

Silicon N-Channel Power MOSFET

Description

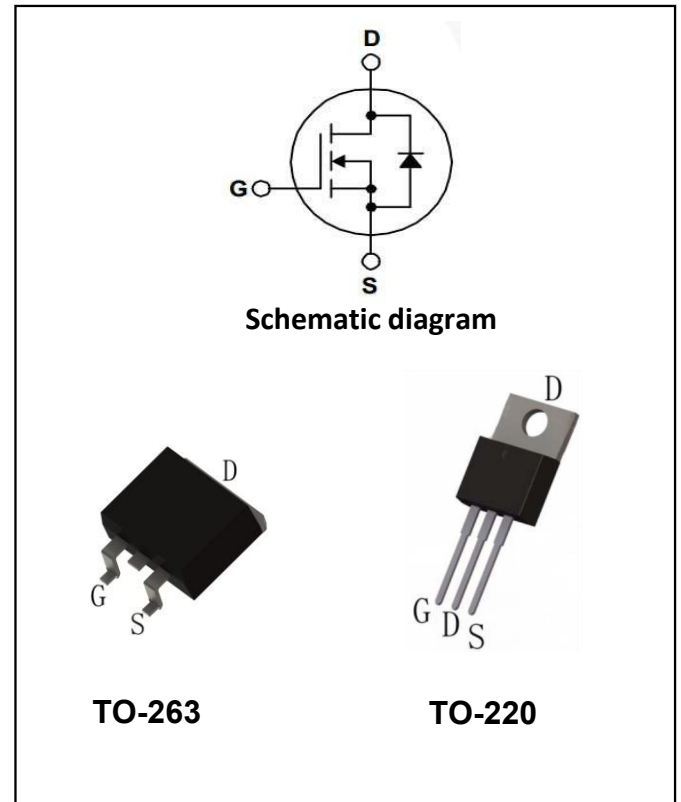
The MPG100N06 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge. It can be used in a wide variety of applications.

KEY CHARACTERISTICS

- ①  $V_{DS}=60V, I_D=100A$   $R_{DS(ON)} < 7.5m\Omega @ V_{GS}=10V$
- ② Special process technology for high ESD capability
- ③ High density cell design for lower  $R_{dson}$
- ④ Fully characterized avalanche voltage and current
- ⑤ Good stability and uniformity with high EAS

Application

- ① Power switching application.
- ② Hard switched and High frequency circuits
- ③ Uninterruptible power supply.



ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
MPG100N06-P	TO-220	MPG100N06P	Tube
MPG100N06-S	TO-263	MPG100N06S	Reel/Tube

Electrical Characteristics @  $T_a=25^\circ C$  (unless otherwise specified)

Limited Parameters:

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-to-Source Breakdown Voltage	60	V
$I_D$	Drain Current (continuous) at $T_c=25^\circ C$	100	A
$I_{DM}$	Drain Current (pulsed)	320	A
$V_{GS}$	Gate to Source Voltage	$\pm 20$	V
$P_{tot}$	Total Dissipation at $T_c=25^\circ C$	107	W
$T_j$	Max. Operating Junction Temperature	175	$^\circ C$
Eas	Single Pulse Avalanche Energy	280	mj

**Electrical Parameters:**

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{DS}$	Drain-source Voltage	$V_{GS}=0V, I_D=250\mu A$	60			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	$V_{GS}=10V, I_D=46A$		6.5	7.5	mΩ
$V_{GS(th)}$	Gated Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V$			1.0	μA
$I_{GSS(F)}$	Gated Body Leakage Current	$V_{GS}=+20V$			100	nA
$I_{GSS(R)}$	Gated Body Leakage Current	$V_{GS}=-20V$			-100	nA
$C_{iss}$	Input Capacitance	$V_{GS}=0V$ $V_{DS}=40V$ $f=1.0MHz$		3000		pF
$C_{oss}$	Output Capacitance			270		pF
$C_{rss}$	Reverse Transfer Capacitance			240		pF
$Q_g$	Total Gate Charge		$V_{DS}=40V$		72	
$Q_{gs}$	Gate-Source Charge	$I_D=10A$		21.5		nC
$Q_{gd}$	Gate-Drain Charge	$V_{GS}=10V$		28		nC

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=40V, I_D=40A$ $V_{GS}=10V, R_{GEN}=3\Omega$		8.5		nS
$t_r$	Turn-on Rise Time			7		nS
$t_{d(off)}$	Turn-off Delay Time			40		nS
$t_f$	Turn-off Fall Time			15		nS

Drain-Source Diode Characteristics						
Diode Forward Voltage	VSD	$V_{GS}=0V, I_S=155A$			1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.  $E_{AS}$  condition :  $T_j=25^\circ C, V_{DD}=50V, V_G=10V, L=0.5mH, R_g=1\Omega$
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production.

Characteristics Curves

Figure 1 Output Characteristics

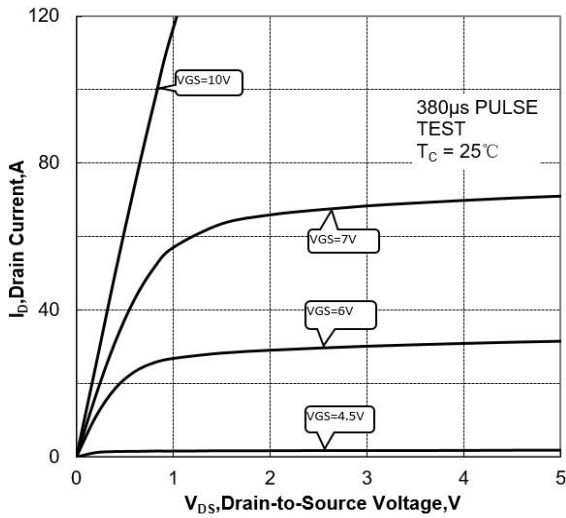


Figure 2 Transfer Characteristics

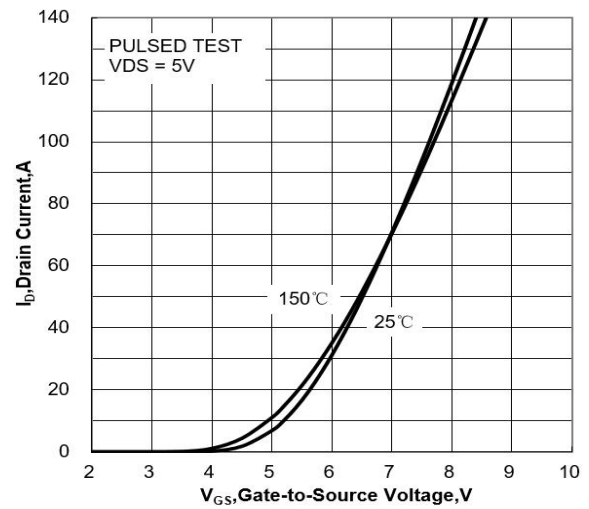


Figure 3 On-Resistance vs. Id and Vgs

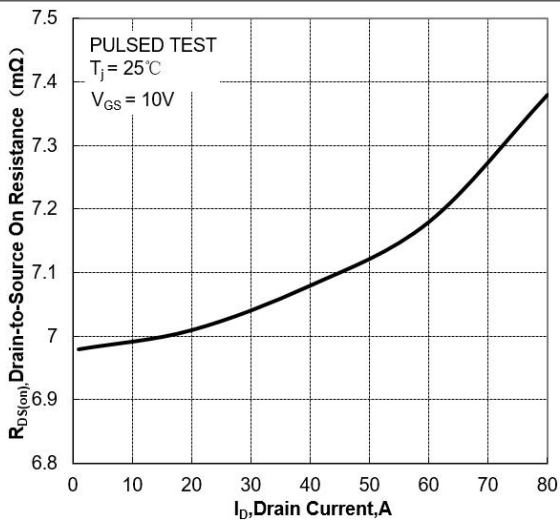


Figure 4 On-Resistance vs. Junction Temperature

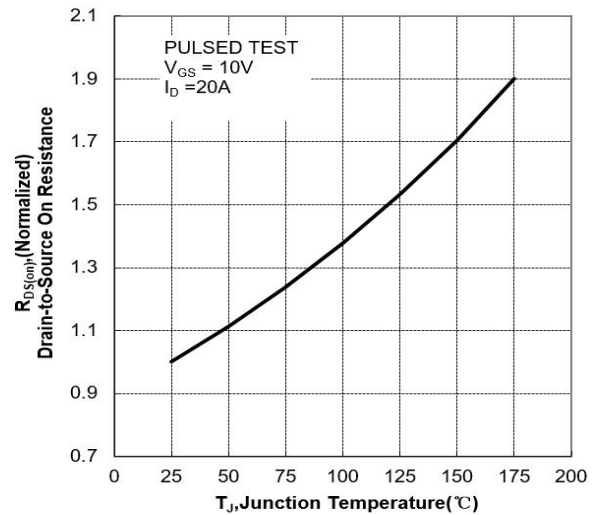


Figure 5 On-Resistance vs. Vgs

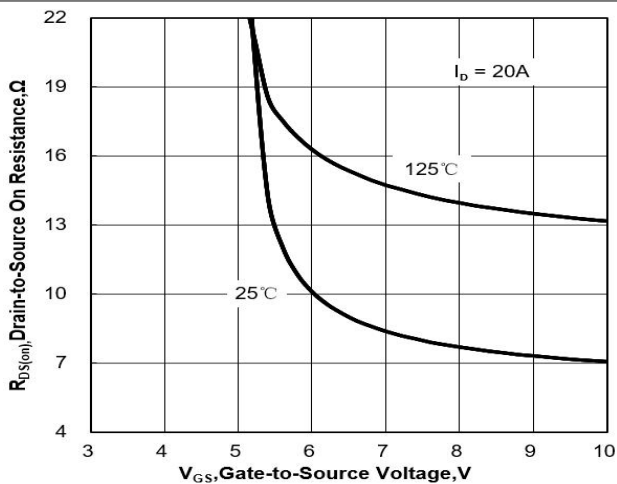


Figure 6 Body Diode Forward Voltage

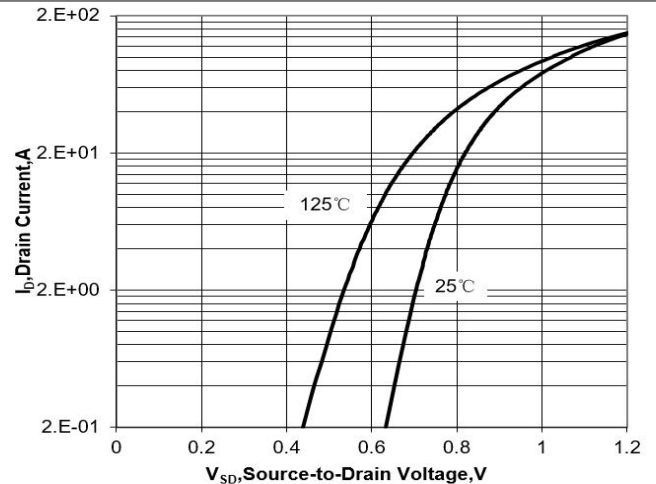


Figure 7 Gate-Charge Characteristics

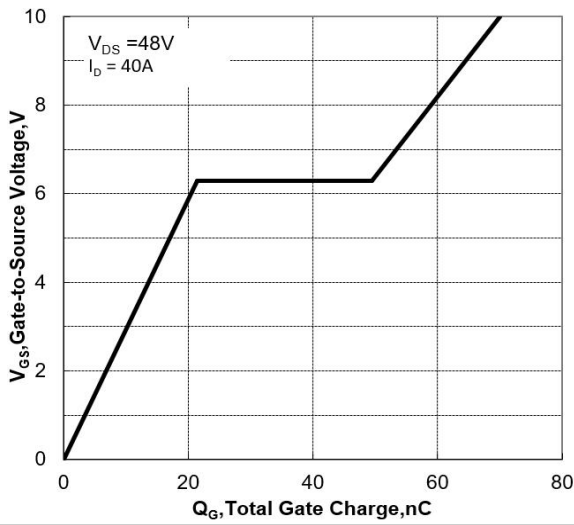


Figure 8 Capacitance Characteristics

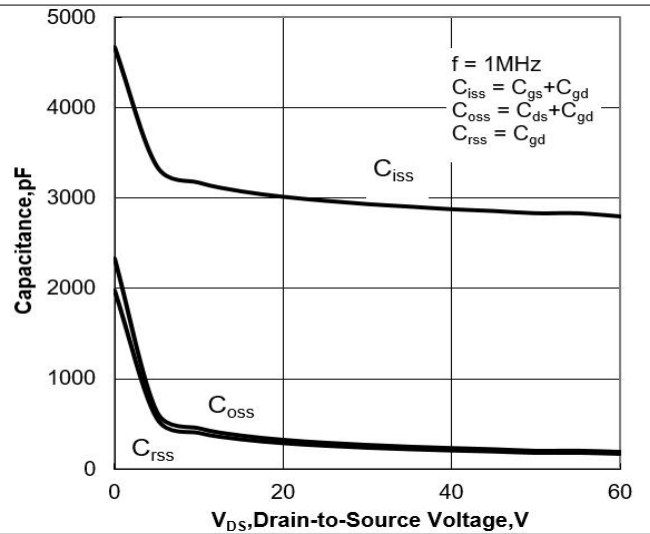


Figure 9 Maximum Forward Biased Safe Operation Area

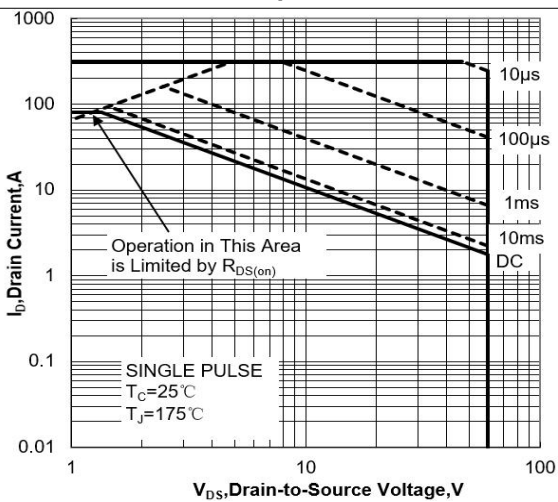


Figure 10 Single Pulse Power Rating Junction-to-Ambient

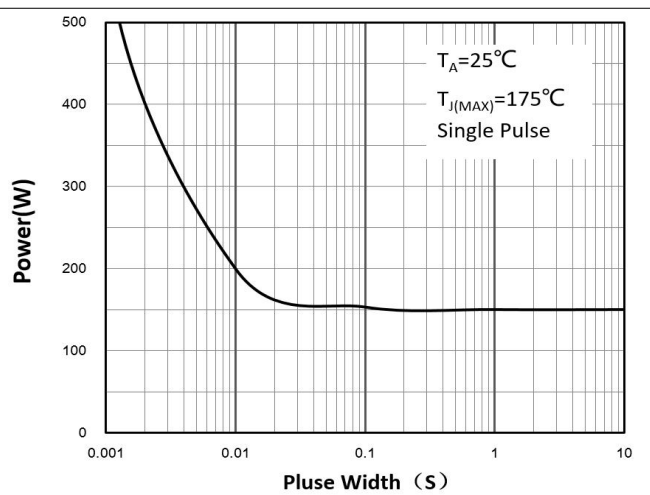
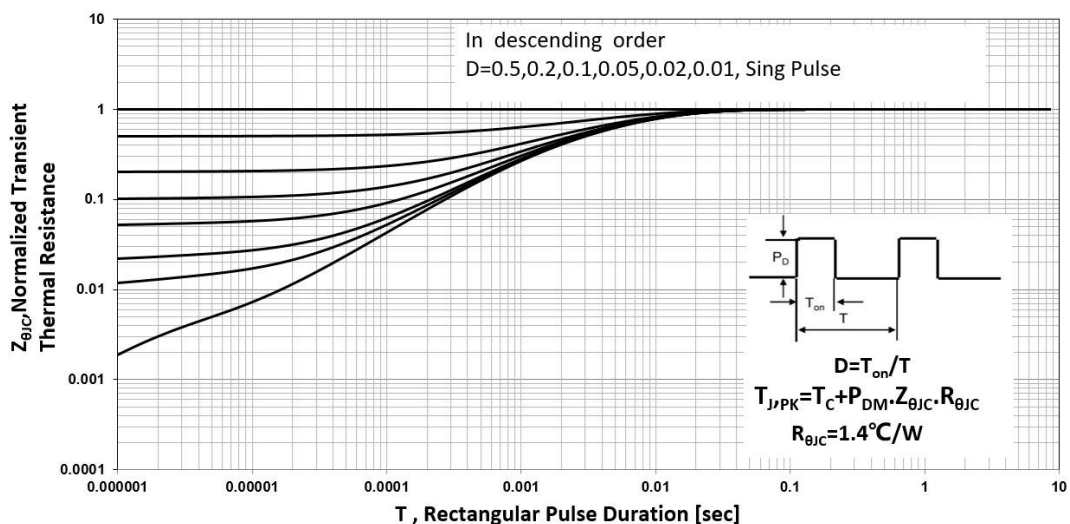
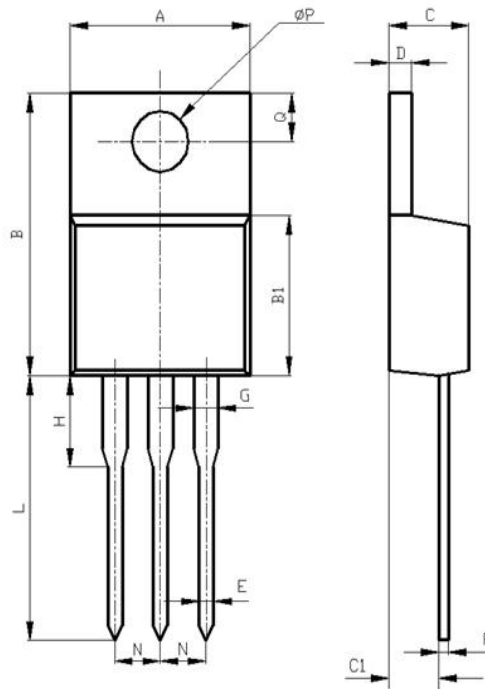


Figure 11 Normalized Maximum Transient Thermal Impedance

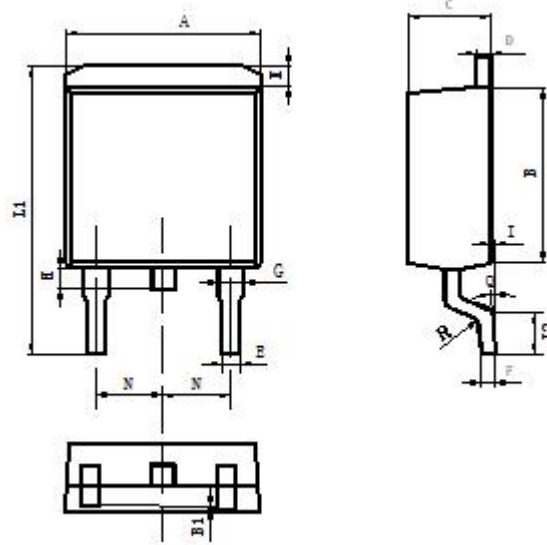


Package Description



Items	Values(mm)	
	MIN	MAX
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
φ P	3.50	3.90

TO-220 Package



Items	Values(mm)	
	MIN	MAX
A	9.80	10.40
B	8.90	9.50
B1	0	0.10
C	4.40	4.80
D	1.16	1.37
E	0.70	0.95
F	0.30	0.60
G	1.07	1.47
H	1.30	1.80
K	0.95	1.37
L1	14.50	16.50
L2	1.60	2.30
I	0	0.2
Q	0°	8°
R	0.4	
N	2.39	2.69

TO-263 Package



**NOTE:**

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shenzhen Minos reserves the right to make changes in this specification sheet and is subject to change without prior notice.

**CONTACT:**

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