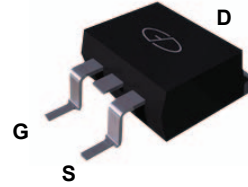
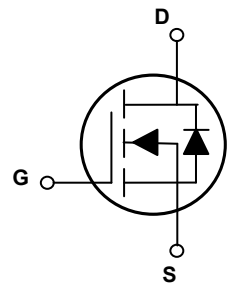


Main Product Characteristics

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



TO-263 (D²PAK)



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}	± 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 ($T_C=25^{\circ}\text{C}$) ¹	I_{DM}	424	A
Single Pulse Avalanche Energy	E_{AS}	600	mJ
Single Pulse Avalanche Current	I_{AS}	49	A
Power Dissipation ($T_C=25^{\circ}\text{C}$) ²	P_D	278	W
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.45	$^{\circ}\text{C/W}$
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
On / Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	200	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =200V, V _{GS} =0V, T _J =25°C	-	-	1	μA
		V _{DS} =200V, V _{GS} =0V, T _J =125°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	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	2.0	-	4.0	V
Gate Resistance	R _G	F=1MHz	-	4.9	-	Ω
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DD} =100V, I _D =44A, V _{GS} =10V	-	64	-	nC
Gate-Source Charge ^{3,4}	Q _{gs}		-	28	-	
Gate-Drain ("Miller") Charge ^{3,4}	Q _{gd}		-	7.9	-	
Gate Plateau ^{3,4}	V _{plateau}		-	5.3	-	V
Turn-On Delay Time ^{3,4}	t _{d(on)}	V _{DD} =100V, R _G =1.6Ω V _{GS} =10V, I _D =44A	-	22	-	nS
Rise Time ^{3,4}	t _r		-	40	-	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	66	-	
Fall Time ^{3,4}	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	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I _S	T _C =25°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 ³	t _{rr}	V _{GS} =0V, I _S =44A, diF/dt=100A/μs	-	130	-	nS
Reverse Recovery Charge ³	Q _{rr}		-	0.7	-	uC

Note:

1. Pulse time 5 μ 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

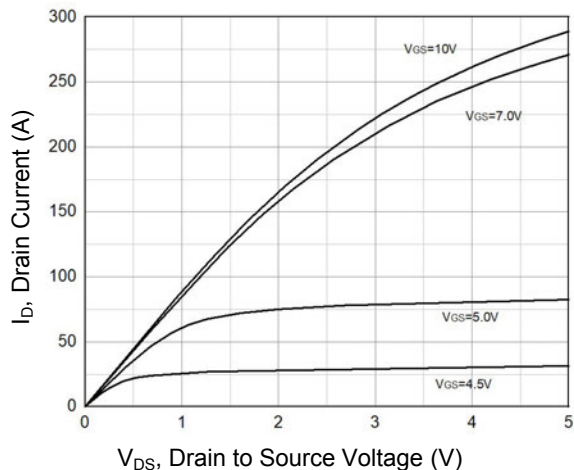


Figure 1. Typical Output Characteristics

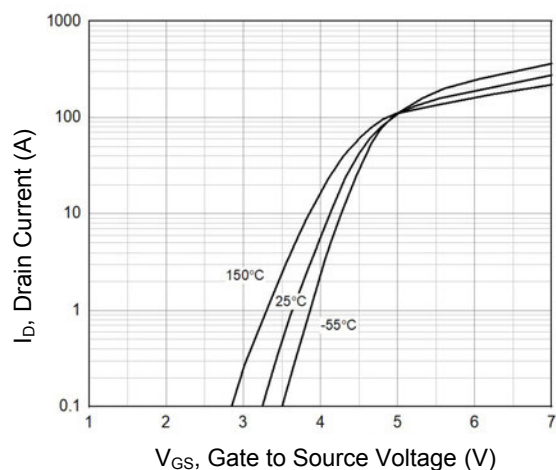


Figure 2. Transfer Characteristics

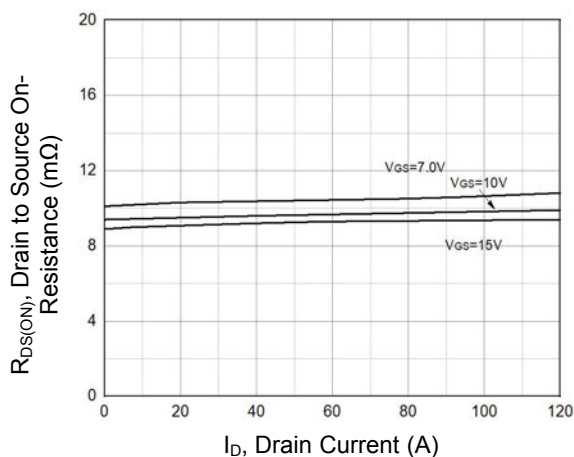


Figure 3. $R_{DS(ON)}$ vs. Drain Current

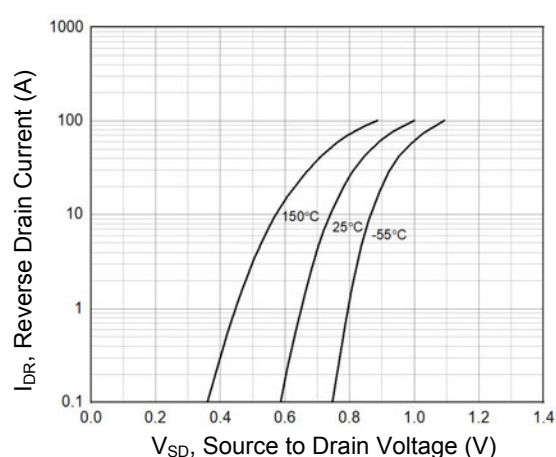


Figure 4. Body Diode Characteristics

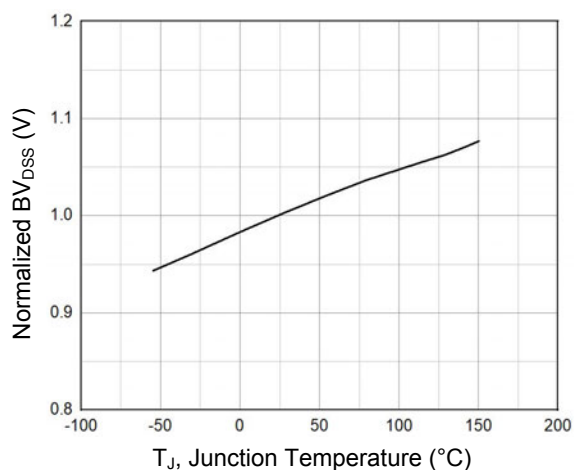


Figure 5. Normalized BV_{DSS} vs. Junction Temperature

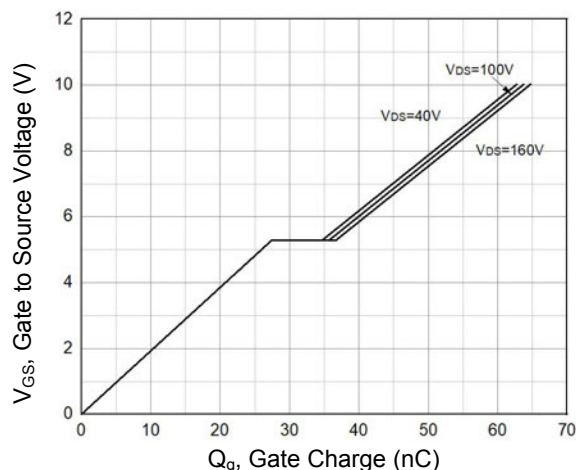


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

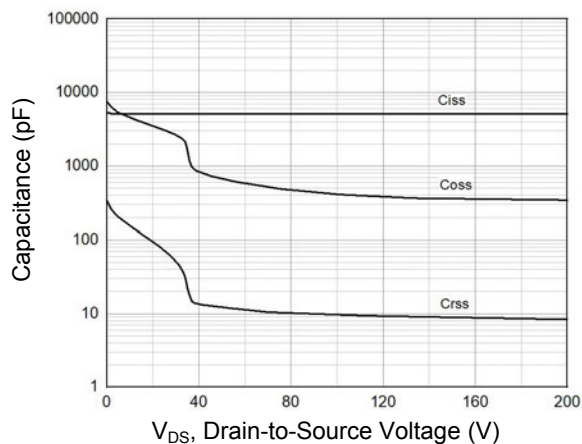


Figure 7. Capacitance Characteristics

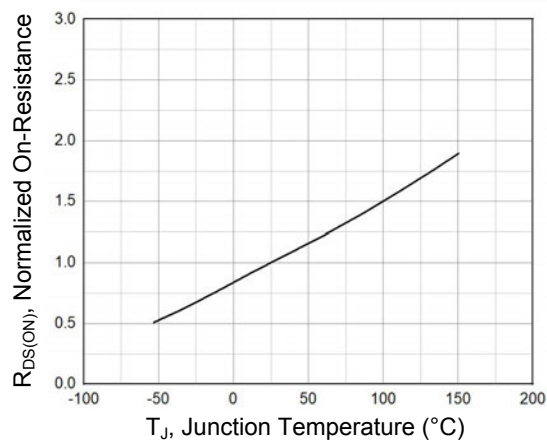


Figure 8. Normalized On-Resistance vs. Junction Temperature

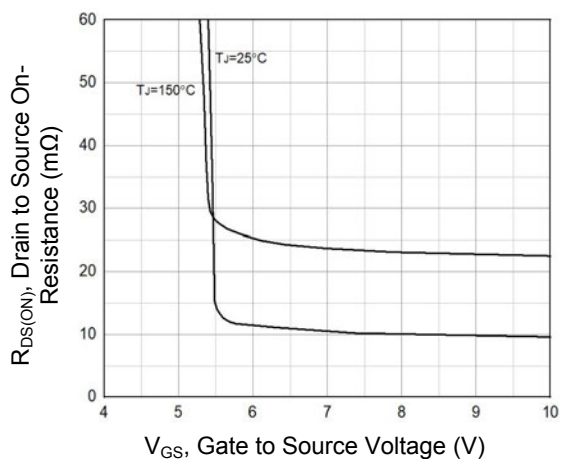


Figure 9. Normalized $R_{DS(ON)}$ vs. V_{GS}

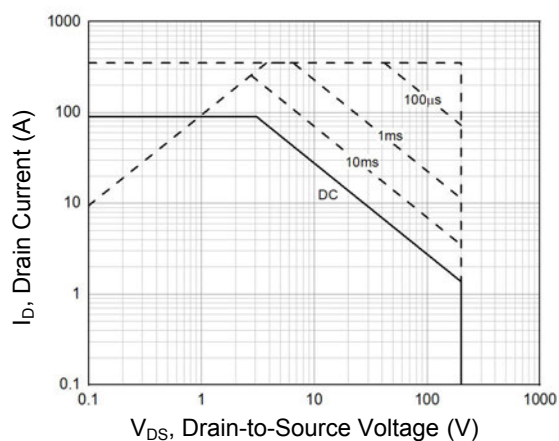


Figure 10. Safe Operation Area

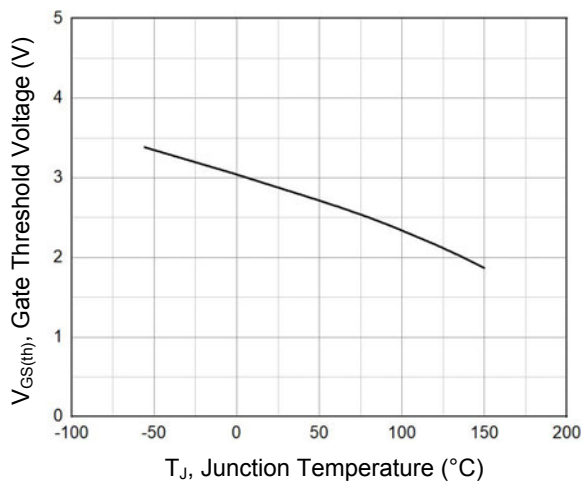


Figure 11. Gate Threshold Voltage vs. T_J

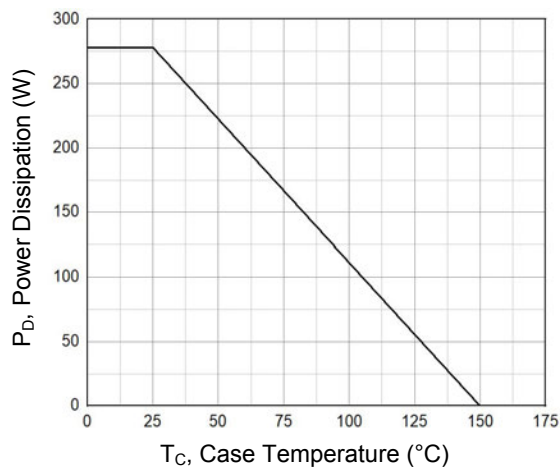
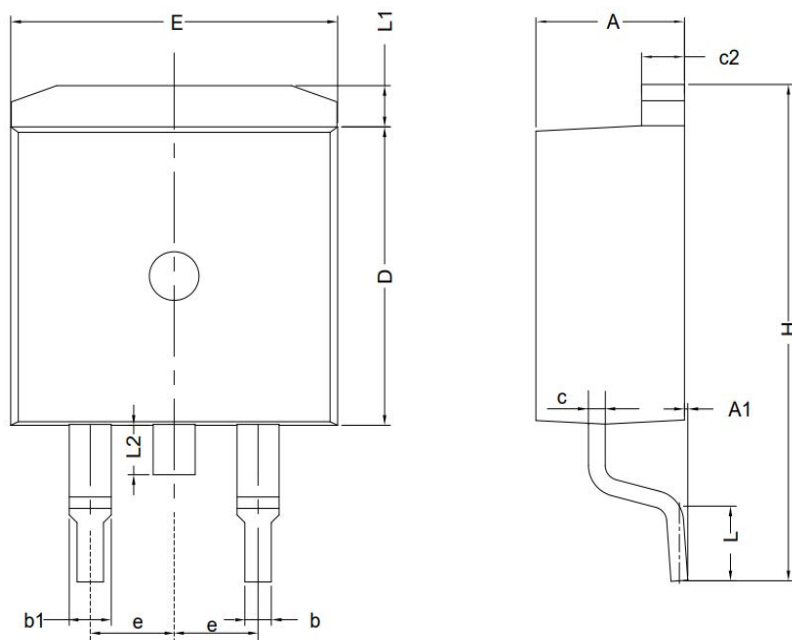


Figure 12. Power Dissipation vs. T_C

Package Outline Dimensions TO-263 (D²PAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.720	0.169	0.186
A1	0.000	0.250	0.000	0.010
b	0.710	0.910	0.028	0.036
b1	1.170	1.500	0.046	0.059
c	0.300	0.600	0.012	0.024
c2	1.170	1.370	0.046	0.054
D	8.500	9.350	0.335	0.368
E	9.800	10.450	0.386	0.411
e	2.540 BSC		0.100 BSC	
H	14.700	15.750	0.579	0.620
L	2.000	2.740	0.079	0.108
L1	1.120	1.420	0.044	0.056
L2	-	1.750	-	0.069