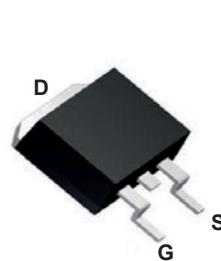
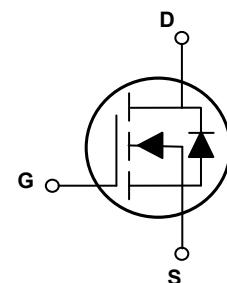


Main Product Characteristics

$V_{(BR)DSS}$	200V
$R_{DS(ON)}$	49mΩ (Max.)
I_D	24A



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 GSFT49020 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$) ¹	I_D	24	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		15	A
Pulsed Drain Current ²	I_{DM}	96	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	150	W
Linear Derating Factor ($T_C=25^\circ\text{C}$)		1.2	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ³	E_{AS}	29	mJ
Junction-to-Case	R_{eJC}	0.83	$^\circ\text{C}/\text{W}$
Junction-to-Ambient (PCB Mounted, Steady-State) ⁴	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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	200	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=200\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
		$T_J=125^\circ\text{C}$	-	-	20	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{\text{GS}}=20\text{V}$	-	-	100	nA
		$V_{\text{GS}}=-20\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=22\text{A}$	-	41.6	49	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2.1	3	3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=100\text{V}$ $F=1\text{MHz}$	-	1223	-	pF
Output Capacitance	C_{oss}		-	94	-	
Reverse Transfer Capacitance	C_{rss}		-	6.8	-	
Total Gate Charge	Q_g	$I_D=12\text{A}, V_{\text{DS}}=100\text{V}, V_{\text{GS}}=10\text{V}$	-	20.5	-	nC
Gate-to-Source Charge	Q_{gs}		-	8.6	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	4.8	-	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=100\text{V}, I_D=12\text{A}, R_{\text{GEN}}=6\Omega$	-	11.5	-	nS
Rise Time	t_r		-	26.3	-	
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	34.5	-	
Fall Time	t_f		-	22.6	-	
Gate Resistance	R_g		-	1.8	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_s	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	24	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	96	A
Diode Forward Voltage	V_{SD}	$I_s=24\text{A}, V_{\text{GS}}=0\text{V}$	-	1	1.2	V
Reverse Recovery Time	T_{rr}	$T_J=25^\circ\text{C}, I_F=24\text{A}, \text{di}/\text{dt}=100\text{A}/\mu\text{s}$	-	83	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.3	-	uc

Note:

1. Pulse test: pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. $L=0.1\text{mH}, V_{\text{DD}}=80\text{V}, I_{\text{AS}}=24\text{A}, T_J=25^\circ\text{C}$.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

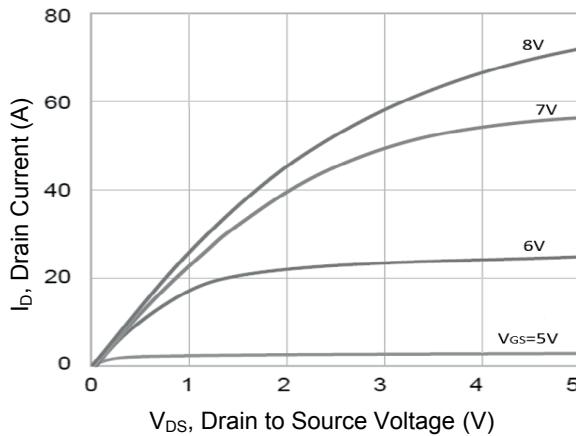


Figure 1. Output Characteristics

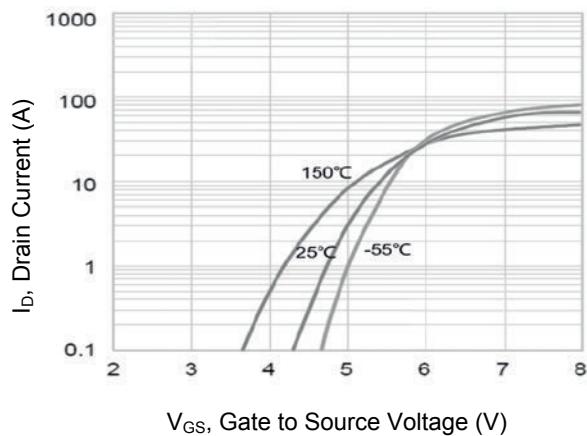


Figure 2. Transfer Characteristics

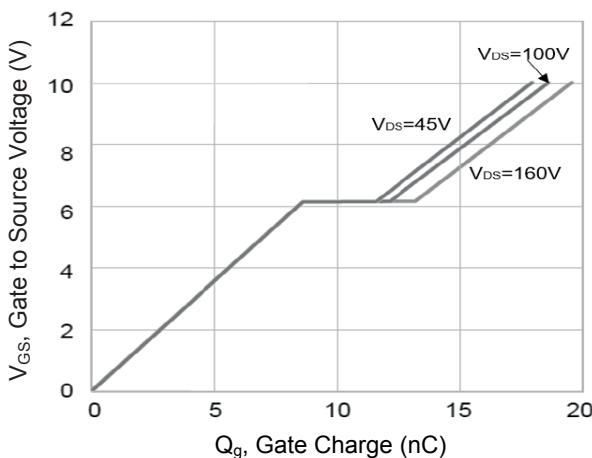


Figure 3. Gate Charge

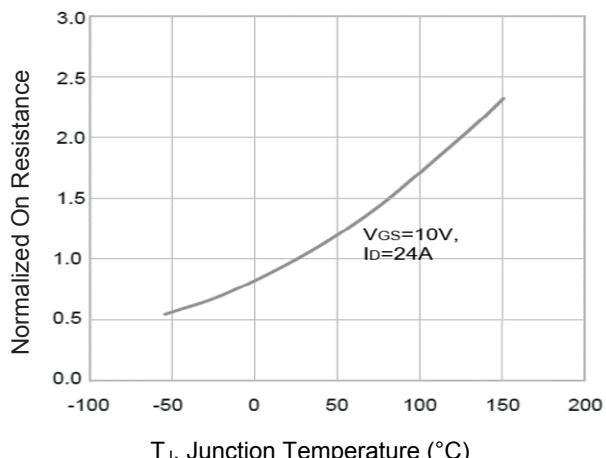


Figure 4. Normalized $R_{DS(on)}$ vs. Junction Temperature

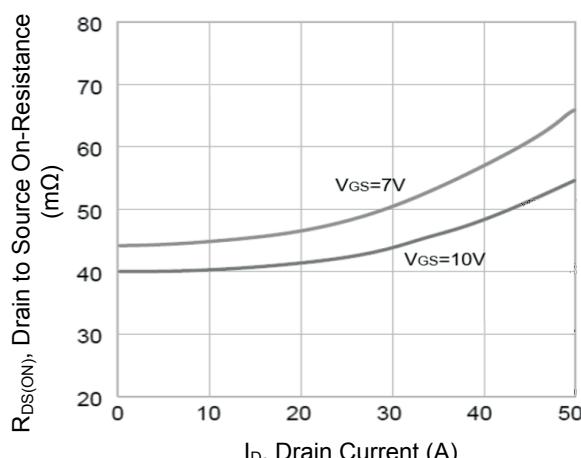


Figure 5. On-Resistance vs. Drain Current

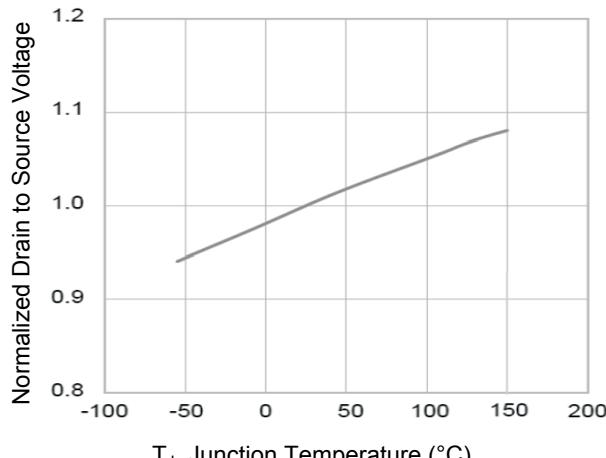


Figure 6. Normalized BV_{DSS} Vs. Junction Temperature

Typical Electrical and Thermal Characteristic Curves

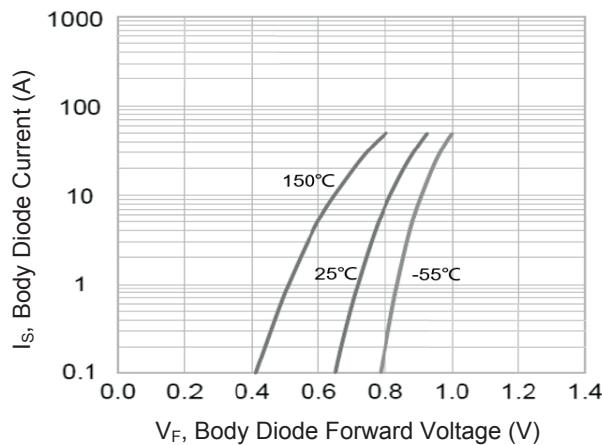


Figure 7. Body Diode Characteristics

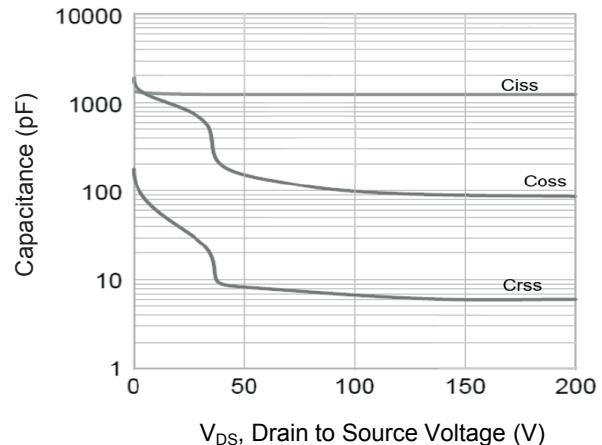


Figure 8. Transfer Characteristics

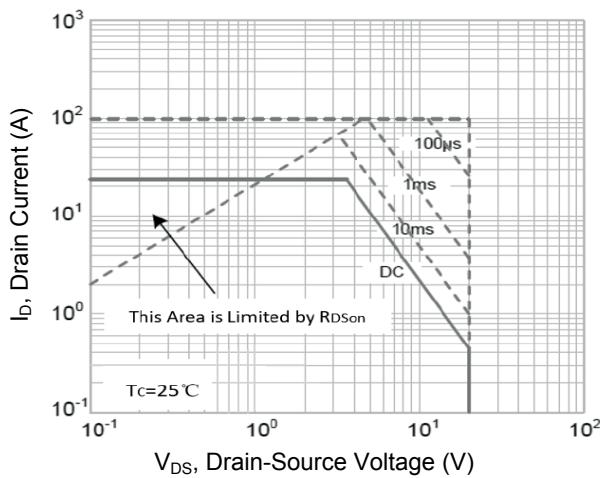
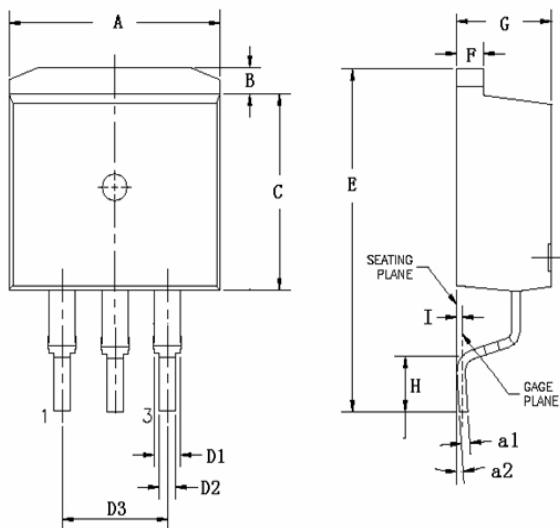


Figure 9. Safe Operation Area

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°