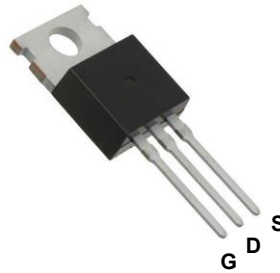
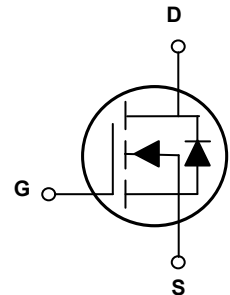


Main Product Characteristics

V_{DS}	100V
$R_{DS(ON)}$	17.5m Ω
I_D	57A



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 GSFH1058 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 supply 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}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	57	A
Drain Current-Continuous ($T_C=100^{\circ}\text{C}$)		40	
Drain Current-Pulsed	I_{DM}	160	A
Single Pulse Avalanche Energy ⁵	E_{AS}	580	mJ
Maximum Power Dissipation	P_D	160	W
Derate Factor	-	1.06	W/ $^{\circ}\text{C}$
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	0.94	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +175	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100	110	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics³						
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =28A	-	14.5	17.5	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =28A	32	-	-	S
Dynamic and Switching Characteristics⁴						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	-	3969	-	pF
Output Capacitance	C _{oss}		-	182.5	-	
Reverse Transfer Capacitance	C _{rss}		-	160.2	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V, I _D =2A, R _L =15Ω V _{GS} =10V, R _G =2.5Ω	-	17	-	nS
Turn-On Rise Time	t _r		-	13	-	
Turn-Off Delay Time	t _{d(off)}		-	55	-	
Turn-Off Fall Time	t _f		-	16	-	
Total Gate Charge	Q _g	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	146.1	-	nC
Gate-Source Charge	Q _{gs}		-	29.3	-	
Gate-Drain Charge	Q _{gd}		-	57.1	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V, I _S =28A	-	0.85	1.2	V
Diode Forward Current ²	I _S	-	-	-	57	A
Reverse Recovery Time	T _{rr}	T _J =25°C, I _F =28A, di/dt=100A/μs ³	-	35	-	nS
Reverse Recovery Charge	Q _{rr}		-	58	-	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_J=25°C, V_{DD}=50V, V_G=10V, L=1mH, R_g=25Ω, I_{AS}=35A

Typical Electrical and Thermal Characteristic Curves

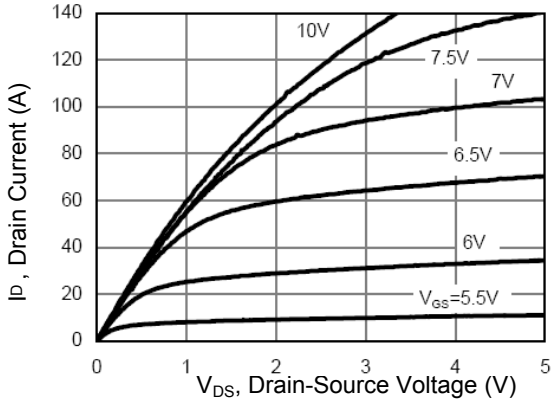


Figure 1. Output Characteristics

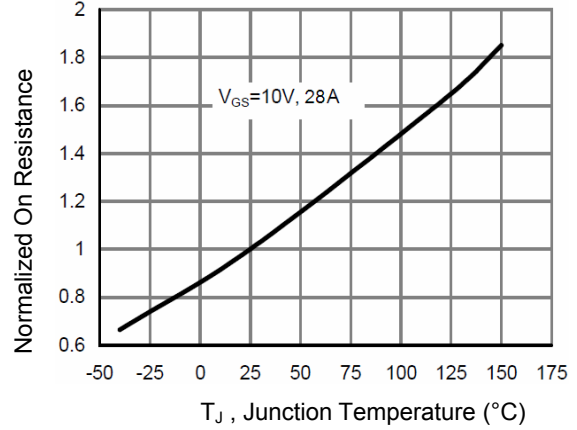


Figure 2. Rdson-Junction Temperature

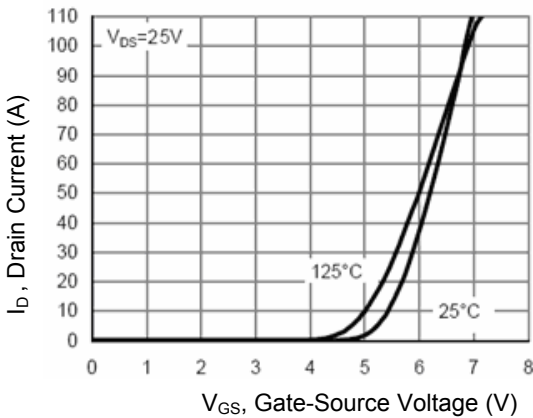


Figure 3. Transfer Characteristics

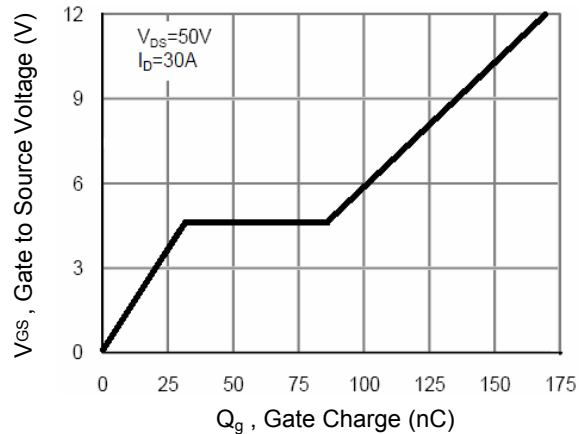


Figure 4. Gate Charge

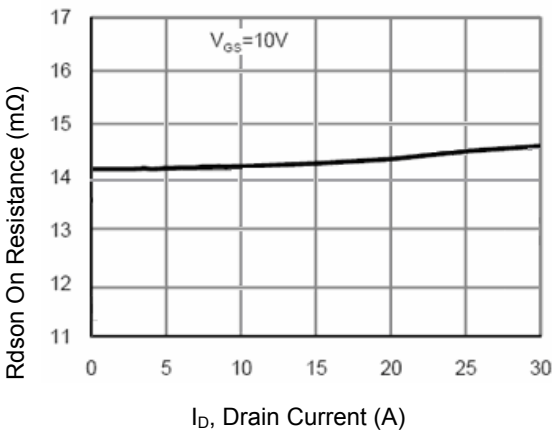


Figure 5. Rdson-Drain Current

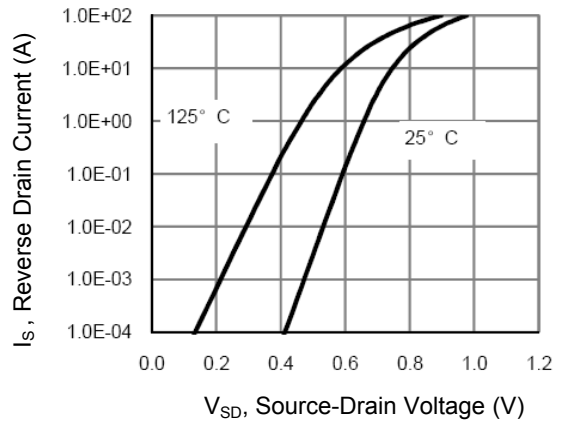


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

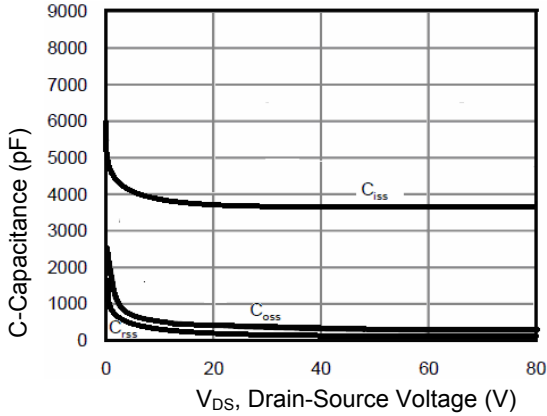


Figure 7. Capacitance vs V_{DS}

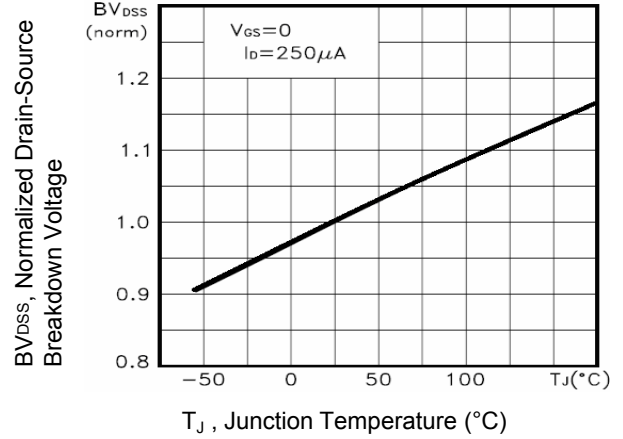


Figure 8. BV_{DSS} vs Junction Temperature

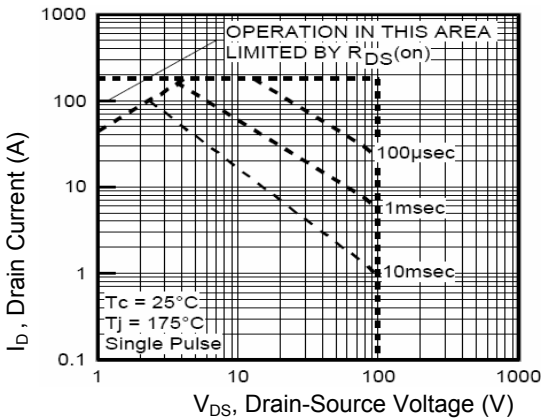


Figure 9. Safe Operation Area

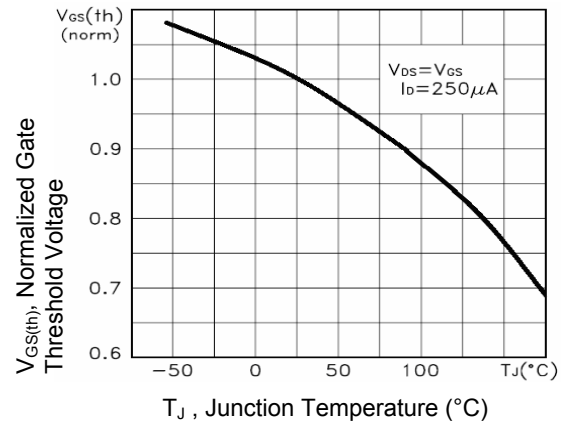


Figure 10. $V_{GS(th)}$ vs Junction Temperature

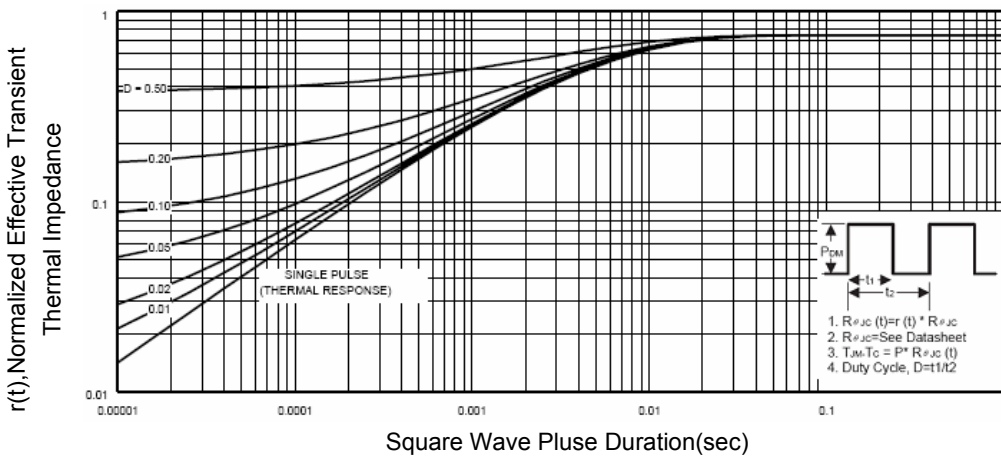


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

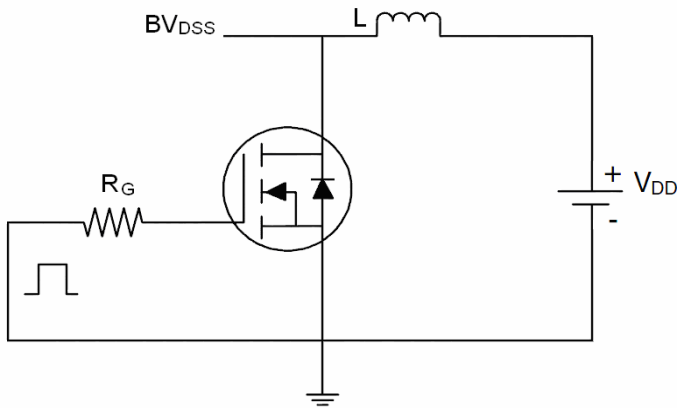


Figure 12. E_{AS} Test Circuit

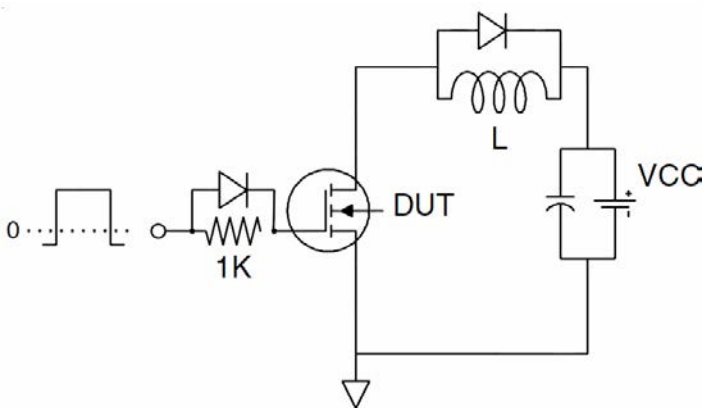


Figure 13. Gate Charge Test Circuit

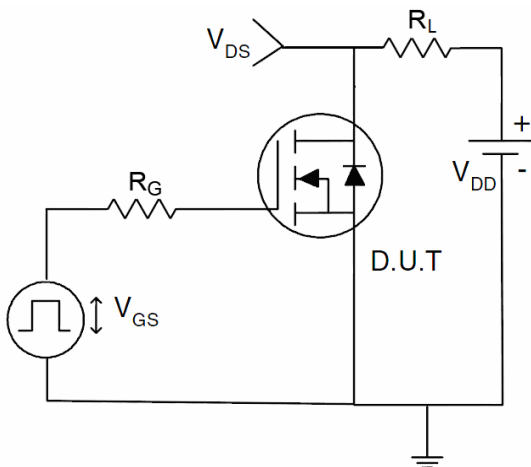
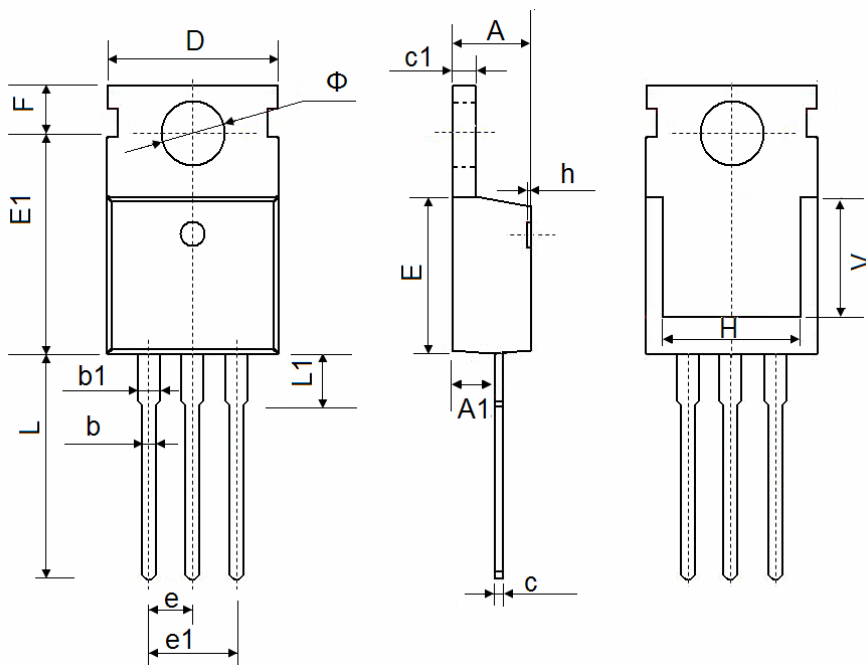


Figure 14. Switch Time Test Circuit

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150