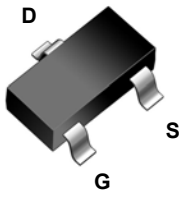
GOOD-ARK SEMICONDUCTOR

GSFCR0600

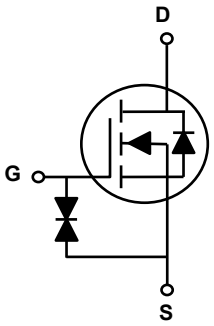
60V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	2.4Ω@10V(Max.)
	2.6Ω@4.5V(Max.)
I_D	0.32A



SOT-323



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 GSFCR0600 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 supply 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-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_A=25°C)	I_D	0.32	A
Continuous Drain Current (T_A=70°C)		0.25	A
Pulsed Drain Current, (T_A=25°C)[1]	I_{DM}	1.12	A
Power Dissipation (T_A=25°C)	P_D	0.44	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	350	°C/W
Operating Junction Temperature Range	T_J	-50 to +150	°C
Storage Temperature Range	T_{STG}	-50 to +150	°C

Electrical Characteristics (T_J=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	60	-	-	V
Zero Gate Voltage Drain Current (T_A=25°C)	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
Zero Gate Voltage Drain Current (T_A=125°C)		V_{DS}=40V, V_{GS}=0V	-	-	100	
Gate Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±10	μA
Drain-Source On-State Resistance[2]	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.22A	-	-	2.4	Ω
		V_{GS}=4.5V, I_D=0.22A	-	-	2.6	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.8	-	1.5	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	30	-	pF
Output Capacitance	C_{oss}		-	6.1	-	
Reverse Transfer Capacitance	C_{rss}		-	3.1	-	
Total Gate Charge	Q_g	I_D=0.25A, V_{DS}=10V, V_{GS}=10V	-	1.5	-	nC
Gate Source Charge	Q_{gs}		-	0.31	-	
Gate Drain Charge	Q_{gd}		-	0.44	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD}=30V, R_G=3.3Ω, I_D=0.3A	-	4	-	nS
Rise Time	t_r		-	2.7	-	
Turn-Off Delay Time	$t_{d(off)}$		-	9.4	-	
Fall Time	t_f		-	33	-	
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_{SD}	T_A=25°C	-	-	0.32	A
Diode Forward Voltage[2]	V_{SD}	I_{SD}=0.2A, V_{GS}=0V, T_J=25°C	-	0.9	1.3	V
Reverse Recovery Time	T_{rr}	I_F=0.5A, di/dt=100A/μs, V_R=10V	-	8.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	3.2	-	nC

Notes:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. Pulse test: Pulse width ≤300us, duty cycle ≤2%.

Typical Electrical and Thermal Characteristic Curves

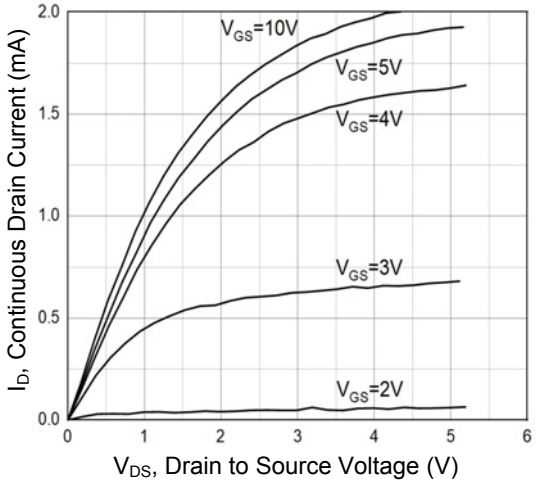


Figure 1. Typical Output Characteristics

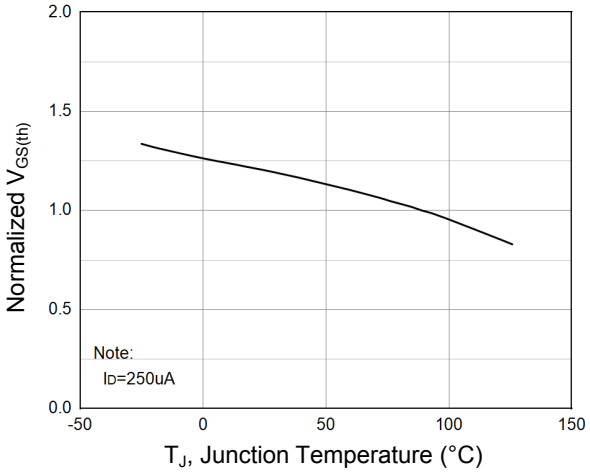


Figure 2. Normalized Threshold Voltage vs. T_J

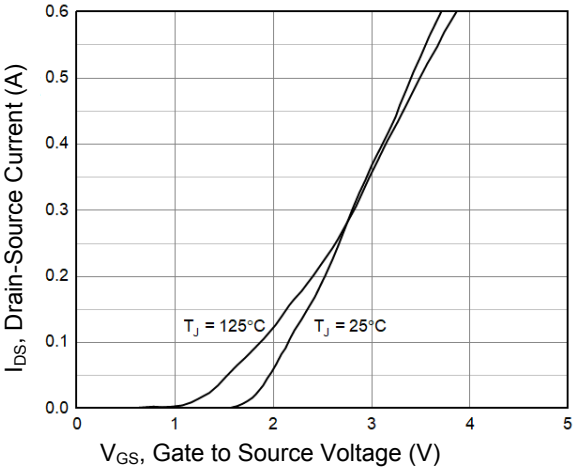


Figure 3. Typical Transfer Characteristics

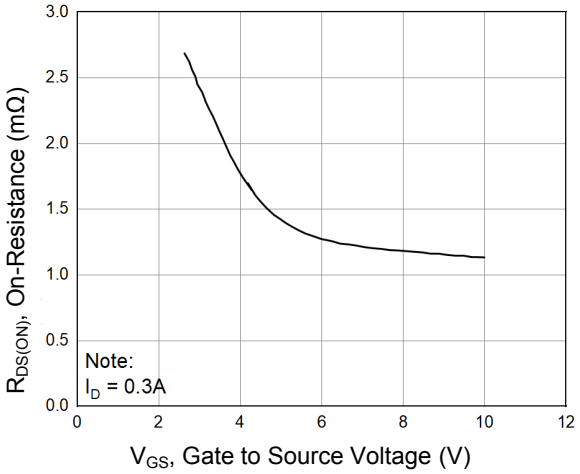


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

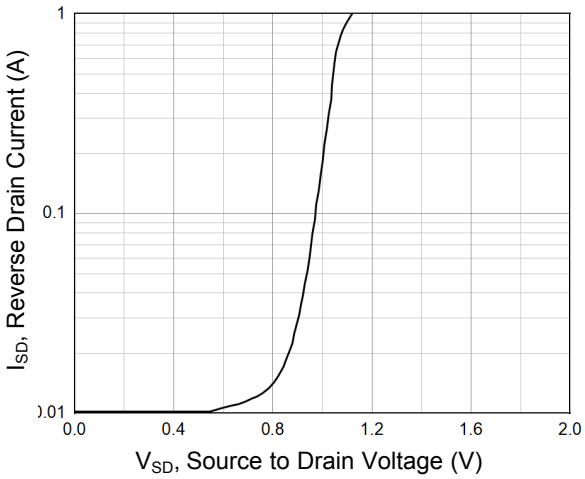


Figure 5. Typical Source - Drain Diode Forward Voltage

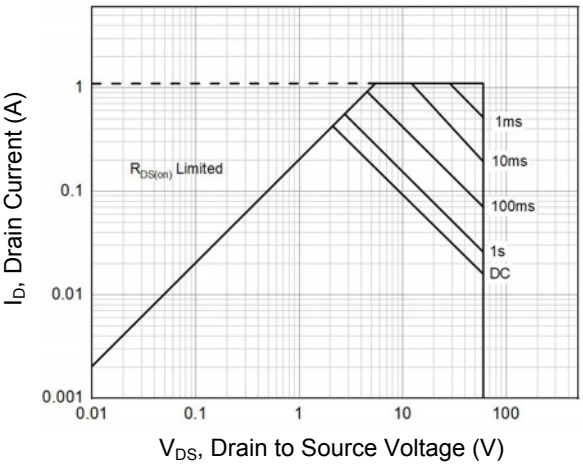


Figure 6. Maximum Safe Operating Area

Typical Electrical and Thermal Characteristic Curves

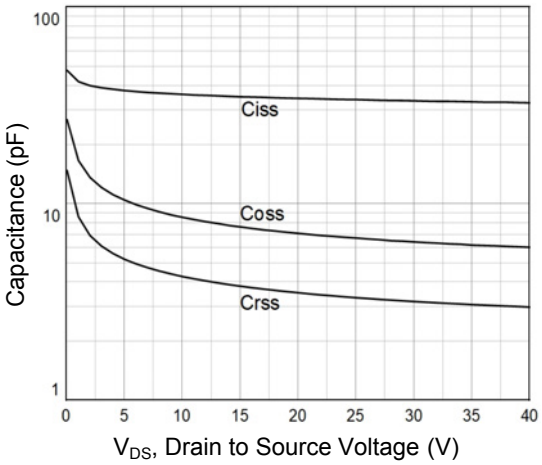


Figure 7. Capacitance Characteristics

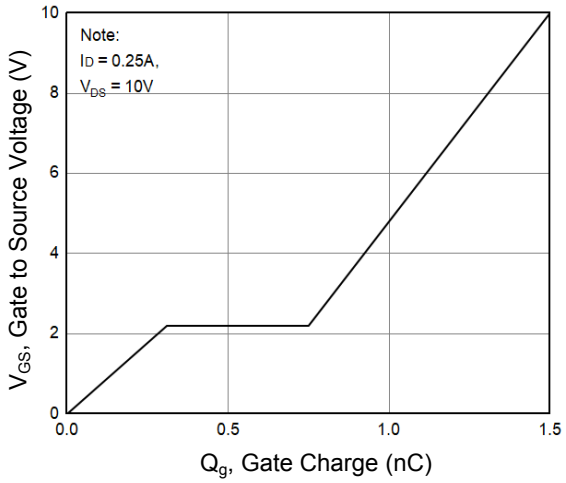


Figure 8. Gate Charge Characteristics

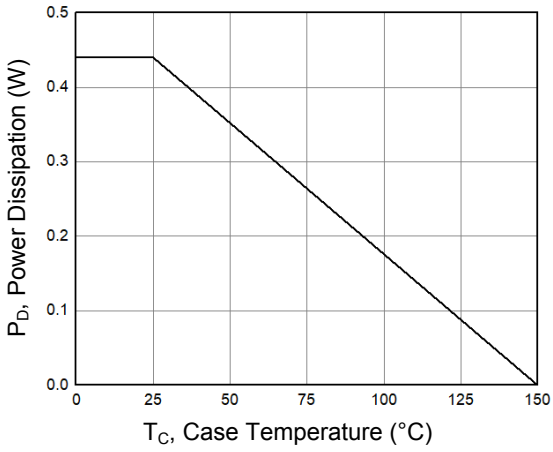


Figure 9. Power Dissipation vs. Case Temperature

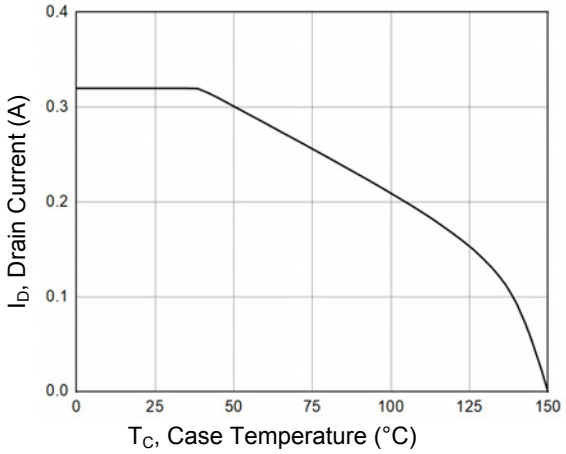
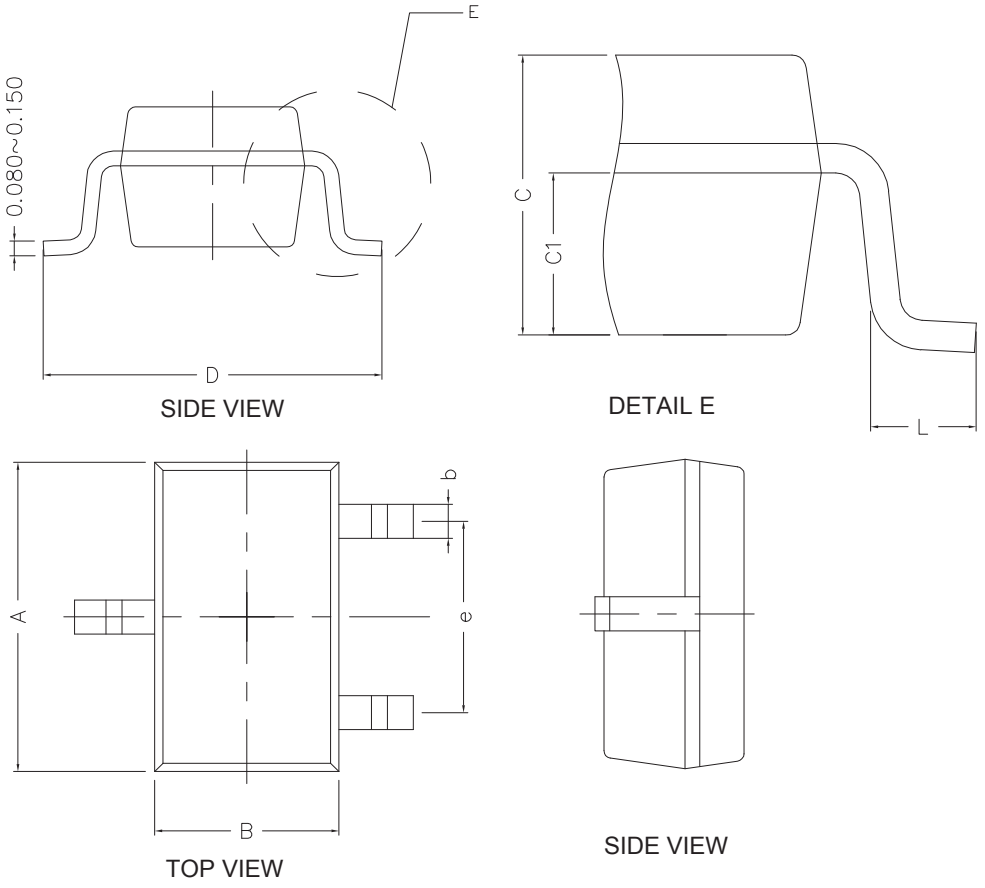


Figure 10. Drain Current vs. Case Temperature

Package Outline Dimensions (SOT-323)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.00	2.20	0.079	0.087
B	1.15	1.35	0.045	0.053
C	0.90	1.00	0.035	0.039
C1	0.50	0.60	0.020	0.024
D	2.10	2.50	0.083	0.098
L	0.22	0.50	0.009	0.020
b	0.20	0.40	0.008	0.016
e	1.30 TYP		0.051 TYP	

Order Information

Device	Package	Marking	Carrier	Quantity
GSFCR0600	SOT-323	W138	Tape & Reel	3,000 Pcs / Reel