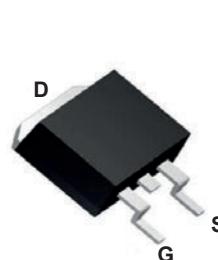
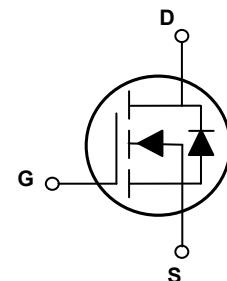


## Main Product Characteristics

$V_{(BR)DSS}$	98V
$R_{DS(ON)}$	4.6mΩ
$I_D$	120A



TO-263



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 GSFT5R010 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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	98	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, @ Steady-State ( $T_C=25^\circ\text{C}$ )	$I_D$	120	A
Continuous Drain Current, @ Steady-State ( $T_C=100^\circ\text{C}$ )		100	A
Pulsed Drain Current	$I_{DM}$	480	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	200	W
		1.6	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	274	mJ
Junction-to-Case	$R_{eJC}$	0.63	$^\circ\text{C}/\text{W}$
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{eJA}$	62.5	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	98	-	-	V
Drain-to-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=98\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1.0	$\mu\text{A}$
Gate-to-Source Forward Leakage	$I_{\text{GSS}}$	$V_{\text{GS}}=20\text{V}$	-	-	100	nA
		$V_{\text{GS}}=-20\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=50\text{A}$	-	4.6	5.5	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2.0	-	4.0	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=50\text{V}$ $F=1\text{MHz}$	-	5208	-	pF
Output Capacitance	$C_{\text{oss}}$		-	565	-	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	22	-	
Total Gate Charge <sup>2,3</sup>	$Q_g$	$I_D=25\text{A}, V_{\text{DD}}=50\text{V},$ $V_{\text{GS}}=10\text{V}$	-	80	-	nC
Gate-to-Source Charge <sup>2,3</sup>	$Q_{\text{gs}}$		-	29	-	
Gate-to-Drain ("Miller") Charge <sup>2,3</sup>	$Q_{\text{gd}}$		-	17	-	
Turn-on Delay Time <sup>2,3</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{GS}}=10\text{V}, V_{\text{DD}}=50\text{V},$ $R_G=1.6\Omega, I_D=25\text{A}$	-	20	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	40	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{\text{d}(\text{off})}$		-	71	-	
Fall Time <sup>2,3</sup>	$t_f$		-	17	-	
Gate Resistance	$R_g$	$F=1\text{MHz}$	-	3.6	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_s$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	120	A
Pulsed Source Current (Body Diode)	$I_{\text{SM}}$		-	-	480	A
Diode Forward Voltage	$V_{\text{SD}}$	$I_s=50\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.4	V
Reverse Recovery Time <sup>2</sup>	$T_{\text{rr}}$	$V_{\text{GS}}=0\text{V}, I_s=25\text{A},$ $d_I/dt=100\text{A}/\mu\text{s}$	-	61	-	nS
Reverse Recovery Charge <sup>2</sup>	$Q_{\text{rr}}$		-	0.12	-	$\mu\text{C}$

Note:

1.  $L=0.1\text{mH}, R_G=25\Omega, I_{\text{AS}}=74\text{A}, V_{\text{DD}}=80\text{V}, T_J=25^\circ\text{C}$ .
2. Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
3. Basically unaffected by operating temperature.

## Typical Electrical and Thermal Characteristic Curves

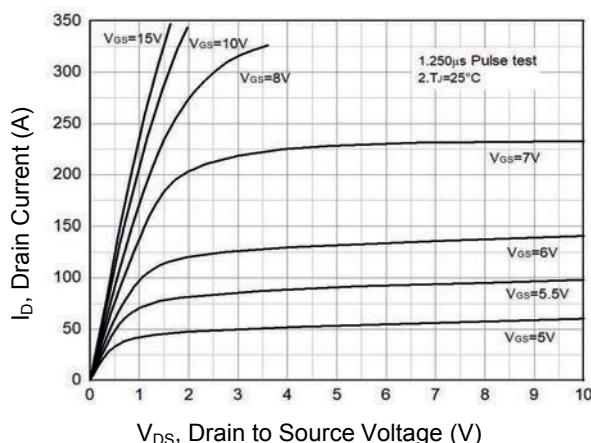


Figure 1. Typical Output Characteristics

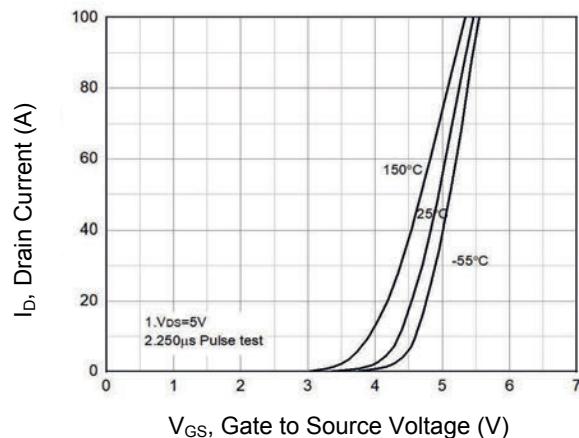


Figure 2. Typical Transfer Characteristics

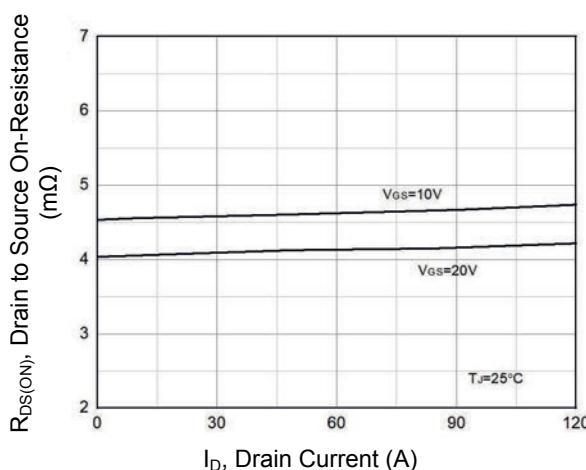


Figure 3. On-Resistance vs. Drain Current

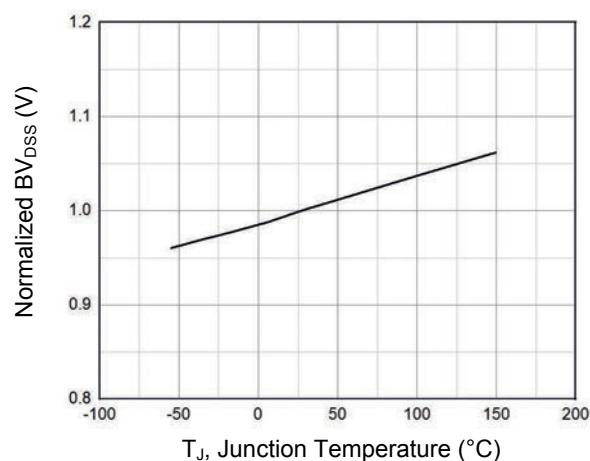


Figure 4. Normalized  $BV_{DSS}$  vs.  $T_J$

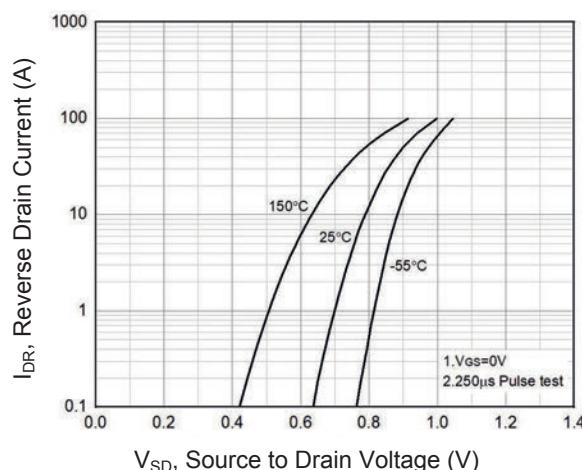


Figure 5. Body Diode Characteristics

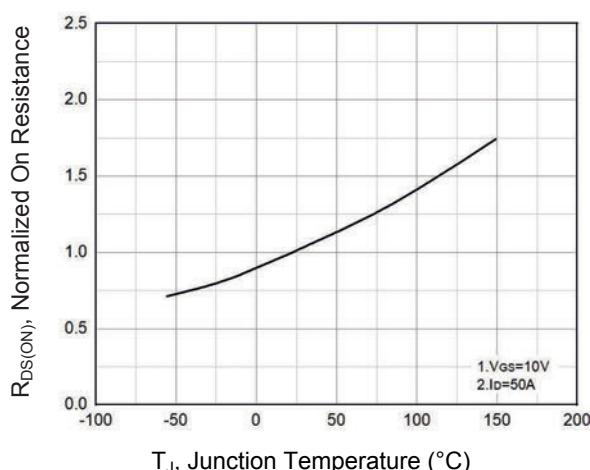


Figure 6. Normalized On-Resistance vs.  $T_J$

## Typical Electrical and Thermal Characteristic Curves

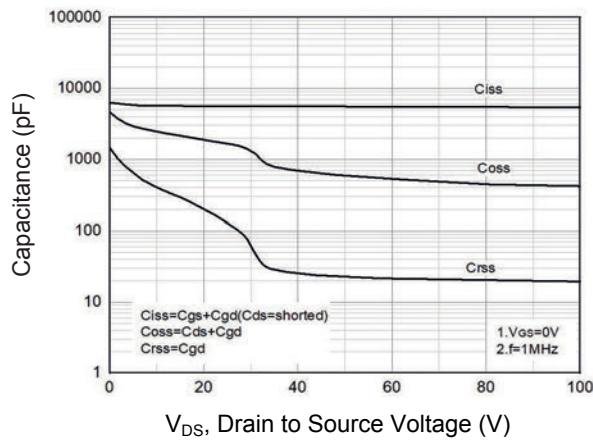


Figure 7. Capacitance Characteristics

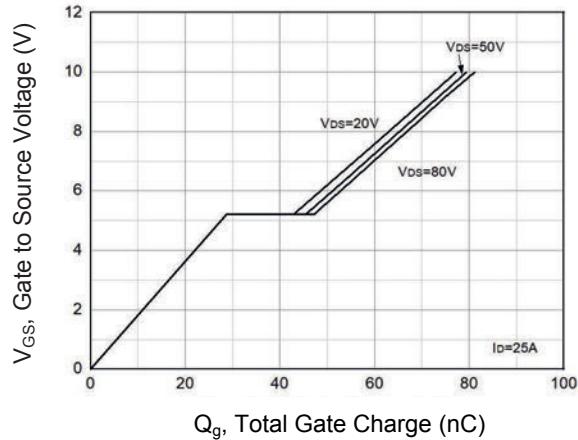


Figure 8. Gate Charge

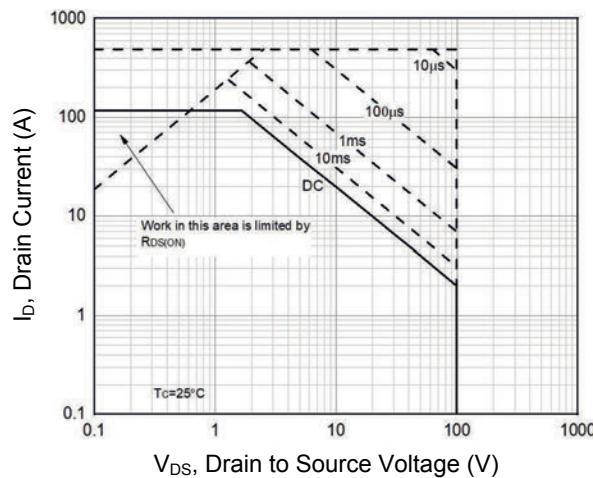


Figure 9. Safe Operation Area

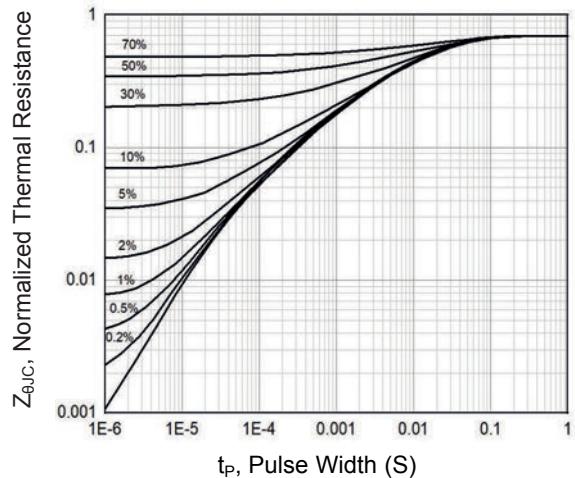
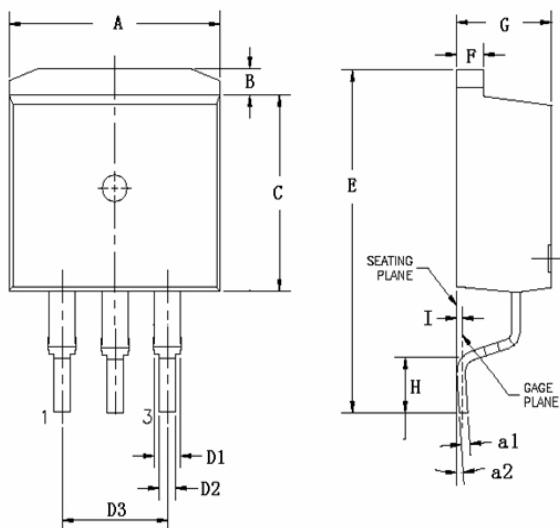


Figure 10. Transient Thermal Impedance vs.  $t_p$

### Package Outline Dimensions TO-263(D2PAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.66	10.28	0.380	0.405
B	1.02	1.32	0.040	0.052
C	8.59	9.40	0.339	0.370
D1	1.14	1.40	0.045	0.055
D2	0.70	0.90	0.028	0.037
D3	5.08 TYP.		0.200 TYP.	
E	15.09	15.39	0.594	0.606
F	1.15	1.40	0.045	0.055
I	0.25 TYP.		0.010 TYP.	
G	4.30	4.70	0.169	0.185
H	2.29	2.79	0.090	0.110
K	1.30	1.60	0.051	0.063
a1	0.45	0.65	0.018	0.026
a2	0°	8°	0°	8°