FH3050GS6

N-Channel Enhancement Mode Power MOSFET

Description

The FH3050GS6 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.

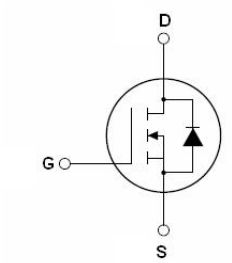
Application

- Motor drivers
- DC - DC Converter

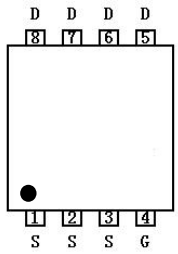
General Features

V_{DSS}	I_D	$R_{DS(ON)}$ (MAX)	
		VGS=10V	VGS=4.5V
30V	50A	6.5mΩ	9.5mΩ

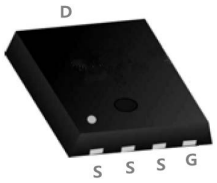
- Surface-mounted package
- Low Thermal Resistance



Schematic diagram



Marking and pin Assignment



PDFN3.3x3.3-8L top and bottom view

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	30	-	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D*,**	Drain Current	T_C = 25 ℃, V_{GS} = 10 V	-	50	A
I_{DM}*,**,***	Pulsed Source Current	T_C = 25 ℃, V_{GS} = 10 V	-	112	A
P_{tot}*	Total Power Dissipation	T_C = 25 ℃	-	20.8	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S	Diode Forward Current	T_C = 25 ℃	-	50	A
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	62.5	℃ / W
$R_{\theta JC}$*	Thermal Resistance- Junction to Case		-	6	

Notes：

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

** Pulse width ≤ 10 μs, duty cycle ≤ 1 %

*** limited by bonding wire

Note: 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)

Electrical Characteristics (TC=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	1.0	-	2.0	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS} = 24, V_{GS} = 0 V	-	-	1	μA
		T_J = 85 ℃	-	-	30	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	-	5.8	6.5	mΩ
		V_{GS} = 4.5 V, I_D = 10A	-	8.9	9.5	
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	-	23	-	nS
Q_{rr}	Reverse Recovery Charge		-	10	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 15 V Frequency = 1 MHz	-	731	-	pF
C_{oss}	Output Capacitance		-	380	-	
C_{rss}	Reverse Transfer Capacitance		-	34	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 15 V, V_{GEN} = 10 V, R_G = 4.5 Ω, R_L = 0.75Ω, I_D = 20 A	-	6.8	-	nS
t_r	Turn-on Rise Time		-	55	-	
t_d(off)	Turn-off Delay Time		-	12	-	
t_f	Turn-off Fall Time		-	20	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{GS} = 10 V, V_{DS} = 15 V, I_{DS} = 20 A	-	14	-	nC
Q_{gs}	Gate-Source Charge		-	3.2	-	
Q_{gd}	Gate-Drain Charge		-	2.2	-	

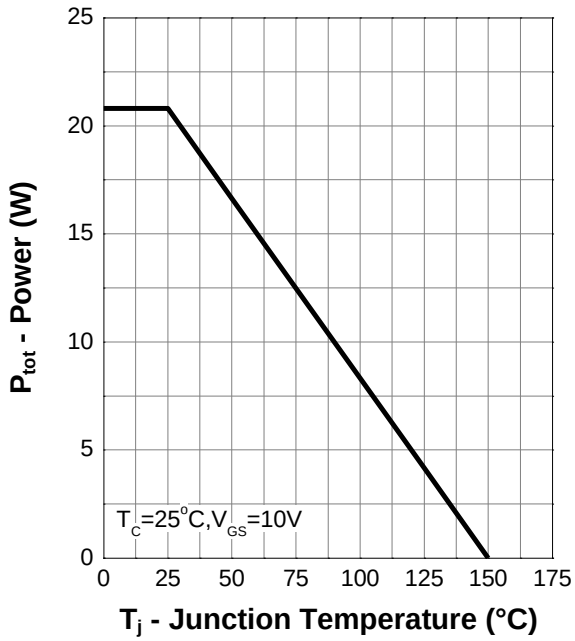
Notes：

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

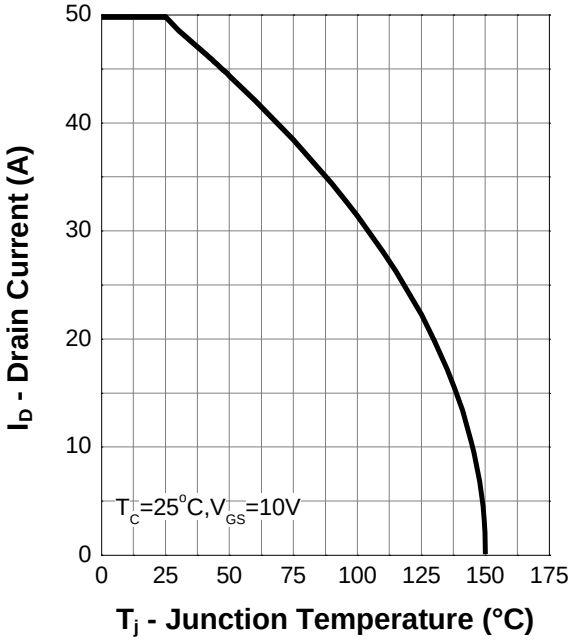
b : Guaranteed by design, not subject to production testing

Typical Characteristics (Cont.)

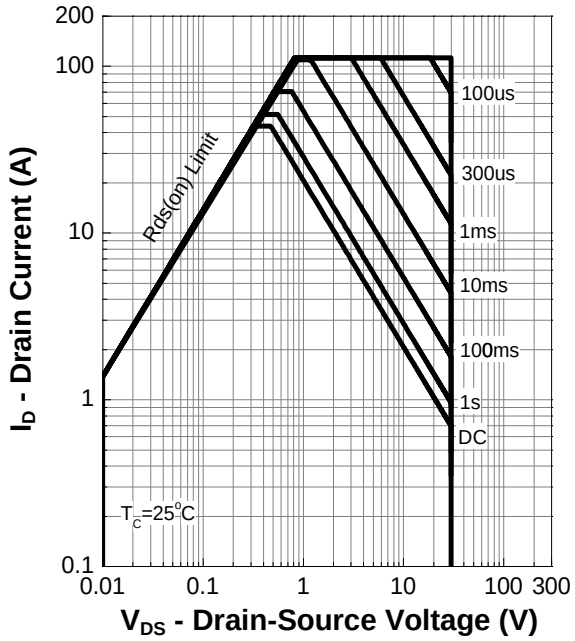
Power Capability



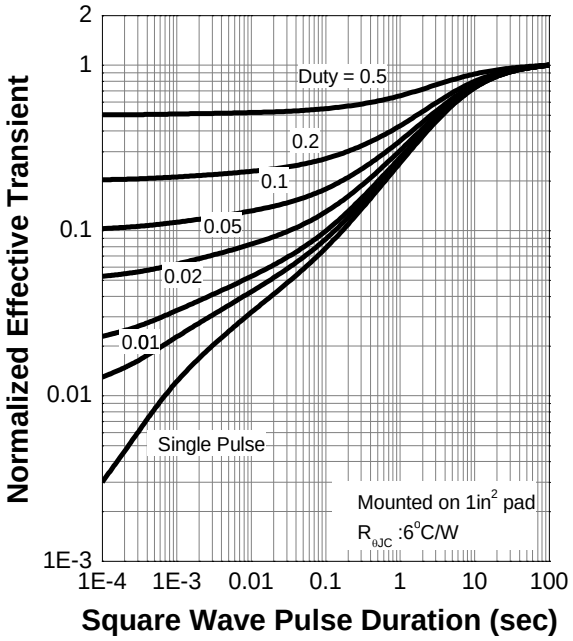
Current Capability



Safe Operation Area

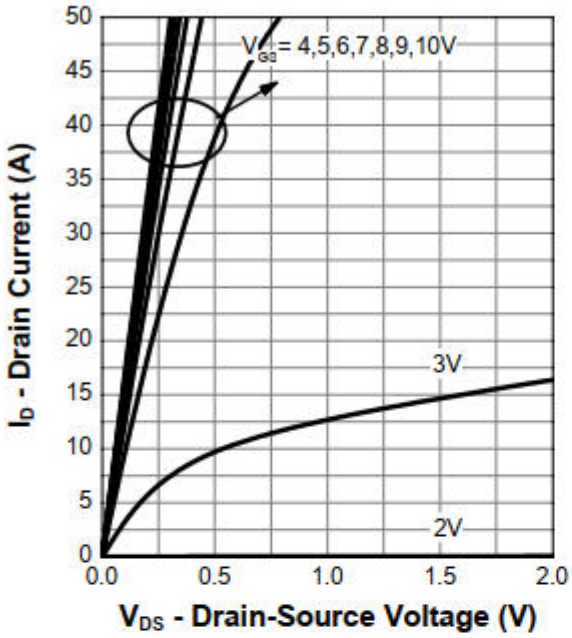


Transient Thermal Impedance

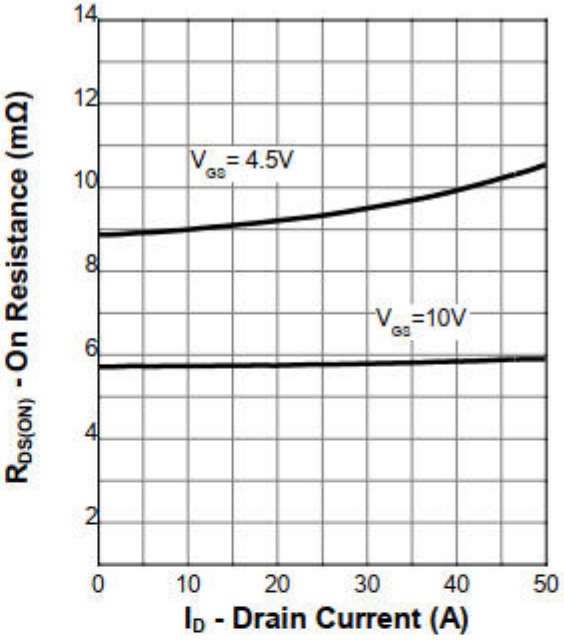


Typical Characteristics (Cont.)

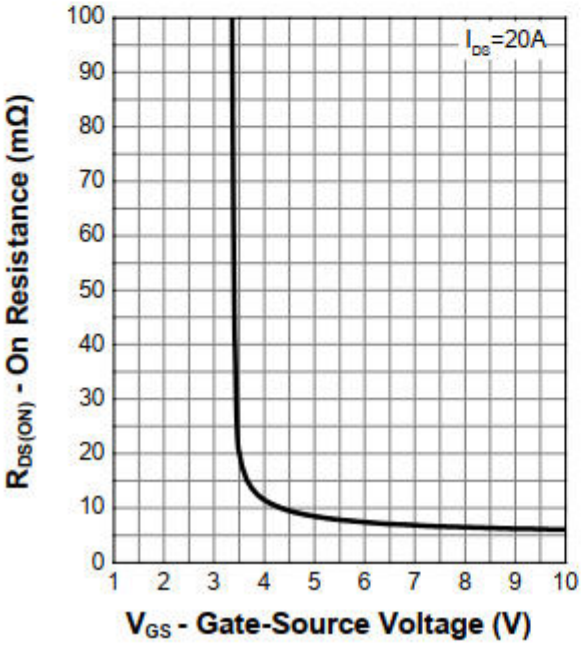
Output Characteristics



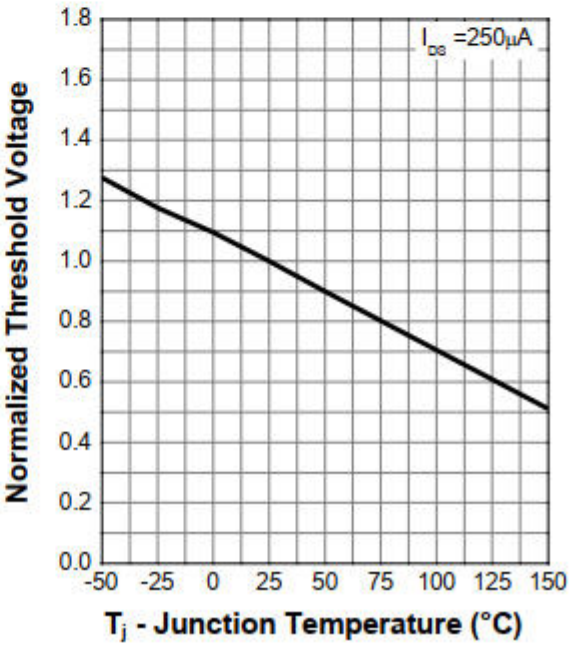
On Resistance



Transfer Characteristics

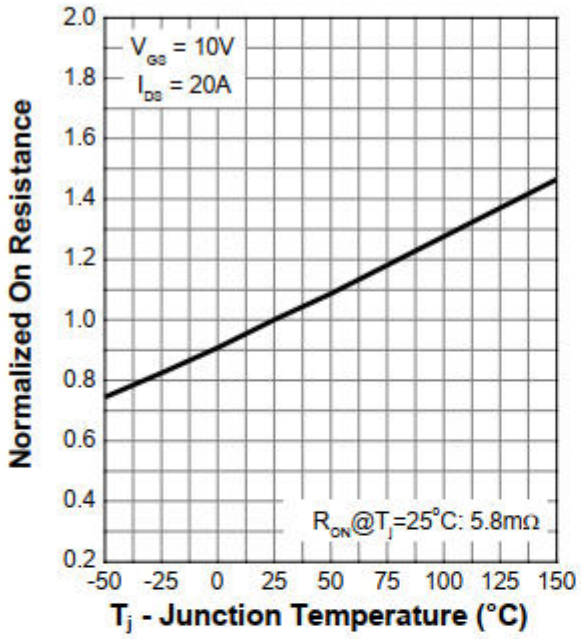


Normalized Threshold Voltage

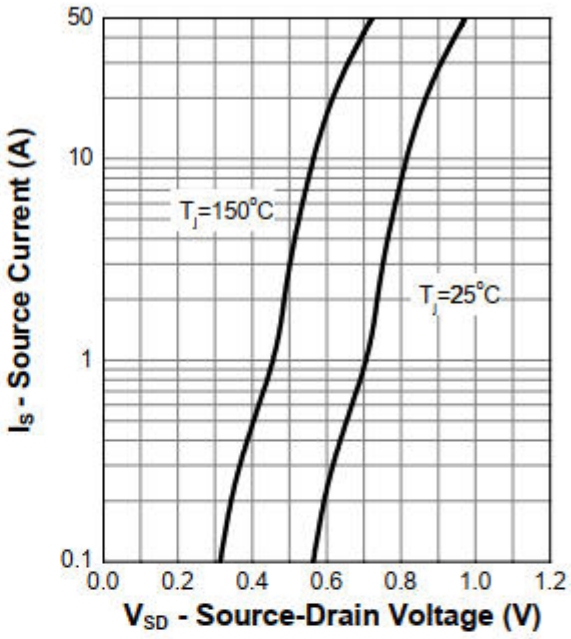


Typical Characteristics (Cont.)

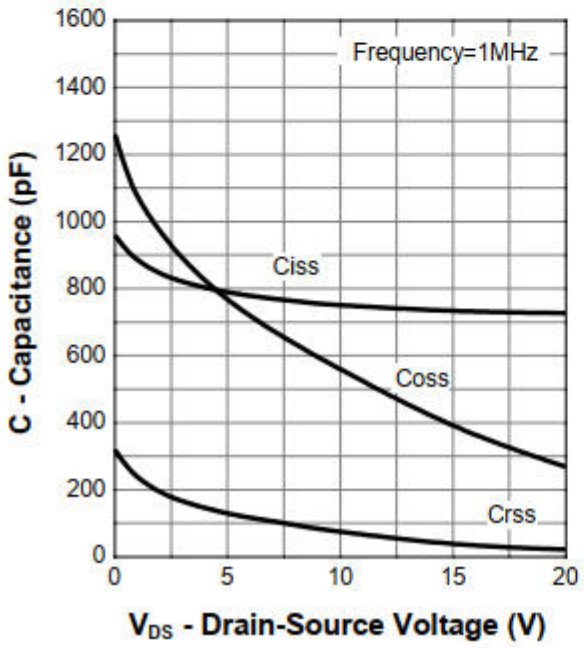
Normalized On Resistance



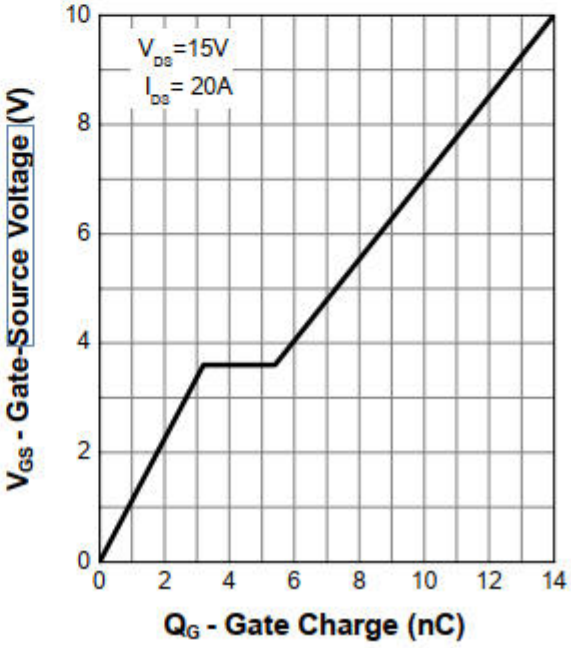
Diode Forward Current



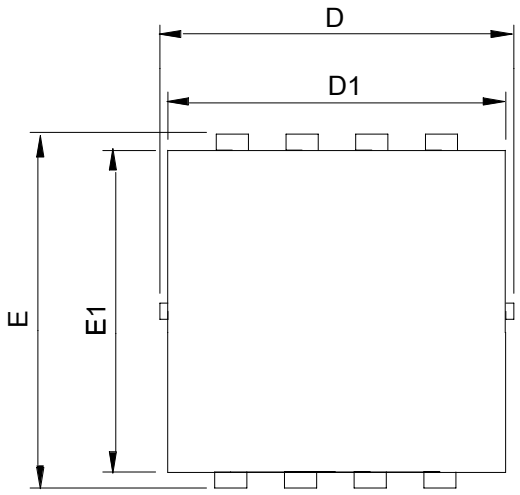
Capacitance



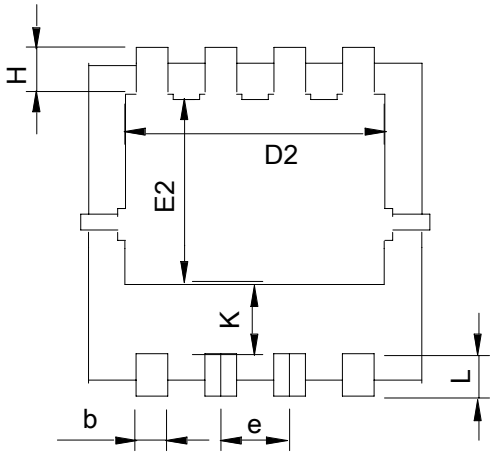
Gate Charge



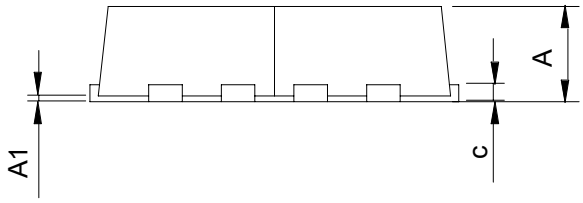
Package Information : PDFN3.3x3.3-8L



Top View



Bottom View



SYMBOL	PDFN3.3x3.3-8L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022