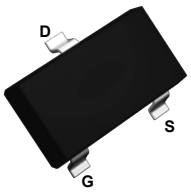
GOOD-ARK SEMICONDUCTOR

GSFC13110

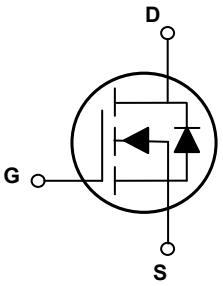
100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	102mΩ (Typ.)
I_D	2.1A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Low on-resistance and low gate charge.
- Featuring low switching and drive losses.
- Fast switching and reverse body recovery.
- High ruggedness and robustness.

Description

The GSFC13110 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	Parameter	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_A=25°C)[1]	I_D	2.1	A
Continuous Drain Current, @ Steady-State (T_A=100°C)		1.3	A
Pulsed Drain Current[2]	I_{DM}	8	A
Power Dissipation (T_A=25°C)	P_D	1.3	W
Linear Derating Factor (T_A=25°C)		0.011	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	11	mJ
Junction-to-Case	$R_{\theta JC}$	50	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	95	°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	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=1.5A	-	102	130	mΩ
		V_{GS}=4.5V, I_D=1A	-	132	176	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.1	1.7	2.7	V
Forward Transconductance	gfs	V_{DS}=5V, I_D=5A	-	5.3	-	S
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=50V, I_D=5A, V_{GS}=10V	-	20	-	nC
Gate-Source Charge	Q_{gs}		-	3	-	
Gate-Drain ("Miller") Charge	Q_{gd}		-	4	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=50V, R_L=10Ω, V_{GS}=10V, R_{GEN}=3Ω	-	6	-	nS
Rise Time	t_r		-	7	-	
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	
Fall Time	t_f		-	3	-	
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, F=1MHz	-	164	-	pF
Output Capacitance	C_{oss}		-	65	-	
Reverse Transfer Capacitance	C_{rss}		-	8.1	-	
Gate Resistance	R_g	F=1MHz	-	2.6	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	2.1	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	8	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A	-	1	1.3	V
Reverse Recovery Time	t_{rr}	I_S=5A, V_{GS}=0V, dI_F/dt=100A/us	-	22	-	nS
Reverse Recovery Charge	Q_{rr}		-	30	-	nC

Notes:

1. Pulse test: Pulse width≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, R_G=25Ω, V_{DD}=80V, I_{AS}=6.5A,T_J=25°C.
4. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

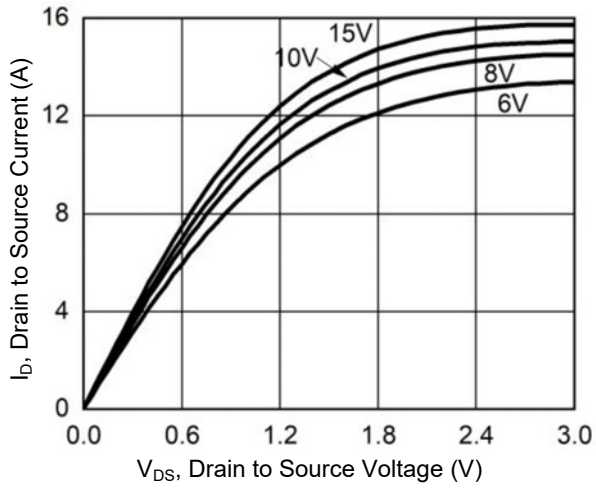


Figure 1. Typical Output Characteristics

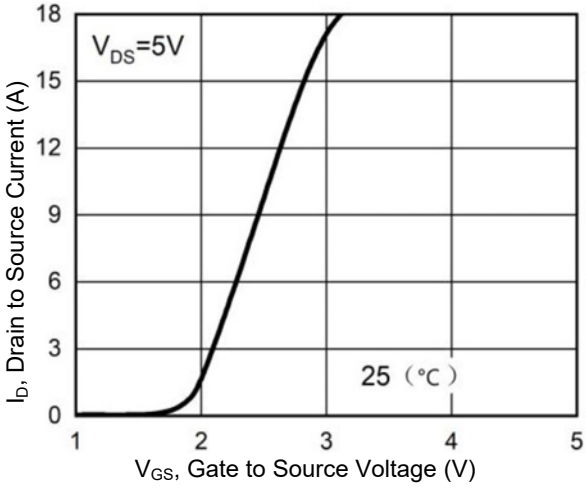


Figure 2. Transfer Characteristics

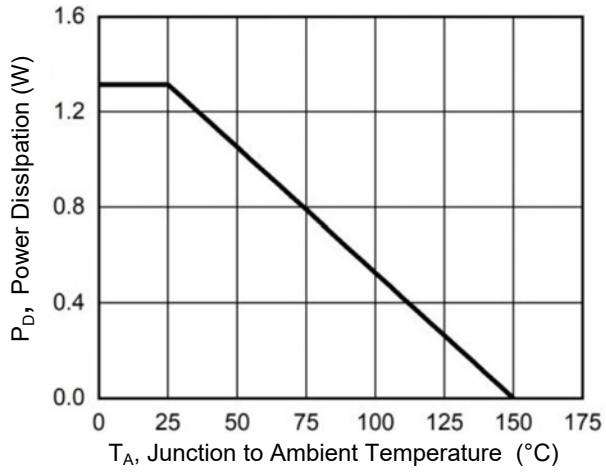


Figure 3. P_D vs. T_A

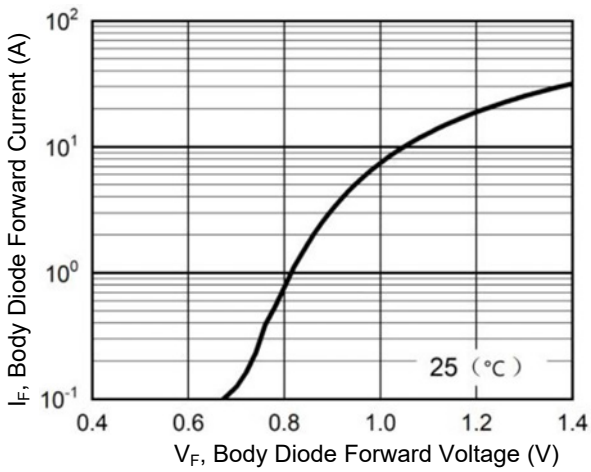


Figure 4. Body Diode Characteristic

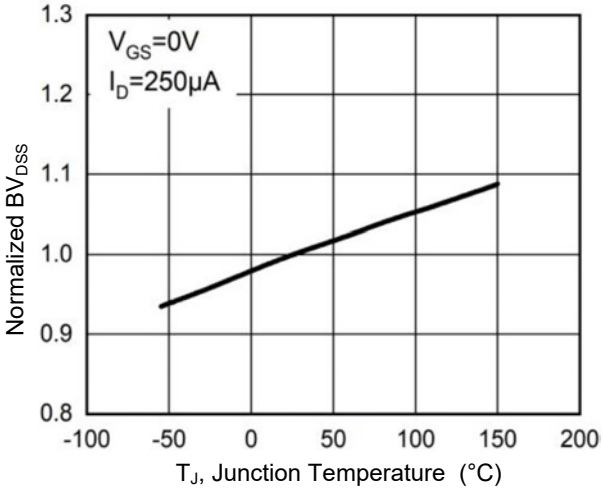


Figure 5. Normalized BVdss vs. T_J

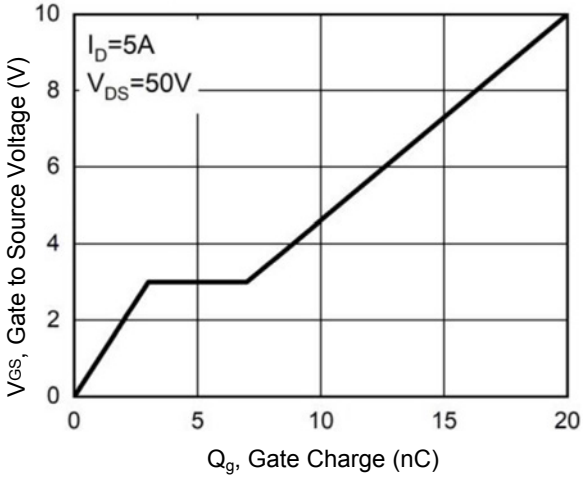


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

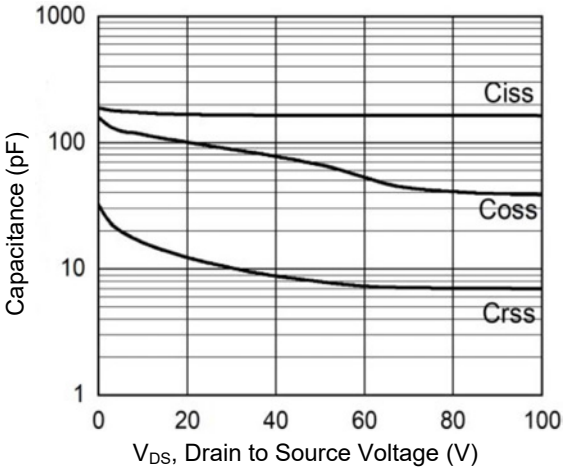


Figure 7. Capacitance Characteristic

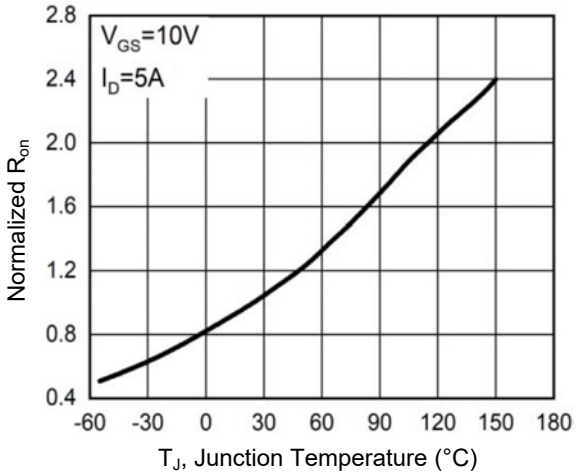
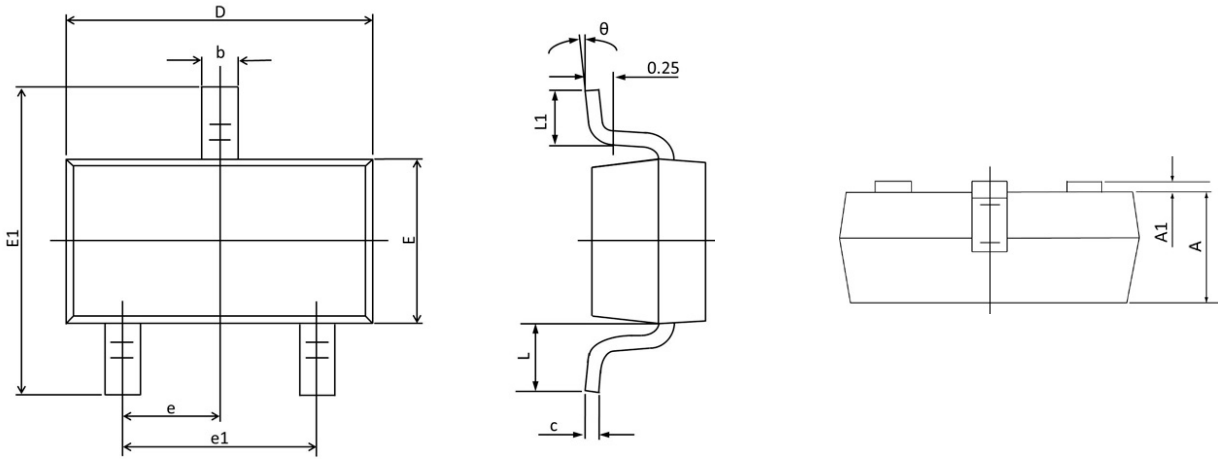


Figure 8. Normalized Rdson vs.T_J

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	0.004	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°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFC13110	SOT-23	C13110	Tape & Reel	3,000 pcs / Reel