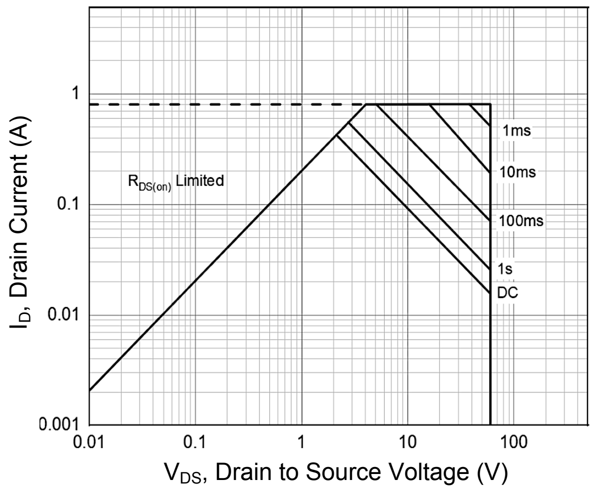


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

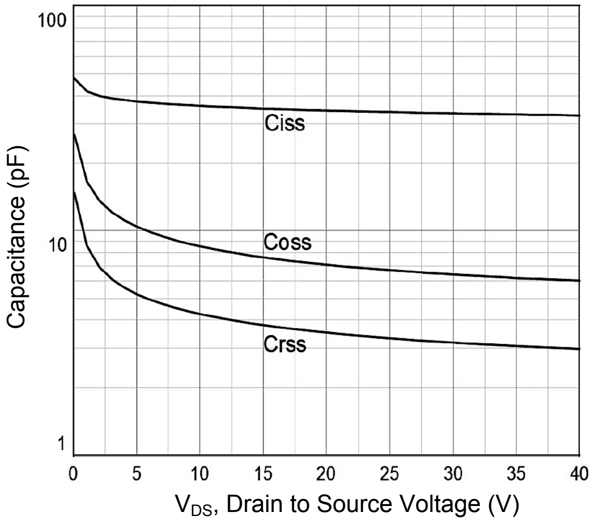


Figure 7. Capacitance Characteristics

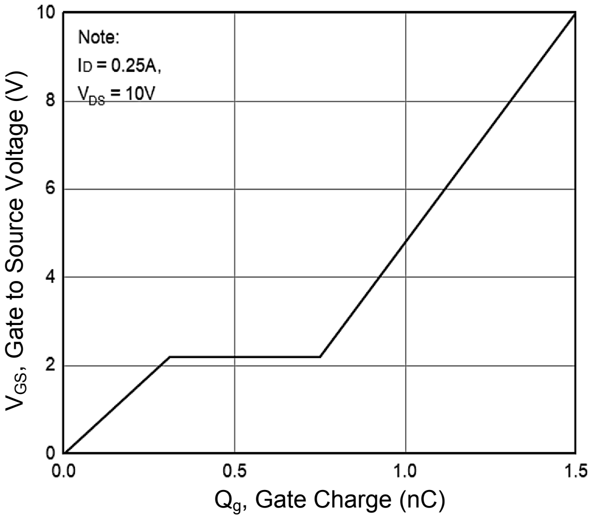
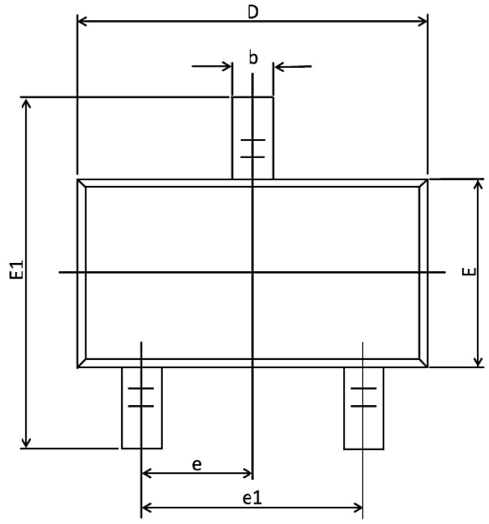
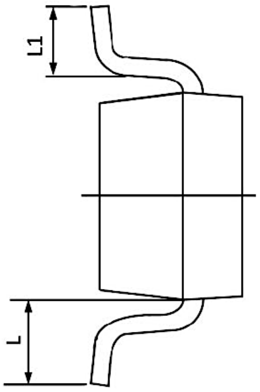
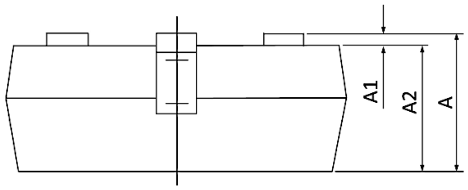


Figure 8. Gate Charge Characteristics

Package Outline Dimensions (SOT-23)







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.047
A1	0.000	0.100	0.000	0.004
A2	0.900	1.150	0.035	0.045
b	0.300	0.500	0.012	0.020
D	2.800	3.040	0.110	0.120
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

Order Information

Device	Package	Marking	Packaging	SPQ
GSFC6002M	SOT-23	.6sC	Tape & Reel	3,000 Pcs / Reel

For more information, please contact us at: inquiry@goodarksemi.com