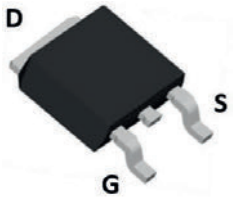
GOOD-ARK SEMICONDUCTOR

GSFD14015

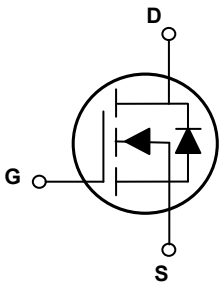
150V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	150V
$R_{DS(ON)}$	14mΩ (Max.)
I_D	100A



TO-252 (DPAK)



Schematic Diagram

Features and Benefits

- Grand Turbo MOSFET process technology.
- Optimized the cell structure.
- Low on-resistance with low gate charge.
- Featuring low switching and drive losses.
- Fast switching and reverse body recovery.
- High ruggedness and robustness.

RoHS Compliant

Description

The GSFD14015 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_J=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{(BR)DSS}$	150	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C) @ Steady-State	I_D	100	A
Drain Current-Continuous (T_C=100°C) @ Steady-State		63	
Pulsed Drain Current[2]	I_{DM}	400	A
Single Pulse Avalanche Energy[1]	E_{AS}	162	mJ
Single Pulsed Avalanche Current	I_{AS}	57	A
Power Dissipation (T_C=25°C)[3]	P_D	100	W
		0.8	W/°C
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	°C/W
Junction to Case	$R_{\theta JC}$	1.25	°C/W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Soldering Temperature	T_{SOLD}	260	°C

Electrical Characteristics (T_J=25°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=250uA	150	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=150V, V_{GS}=0V, T_J=125°C	-	5	-	μA
Gate-Source Forward Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=50A	-	12.5	14	mΩ
Gate Resistance	R_g	F=1MHz	-	1.6	-	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250uA	2	-	2.4	V
Dynamic and Switching Characteristics						
Total Gate Charge[4,5]	Q_g	V_{DD}=75V, I_D=50A, V_{GS}=10V	-	36	-	nC
Gate-Source Charge[4,5]	Q_{gs}		-	24	-	
Gate-to-Drain("Miller") Charge[4,5]	Q_{gd}		-	4.8	-	
Gate Plateau[4,5]	Vplateau		-	8	-	V
Turn-On Delay Time[4,5]	$t_{d(on)}$	V_{DD}=75V, R_G=1.6Ω, V_{GS}=10V, I_D=50A	-	22	-	nS
Rise Time[4,5]	t_r		-	25	-	
Turn-Off Delay Time[4,5]	$t_{d(off)}$		-	25	-	
Fall Time[4,5]	t_f		-	11	-	
Input Capacitance	C_{lss}	V_{DS}=75V, V_{GS}=0V, F=1MHz	-	2614	-	pF
Output Capacitance	C_{oss}		-	328	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	Is	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	100	A
Diode Pulse Current	$I_{s,pulse}$		-	-	400	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=50A	-	-	1.4	V
Reverse Recovery Time[4]	t_{rr}	V_{GS}=0V, I_S=50A, dI_F/dt=100A/μs, V_R=48V	-	96	-	nS
Reverse Recovery Charge[4]	Q_{rr}		-	0.35	-	nC

Notes:

1. EAS test condition: L=0.1mH,V_{DD}=100V,R_G=25Ω.
2. Pulse time of 5μs.
3. The dissipated power value will change with the temperature. When it is greater than 25°C, the dissipated power value will decrease by 1.11°C/W for every 1 degree of temperature increase.
4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
5. Basically unaffected by operating temperature.

Typical Electrical and Thermal Characteristic Curves

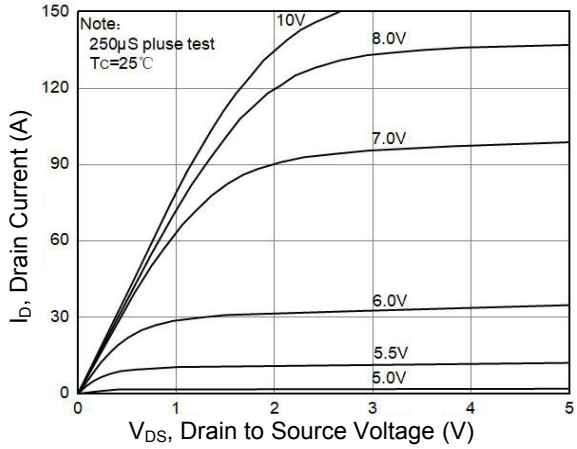


Figure 1. Typical Output Characteristics

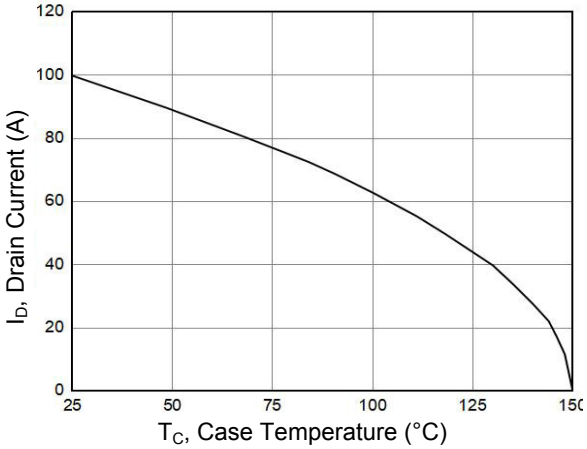


Figure 2. Power Dissipation vs. T_C

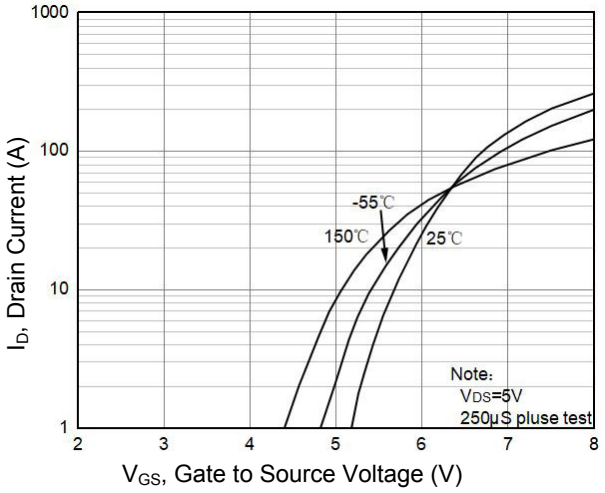


Figure 3. Transfer Characteristics

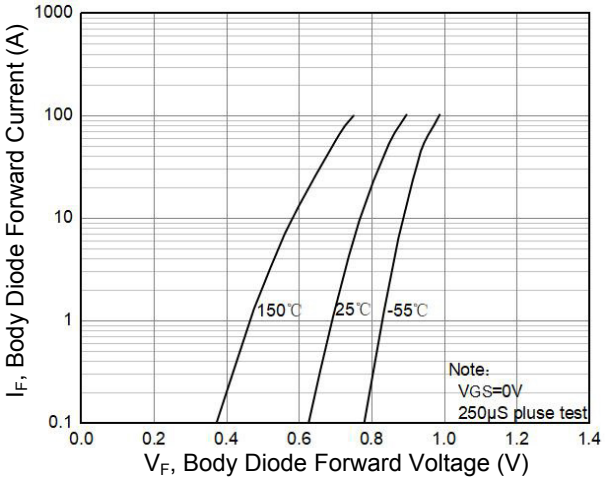


Figure 4. Body Diode Characteristics

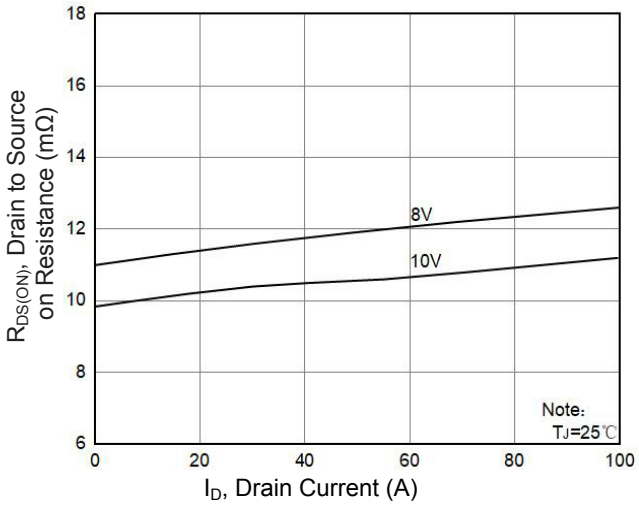


Figure 5. $R_{DS(ON)}$ vs. Drain Current

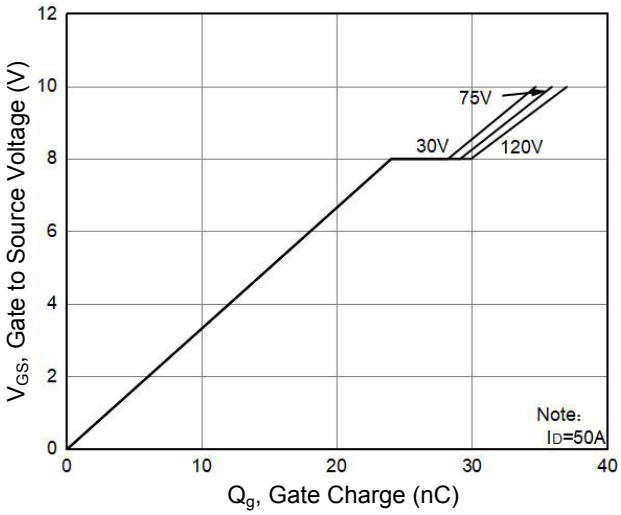


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

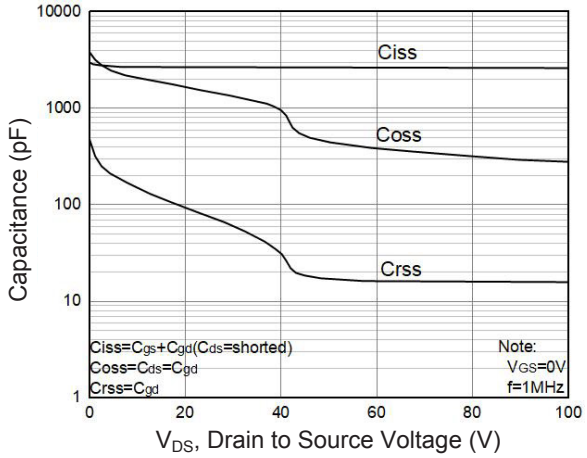


Figure 7. Capacitance Characteristics

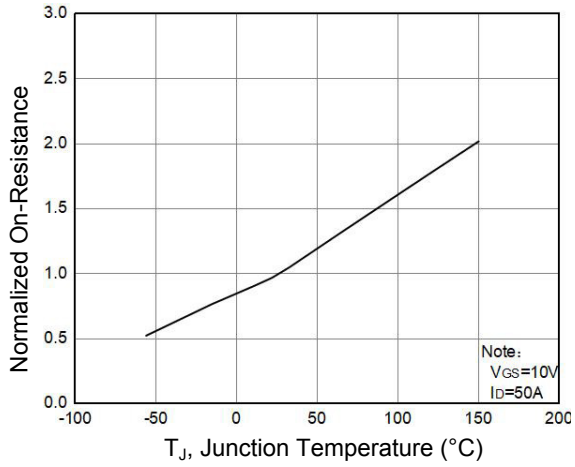


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

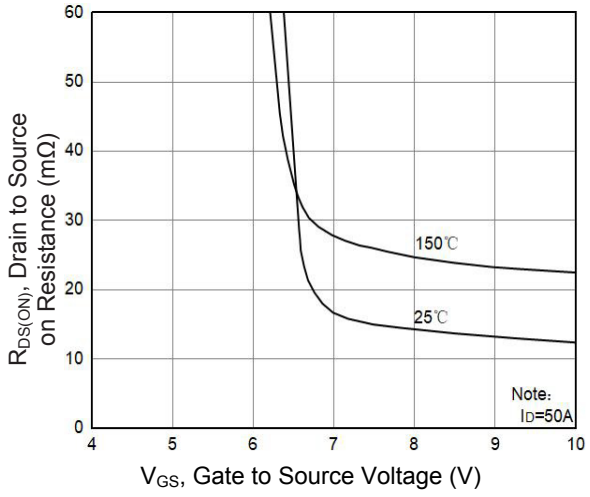


Figure 9. $R_{DS(ON)}$ vs. V_{GS}

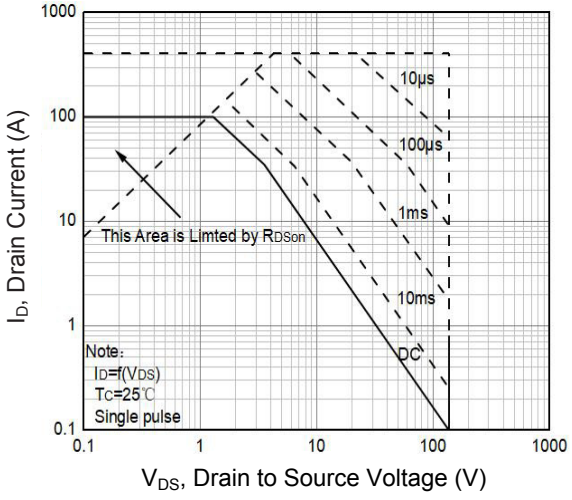


Figure 10. Safe Operation Area

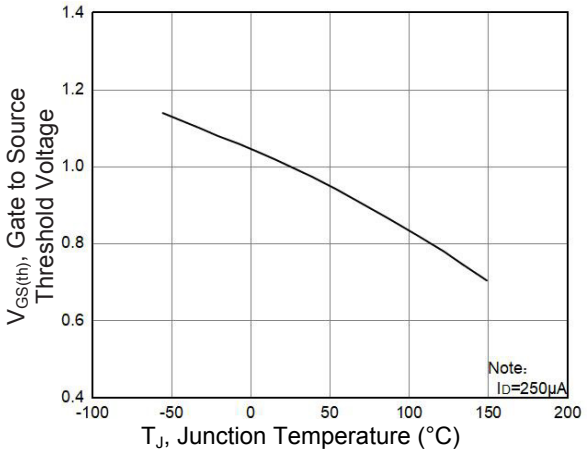


Figure 11. Gate Threshold Voltage vs T_J

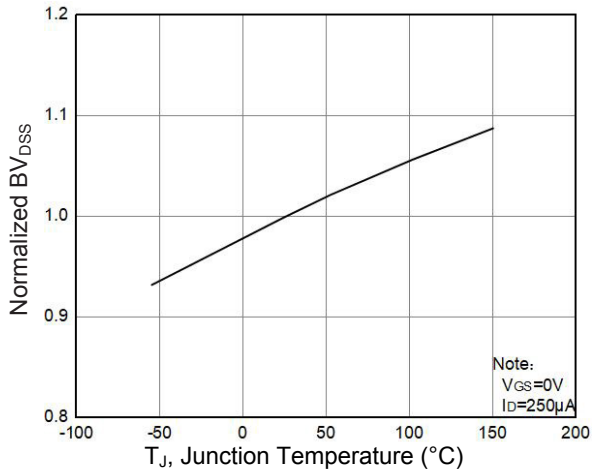
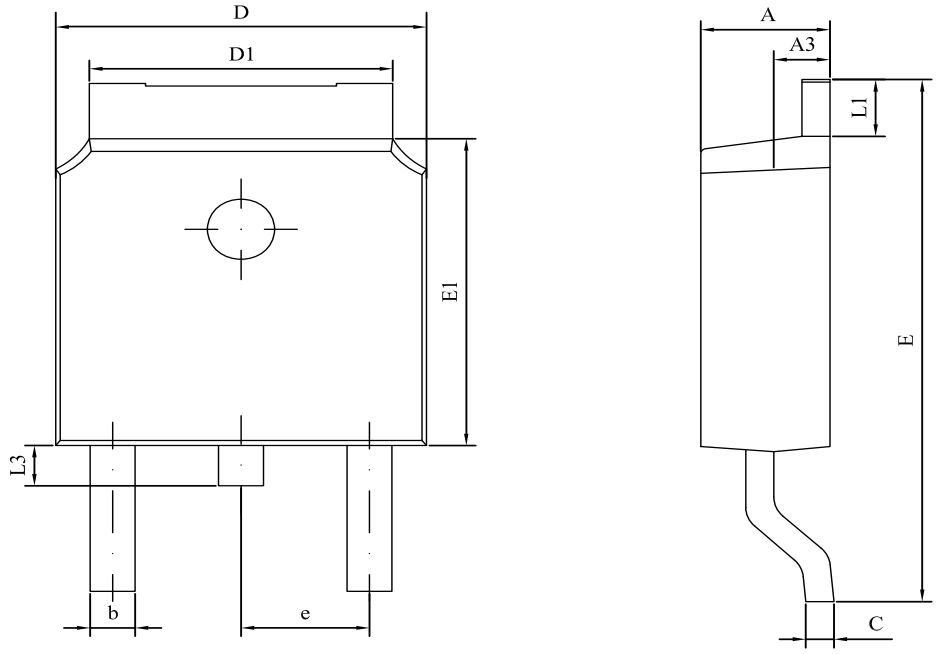


Figure 12. Normalized BV_{DSS} vs. T_J

Package Outline Dimensions TO-252(DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.150	2.400	0.085	0.094
A3	0.900	1.100	0.035	0.043
b	0.500	0.900	0.020	0.035
C	0.400	0.650	0.016	0.026
D	6.300	6.900	0.248	0.272
D1	4.950	5.500	0.195	0.217
E	9.400	10.410	0.370	0.410
E1	5.900	6.300	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.890	1.270	0.035	0.050
L3	0.600	1.100	0.024	0.043

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD14015	TO-252(DPAK)	D14015	Tape & Reel	2,500 Pcs / Reel