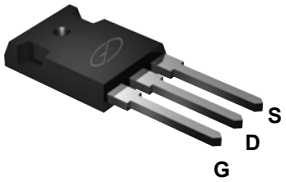
GOOD-ARK SEMICONDUCTOR

GSFA06200

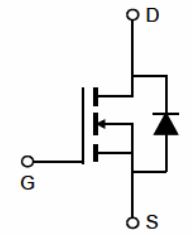
60V N-Channel MOSFET

Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	2.2mΩ
I_D	200A



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 GSFA06200 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 supply 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}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous(Silicon Limited)	I_D	200	A
Drain Current-Continuous(T_C=100°C)	I_D(100°C)	150	A
Pulsed Drain Current	I_{DM}	800	A
Maximum Power Dissipation	P_D	255	W
Derating Factor		1.7	W/°C
Single Pulse Avalanche Energy[5]	E_{AS}	2000	mJ
Thermal Resistance, Junction-to-Case[2]	$R_{\theta JC}$	0.59	°C/W
Operating Junction Temperature Range	T_J	-55 To +175	°C
Storage Temperature Range	T_{STG}	-55 To +175	°C

Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.2	2.7	3.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=100A	-	1.8	2.2	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=100A	-	60	-	S
Dynamic Characteristics[4]						
Input Capacitance	C_{lss}	V_{DS}=30V, V_{GS}=0V, F=1.0MHz	-	9200	-	pF
Output Capacitance	C_{oss}		-	1900	-	
Reverse Transfer Capacitance	C_{rss}		-	61	-	
Switching Characteristics[4]						
Total Gate Charge	Q_g	V_{DS}=30V, I_D=100A, V_{GS}=10V	-	130	-	nC
Gate-Source Charge	Q_{gs}		-	31.5	-	
Gate-Drain Charge	Q_{gd}		-	10.5	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=30V, I_D=100A, V_{GS}=10V, R_G=4.7Ω	-	23	-	nS
Turn-On Rise Time	t_r		-	19	-	
Turn-Off Delay Time	$t_{d(off)}$		-	58	-	
Turn-Off Fall Time	t_f		-	14	-	
Drain-Source Diode Characteristics						
Diode Forward Current[2]	I_S		-	-	200	A
Diode Forward Voltage[3]	V_{SD}	I_S=200A, V_{GS}=0V	-	-	1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=I_S di/dt=100A/μs[3]	-	67	-	nS
Reverse Recovery Charge	Q_{rr}		-	112	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design
5. EAS condition : Tj=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristic Curves

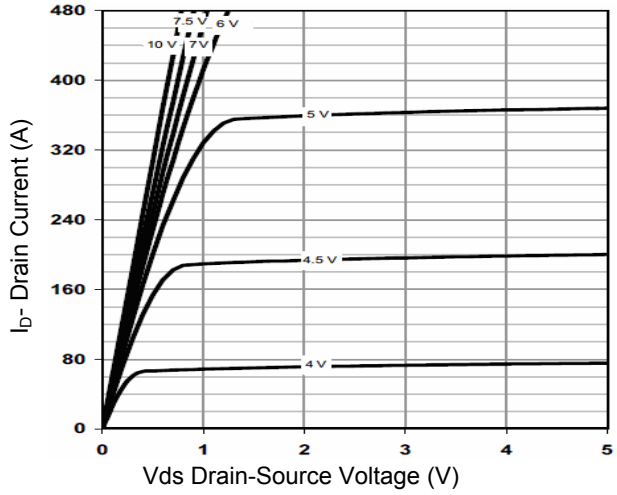


Figure 1. Output Characteristics

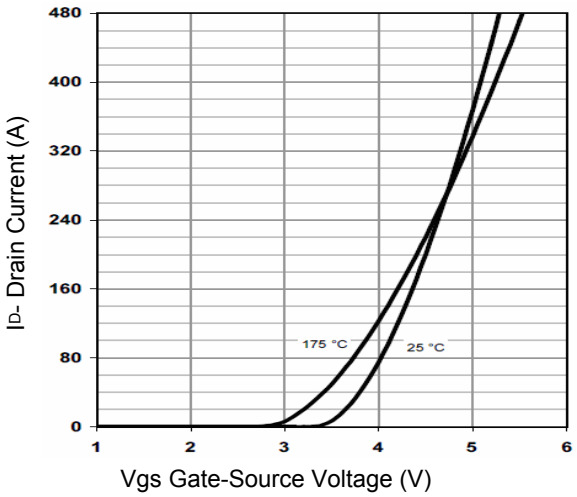


Figure 2. Transfer Characteristics

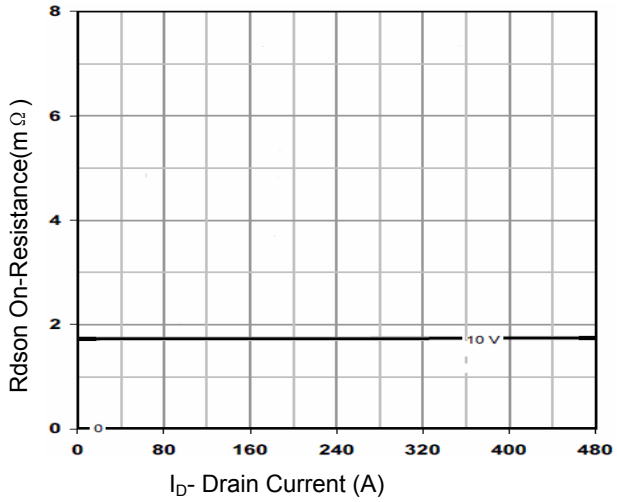


Figure 3. Rdson- Drain Current

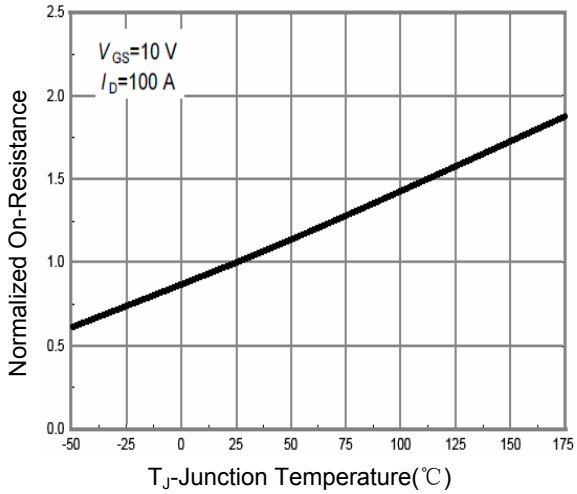


Figure 4. Rdson-JunctionTemperature

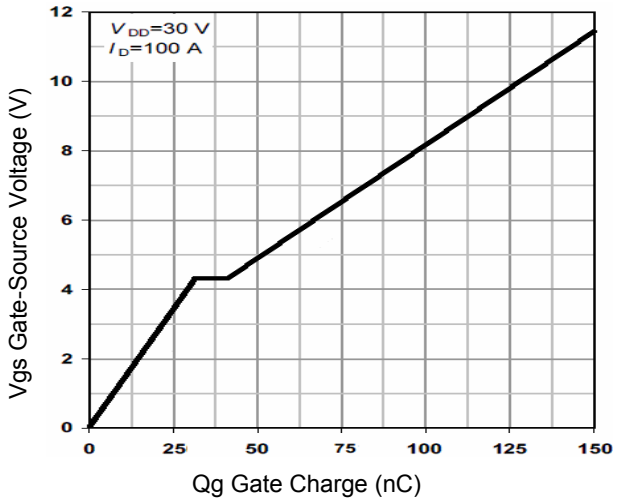


Figure 5. Gate Charge

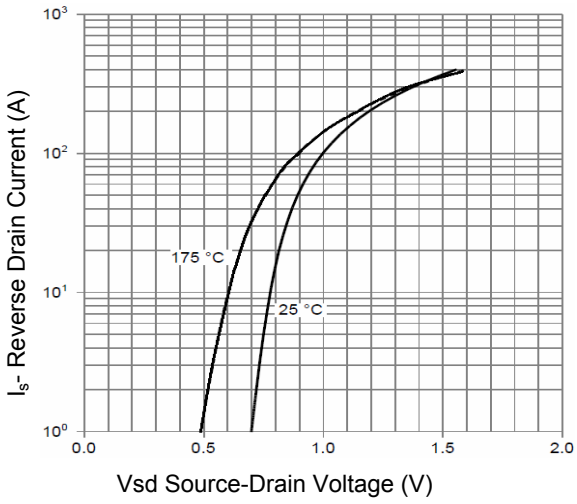


Figure 6. Source- Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

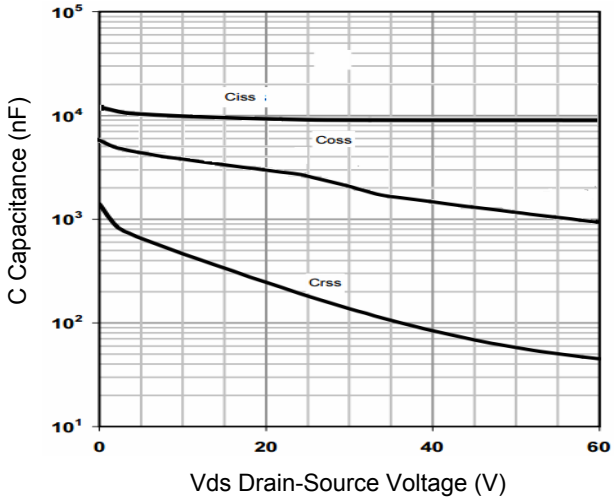


Figure 7. Capacitance vs Vds

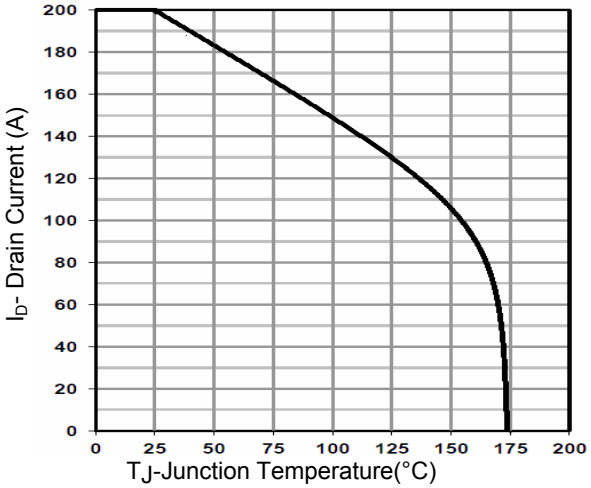


Figure 8.Current De-rating

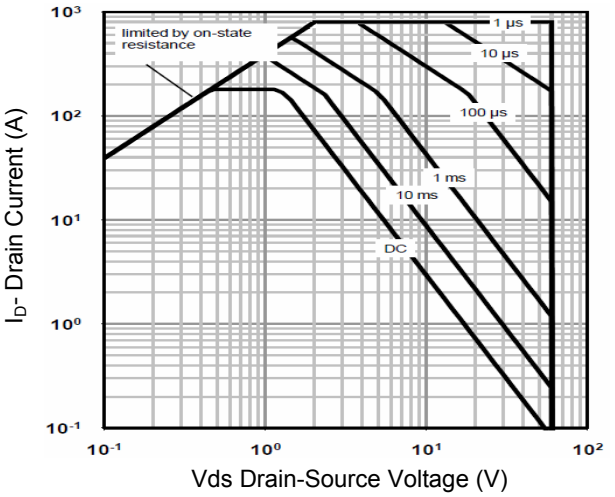


Figure 9. Safe Operation Area

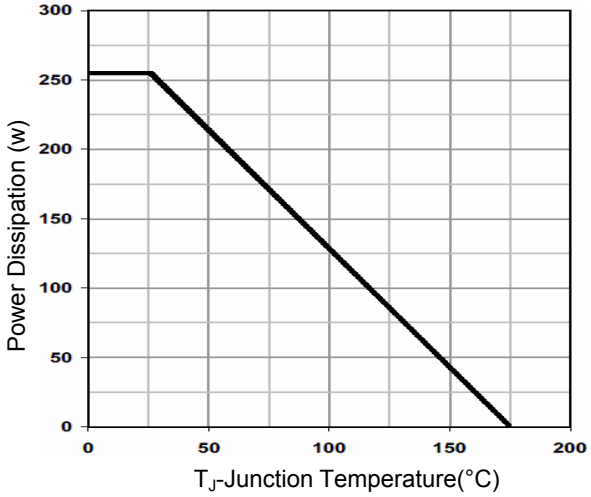


Figure 10. Power De-rating

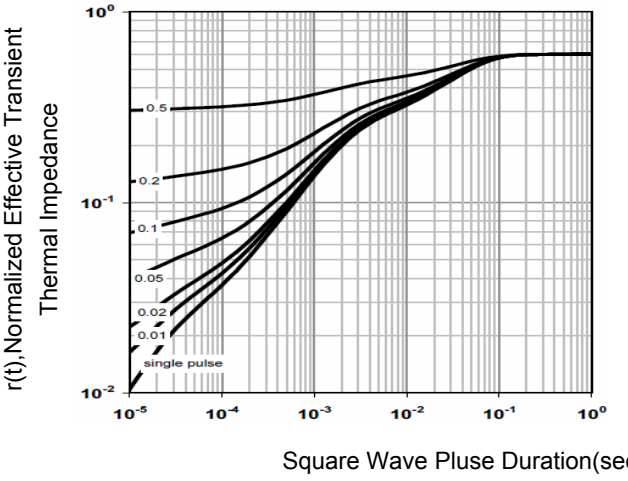
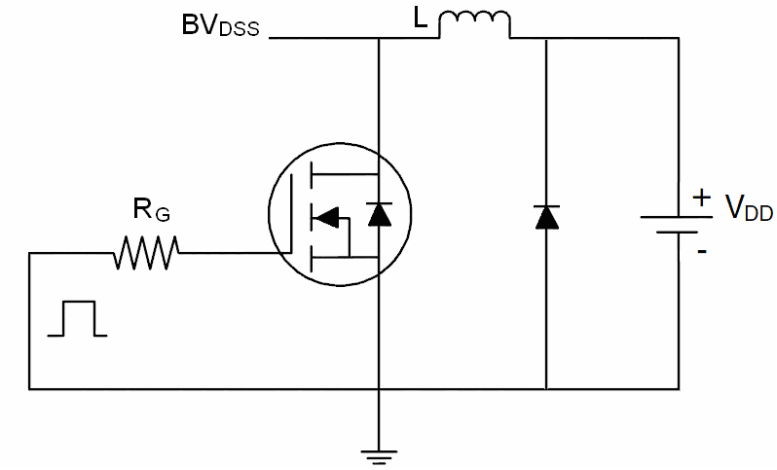
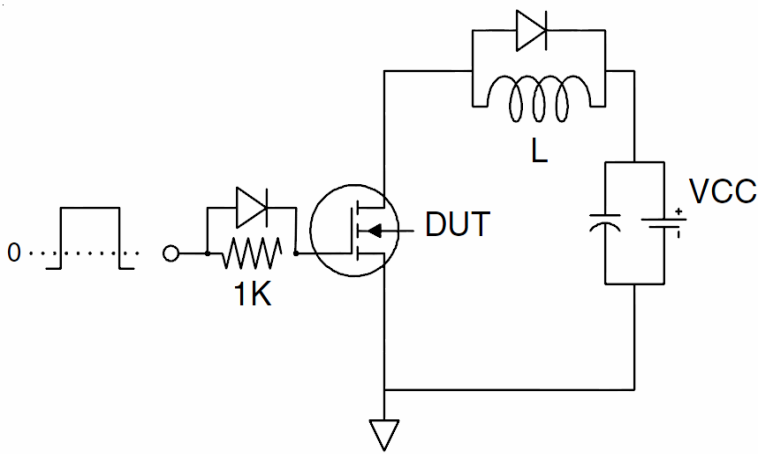


Figure 11. Normalized Maximum Transient Thermal Impedance

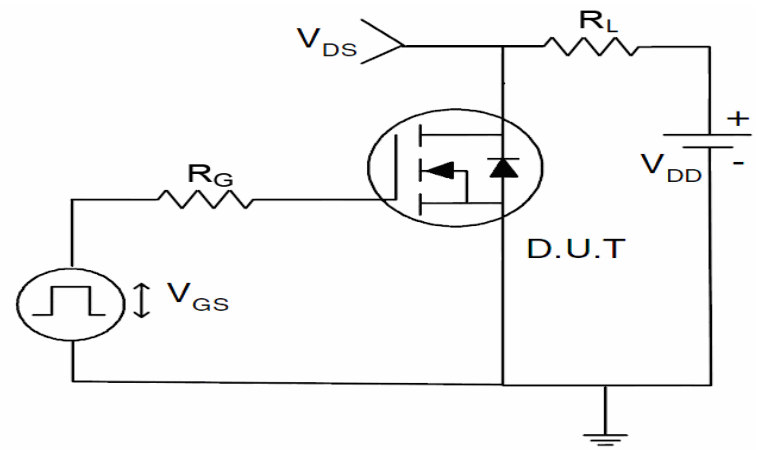
Typical Electrical and Thermal Characteristic Curves



Firgure 12. E_{AS} Test Circuit

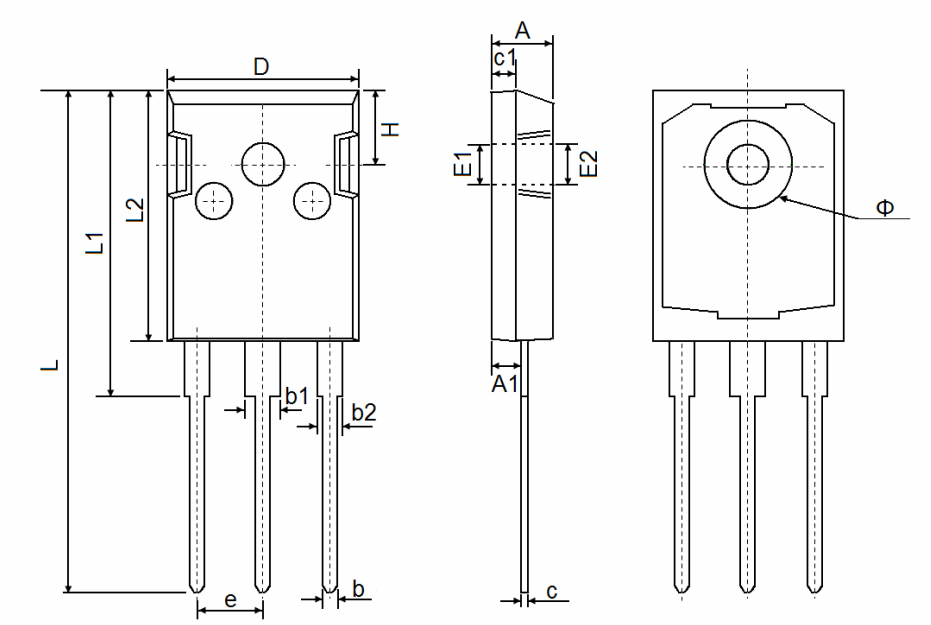


Firgure 13. Gate Charge Test Circuit



Firgure 14. Switch Time Test Circuit

Package Outline Dimensions (TO-247)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	