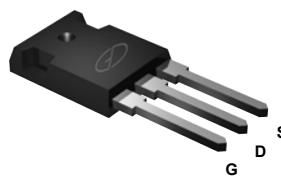
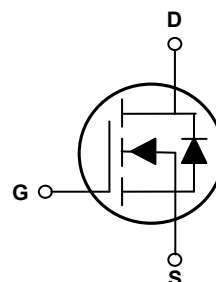


Main Product Characteristics

BV_{DSS}	200V
$R_{DS(ON)}$	10.7mΩ (Max)
I_D	106A



TO-247



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 GSFA20106 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 ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, @Steady-State ($T_C=25^{\circ}\text{C}$)	I_D	106	A
Drain Current-Continuous, @Steady-State ($T_C=100^{\circ}\text{C}$)		76	
Drain Current-Pulsed ($T_C=25^{\circ}\text{C}$) ¹	I_{DM}	424	A
Single Pulse Avalanche Energy	E_{AS}	600	mJ
Single Pulse Avalanche Current	I_{AS}	49	A
Power Dissipation ($T_C=25^{\circ}\text{C}$) ²	P_D	340	W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.36	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=200V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=200V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	10	-	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=88A$	-	9.4	10.7	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DD}=100V, I_D=44A, V_{GS}=10V$	-	64	-	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	28	-	
Gate-Drain ("Miller") Charge ^{3,4}	Q_{gd}		-	7.9	-	
Gate to Plateau ^{3,4}	$V_{plateau}$		-	5.3	-	V
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=100V, R_G=1.6\Omega, V_{GS}=10V, I_D=44A$	-	22	-	nS
Rise Time ^{3,4}	t_r		-	40	-	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	66	-	
Fall Time ^{3,4}	t_f		-	18	-	
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, F=1\text{MHz}$	-	4720	-	pF
Output Capacitance	C_{oss}		-	430	-	
Reverse Transfer Capacitance	C_{rss}		-	11	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	4.9	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	$T_C=25^\circ\text{C}$, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	88	A
Pulsed Source Current	$I_{S,pulse}$		-	-	352	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=88A$	-	-	1.4	V
Reverse Recovery Time ³	t_{rr}	$V_{GS}=0V, I_S=44A, di/dt=100A/\mu s$	-	130	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	0.7	-	μC

Note:

1. Pulse time of 5us, pulse width limited by maximum junction temperature.
2. The dissipated power value will change with the temperature. When it is greater than 25°C , the dissipated power value will decrease by $2.5W/^\circ\text{C}$ for every 1 degree of temperature rise.
3. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

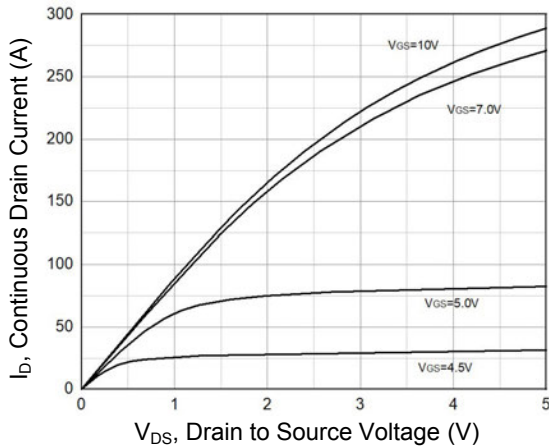


Figure 1. Typical Output Characteristics

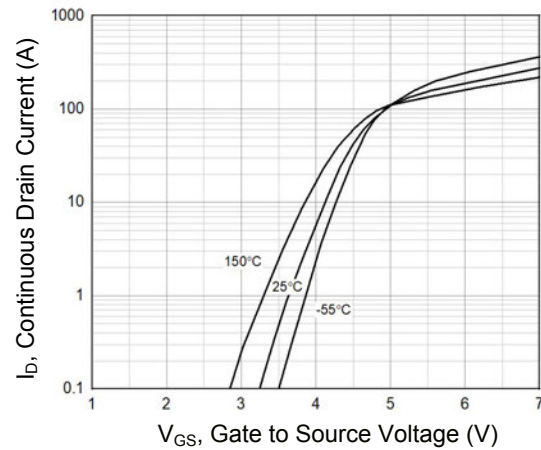


Figure 2. Transfer Characteristics

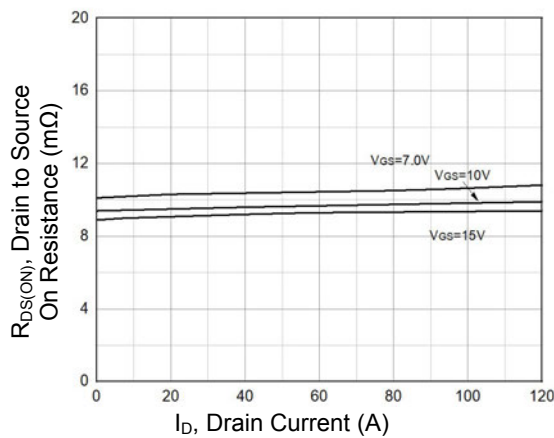


Figure 3. $R_{DS(ON)}$ vs. Drain Current

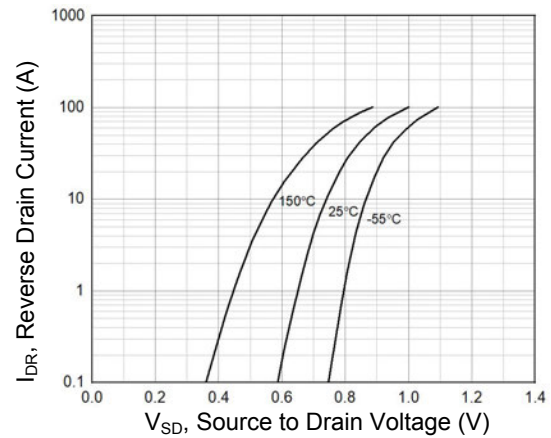


Figure 4. Body Diode Characteristics

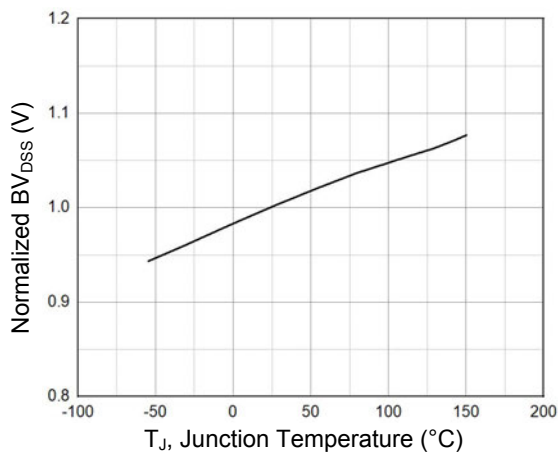


Figure 5. Normalized BV_{DSS} vs. T_J

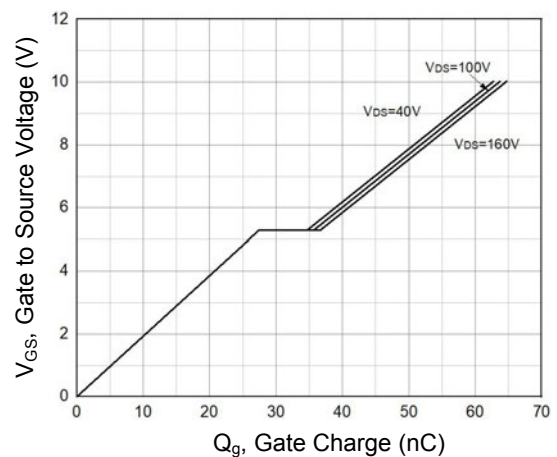


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

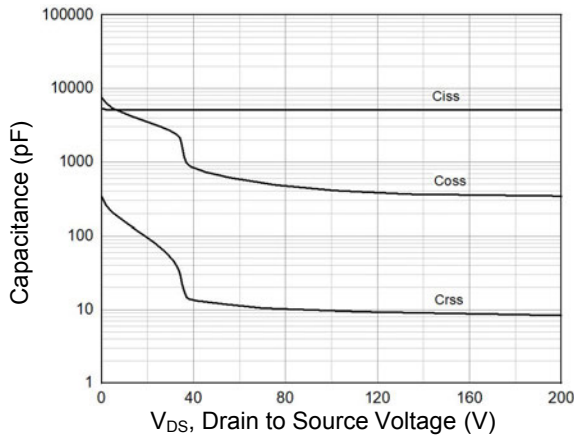


Figure 7. Capacitance Characteristics

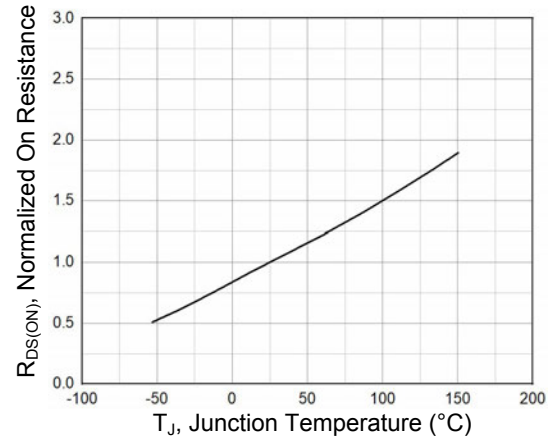


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

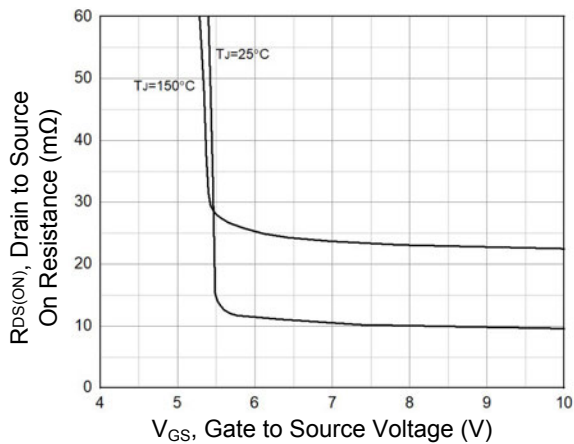


Figure 9. Normalized $R_{DS(ON)}$ vs. V_{GS}

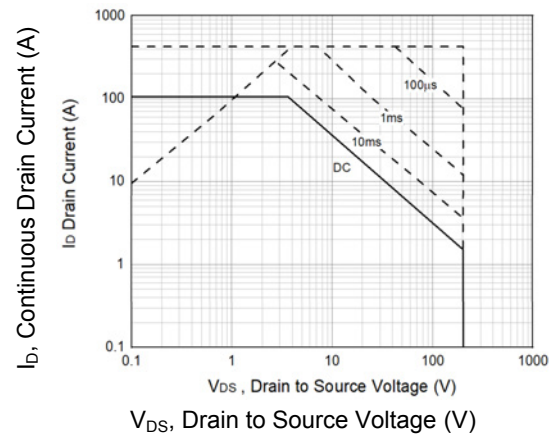


Figure 10. Maximum Safe Operation Area

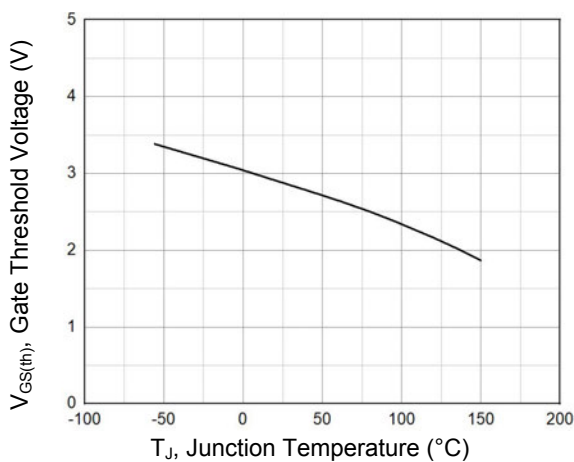


Figure 11. Gate Threshold Voltage vs. T_J

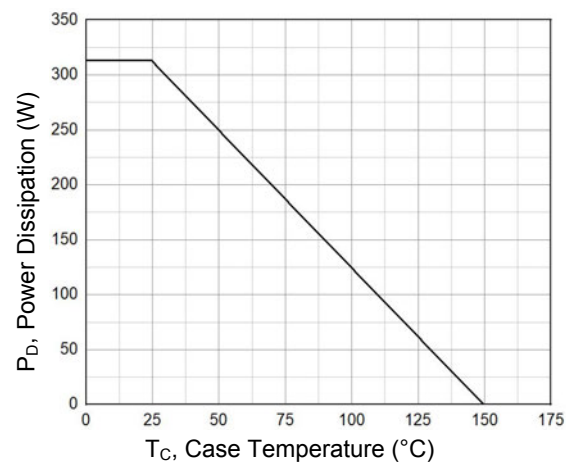
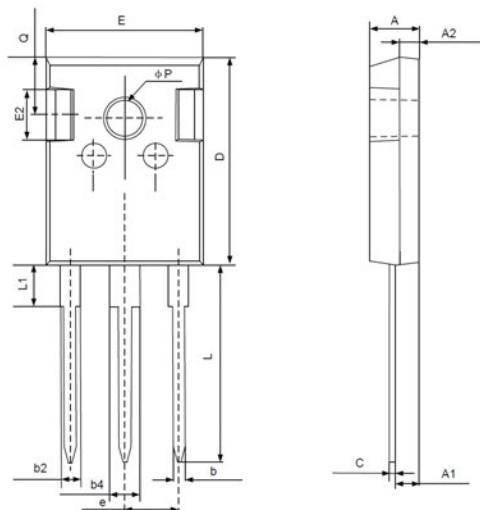


Figure 12. Power Dissipation vs. T_C

Package Outline Dimensions (TO-247)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.800	5.200	0.189	0.205
A1	2.210	2.590	0.087	0.102
A2	1.850	2.150	0.073	0.085
b	1.110	1.360	0.044	0.054
b2	1.910	2.250	0.075	0.089
b4	2.910	3.250	0.115	0.128
c	0.510	0.750	0.020	0.030
D	20.800	21.300	0.819	0.839
E	15.500	16.100	0.610	0.634
E2	4.400	5.200	0.173	0.205
e	5.440 BSC		0.214 BSC	
L	19.720	20.220	0.776	0.796
L1	-	4.300	-	0.170
Q	5.600	6.000	0.220	0.236
P	3.400	3.800	0.134	0.150

Order Information

Device	Package	Marking	Quantity	HSF Status
GSFA20106	TO-247	A10020	50pcs / Tube	RoHS Compliant