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 Industrlal

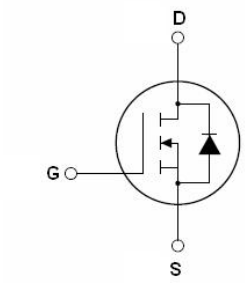
Features

- V_{DS} = 30V ; I_D = 120A

  $R_{DS(ON)}$(Typ.)= 1.0 mΩ @V_{GS} = 10 V

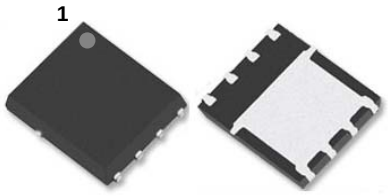
  $R_{DS(ON)}$(Typ.)= 1.6 mΩ @V_{GS} = 4.5V

- 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 top and bottom view

Absolute Maximum Ratings (T_C=25℃ 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℃	120	A
		T_C = 100℃	68	A
I_{DM} * ** ***	Pulsed Drain Current		314	A
E_{AS} ****	Single Pulsed Avalanche Energy		128	mJ
P_D *	Power Dissipation	T_C = 25℃	34	W
$R_{\theta JC}$ *	Thermal Resistance, Junction to Case		3.2	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Notes :

* Surface Mounted on 1 in^2 pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

*** limited by bonding wire

**** VD=20V,VG=10V, RG=25Ω， L=0.5mH

Electrical Characteristics (T_C=25℃ 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=250μA	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} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	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	mΩ
		V_{GS} =4.5V, I_D =10 A	-	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}=3.3Ω, 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
trr	Body Diode Reverse Recovery Time	I_F=30A,dI/dt=100A/μs	-	57	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	71	-	nC

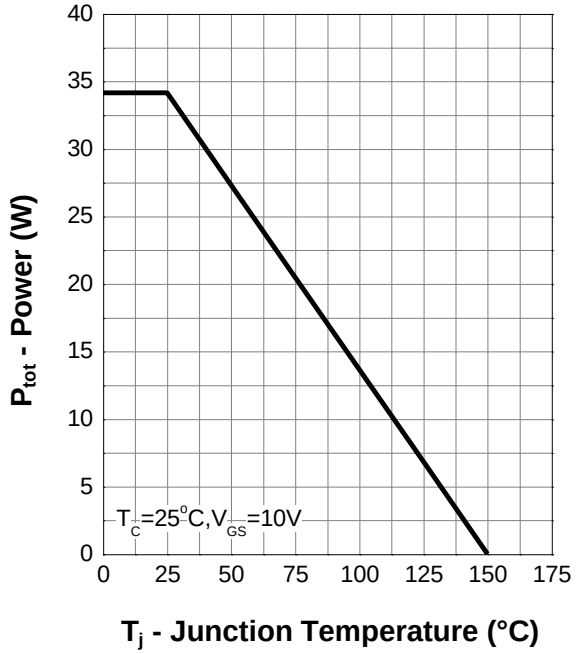
Notes：

a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

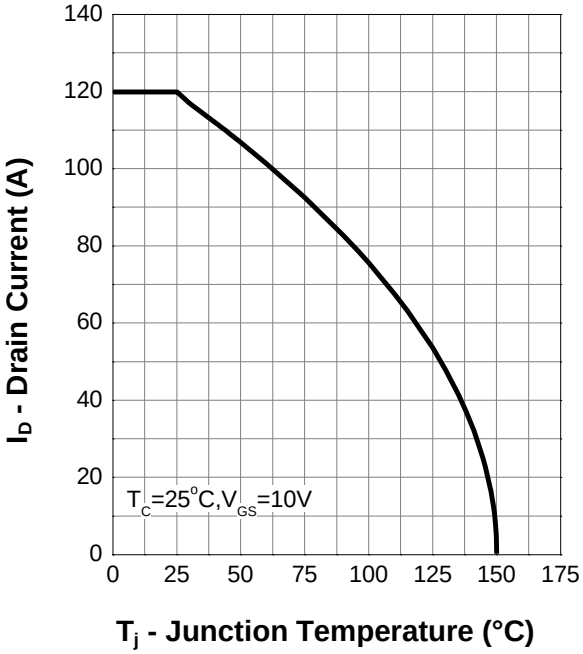
b : Guaranteed by design, not subject to production testing

Typical Characteristics (Cont.)

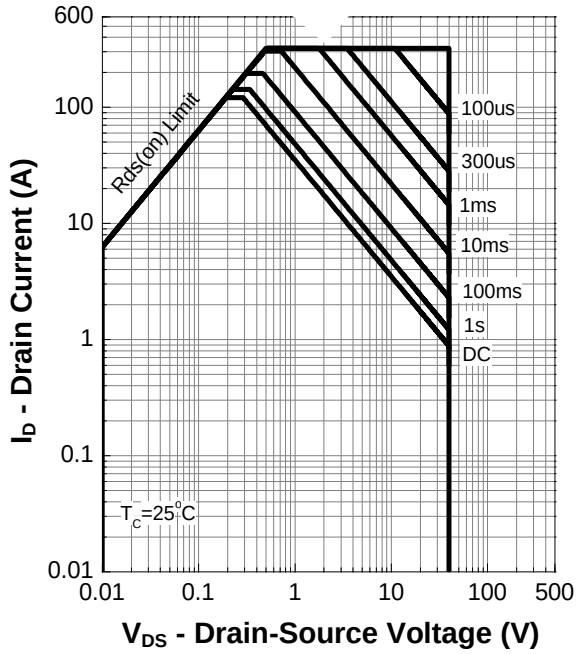
Power Capability



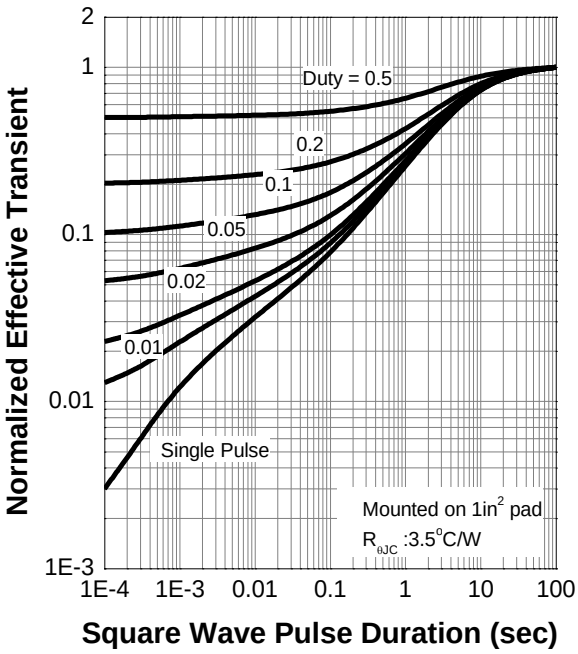
Current Capability



Safe ´ ´ Area

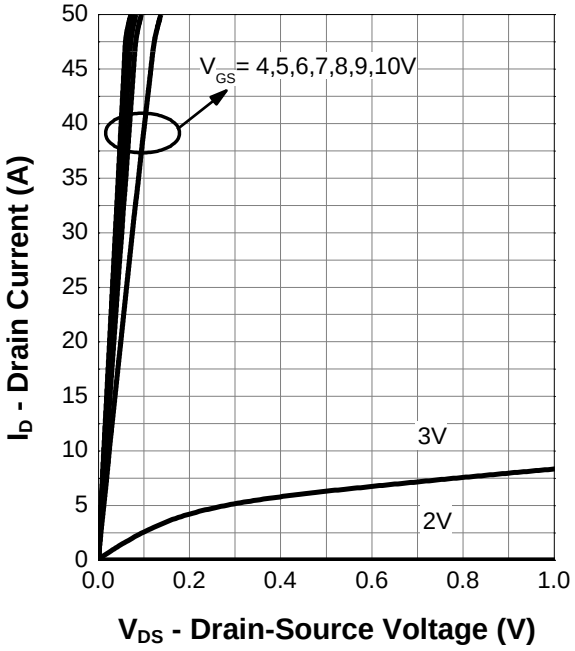


Transient Thermal Impedance

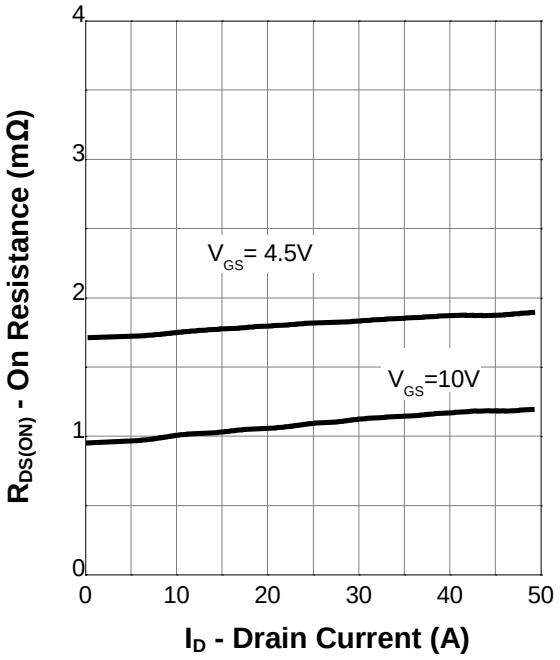


Typical Characteristics (Cont.)

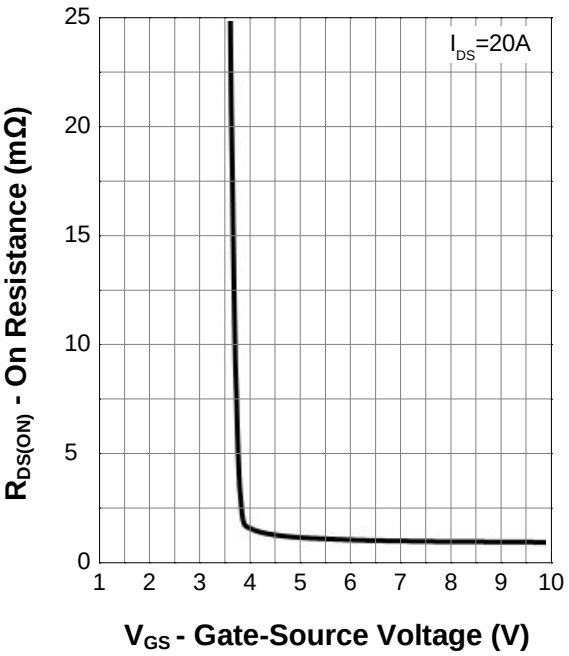
Output Characteristics



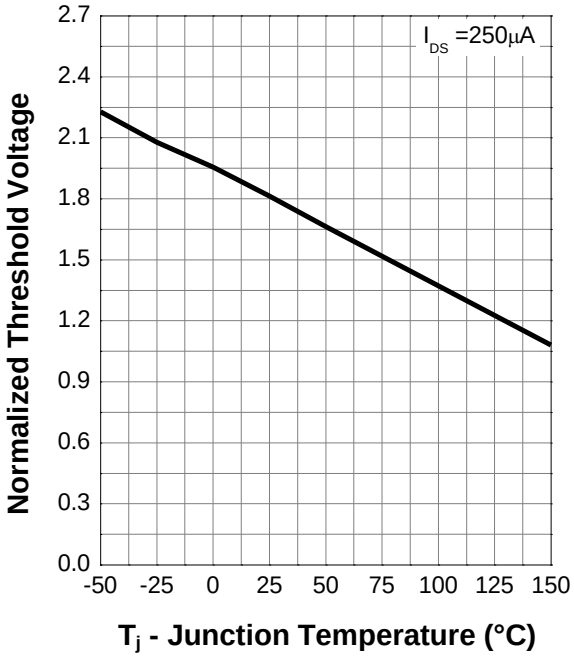
On Resistance



Transfer Characteristics

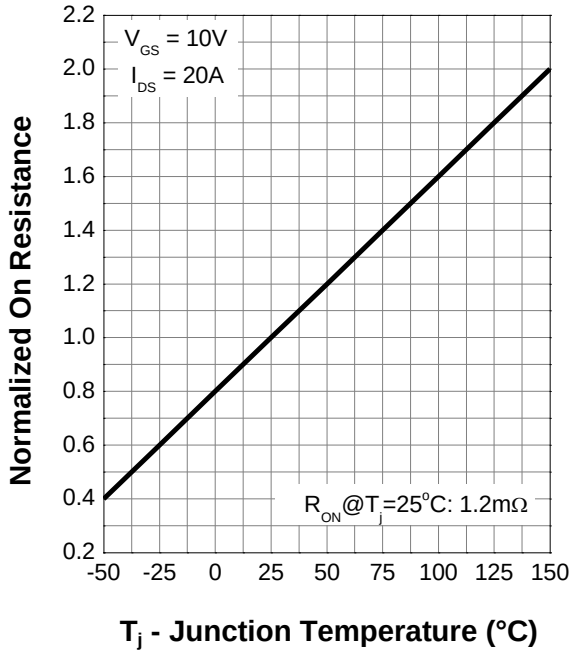


Normalized Threshold Voltage

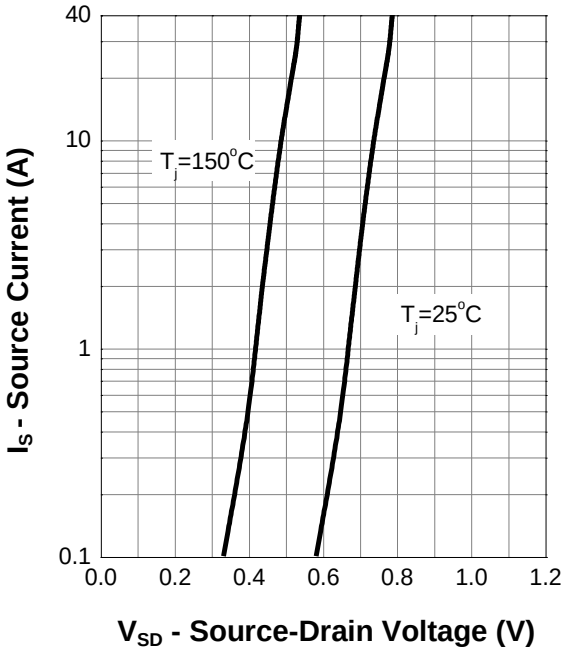


Typical Characteristics (Cont.)

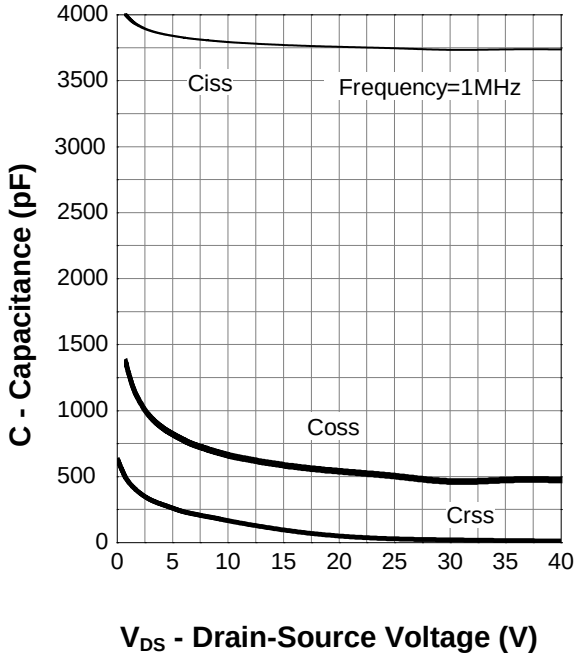
Normalized On Resistance



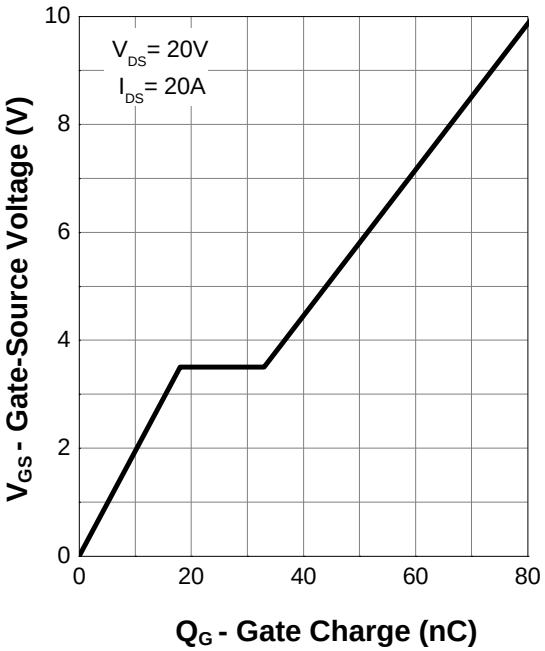
Diode Forward Current



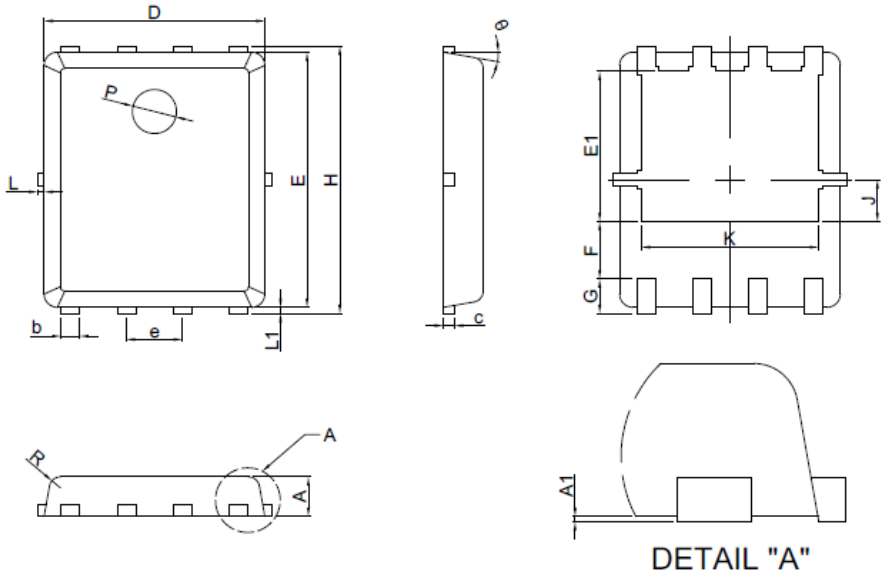
Capacitance



Gate Charge



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	

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