

N-MOSFET 100V 5.5mΩ 122A

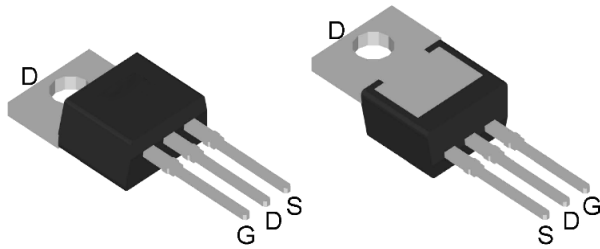
■ Product Summary

- V_{DS} 100V
- I_D 122A
- R_{DS(ON)} (at V_{GS}=10V) <6.6mΩ (Typ: 5.5mΩ)

■ Naming convention

M	G	P	0	5	5	N	1	0	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		15: 150V 12: 120V 10: 100V 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



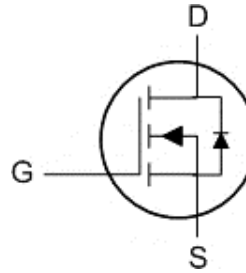
■ Features

- Advanced Trench MOS Technology
- 100% EAS Guaranteed
- Fast Switching Speed
- Green Device Available

■ Application

- DC/DC Converter
- High frequency switching and synchronous rectification

■ Symbol



■ Ordering Information

Order code	Package	Form	Quantity (PCS)	Marking
MGP055N10N	TO220	Tube	50 / Tube	MGP055N10N

■ Absolute Maximum Ratings

T_C=25°C Unless Otherwise Noted.

Symbol	Parameter	Value	Units
V _{DS}	Drain-Source Voltage	100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous ^{1,6} (T _C =25°C)	122	A
	Drain Current – Continuous ^{1,6} (T _C =100°C)	87	
I _{DM}	Pulsed Drain Current ²	344	A
EAS	Single Pulse Avalanche Energy ³	L=0.1mH	mJ
		L=0.5mH	
I _{AS}	Avalanche Current	L=0.1mH	A
		L=0.5mH	
P _D	Total Power Dissipation ⁴ (T _C =25°C)	(T _C =25°C)	W
		(T _C =100°C)	
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
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ¹	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case ¹	1	°C/W

■ Electrical Characteristics

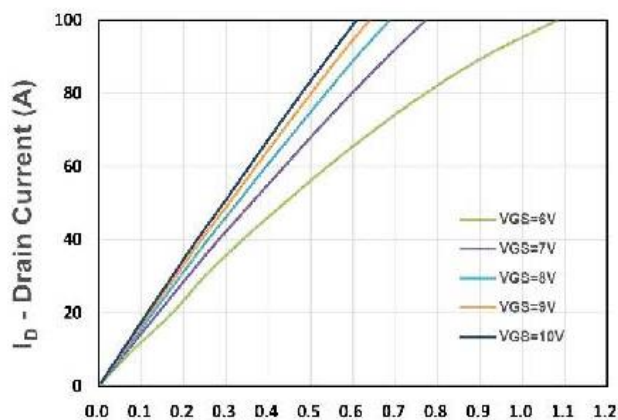
$T_J=25^{\circ}\text{C}$ Unless Otherwise Noted.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
B _{VDS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100	-	-	V
R _{DS(ON)}	Drain-Source On-state Resistance ²	V _{GS} =10V, I _D =13.5A	-	5.5	6.6	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	3	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V	-	-	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =10A	-	22	-	S
R _g	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	0.5	-	Ω
Q _g	Total Gate Charge (6V)	V _{DS} =50V, V _{GS} =6V I _D =20A	-	35	-	nC
Q _g	Total Gate Charge (10V)	V _{DS} =50V, V _{GS} =10V I _D =20A	-	53	-	
Q _{gs}	Gate-Source Charge		-	15.8	-	
Q _{gd}	Gate-Drain Charge		-	15.2	-	
T _{d(ON)}	Turn-on Delay Time	V _{DS} =25V, V _{GS} =10V, R _G =3Ω, I _D =1A	-	10	-	nS
T _r	Turn-on Rise Time		-	6.5	-	
T _{d(OFF)}	Turn-off Delay Time		-	45	-	
T _f	Turn-off Fall Time		-	7.5	-	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	-	2870	-	pF
C _{oss}	Output Capacitance		-	925	-	
C _{rss}	Reverse Transfer Capacitance		-	58	-	
Diode Characteristics						
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _{SD} =10A	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _F =10A,	-	47.8	-	nS
Q _{rr}	Reverse Recovery Charge	V _R =50V, dI _F /dt=100A/us	-	66.5	-	nC

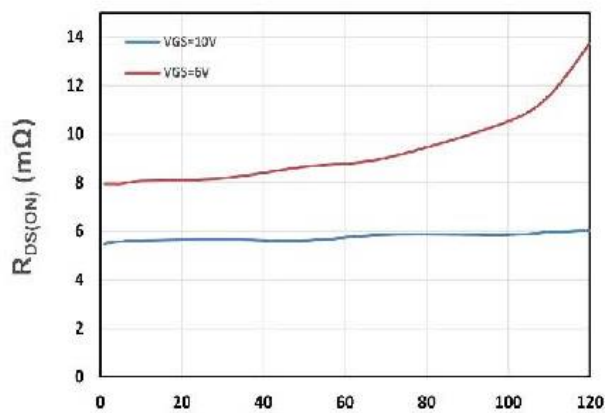
Note :

1. Max. current is limited by bonding wire
2. UIS tested and pulse width are limited by maximum junction temperature 150°C
3. Surface Mounted on 1in2 FR-4 board with 1oz
4. Pulse test (pulse width 300us, duty cycle 2%).
5. Guaranteed by design, not subject to production testing.

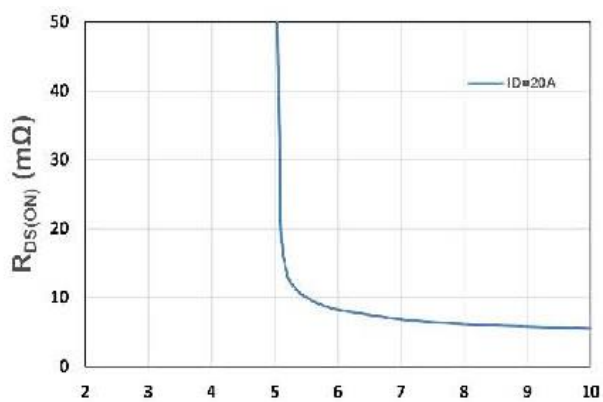
■ Typical Characteristics



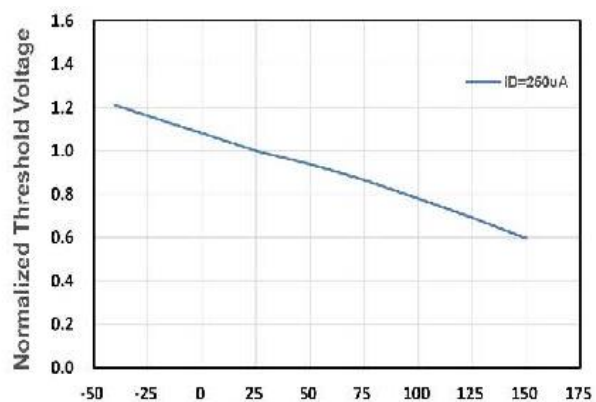
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



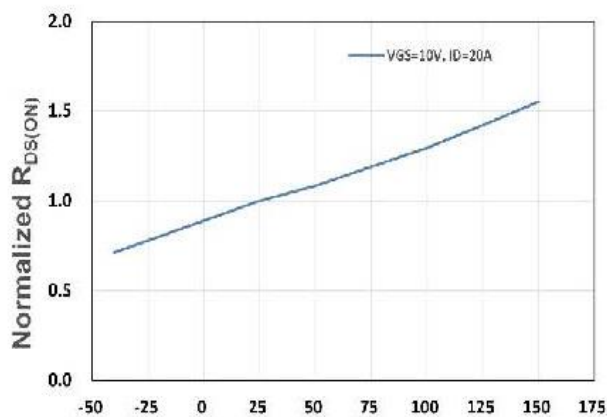
I_D - Drain Current (A)
Figure 2. On-Resistance vs. I_D



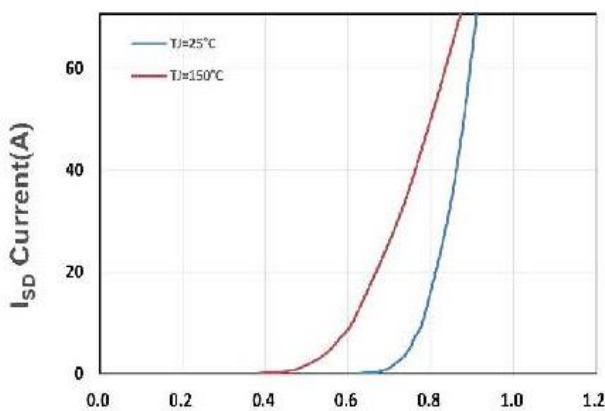
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. V_{GS}



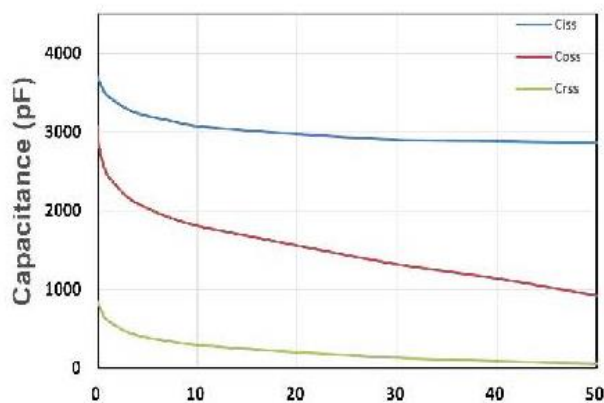
T_J , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



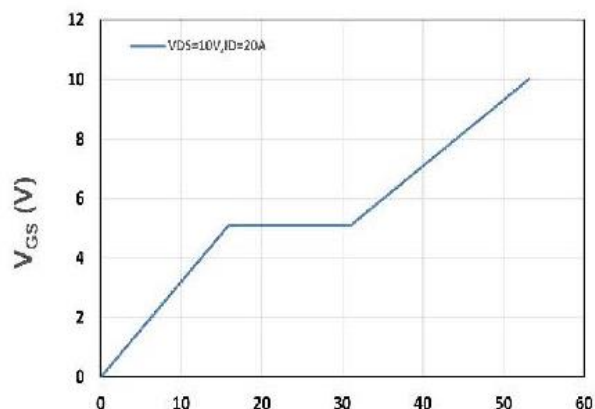
T_J , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



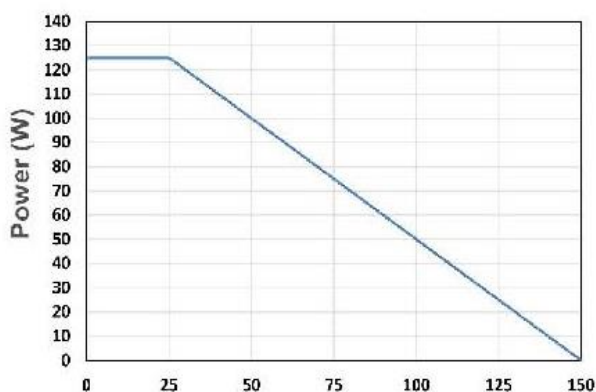
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



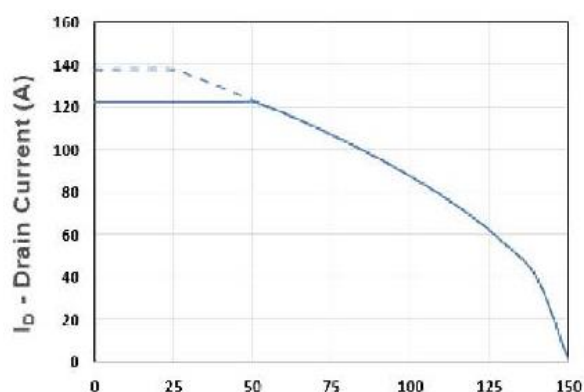
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



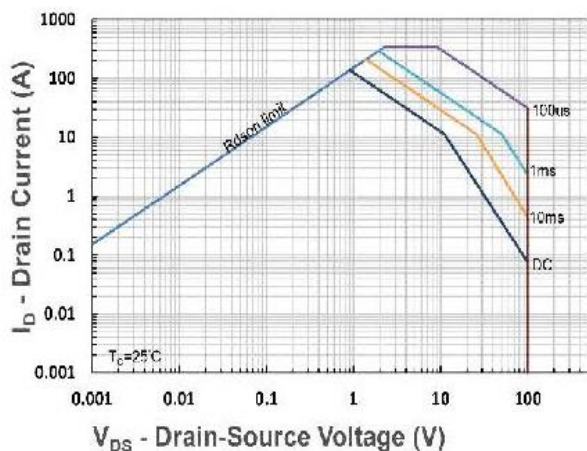
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



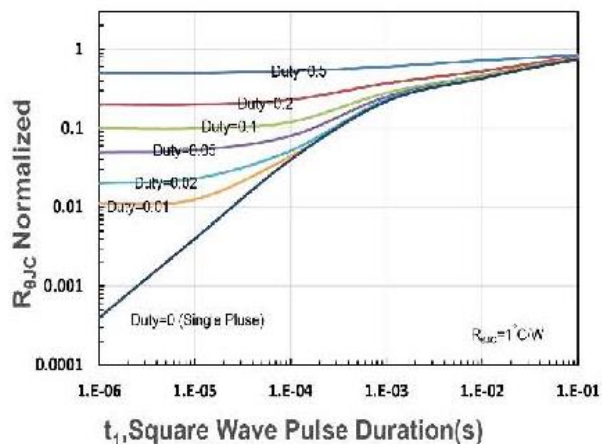
T_c - Case Temperature ($^{\circ}\text{C}$)
Figure 9. Power Dissipation



T_c - Case Temperature ($^{\circ}\text{C}$)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area



t_1 , Square Wave Pulse Duration(s)
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

■ Package size

Unit: mm.

TO220:

