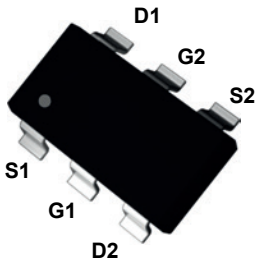
GSFJ138A

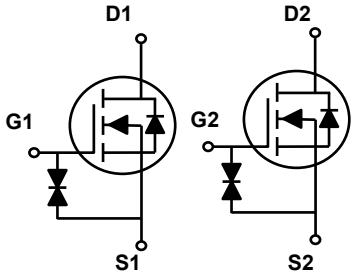
60V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	60V
$R_{DS(ON)}$	3Ω @10V (Max.)
	4.6Ω @4.5V (Max.)
I_D	0.20A



SOT-563



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 GSFJ138A 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
Drain Current-Continuous (T_A=25°C)	I_D	0.20	A
Drain Current-Continuous (T_A=70°C)		0.14	
Drain Current-Pulsed (T_A=25°C)[1]	I_{DM}	0.8	A
Power Dissipation (T_A=25°C)	P_D	0.26	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	500	°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-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V, T_A=25°C	-	-	1	uA
		V_{DS}=48V, V_{GS}=0V, T_A=125°C	-	-	100	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	0.6	-	1.5	V
Drain-Source On-State Resistance[2]	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.16A	-	-	3.0	Ω
		V_{GS}=4.5V, I_D=0.14A	-	-	4.6	Ω
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=10V, V_{GS}=10V, I_D=0.25A	-	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_{DD}=30V, V_{GS}=10V, R_G=3.3Ω, I_D=0.3A	-	4.0	-	nS
Rise Time	t_r		-	2.7	-	
Turn-Off Delay Time	$t_{d(off)}$		-	9.4	-	
Fall Time	t_f		-	33	-	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	30	-	pF
Output Capacitance	C_{oss}		-	6.1	-	
Reverse Transfer Capacitance	C_{rss}		-	3.1	-	
Source-Drain Ratings and Characteristics						
Source Drain Current (Body Diode)	I_{SD}	T_A=25°C	-	-	0.20	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_{SD}=0.16A, T_J=25°C	-	0.88	1.3	V
Reverse Recovery Time	T_{rr}	I_F=0.5A, V_R=10V, dI/dt=100A/us	-	8.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	3.2	-	nC

Notes:

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

Typical Electrical and Thermal Characteristic Curves

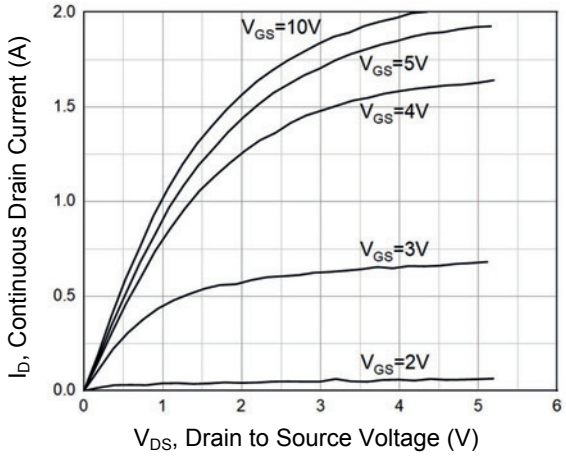


Figure 1. Typical Output Characteristics

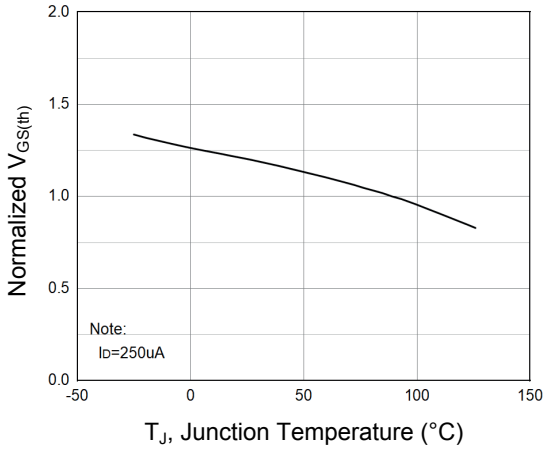


Figure 2. Normalized Threshold Voltage vs. T_J

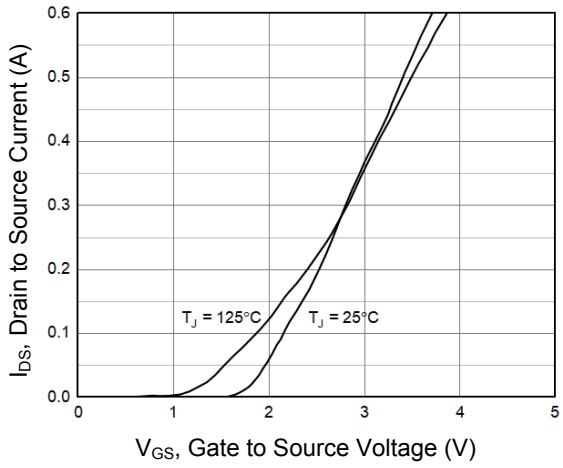


Figure 3. Typical Transfer Characteristics

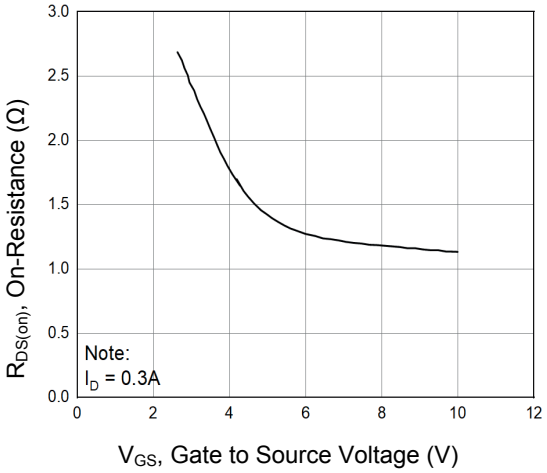


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

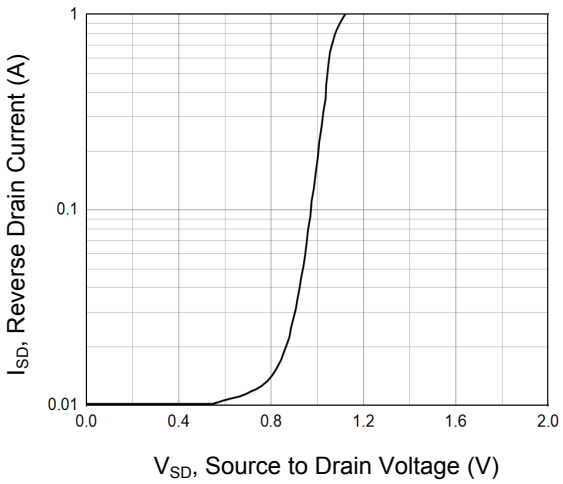


Figure 5. Typical Source-Drain Diode Forward Voltage

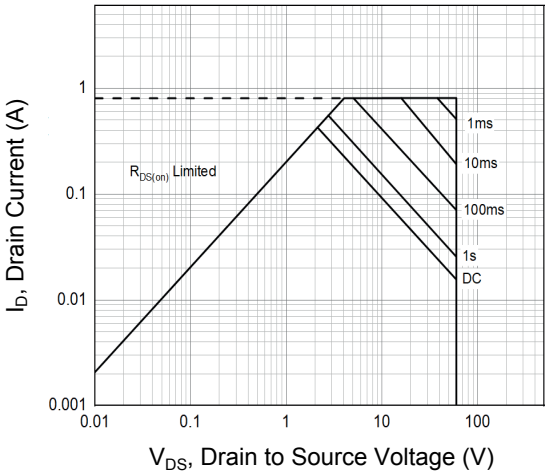


Figure 6. Maximum Safe Operating Area

Typical Electrical and Thermal Characteristic Curves

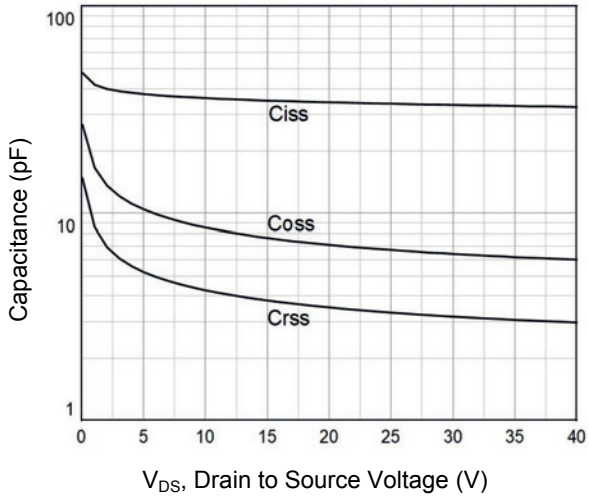


Figure 7. Capacitance Characteristics

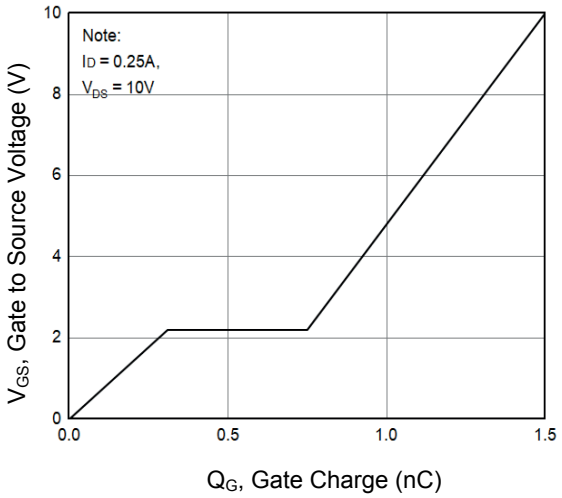


Figure 8. Gate Charge Characteristics

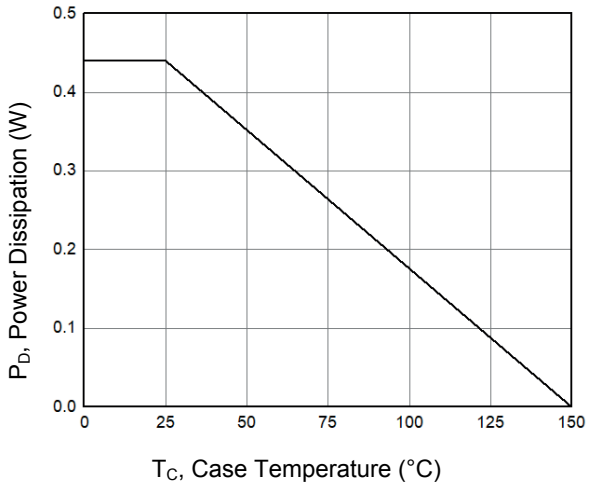


Figure 9. Power Dissipation vs. T_C

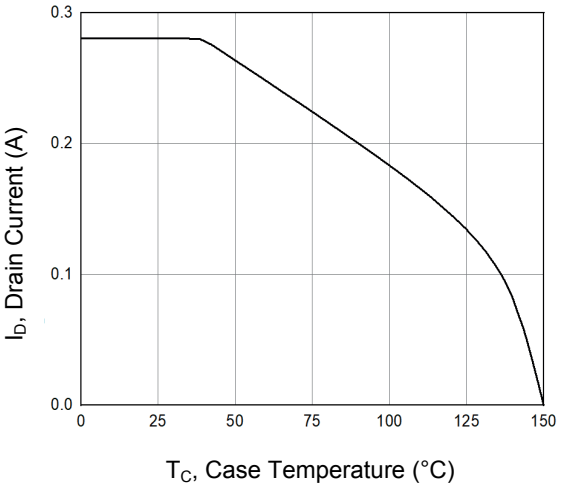
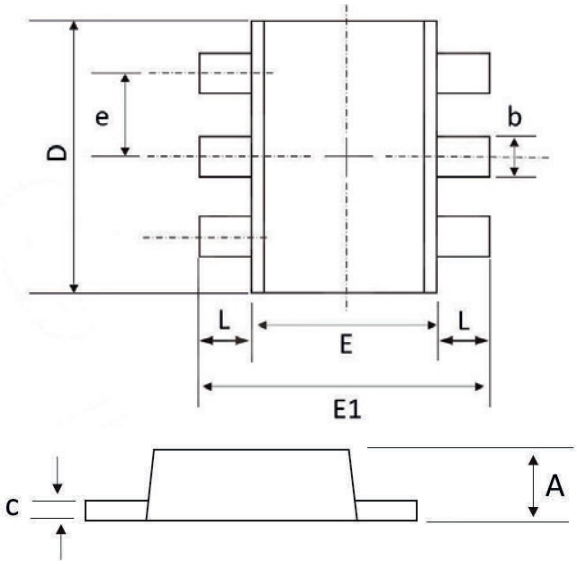


Figure 10. Drain Current vs. T_C

Package Outline Dimensions (SOT-563)



Symbol	Dimensions in Milimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.500	0.600	0.020	0.024
b	0.150	0.300	0.006	0.012
c	0.100	0.180	0.004	0.007
D	1.500	1.700	0.059	0.067
E	1.100	1.250	0.043	0.049
E1	1.550	1.700	0.061	0.067
e	0.500 BSC		0.020 BSC	
L	0.100	0.300	0.004	0.012

Order Information

Device	Package	Marking	Carrier	Quantity
GSFJ138A	SOT-563	L138	Tape & Reel	3,000pcs / Reel