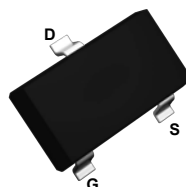
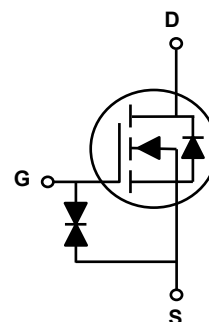


Main Product Characteristics

BV_{DSS}	20V
$R_{DS(ON)}$	27mΩ
I_D	6.5A



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 GSF3416 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 ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	6.5	A
Drain Current-Pulsed ¹	I_{DM}	30	A
Maximum Power Dissipation	P_D	1.4	W
Thermal Resistance, Junction-to-Ambient ²	$R_{\theta JA}$	89	$^{\circ}\text{C/W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V , V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
On Characteristics ³						
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =6.5A	-	17	27	mΩ
		V _{GS} =2.5V, I _D =5.5A	-	21	33	
		V _{GS} =1.8V, I _D =5A	-	28	40	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.7	1.0	V
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6.5A	8	-	-	S
Dynamic and Switching Characteristics ⁴						
Total Gate Charge	Q _g	V _{DS} =10V, I _D =6.5A, V _{GS} =4.5V	-	8	-	nC
Gate-Source Charge	Q _{gs}		-	2.5	-	
Gate-Drain Charge	Q _{gd}		-	3	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =10V, R _L =1.5Ω V _{GS} =5V, R _{GEN} =3Ω	-	0.5	-	nS
Turn-On Rise Time	t _r		-	1	-	
Turn-Off Delay Time	t _{d(off)}		-	12	-	
Turn-Off Fall Time	t _f		-	4	-	
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, F=1MHz	-	660	-	pF
Output Capacitance	C _{oss}		-	160	-	
Reverse Transfer Capacitance	C _{rss}		-	87	-	
Drain-Source Diode Characteristics						
Diode Forward Current ²	I _S		-	-	6.5	A
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V, I _S =6.5A	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design

Typical Electrical and Thermal Characteristic Curves

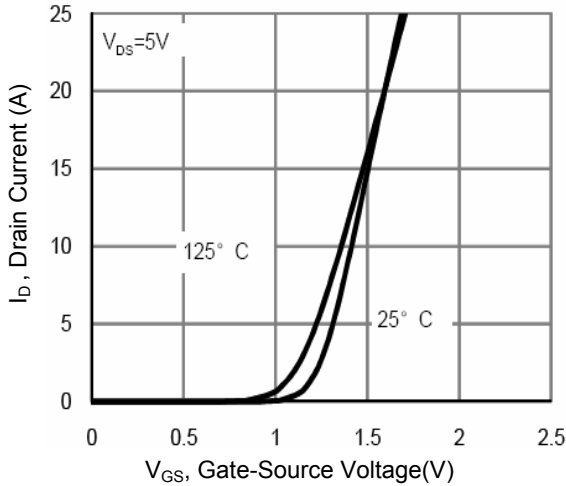


Figure 1. Transfer Characteristics

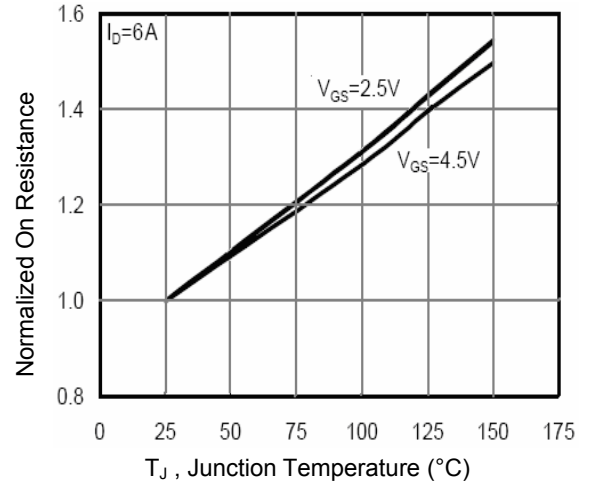


Figure 2. $R_{DS(on)}$ -Junction Temperature

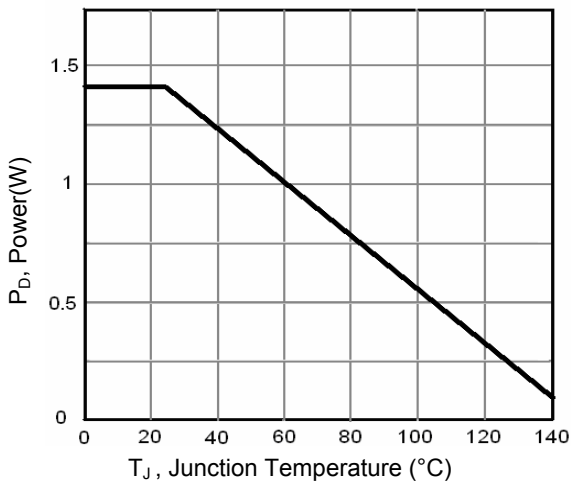


Figure 3. Power De-Rating

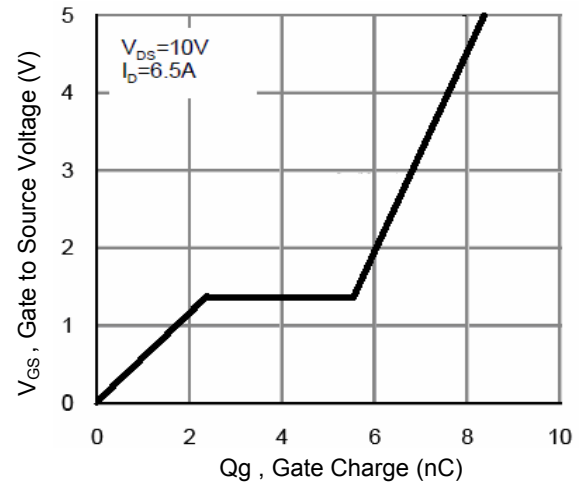


Figure 4. Gate Charge

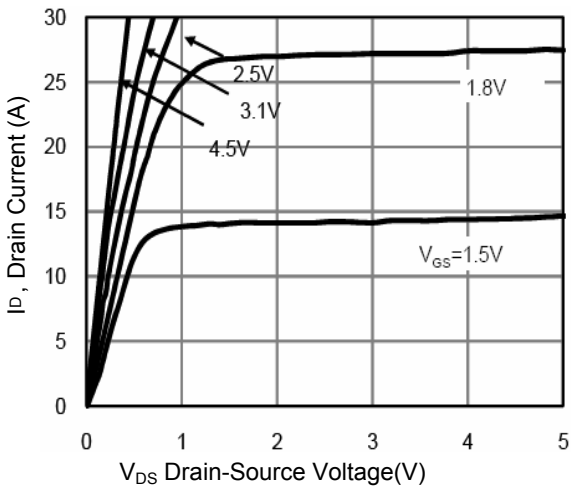


Figure 5. Output Characteristics

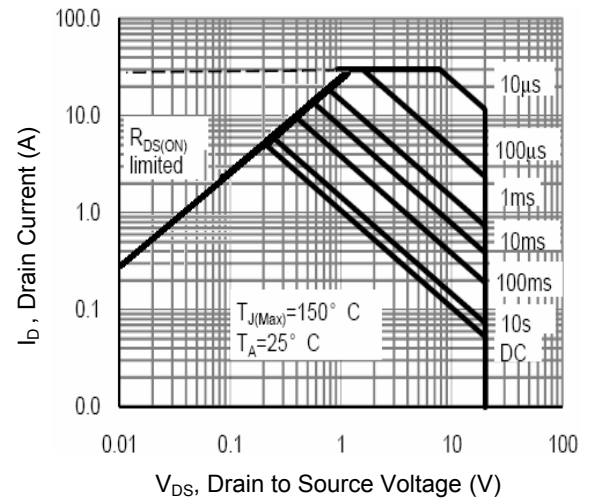


Figure 6. Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

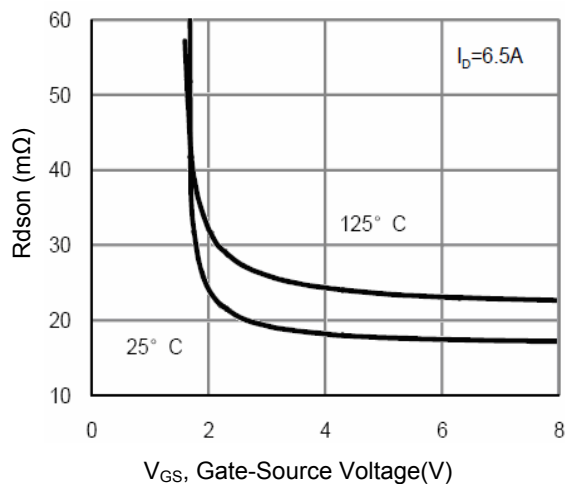


Figure 7. Rdson vs. VGS

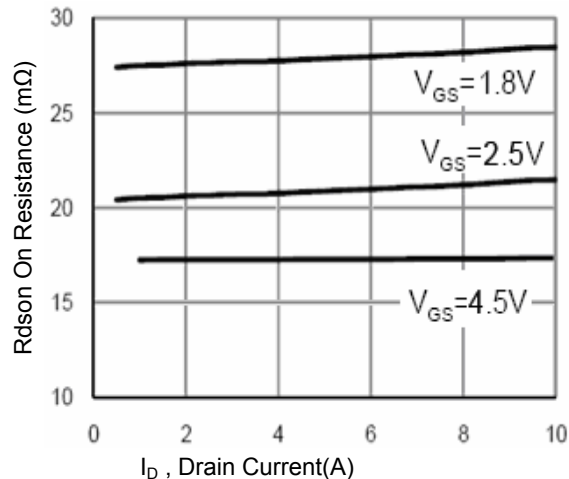


Figure 8. Rdson-Drain Current

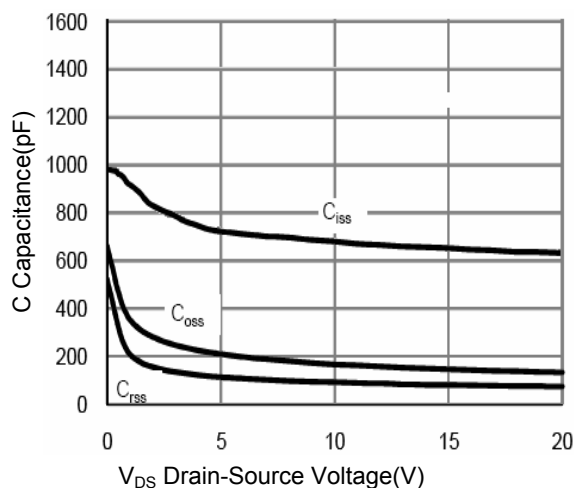


Figure 9. Capacitance vs. VDS

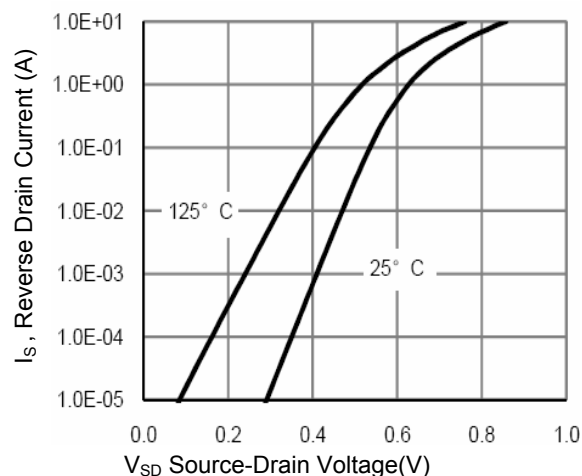


Figure 10. Source-Drain Diode Forward

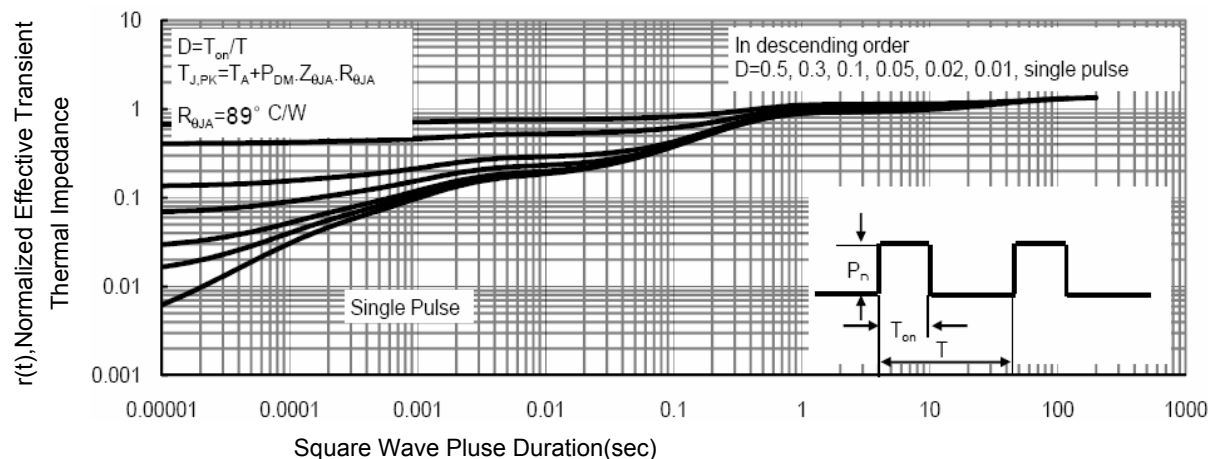


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

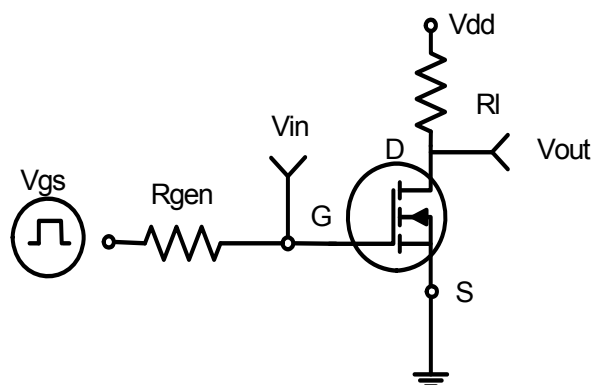


Figure 12. Switching Test Circuit

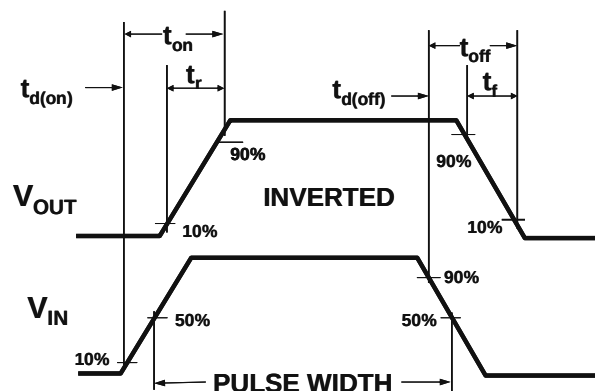
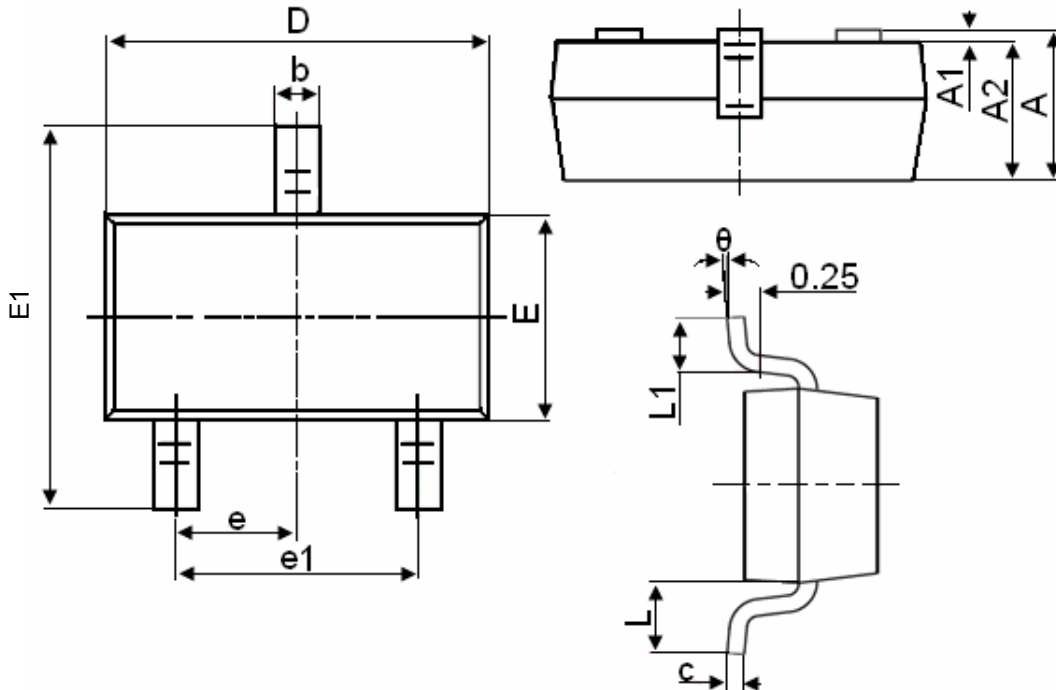


Figure 13. Switching Waveform

Package Outline Dimensions (SOT-23)



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.