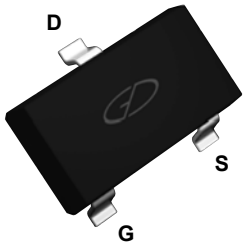
GOOD-ARK
SEMICONDUCTOR

GSFC02501

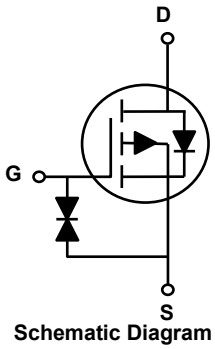
25V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-25V
$R_{DS(ON)}$	640mΩ
I_D	-0.85A



SOT-23



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 GSFC02501 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}	-25	V
Gate-Source Voltage	V_{GS}	±8	V
Drain Current-Continuous (T_A=25°C)[1,3]	I_D	-0.85	A
Drain Current-Continuous (T_A=70°C)[1,3]		-0.68	
Drain Current-Pulsed[2]	I_{DM}	-2.1	A
Power Dissipation (T_A=25°C)	P_D	0.69	W
Power Dissipation (T_A=70°C)		0.44	W
Thermal Resistance, Junction-to-Ambient[1]	$R_{\theta JA}$	180	°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=-250uA	-25	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V	-	-	-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±10	μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-0.55A	-	530	640	mΩ
		V_{GS}=-2.5V, I_D=-0.45A	-	730	950	
		V_{GS}=-1.8V, I_D=-0.35A	-	1300	1950	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-0.5	-	-1	V
Forward Transconductance	g_{fs}	V_{DS}=-5V, I_D=-0.55A	-	1	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{GS}=-2.5V, V_{DS}=-10V, I_D=-1A	-	0.53	-	nC
Total Gate Charge[3,4]	Q_g	V_{DS}=-10V, I_D=-1A V_{GS}=-4.5V	-	0.8	-	nC
Gate-Source Charge[3,4]	Q_{gs}		-	0.2	-	
Gate-Drain Charge[3,4]	Q_{gd}		-	0.2	-	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DS}=-10V, R_G=3Ω V_{GS}=-4.5V, I_D=-1.33A	-	400	-	nS
Rise Time[3,4]	t_r		-	60	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	20	-	
Fall Time[3,4]	t_f		-	800	-	
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, F=1MHz	-	58	-	pF
Output Capacitance	C_{oss}		-	5.7	-	
Reverse Transfer Capacitance	C_{rss}		-	4.4	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{SD}=-1A	-	-	-1.1	V
Reverse Recovery Time	t_{rr}	I_F=-1A, di/dt=100A/μs	-	9.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.8	-	nC

Notes:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.
2. Repetitive rating, pulse width limited by junction temperature.
3. The current rating is based on the t<10s junction to ambient thermal resistance rating.

Typical Electrical and Thermal Characteristic Curves

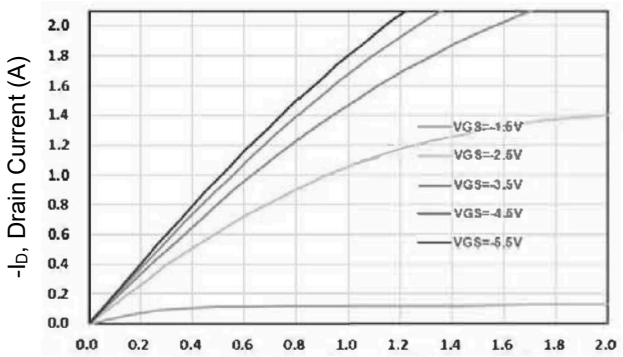


Figure 1. Output Characteristics

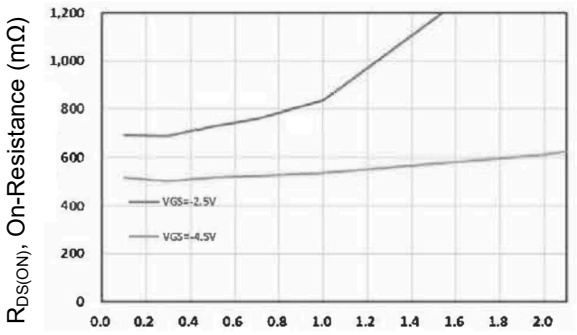


Figure 2. On-Resistance vs. I_D

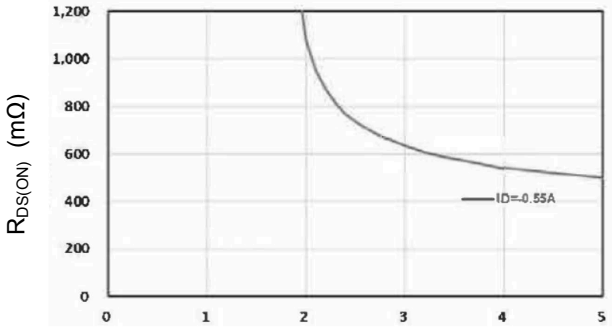


Figure 3. Power Dissipation

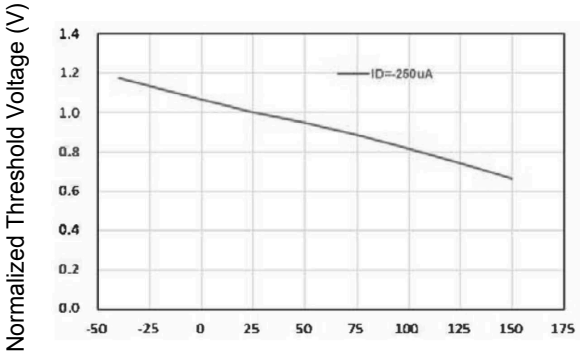


Figure 4. Gate Threshold Voltage

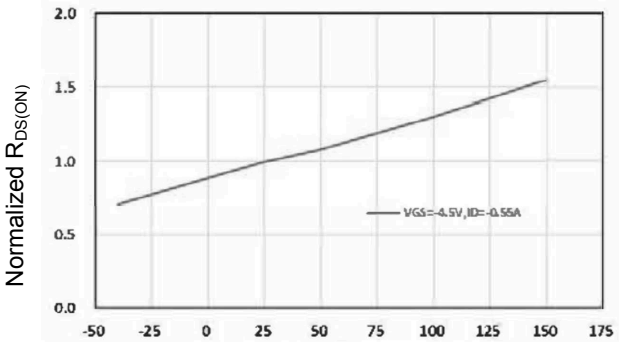


Figure 5. Drain-Source On Resistance

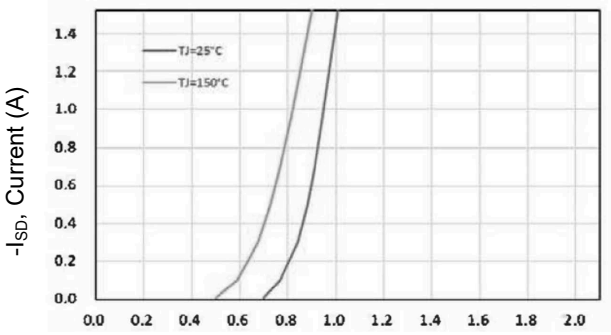


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

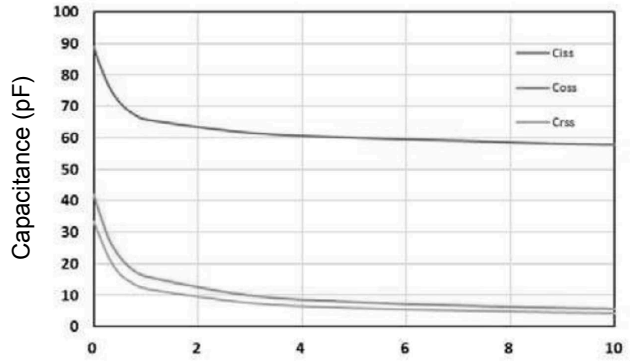


Figure 7. Capacitance Characteristics

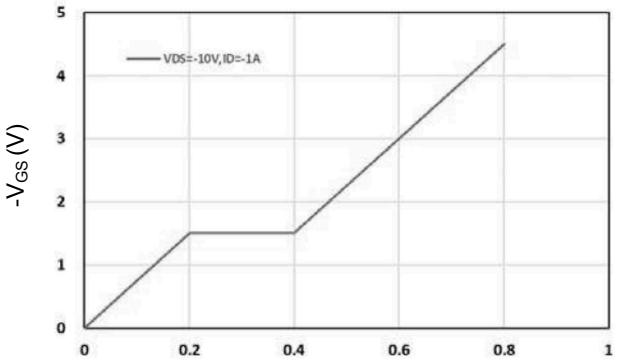


Figure 8. Gate Charge Characteristics

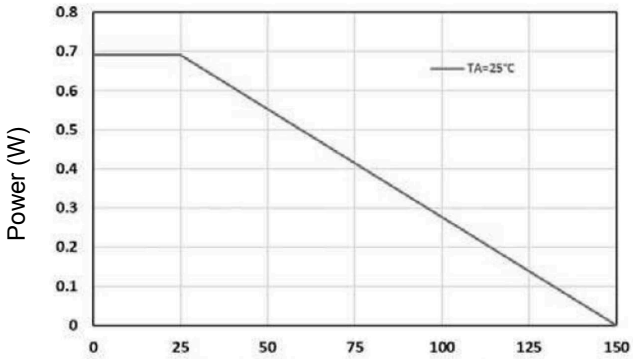


Figure 9. Power Dissipation

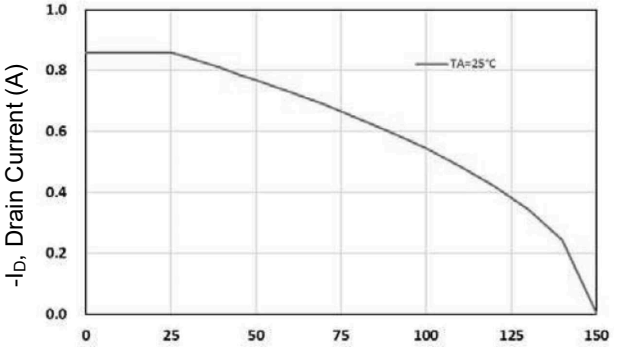


Figure 10. Drain Current

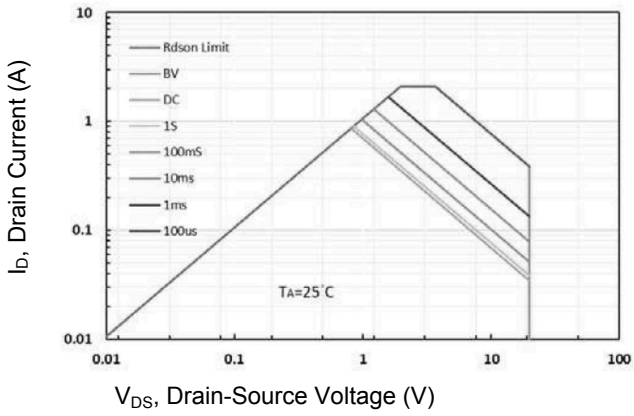


Figure 11. Safe Operating Area

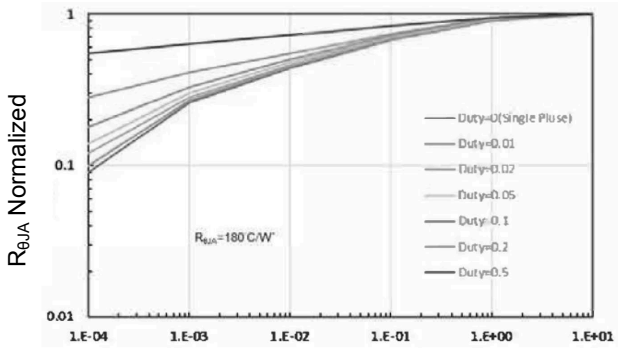
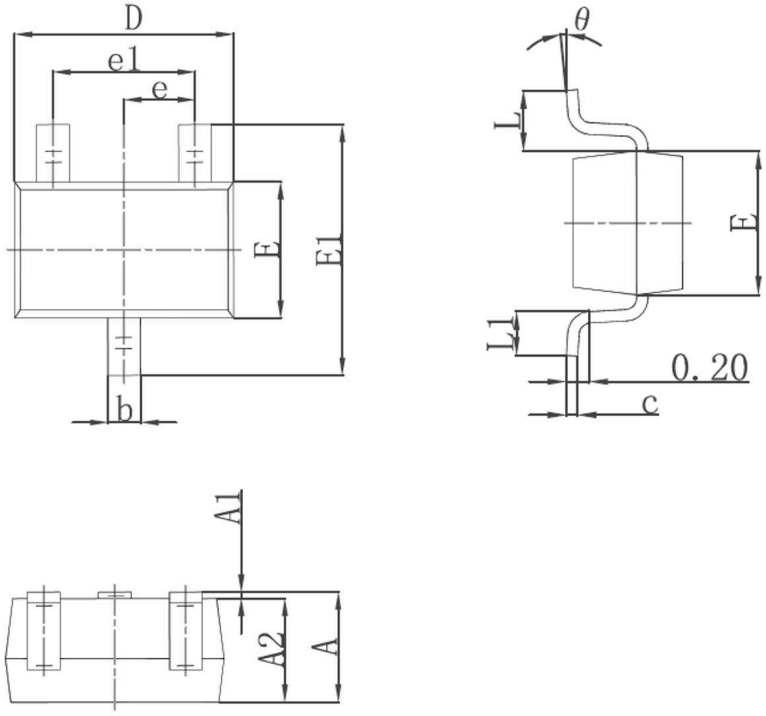


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

Package Outline Dimensions (SOT-23)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°