FH1804GSB

N-Channel Enhancement Mode Power MOSFET

Description

The FH1804GSB uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

- Motor drivers
- Power switching application
- DC/DC Converters In Computing
- LCD TV appliances

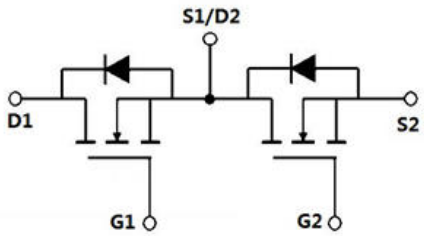
General Features

V_{DS}=40V ; ID=60A / 80A

$R_{DS(ON)}$=4.0mΩ(typ) @ V_{GS}=10V

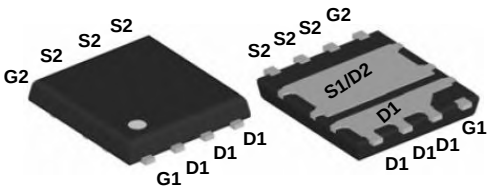
$R_{DS(ON)}$=5.7mΩ(typ) @ V_{GS}=4.5V

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



Schematic diagram

Marking and pin assignment



PDFN5x6-8L Pin assignment and Top / Bottom View

Absolute Maximum Ratings

Symbol	Parameter		Channel 1	Channel 2	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)					
V_{DSS}	Drain-Source Voltage		40	40	V
V_{GSS}	Gate-Source Voltage		±20	±20	
T_J	Maximum Junction Temperature		150	150	°C
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	30	30	A
Mounted on Large Heat Sink					
I_{DM} ①	300μs Pulsed Source Current	T_C=25°C	120	160	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=10V)	T_C=25°C	60	80	A
		T_C=100°C	38	52	
	Continuous Drain Current@T_A(V_{GS}=10V) ③	T_A=25°C	20	28	
		T_A=70°C	16	22	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	30	42	W
		T_C=100°C	12.5	17	
	Maximum Power Dissipation@T_A ③	T_A=25°C	4.2	4.2	
		T_A=70°C	2.7	2.7	

Symbol	Parameter	Channel 1	Channel 2	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.7	3.9	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	65	55	°C/W
E_{AS} ④	Avalanche Energy, Single Pulsed	100		mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V			1	μA
		T_J=125°C			100	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.0		2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		4.0	5.2	mΩ
		V_{GS}=4.5V, I_{DS}=15A		5.7	7.6	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs		20		ns
Q_{rr}	Reverse Recovery Charge			13		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.4		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz		1105		pF
C_{oss}	Output Capacitance			246		
C_{rss}	Reverse Transfer Capacitance			31		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_L=1.00Ω, I_{DS}=20A, V_{GEN}=10V, R_G=3Ω		9.2		ns
t_r	Turn-on Rise Time			23		
$t_{d(OFF)}$	Turn-off Delay Time			25.6		
t_f	Turn-off Fall Time			6		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V, I_{DS}=20A		22.7		nC
Q_{gs}	Gate-Source Charge			3.84		
Q_{gd}	Gate-Drain Charge			4.8		

Notes: ①Pulse width limited by safe operating area.

②Calculated continuous current based on maximum allowable junction temperature.

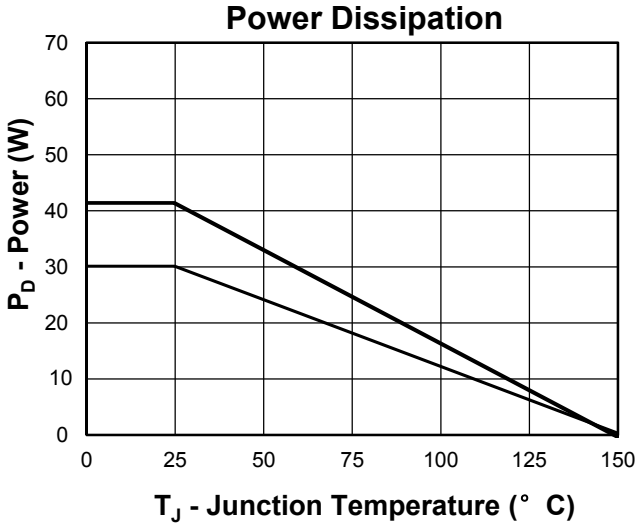
③When mounted on 1 inch square copper board, t≤10sec.

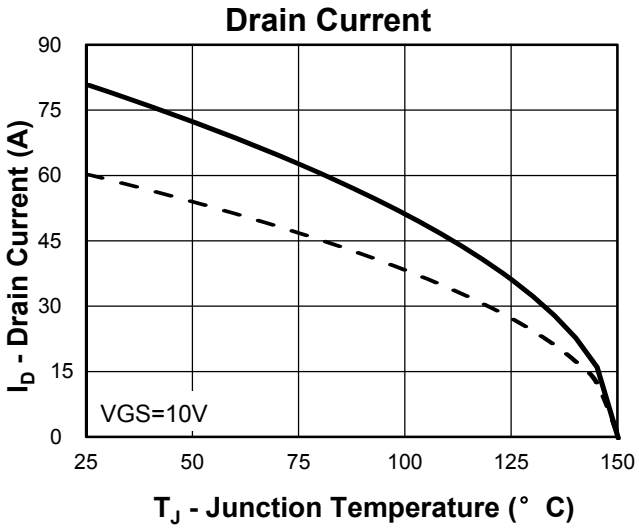
④Limited by TJmax, IAS =20A, VDD = 20V, RG = 50Ω, L=0.5mH, Starting TJ = 25°C.

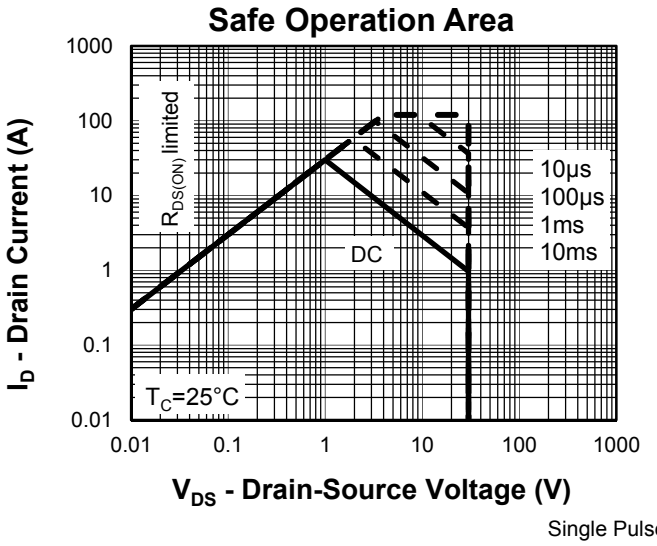
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.

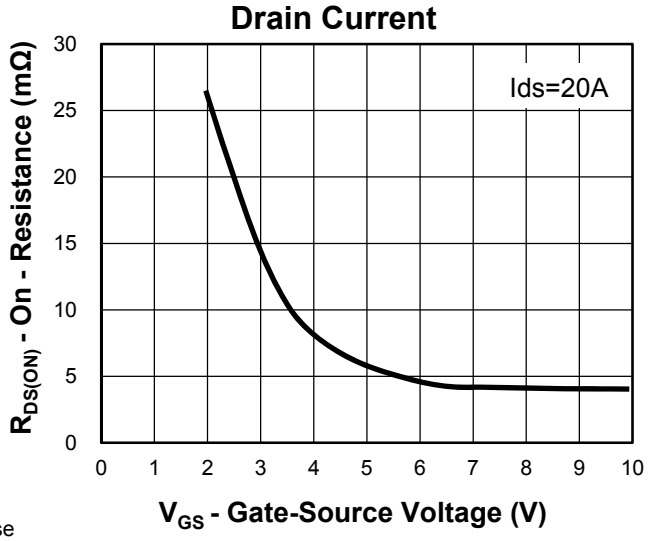
⑥Guaranteed by design, not subject to production testing.

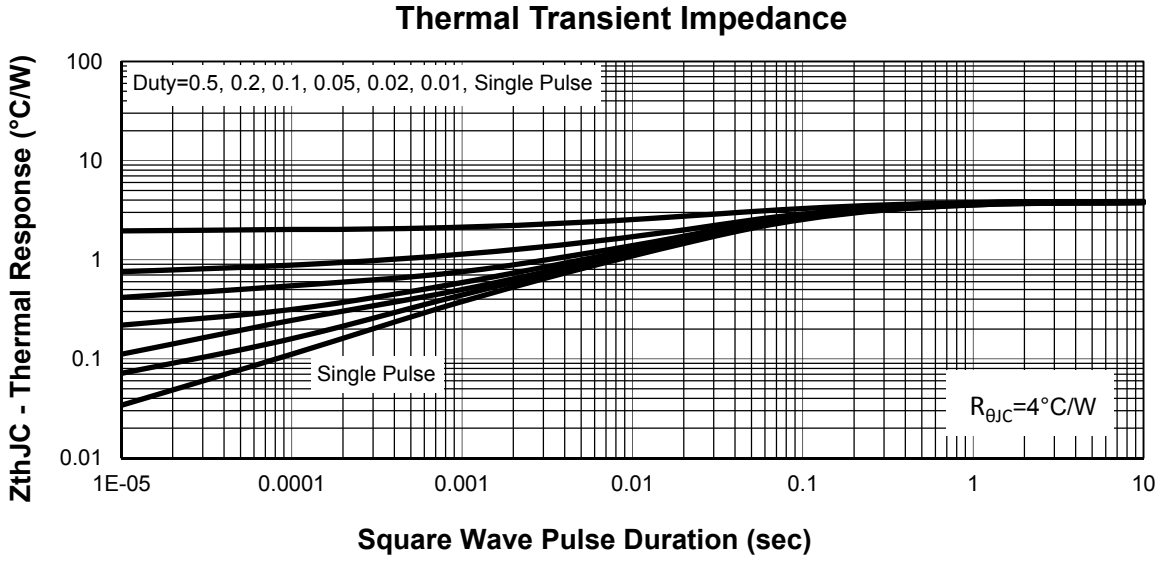
Typical Characteristics





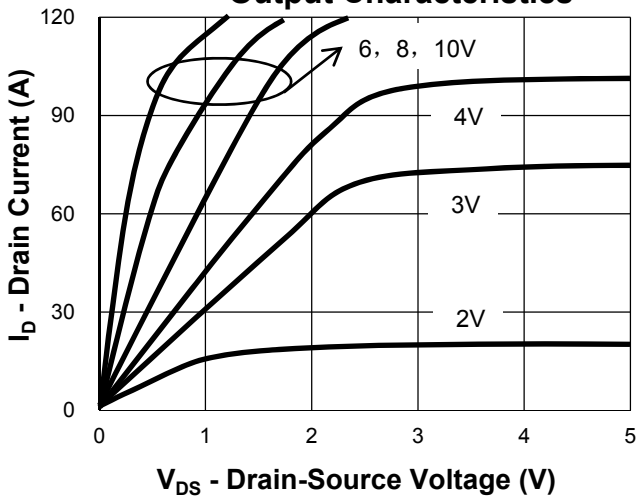




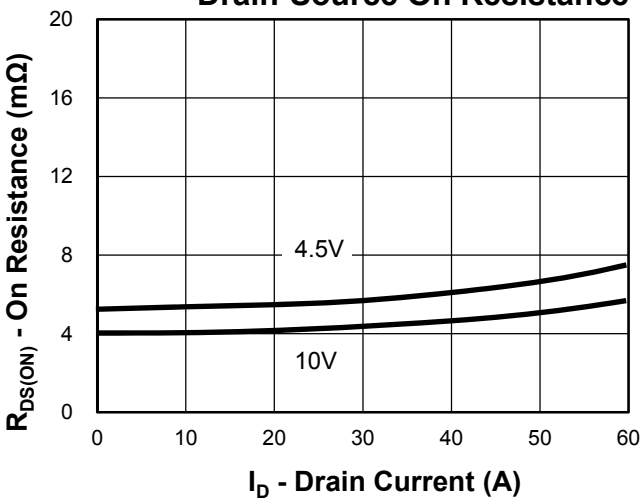


Typical Characteristics

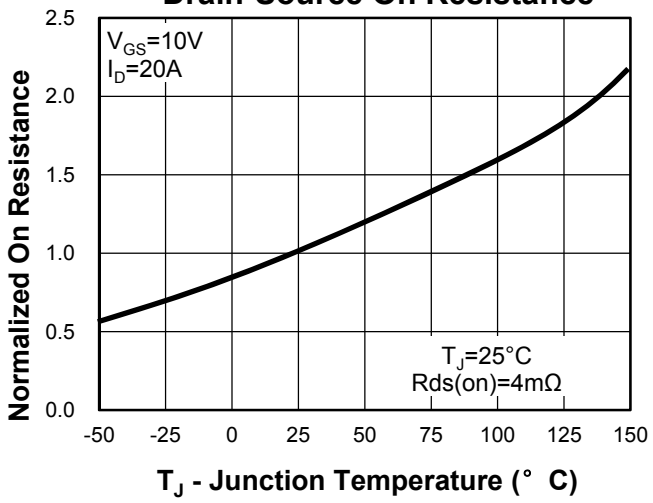
Output Characteristics



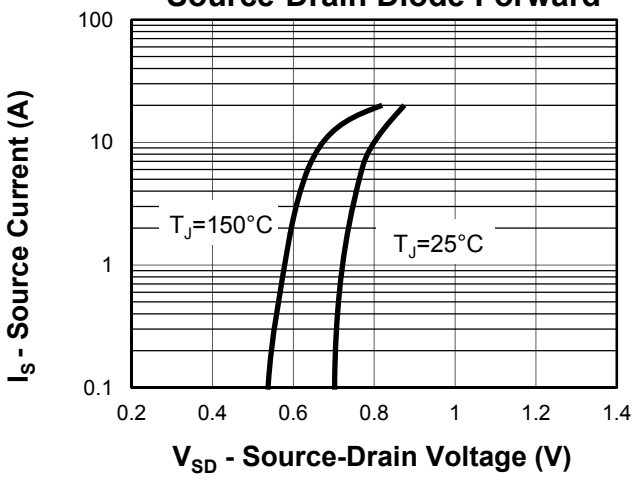
Drain-Source On Resistance



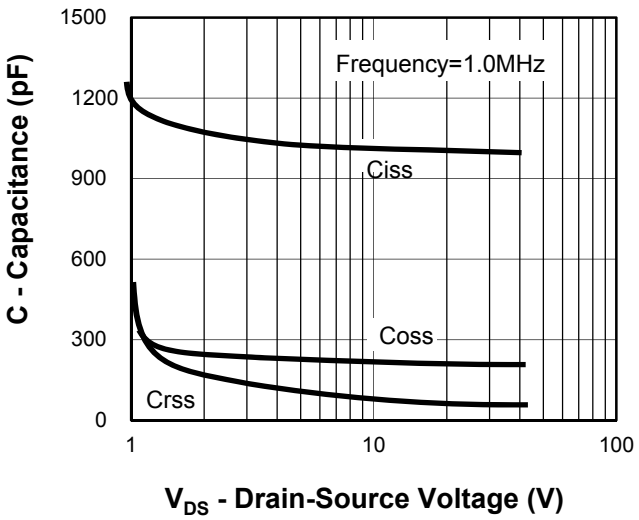
Drain-Source On Resistance



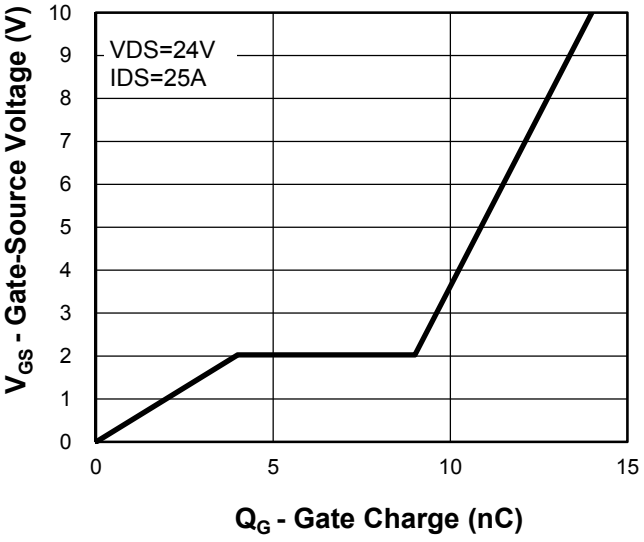
Source-Drain Diode Forward



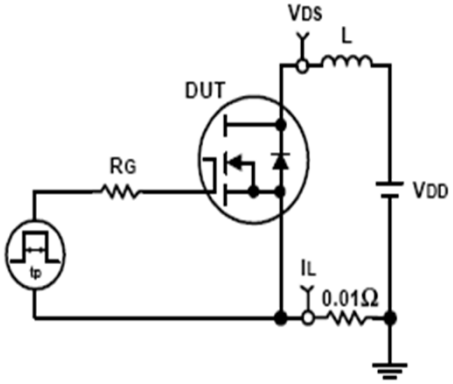
Capacitance

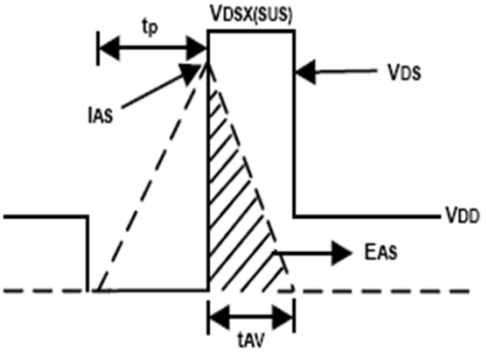


Gate Charge

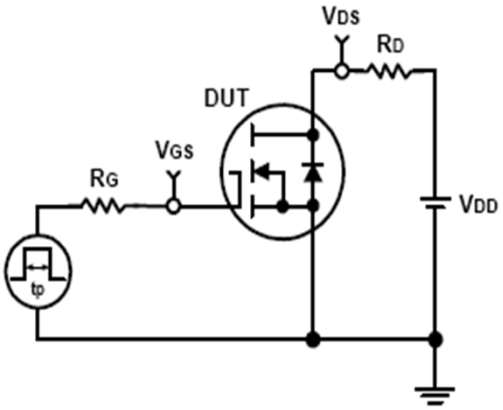


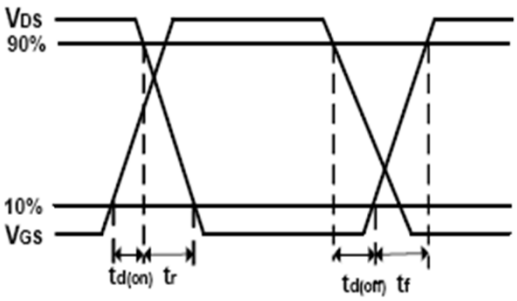
Avalanche Test Circuit and Waveforms



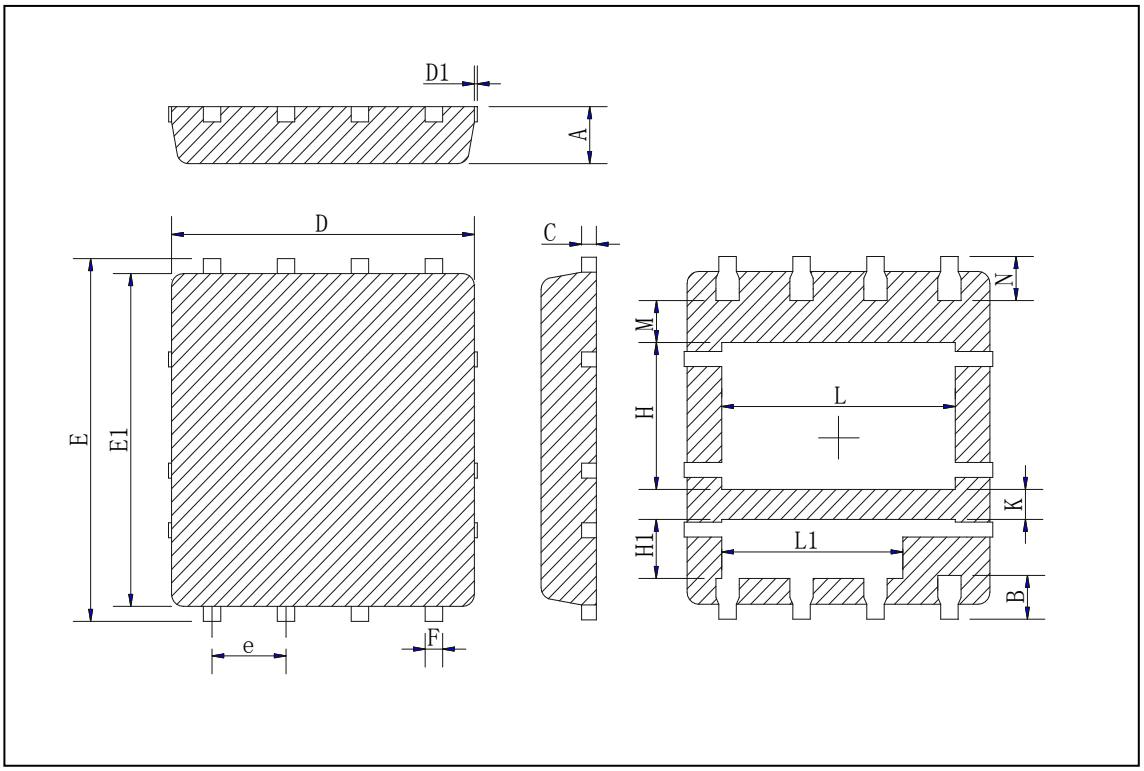


Switching Time Test Circuit and Waveforms





Package Information : PDFN5x6-8L



Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.60	0.70	0.80
C	0.20	0.254	0.30
D	5.10	5.20	5.30
D1			0.12
E	5.95	6.05	6.15
E1	5.40	5.55	5.70
e	1.22	1.27	1.32
F	0.25	0.30	0.35
H	2.35	2.45	2.55
H1	0.88	0.98	1.08
L	3.80	4.00	4.20
L1	3.00	3.10	3.20
M	0.60	0.70	0.80
N	0.63	0.73	0.83
K	0.40	0.50	0.60