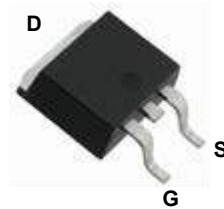
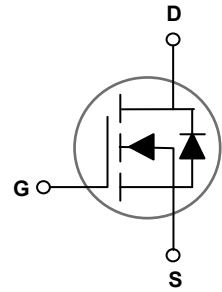


### Main Product Characteristics

$V_{(BR)DSS}$	150V
$R_{DS(on)}$	22mΩ
$I_D$	50A



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

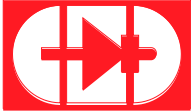


### Description

The GSFD1550 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 ( $T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous ( $T_C=25^{\circ}C$ )	$I_D$	50	A
Drain Current-Continuous ( $T_C=100^{\circ}C$ )		32	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	200	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	153	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	17.5	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	133	W
Power Dissipation-Derate above 25°C		1.06	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.94	°C/W
Operating Junction Temperature Range	$T_J$	-50 To +150	°C
Storage Temperature Range	$T_{STG}$	-50 To +150	°C



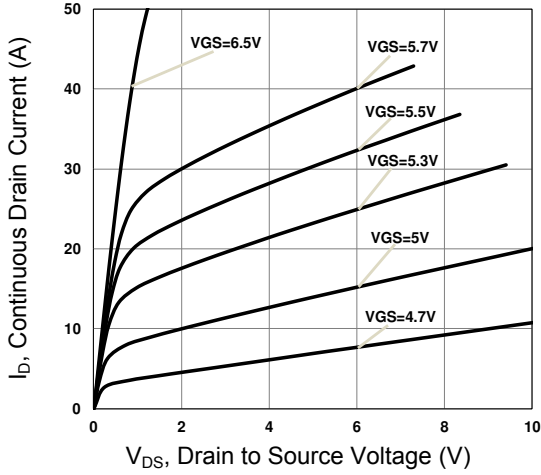
### Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	150	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=120V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=120V, V_{GS}=0V, T_J=85^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance <sup>3</sup>	$R_{DS(ON)}$	$V_{GS}=10V, I_D=25A$	-	18	22	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	3	4	V
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	-	11	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=75V, I_D=25A, V_{GS}=10V$	-	39	60	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	9.5	15	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		-	15	23	
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=75V, R_G=6\Omega, V_{GS}=10V, I_D=25A$	-	15	23	nS
Rise Time <sup>3,4</sup>	$t_r$		-	28	42	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	45	68	
Fall Time <sup>3,4</sup>	$t_f$		-	32	48	
Input Capacitance	$C_{iss}$	$V_{DS}=75V, V_{GS}=0V, F=1\text{MHz}$	-	2300	3450	pF
Output Capacitance	$C_{oss}$		-	220	330	
Reverse Transfer Capacitance	$C_{rss}$		-	10	15	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.5	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	50	A
Pulsed Source Current	$I_{SM}$		-	-	100	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time <sup>3</sup>	$t_{rr}$	$V_R=100V, I_S=10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	90	-	nS
Reverse Recovery Charge <sup>3</sup>	$Q_{rr}$		-	355	-	nC

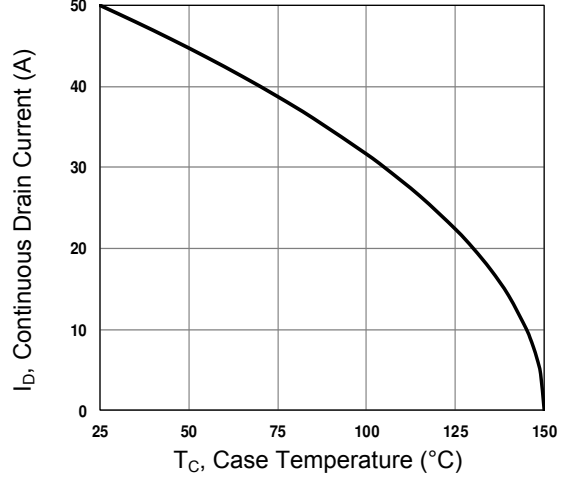
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V, V_{GS}=10V, L=1\text{mH}, I_{AS}=17.5A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}.$
3. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

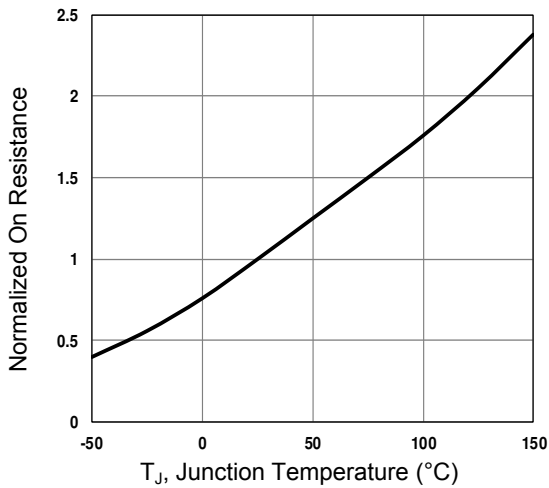
**Typical Electrical and Thermal Characteristic Curves**



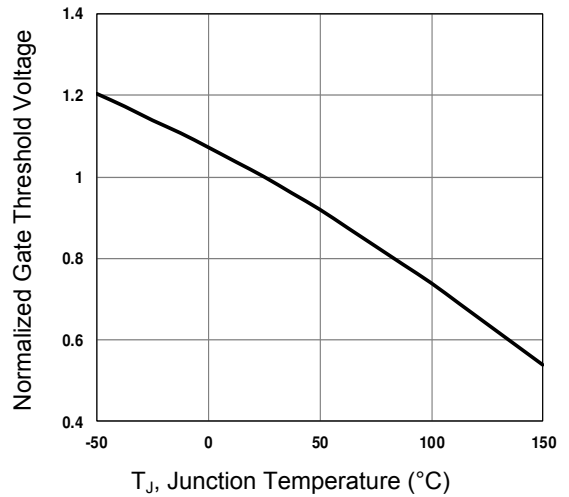
**Figure 1. Typical Output Characteristics**



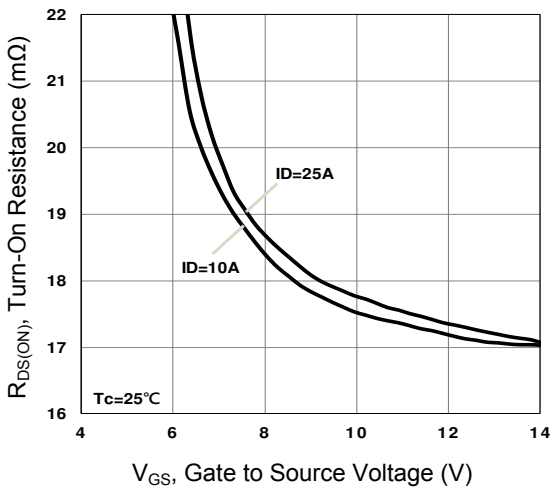
**Figure 2. Continuous Drain Current vs.  $T_C$**



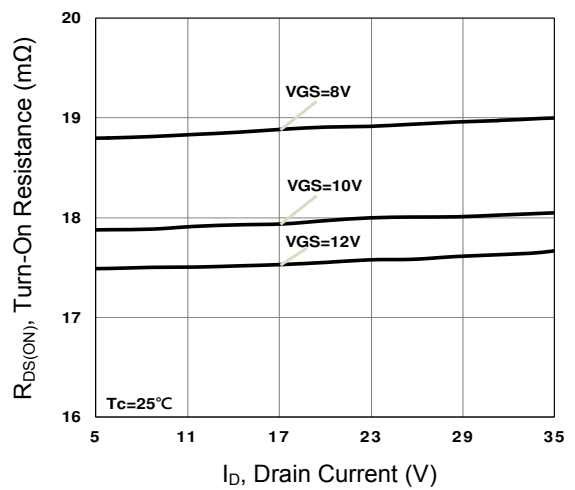
**Figure 3. Normalized  $R_{DS(on)}$  vs.  $T_J$**



**Figure 4. Normalized  $V_{th}$  vs.  $T_J$**

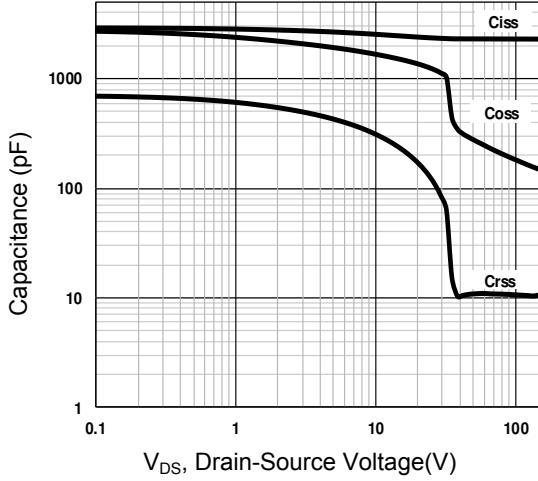


**Figure 5. Turn-On Resistance vs.  $V_{GS}$**

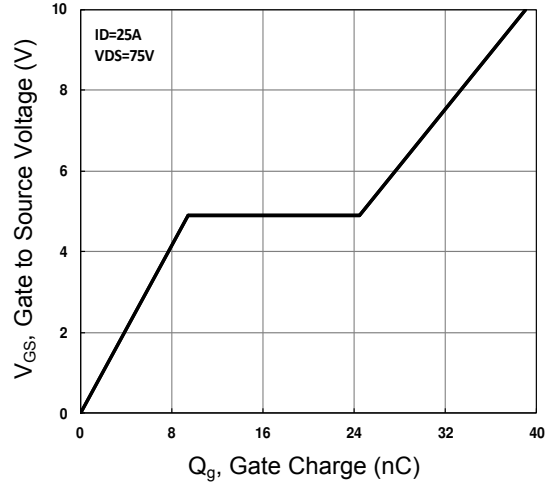


**Figure 6. Turn-On Resistance vs.  $I_D$**

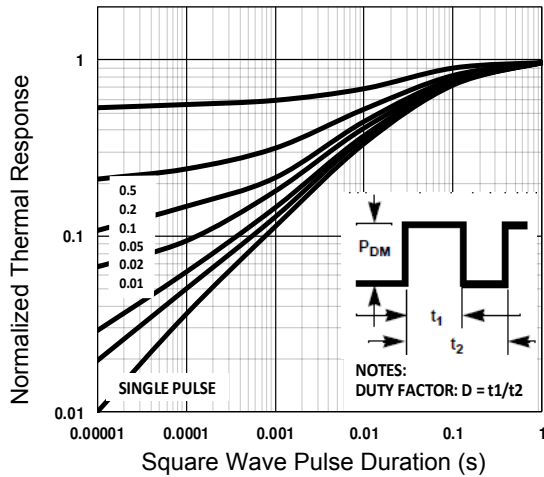
**Typical Electrical and Thermal Characteristic Curves**



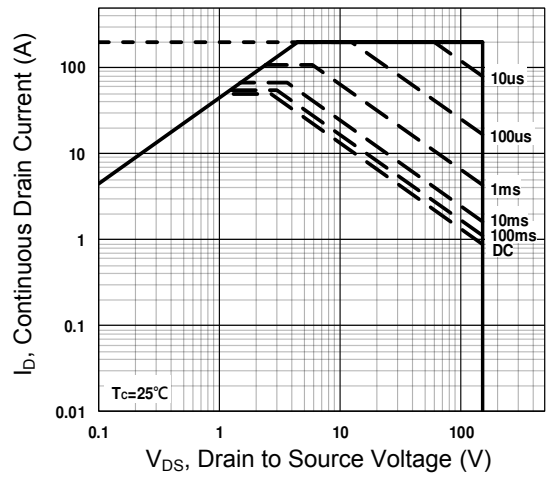
**Figure 7. Capacitance Characteristics**



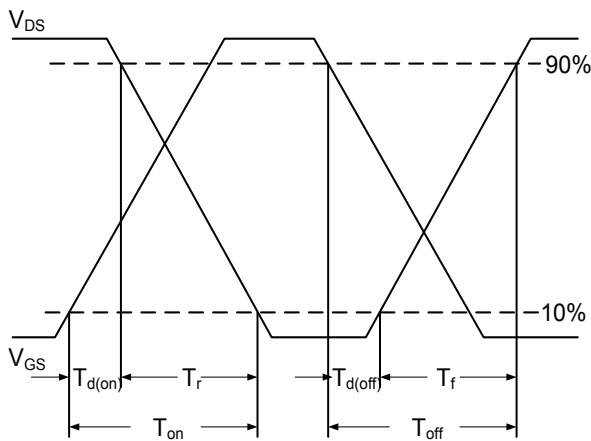
**Figure 8. Gate Charge Waveform**



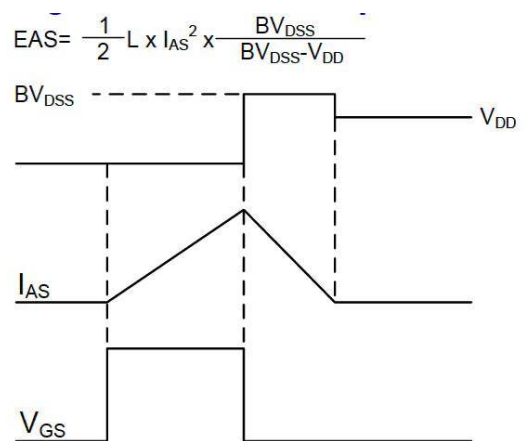
**Figure 9. Normalized Transient Impedance**



**Figure 10. Maximum Safe Operation Area**

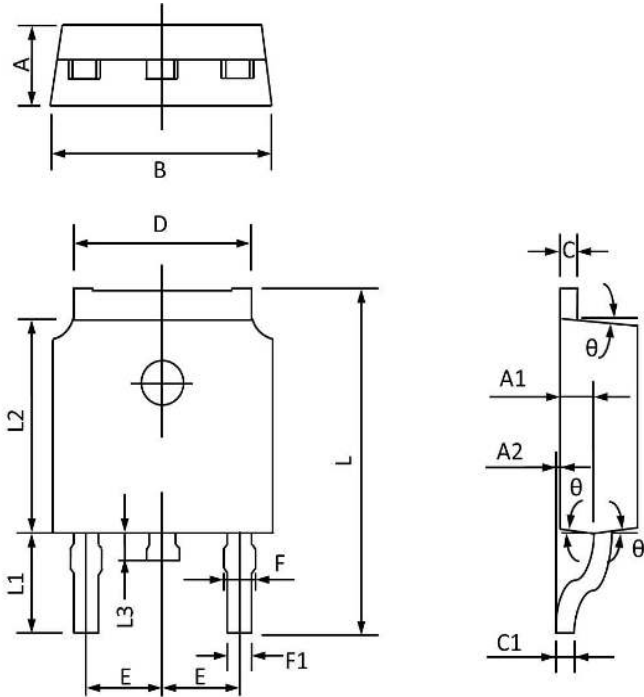


**Figure 11. Switching Time Waveform**



**Figure 12. EAS Waveform**

**Package Outline Dimensions TO-252 (DPAK)**



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.150	2.450	0.085	0.096
A1	0.910	1.200	0.036	0.047
A2	0.000	0.150	0.000	0.006
B	6.300	6.800	0.248	0.268
C	0.350	0.580	0.014	0.023
C1	0.380	0.550	0.015	0.022
D	5.100	5.500	0.201	0.217
E	2.000	2.390	0.079	0.094
F	0.600	0.940	0.024	0.037
F1	0.500	0.860	0.020	0.034
L	9.400	10.400	0.370	0.409
L1	2.400	3.000	0.094	0.118
L2	5.300	6.200	0.209	0.244
L3	0.600	1.200	0.024	0.047
θ	3°	9°	3°	9°