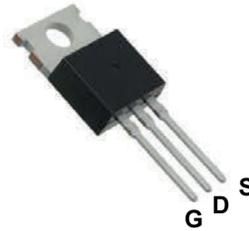
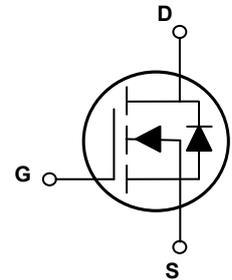


Main Product Characteristics

V_{DS}	60V
I_D	200A
$R_{DS(ON)}$ (Max.)	2.5m Ω @ $V_{GS}=10V$
	4m Ω @ $V_{GS}=4.5V$



TO-220



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 GSFU06R02 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 ($T_J=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	60	V
Gate Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $T_C=25^{\circ}C^1$	I_D	200	A
Pulsed Drain Current, $T_C=25^{\circ}C^2$	$I_{D, pulse}$	600	A
Continuous Diode Forward Current, $T_C=25^{\circ}C^1$	I_S	200	A
Diode Pulsed Current, $T_C=25^{\circ}C^2$	$I_{S, Pulse}$	600	A
Power Dissipation, $T_C=25^{\circ}C^3$	P_D	132	W
Single Pulsed Avalanche Energy ⁵	E_{AS}	240	mJ
Operation and Storage Temperature	T_{stg}, T_J	-55 to 150	$^{\circ}C$
Thermal Resistance, Junction-Case	$R_{\theta JC}$	0.95	$^{\circ}C/W$
Thermal Resistance, Junction-Ambient ⁴	$R_{\theta JA}$	62	$^{\circ}C/W$

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

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	-	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	2.3	2.5	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =10A	-	2.9	4.0	mΩ
Gate-Source Leakage Current	I _{GSS}	V _{GS} =20V	-	-	100	nA
		V _{GS} =-20V	-	-	-100	
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, F=100kHz	-	6498	-	pF
Output Capacitance	C _{oss}		-	1260	-	pF
Reverse Transfer Capacitance	C _{rss}		-	52	-	pF
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DS} =50V, R _G =2Ω, I _D =50A	-	27.5	-	ns
Rise Time	t _r		-	8.1	-	ns
Turn-off Delay Time	t _{d(off)}		-	84.5	-	ns
Fall Time	t _f		-	18.3	-	ns
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =50A	-	106	-	nC
Gate-Source Charge	Q _{gs}		-	16.3	-	nC
Gate-Drain Charge	Q _{gd}		-	19	-	nC
Gate Plateau Voltage	V _{plateau}		-	3.3	-	V
Gate Resistance	R _g	F=1MHz, Open Drain	-	1.8	-	Ω
Source-Drain Ratings and Characteristics						
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	-	1.3	V
Reverse Recovery Time	T _{rr}	V _R =50V, I _S =50A, di/dt=100A/μs	-	86.8	-	ns
Reverse Recovery Charge	Q _{rr}		-	130.4	-	nC
Peak Reverse Recovery Current	I _{rrm}		-	2.5	-	A

Note:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Pd is based on max. junction temperature, using junction-case thermal resistance.
4. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. copper, in a still air environment with T_A=25°C.
5. V_{DD}=50V, V_{GS}=10V, L=0.3mH, starting T_J=25°C.

Typical Electrical and Thermal Characteristic Curves

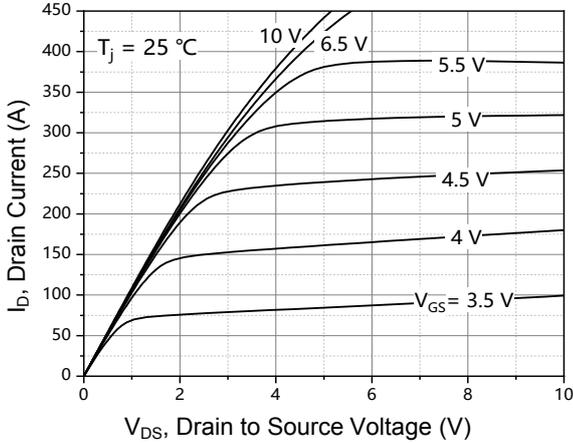


Figure 1. Typical Output Characteristics

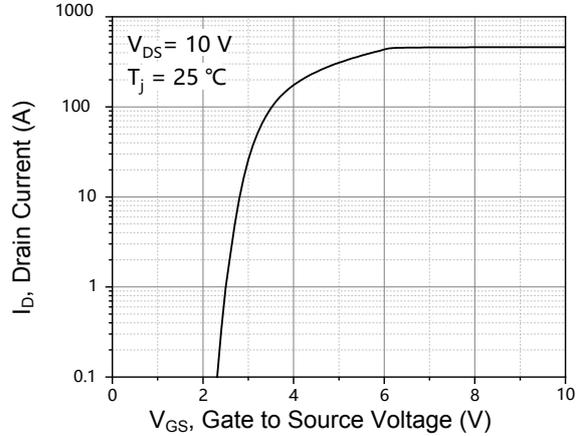


Figure 2. Typical Transfer Characteristics

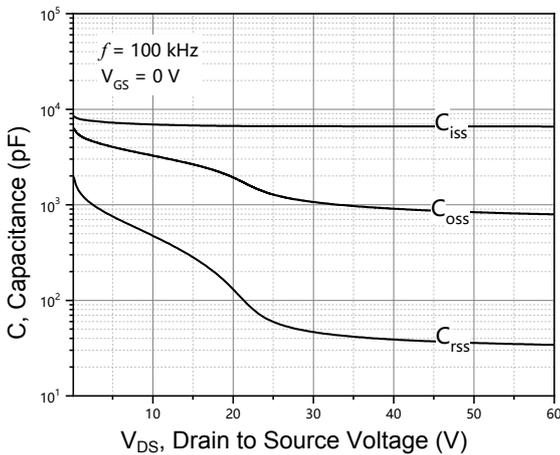


Figure 3. Typical Capacitances

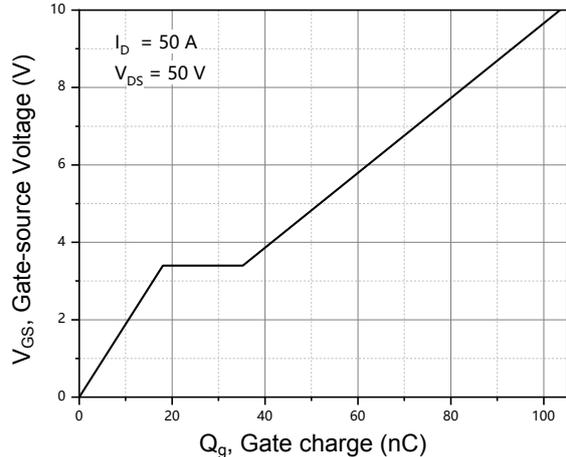


Figure 4. Typical Gate Charge

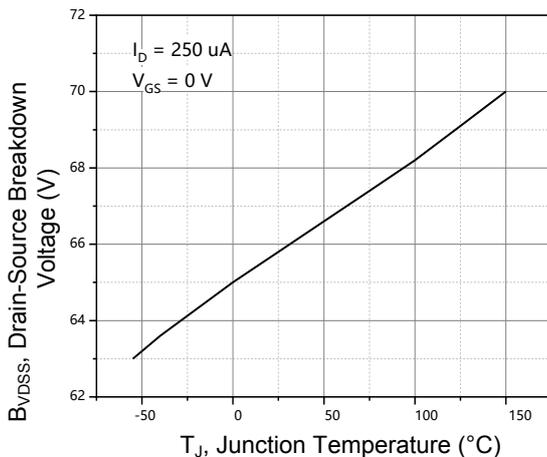


Figure 5. Drain-Source Breakdown Voltage

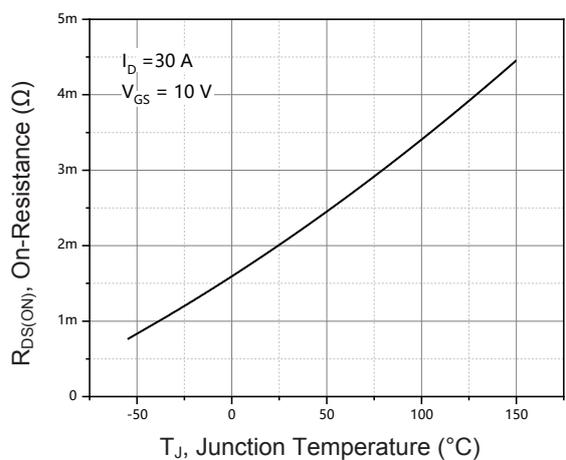


Figure 6. Drain-Source On-State Resistance

Typical Electrical and Thermal Characteristic Curves

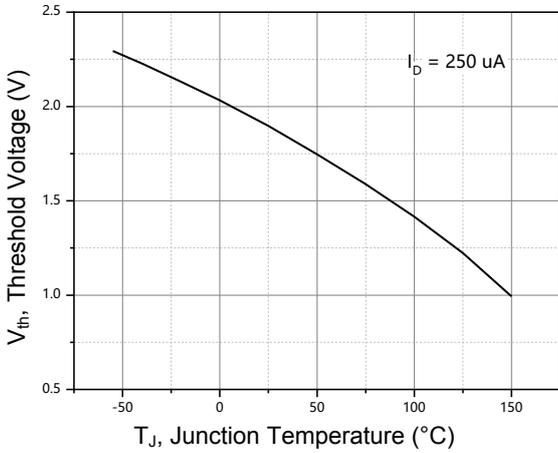


Figure 7. Threshold Voltage

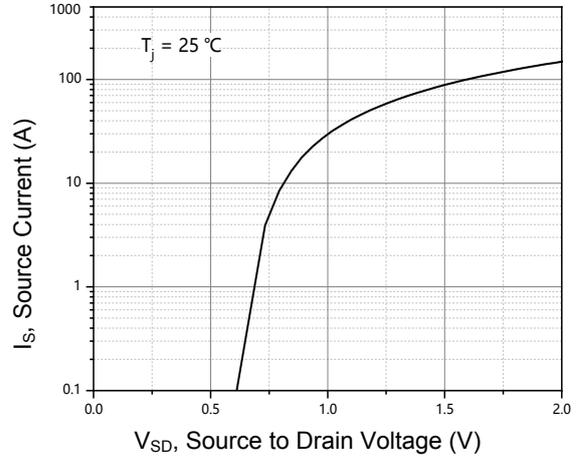


Figure 8. Forward Characteristic of Body Diode

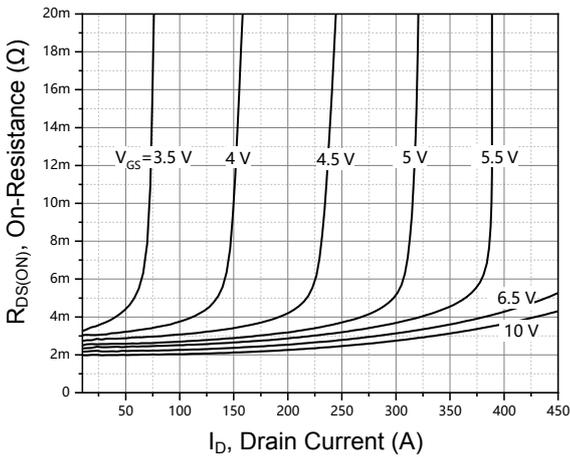


Figure 9. Drain-Source On-State Resistance

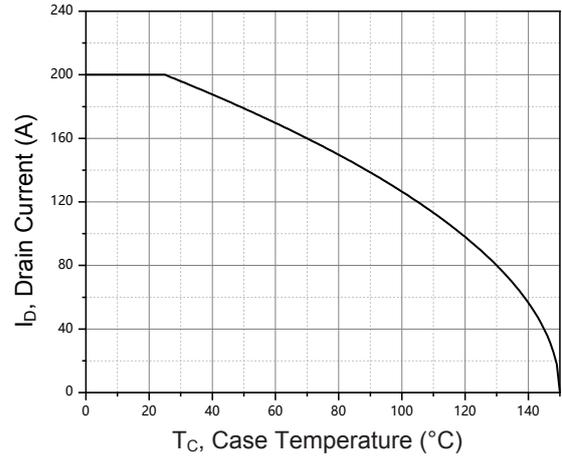


Figure 10. Drain Current

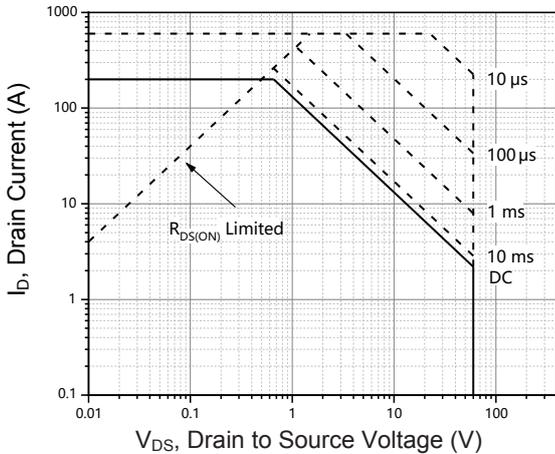


Figure 11. Safe Operation Area $T_c=25^\circ\text{C}$

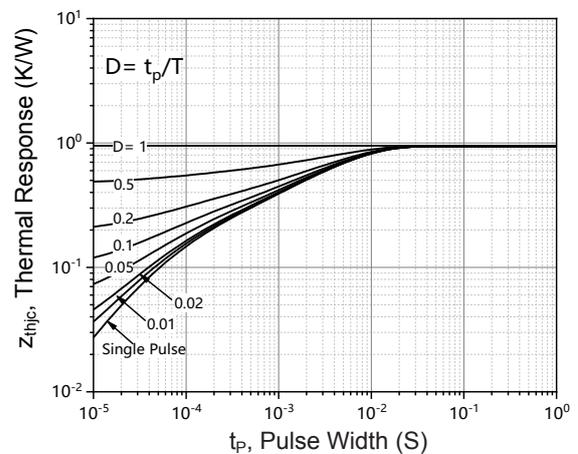
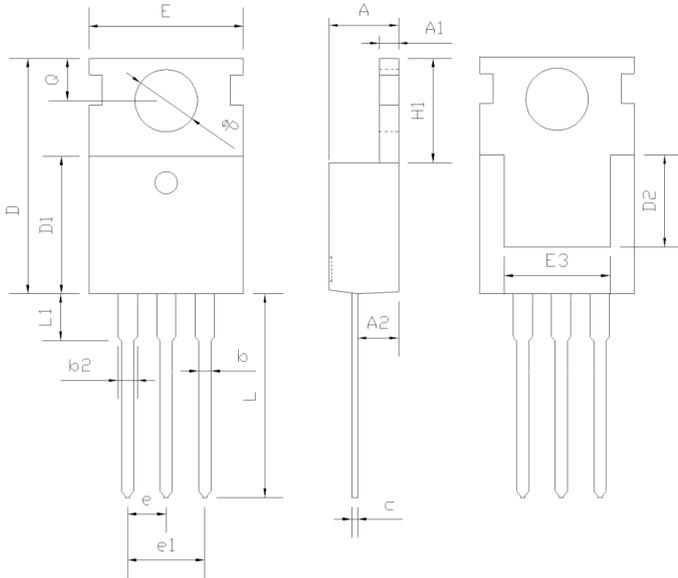


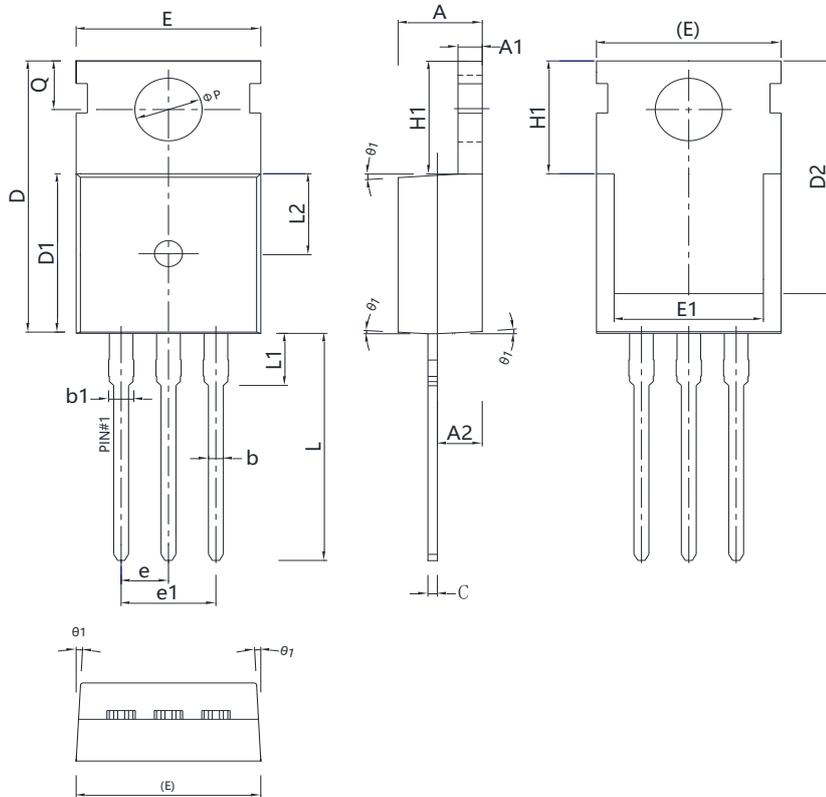
Figure 12. Max Transient Thermal Impedance

Package Outline Dimensions (TO-220-P)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.37	4.77	0.172	0.188
A1	1.25	1.45	0.049	0.057
A2	2.20	2.60	0.087	0.102
b	0.70	0.95	0.028	0.037
b2	1.17	1.47	0.046	0.058
c	0.40	0.65	0.016	0.026
D	15.10	16.10	0.594	0.634
D1	8.80	9.40	0.346	0.370
D2	5.50	-	0.217	-
E	9.70	10.30	0.382	0.406
E3	7.00	-	0.276	-
e	2.54 BSC		0.100 BSC	
e1	5.08 BSC		0.200 BSC	
H1	6.25	6.85	0.246	0.270
L	12.75	13.80	0.502	0.543
L1	-	3.40	-	0.134
ΦP	3.40	3.80	0.134	0.150
Q	2.60	3.00	0.102	0.118

Package Outline Dimensions (TO-220-J)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	1.27	1.33	0.050	0.052
A2	2.30	2.50	0.091	0.098
b	0.70	0.90	0.028	0.035
b1	1.27	1.40	0.050	0.055
c	0.45	0.60	0.018	0.024
D	15.30	16.10	0.602	0.634
D1	9.10	9.30	0.358	0.366
D2	13.10	13.70	0.516	-
E	9.70	10.20	0.382	0.402
E1	7.80	8.20	0.307	-
e	2.54 BSC		0.100 BSC	
e1	5.08 BSC		0.200 BSC	
H1	6.30	6.70	0.248	0.264
L	12.78	13.38	0.503	0.527
L1	-	3.50	-	0.138
L2	4.60 REF		0.181 REF	
ΦP	3.55	3.65	0.140	0.144
Q	2.73	2.87	0.107	0.113
θ1	1°	5°	1°	5°