

FH30120GS

N-Channel Trench Power MOSFET

Description

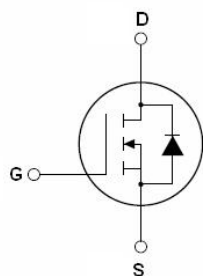
The FH30120GS uses advanced Shielded Gate trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

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

Features

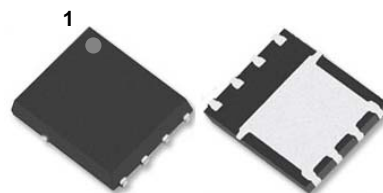
- $V_{DS} = 30V$; $I_D = 120A$
 $R_{DS(ON)}(Typ.) = 1.0 m\Omega @ V_{GS} = 10 V$
 $R_{DS(ON)}(Typ.) = 1.6 m\Omega @ V_{GS} = 4.5V$
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



Schematic diagram



Marking and pin Assignment



PDFN5x6-8L top and bottom view

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D^*	Continuous Drain Current	$T_C = 25^\circ C$	120
		$T_C = 100^\circ C$	68
I_{DM}^{*****}	Pulsed Drain Current	314	A
E_{AS}^{****}	Single Pulsed Avalanche Energy	128	mJ
P_D^*	Power Dissipation	34	W
$R_{\theta JC}^*$	Thermal Resistance, Junction to Case	3.2	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

Notes :

- * Surface Mounted on 1 in² pad area, $t \leq 10$ sec
- ** Pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$
- *** limited by bonding wire
- **** $V_D=20V, V_G=10V, R_G=25 \Omega, L=0.5mH$

Electrical Characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

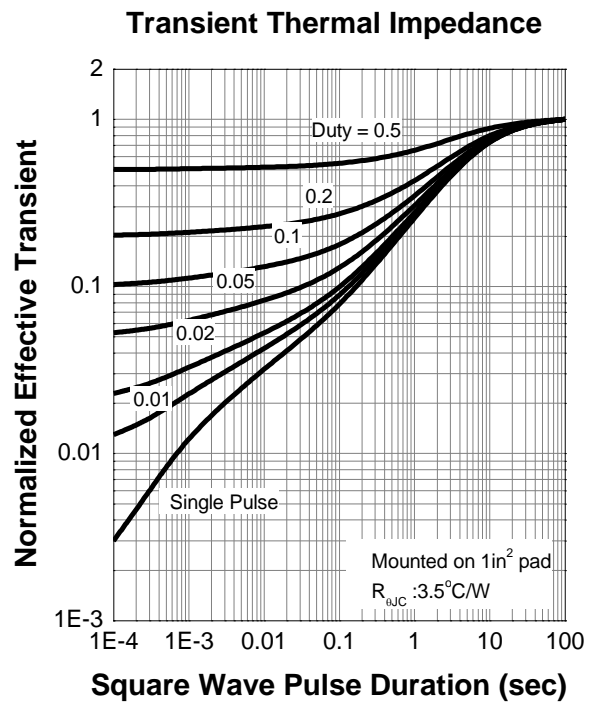
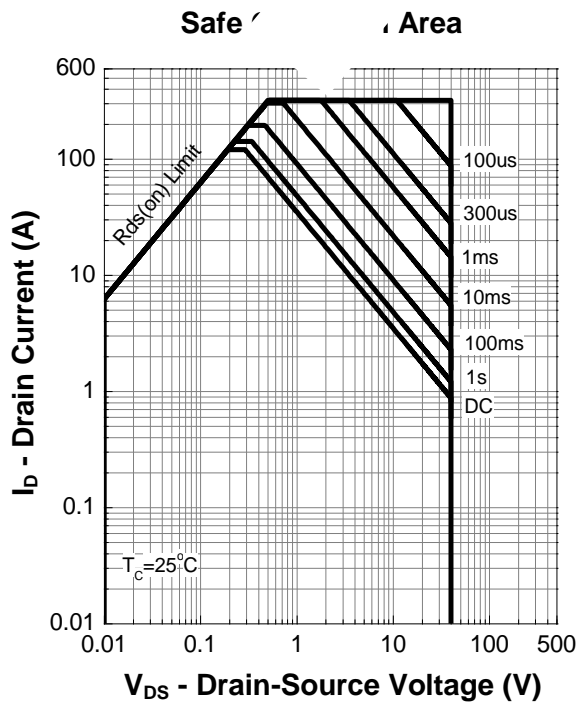
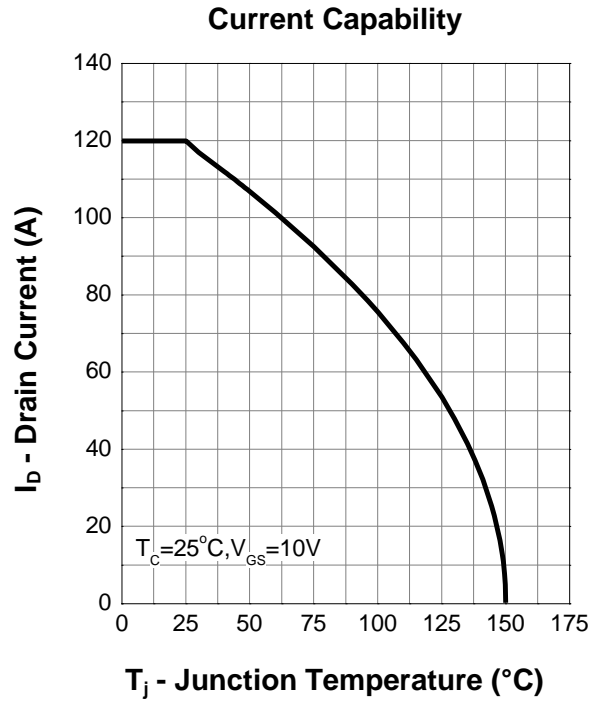
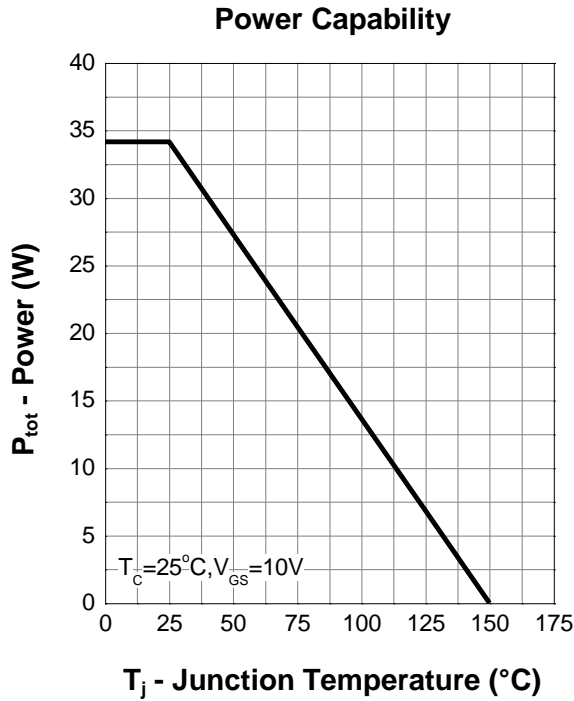
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	2.5	V
$R_{DS(on)}^a$	Static Drain-Source on-Resistance	$V_{GS}=10V, I_D=20A$	-	1.0	1.4	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	1.6	2.0	
g_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=10A$	-	15.5	-	S
Dynamic Characteristics ^b						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	-	3930	-	pF
C_{oss}	Output Capacitance		-	1020	-	pF
C_{rss}	Reverse Transfer Capacitance		-	167	-	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=24A,$ $V_{GS}=10V$	-	82	-	nC
Q_{gs}	Gate-Source Charge		-	14	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	15	-	nC
Switching Characteristics ^b						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=15V,$ $I_D=15A, R_{GEN}=3.3\Omega,$ $V_{GS}=10V$	-	15.6	-	ns
t_r	Turn-on Rise Time		-	23.5	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	62.8	-	ns
t_f	Turn-off Fall Time		-	15.2	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	120	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	314	A
V_{SD}^a	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=30A, dI/dt=100A/\mu s$	-	57	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	71	-	nC

Notes :

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

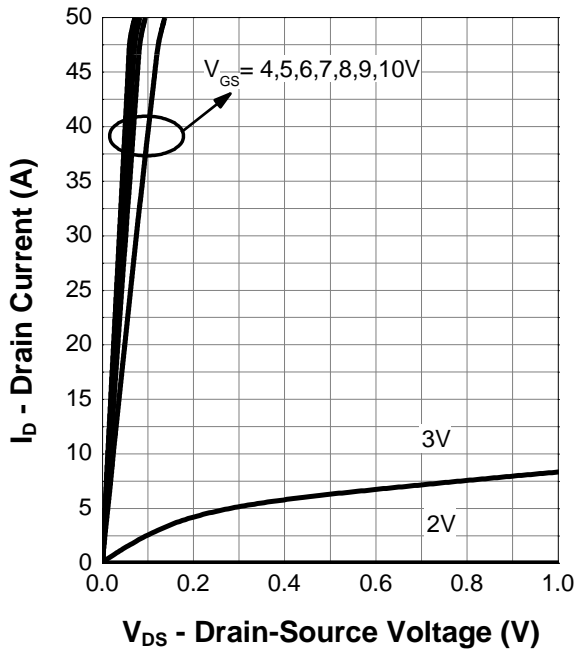
b : Guaranteed by design, not subject to production testing

Typical Characteristics (Cont.)

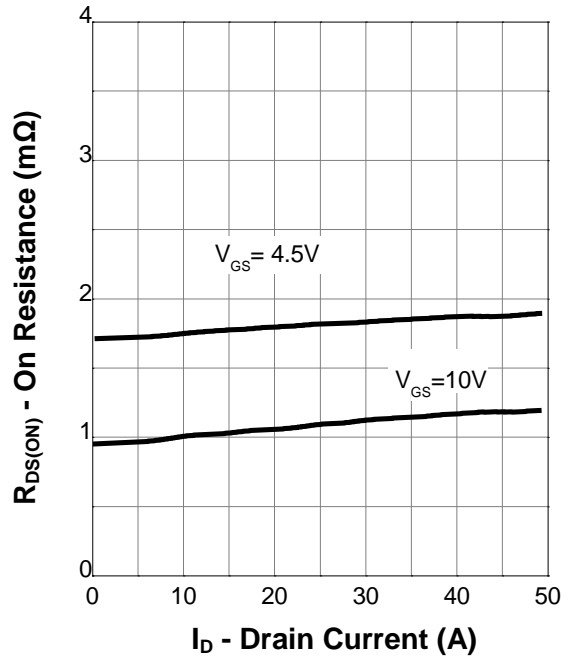


Typical Characteristics (Cont.)

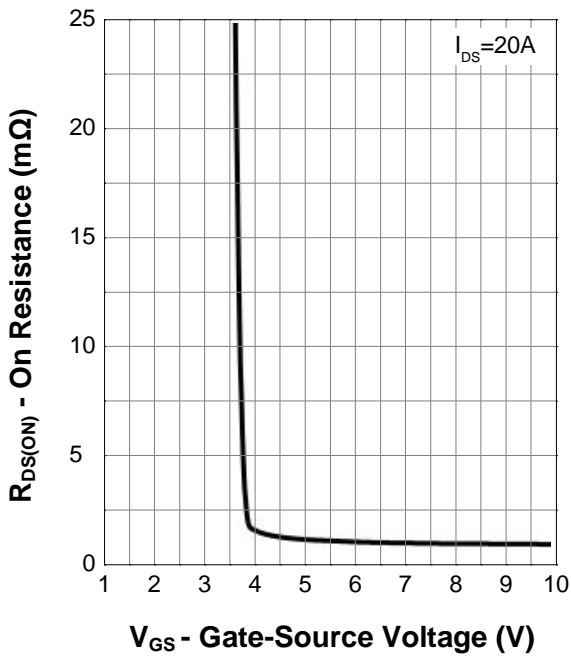
Output Characteristics



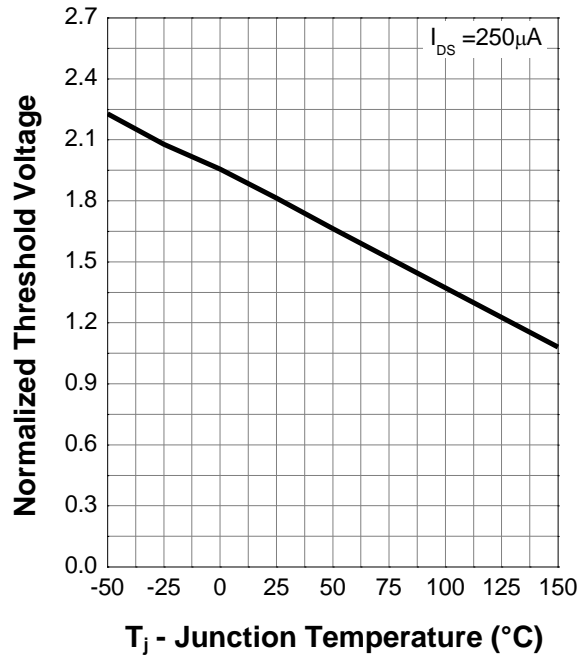
On Resistance



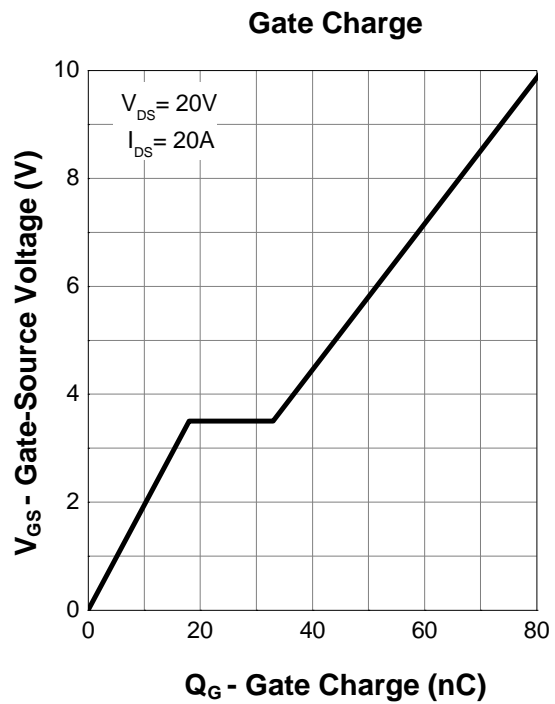
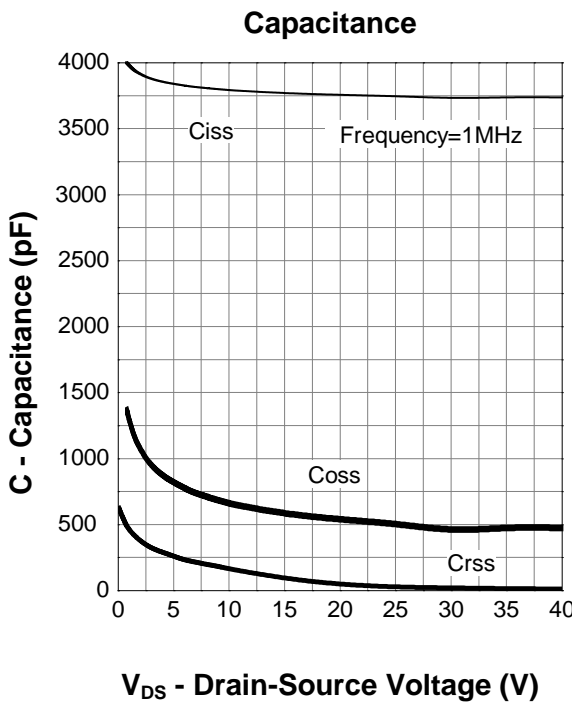
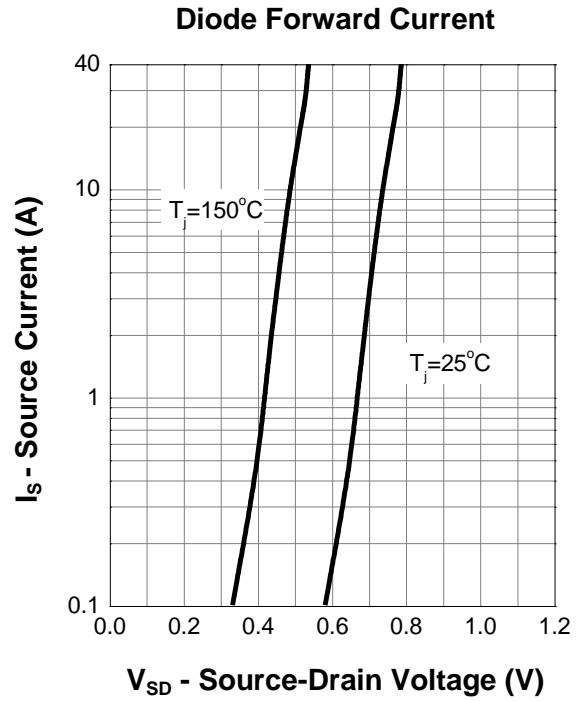
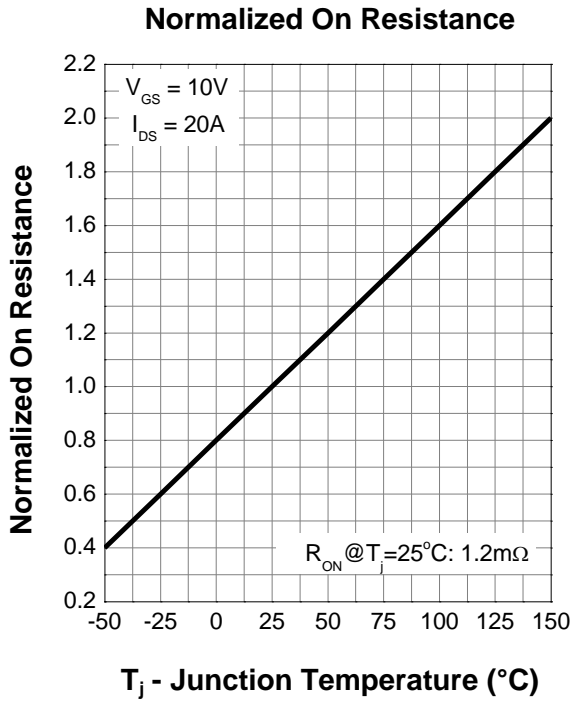
Transfer Characteristics



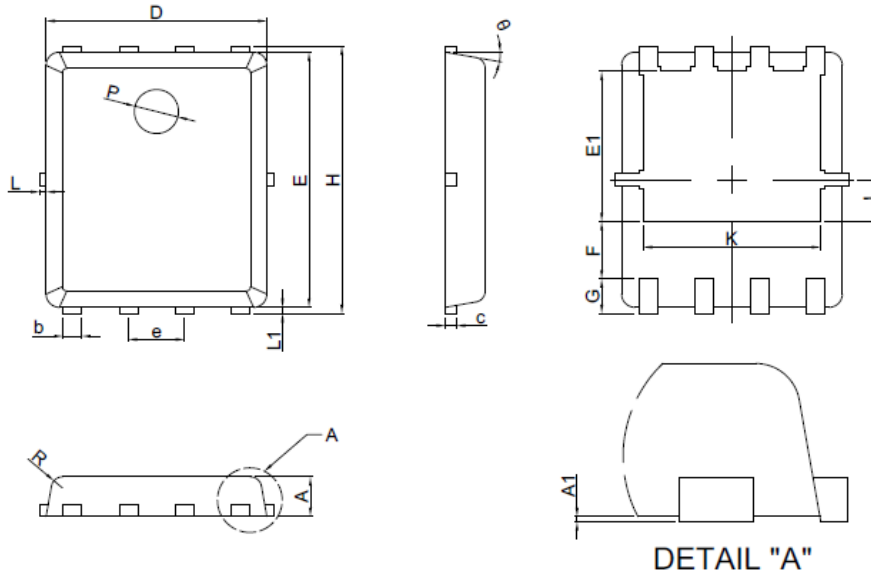
Normalized Threshold Voltage



Typical Characteristics (Cont.)



Package Dimensions : 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	4.90	5.10
F	1.40REF	
E	5.70	5.90
e	1.27BSC	
H	5.95	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	