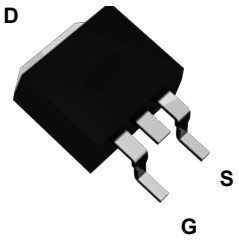
GOOD-ARK SEMICONDUCTOR

GSFT4003

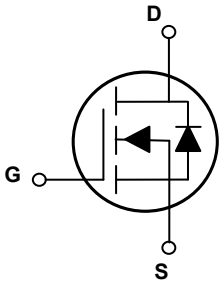
40V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	3.0mΩ (Max.)
I_D	240A



TO-263 (D^2PAK)



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 GSFT4003 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°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)[1]	I_D	240	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		150	A
Pulsed Drain Current[2]	I_{DM}	960	A
Power Dissipation (T_C=25°C)	P_D	260	W
Power Dissipation (T_C=100°C)		175	
Linear Derating Factor (T_C=25°C)		2.1	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	610	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.48	°C/W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.0	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	40	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=80A	-	2.2	3.0	mΩ
		V_{GS}=6.0V, I_D=40A	-	2.5	3.6	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.1	3.0	3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	5700	-	pF
Output Capacitance	C_{oss}		-	770	-	
Reverse Transfer Capacitance	C_{rss}		-	530	-	
Total Gate Charge	Q_g	I_D=50A, V_{DD}=32V, V_{GS}=10V	-	108	-	nC
Gate-to-Source Charge	Q_{gs}		-	34	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	30	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD}=20V, I_D=30A, R_{GEN}=2.7Ω	-	28	-	nS
Rise Time	t_r		-	89	-	
Turn-Off Delay Time	$t_{d(off)}$		-	134	-	
Fall Time	t_f		-	116	-	
Gate Resistance	R_g	f=1MHz	-	4.0	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	240	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	960	A
Diode Forward Voltage	V_{SD}	I_S=50A, V_{GS}=0V	-	0.95	1.2	V
Reverse Recovery Time	T_{rr}	T_J=25°C, I_F=50A, di/dt=100A/μs	-	29	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.03	-	uC

Note:

1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=1mH, V_{DD}=38V, R_g=25Ω, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

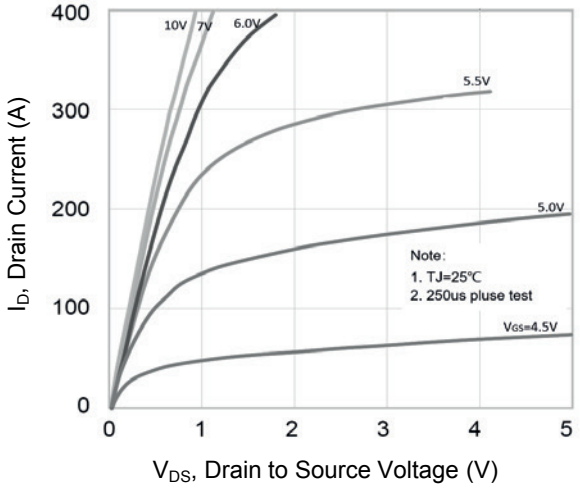


Figure 1. Output Characteristics

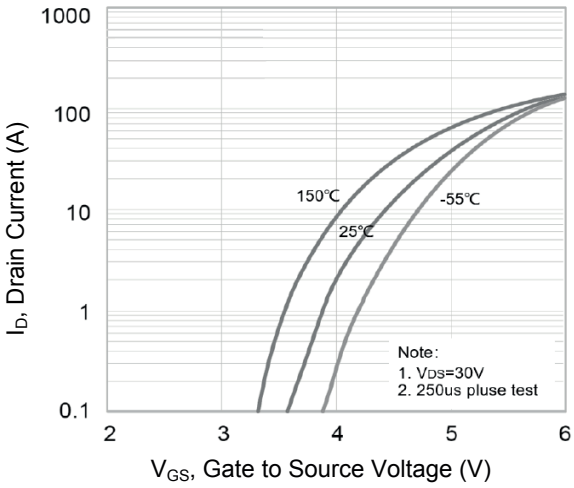


Figure 2. Transfer Characteristics

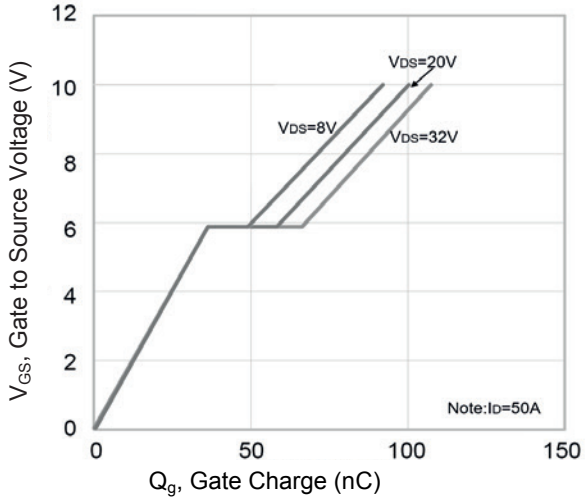


Figure 3. Gate Charge

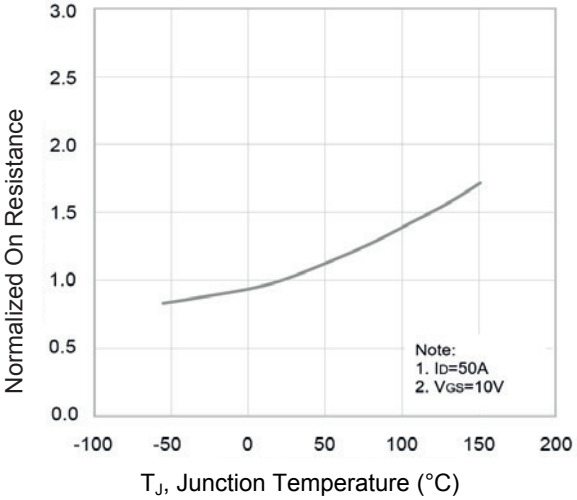


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

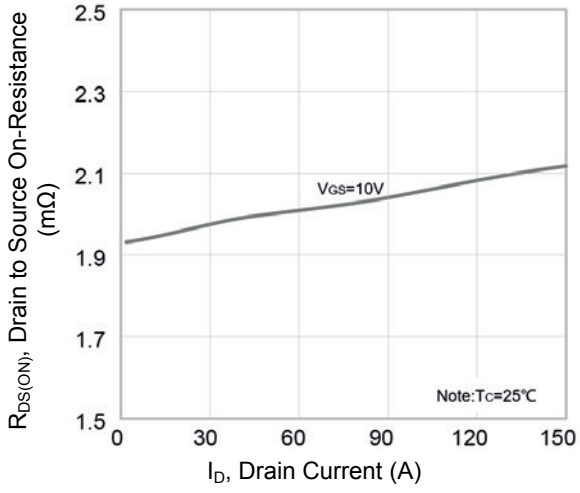


Figure 5. $R_{DS(ON)}$ vs. Drain Current

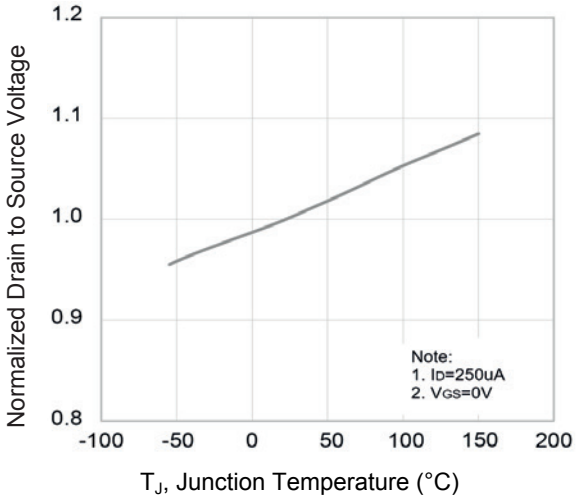


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

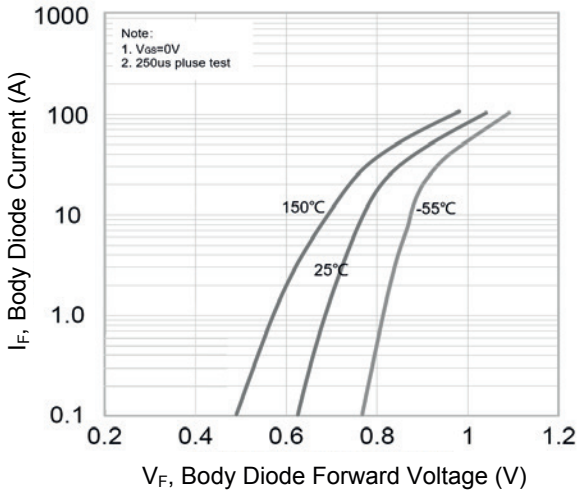


Figure 7. Body Diode Characteristics

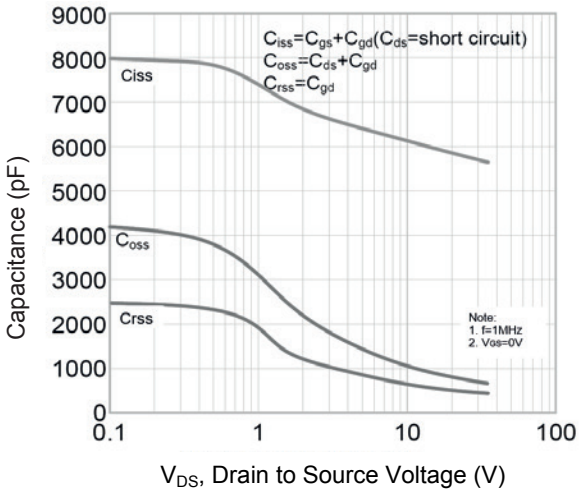


Figure 8. Capacitance Characteristics

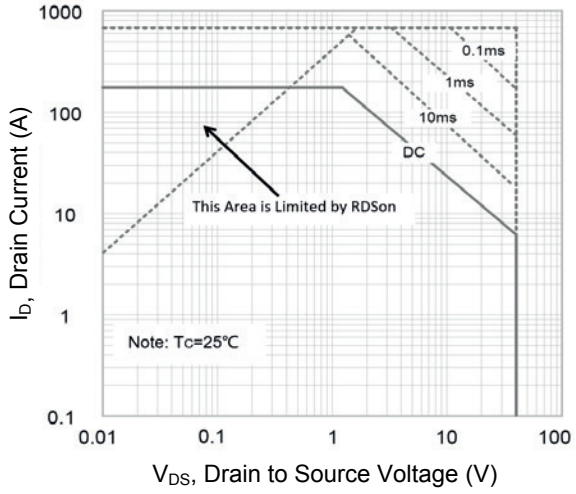
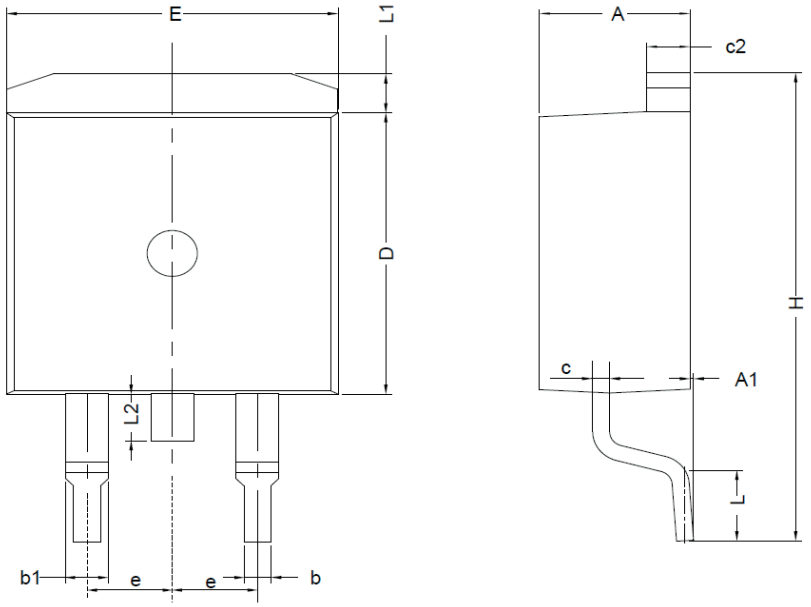


Figure 9. Safe Operation Area

Package Outline Dimensions (TO-263)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.72	0.169	0.186
A1	0.00	0.25	0.000	0.010
b	0.71	0.91	0.028	0.036
b1	1.17	1.50	0.046	0.059
C	0.30	0.60	0.012	0.024
c2	1.17	1.37	0.046	0.054
D	8.50	9.35	0.335	0.368
E	9.80	10.45	0.386	0.411
e	2.54 BSC		0.100 BSC	
H	14.70	15.75	0.579	0.620
L	2.00	2.74	0.079	0.108
L1	1.12	1.42	0.044	0.056
L2	-	1.75	-	0.069

Order Information

Device	Package	Marking	Carrier	Quantity
GSFT4003	TO-263	T4003	Tape & Reel	800 Pcs / Reel