

# FH3030BG6

## N-Channel Enhancement Mode Power MOSFET

### Description

The FH3030BG6 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.

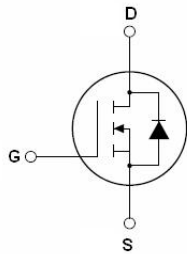
### Application

- Motor drivers
- Power switching application
- DC/DC Converters In Computing
- LCD TV appliances

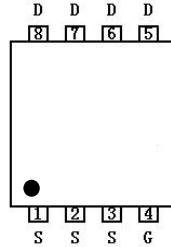
### General Features

$V_{DSS}$	$I_D$	$R_{DS(ON)} (MAX)$	
		$V_{GS}=10V$	$V_{GS}=4.5V$
30V	27A	13 m $\Omega$	18 m $\Omega$

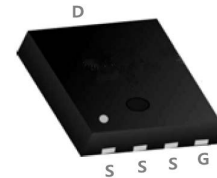
- High density cell design for ultra low  $R_{ds}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation



Schematic dia gram



Markin ga nd pin Assignment



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

## Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_A = 25\text{ }^\circ\text{C}$	-	30	V
$V_{GS}$	Gate-Source Voltage	$T_A = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_A = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	27	A
		$T_A = 100\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$		18	A
$I_{DM}^{***}$	Pulsed Drain Current	$T_A = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	82	A
$P_{tot}$	Total Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	-	22	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-55	150	$^\circ\text{C}$
$I_S$	Diode Forward Current	$T_A = 25\text{ }^\circ\text{C}$	-	27	A
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	66.5	$^\circ\text{C} / \text{W}$

Notes :

\* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$

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

## 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	$V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$	30	-	-	V	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	1.0	-	2.0	V	
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$	
		$T_J = 85\text{ }^\circ\text{C}$			30	$\mu\text{A}$	
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	-	-	$\pm 100$	nA	
$R_{DS(ON)}^a$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 10\text{ A}$		9.5	13	m $\Omega$	
		$V_{GS} = 4.5\text{ V}, I_{DS} = 5\text{ A}$	-	13	18		
Diode Characteristics							
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 10\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V	
$t_{rr}$	Reverse Recovery Time	$I_{DS} = 10\text{ A}, V_{GS} = 0\text{ V}$ $di_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	34	-	ns	
$Q_{rr}$	Reverse Recovery Charge				7.1		$\mu\text{C}$
Dynamic Characteristics <sup>b</sup>							
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}$ Frequency = 1 MHz	-	1085	-	pF	
$C_{oss}$	Output Capacitance		-	101	-		
$C_{riss}$	Reverse Transfer Capacitance		-	82	-		
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 15\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 4.5\text{ }\Omega, R_L = 1.5\text{ }\Omega,$ $I_{DS} = 10\text{ A}$	-	7	-	ns	
$t_r$	Turn-on Rise Time		-	30	-		
$t_d(off)$	Turn-off Delay Time		-	17	-		
$t_f$	Turn-off Fall Time		-	18	-		
Gate Charge Characteristics <sup>b</sup>							
$Q_g$	Total Gate Charge	$V_{GS} = 15\text{ V}, V_{DS} = 10\text{ V},$ $I_{DS} = 10\text{ A}$	-	22	-	nC	
$Q_{gs}$	Gate Source Charge				5		
$Q_{gd}$	Gate-Drain Charge				3.3		

Notes :

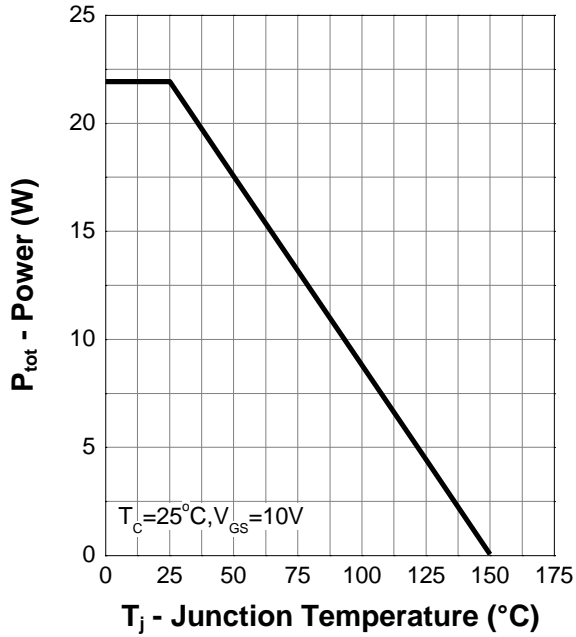
a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

b : Guaranteed by design, not subject to production testing

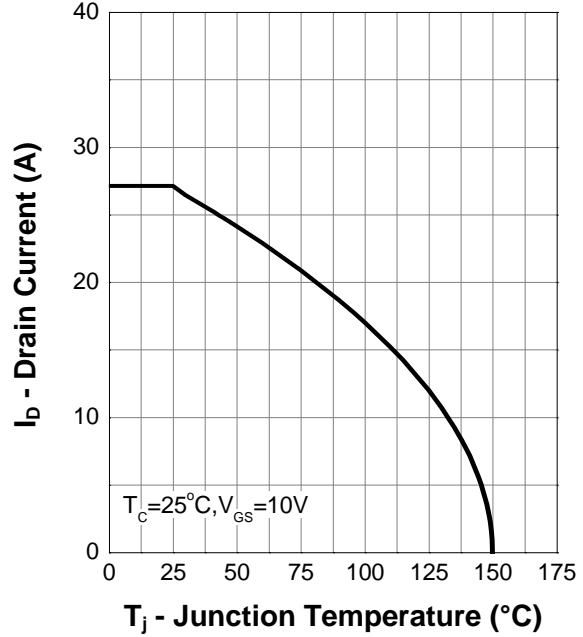
c: NHCX defines "Green" as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

### Typical Characteristics

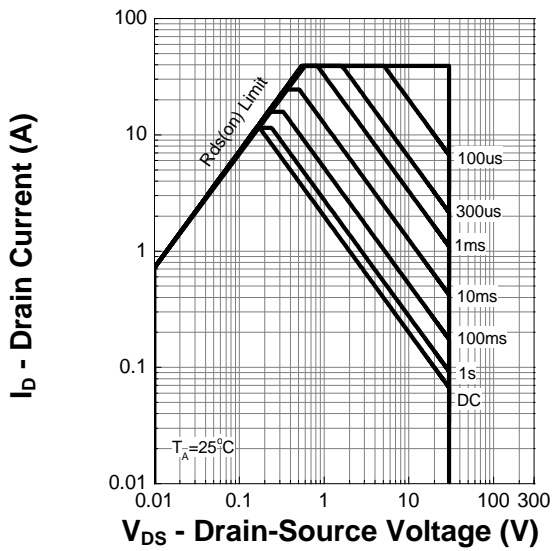
Power Capability



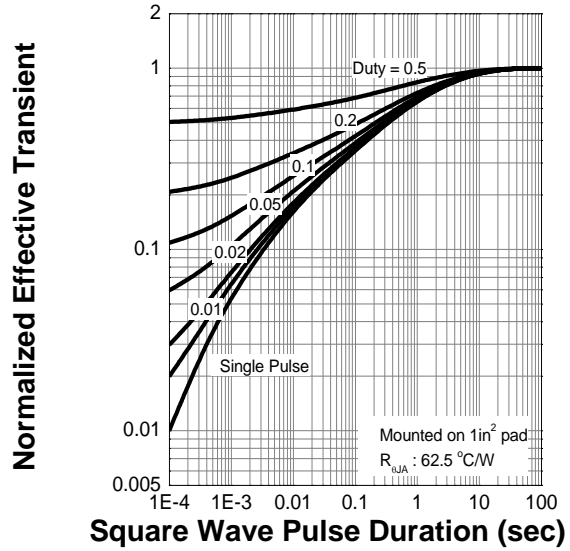
Current Capability



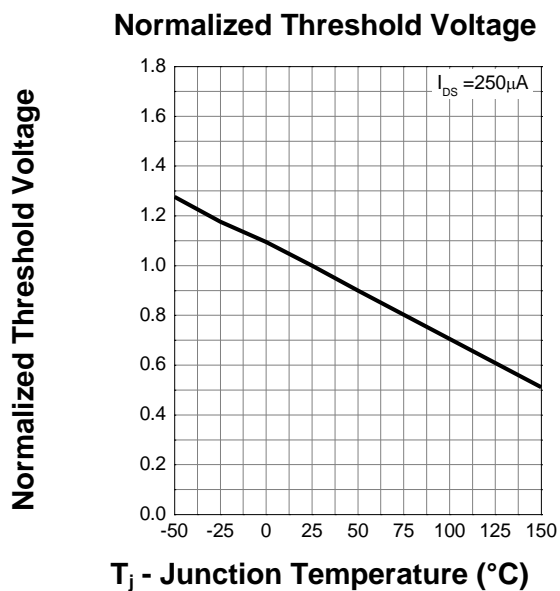
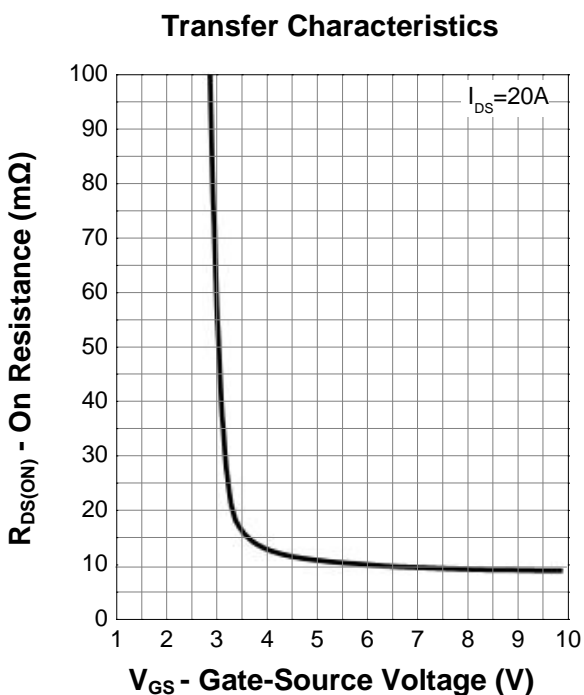
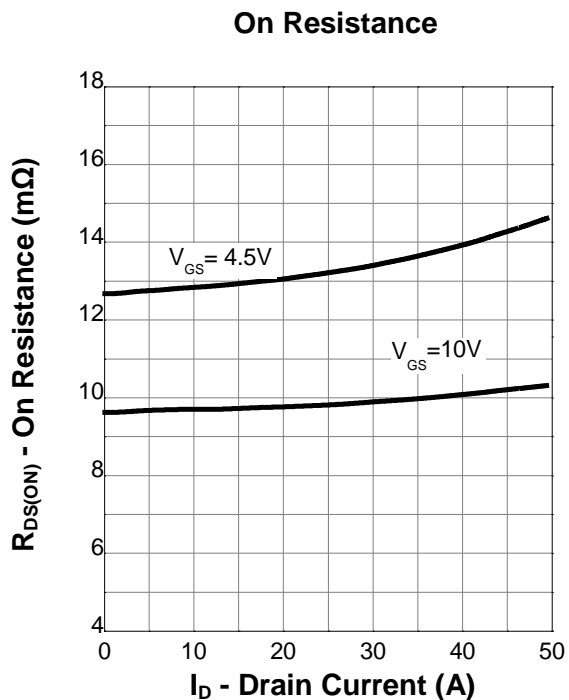
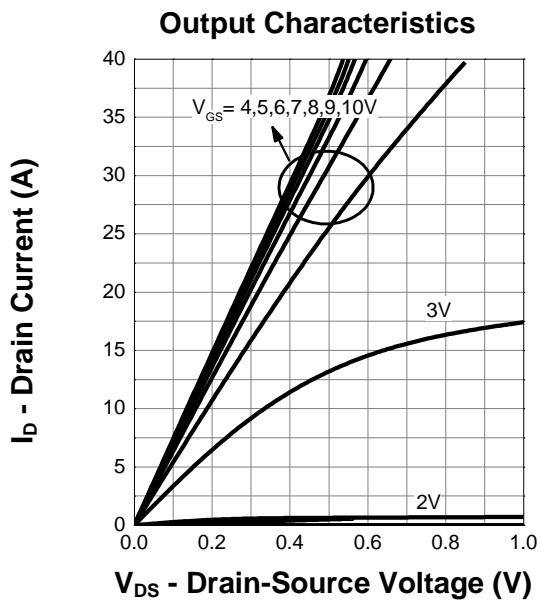
Operating



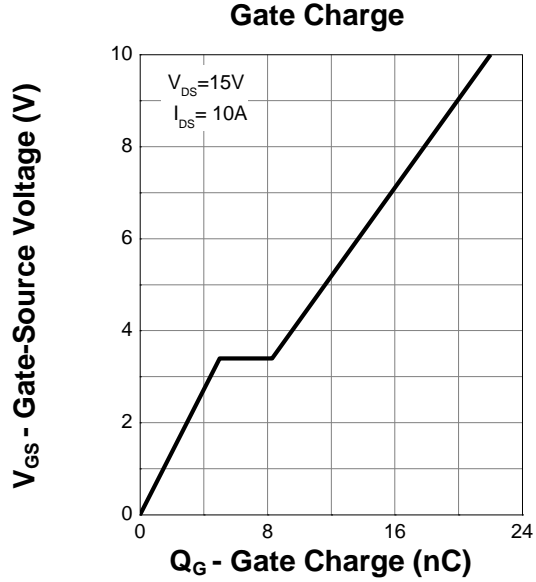
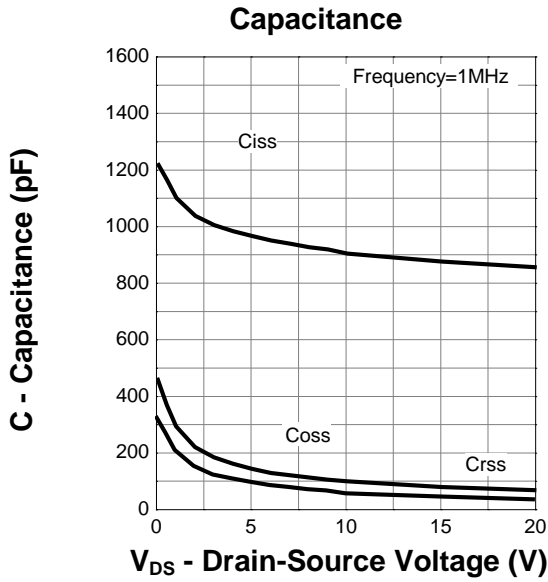
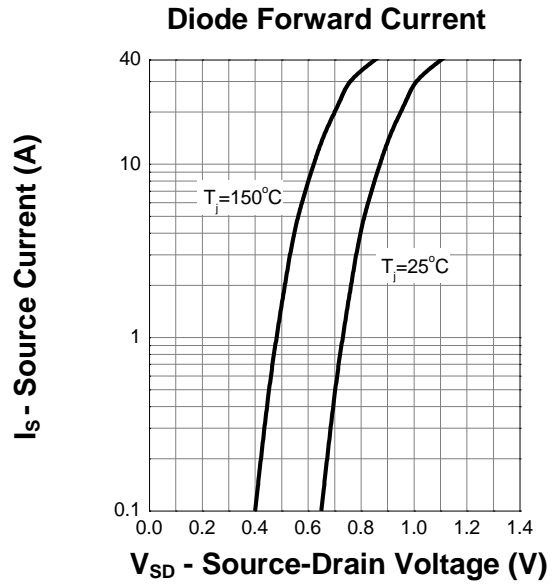
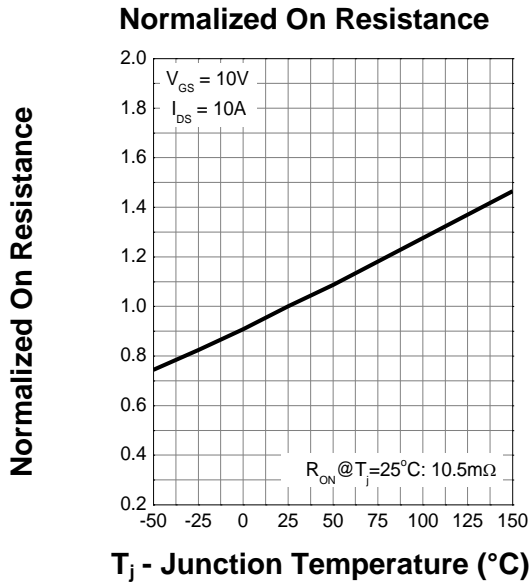
Transient Thermal Impedance



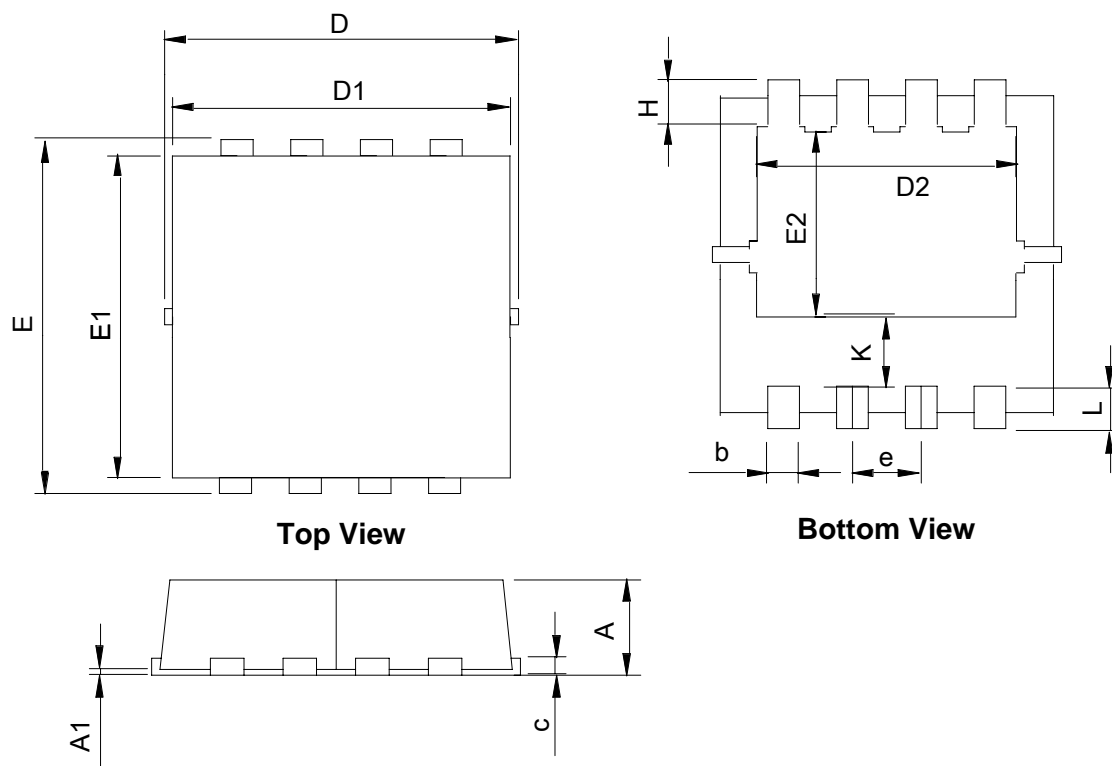
Typical Characteristics (cont.)



Typical Characteristics (cont.)



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



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

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