N-MOSFET 60V 1.7mΩ 100A

■ Product Summary

- VDS 60V
- ID 100A
- RDS(ON) (at VGS=10V) ＜2.1 mΩ（Typ：1.7 mΩ）

■ Features

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

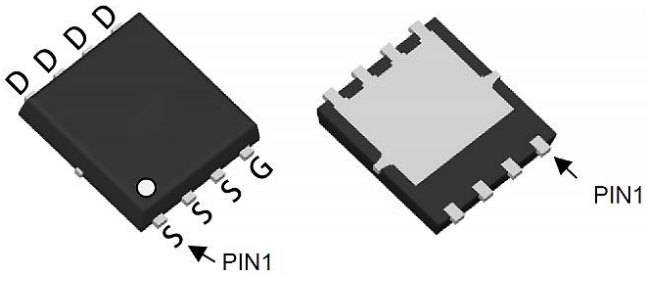
■ Naming convention

M	G	C	0	1	7	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_{th}(1~2.5V) N:V_{th}(2~4V)

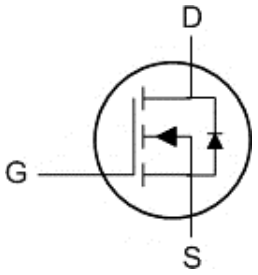
■ Application

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

■ Pin configuration



■ Symbol



■ Ordering Information

Order code	Package	Form	Quantity（PCS）	Marking
MGC017N06L	PDFN 5x6	Tape & Reel	5000 / Tape & Reel	MGC017N06L

■ 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℃)	100	A
	Drain Current – Continuous[1,6] (T_C=100℃)	66	A
I_{DM}	Pulsed Drain Current [2]	400	A
EAS	Single Pulse Avalanche Energy[3]	306	mJ
I_{AS}	Avalanche Current	35	A
P_D	Total Power Dissipation[4](T_C=25°C)	83	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

■ Thermal Characteristics

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient[1]	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case[1]	1.1	℃/W

■ Electrical Characteristics

T_J=25°C Unless Otherwise Noted.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
B_{VDSS}	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=20A	-	1.7	2.1	mΩ
		V_{GS}=4.5V, I_D=20A		2.3	3.2	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}=52V, V_{GS}=0V	-	-	1	uA
		V_{DS}=52V, V_{GS}=0V T_J=55℃	-	-	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
gfs	Forward Transconductance	V_{DS}=5V, I_D=20A	-	60	-	S
Rg	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	1.6	-	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=30V, V_{GS}=10V I_D=20A	-	102	-	nC
Q_g	Total Gate Charge (4.5V)		-	54.1	-	
Q_{gs}	Gate-Source Charge		-	15.7	-	
Q_{gd}	Gate-Drain Charge		-	27.9	-	
$T_{d(ON)}$	Turn-on Delay Time	V_{DS}=30V, V_{GS}=10V, R_G=3Ω, I_D=20A	-	15	-	nS
T_r	Turn-on Rise Time		-	12	-	
$T_{d(OFF)}$	Turn-off Delay Time		-	60	-	
T_f	Turn-off Fall Time		-	19	-	
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, F=1MHz	-	5471	-	pF
C_{oss}	Output Capacitance		-	1847	-	
C_{rss}	Reverse Transfer Capacitance		-	86	-	
Diode Characteristics						
I_S	Continuous Source Current[1,5,6]	V_G=V_D=0V,Force Current	-	-	100	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V, I_S=1A	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_F=20A, dI_F/dt=100A/us	-	50	-	nS
Q_{rr}	Reverse Recovery Charge		-	72	-	nC

Note :
1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3.The EAS data shows Max. rating . The test condition is V_{DD}=50V,V_{GS}=10V,L=0.5mH,I_{AS}=35A.
4.The power dissipation is limited by 150℃ 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

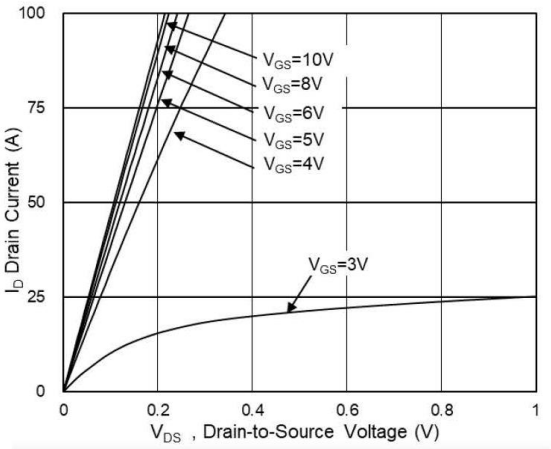


Fig.1 Typical Output Characteristics

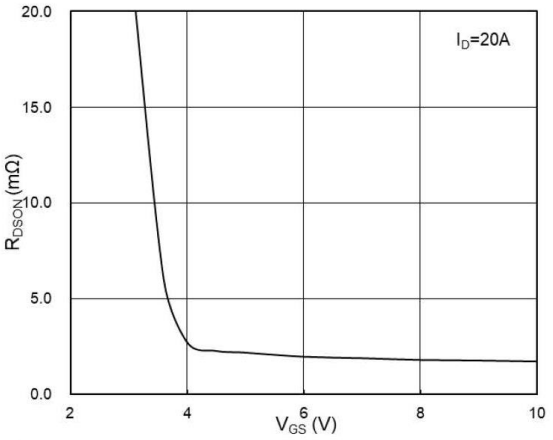


Fig.2 On-Resistance vs G-S Voltage

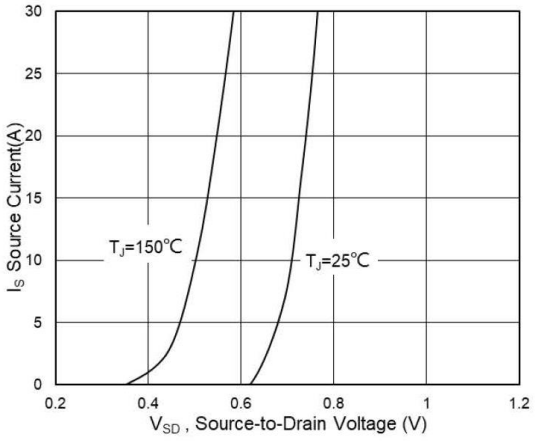


Fig.3 Diode Forward Voltage vs Current

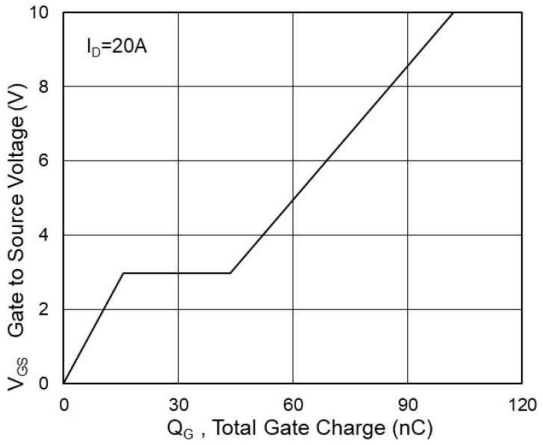


Fig.4 Gate-Charge Characteristics

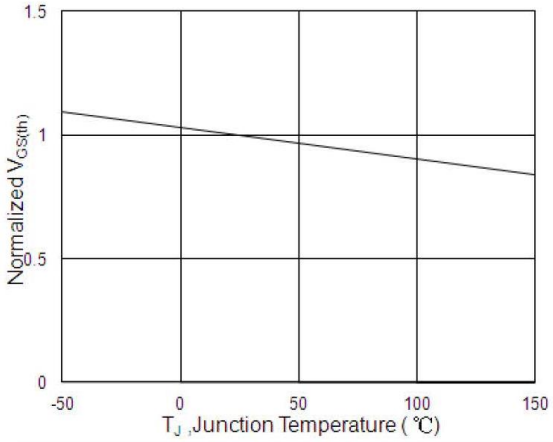


Fig.5 Normalized $V_{GS(th)}$ vs T_J

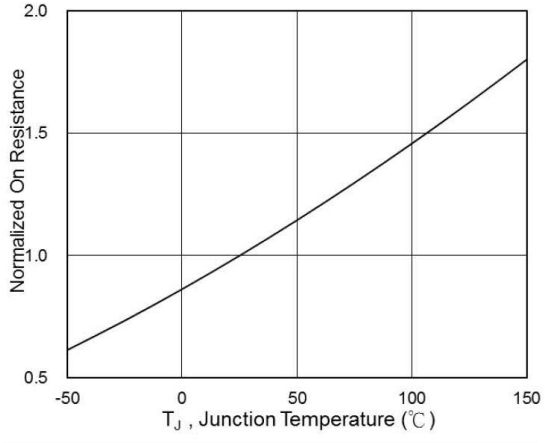


Fig.6 Normalized R_{DSON} vs T_J

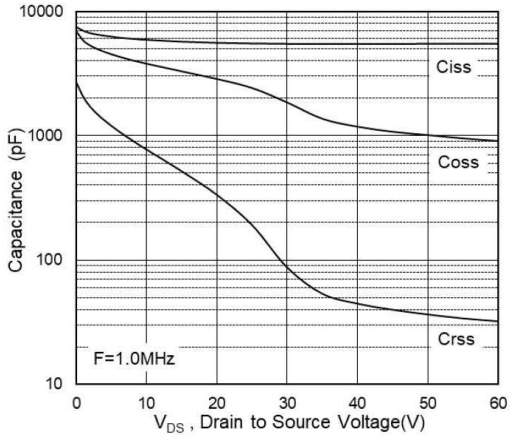


Fig.7 Capacitance

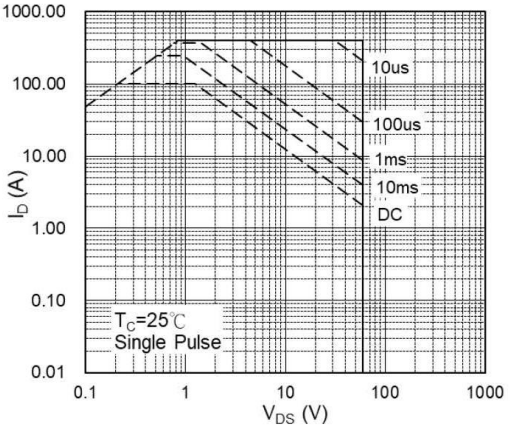


Fig.8 Safe Operating Area

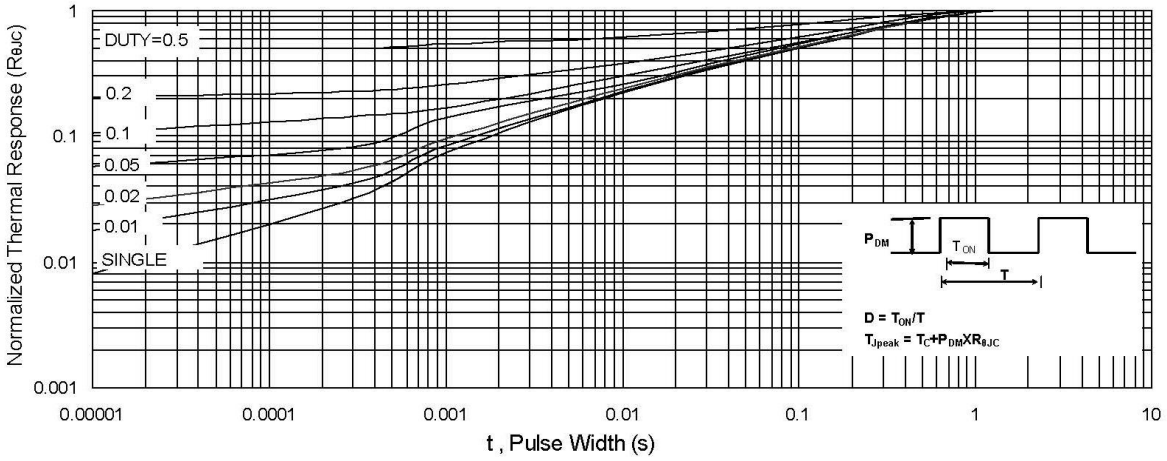


Fig.9 Normalized Maximum Transient Thermal Impedance

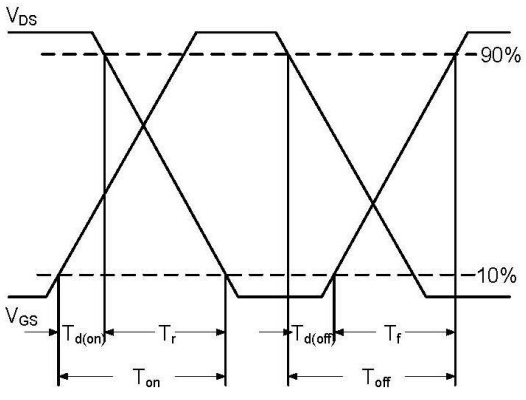


Fig.10 Switching Time Waveform

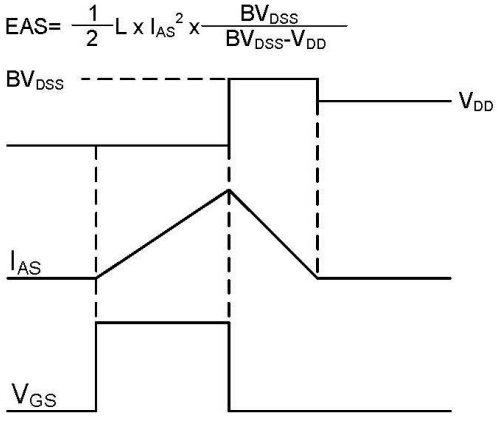
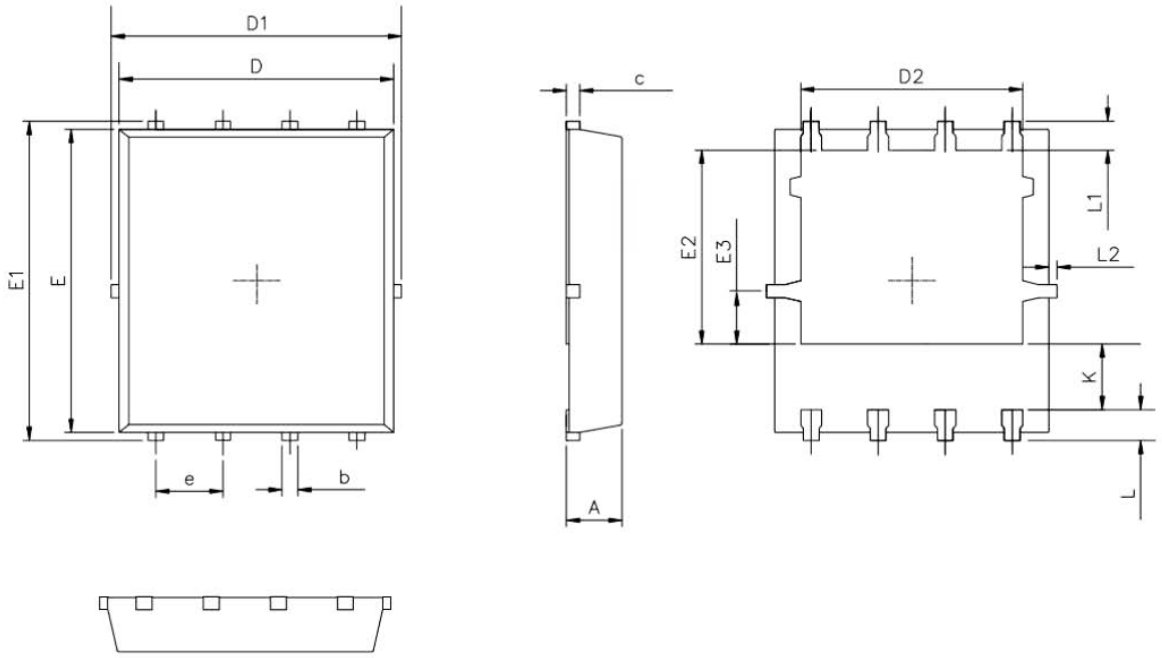


Fig.11 Unclamped Inductive Switching Waveform

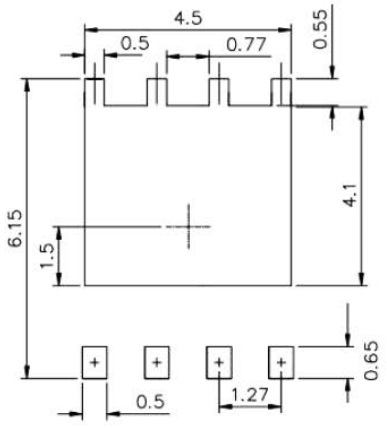
■ Package size

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