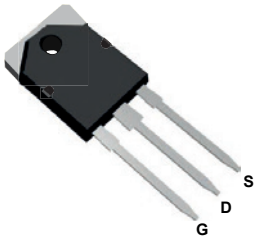
GOOD-ARK SEMICONDUCTOR

GSFV2546

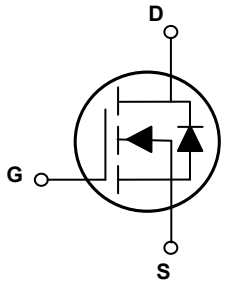
250V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	250V
$R_{DS(ON)}$	46mΩ (Max.)
I_D	68A



TO-3P



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 GSFV2546 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	Value	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-to-Source Voltage	V_{GS}	±30	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	68	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		45.6	A
Pulsed Drain Current[1]	I_{DM}	272	A
Power Dissipation (T_C=25°C)	P_D	480	W
		3.84	W/°C
Single Pulse Avalanche Energy[4]	E_{AS}	625	mJ
Single Pulse Avalanche Current[4]	I_{AS}	50	A
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.26	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C
Maximum 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=20A	-	34.5	46	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	3.0	-	4.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	8502	-	pF
Output Capacitance	C_{oss}		-	425	-	
Reverse Transfer Capacitance	C_{rss}		-	86	-	
Total Gate Charge[2,3]	Q_g	I_D=40A, V_{DS}=50V, V_{GS}=10V	-	152	-	nC
Gate-to-Source Charge[2,3]	Q_{gs}		-	21.8	-	
Gate-to-Drain ("Miller") Charge[2,3]	Q_{gd}		-	43.5	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=50V, V_{GS}=10V, R_G=3Ω, I_D=40A	-	35.8	-	nS
Rise Time[2,3]	t_r		-	9.8	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	63	-	
Fall Time[2,3]	t_f		-	6.1	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	1.5	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	T_C=25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	68	A
Diode Pulse Current	I_{SM}		-	-	272	A
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	-	-	1.3	V
Reverse Recovery Time	t_{rr}	I_S=40A, V_{GS}=0V, dI_F/dt=100A/us	-	156.7	-	nS
Reverse Recovery Charge	Q_{rr}		-	1.07	-	uC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.
4. E_{AS} condition: T_J=25°C, V_{DD}=40V, V_G=10V, R_g=25Ω, L=0.5mH.

Typical Electrical and Thermal Characteristic Curves

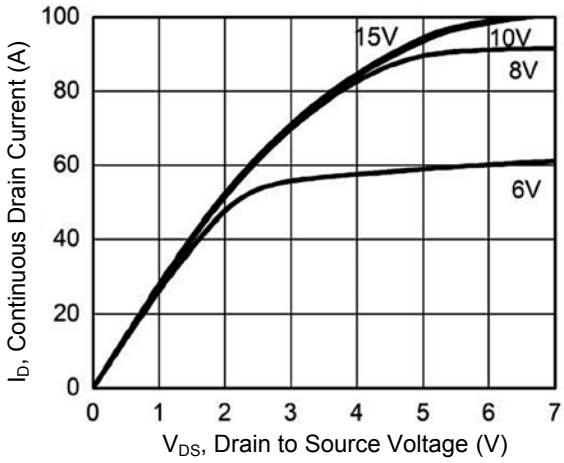


Figure 1. Output Characteristics

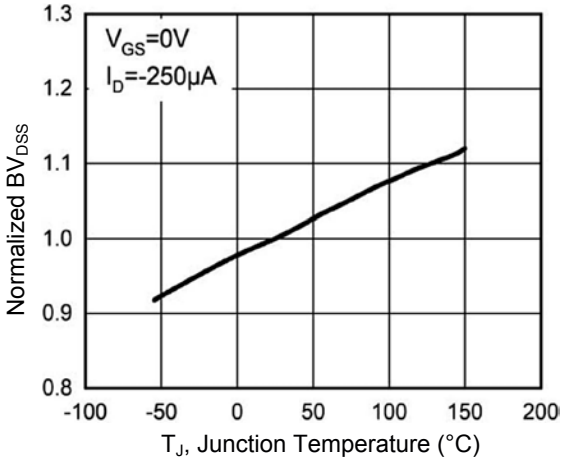


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

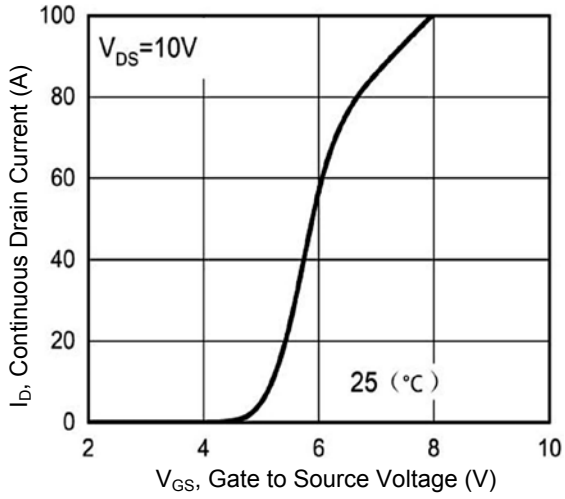


Figure 3. Transfer Characteristics

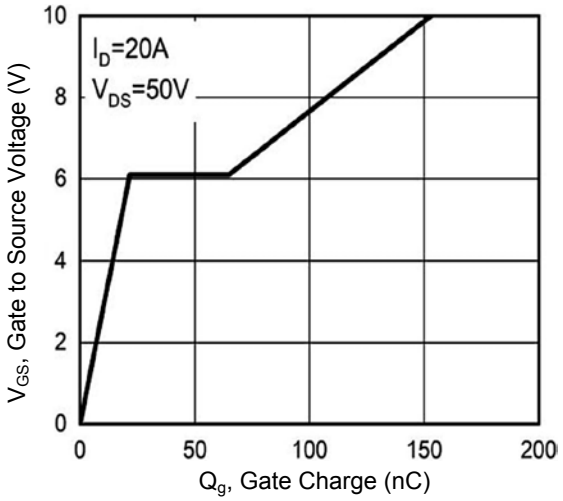


Figure 4. Gate Charge Waveform

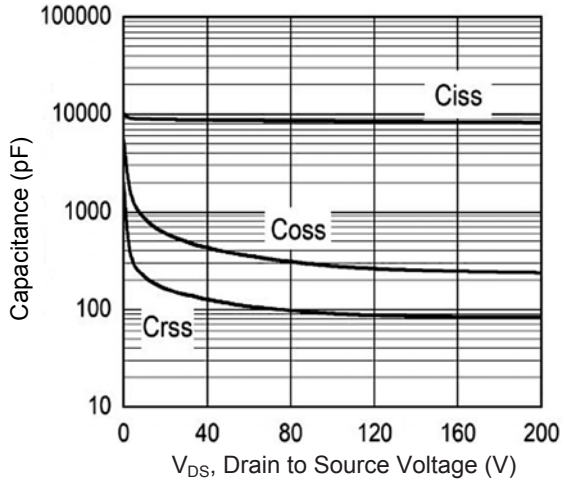


Figure 5. Capacitance Characteristics

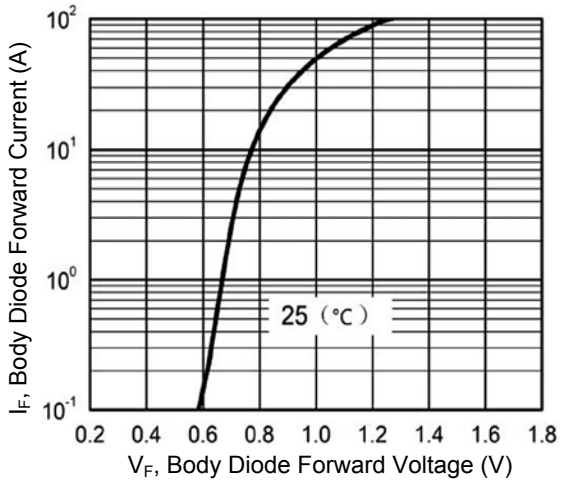
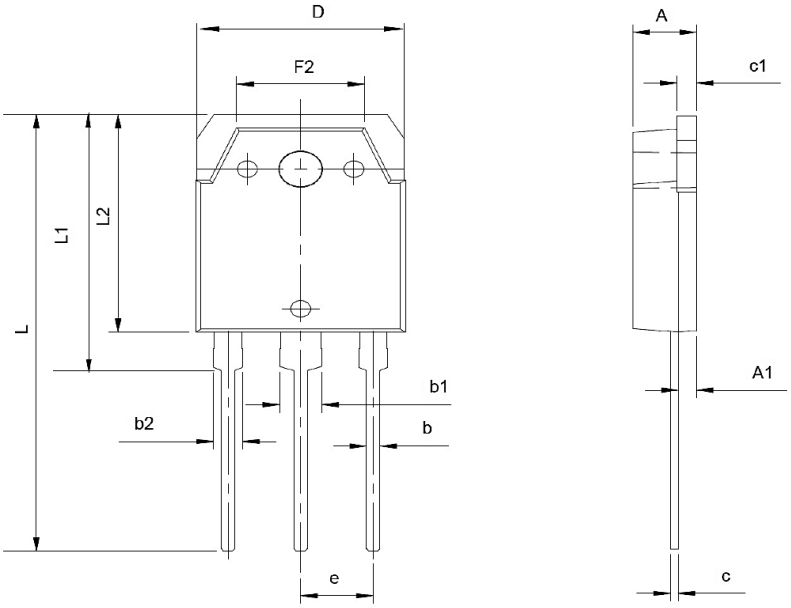


Figure 6. Body Diode Characteristics

Package Outline Dimensions (TO-3P)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.40	5.20	0.173	0.205
c1	1.20	1.80	0.047	0.071
A1	1.20	2.00	0.047	0.079
b	0.70	1.30	0.028	0.051
b1	2.70	3.30	0.106	0.130
b2	1.70	2.30	0.067	0.091
D	15.00	16.00	0.591	0.630
c	0.40	0.80	0.016	0.031
F2	8.50	10.00	0.335	0.394
e	5.45 TYP		0.215 TYP	
L1	22.60	23.60	0.890	0.929
L	39.00	41.50	1.535	1.634
L2	19.50	21.00	0.768	0.827

Order Information

Device	Package	Marking	Carrier	Quantity
GSFV2546	TO-3P	V2546	Tube	30 Pcs / Tube