

# FH037N10B

## N-Channel Enhancement Mode Power MOSFET

### ◆ General Description

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

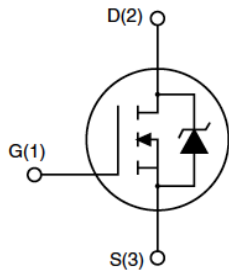
### ◆ Applications

- 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
$R_{DS(ON)}$ (@ $V_{GS} = 10V$ )	3.4	mΩ (Typ)

- 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

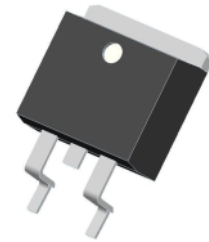


Schematic diagram

### TO-263



Marking and pin assignment



TO-263 top 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, $V_{GS}=10V$	75	A
IDM	Pulsed Drain Current <sup>1</sup>	480	A
EAS	Single Pulse Avalanche Energy <sup>4</sup>	530	mJ
$PD@T_c=25^\circ C$	Total Power Dissipation	227	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	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	--	0.69	°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	--	3.4	4	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) <sup>2,3</sup>	--	90	--	nC	VDS=50V, VGS=10V, ID=20A
Qgs	Gate-Source Charge <sup>2,3</sup>	--	28	--		
Qgd	Gate-Drain Charge <sup>2,3</sup>	--	19	--		
Td(on)	Turn-On Delay Time <sup>2,3</sup>	--	28	--	ns	VDD=50V, VGS=10V, RG=3Ω ID=30A
Tr	Rise Time <sup>2,3</sup>	--	32	--		
Td(off)	Turn-Off Delay Time <sup>2,3</sup>	--	48	--		
Tf	Fall Time <sup>2,3</sup>	--	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

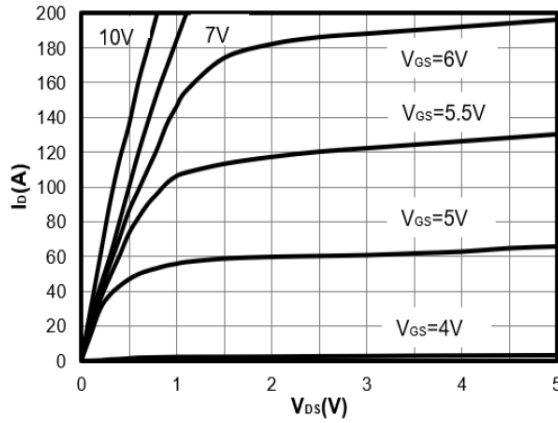


Fig2 Transfer Characteristics

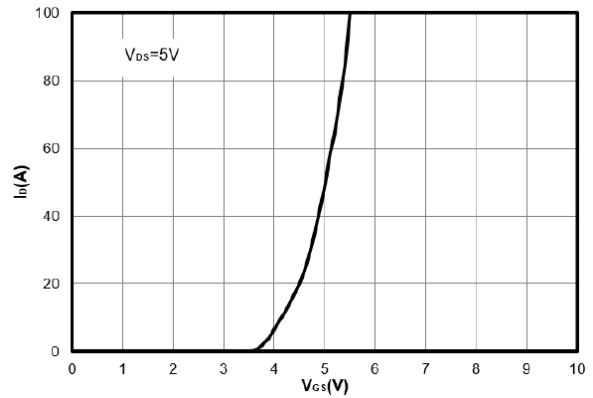


Fig3 Rds(on) VS Drain current

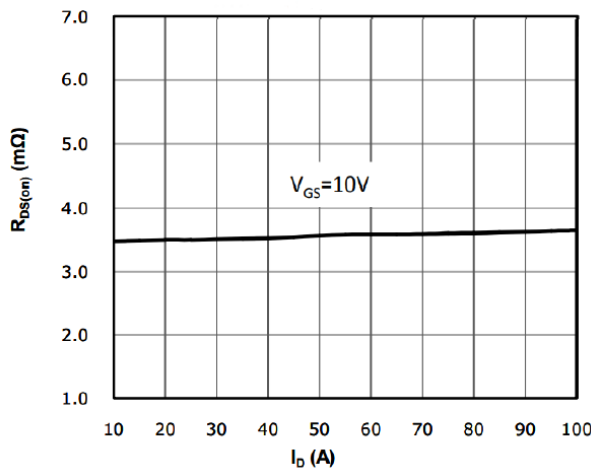


Fig4 Capacitance Characteristics

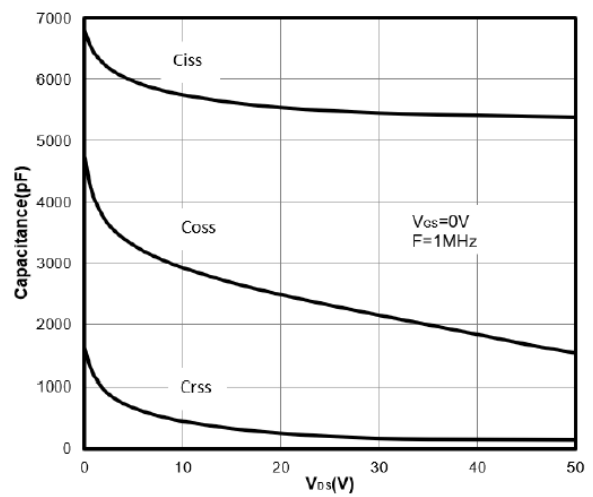


Fig5 Gate Charge Characteristics

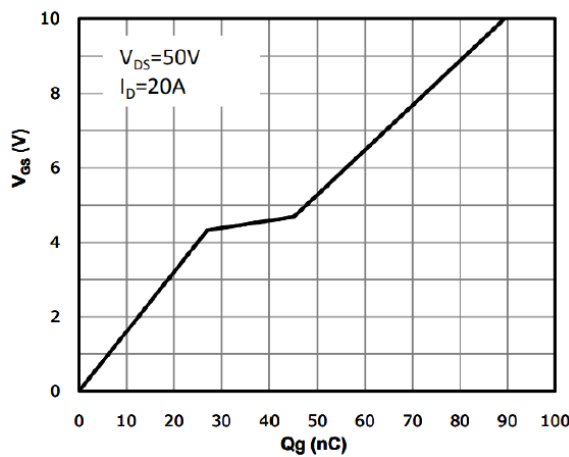


Fig.6 Safe Operating Area

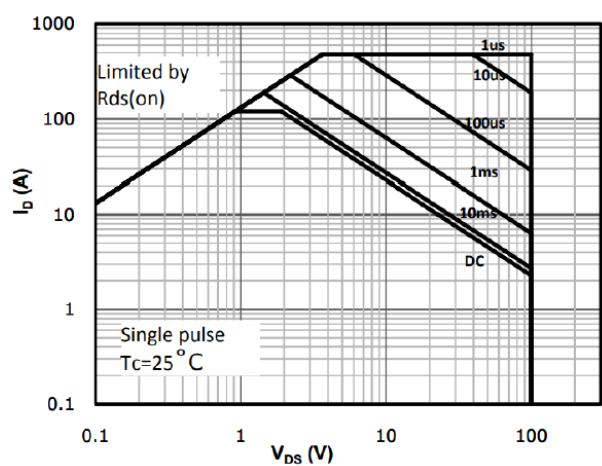
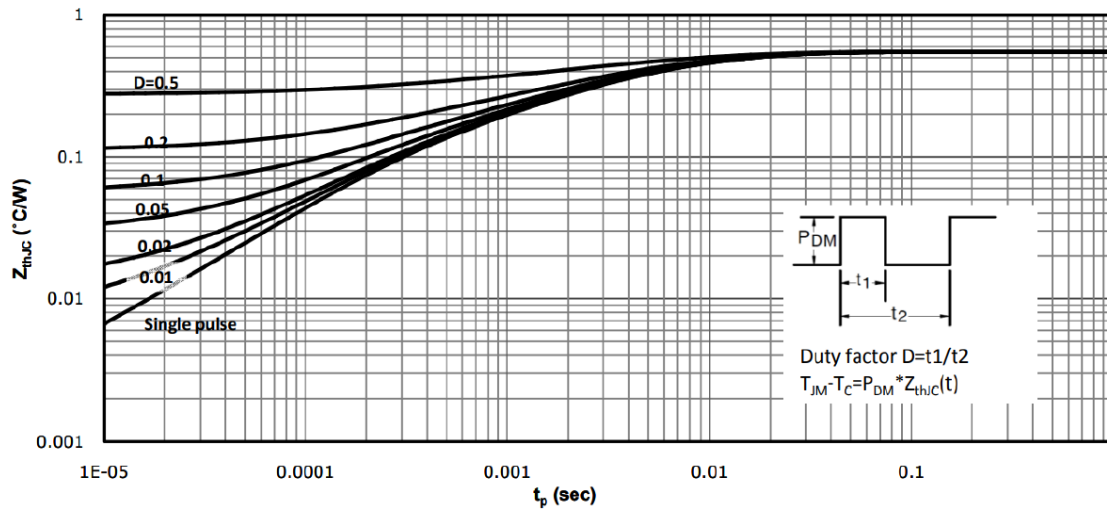
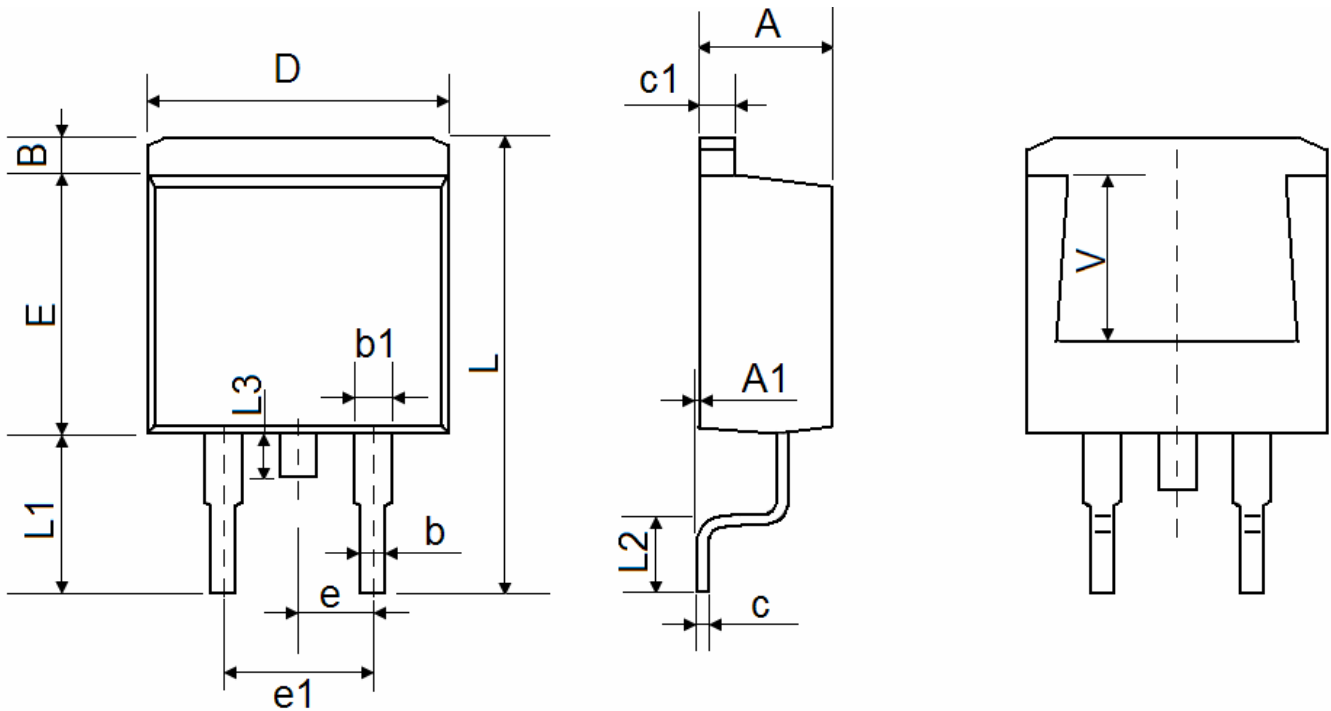


Fig.7 Max. Transient Thermal Impedance



## Package Information : TO-263



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF		0.220 REF	