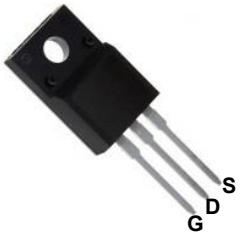
GOOD-ARK
SEMICONDUCTOR

GSFU10004

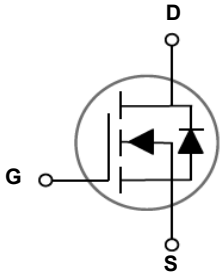
1000V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	1000V
$R_{DS(ON)}$	3.6Ω (typ)
I_D	4A



TO-220F



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 GSFU10004 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_{DSS}	1000	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current	T_C = 25°C	I_D	4	A
	T_C = 100°C		2.7	A
Pulsed Drain Current[1]		I_{DM}	16	A
Single Pulsed Avalanche Energy[2]		E_{AS}	88	mJ
Power Dissipation	T_C = 25°C	P_D	36	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	3.47	°C/W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	62.5	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristic						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	1000	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 1000V, V_{GS} = 0V, T_J= 25°C	-	-	1	
		V_{DS} = 800V, V_{GS} = 0V, T_J= 125°C	-	-	50	μA
Gate to Body Leakage Current	I_{GSS}	V_{DS} =0V,V_{GS} = ±30V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	2	-	4	V
Static Drain-Source on-Resistance[3]	$R_{DS(on)}$	V_{GS} =10V, I_D =2.0A	-	3.6	4.3	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	689	-	pF
Output Capacitance	C_{oss}		-	68	-	pF
Reverse Transfer Capacitance	C_{rss}		-	13	-	pF
Total Gate Charge	Q_g	V_{DD} =800V, I_D =4A, V_{GS} = 10V	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	4	-	nC
Gate-Drain(“Miller”) Charge	Q_{gd}		-	11	-	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 500V, I_D =4A, R_G= 25Ω	-	37	-	ns
Turn-on Rise Time	t_r		-	16	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	143	-	ns
Turn-off Fall Time	t_f		-	37	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I_S		-	-	4	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}		-	-	16	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_{SD} =4A	-	-	1.4	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V, I_S=4A, di/dt=100A/μs	-	980	-	ns
Reverse Recovery Charge	Q_{rr}		-	1.4	-	μC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2 . V_{DD} = 50V, L=10mH,R_G = 25 Ω, Starting T_J = 25°C

3 . Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

Typical Electrical and Thermal Characteristic Curves

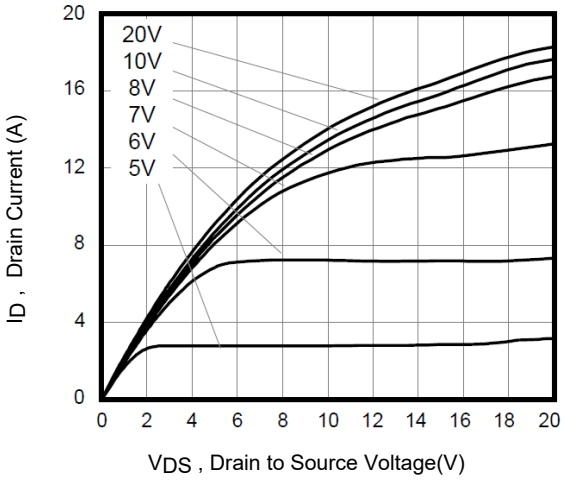


Figure 1. Output Characteristics

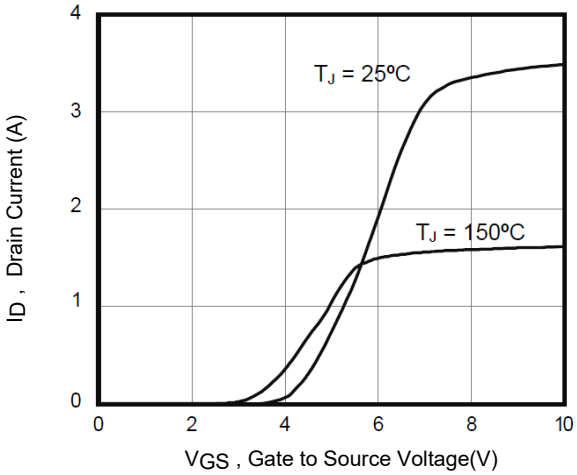


Figure 2. Transfer Characteristics

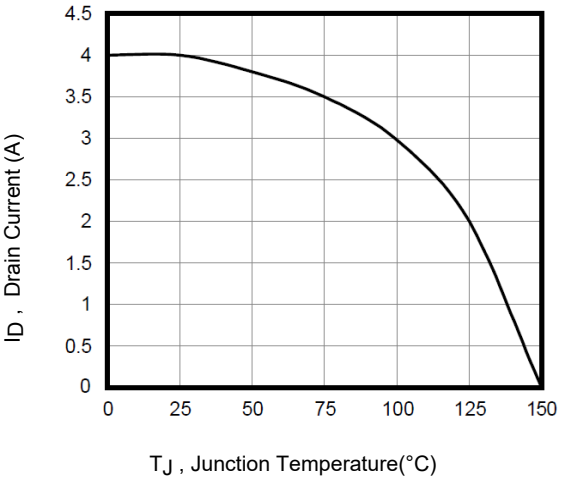


Figure 3. Current De-rating

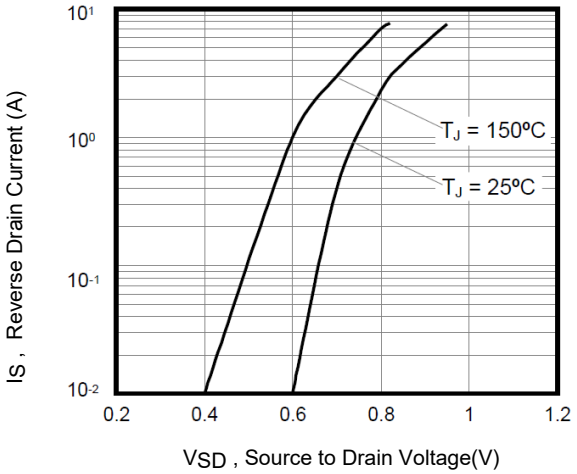


Figure 4. Body Diode Characteristics

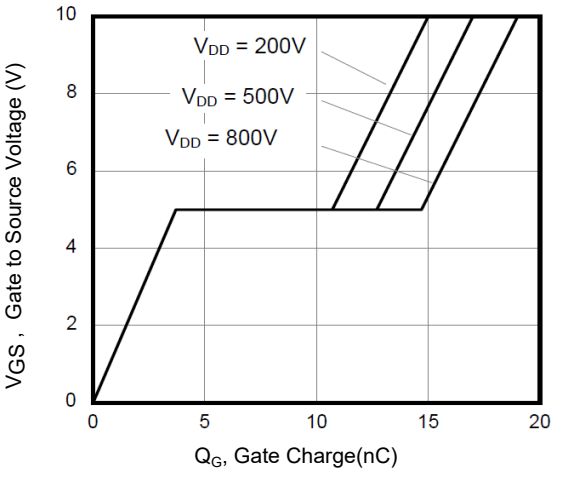


Figure 5. Gate Charge

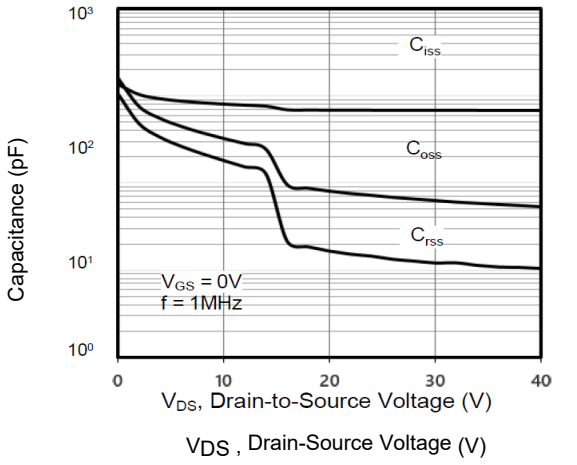


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

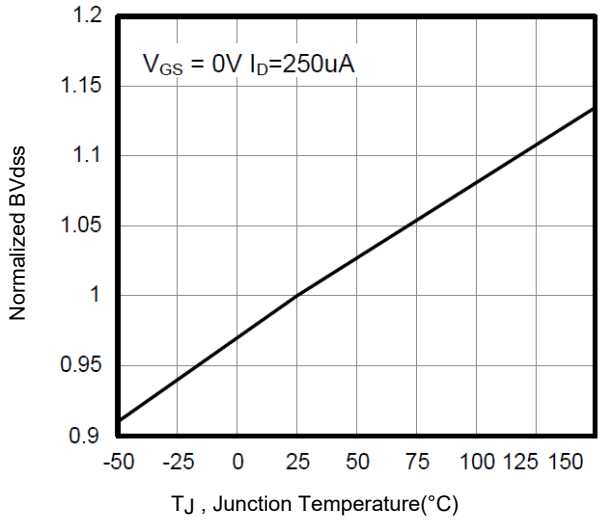


Figure 7. Normalized BVdss vs. Junction Temperature

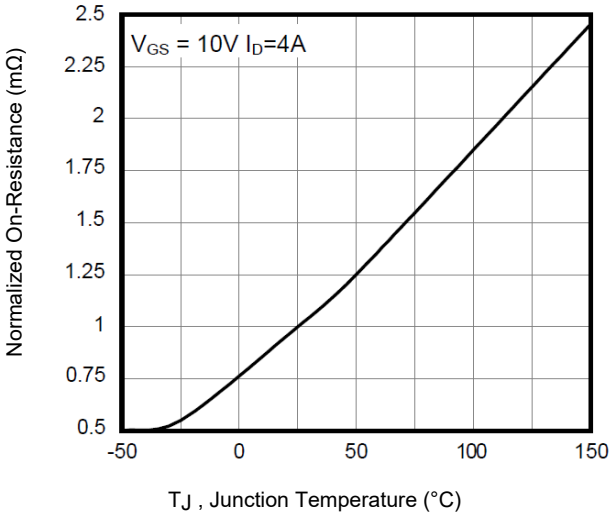


Figure 8. Normalized RDSon vs. Junction Temperature

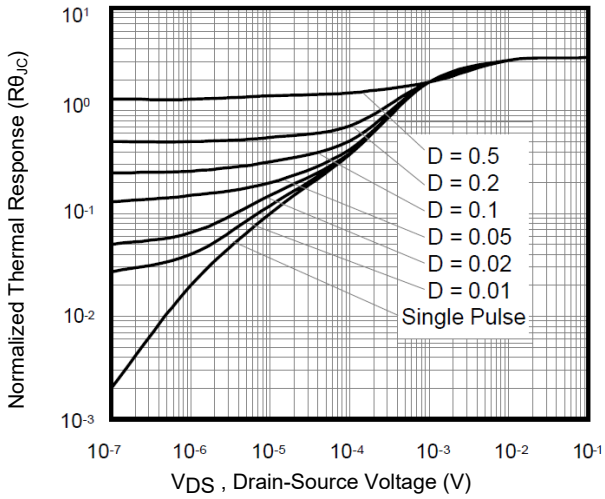


Figure 9. Transient Thermal Impedance

Test Circuit & Waveform

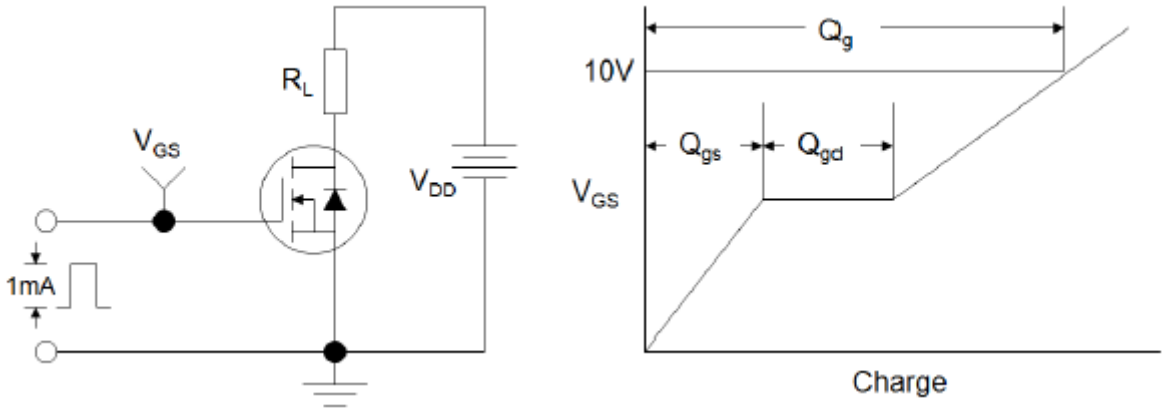


Figure 10. Gate Charge Test Circuit & Waveform

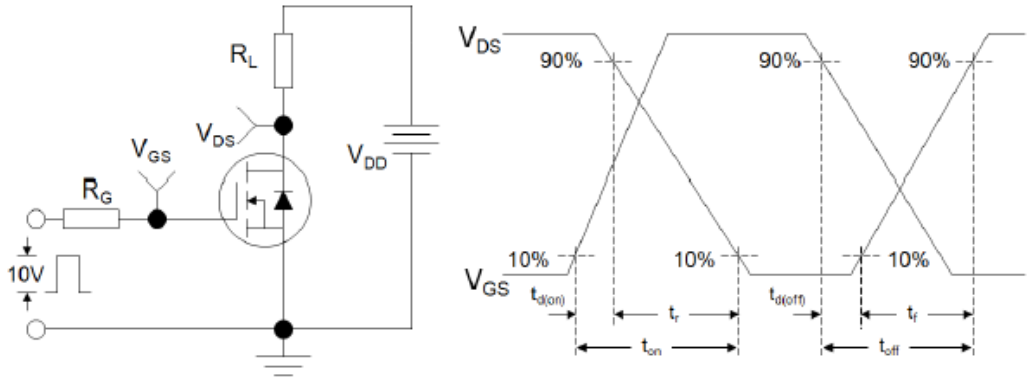


Figure 11. Resistive Switching Test Circuit & Waveforms

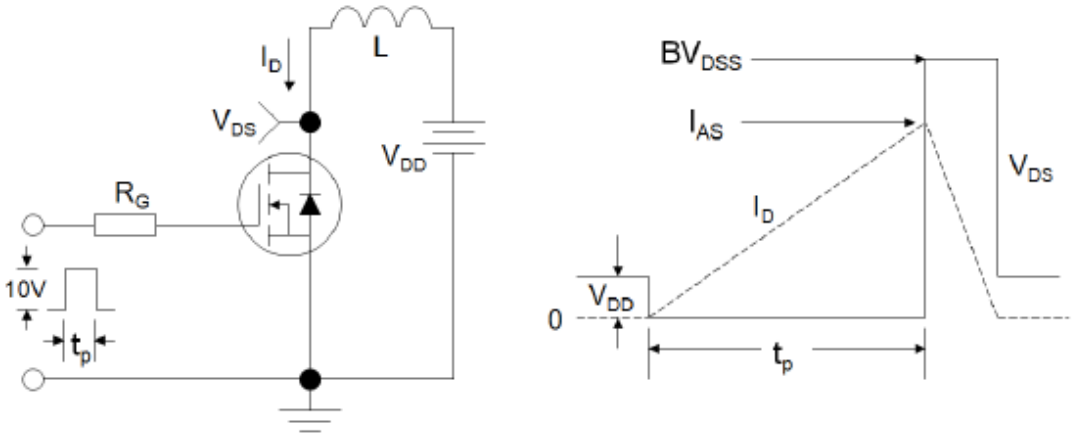
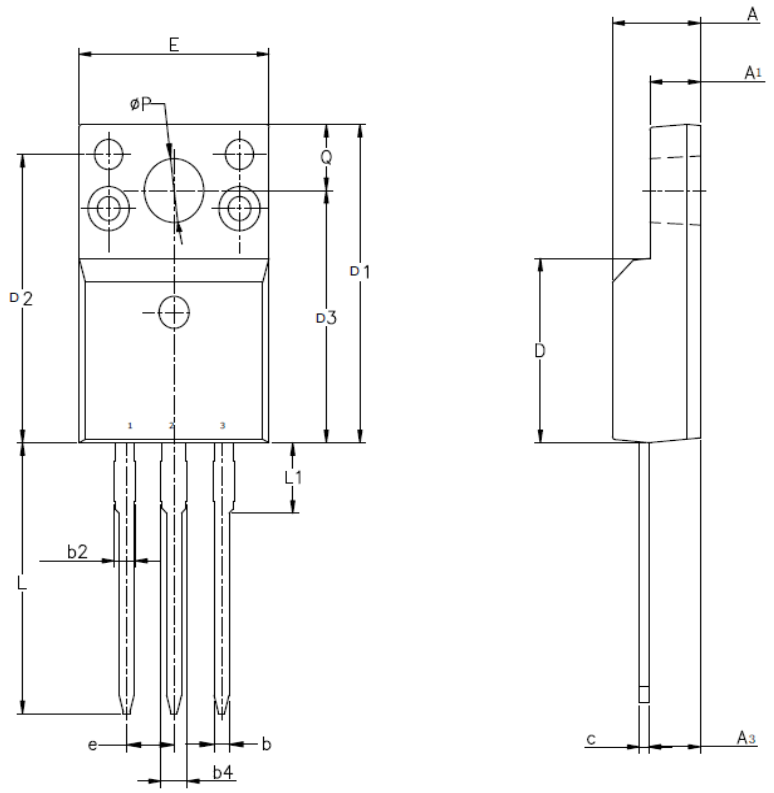


Figure 12. Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline Dimensions TO-220F



Ref.	Dimensions						
	Millimeters						
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.50		4.90	D	8.80		9.39
A1	2.45		2.83	D1	15.8		16.2
A3	2.56		3.00	D2	14.1		14.6
b	0.74	0.80	0.9	D3	12.3		12.9
b2	0.96		1.19	E	9.80		10.40
b4	1.14		1.70	L	13.20		13.70
c	0.46		0.65	L1	3.37		3.67
Q	3.20		3.40	ΦP	3.10		3.60
e	2.54 BSC						