GOOD-ARK SEMICONDUCTOR

GSFW3004

30V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	560mΩ
I_D	400mA
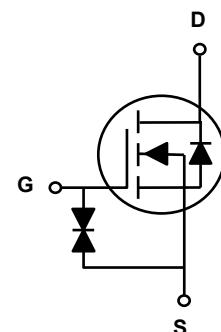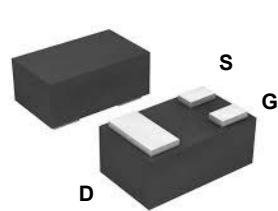
SOT-883

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 GSFW3004 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_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous(T_C=25°C)	I_D	400	mA
Drain Current-Continuous(T_C=100°C)		250	mA
Drain Current-Pulsed[1]	I_{DM}	1600	mA
Power Dissipation(T_C=25°C)	P_D	155	mW
Power Dissipation-Derate Above 25°C		1.25	mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	800	°C/W
Storage Temperature Range	T_{STG}	-55 To +150	°C
Operating Junction Temperature Range	T_J	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250µA	30	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V , V_{GS}=0V, T_J=25°C	-	-	1	µA
		V_{DS}=24V , V_{GS}=0V, T_J=125°C	-	-	10	µA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±20	µA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.2A	-	465	560	mΩ
		V_{GS}=2.5V, I_D=0.1A	-	575	750	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250µA	0.5	0.8	1.2	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	-1.74	-	mV/°C
Forward Transconductance	g_{FS}	V_{DS}=4V, I_D=0.3A	-	1	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=15V, I_D=0.3A, V_{GS}=4.5V	-	2.6	5.2	nC
Gate-Source Charge[2,3]	Q_{gs}		-	0.9	1.8	
Gate-Drain Charge[2,3]	Q_{gd}		-	0.6	1.2	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=15V, R_G=10Ω V_{GS}=4.5V, I_D=0.3A	-	5.5	11	nS
Rise Time[2,3]	t_r		-	4	8	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	14.5	29	
Fall Time[2,3]	t_f		-	6.5	13	
Input Capacitance	C_{Iss}	V_{DS}=15V, V_{GS}=0V, F=1MHz	-	72.9	146	PF
Output Capacitance	C_{oss}		-	18.3	36.6	
Reverse Transfer Capacitance	C_{rss}		-	7.4	14.8	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	400	mA
Pulsed Source Current	I_{SM}		-	-	800	
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=0.2A, T_J=25°C	-	-	1	V
Reverse Recovery Time	T_{rr}	V_{GS}=0V, I_S=0.3A, di/dt=100A/µs, T_J=25°C	-	13	-	nS
Reverse Recovery Charge	Q_{rr}		-	6	-	nC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.

2. The data tested by pulsed , pulse width $\leq$ 300us , duty cycle $\leq$ 2%.

3. Essentially independent of operating temperature.

## Typical Electrical and Thermal Characteristic Curves
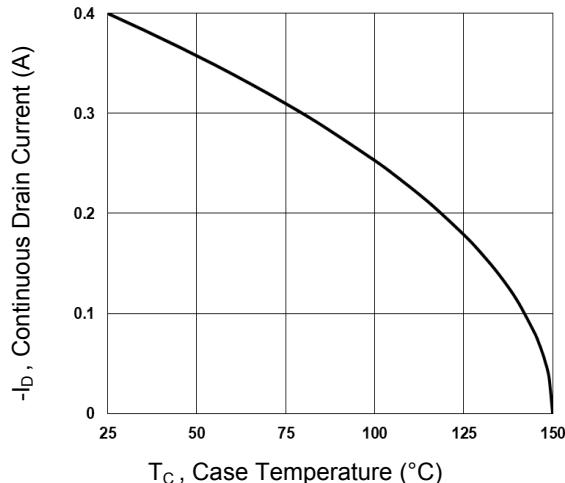

Figure 1. Continuous Drain Current vs. T_C
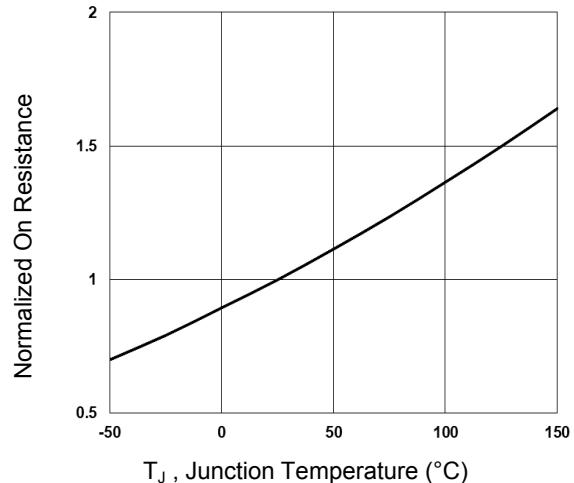
Figure 2. Normalized R_{DSON} vs. T_J
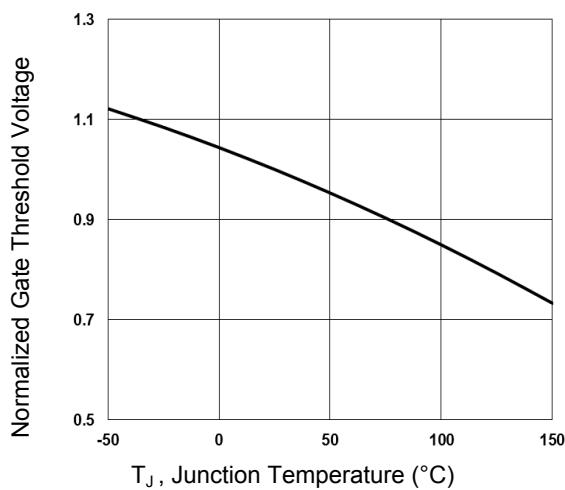

Figure 3. Normalized V_{th} vs. T_J
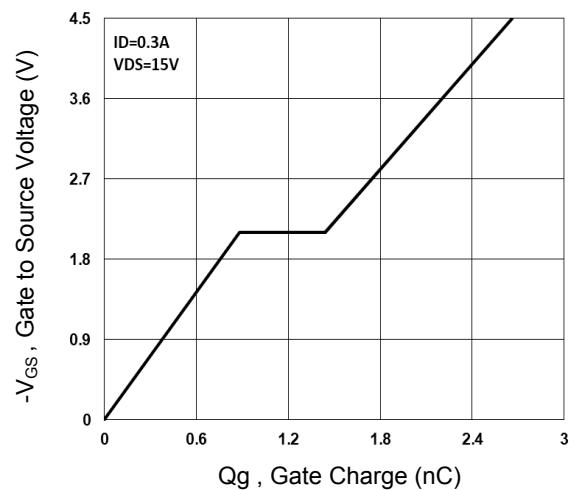
Figure 4. Gate Charge Waveform
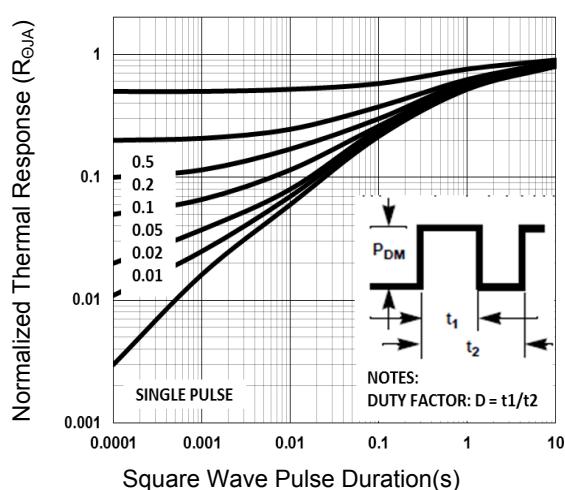
Figure 5. Normalized Transient Response
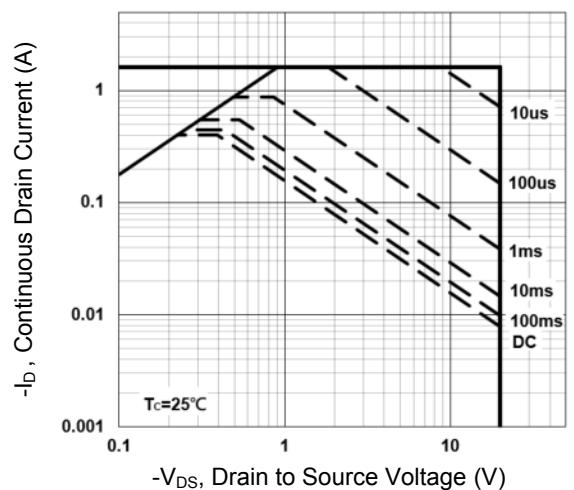
Figure 6. Maximum Safe Operation Area

## Typical Electrical and Thermal Characteristic Curves
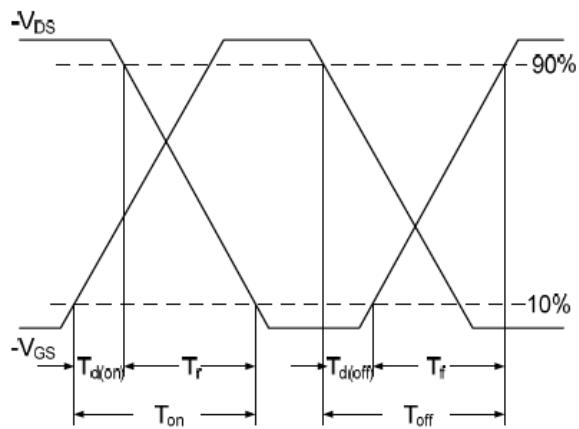

Firgure 7. Switching Time Waveform
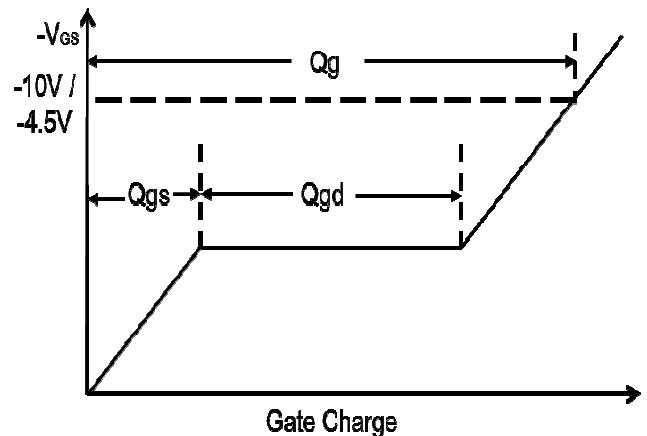
Firgure 8. Gate Charge Waveform

Package Outline Dimensions (SOT-883)
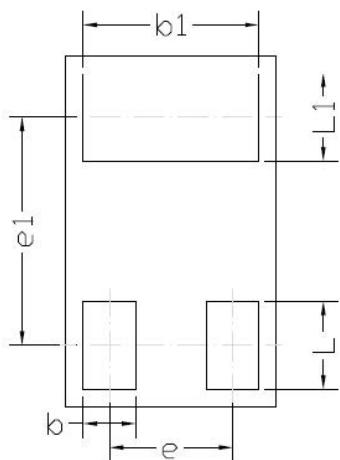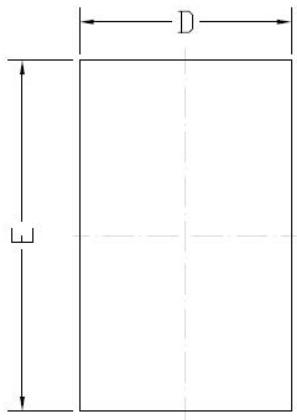
SIDE VIEW
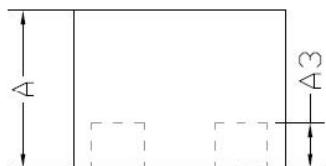
S Y M B O L	COMMON DIMENSIONS MILLIMETER		
	MIN	NOM.	MAX
A	0.40	0.45	0.50
A3	0.127 BSC		
D	0.55	0.60	0.65
E	0.95	1.00	1.05
e	0.35 BSC		
e1	0.65 BSC		
b	0.13	0.15	0.18
b1	0.45	0.50	0.55
L	0.20	0.25	0.30
L1	0.20	0.25	0.30