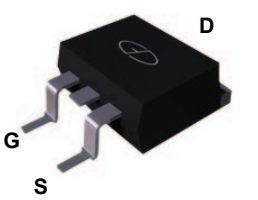
GOOD-ARK SEMICONDUCTOR

GSGT15150

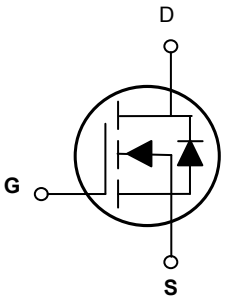
150V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	150V
$R_{DS(ON)}$	5.8mΩ
I_D	150A



TO-263(D^2PAK)



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 GSGT15150 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_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	150	A
Drain Current-Continuous (T_C=100°C)		95	
Drain Current-Pulsed[1]	I_{DM}	600	A
Single Pulse Avalanche Energy[2]	E_{AS}	1350	mJ
Single Pulse Avalanche Current[2]	I_{AS}	52	A
Power Dissipation (T_C=25°C)	P_D	305	W
Power Dissipation-Derate above 25°C		2.44	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.41	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°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=250μA	150	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=120V, V_{GS}=0V T_J=25°C	-	-	1	μA
		V_{DS}=120V, V_{GS}=0V T_J=85°C	-	-	10	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	-	4.8	5.8	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	2.0	2.8	4.0	V
Forward Transconductance	g_{fs}	V_{DS}=10V, I_D=3A	-	18	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=75V, I_D=80A, V_{GS}=10V	-	130	170	nC
Gate-Source Charge[3,4]	Q_{gs}		-	36	55	
Gate-Drain Charge[3,4]	Q_{gd}		-	32	50	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=75V, R_G=6Ω, V_{GS}=10V, I_D=80A	-	70	105	nS
Rise Time[3,4]	t_r		-	205	310	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	402	600	
Fall Time[3,4]	t_f		-	197	300	
Input Capacitance	C_{Iss}	V_{DS}=75V, V_{GS}=0V, F=1MHz	-	8525	12500	pF
Output Capacitance	C_{oss}		-	700	1050	
Reverse Transfer Capacitance	C_{rss}		-	25	40	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	2.7	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	150	A
Pulsed Source Current	I_{SM}		-	-	300	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V
Reverse Recovery Time	t_{rr}	V_R=100V, I_S=20A, di/dt=100A/μs, T_J=25°C	-	135	-	nS
Reverse Recovery Charge	Q_{rr}		-	730	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=1mH, I_{AS}=52A, R_G=25Ω, starting T_J=25°C.
3. Pulse test: pulse width ≤300us,duty cycle≤2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

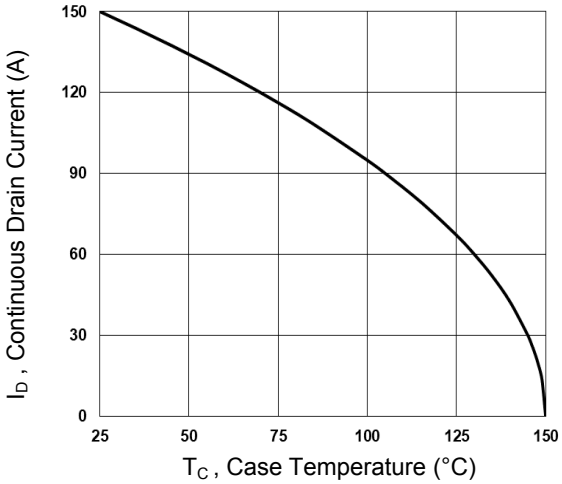


Figure 1. Continuous Drain Current vs. T_C

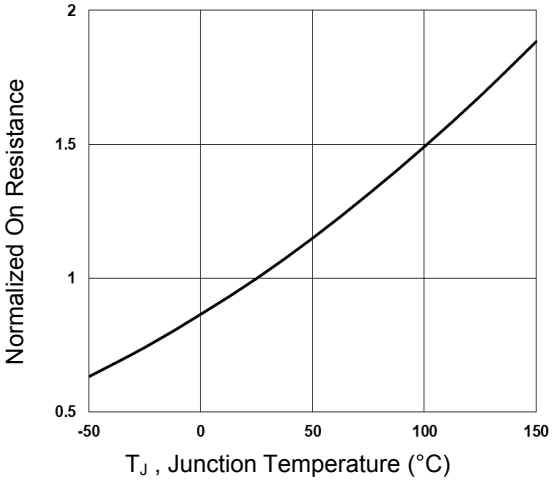


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

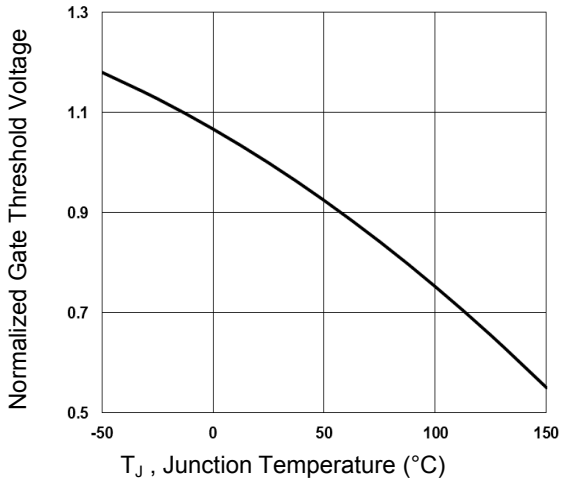


Figure 3. Normalized V_{th} vs. T_J

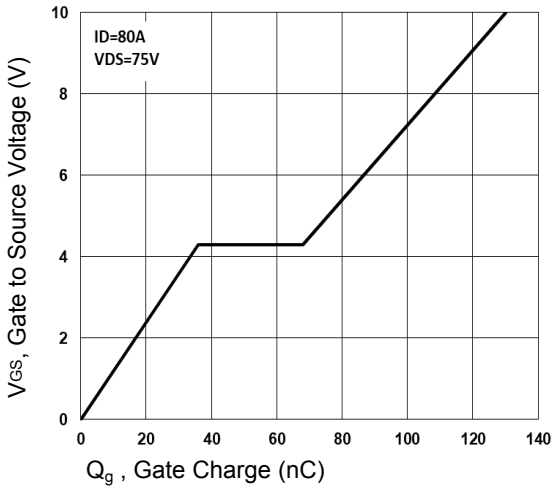


Figure 4. Gate Charge Characteristic

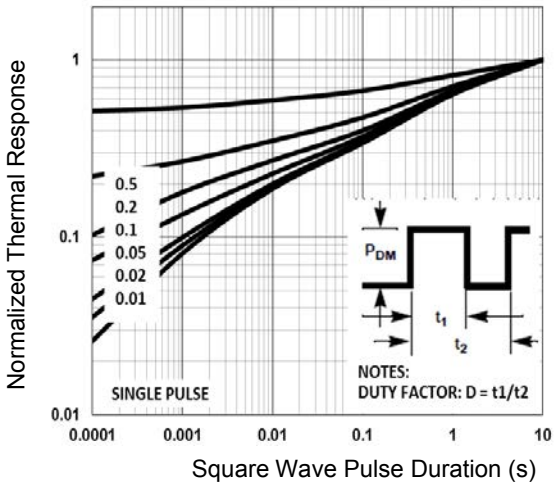


Figure 5. Normalized Transient Impedance

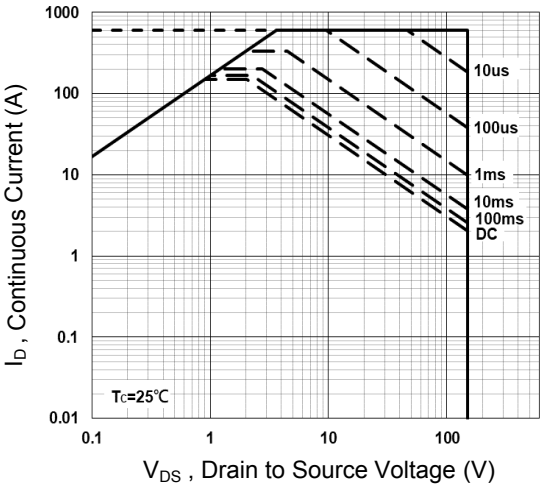


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

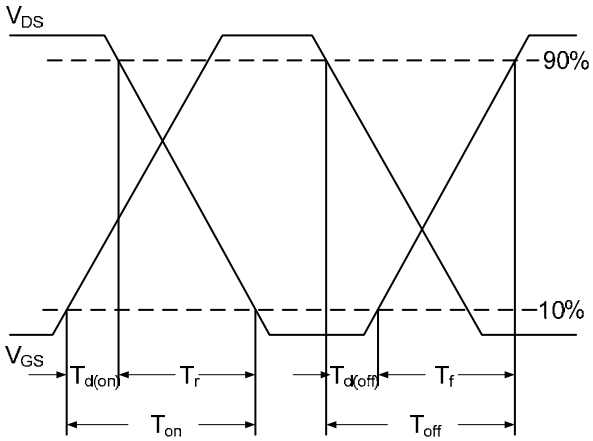


Figure 7. Switching Time Waveform

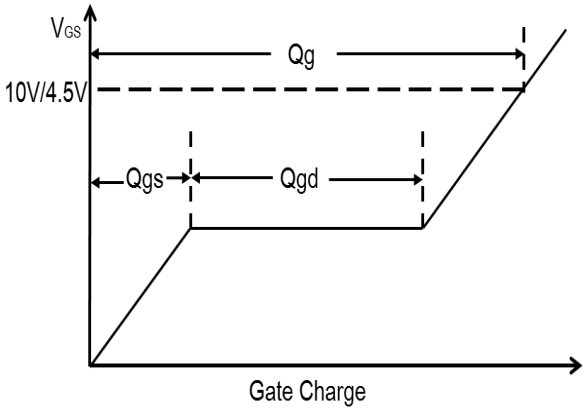


Figure 8. Gate Charge Waveform

Package Outline Dimensions TO-263(D²PAK)