

# FH3055GS

# N-Channel Enhancement Mode MOSFET

## Description

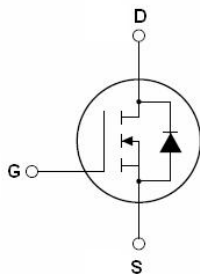
The FH3055GS is the N-Channel enhancementmode MOSFET in a plastic package (PDFN5x6-8L) using the Trench technology.

## Applications

- ◆ High Speed Switch
- ◆ DC-DC Converters
- ◆ Lithium-Ion Battery

## Features

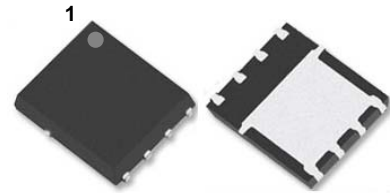
- ◆  $V_{DS} = 30V ; I_D = 65A$
- ◆  $R_{DS(ON)}(Typ.) = 4.2 m\Omega @ V_{GS} = 10 V$
- ◆  $R_{DS(ON)}(Typ.) = 6.5 m\Omega @ V_{GS} = 4.5V$
- ◆ LogicLevelCompatible
- ◆ SMDPackage(PDFN5x6-8L)
- ◆ TrenchTechnology
- ◆ FastSwitching



Schematic diagram



Marking and pin Assignment



PDFN5x6-8L top and bottom view

## Absolute Maximum Ratings (T<sub>A</sub> = 25°C, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>C</sub> = 25 °C	30	-	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>C</sub> = 25 °C	-	± 20	V
I <sub>D</sub> *	Drain Current ( DC )	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	65	A
		T <sub>C</sub> = 100 °C, V <sub>GS</sub> = 10 V	-	44	A
I <sub>DM</sub> <sup>*,**,***</sup>	Drain Current ( Pulsed )	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	223	A
P <sub>tot</sub> *	Total Power Dissipation	T <sub>C</sub> = 25 °C	-	35	W
T <sub>stg</sub>	Storage Temperature		- 55	150	°C
T <sub>J</sub>	Junction Temperature		-	150	°C
I <sub>S</sub>	Diode Forward Current	T <sub>C</sub> = 25 °C	-	65	A
E <sub>AS</sub> *	Single Pulsed Avalanche Energy	V <sub>DD</sub> = 30 V , L = 1 mH	-	117	mJ
R <sub>θJA</sub> *	Thermal Resistance- Junction to Ambient		-	62.5	°C / W
R <sub>θJC</sub> *	Thermal Resistance- Junction to Case		-	3.5	

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- \*\*\* limited by bonding wire

**Electrical Characteristics** ( $T_A = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	1	-	2	V
$I_{DSS}$	Zero Gate Voltage Source Current	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	-	-	$\pm 100$	nA
$R_{DS(on)}^a$	Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$	-	4.2	5.2	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$	-	6.5	8.7	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 15\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 15\text{ A}, dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	14	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	3.3	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}$ Frequency = 1 MHz	-	960	-	pF
$C_{oss}$	Output Capacitance		-	238	-	
$C_{rss}$	Reverse Transfer Capacitance		-	69	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 15\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 3.9\text{ }\Omega, R_L = 1\text{ }\Omega,$ $I_{DS} = 15\text{ A}$	-	6.7	-	nS
$t_r$	Turn-on Rise Time		-	41	-	
$t_d(off)$	Turn-off Delay Time		-	26	-	
$t_f$	Turn-off Fall Time		-	19	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V},$ $I_{DS} = 15\text{ A}$	-	21	-	nC
$Q_{gs}$	Gate-Source Charge		-	4.3	-	
$Q_{gd}$	Gate-Drain Charge		-	4.7	-	

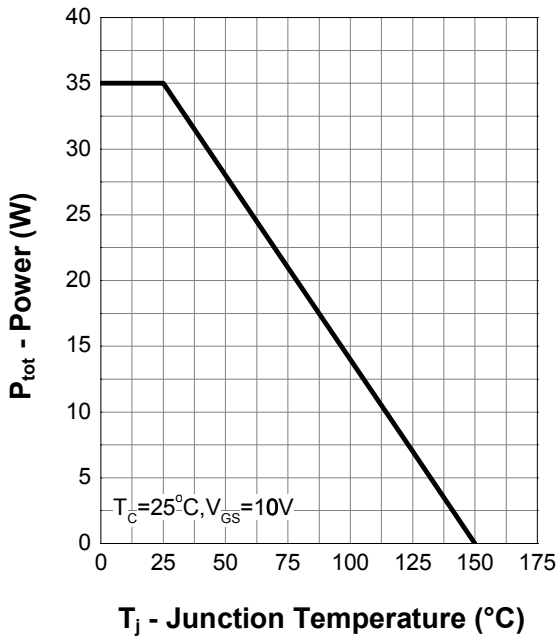
Notes1 :

- a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$   
b : Guaranteed by design, not subject to production testing

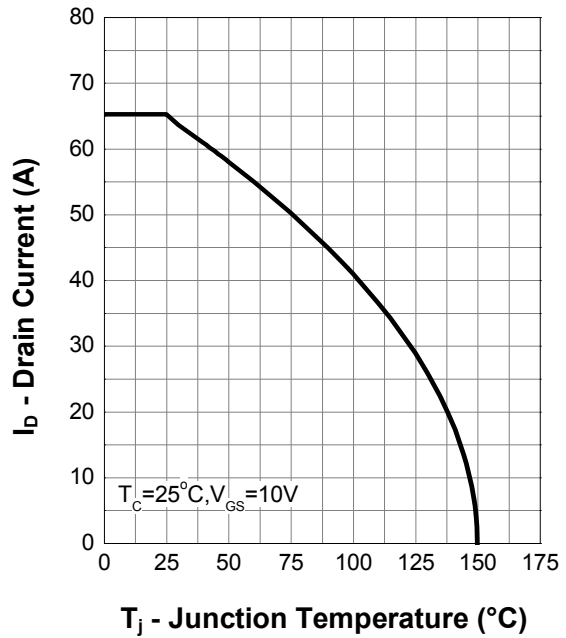
Note2: NHCX defines " Green " as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

Typical Characteristics (Cont.)

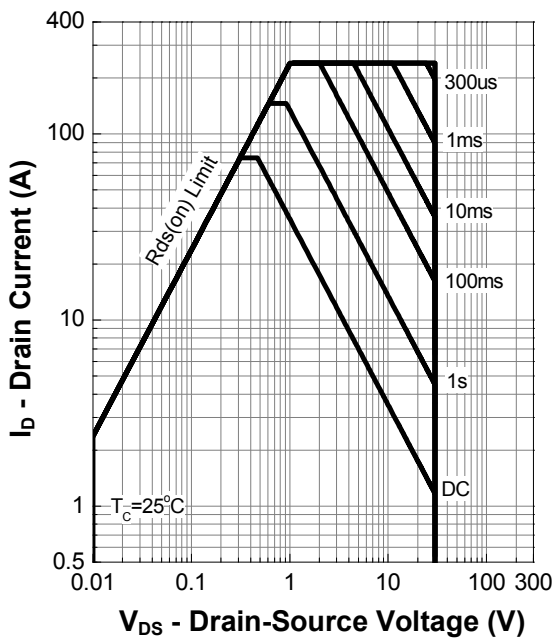
Power Capability



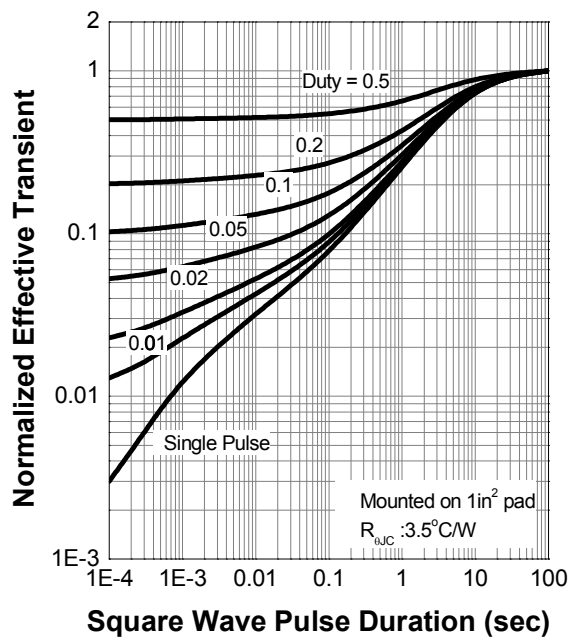
Current Capability



Safe Operation Area

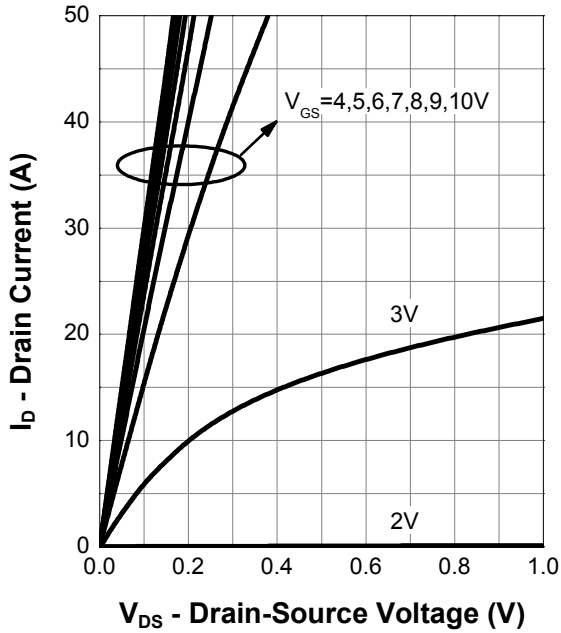


Transient Thermal Impedance

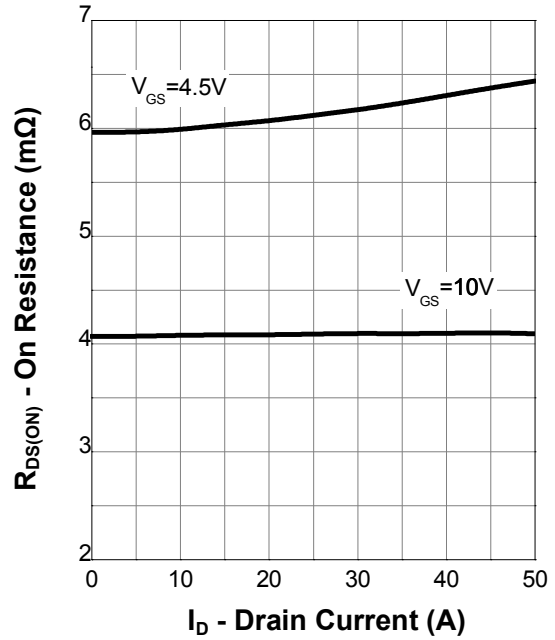


Typical Characteristics ( Cont.)

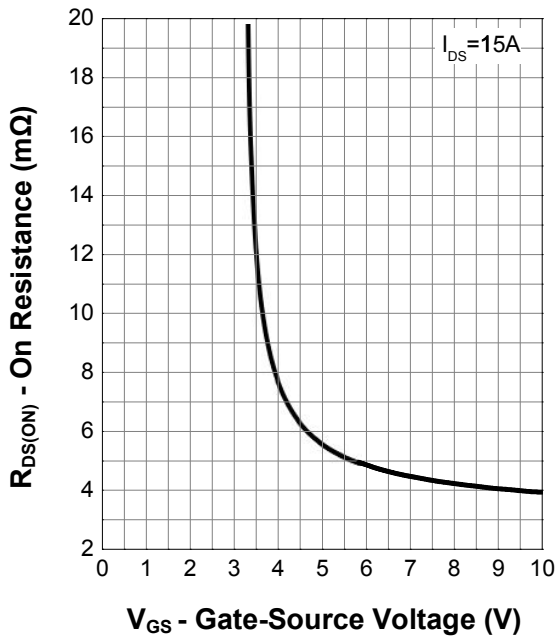
Output Characteristics



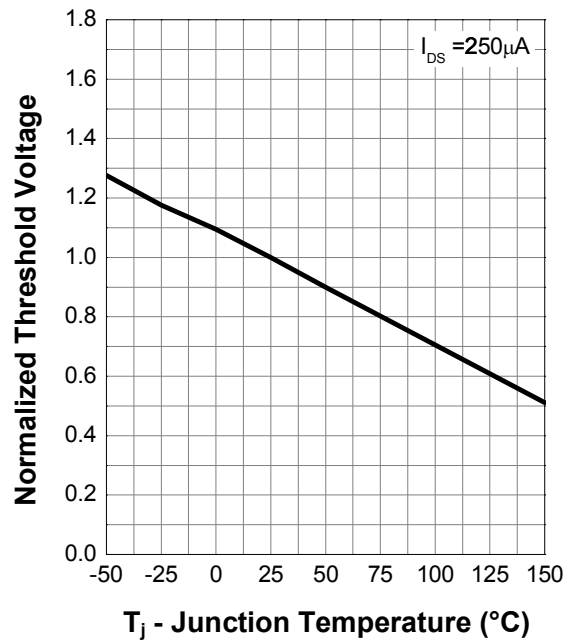
On Resistance



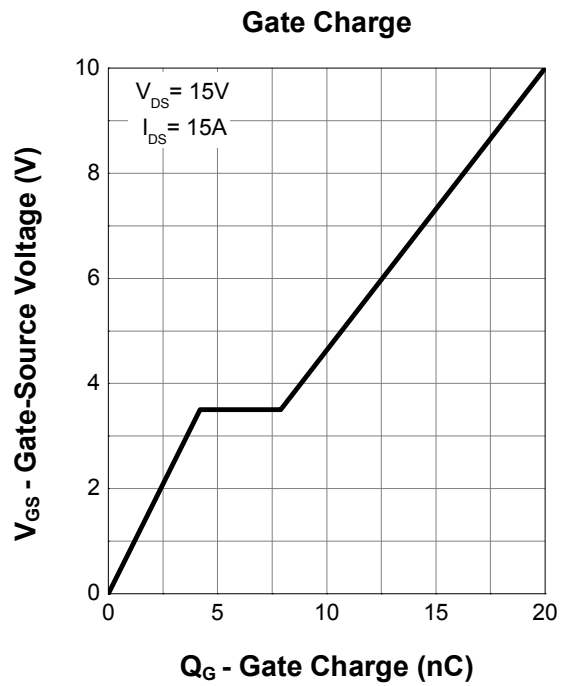
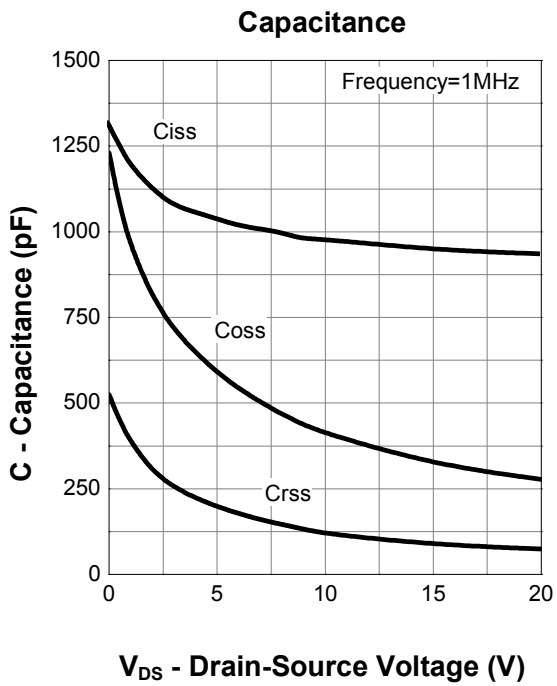
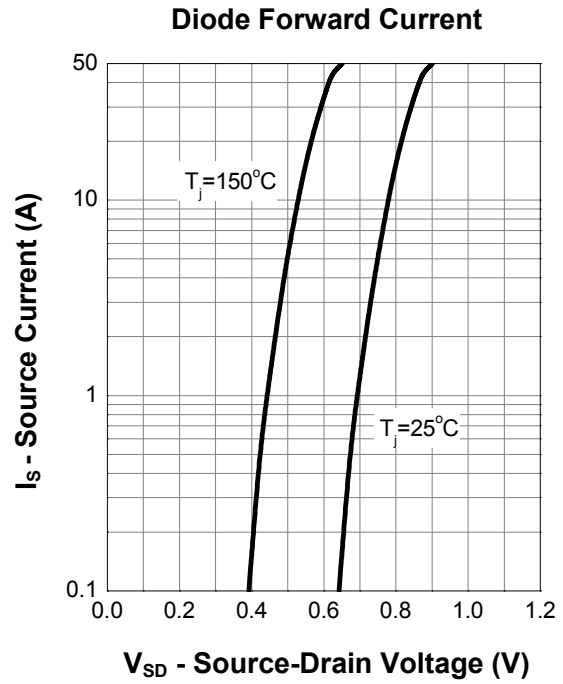
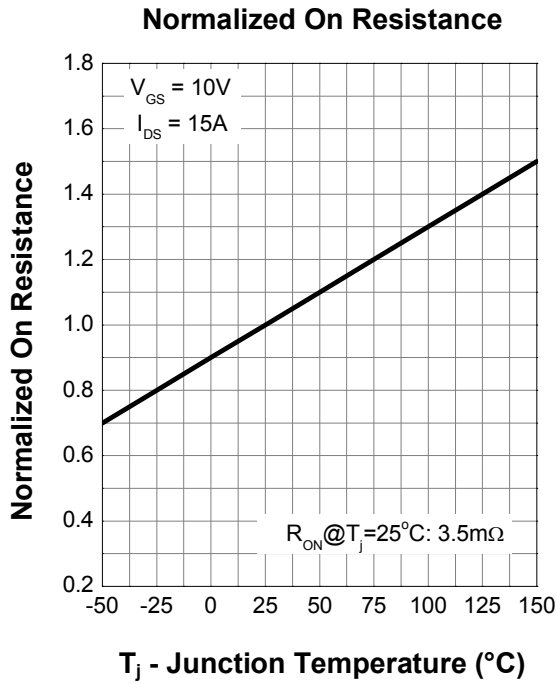
Transfer Characteristics



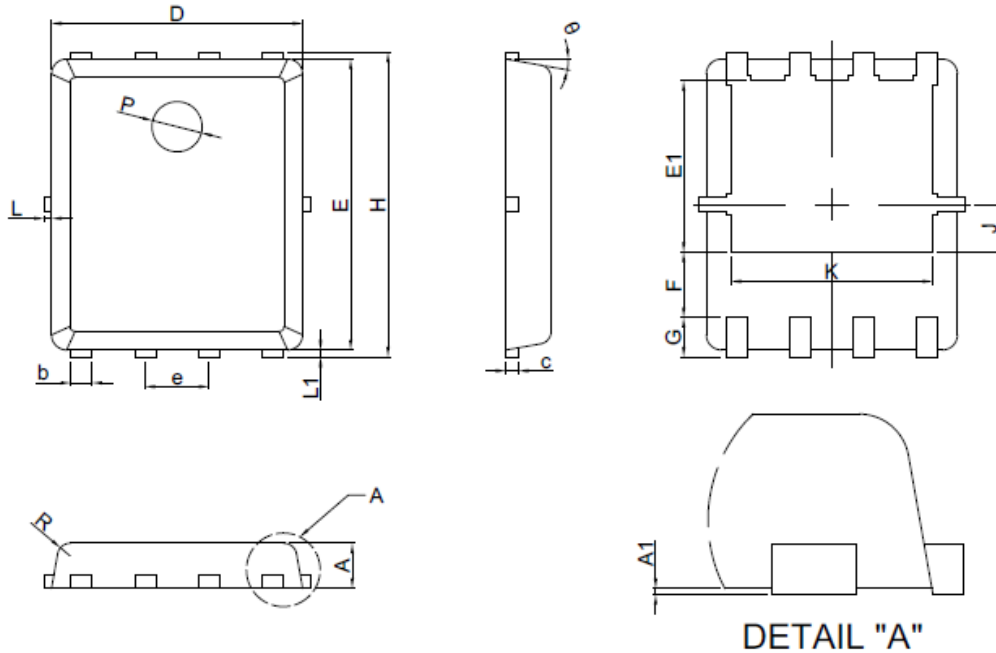
Normalized Threshold Voltage



Typical Characteristics (Cont.)



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	

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