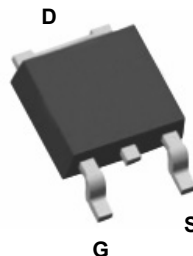
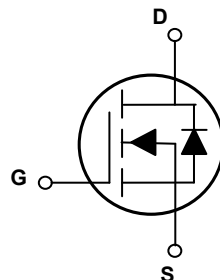


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	13mΩ(max.)
I_D	60A



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



Description

The GSFD6016 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, at Steady-State, ($T_C=25^\circ\text{C}$) ¹	I_D	60	A
Drain Current-Continuous, at Steady-State, ($T_C=100^\circ\text{C}$)	I_D	42	
Drain Current-Pulsed ²	I_{DM}	240	A
Single Pulse Avalanche Energy ³	E_{AS}	405	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	90	W
Linear Derating Factor ($T_C=25^\circ\text{C}$)		0.72	W/ $^\circ\text{C}$
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.39	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-Source Forward Leakage	I_{GSS}	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	-	11	13	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.1	-	2.4	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DD}=48V, I_D=60A, V_{GS}=10V$	-	52	-	nC
Gate-Source Charge	Q_{gs}		-	11	-	
Gate-Drain ("Miller") Charge	Q_{gd}		-	12	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, R_G=25\Omega, V_{GS}=10V, I_D=30A$	-	16	-	nS
Rise Time	t_r		-	73	-	
Turn-Off Delay Time	$t_{d(off)}$		-	182	-	
Fall Time	t_f		-	80	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	-	2460	-	pF
Output Capacitance	C_{oss}		-	172	-	
Reverse Transfer Capacitance	C_{rss}		-	131	-	
Gate Resistance	R_g	$F=1MHz$	-	3.5	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	60	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	240	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=60A$	-	-	1.3	V
Reverse Recovery Time	T_{rr}	$V_{GS}=0V, I_S=30A, dif/dt=100A/\mu s$	-	20	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.02	-	μC

Note:

1. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Repetitive rating: Pulsed width limited by maximum junction temperature.
3. $L=10mH, V_{DD}=50V, R_G=10\Omega, T_J=25^{\circ}\text{C}$.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

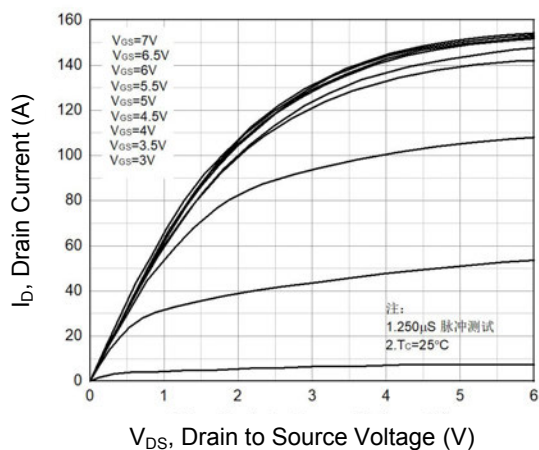


Figure 1. Output Characteristics

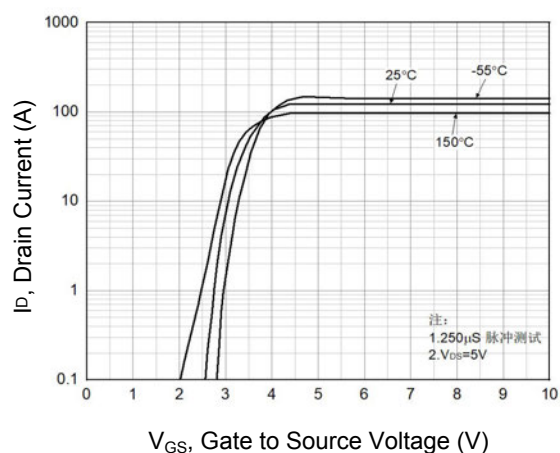


Figure 2. Transfer Characteristics

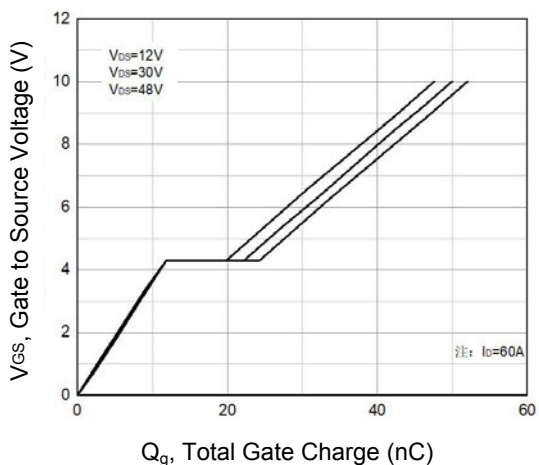


Figure 3. Gate Charge Characteristics

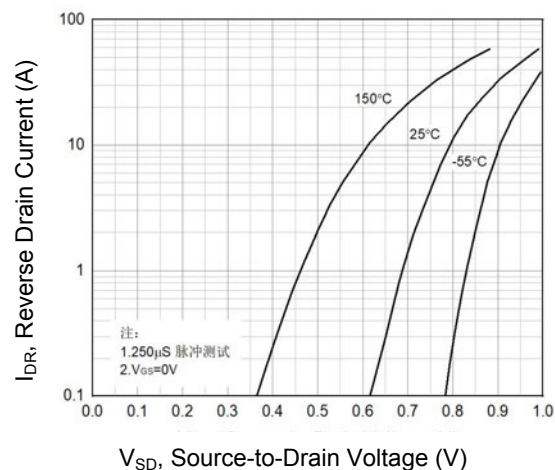


Figure 4. Normalized V_{SD} vs. I_{DR}

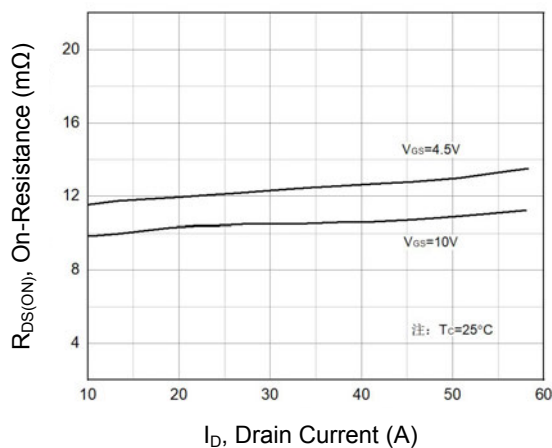


Figure 5. On Resistance vs. Drain Current

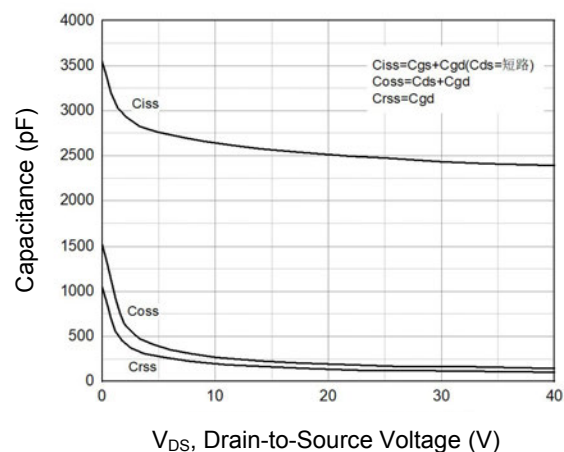


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

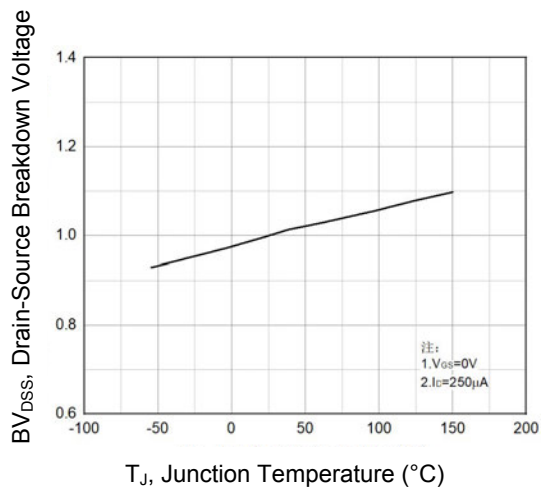


Figure 7. Normalized BV_{DSS} vs. T_J

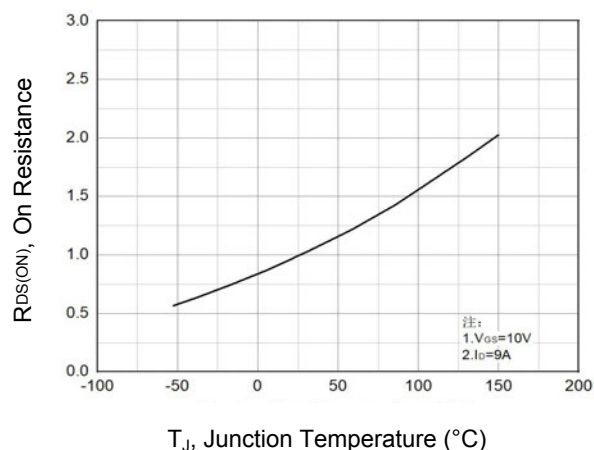


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

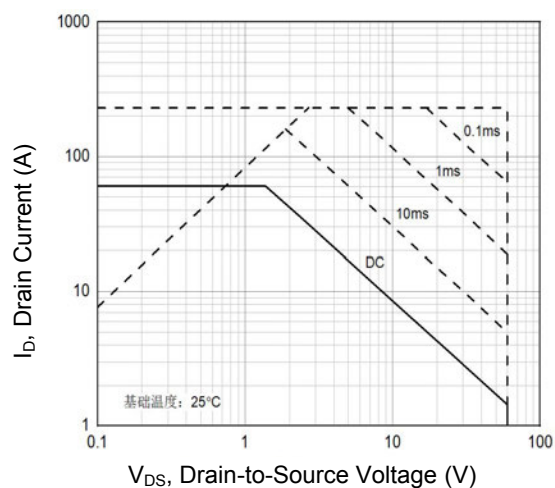
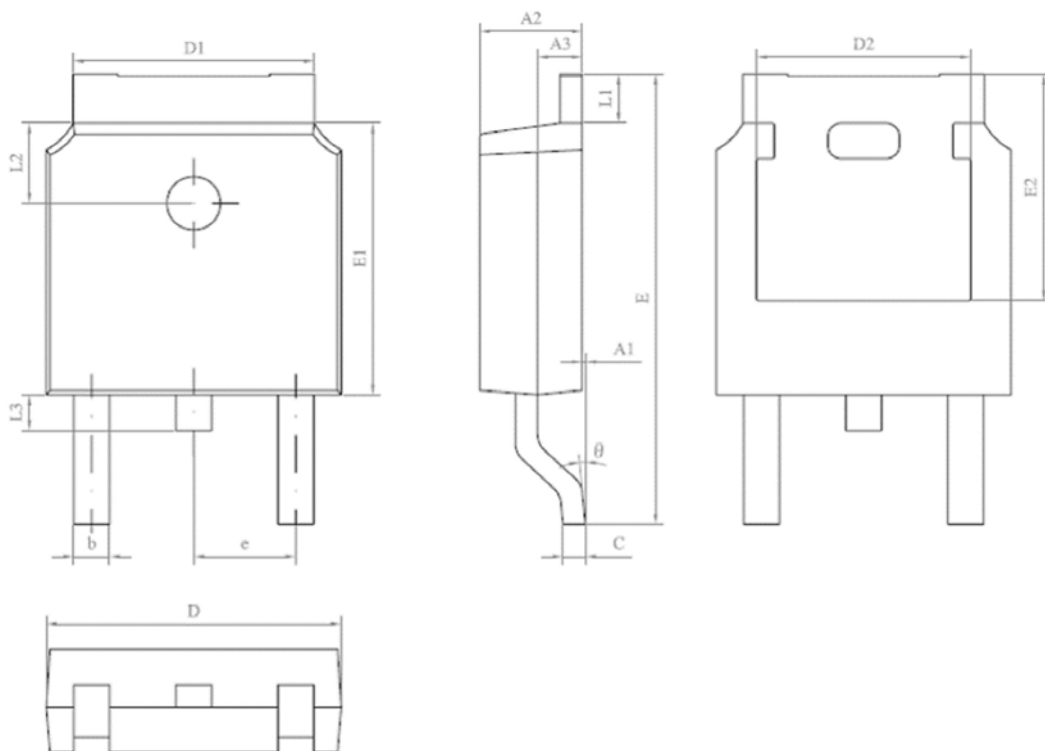


Figure 9. Maximum Safe Operating Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A1	0.00	0.10	E	9.90	10.30
A2	2.20	2.40	E1	6.00	6.20
A3	0.09	1.10	E2	5.00	5.20
b	0.75	0.85	e	2.40	2.20
C	0.50	0.60	L1	0.90	1.25
D	6.50	6.70	L2	1.70	1.90
D1	5.30	5.50	L3	0.60	1.00
D2	4.70	4.90	θ	0°	8°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD6016	TO-252 (DPAK)	D6016	Tape & Reel	2,500 pcs / Reel