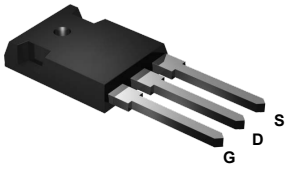
GOOD-ARK SEMICONDUCTOR

GSFA10200

100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	2.7mΩ (Max)
I_D	200A



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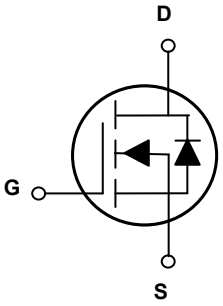

Schematic Diagram

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 GSFA10200 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 @ Steady-State (T_C=25°C)[1]	I_D	200	A
Drain Current-Continuous @ Steady-State (T_C=100°C)		142	
Drain Current-Pulsed[2]	I_{DM}	800	A
Single Pulse Avalanche Energy[3]	E_{AS}	961	mJ
Power Dissipation (T_C=25°C)	P_D	400	W
Linear Derating Factor		3.2	W/°C
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.32	°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	BV_{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	-	-	20	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=60A	-	2.1	2.7	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	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-to-Drain ("Miller") Charge	Q_{gd}		-	40	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=50V, R_G=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_{lss}	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	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	200	A
Pulsed Source Current	I_{SM}		-	-	800	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=60A	-	1	1.2	V
Reverse Recovery Time	t_{rr}	I_F=90A, di/dt=100A/μs, T_J=25°C	-	85	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.26	-	μC

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, starting 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

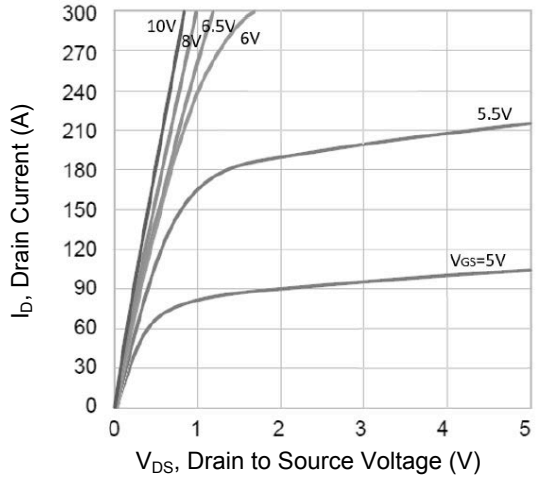

Figure 1. Output Characteristics

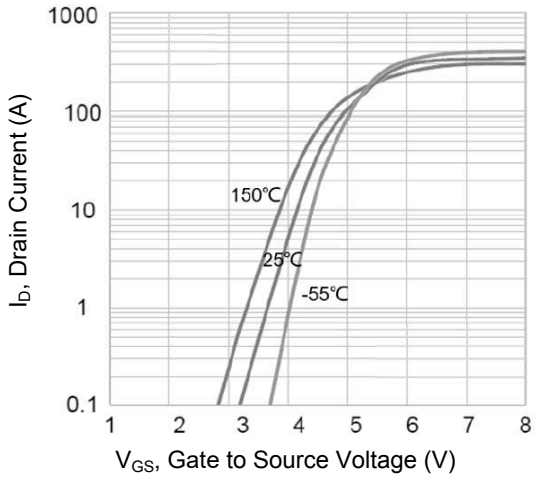

Figure 2. Transfer Characteristics

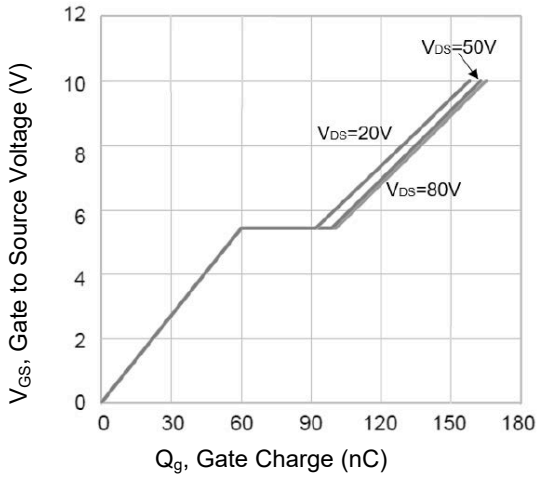

Figure 3. Gate Charge

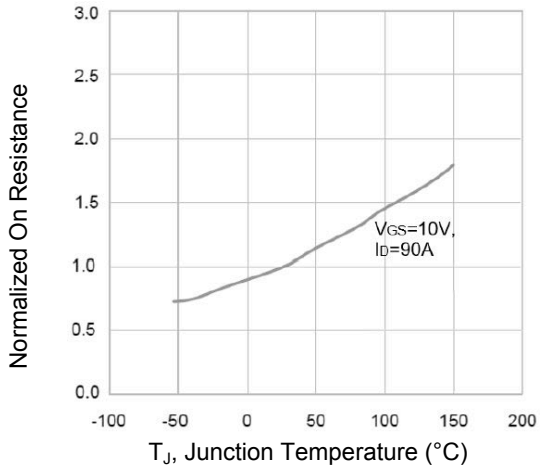

Figure 4. Normalized $R_{DS(ON)}$ vs. Junction Temperature

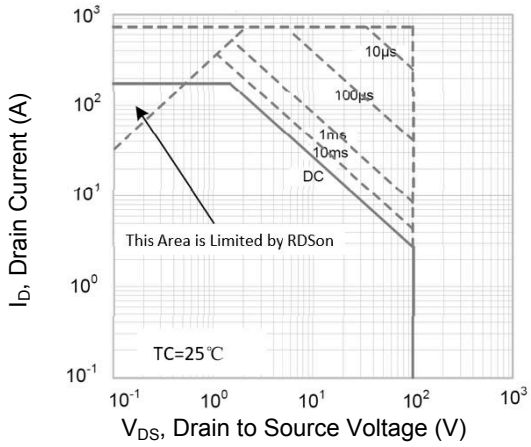

Figure 5. Safe Operation Area

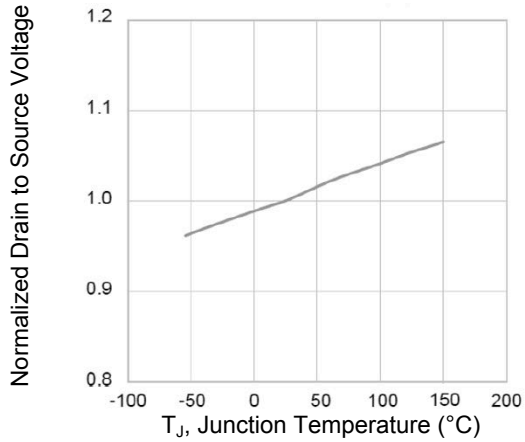

Figure 6. Normalized BV_{DSS} vs. Junction Temperature

Typical Electrical and Thermal Characteristic Curves

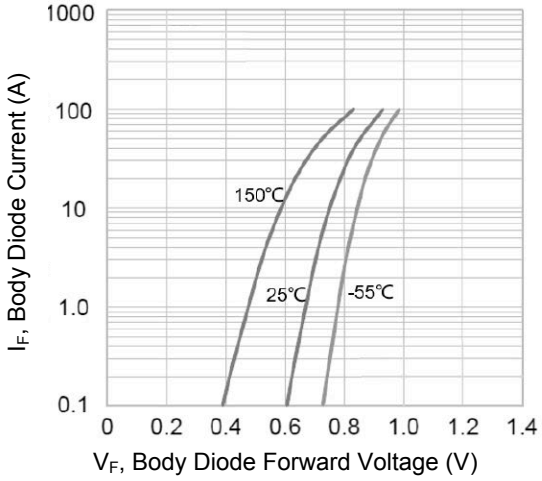

Figure 7. Body Diode Characteristics

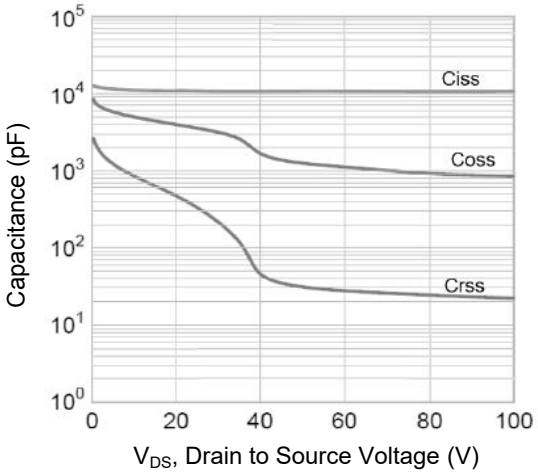

Figure 8. Capacitance Characteristics

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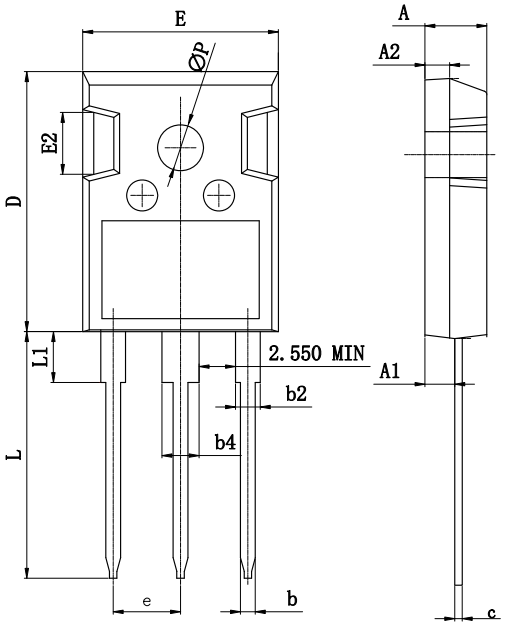
Package Outline Dimensions (TO-247)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.75	5.20	0.187	0.205
A1	2.21	2.65	0.087	0.104
A2	1.85	2.15	0.073	0.085
b	1.00	1.36	0.039	0.054
b2	1.80	2.25	0.071	0.089
b4	2.91	3.25	0.115	0.128
c	0.51	0.75	0.020	0.030
D	20.80	21.30	0.819	0.839
E	15.50	16.10	0.610	0.634
E2	4.40	5.20	0.173	0.205
e	5.44 BSC		0.214 BSC	
L	19.72	20.22	0.776	0.796
L1	-	4.30	-	0.169
P	3.40	3.80	0.134	0.150

Order Information

Device	Package	Marking	Carrier	Quantity
GSFA10200	TO-247	A2R710	Tube	30pcs / Tube