

FH1906GS

N-Channel Enhancement Mode Power MOSFET

◆ General Description

This N channel SGT MOSFET has been designed to very low on-state resistance (RDSON) and yet maintain superior switching performance, especially for high efficiency power management applications.

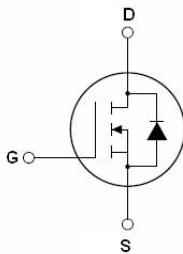
◆ Applications

- Motor drivers
- Power switching application
- DC/DC Converters In Computing
- Isolated DC/DC Converters In Telecom and Industrial

◆ Features

Parameter	Typ.	Unit
V_{DS}	60	V
I_D (@ $V_{GS} = 10V$)	90	A
$R_{DS(ON)}$ (@ $V_{GS} = 10V$) (Typ)	4.2	m Ω
$R_{DS(ON)}$ (@ $V_{GS} = 4.5V$) (Typ)	5.9	m Ω

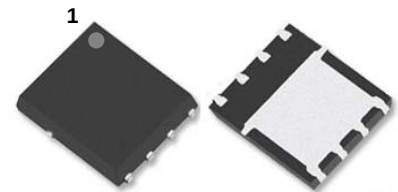
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



Schematic diagram



Marking and pin assignment



PDFN5x6-8L top and bottom view

Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	60	-	V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current (DC)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	90	A
		$T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	51	A
I_{DM}^{***}	Drain Current (Pulsed)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	270	A
P_{tot}^*	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	-	37	W
T_{stg}	Storage Temperature		- 55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_C = 25\text{ }^{\circ}\text{C}$	-	90	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD} = 30\text{ V}, L = 0.5\text{mH}$	-	162	mJ
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	59	$^{\circ}\text{C} / \text{W}$
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	3.0	

Notes :

* Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$

** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

*** limited by bonding wire

Electrical Characteristics ($T_A = 25\text{ }^{\circ}\text{C}$ Unless Otherwise Noted)

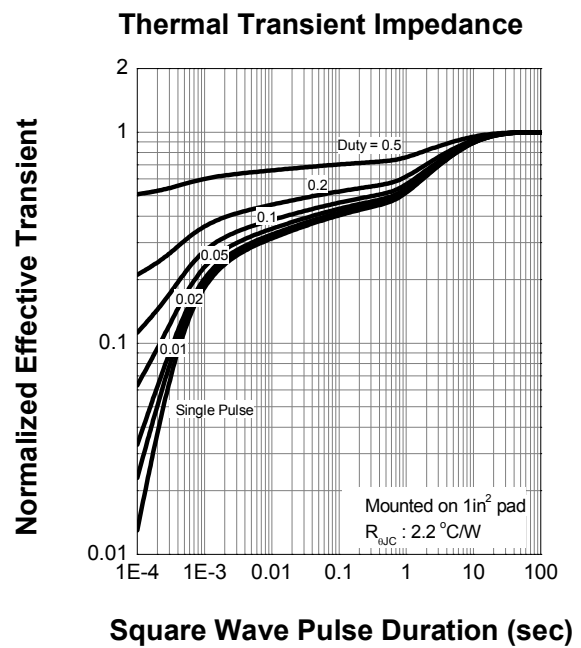
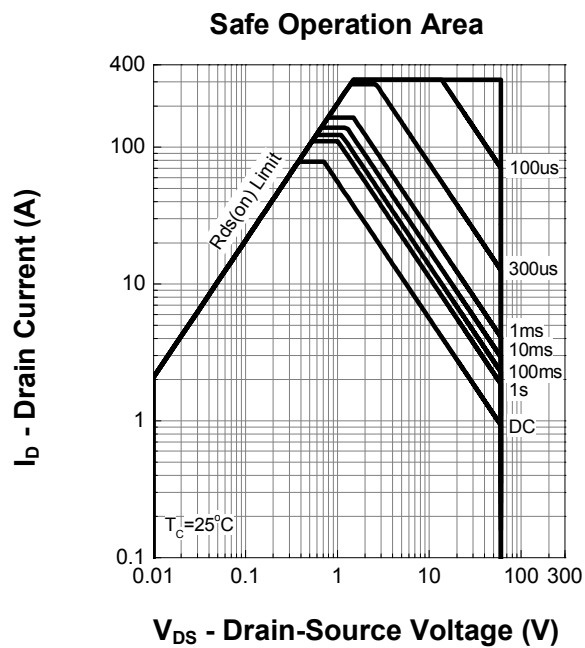
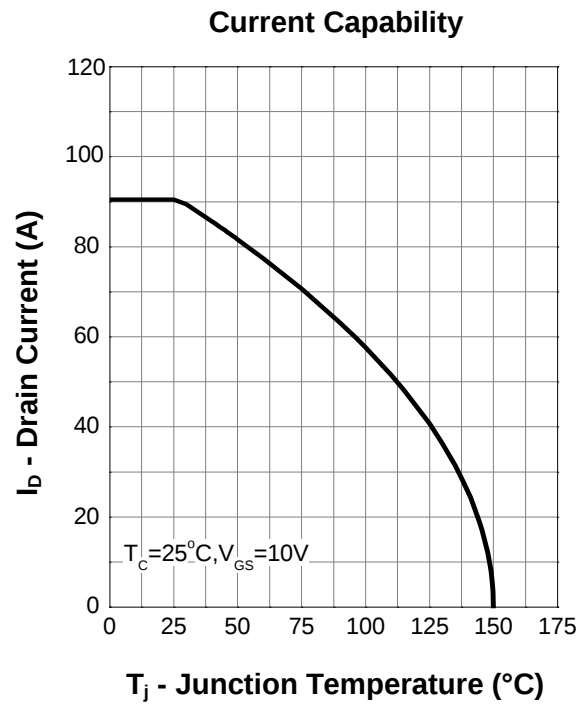
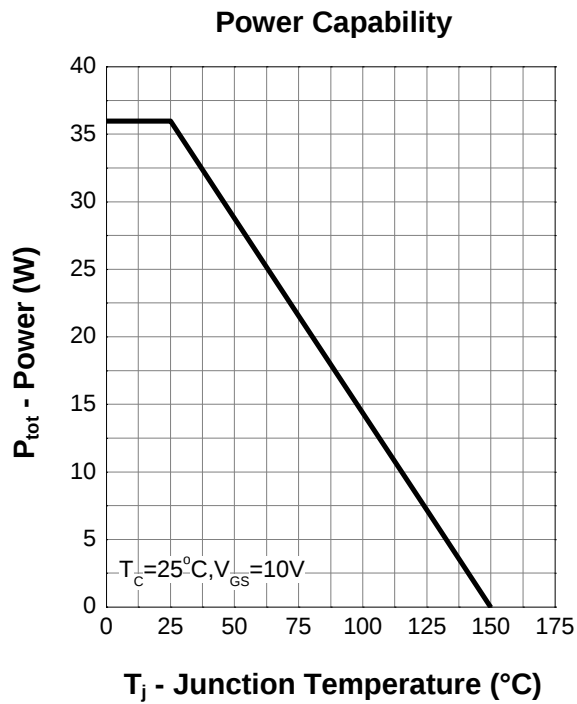
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = 250 μA	60	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1.0	-	2.0	V
I _{DSS}	Drain Leakage Current	V _{DS} = 55 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 20 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)} ^a	Channel On-State Resistance	V _{GS} = 10 V, I _D = 20 A	-	4.2	5.2	mΩ
	Channel On-State Resistance	V _{GS} = 6 V, I _D = 15 A	-	4.9	6.4	
	Channel On-State Resistance	V _{GS} = 4.5 V, I _D = 10 A	-	5.9	7.8	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 20 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} = 20 A, dI _{SD} / dt = 100 A / μs	-	36	-	ns
Q _{rr}	Reverse Recovery Charge		-	19	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 30 V Frequency = 1 MHz	-	1855	-	pF
C _{oss}	Output Capacitance		-	736	-	
C _{rss}	Reverse Transfer Capacitance		-	56	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 30 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 1.5 Ω, I _{DS} = 20 A	-	9	-	nS
t _r	Turn-on Rise Time		-	26	-	
t _{d(off)}	Turn-off Delay Time		-	34	-	
t _f	Turn-off Fall Time		-	29	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{GS} = 10 V, V _{DS} = 30 V, I _{DS} = 20 A	-	41	-	nC
Q _{gs}	Gate-Source Charge		-	7.6	-	
Q _{gd}	Gate-Drain Charge		-	9	-	

Notes :

a : Pulse test ; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

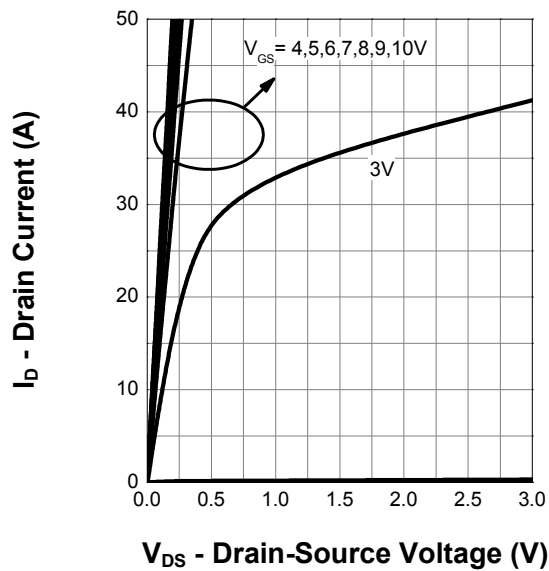
b : Guaranteed by design, not subject to production testing

Typical Characteristics (Cont.)

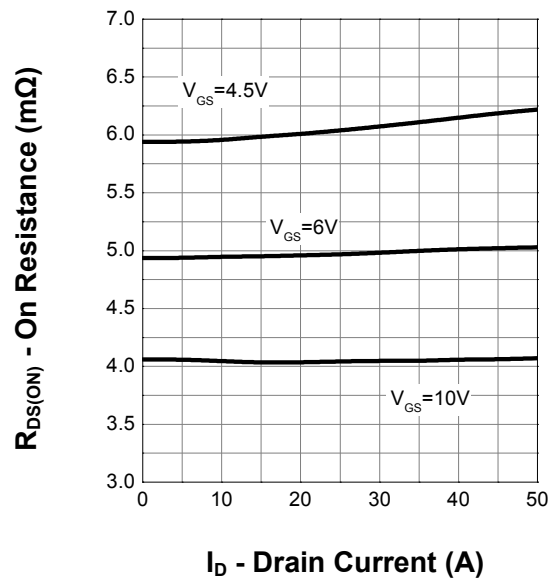


Typical Characteristics (cont.)

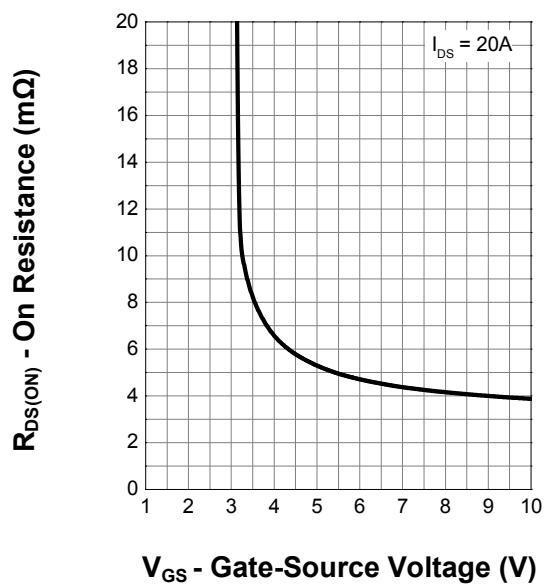
Output Characteristics



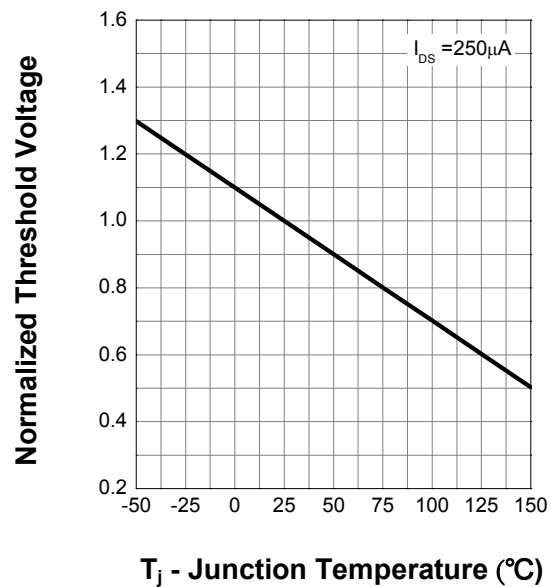
Drain-Source On Resistance



Transfer Characteristics

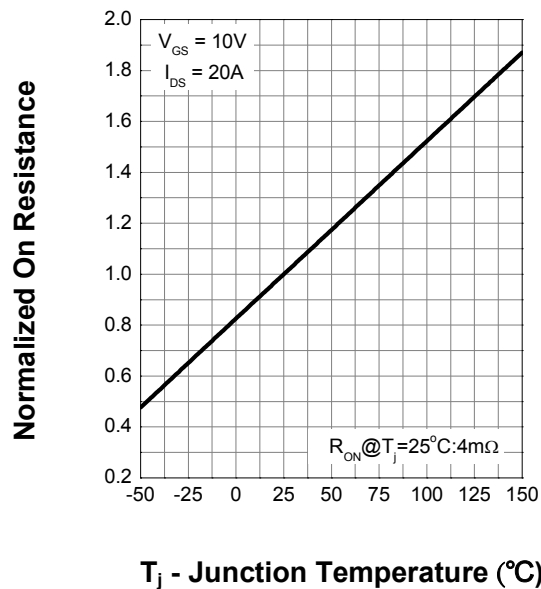


Gate Threshold Voltage

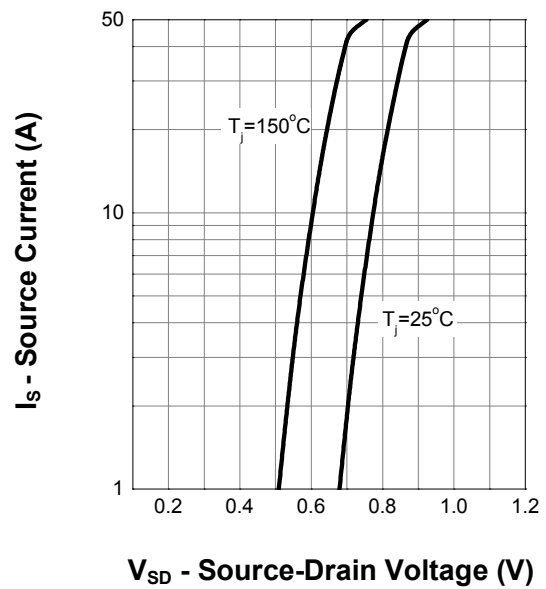


Typical Characteristics (cont.)

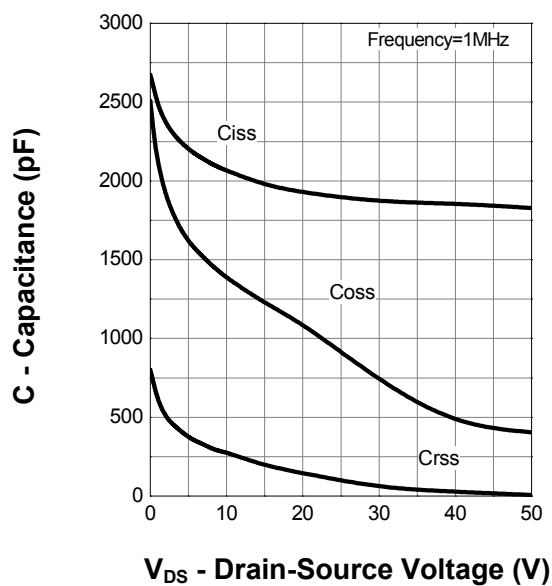
Drain-Source On Resistance



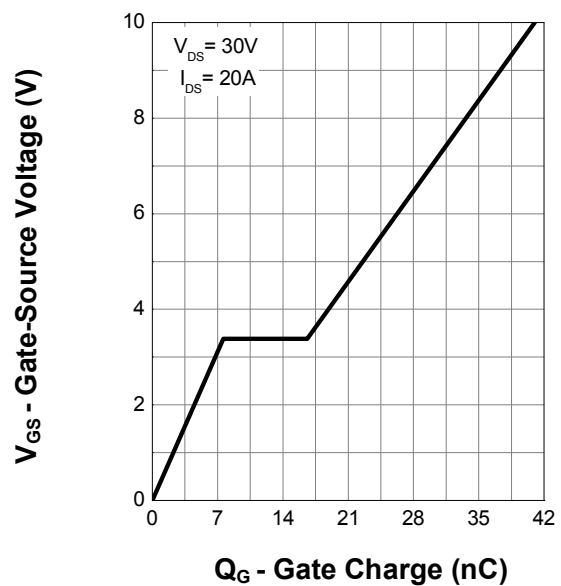
Source-Drain Diode Forward



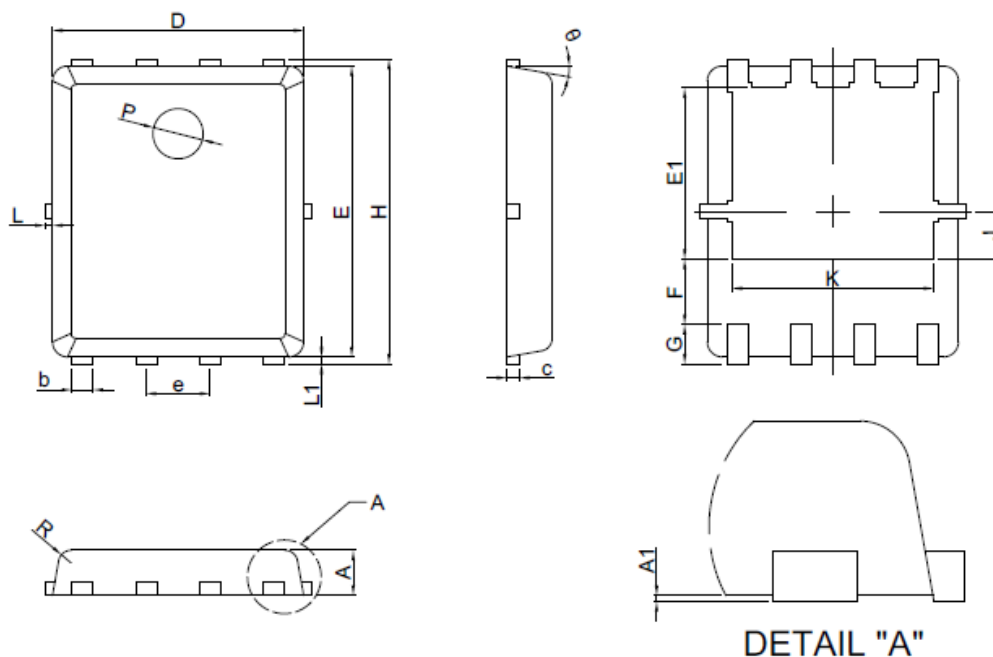
Capacitance



Gate Charge



Package Information :PDFN5x6-8L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	0.80	1.00
A1	0.00	0.05
b	0.35	0.49
c	0.254REF	
D	4.80	5.20
F	1.40REF	
E	5.60	5.90
e	1.27BSC	
H	5.80	6.20
L1	0.10	0.18
G	0.60REF	
K	4.00REF	
L	-	0.15
J	0.95BSC	
P	1.00REF	
E1	3.40REF	
θ	6°	14°
R	0.25REF	