

FH1510GS

N-Channel Enhancement Mode Power MOSFET

Description

The FH1510GS 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.

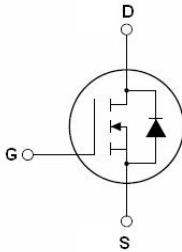
Applications

- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

Product Summary

Parameter	Typ.	Unit
V_{DS}	100	V
$V_{GS(th)}$	1.8	V
I_D (@ $V_{GS} = 10V$)	50	A
$R_{DS(ON)}$ (@ $V_{GS} = 10V$)	8.2	m Ω (Typ)
$R_{DS(ON)}$ (@ $V_{GS} = 4.5V$)	9.5	m Ω (Typ)

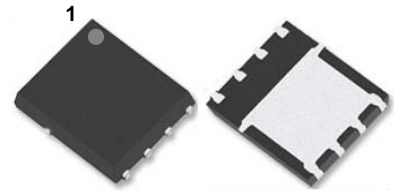
- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- High Current Capability
- 100% UIS Tested, 100% R_{θ} Tested



Schematic dia Gram



Marking and pin Assignment



PDFN5x6-8L top and bottom view

Limiting Values

ymbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	100		V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	± 20	V
I_D^*	Drain Current (DC)	$T_C = 25\text{ }^\circ\text{C}$, $V_{GS} = 10\text{ V}$	-	50	A
$I_{DM}^{***, **}$	Drain Current (Pulsed)	$T_C = 25\text{ }^\circ\text{C}$, $V_{GS} = 10\text{ V}$	-	158	A
P_{tot}^*	Total Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	48	W
T_{stg}	Storage Temperature		- 55	150	$^\circ\text{C}$
T_J	Junction Temperature		-	150	$^\circ\text{C}$
I_S	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	-	20	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD} = 50\text{ V}$, $L = 0.5\text{ mH}$	-	60	mJ
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	71	$^\circ\text{C} / \text{W}$
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	4.5	

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 °C Unless Otherwise Noted)

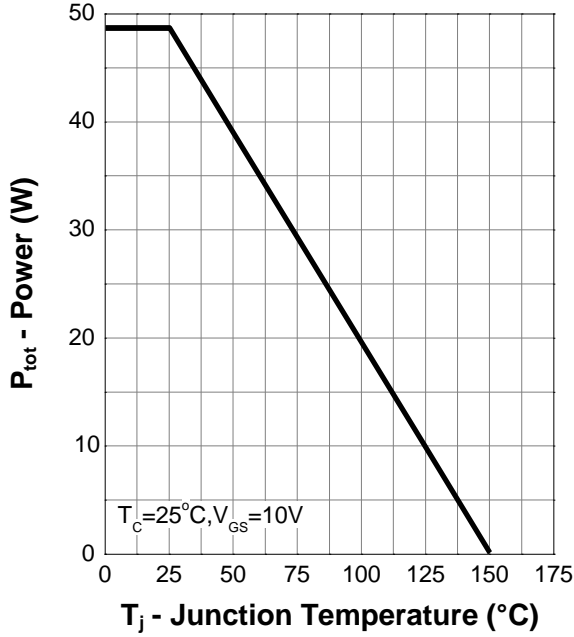
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1.5	1.8	2.5	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} = 90, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 20 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} = 10 V, I _D = 20A	-	8.2	10	mΩ
		V _{GS} = 4.5 V, I _D = 10A	-	9.5	13	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 20 A, V _{GS} = 0 V	-	0.86	1.0	V
t _{rr}	Reverse Recovery Time	I _{SD} = 20 A, dI _{SD} /dt = 100 A/μs	-	50.7	-	nS
Q _{rr}	Reverse Recovery Charge		-	72.5	-	nC
Dynamic Characteristics^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 50 V Frequency = 1 MHz	-	2131	-	pF
C _{oss}	Output Capacitance		-	606	-	
C _{rss}	Reverse Transfer Capacitance		-	21	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 50 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 2.5 Ω, I _D = 20 A	-	17	-	nS
t _r	Turn-on Rise Time		-	4	-	
t _{d(off)}	Turn-off Delay Time		-	32	-	
t _f	Turn-off Fall Time		-	8	-	
Gate Charge Characteristics^b						
Q _g	Total Gate Charge	V _{GS} = 10 V, V _{DS} = 50 V, I _{DS} = 20 A	-	29.4	-	nC
Q _{gs}	Gate-Source Charge		-	9	-	
Q _{gd}	Gate-Drain Charge		-	5	-	

Notes :

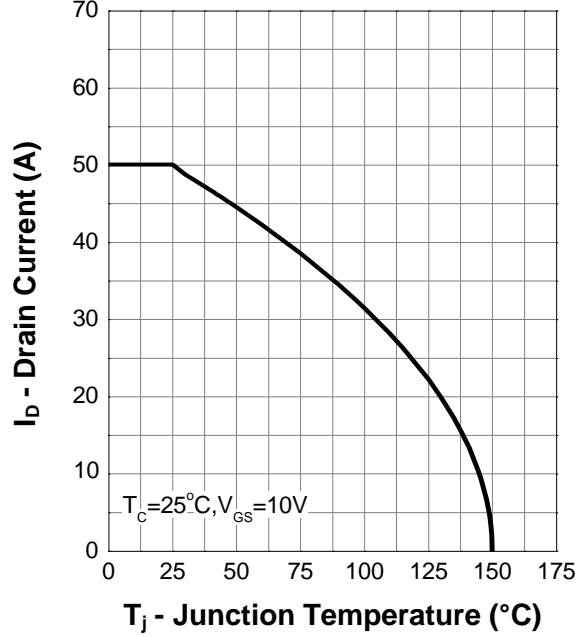
- a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b : Guaranteed by design, not subject to production testing
- c : NHCX defines “ Green ” as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)

Typical Characteristics (Cont.)

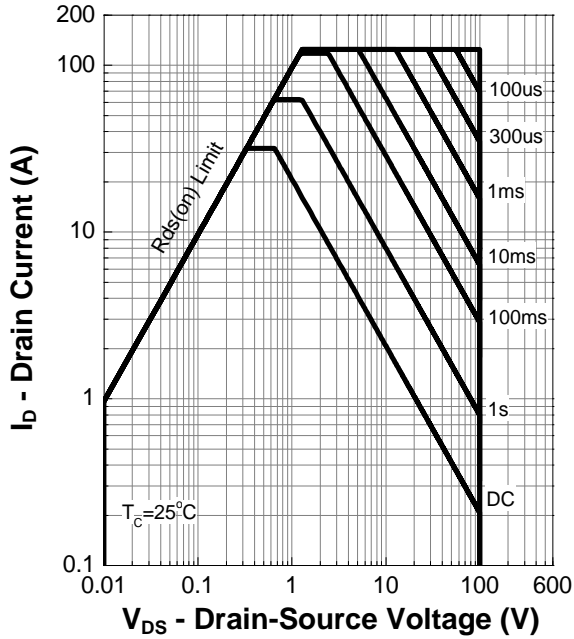
Power Capability



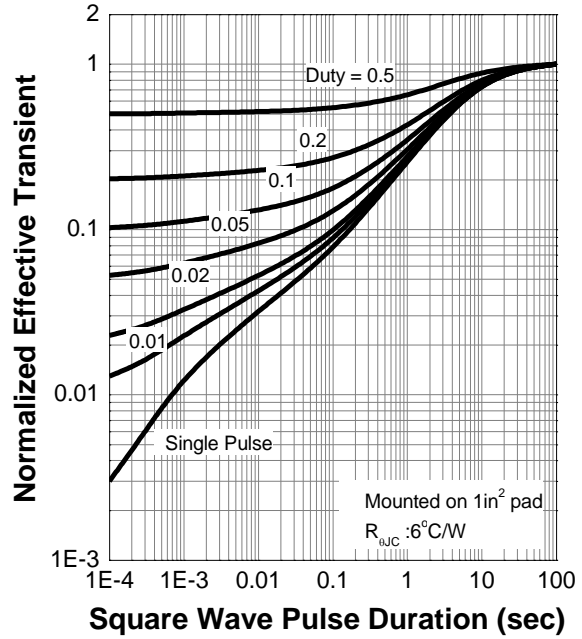
Current Capability



Safe Operating Area

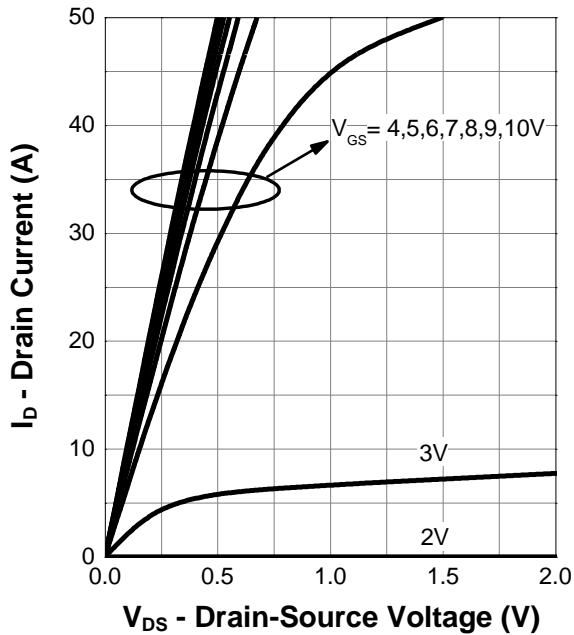


Transient Thermal Impedance

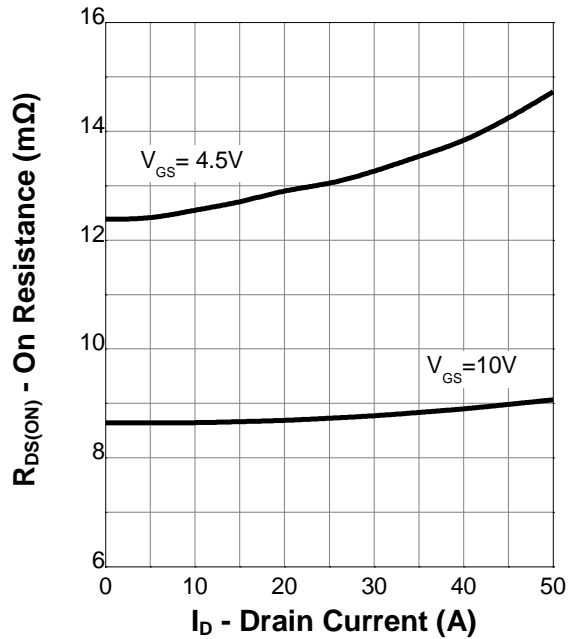


Typical Characteristics (Cont.)

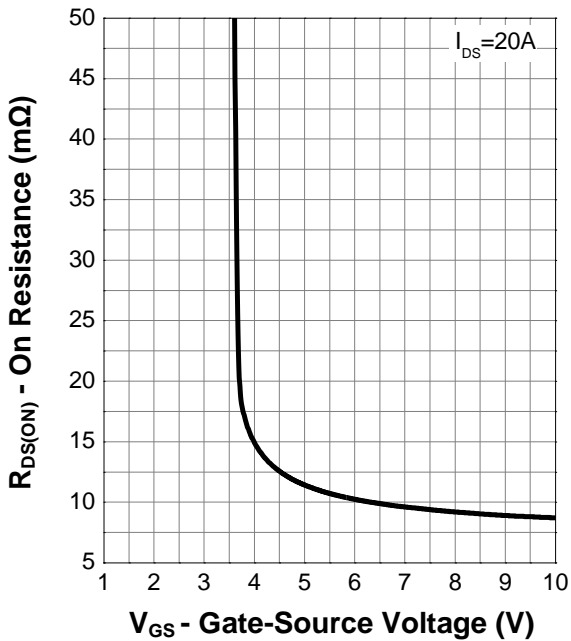
Output Characteristics



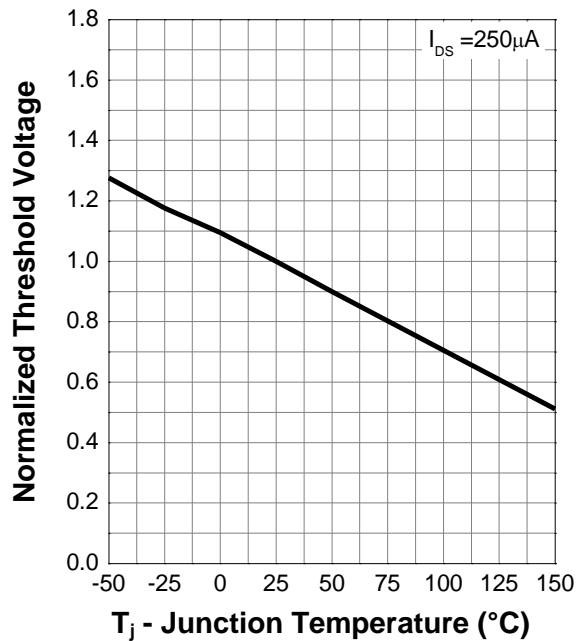
On Resistance



Transfer Characteristics

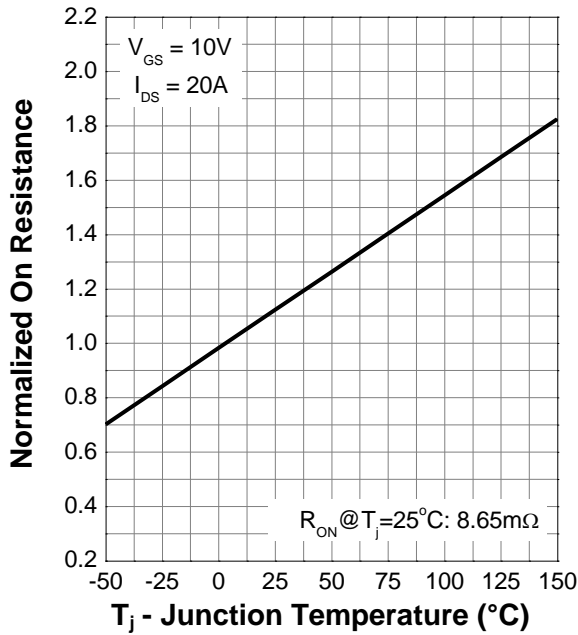


Normalized Threshold Voltage

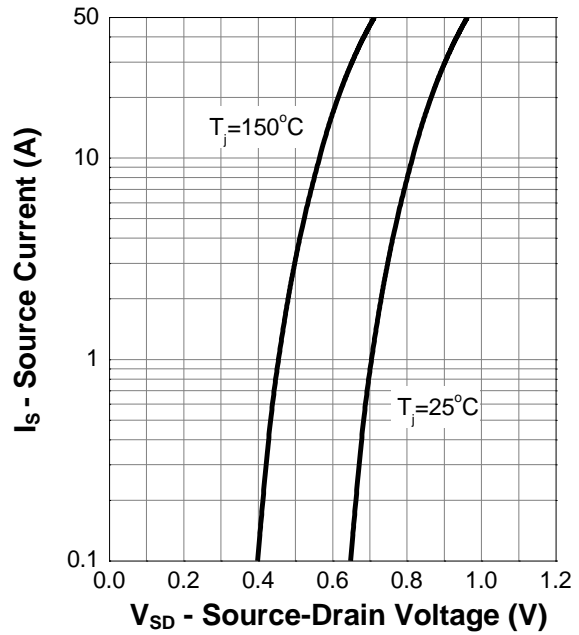


7. Typical Characteristics (Cont.)

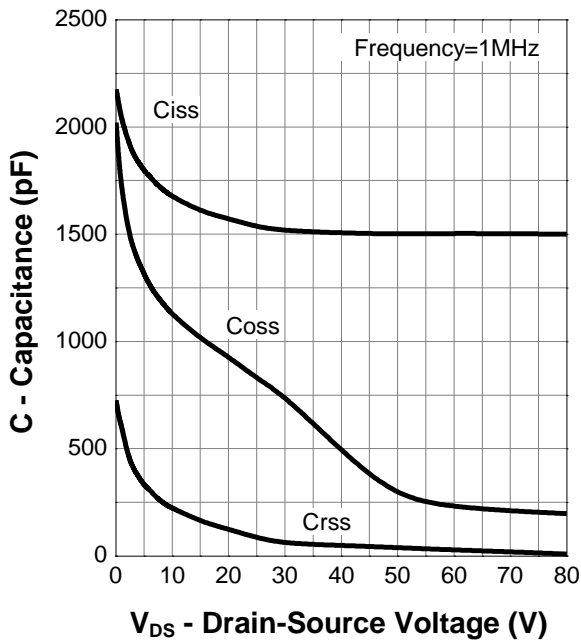
Normalized On Resistance



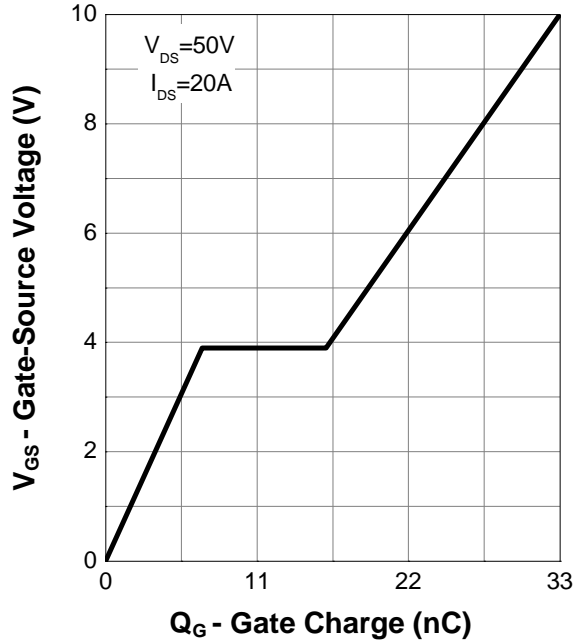
Diode Forward Current



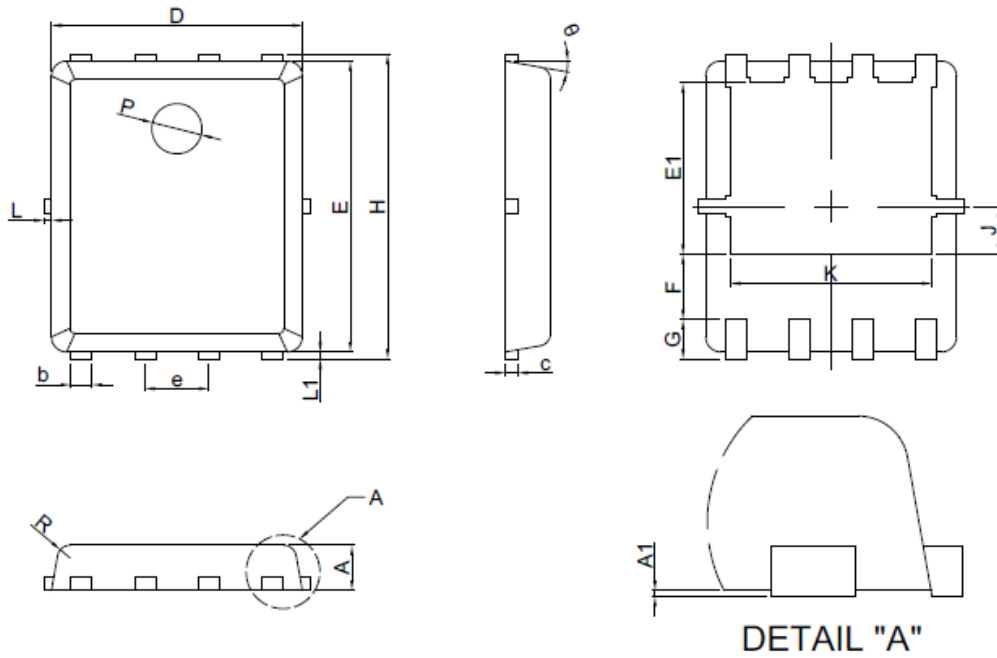
Capacitance



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	