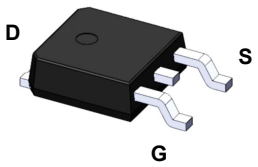
GOOD-ARK SEMICONDUCTOR

GSFD2506

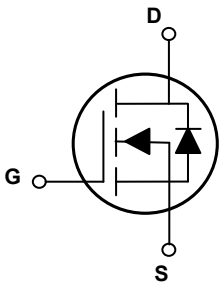
250V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	250V
$R_{DS(ON)}$	0.62Ω (Max.)
I_D	6A



TO-252 (DPAK)



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

RoHS Compliant

Description

The GSFD2506 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_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	6	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		4.2	A
Pulsed Drain Current[1]	I_{DM}	24	A
Power Dissipation	P_D	38	W
		0.31	W/°C
Single Pulse Avalanche Energy[2]	E_{AS}	10.6	mJ
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.29	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C
Lead Temperature for Soldering Purposes	T_L	260	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	250	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=250V, V_{GS}=0V, T_C=25°C	-	-	1.0	μA
		V_{DS}=200V, T_C=125°C	-	-	100	μA
Gate-to-Source Forward Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=20V	-	-	100	nA
		V_{DS}=0V, V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2A	-	0.53	0.62	Ω
		V_{GS}=4.5V, I_D=2A	-	0.59	0.69	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	-	3.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	777	-	pF
Output Capacitance	C_{oss}		-	14	-	
Reverse Transfer Capacitance	C_{rss}		-	4.6	-	
Total Gate Charge[3,4]	Q_g	I_D=4.0A, V_{DS}=100V, V_{GS}=10V	-	13	-	nC
Gate-to-Source Charge[3,4]	Q_{gs}		-	2.3	-	
Gate-to-Drain ("Miller") Charge[3,4]	Q_{gd}		-	2.5	-	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=100V, V_{GS}=10V, R_G=5Ω, I_D=5.0A	-	14	-	nS
Rise Time[3,4]	t_r		-	11	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	40	-	
Fall Time[4,5]	t_f		-	10	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	1.6	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	T_C=25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	6.0	A
Diode Pulse Current	I_{SM}		-	-	24	A
Diode Forward Voltage	V_{SD}	I_S=4.0A, V_{GS}=0V	-	-	1.3	V
Reverse Recovery Time[3]	T_{rr}	I_S=4.0A, V_{GS}=0V, dI_F/dt=100A/us	-	86	-	nS
Reverse Recovery Charge[3]	Q_{rr}		-	0.29	-	μC

Note:

1. Pulse width limited by maximum junction temperature.
2. L=0.5mH, V_{DD}=40V, R_G=25Ω, starting T_J=25°C.
3. Pulse test: Pulse width ≤ 300μs, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

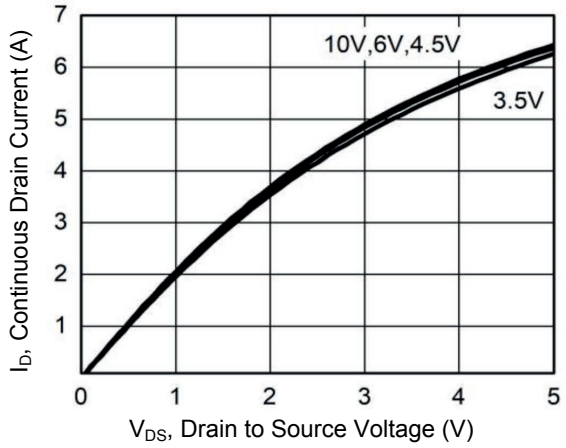


Figure 1. Output Characteristics

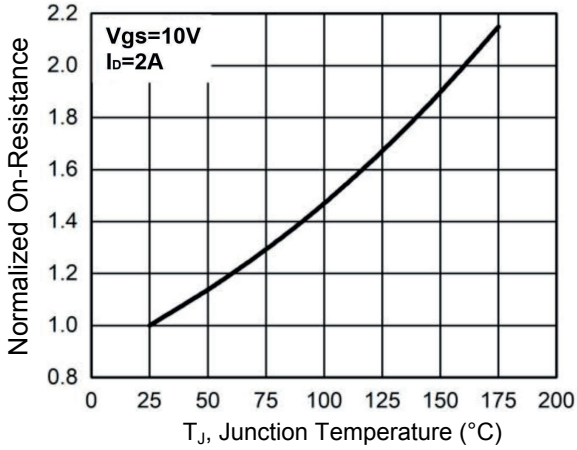


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

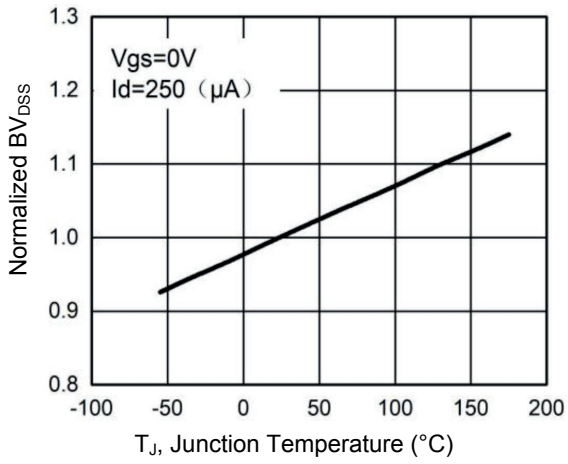


Figure 3. Normalized BV_{DSS} vs. T_J

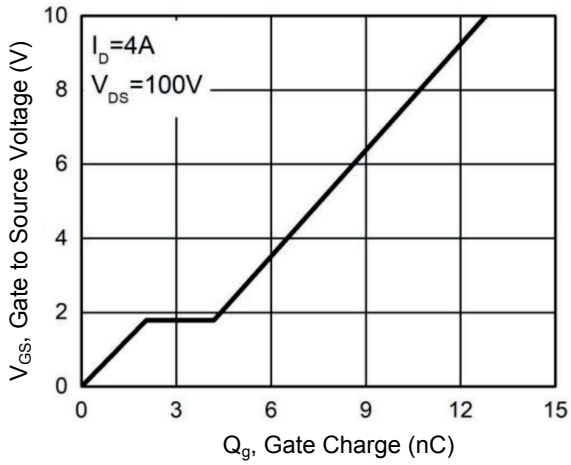


Figure 4. Gate Charge Waveform

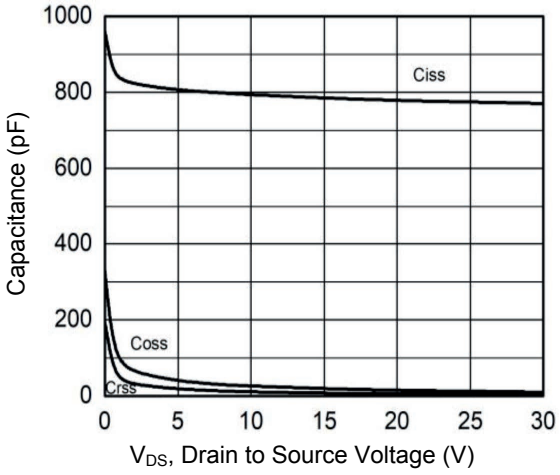


Figure 5. Capacitance Characteristics

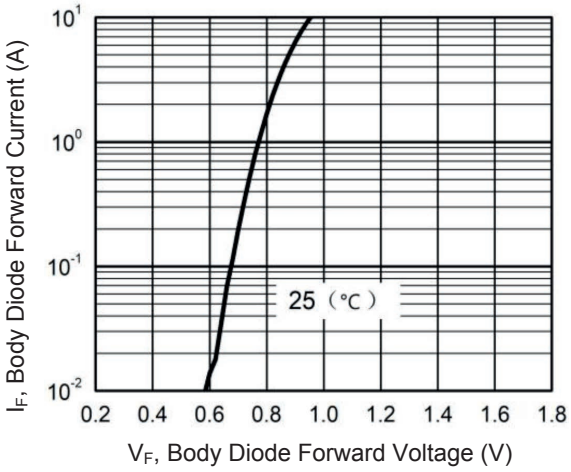
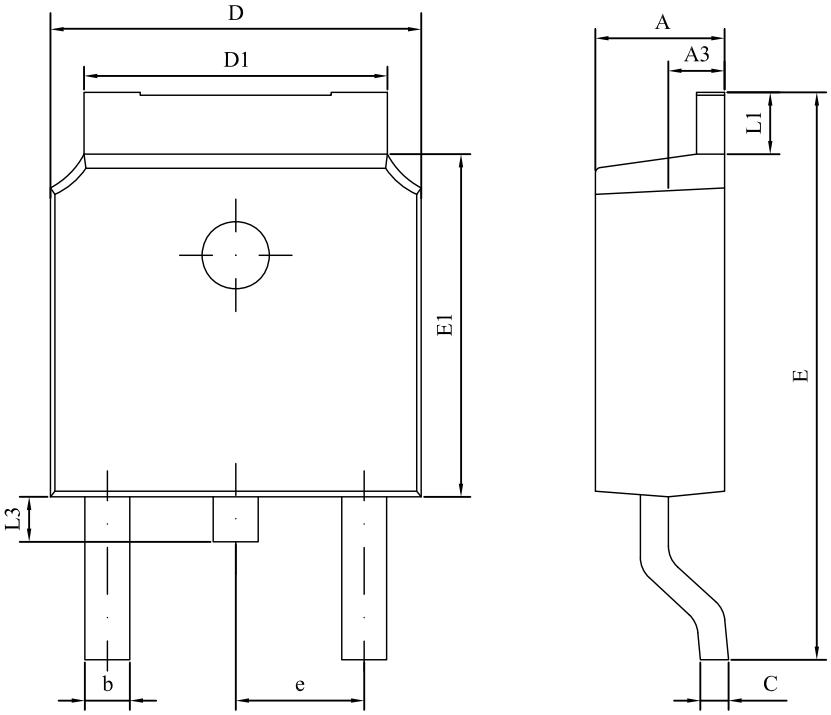


Figure 6. Body Diode Characteristics

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.40	0.085	0.094
A3	0.90	1.10	0.035	0.043
b	0.50	0.90	0.020	0.035
C	0.40	0.65	0.016	0.026
D	6.30	6.90	0.248	0.272
D1	4.95	5.50	0.195	0.217
E	9.40	10.41	0.370	0.410
E1	5.90	6.30	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.89	1.27	0.035	0.050
L3	0.60	1.10	0.024	0.043

Order Information

Device	Package	Marking	Packaging	SPQ
GSFD2506	TO-252 (DPAK)	D2506	Tape & Reel	2,500 Pcs / Reel