GOOD-ARK
SEMICONDUCTOR

GSFD06550

65V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	65V
$R_{DS(ON)}$	9mΩ
I_D	50A
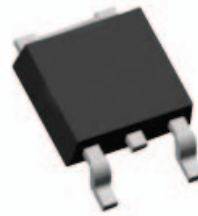
TO-252 (DPAK)
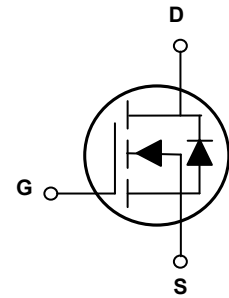
Schematic Diagram

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 GSFD06550 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}	65	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	50	A
Drain Current-Continuous (T_C=100°C)		32	
Drain Current-Pulsed[1]	I_{DM}	200	A
Single Pulse Avalanche Energy[2]	E_{AS}	72	mJ
Single Pulse Avalanche Current[2]	I_{AS}	38	A
Power Dissipation (T_C=25°C)	P_D	53	W
Power Dissipation-Derate above 25°C		0.42	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.36	°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$_D$=250uA	65	-	-	V
Drain-Source Leakage Current	I$_{DSS}$	V$_{DS}$=60V, V$_{GS}$=0V, T$_J$=25°C	-	-	1	μA
		V$_{DS}$=48V, V$_{GS}$=0V, T$_J$=85°C	-	-	10	μA
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$_D$=15A	-	7.5	9	mΩ
Gate Threshold Voltage	V$_{GS(th)}$	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	2	3	4	V
Forward Transconductance	g$_{fs}$	V$_{DS}$=10V, I$_D$=3A	-	8	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q$_g$	V$_{DS}$=30V, I$_D$=25A V$_{GS}$=10V	-	19	30	nC
Gate-Source Charge[3,4]	Q$_{gs}$		-	2.9	4.5	
Gate-Drain Charge[3,4]	Q$_{gd}$		-	8.7	13	
Turn-On Delay Time[3,4]	t$_{d(on)}$	V$_{DD}$=30V, R$_G$=6Ω V$_{GS}$=10V, I$_D$=25A	-	10	15	nS
Rise Time[3,4]	t$_r$		-	14	21	
Turn-Off Delay Time[3,4]	t$_{d(off)}$		-	28	42	
Fall Time[3,4]	t$_f$		-	20	30	
Input Capacitance	C$_{Iss}$	V$_{DS}$=30V, V$_{GS}$=0V, F=1MHz	-	950	1450	pF
Output Capacitance	C$_{oss}$		-	300	450	
Reverse Transfer Capacitance	C$_{rss}$		-	20	30	
Gate Resistance	R$_g$	V$_{GS}$=0V, V$_{DS}$=0V, F=1MHz	-	0.9	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I$_S$	V$_G$=V$_D$=0V, 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°C	-	-	1	V
Reverse Recovery Time	t$_{rr}$	V$_R$=50V, I$_S$=10A di/dt=100A/μs T$_J$=25°C	-	30	-	nS
Reverse Recovery Charge	Q$_{rr}$		-	30	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V$_{DD}$=25V, V$_{GS}$=10V, L=0.1mH, I$_{AS}$=38A, R$_G$=25Ω,starting T$_J$=25°C.
3. Pulse test: pulse width ≤300us,duty cycle≤2%.
4. Essentially independent of operation temperature.

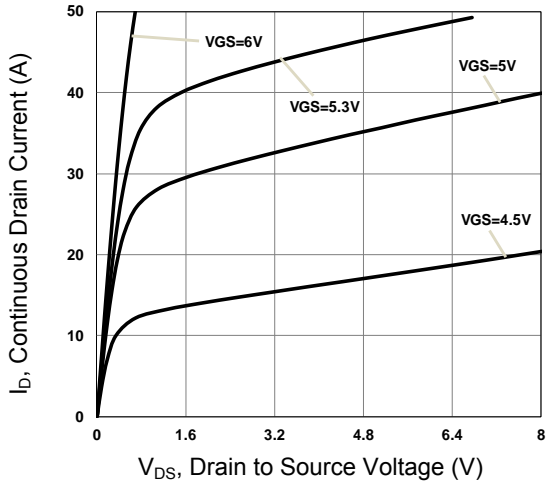## Typical Electrical and Thermal Characteristic Curves

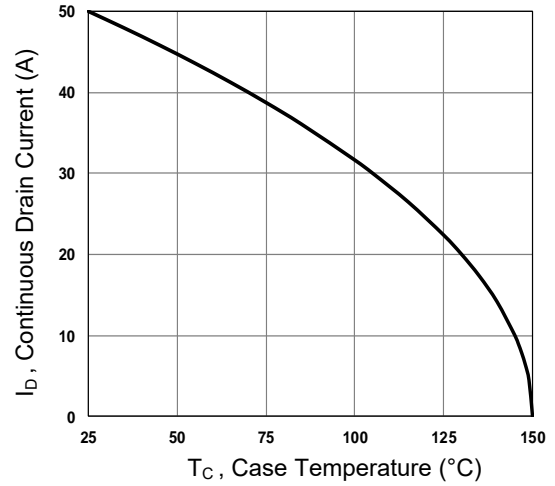

Figure 1. Typical Output Characteristics

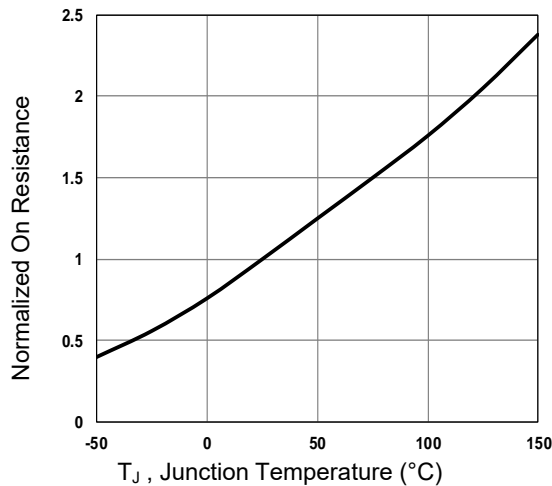**Figure 2. Continuous Drain Current vs. T$_C$**

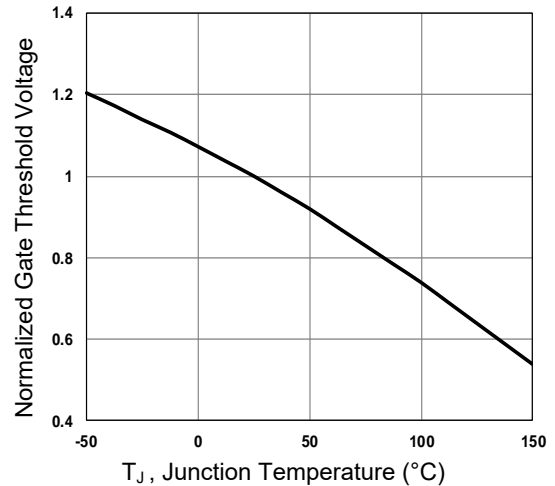**Figure 3. Normalized R$_{DSON}$ vs. T$_J$**

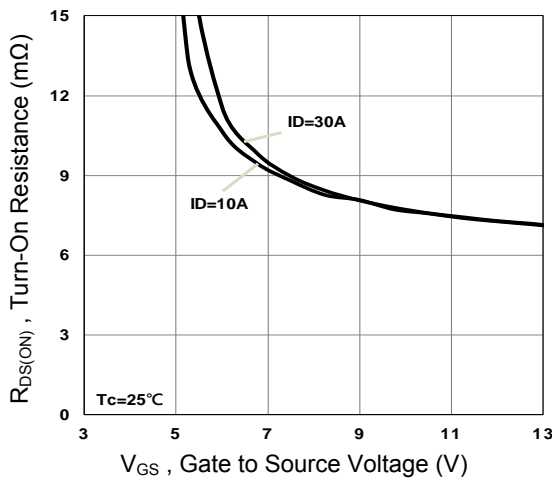
Figure 4. Normalized V$_{th}$ vs. T$_J$
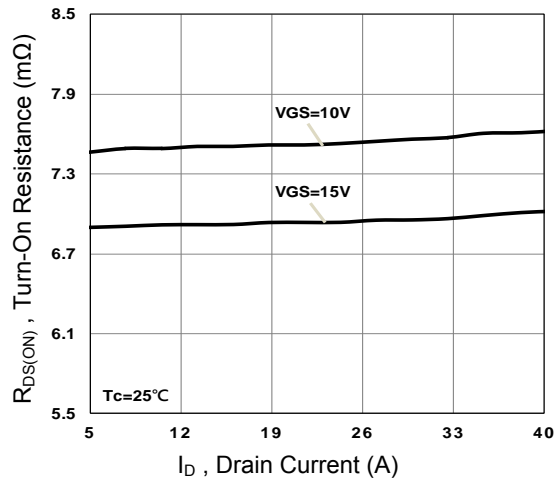

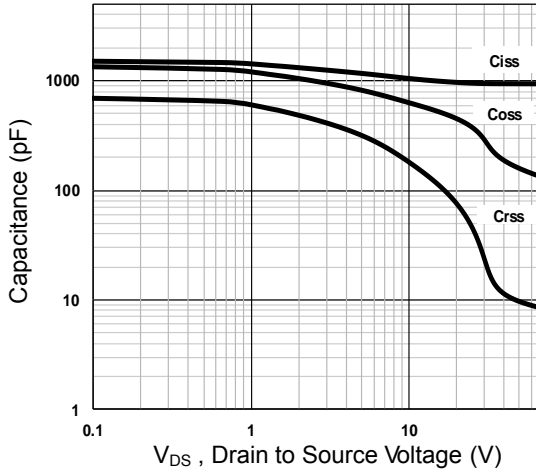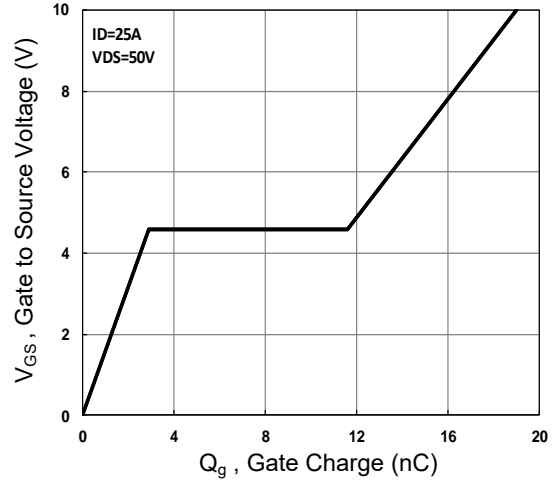**Figure 5. Turn-On Resistance vs. V$_{GS}$**
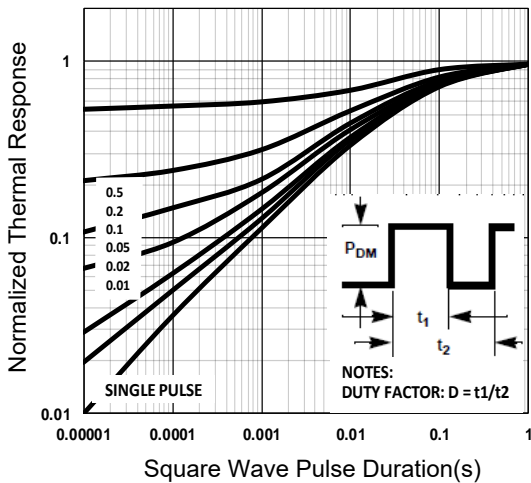

Figure 6. Turn-On Resistance vs. I$_D$

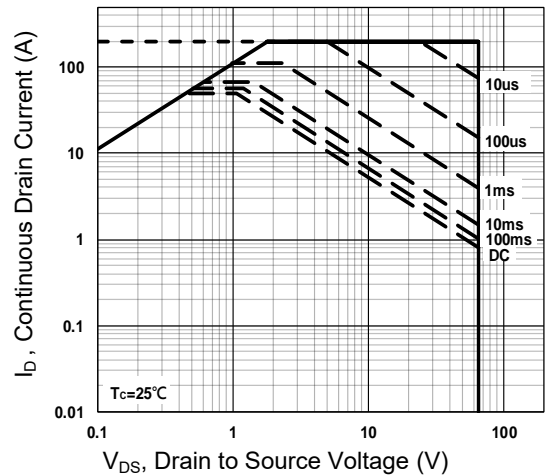# Typical Electrical and Thermal Characteristic Curves
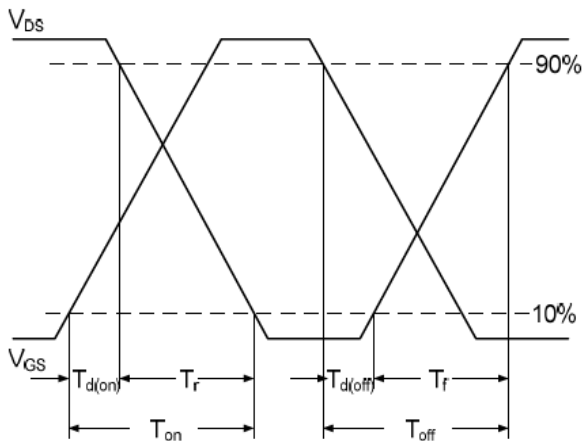
Figure 7. Capacitance Characteristics
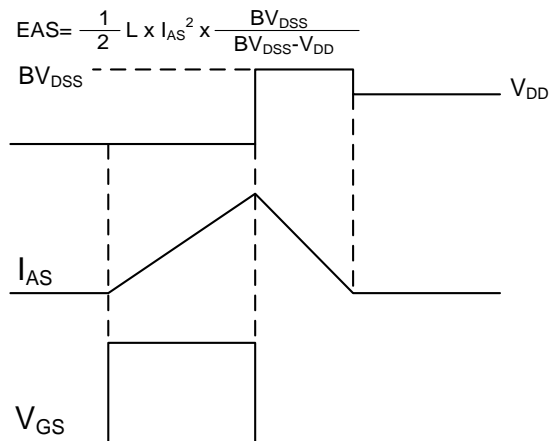
Figure 8. Gate Charge Characteristics

Figure 9. Normalized Transient Impedance

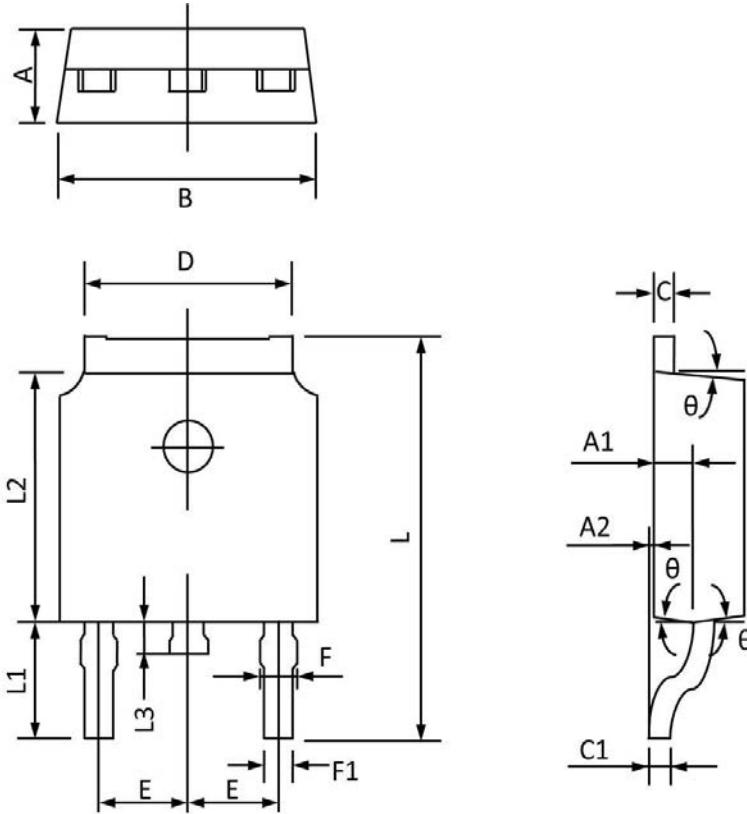**Figure 10. Maximum Safe Operation Area**

Figure 11. Switching Time Waveform

$$EAS= \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Figure 12. EAS Waveform

Package Outline Dimensions (TO-252/DPAK)

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