

FH037N10G

N-Channel Enhancement Mode Power MOSFET

◆ General Description

This N channel SGT MOSFET has been designed to very low on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, especially for high efficiency power management applications.

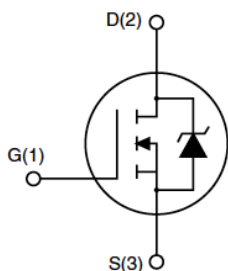
◆ Applications

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

◆ Product Summary

Parameter	Typ.	Unit
BV_{DSS}	100	V (Min)
$V_{GS(th)}$	3.0	V (Typ)
I_D (@ $V_{GS} = 10V$)	120	A
$R_{DS(ON)}$ (@ $V_{GS} = 10V$)	3.6	m Ω (Typ)

- High density cell design for ultra low $R_{ds(on)}$
- 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 (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS}=10V$	120	A
$I_D@T_c=100^\circ C$	Continuous Drain Current, $V_{GS}=10V$	69	A
IDM	Pulsed Drain Current ¹	352	A
EAS	Single Pulse Avalanche Energy ⁴	530	mJ
$PD@T_c=25^\circ C$	Total Power Dissipation	86	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_j	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristic

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.9	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	--	2.28	°C/W

Electrical Characteristics (TC=25°C unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	100	--	--	V	VGS=0V, ID=250uA
RDS(ON)	Static Drain-Source On-Resistance	--	3.6	4.5	mΩ	VGS=10V, ID=30A
VGS(th)	Gate Threshold Voltage	2	3	4	V	VGS=VDS, ID=250uA
IDSS	Drain-Source Leakage Current	--	--	1	uA	VDS=100V, VGS=0V, TJ=25°C
		--	--	10	uA	VDS=100V, VGS=0V, TJ=125°C
IGSS	Gate-Source Leakage Current	--	--	±100	nA	VGS=±20V, VDS=0V
gfs	Forward Transconductance	--	50	--	S	VDS=5V, ID=30A
Rg	Gate Resistance	--	0.64	--	Ω	VDS=0V, VGS=0V, f=1MHz
Qg	Total Gate Charge (10V) ^{2,3}	--	90	--	nC	VDS=50V, VGS=10V, ID=20A
Qgs	Gate-Source Charge ^{2,3}	--	28	--		
Qgd	Gate-Drain Charge ^{2,3}	--	19	--		
Td(on)	Turn-On Delay Time ^{2,3}	--	28	--	ns	VDD=50V, VGS=10V, RG=3Ω ID=30A
Tr	Rise Time ^{2,3}	--	32	--		
Td(off)	Turn-Off Delay Time ^{2,3}	--	48	--		
Tf	Fall Time ^{2,3}	--	27	--		
Ciss	Input Capacitance	--	5385	--	pF	VDS=50V, VGS=0V, f=1MHz
Coss	Output Capacitance	--	1530	--		
Crss	Reverse Transfer Capacitance	--	136	--		
Trr	Body Diode Reverse Recovery Time	--	80	--	ns	IF=30A, di/dt=100A/us
Qrr	Body Diode Reverse Recovery Charge	--	190	--	nC	
VSD	Diode Forward Voltage		--	1	V	VGS=0V, IS=1A, TJ=25°C

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\cong 300\mu\text{s}$, duty cycle $\cong 2\%$.
3. Essentially independent of operating temperature.
4. The EAS data shows Max. rating. The test condition is VDD=50V, VGS=10V, L=0.5mH.

Typical Performance Characteristics

Fig1 Output Characteristics

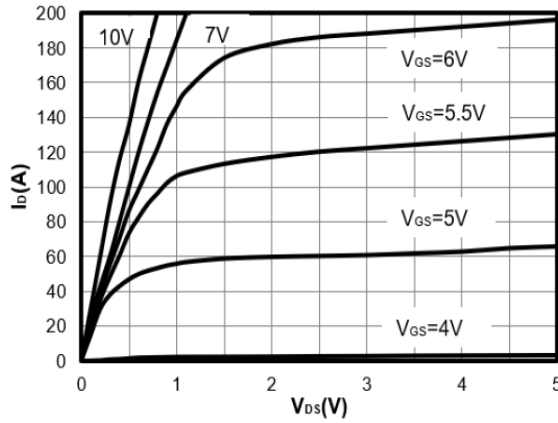


Fig2 Transfer Characteristics

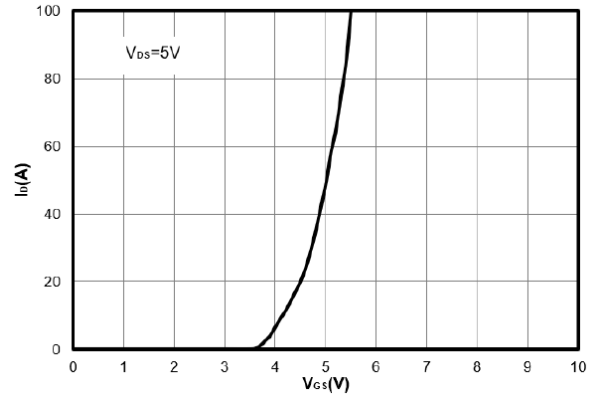


Fig3 Rds(on) VS Drain current

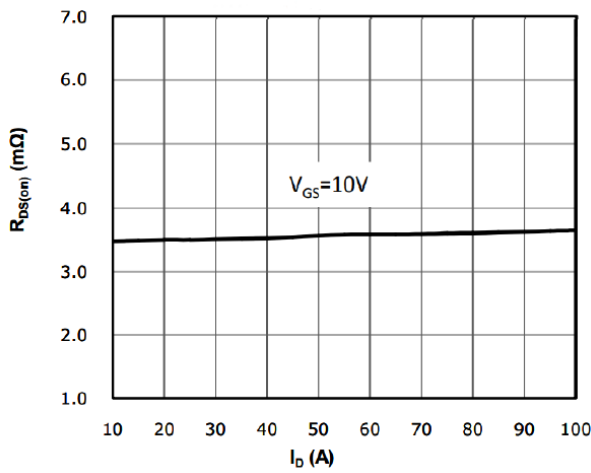


Fig4 Capacitance Characteristics

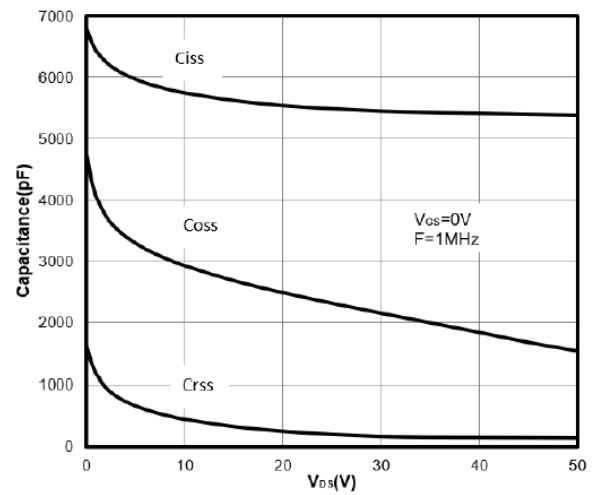


Fig5 Gate Charge Characteristics

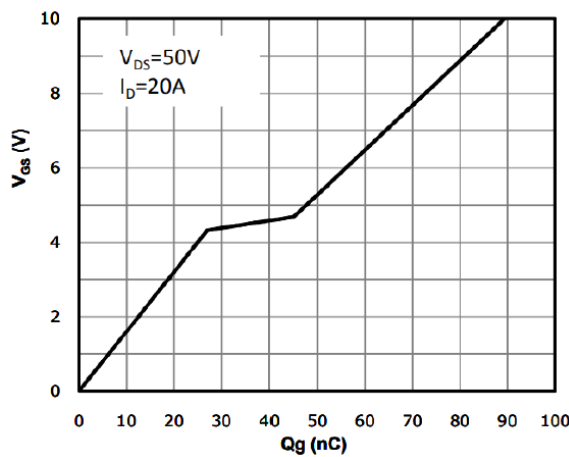


Fig.6 Safe Operating Area

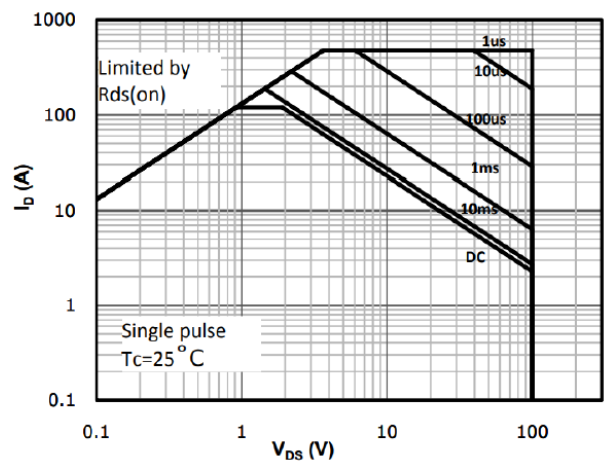
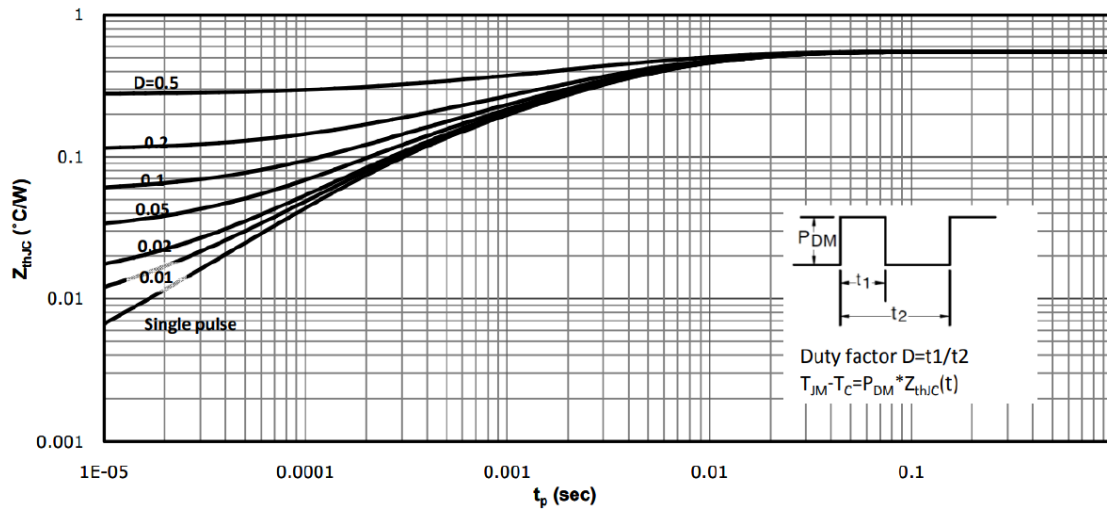
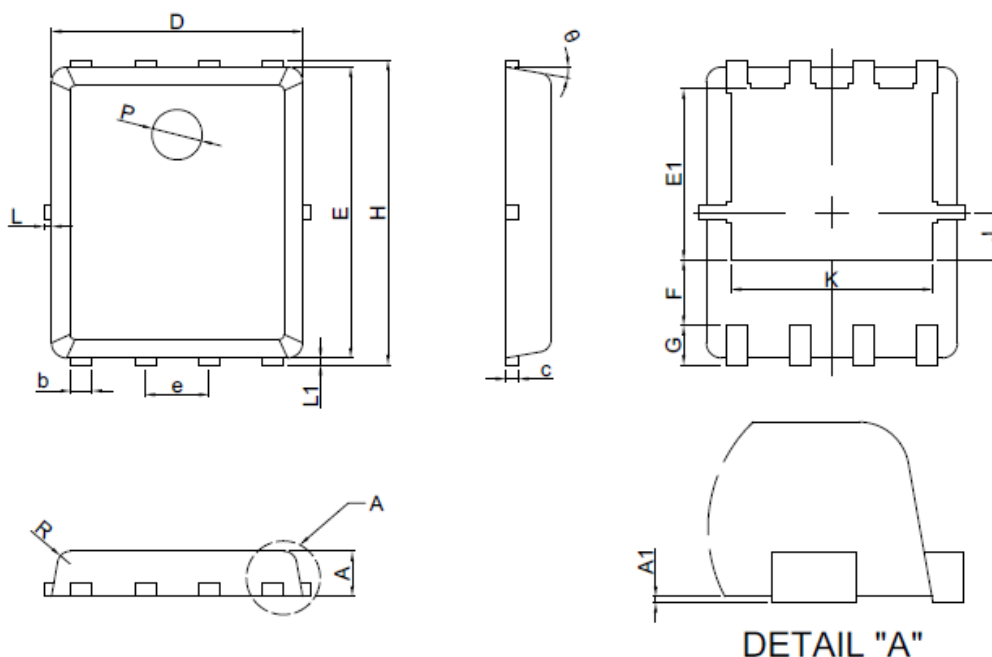


Fig.7 Max. Transient Thermal Impedance



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	