N-MOSFET 40V 2.1mΩ 132A

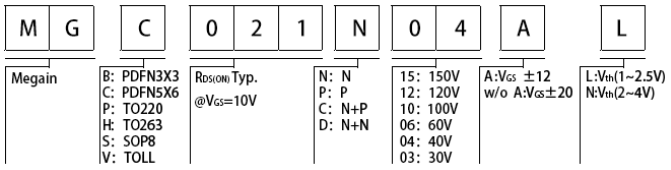
■ Product Summary

- VDS 40V
- ID 132A
- RDS(ON) (at VGS=10V) ＜2.8 mΩ（Typ：2.1mΩ）

■ Features

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

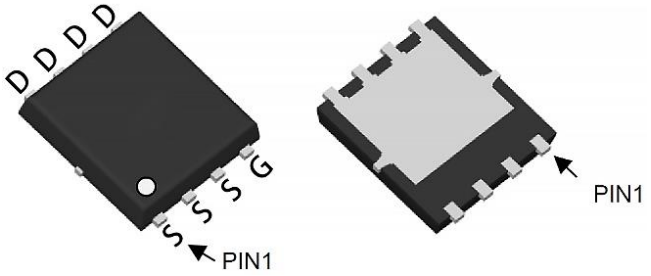
■ Naming convention



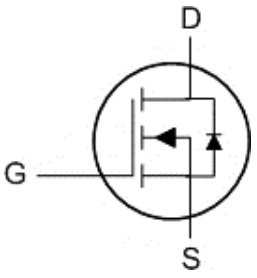
■ Application

- SMPS Synchronous Rectification.
- DC/DC Converters.
- Or-ing.

■ Pin configuration



■ Symbol



■ Ordering Information

Order code	Package	Form	Quantity（PCS）	Marking
MGC021N04L	PDFN 5x6	Tape & Reel	3000 / Tape & Reel	MGC021N04L

■ Absolute Maximum Ratings

T_A=25°C Unless Otherwise Noted.

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current, V_{GS} @ 10V[1](T_C=25℃)	132	A
	Continuous Drain Current, V_{GS} @ 10V[1](T_C=100℃)	83	
I_{DM}	Pulsed Drain Current [2]	528	A
EAS	Single Pulse Avalanche Energy[3]	529	mJ
P_D	Total Power Dissipation(T_C=25°C)	83	W
	Total Power Dissipation(T_C=100°C)	33	
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]	20	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case[1]	1.5	℃/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	40	-	-	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V, I_D=20A	-	2.1	2.8	mΩ
		V_{GS}=4.5V, I_D=10A		2.6	3.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	1.2	1.6	2.2	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V, V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
gFS	Forward Transconductance	V_{DS}=5V, I_D=10A	-	28	-	S
Rg	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	2.6	-	Ω
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V I_D=12A	-	20	-	nC
Q_{gs}	Gate-Source Charge		-	9	-	
Q_{gd}	Gate-Drain Charge		-	11	-	
$T_{d(ON)}$	Turn-on Delay Time	V_{DS}=15V, V_{GS}=10V, R_L=0.75Ω, R_G=3.3Ω	-	6.9	-	nS
T_r	Turn-on Rise Time		-	1.7	-	
$T_{d(OFF)}$	Turn-off Delay Time		-	30	-	
T_f	Turn-off Fall Time		-	15	-	
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, F=1MHz	-	6150	-	pF
C_{oss}	Output Capacitance		-	430	-	
C_{rss}	Reverse Transfer Capacitance		-	372	-	
Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)		-	-	132	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=20A	-	-	1.2	V

Note :
1. The maximum current rating is package limited.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. EAS condition: TJ=25℃,VDD=25V,Vgs=10V,ID=46A,L=0.5mH,RG=25ohm

■ Typical Characteristics

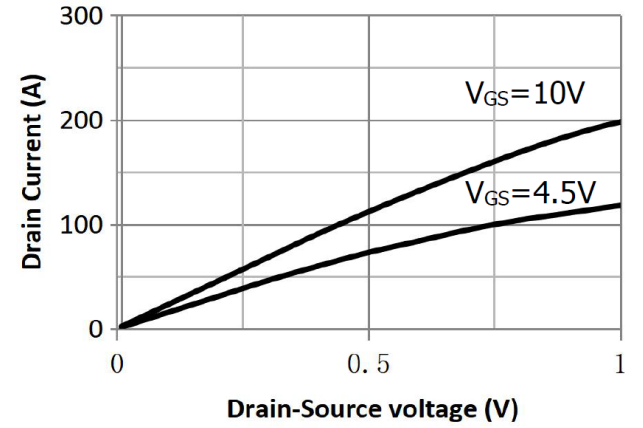


Fig 1. Typical output Characteristics

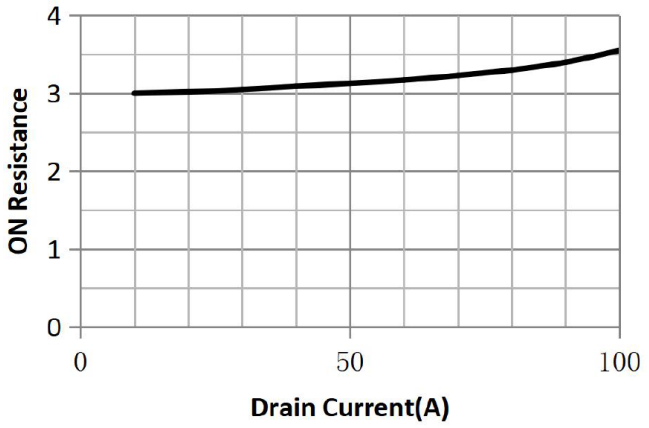


Fig 2. Resistance V.S Drain Current

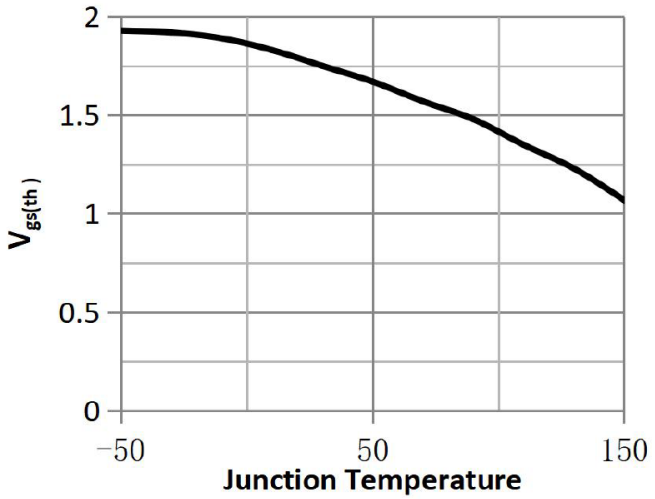


Fig 3. Threshold Voltage V.S Junction Temperature

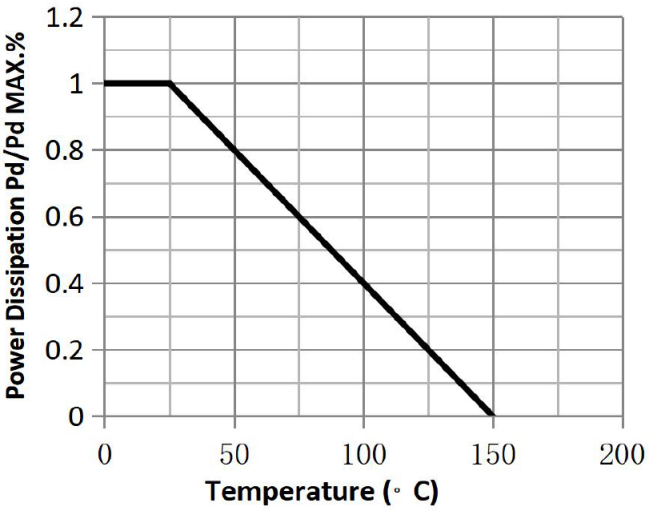


Fig 4. Power Dissipation

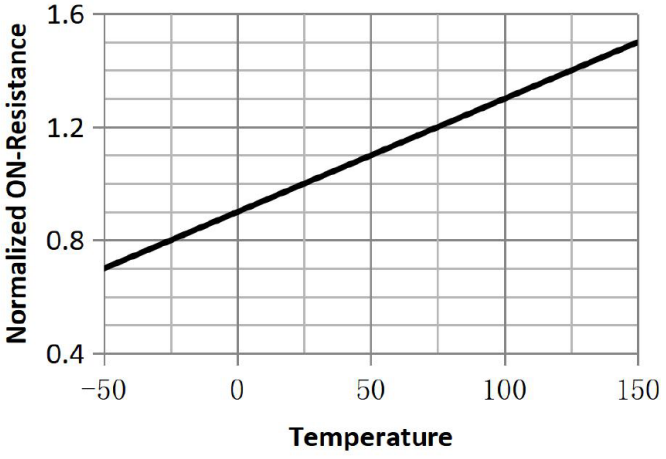


Fig 5. On-Resistance V.S Junction Temperature

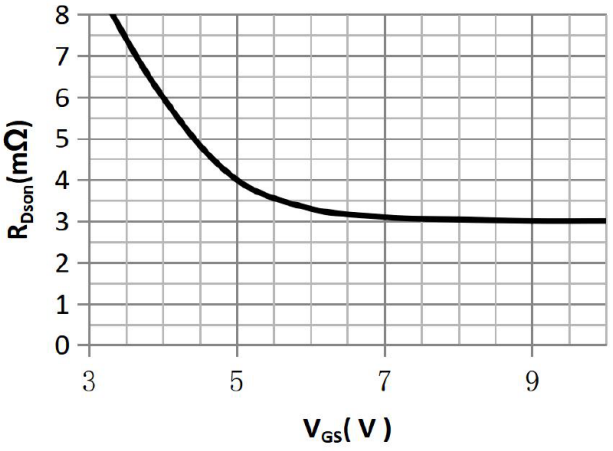


Fig 6. On-Resistance VS Gate Source Voltage

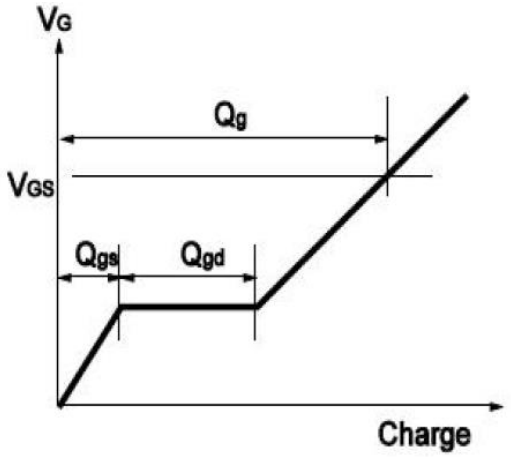


Fig 7. Gate Charge Waveform

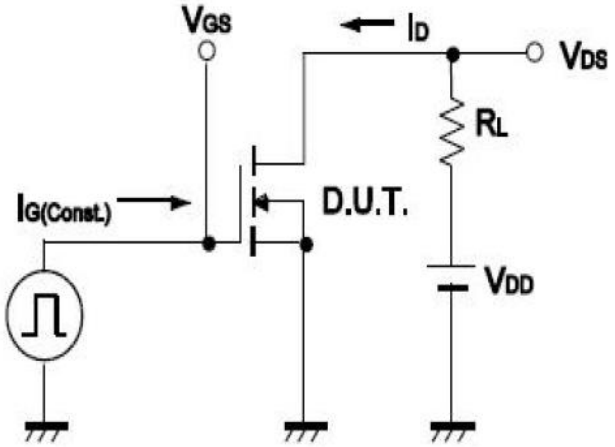


Fig 8. Switching Time Measurement Circuit

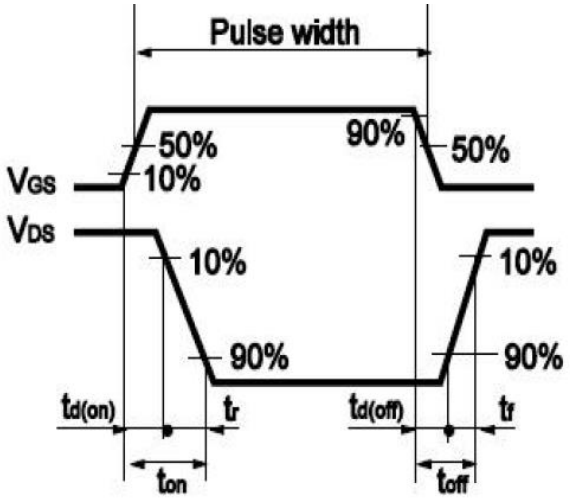


Fig 9. Gate Charge Waveform

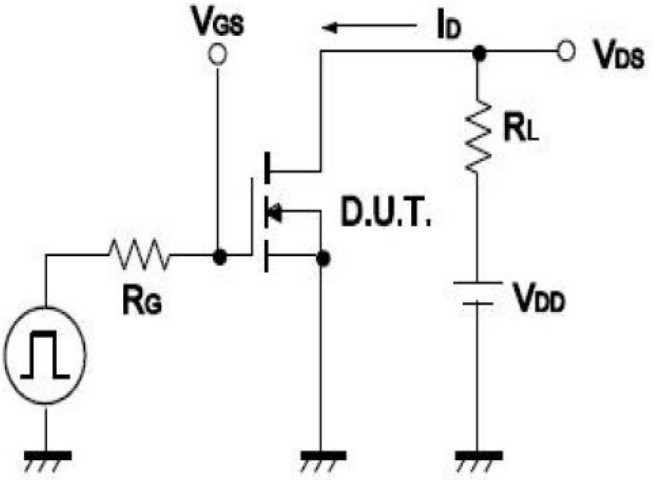


Fig 10. Switching Time Measurement Circuit

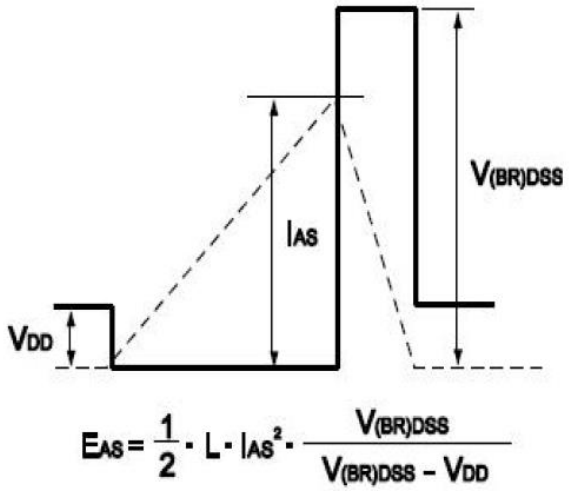


Fig 11. Avalanche Waveform

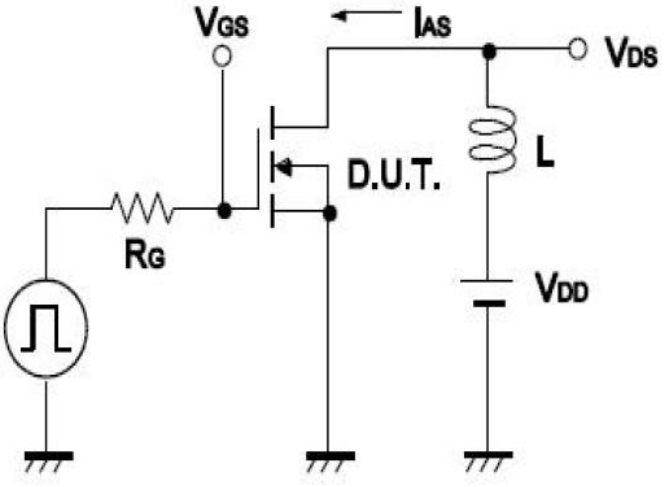
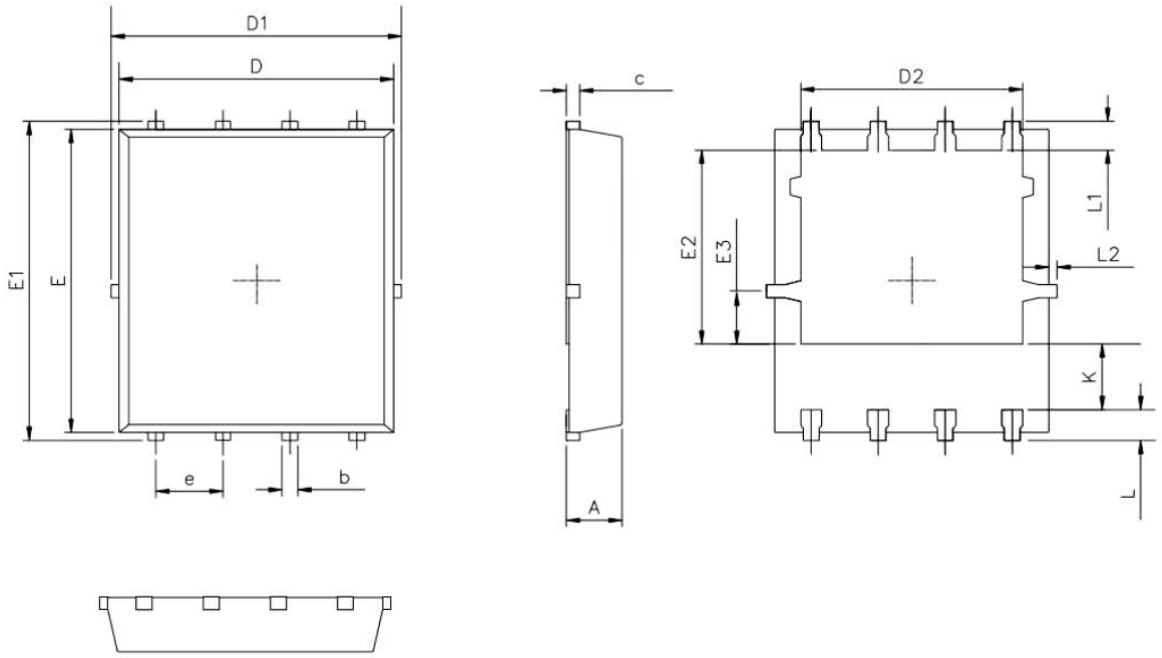


Fig 12. Avalanche Measurement Circuit

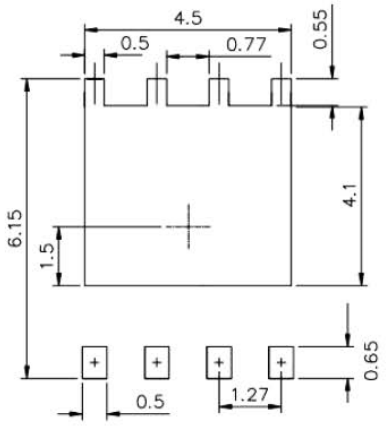
■ Package size

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