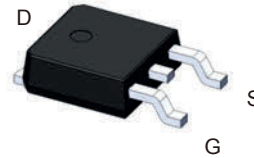
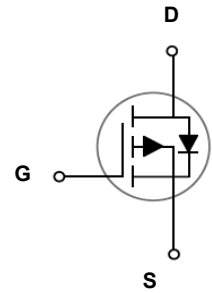


Main Product Characteristics

$V_{(BR)DSS}$	-40V
$R_{DS(ON)}$	15mΩ (Max.)
I_D	-40A



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 GSFD4015 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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, $T_C=25^\circ\text{C}$, $V_{GS}=10\text{V}^1$	I_D	-40	A
Drain Current-Continuous, $T_C=100^\circ\text{C}$, $V_{GS}=10\text{V}^1$		-27	
Drain Current-Pulsed ²	I_{DM}	-160	A
Pulsed Source Current (Body Diode) ²	I_{SM}	-160	A
Power Dissipation ($T_C=25^\circ\text{C}$) ³	P_D	80	W
Single Pulse Avalanche Energy, (L=0.3mH)	E_{AS}	245	mJ
Single Pulse Avalanche Current, (L=0.3mH)	I_{AS}	40	A
Thermal Resistance, Junction-to-Ambient, ($t \leq 10\text{s}$) ⁴	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.56	$^\circ\text{C/W}$
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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-40	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V$	-	-	-1	μA
		$V_{DS}=-40V, V_{GS}=0V, T_J=125^\circ C$	-	-	-50	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain Static-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-20A$	-	11	15	m Ω
		$V_{GS}=-4.5V, I_D=-10A$	-	15	20	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1	-1.6	-3	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DD}=-20V, I_D=-20A, V_{GS}=-10V$	-	67	-	nC
Gate-Source Charge	Q_{gs}		-	11	-	
Gate-to-Drain Charge	Q_{gd}		-	12	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, R_G=3\Omega, R_L=1.5\Omega, V_{GS}=-10V, I_D=-20A$	-	8	-	nS
Rise Time	t_r		-	26.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	105.2	-	
Fall Time	t_f		-	142.1	-	
Input Capacitance	C_{iss}	$V_{DS}=-20V, V_{GS}=0V, F=1MHz$	-	3680	-	pF
Output Capacitance	C_{oss}		-	264	-	
Reverse Transfer Capacitance	C_{rss}		-	294	-	
Gate Resistance	R_g	$F=1MHz$	-	4.3	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Body-Diode Continuous Current	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-40	-	A
Maximum Body-Diode Pulse Current	I_{SM}		-	-160	-	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-20A, T_J=25^\circ C$	-	-0.8	-1.2	V
Reverse Recovery Time	T_{rr}	$T_J=25^\circ C, I_F=-30A, di/dt=100A/\mu s$	-	15.5	-	nS
Reverse Recovery Charge	Q_{rr}		-	10.5	-	nC

Note:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. copper, in a still air environment with $T_A=25^\circ C$.

Typical Electrical and Thermal Characteristic Curves

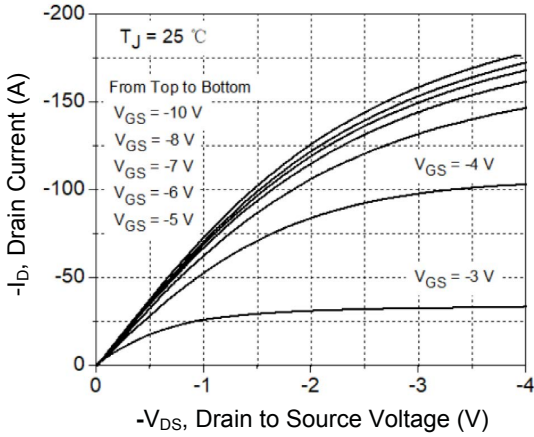


Figure 1. Output Characteristics

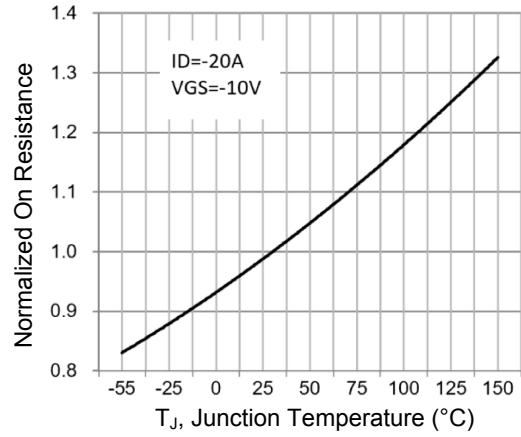


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

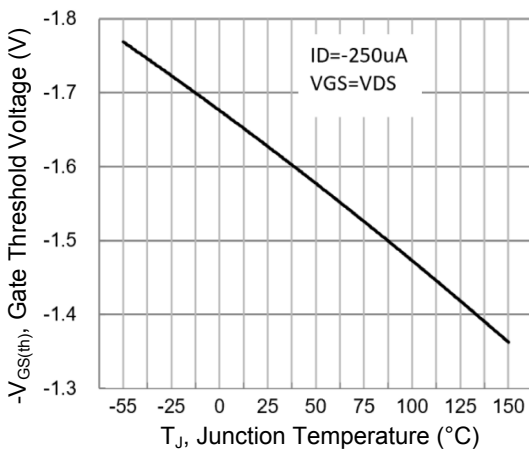


Figure 3. Gate Threshold Voltage vs. T_J

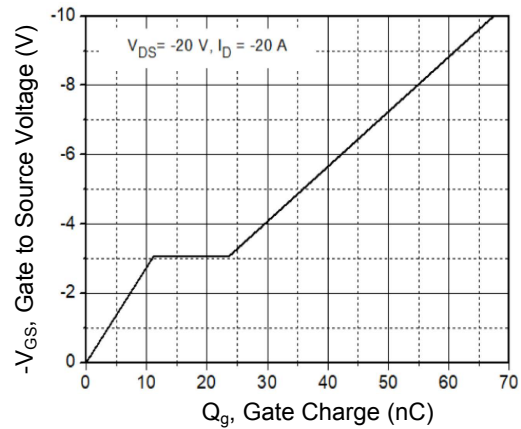


Figure 4. Gate Charge Waveform

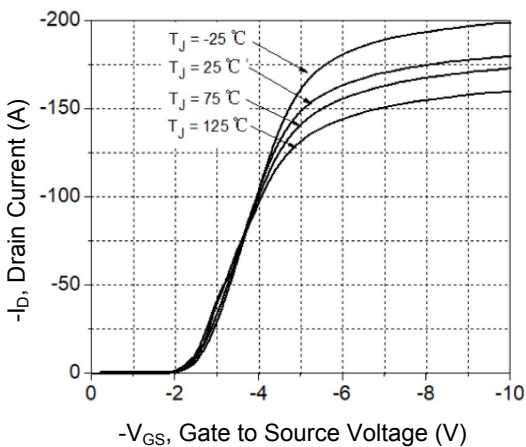


Figure 5. Transfer Characteristics

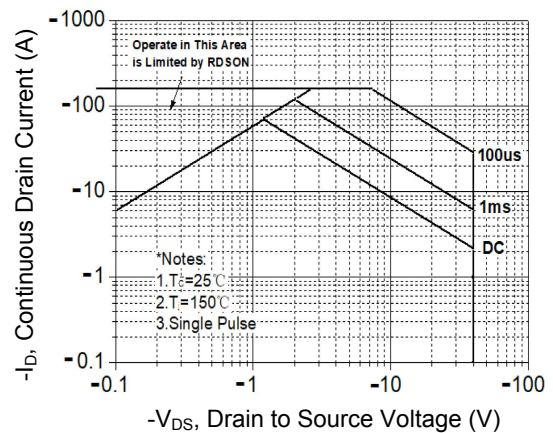
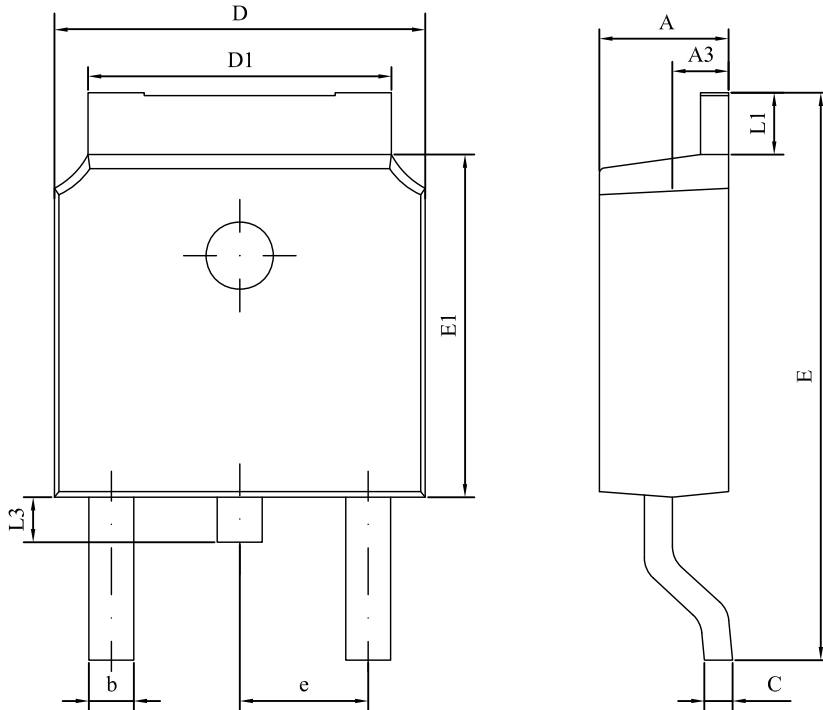


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.40	0.085	0.094
A3	0.90	1.10	0.035	0.043
b	0.50	0.90	0.020	0.035
C	0.40	0.65	0.016	0.026
D	6.30	6.90	0.248	0.272
D1	4.95	5.50	0.195	0.217
E	9.40	10.41	0.370	0.410
E1	5.90	6.30	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.89	1.27	0.035	0.050
L3	0.60	1.10	0.024	0.043

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD4015	TO-252 (DPAK)	D4015	Tape & Reel	2,500 Pcs / Reel