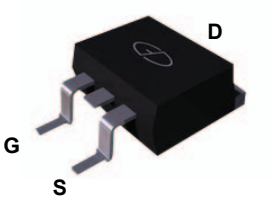
GOOD-ARK SEMICONDUCTOR

GSFT3R110

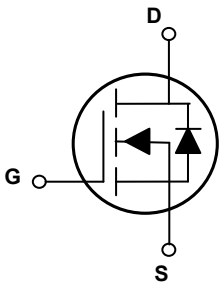
100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	3.1mΩ (max.)
I_D	180A



TO-263 (D^2PAK)



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 GSFT3R110 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_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous, at Steady-State, (T_C=25°C)[1]	I_D	180	A
Drain Current-Continuous, at Steady-State, (T_C=100°C)		128	
Drain Current-Pulsed[2]	I_{DM}	720	A
Single Pulse Avalanche Energy[3]	E_{AS}	961	mJ
Power Dissipation (T_C=25°C)	P_D	224	W
Linear Derating Factor (T_C=25°C)		1.8	W/°C
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.56	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_C=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	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	20	
Gate-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=90A	-	2.4	3.1	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	2.1	3	3.9	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=50V, I_D=90A, V_{GS}=10V	-	165	-	nC
Gate-Source Charge	Q_{gs}		-	61	-	
Gate-Drain ("Miller") Charge	Q_{gd}		-	40	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=50V, R_{GEN}=3Ω, V_{GS}=10V, I_D=90A	-	33	-	nS
Rise Time	t_r		-	46	-	
Turn-Off Delay Time	$t_{d(off)}$		-	119	-	
Fall Time	t_f		-	44	-	
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, F=1MHz	-	10430	-	pF
Output Capacitance	C_{oss}		-	1263	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Gate Resistance	R_g	F=1MHz	-	2.2	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	180	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	720	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=90A	-	1	1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=90A, di/dt=100A/μs	-	85	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.26	-	uc

Note:

1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating: Pulsed width limited by maximum junction temperature.
3. L=0.5mH, V_{DD}=80V, I_{AS}=62A, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

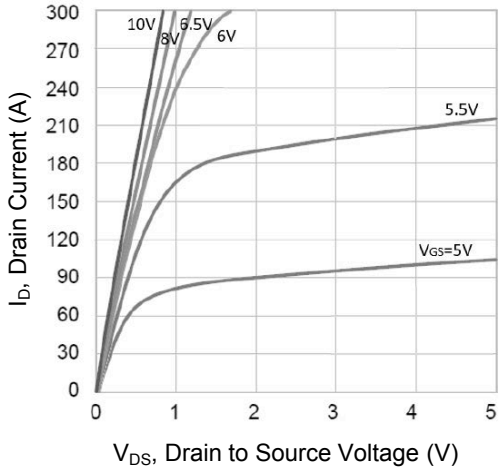


Figure 1. Typical Output Characteristics

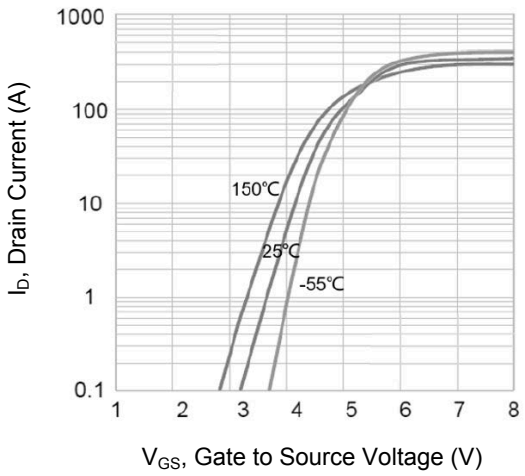


Figure 2. Typical Transfer Characteristics

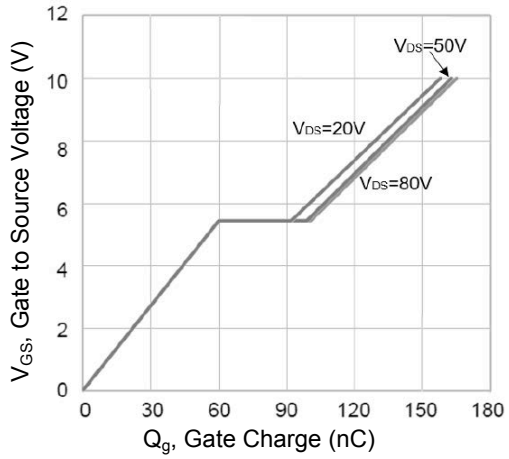


Figure 3. Gate Charge Characteristics

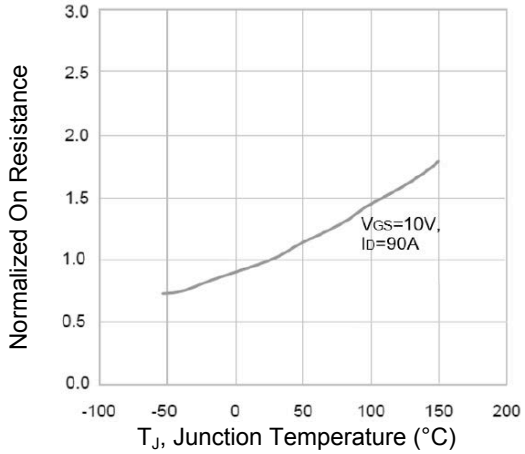


Figure 4. Normalized On-Resistance vs. Junction Temperature

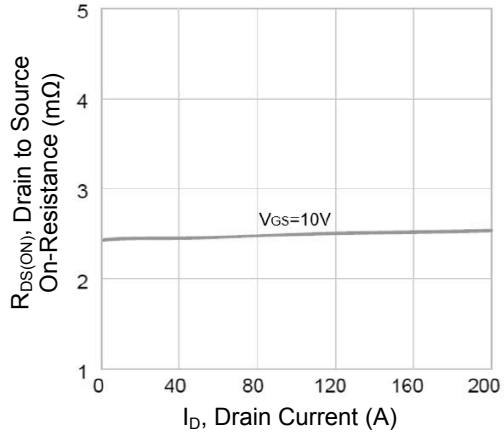


Figure 5. On Resistance vs. Drain Current

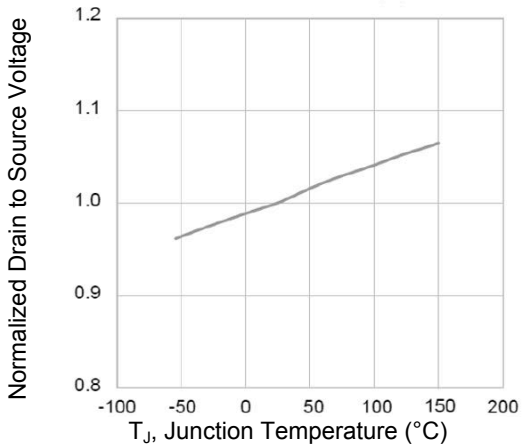


Figure 6. Normalized BV_{DSS} vs. Junction Temperature

Typical Electrical and Thermal Characteristic Curves

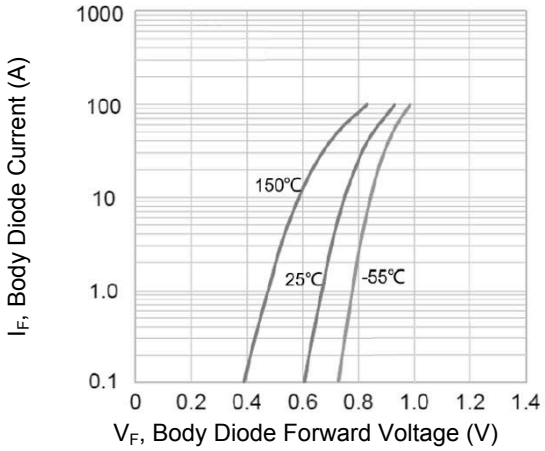


Figure 7. Body Diode Characteristics

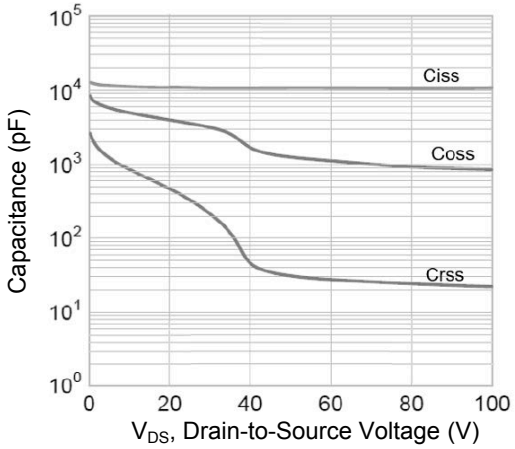


Figure 8. Transfer Characteristics

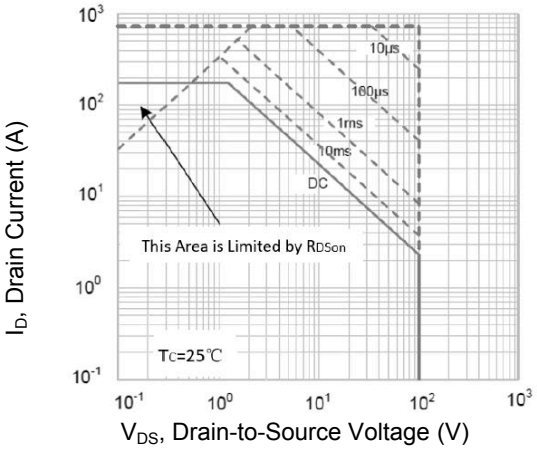
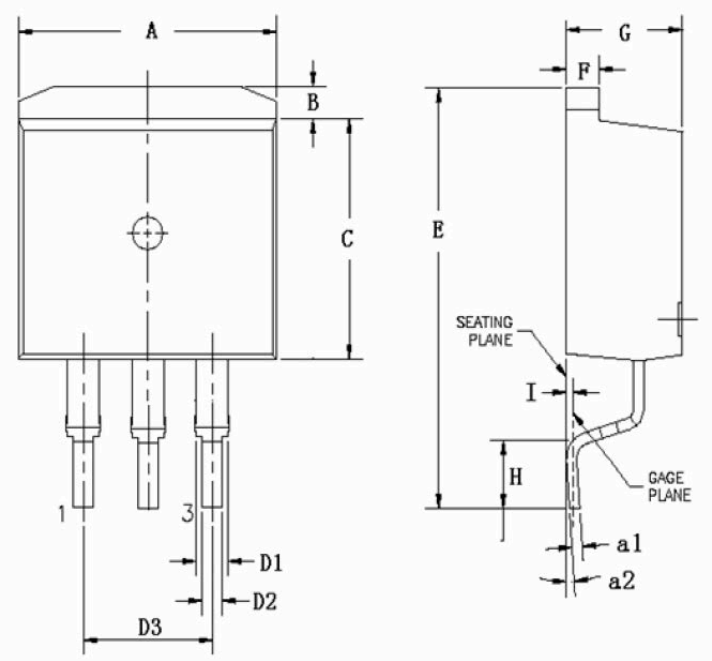


Figure 9. Safe Operation Area

Package Outline Dimensions TO-263 (D^2PAK)



Symbol	Dimesions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	9.660	10.280	0.380	0.405
B	1.020	1.320	0.040	0.052
C	8.590	9.400	0.339	0.370
D1	1.140	1.400	0.045	0.055
D2	0.700	0.900	0.028	0.037
D3	5.080 TYP		0.200 TYP	
E	15.090	15.390	0.594	0.606
F	1.150	1.400	0.045	0.055
I	0.250 TYP		0.010 TYP	
G	4.300	4.700	0.169	0.185
H	2.290	2.790	0.090	0.110
K	1.300	1.600	0.051	0.063
a1	0.450	0.650	0.018	0.026
a2	0°	8°	0°	8°