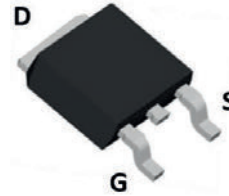
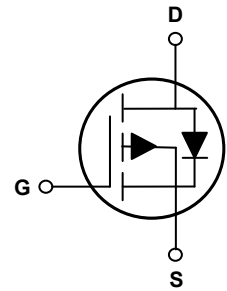


Main Product Characteristics

$V_{(BR)DSS}$	-200V
$R_{DS(ON)}$	0.89 Ω (Max.)
I_D	-6A



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 GSFD2089 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}	-200	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$) ¹	I_D	-6	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		-4.2	A
Pulsed Drain Current ²	I_{DM}	-24	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	75	W
Linear Derating Factor ($T_C=25^\circ\text{C}$)		0.60	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ³	E_{AS}	81	mJ
Junction-to-Case	$R_{\theta JC}$	1.67	$^\circ\text{C}/\text{W}$
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (T_A=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	-200	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =-200V, V _{GS} =0V	-	-	-1	μA
		T _J =125°C	-	-	-50	
Gate-to-Source Forward Leakage	I _{GSS}	V _{GS} =20V	-	-	-100	nA
		V _{GS} =-20V	-	-	100	
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-3A	-	0.69	0.89	Ω
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-2.1	-3	-3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-25V, f=1MHz	-	2146	-	pF
Output Capacitance	C _{oss}		-	49.8	-	
Reverse Transfer Capacitance	C _{rss}		-	41	-	
Total Gate Charge	Q _g	I _D =-3A, V _{DS} =-50V, V _{GS} =-10V	-	81	-	nC
Gate-to-Source Charge	Q _{gs}		-	16	-	
Gate-to-Drain ("Miller") Charge	Q _{gd}		-	28.4	-	
Turn-on Delay Time	t _{d(on)}	V _{GS} =-10V, V _{DS} =-50V, R _G =3Ω, I _D =-3A	-	17.3	-	nS
Rise Time	t _r		-	4.4	-	
Turn-Off Delay Time	t _{d(off)}		-	15	-	
Fall Time	t _f		-	27.6	-	
Gate Resistance	R _g	f=1MHz	-	5.5	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I _S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	-6	A
Pulsed Source Current (Body Diode)	I _{SM}		-	-	-24	A
Diode Forward Voltage	V _{SD}	I _S =-3A, V _{GS} =0V	-	-	-1.4	V
Reverse Recovery Time	T _{rr}	T _J =25°C, I _F =-3A, di/dt=-100A/μs	-	63	-	ns
Reverse Recovery Charge	Q _{rr}		-	193	-	nc

Notes:

1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, V_{DD}=50V, R_G=25Ω, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

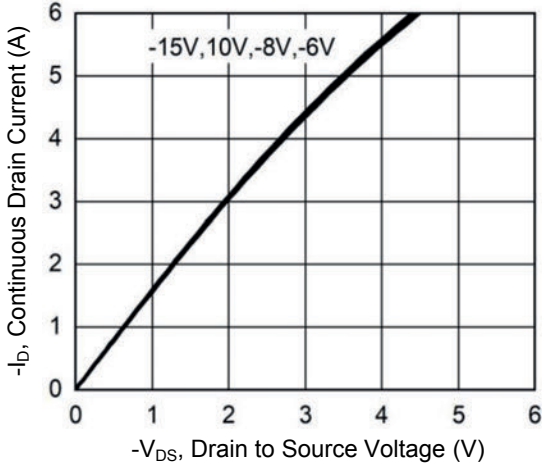


Figure 1. Output Characteristics

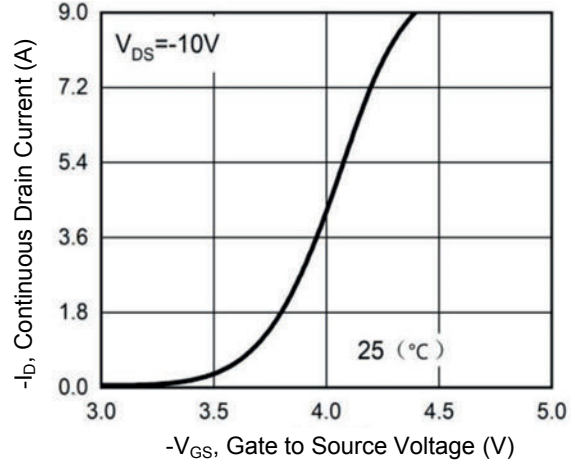


Figure 2. Transfer Characteristics

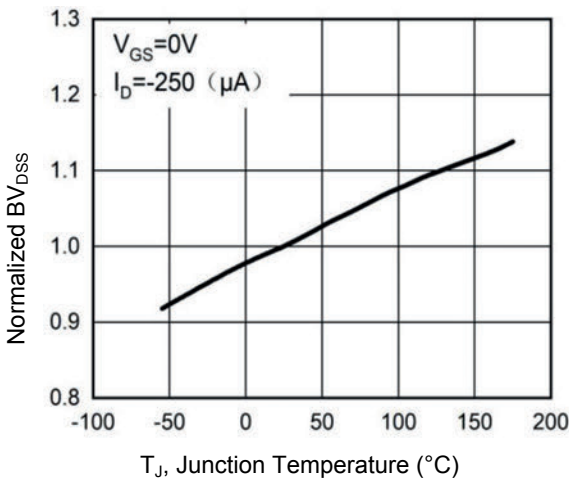


Figure 3. Normalized BV_{DS} vs. T_J

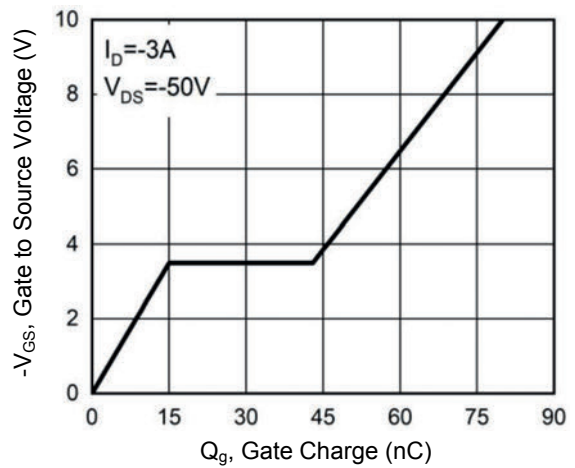


Figure 4. Gate Charge Waveform

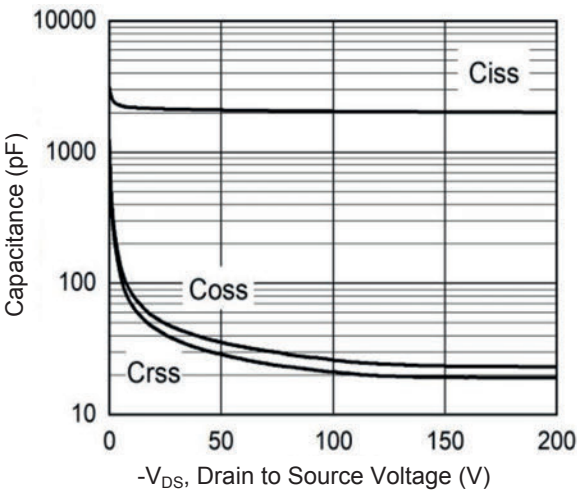


Figure 5. Capacitance Characteristics

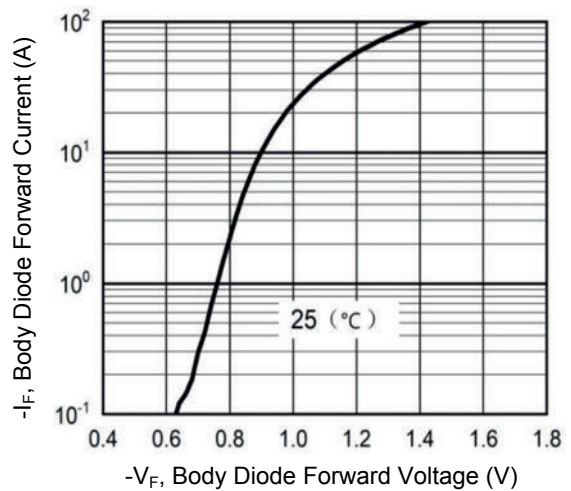
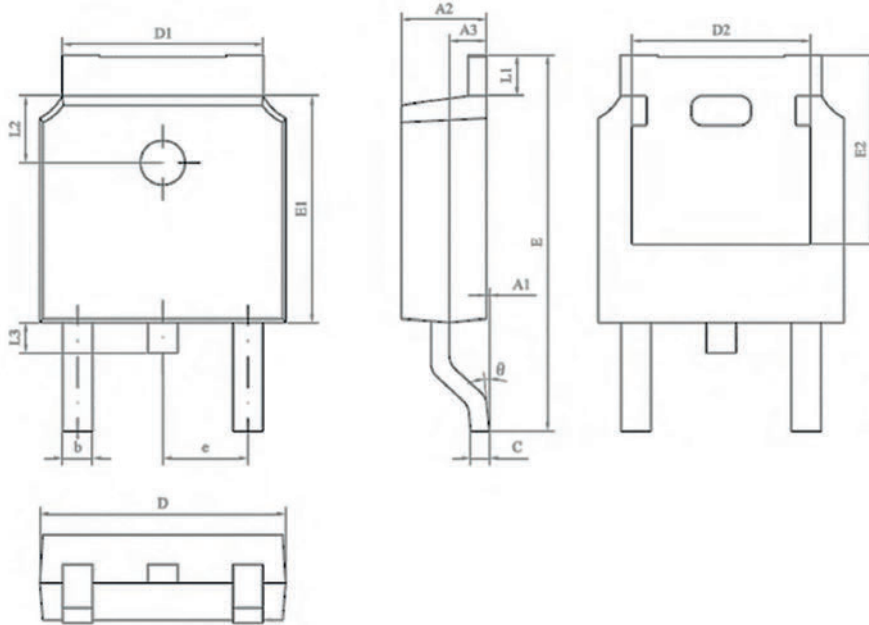


Figure 6. Body Diode Characteristics

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.00	0.10	0.000	0.004
A2	2.20	2.40	0.087	0.094
A3	0.09	1.10	0.004	0.043
b	0.75	0.85	0.030	0.033
C	0.50	0.60	0.020	0.024
D	6.50	6.70	0.256	0.264
D1	5.30	5.50	0.209	0.217
D2	4.70	4.90	0.185	0.193
E	9.90	10.30	0.390	0.406
E1	6.00	6.20	0.236	0.244
E2	5.00	5.20	0.197	0.205
e	2.20	2.40	0.087	0.094
L1	0.90	1.25	0.035	0.049
L2	1.70	1.90	0.067	0.075
L3	0.60	1.00	0.024	0.039
θ	0°	8°	0°	8°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD2089	TO-252 (DPAK)	D2089	Tape & Reel	2,500pcs / Reel

For more information, please contact us at: inquiry@goodarksemi.com