

N-MOSFET 60V 7mΩ 58A

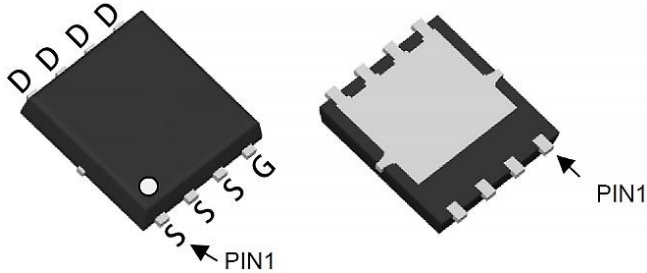
■ Product Summary

- V_{DS} 60V
- I_D 58A
- R_{DS(ON)} (at V_{GS}=10V) <8.5 mΩ (Typ: 7.0 mΩ)

■ Naming convention

M	G	C	0	7	0	N	0	6	A	L
Megain		B: PDFN3X3 C: PDFN5X6 P: TO220 H: TO263 S: SOP8 D: TO252	R _{DS(on)} Typ. @V _{GS} =10V		N: N P: P C: N+P D: N+N		10: 100V 08: 80V 06: 60V 04: 40V 03: 30V		A:V _{GS} 20/-12 w/o A: V _{GS} ±20	L:V _{DS} (1~2.5V) N:V _{DS} (2~4V)

■ Pin configuration



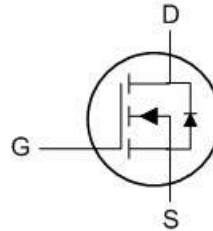
■ Features

- Advanced Trench MOS Technology
- Low Gate Charge
- Low R_{DS(ON)}
- 100% EAS Guaranteed
- Green Device Available

■ Application

- Motor Control
- DC/DC Converter
- Synchronous rectifier applications

■ Symbol



■ Ordering Information

Order code	Package	Form	Quantity (PCS)	Marking
MGC070N06L	PDFN 5x6	Tape & Reel	5000 / Tape & Reel	MGC070N06L

■ Absolute Maximum Ratings

T_C=25°C Unless Otherwise Noted.

Symbol	Parameter	Value	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous ^{1,6} (T _C =25°C)	58	A
	Drain Current – Continuous ^{1,6} (T _C =100°C)	37	A
I _{DM}	Pulsed Drain Current ²	250	A
EAS	Single Pulse Avalanche Energy ³	26.5	mJ
I _{AS}	Avalanche Current	23	A
P _D	Total Power Dissipation ⁴ (T _C =25°C)	50	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

■ Thermal Characteristics

Symbol	Parameter	Max	Units
R _{θJA}	Thermal Resistance Junction to Ambient ¹ (t≤10S)	25	°C/W
	Thermal Resistance Junction to Ambient ¹ (Steady State)	60	°C/W
R _{θJC}	Thermal Resistance Junction to Case ¹	2.5	°C/W

■ Electrical Characteristics

T_J=25°C Unless Otherwise Noted.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
B _{VDS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	-	-	V
R _{DS(ON)}	Drain-Source On-state Resistance ²	V _{GS} =10V, I _D =15A	-	7.0	8.5	mΩ
		V _{GS} =4.5V, I _D =15A	-	10.5	12.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	-	2.3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V T _J =25°C	-	-	1	uA
		V _{DS} =48V, V _{GS} =0V T _J =55°C	-	-	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	1.3	-	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =30V, V _{GS} =10V I _D =15A	-	15	-	nC
Q _{gs}	Gate-Source Charge		-	3.5	-	
Q _{gd}	Gate-Drain Charge		-	4.2	-	
T _{d(ON)}	Turn-on Delay Time	V _{DS} =30V, V _{GS} =10V, R _G =3.3Ω, I _D =15A	-	7	-	nS
T _r	Turn-on Rise Time		-	4.5	-	
T _{d(OFF)}	Turn-off Delay Time		-	26	-	
T _f	Turn-off Fall Time		-	5	-	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, F=1MHz	-	1270	-	pF
C _{oss}	Output Capacitance		-	479	-	
C _{rss}	Reverse Transfer Capacitance		-	40	-	

Diode Characteristics

I _S	Continuous Source Current ^{1,5,6}	V _G =V _D =0V, Force Current	-	-	30	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A T _J =25°C	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _F =15A, dI/dt=100A/μs,	-	22	-	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	-	72	-	nC

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2. Single pulse width limited by junction temperature T_{J(MAX)}=150°C.

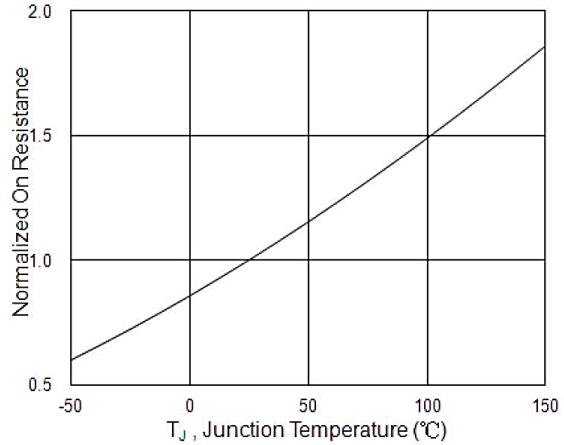
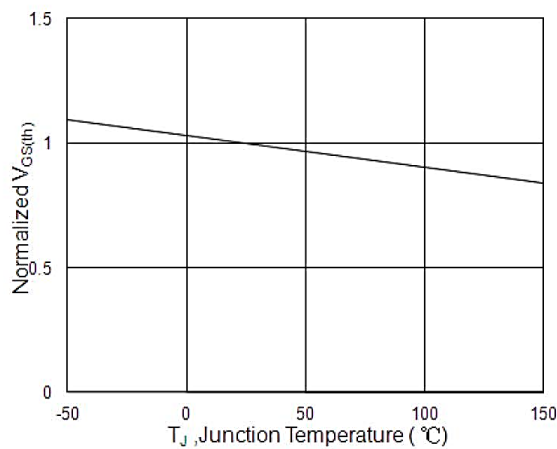
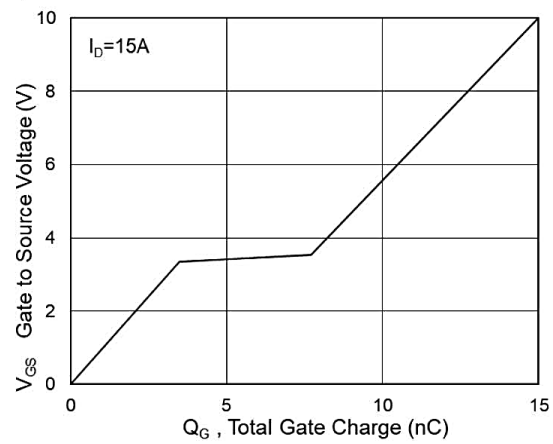
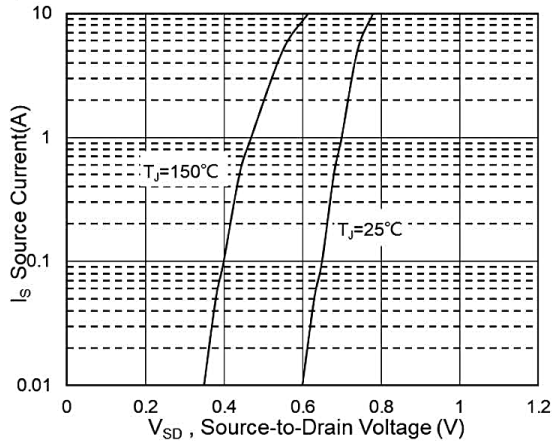
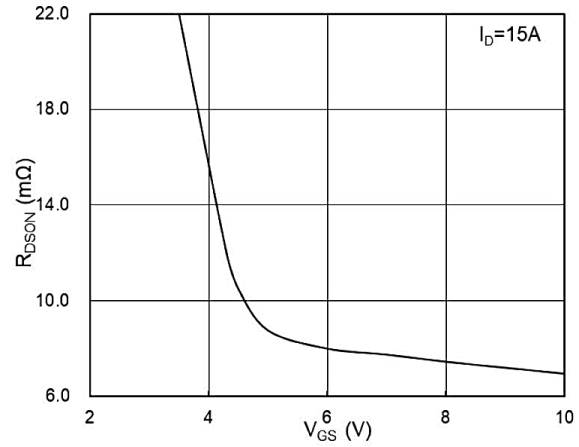
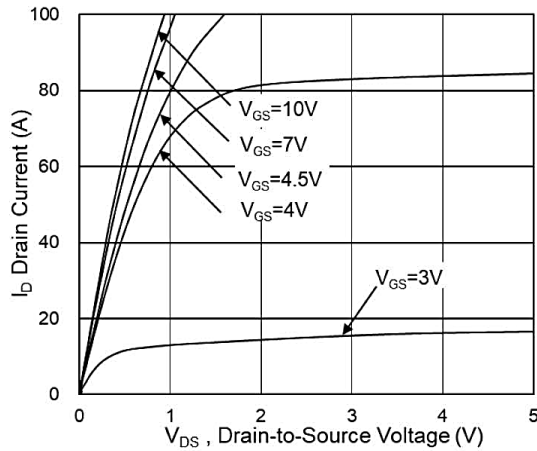
3. The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=23A

4. The power dissipation is limited by 150°C junction temperature

5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

6. The maximum current rating is package limited.

■ Typical Characteristics



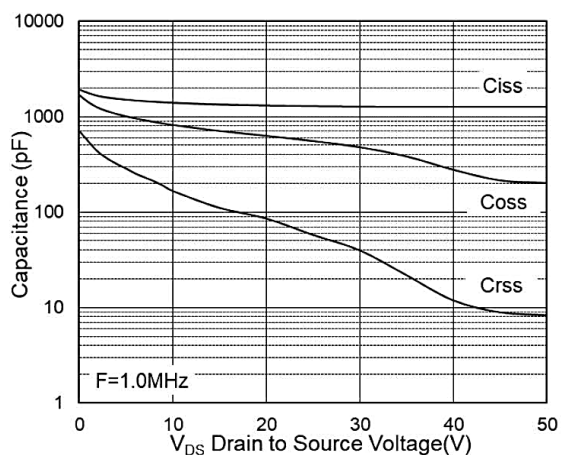


Fig.7 Capacitance

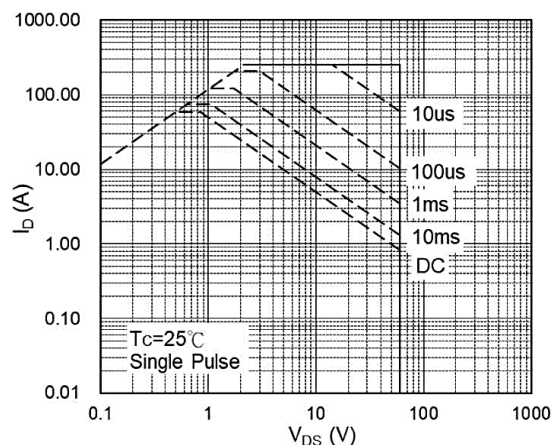


Fig.8 Safe Operating Area

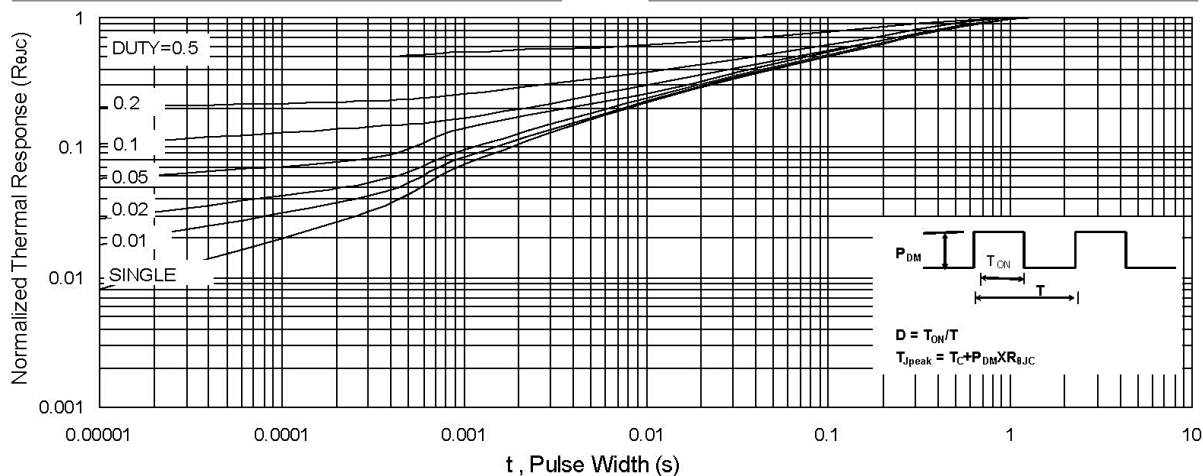


Fig.9 Normalized Maximum Transient Thermal Impedance

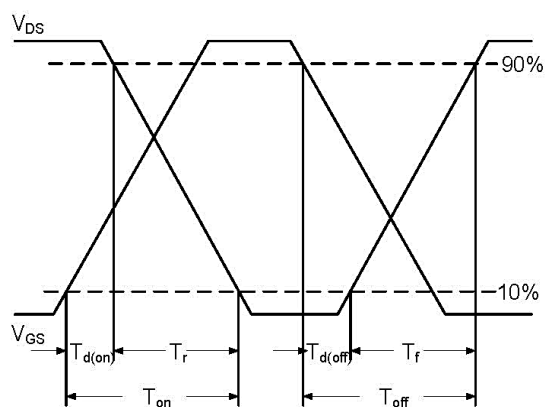


Fig.10 Switching Time Waveform

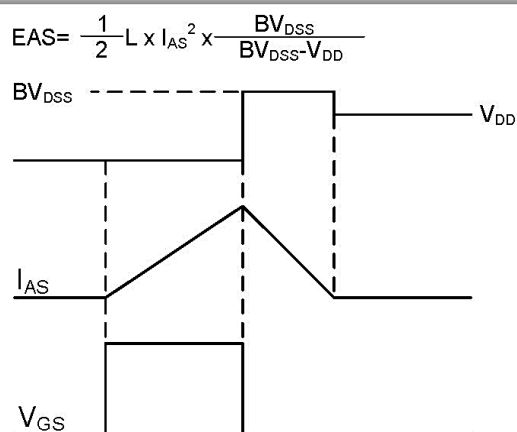
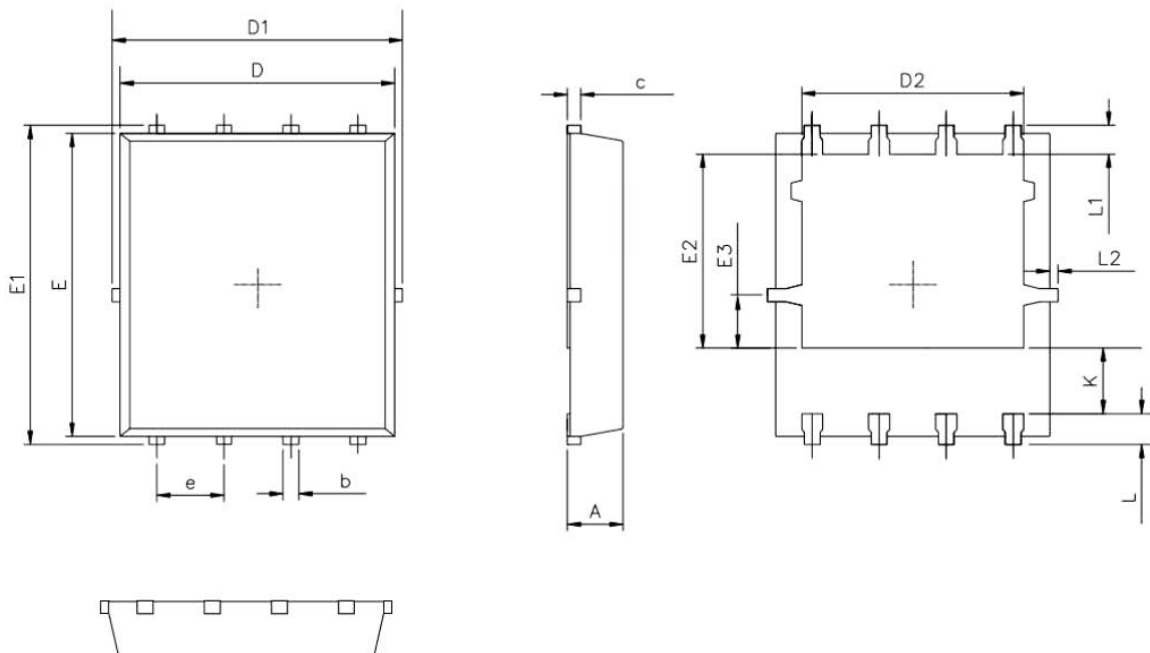


Fig.11 Unclamped Inductive Switching Waveform

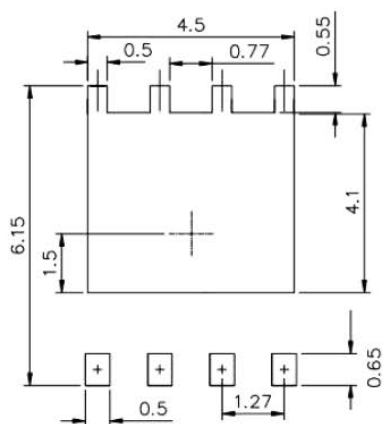
■ Package size

Unit: mm。

PDFN 5X6:



RECOMMENDED LAND PATTERN



UNIT:mm

	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.35	0.50
c	0.10	0.20	0.30
D	4.80	5.00	5.30
D1	4.90	5.10	5.50
D2	3.92	4.02	4.20
E	5.65	5.75	5.85
E1	5.90	6.05	6.20
E2	3.325	3.525	3.775
E3	0.80	0.90	1.00
e		1.27	
L	0.40	0.55	0.70
L1		0.65	
L2	0.00		0.15
K	1.00	1.30	1.50