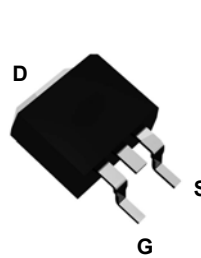
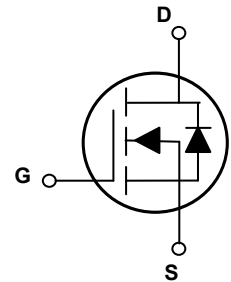


## Main Product Characteristics

$V_{(BR)DSS}$	200V
$R_{DS(ON)}$	10.7m $\Omega$ (max.)
$I_D$	106A



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 GSFT10020 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 ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous, at Steady-State ( $T_C=25^{\circ}\text{C}$ )	$I_D$	106	A
Drain Current-Continuous, at Steady-State ( $T_C=100^{\circ}\text{C}$ )		76	
Drain Current-Pulsed ( $T_C=25^{\circ}\text{C}$ ) <sup>1</sup>	$I_{DM}$	424	A
Single Pulse Avalanche Energy	$E_{AS}$	600	mJ
Single Pulse Avalanche Current	$I_{AS}$	49	A
Power Dissipation ( $T_C=25^{\circ}\text{C}$ ) <sup>2</sup>	$P_D$	278	W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.45	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^{\circ}\text{C}$
Soldering Temperature (SMD)	$T_{SOLD}$	260	$^{\circ}\text{C}$

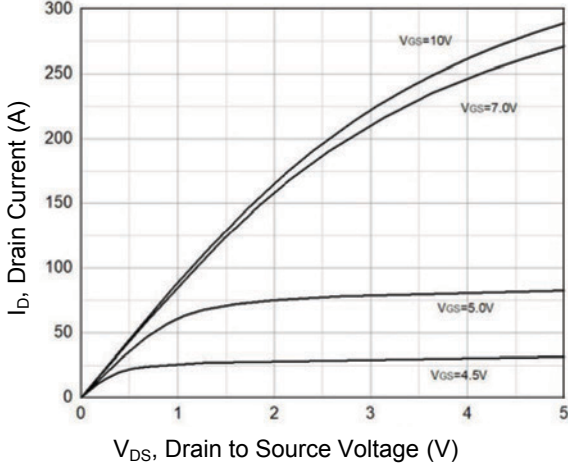
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=200V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	$\mu A$
		$V_{DS}=200V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	10	-	
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
		$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=88A$	-	9.4	10.7	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	-	4.0	V
Gate Resistance	$R_G$	F=1MHz	-	4.9	-	$\Omega$
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DD}=100V, I_D=44A, V_{GS}=10V$	-	64	-	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	28	-	
Gate-Drain ("Miller") Charge <sup>3,4</sup>	$Q_{gd}$		-	7.9	-	
Gate Plateau <sup>3,4</sup>	$V_{plateau}$		-	5.3	-	V
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=100V, R_G=1.6\Omega, V_{GS}=10V, I_D=44A$	-	22	-	nS
Rise Time <sup>3,4</sup>	$t_r$		-	40	-	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	66	-	
Fall Time <sup>3,4</sup>	$t_f$		-	18	-	
Input Capacitance	$C_{iss}$	$V_{DS}=100V, V_{GS}=0V, F=1MHz$	-	4720	-	pF
Output Capacitance	$C_{oss}$		-	430	-	
Reverse Transfer Capacitance	$C_{rss}$		-	11	-	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current (Body Diode)	$I_S$	$T_C=25^{\circ}\text{C}$ , MOSFET symbol showing the integral reverse p-n junction diode.	-	-	106	A
Diode Pulse Current	$I_{S,Pulse}$		-	-	424	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=88A$	-	-	1.4	V
Reverse Recovery Time <sup>3</sup>	$t_{rr}$	$V_{GS}=0V, I_S=44A, diF/dt=100A/\mu s$	-	130	-	nS
Reverse Recovery Charge <sup>3</sup>	$Q_{rr}$		-	0.7	-	$\mu C$

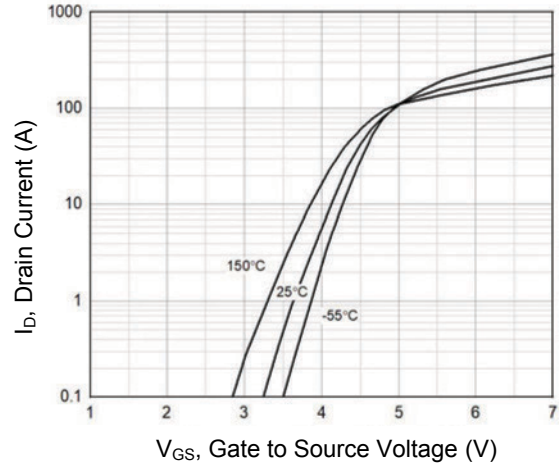
Note:

1. Pulse time 5 $\mu$ s.
2. The dissipated power value will change with the temperature. When it is greater than 25 $^{\circ}\text{C}$ , the dissipated power will decrease by 2.22W/ $^{\circ}\text{C}$  for every 1 degree of temperature rise.
3. Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

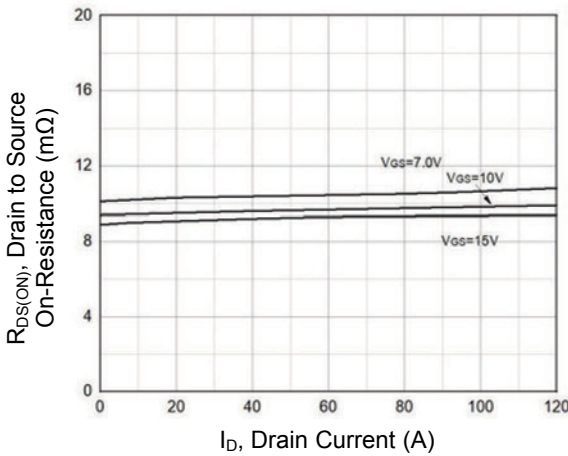
**Typical Electrical and Thermal Characteristic Curves**



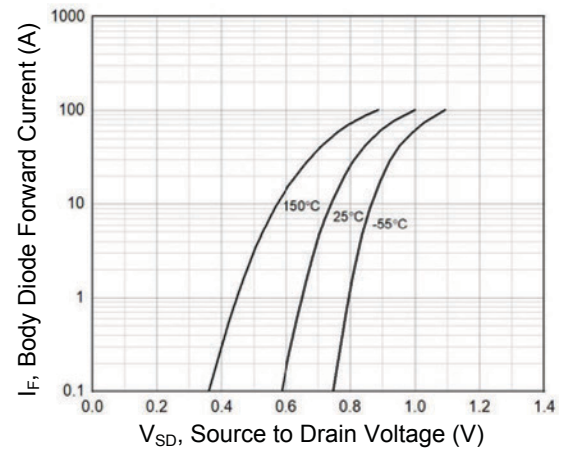
**Figure 1. Typical Output Characteristics**



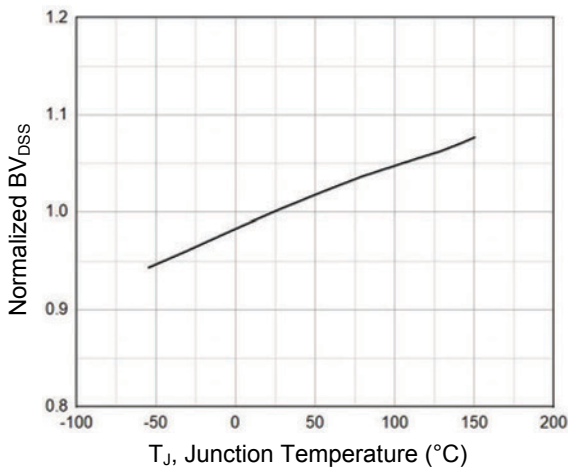
**Figure 2. Transfer Characteristics**



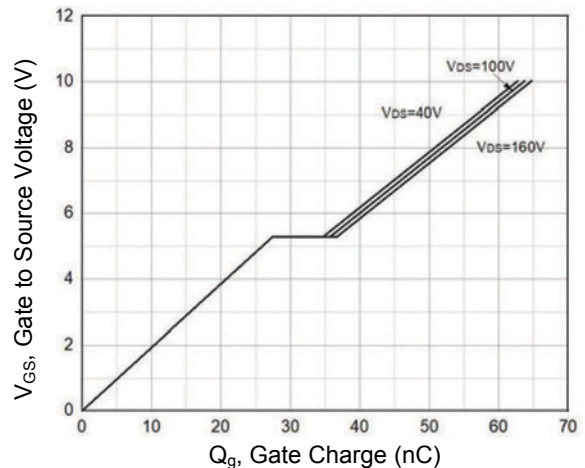
**Figure 3.  $R_{DS(ON)}$  vs. Drain Current**



**Figure 4. Body Diode Characteristics**

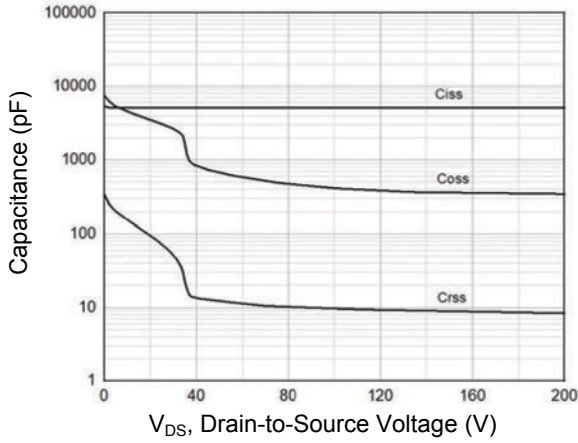


**Figure 5. Normalized  $BV_{DSS}$  vs. Junction Temperature**

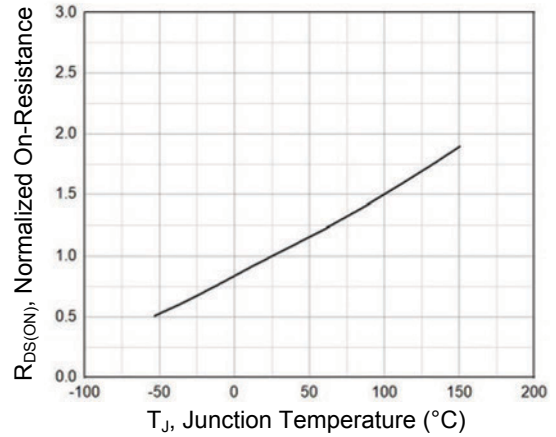


**Figure 6. Gate Charge Characteristics**

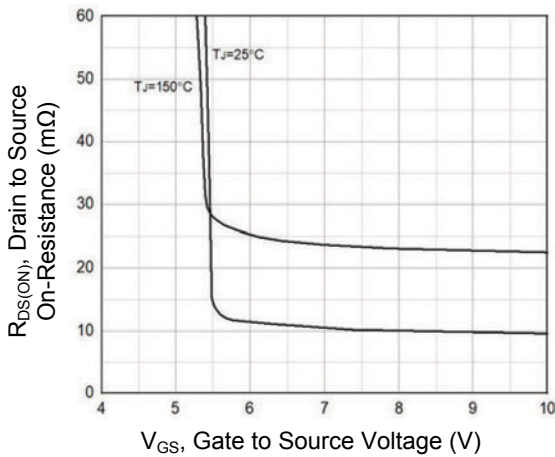
**Typical Electrical and Thermal Characteristic Curves**



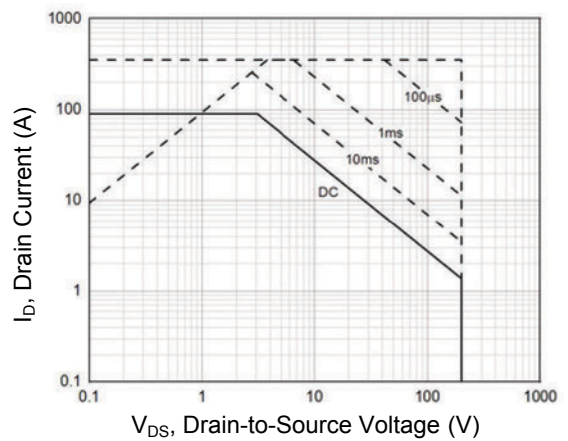
**Figure 7. Capacitance Characteristics**



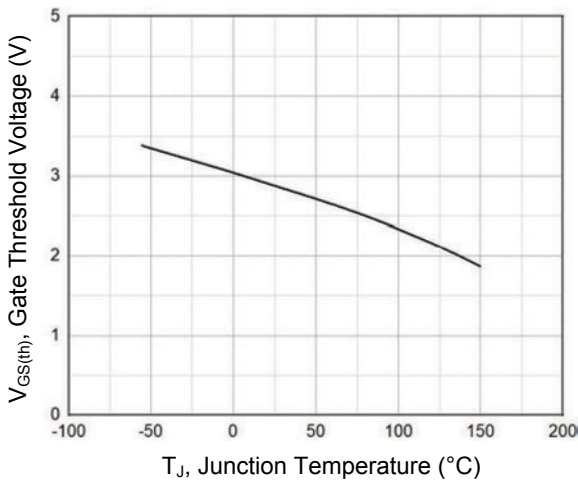
**Figure 8. Normalized On-Resistance vs. Junction Temperature**



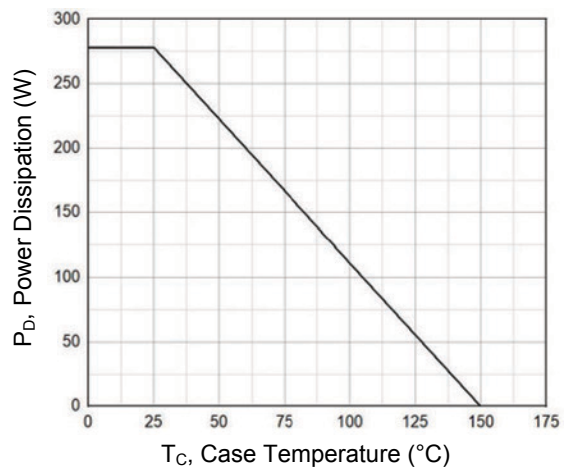
**Figure 9.  $R_{DS(ON)}$  vs.  $V_{GS}$**



**Figure 10. Safe Operation Area**

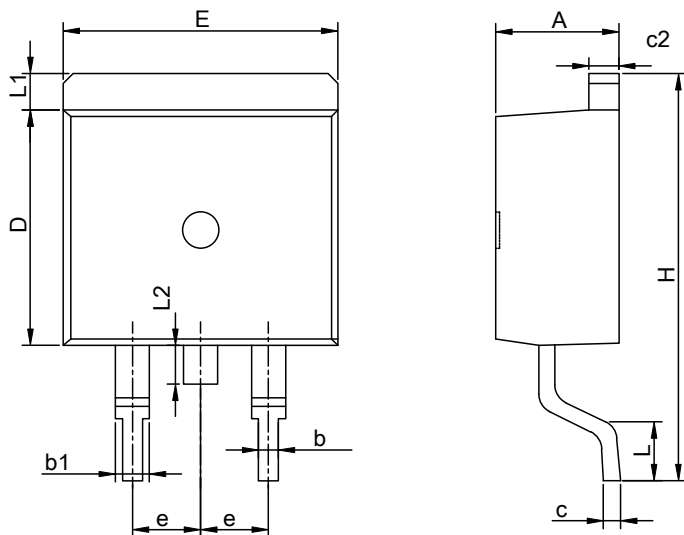


**Figure 11. Gate Threshold Voltage vs.  $T_J$**



**Figure 12. Power Dissipation vs.  $T_C$**

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



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.30	4.90	0.169	0.193
b	0.70	0.95	0.028	0.037
b1	1.07	1.50	0.042	0.059
c	0.28	0.60	0.011	0.024
c2	1.17	1.37	0.046	0.054
D	8.40	9.35	0.331	0.368
E	9.80	10.45	0.386	0.411
e	2.54 BSC		0.100 BSC	
H	14.70	16.30	0.579	0.642
L	2.00	3.80	0.079	0.150
L1	0.97	1.42	0.038	0.056
L2	-	1.75	-	0.069

**Order Information**

Device	Package	Marking	Carrier	Quantity
GSFT10020	TO-263 (D <sup>2</sup> PAK)	T10020	Tape & Reel	800 Pcs / Reel

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)