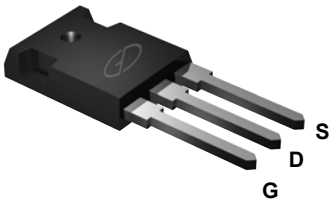
GOOD-ARK SEMICONDUCTOR

GSFA2072

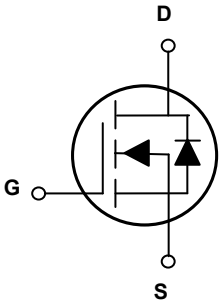
200V N-Channel MOSFET

Main Product Characteristics

V_{DS}	200V
$R_{DS(ON)}$	24mΩ (Max)
I_D	72A



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 GSFA2072 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°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 (T_C=25°C)	I_D	72	A
Drain Current-Continuous (T_C=100°C)		45	
Drain Current-Pulsed (T_C=25°C)[1]	I_{DM}	288	A
Single Pulse Avalanche Energy	E_{AS}	140	mJ
Single Pulse Avalanche Current	I_{AS}	53	A
Power Dissipation (T_C=25°C)[2]	P_D	250	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.5	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 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	BV_{DSS}	V_{GS}=0V, I_D=250μA	200	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=200V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=200V, V_{GS}=0V, T_J=125°C	-	10	-	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=46A	-	19.4	24	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	3.0	-	5.0	V
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DD}=100V, I_D=46A, V_{GS}=10V	-	36	-	nC
Gate-Source Charge[3,4]	Q_{gs}		-	22	-	
Gate-Drain Charge[3,4]	Q_{gd}		-	4.3	-	
Gate Plateau[3,4]	$V_{plateau}$		-	6.9	-	V
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=100V, R_G=2.5Ω, V_{GS}=10V, I_D=46A	-	22	-	nS
Rise Time[3,4]	t_r		-	80	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	34	-	
Fall Time[3,4]	t_f		-	9.6	-	
Input Capacitance	C_{lss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	2655	-	pF
Output Capacitance	C_{oss}		-	1593	-	
Reverse Transfer Capacitance	C_{rss}		-	37	-	
Gate Resistance	R_g	F=1MHz	-	4.4	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	T_C=25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	72	A
Diode Pulsed Current	$I_{S.pulse}$		-	-	288	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=46A	-	-	1.4	V
Reverse Recovery Time[3]	t_{rr}	I_S=46A, V_{GS}=0V, di/dt=100A/μs	-	128	-	nS
Reverse Recovery Charge[3]	Q_{rr}		-	0.59	-	μC

Note:

1. Pulse time 5μs.
2. The dissipated power value will change with the temperature. When it is greater than 25°C, the dissipated power will decrease by 1.67W/°C for every 1 degree of temperature rise.
3. Pulse test: pulse width ⩽ 300us, duty cycle ⩽ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

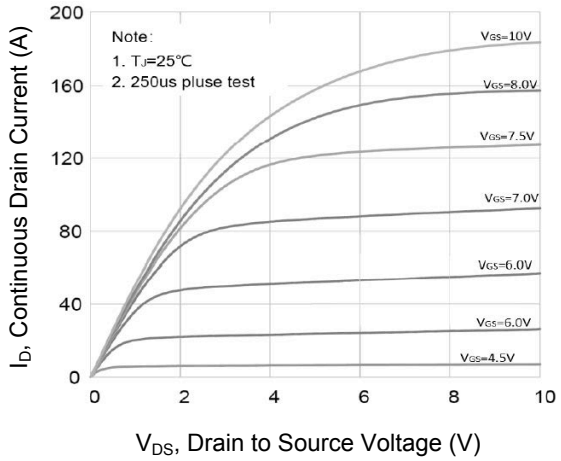


Figure 1. Output Characteristics

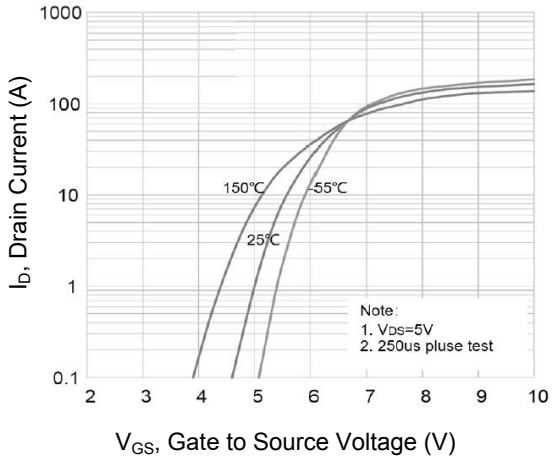


Figure 2. Transfer Characteristics

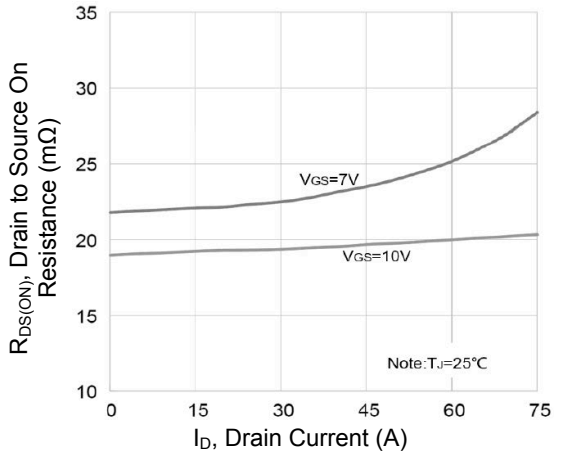


Figure 3. $R_{DS(ON)}$ vs. Drain Current

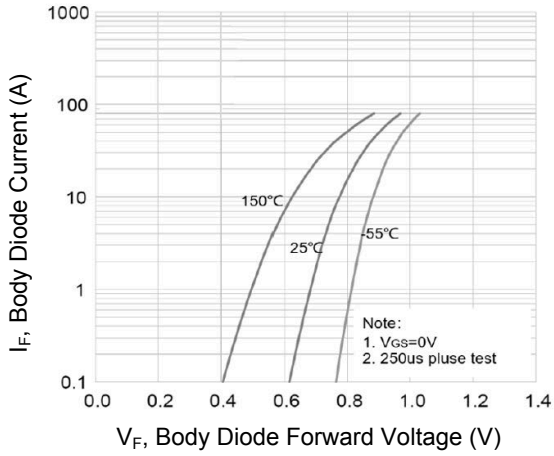


Figure 4. Body Diode Characteristics

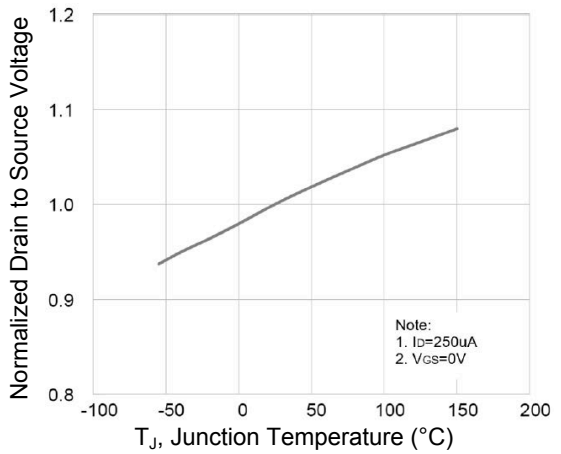


Figure 5. Normalized BV_{DSS} vs. Junction Temperature

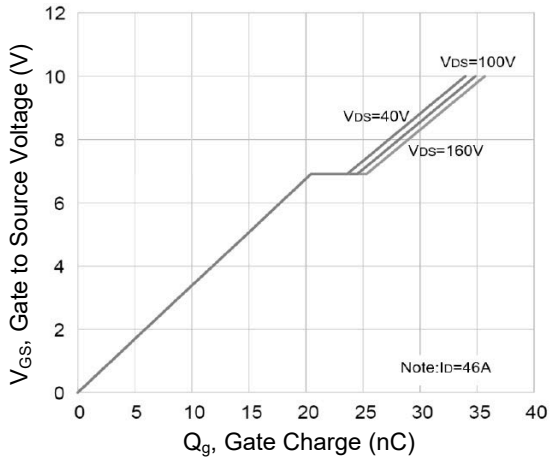


Figure 6. Gate Charge Waveform

Typical Electrical and Thermal Characteristic Curves

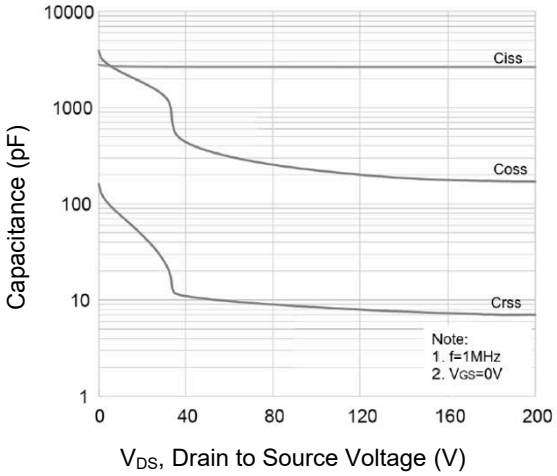


Figure 7. Capacitance Characteristics

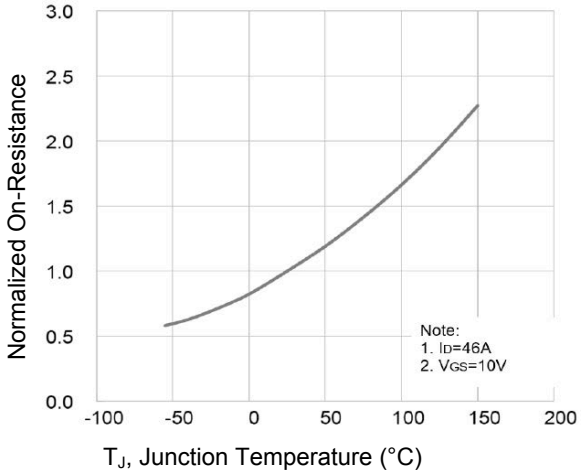


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

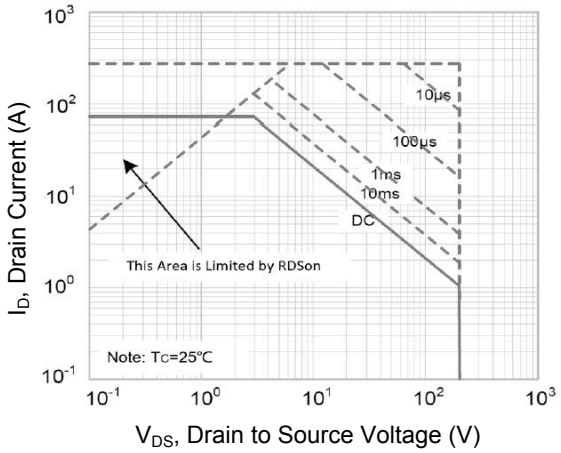
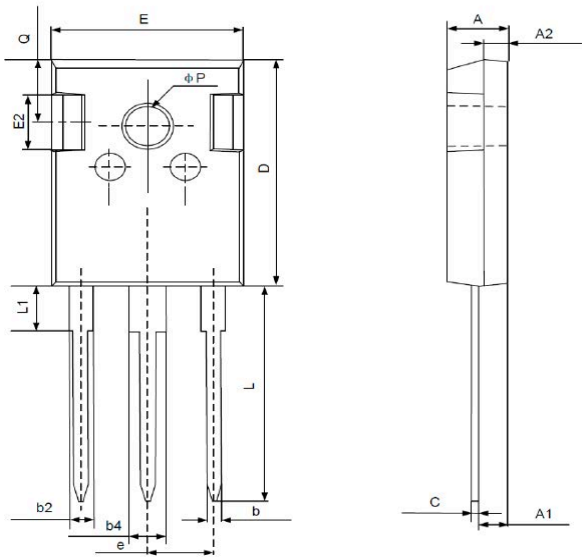


Figure 9. Safe Operation Area

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	-	0.169
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
GSFA2072	TO-247	A24020	50pcs / Tube	RoHS Compliant