

N-MOSFET 60V 4mΩ 115A

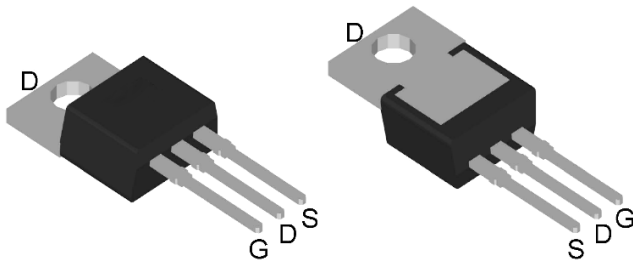
■ Product Summary

- V_{DS} 60V
- I_D 115A
- R_{DS(ON)} (at V_{GS}=10V) <4.8 mΩ (Typ: 4 mΩ)

■ Naming convention

M	G	P	0	4	0	N	0	6	A	N
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)	

■ Pin configuration



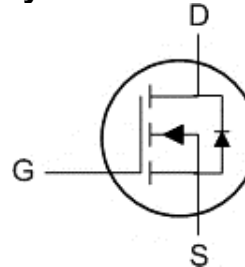
■ Features

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

■ Application

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

■ Symbol



■ Ordering Information

Order code	Package	Form	Quantity (PCS)	Marking
MGP040N06N	TO220	Tube	50 / Tube	MGP040N06N

■ 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)	115	A
	Drain Current – Continuous ^{1,6} (T _C =100°C)	81	A
I _{DM}	Pulsed Drain Current ²	400	A
EAS	Single Pulse Avalanche Energy ³	101	mJ
I _{AS}	Avalanche Current	45	A
P _D	Total Power Dissipation ⁴ (T _C =25°C)	136	W
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

■ Thermal Characteristics

Symbol	Parameter	Max	Units
R _{θJA}	Thermal Resistance Junction to Ambient ¹	50	°C/W
R _{θJA}	Thermal Resistance Junction-Ambient 1,t≤10s	18	
R _{θJC}	Thermal Resistance Junction to Case ¹	1.1	°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 =20A	-	4	4.8	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	-	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V T _J =25℃	-	-	1	uA
		V _{DS} =48V, V _{GS} =0V T _J =55℃	-	-	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	-	65	-	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	-	0.7	-	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =30V, V _{GS} =10V I _D =20A	-	59	-	nC
Q _{gs}	Gate-Source Charge		-	15	-	
Q _{gd}	Gate-Drain Charge		-	10	-	
T _{d(ON)}	Turn-on Delay Time	V _{DS} =30V, V _{GS} =10V, R _G =3Ω, I _D =20A	-	20	-	nS
T _r	Turn-on Rise Time		-	9	-	
T _{d(OFF)}	Turn-off Delay Time		-	60	-	
T _f	Turn-off Fall Time		-	15	-	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, F=1MHz	-	3509	-	pF
C _{oss}	Output Capacitance		-	1175	-	
C _{rss}	Reverse Transfer Capacitance		-	68	-	
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 T _J =25℃	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _F =20A,	-	24	-	nS
Q _{rr}	Reverse Recovery Charge	dl _F /dt=100A/usT _J =25℃	-	85	-	nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

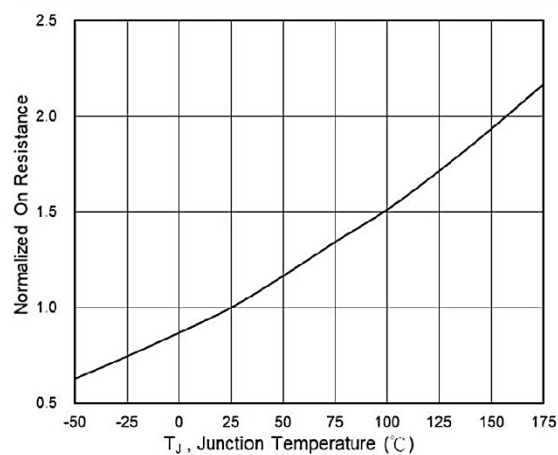
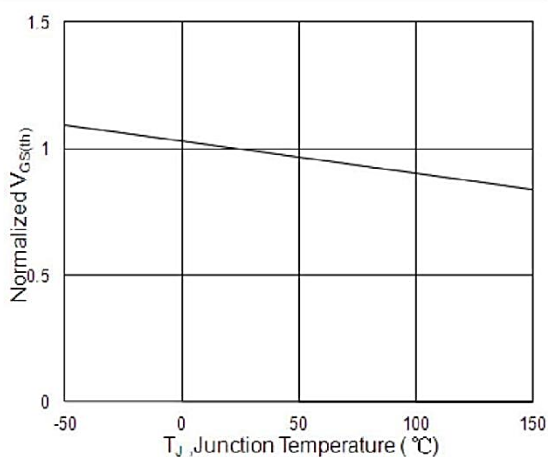
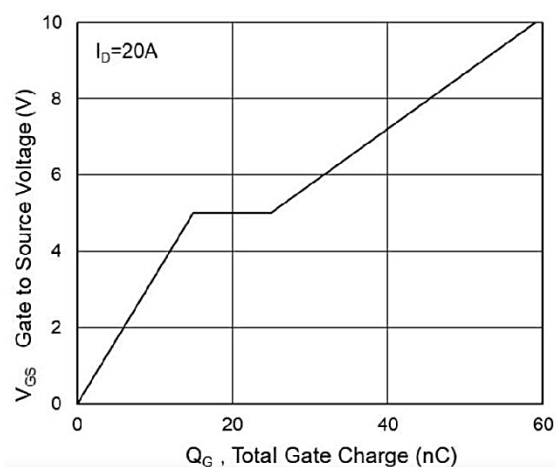
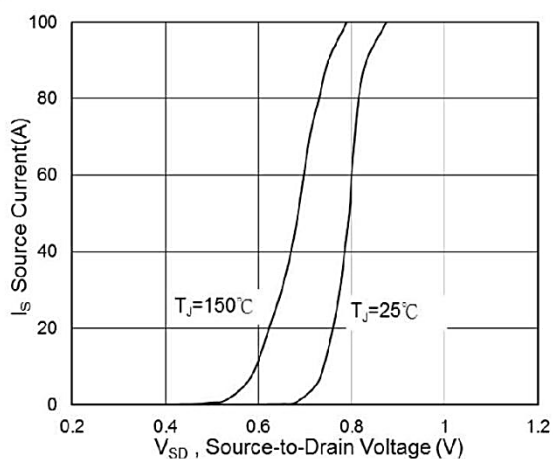
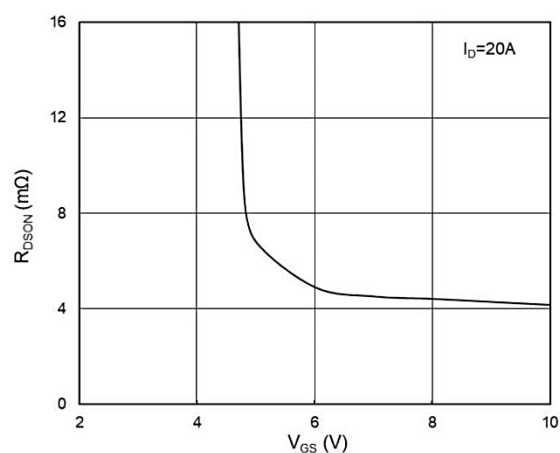
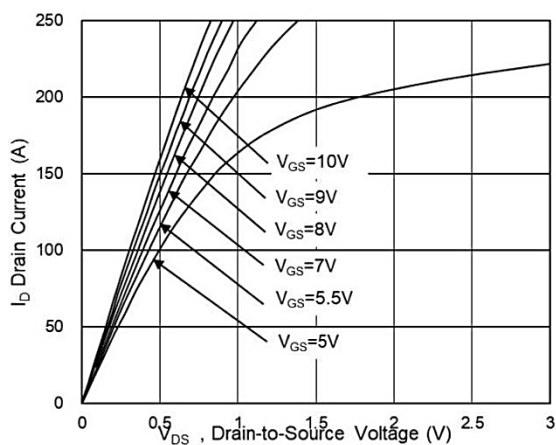
3.The EAS data shows Max. rating . The test condition is V_{DD}=50V,V_{GS}=10V,L=0.1mH,I_{AS}=45A

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. Bonding wire limitation current is 85A.

■ Typical Characteristics



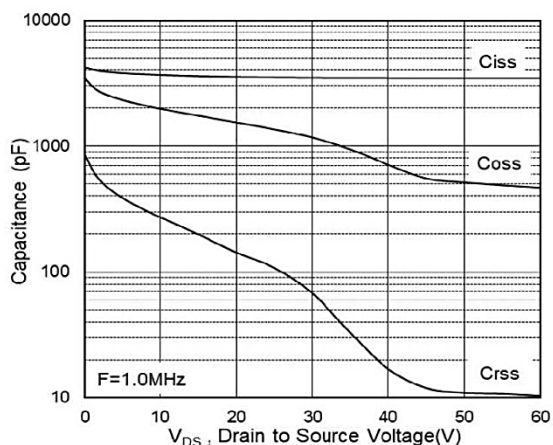


Fig.7 Capacitance

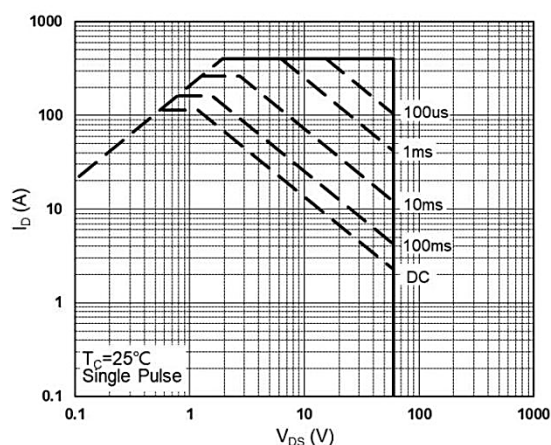


Fig.8 Safe Operating Area

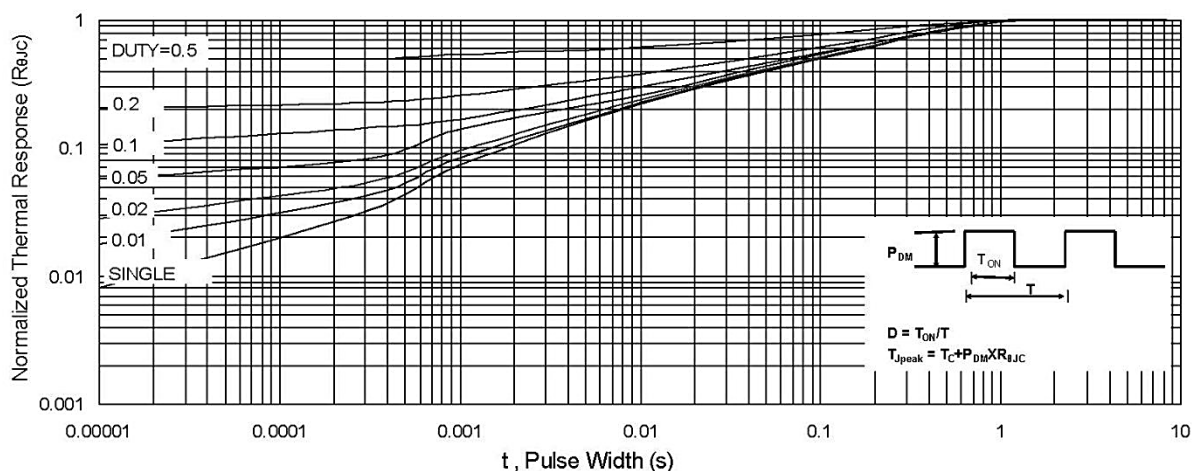


Fig.9 Normalized Maximum Transient Thermal Impedance

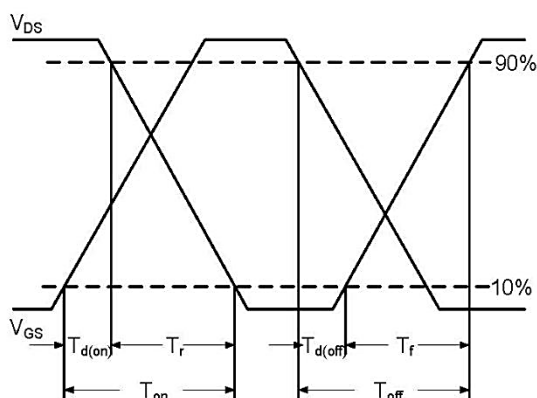


Fig.10 Switching Time Waveform

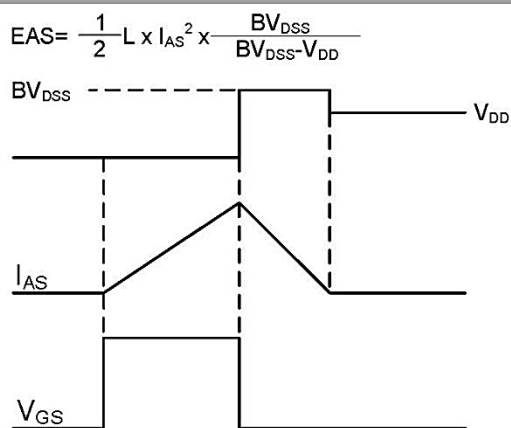


Fig.11 Unclamped Inductive Switching Waveform

■ Package size

Unit: mm.

TO220:

