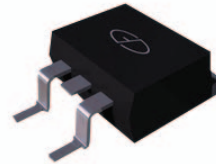
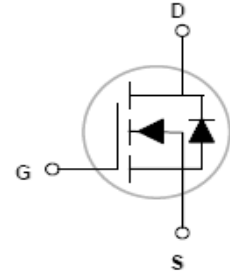


## Main Product Characteristics

$V_{DS}$	60V
$R_{DS(ON)}$	4.0m $\Omega$
$I_D$	150A



TO-263(D<sup>2</sup>PAK)



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 GSFT06150 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 ( $T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	150	A
Drain Current-Continuous( $T_C=100^{\circ}\text{C}$ )	$I_{D(100^{\circ}\text{C})}$	105	A
Pulsed Drain Current	$I_{DM}$	600	A
Maximum Power Dissipation	$P_D$	220	W
Derating Factor		1.47	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy <sup>5</sup>	$E_{AS}$	900	mJ
Thermal Resistance, Junction-to-Case <sup>2</sup>	$R_{\theta JC}$	0.68	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +175	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +175	$^{\circ}\text{C}$

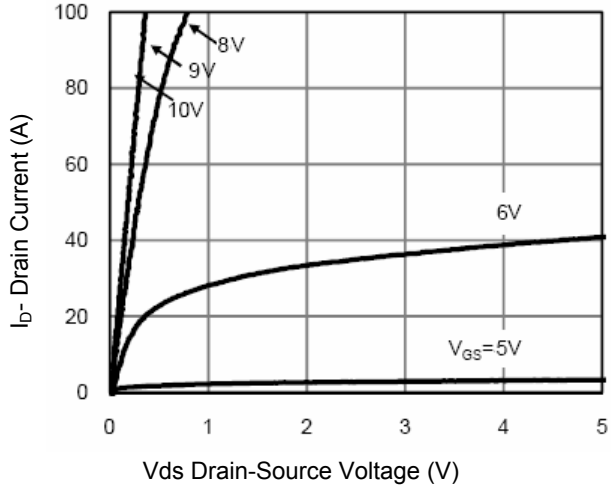
### Electrical Characteristics ( $T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics<sup>3</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=75A$	-	3.1	4.0	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=75A$	-	80	-	S
<b>Dynamic Characteristics<sup>4</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, F=1.0MHz$	-	5451	-	PF
Output Capacitance	$C_{oss}$		-	609	-	
Reverse Transfer Capacitance	$C_{rss}$		-	488	-	
<b>Switching Characteristics<sup>4</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS}=30V, I_D=75A, V_{GS}=10V$	-	130.8	-	nC
Gate-Source Charge	$Q_{gs}$		-	22.8	-	
Gate-Drain Charge	$Q_{gd}$		-	56.9	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, R_L=0.4\Omega, V_{GS}=10V, R_G=2.5\Omega$	-	25	-	nS
Turn-On Rise Time	$t_r$		-	23	-	
Turn-Off Delay Time	$t_{d(off)}$		-	90	-	
Turn-Off Fall Time	$t_f$		-	38	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Current <sup>2</sup>	$I_S$		-	-	150	A
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$I_S=75A, V_{GS}=0V$	-	-	1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J=25^{\circ}\text{C}, I_F=75A, di/dt=-100A/\mu s^3$	-	60	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	80	-	nC
Forward Turn-On Time	$t_{on}$	Intrinsic turn-on is negligible(turn-on is dominated by LS+LD)				

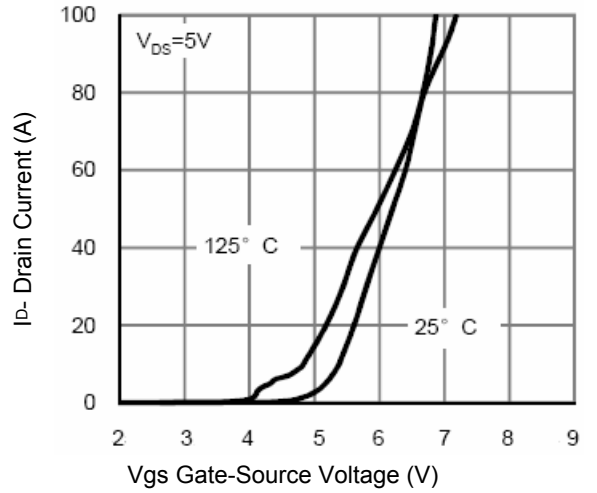
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5. EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25\Omega$

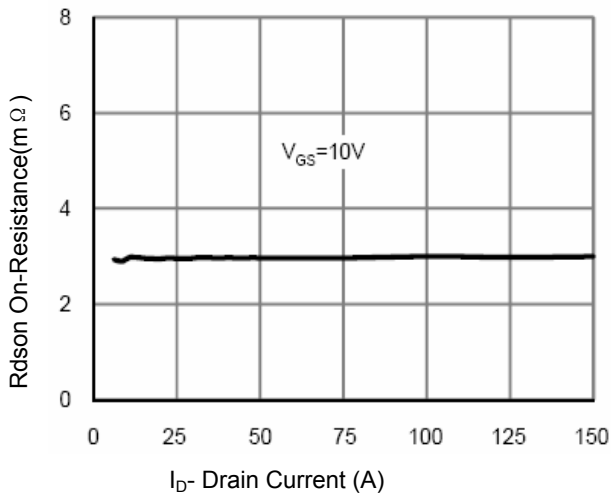
**Typical Electrical and Thermal Characteristic Curves**



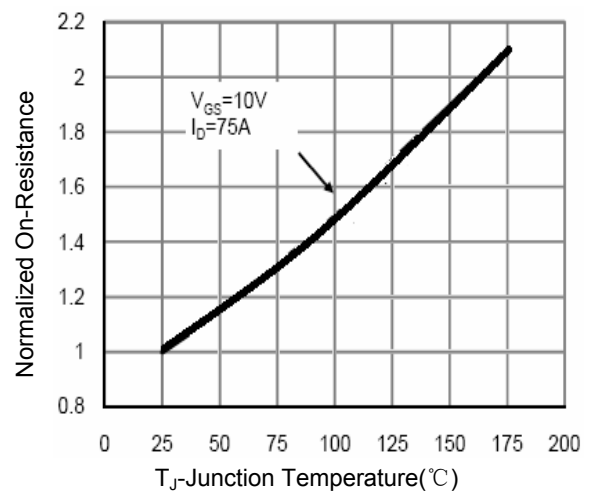
**Figure 1. Output Characteristics**



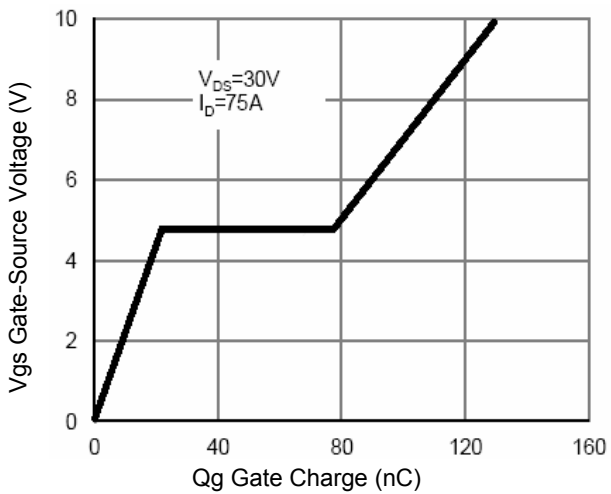
**Figure 2. Transfer Characteristics**



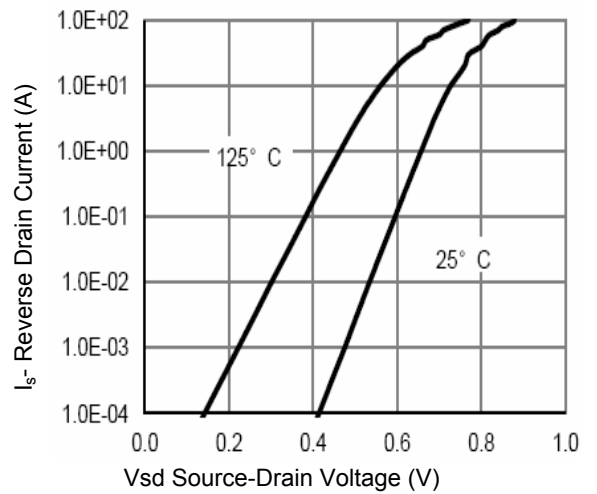
**Figure 3. Rdson- Drain Current**



**Figure 4. Rdson-Junction Temperature**

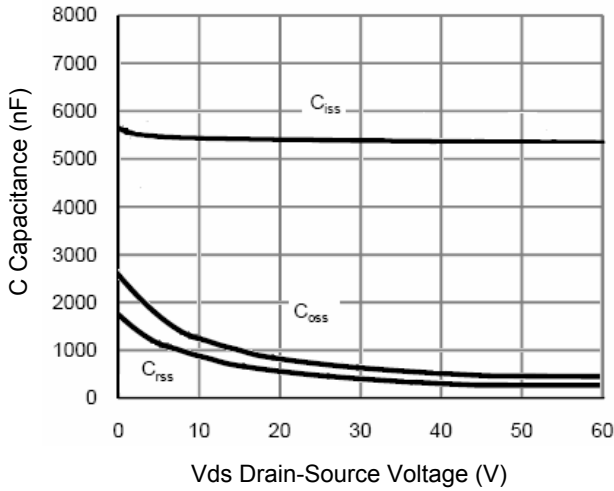


**Figure 5. Gate Charge**

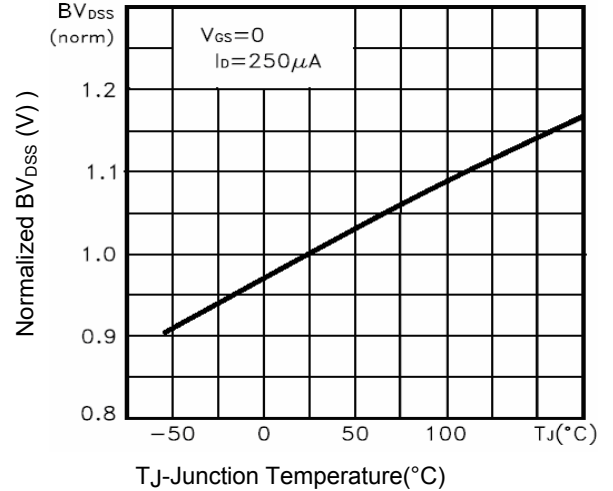


**Figure 6. Source- Drain Diode Forward**

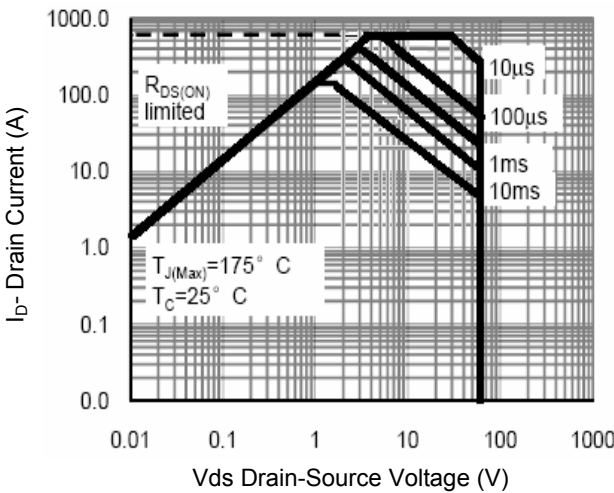
**Typical Electrical and Thermal Characteristic Curves**



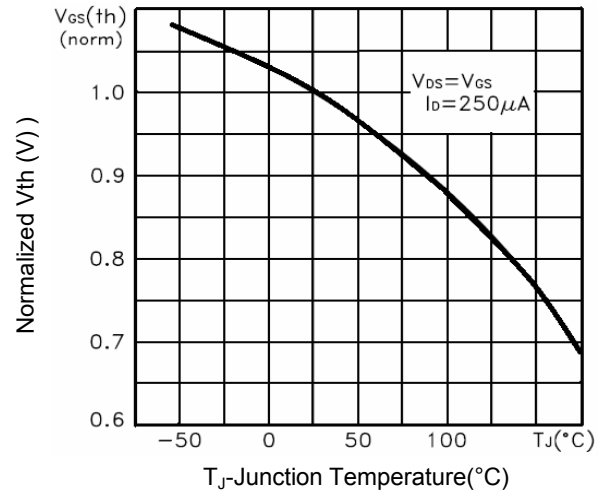
**Figure 7. Capacitance vs Vds**



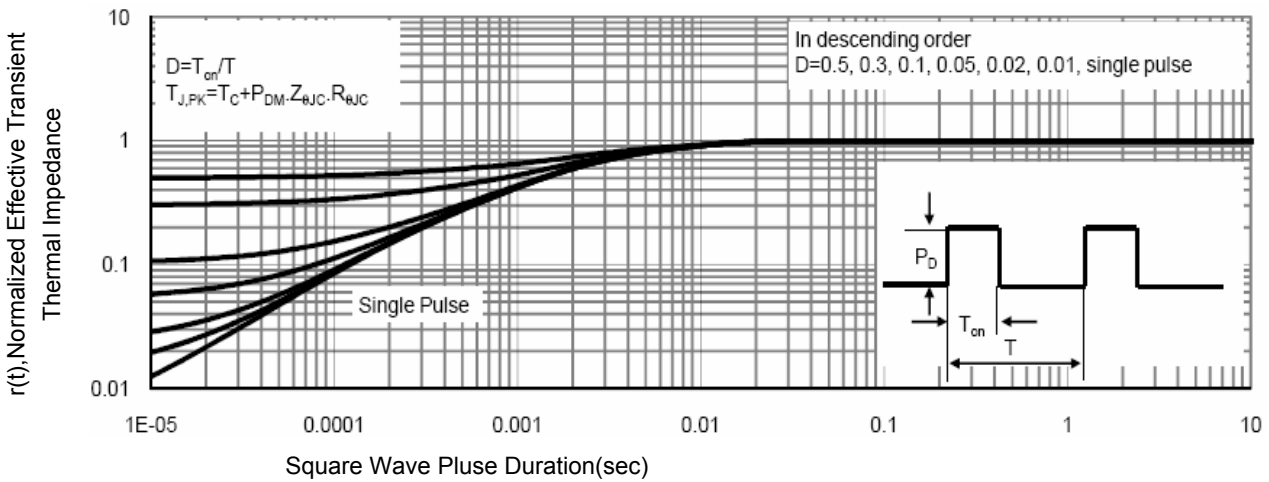
**Figure 8. BV<sub>DSS</sub> vs Junction Temperature**



**Figure 9. Safe Operation Area**

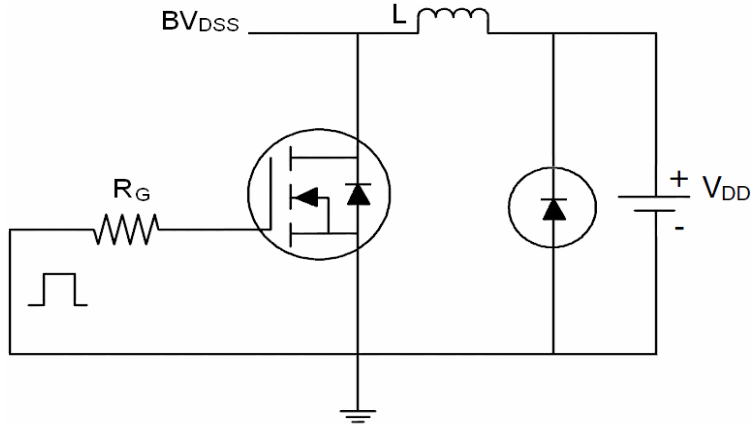


**Figure 10. V<sub>th</sub> vs Junction Temperature**

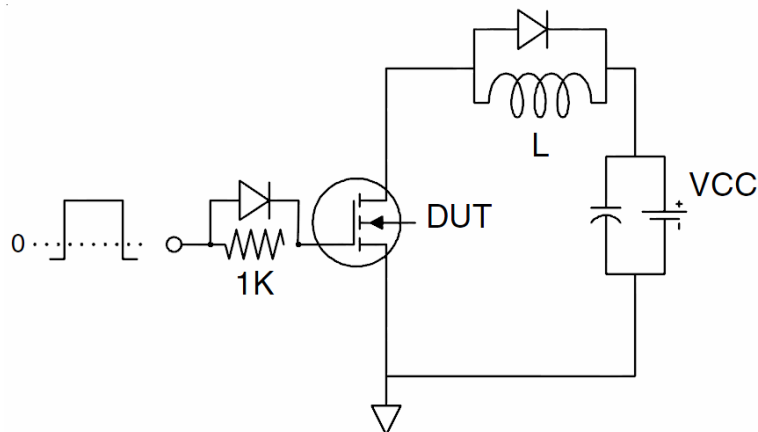


**Figure 11. Normalized Maximum Transient Thermal Impedance**

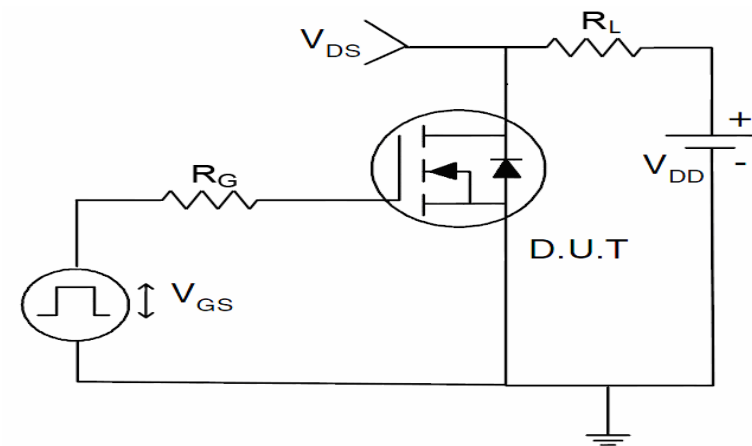
**Typical Electrical and Thermal Characteristic Curves**



**Figure 12.  $E_{AS}$  Test Circuit**

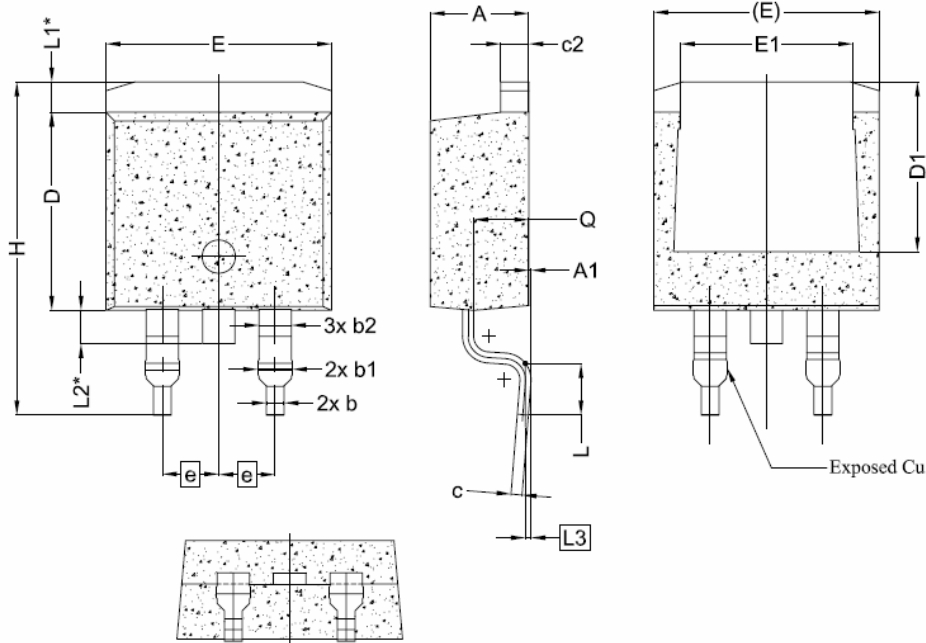


**Figure 13. Gate Charge Test Circuit**



**Figure 14. Switch Time Test Circuit**

**Package Outline Dimensions (TO-263/D<sup>2</sup>PAK)**



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.70	0.80	0.90
b1	1.20	1.55	1.75
b2	1.20	1.45	1.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	-
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	2.54BS		
H	14.61	15.00	15.88
L	1.78	2.32	2.79
L1	1.36 REF.		
L2	1.50 REF.		
L3	0.25 BSC		
Q	2.30	2.48	2.70