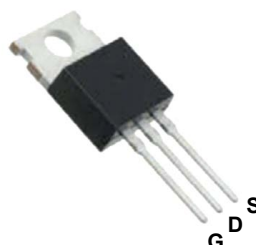
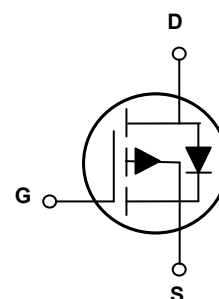


Main Product Characteristics

$V_{(BR)DSS}$	-100V
$R_{DS(ON)}$	180mΩ (Max.)
I_D	-20A



TO-220



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 GSFH1003 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}	-100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_A=25^{\circ}\text{C}$)	I_D	-20	A
Drain Current-Continuous ($T_A=70^{\circ}\text{C}$)		-14	
Drain Current-Pulsed ¹	I_{DM}	-60	A
Single Pulse Avalanche Energy ²	E_{AS}	24	mJ
Single Pulse Avalanche Current ²	I_{AS}	22	A
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	54	W
Power Dissipation-De-rate above 25°C		0.43	W/ $^{\circ}\text{C}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.3	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

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	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	-1	μA
		$V_{DS}=-80V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5A$	-	150	180	m Ω
		$V_{GS}=-4.5V, I_D=-2A$	-	165	210	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.1	-1.6	-2.7	V
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-1.5A$	-	6.5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=-50V, I_D=-1A, V_{GS}=-10V$	-	20	-	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	2.4	-	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	3.3	-	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=-50V, R_G=6\Omega, V_{GS}=-10V, I_D=-1A$	-	18	-	nS
Rise Time ^{3,4}	t_r		-	8	-	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	100	-	
Fall Time ^{3,4}	t_f		-	30	-	
Input Capacitance	C_{iss}	$V_{DS}=-50V, V_{GS}=0V, F=1\text{MHz}$	-	1280	-	pF
Output Capacitance	C_{oss}		-	55	-	
Reverse Transfer Capacitance	C_{rss}		-	30	-	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	16	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	-20	A
Pulsed Source Current	I_{SM}		-	-	-60	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-5A, T_J=25^{\circ}\text{C}$	-	-	-1	V
Reverse Recovery Time	t_{rr}	$V_R=-100V, I_S=-1A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	35	-	nS
Reverse Recovery Charge	Q_{rr}		-	30	-	nC

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22A$, starting $T_J=25^{\circ}\text{C}$.
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

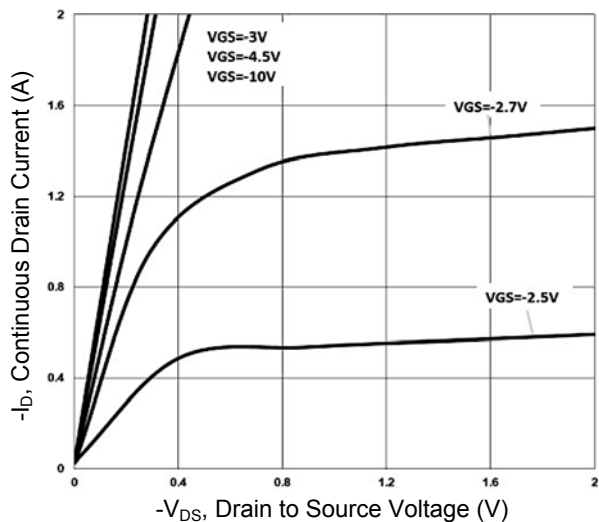


Figure 1. Typical Output Characteristics

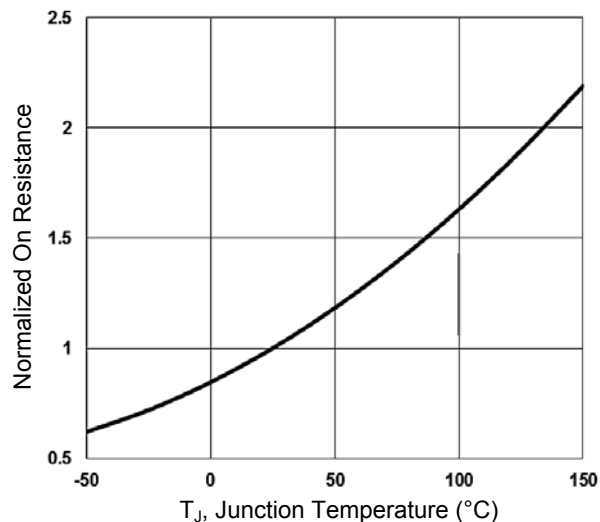


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

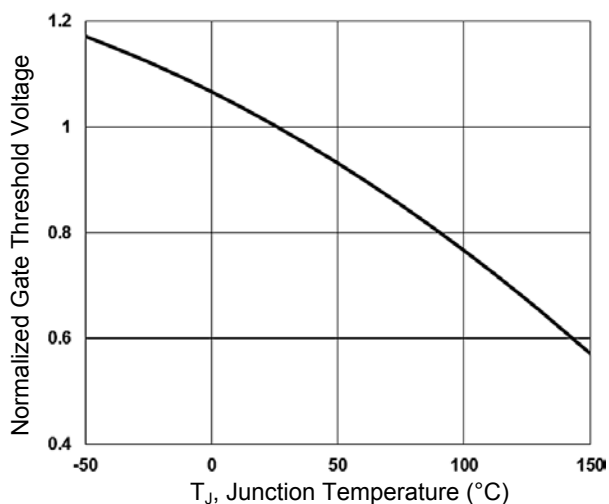


Figure 3. Normalized V_{th} vs. T_J

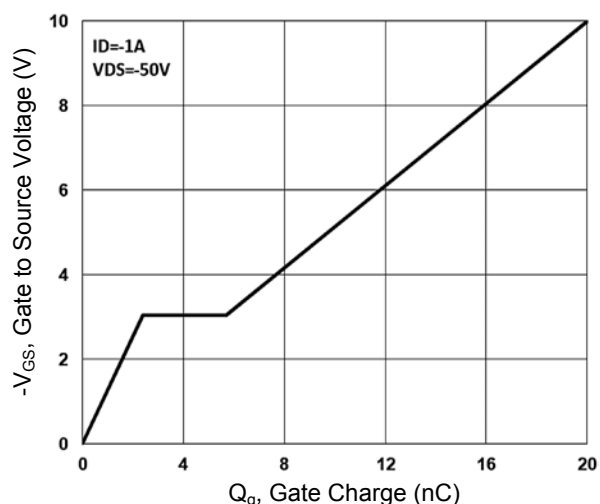


Figure 4. Gate Charge Characteristics

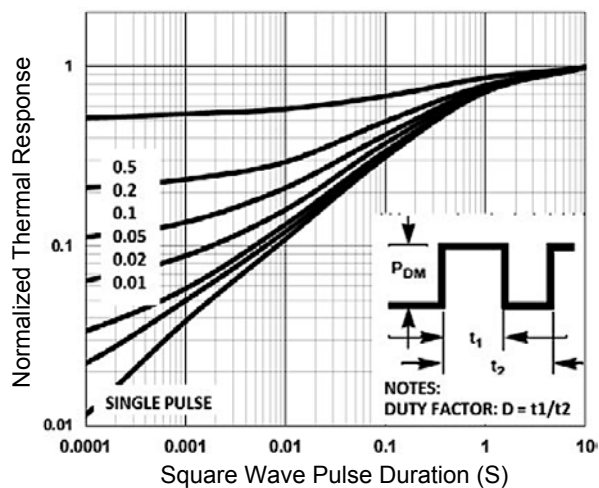


Figure 5. Normalized Transient Impedance

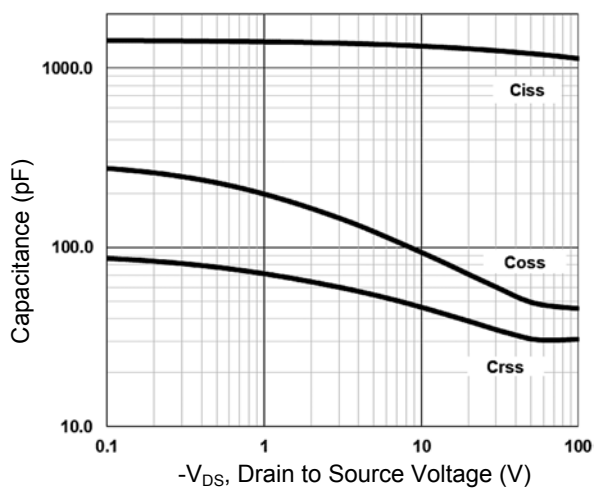
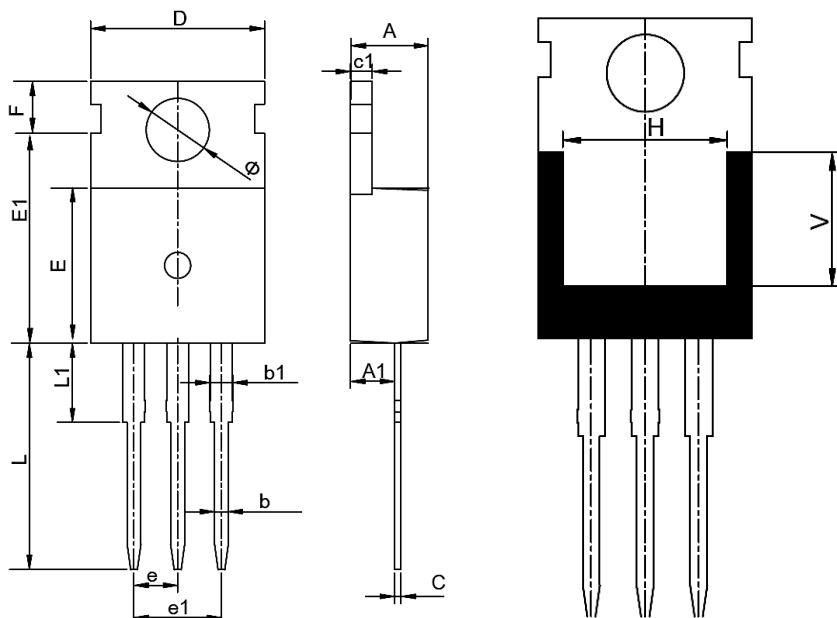


Figure 6. Capacitance Characteristics

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
A1	2.25	2.70	0.089	0.106
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
C	0.33	0.65	0.013	0.026
c1	1.20	1.40	0.047	0.055
D	9.91	10.25	0.390	0.404
E	8.95	9.75	0.352	0.384
E1	12.65	13.00	0.498	0.512
e	2.54 TYP		0.100 TYP	
e1	4.98	5.18	0.196	0.204
F	2.65	2.95	0.104	0.116
H	7.90	8.10	0.311	0.319
L	12.90	13.40	0.508	0.528
L1	2.68	3.25	0.106	0.128
V	6.90 REF		0.272 REF	
Φ	3.40	3.80	0.134	0.150

Order Information

Device	Package	Marking	Carrier	Quantity
GSFH1003	TO-220	H1003	Tube	50 Pcs / Tube