

80V N-Channel Power MOSFET

DESCRIPTION

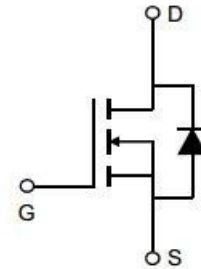
The MPG100N08 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

Feature Description

- ① $V_{DS} = 80V, I_D = 100A$.
 $R_{DS(ON)} = 5.8m\Omega$ (typ.) @ $V_{GS} = 10V$.
 $R_{DS(ON)} = 8.6m\Omega$ (Max.) @ $V_{GS} = 10V$.
- ② Uses CRM(CQ) advanced Trench technology.
- ③ Extremely low on-resistance $R_{DS(on)}$.
- ④ Excellent $Q_g \times R_{DS(on)}$ product(FOM).
- ⑤ Qualified according to JEDEC criteria.

Applications

- ① Motor control and drive.
- ② Battery management.
- ③ UPS (Uninterruptible Power Supplies).
- ④ 100% DVDS Tested.
- ⑤ 100% Avalanche Tested.



Schematic diagram



TO-220

Package Marking And Ordering Information

Ordering Codes	Package	Product Code	Packing
MPG100N08-P	TO-220	MPG100N08P	Tube

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	80	V
I_D	Continuous Drain Current	TC=25°C	100
		TC=100°C	56
$I_{D \text{ pulse}}$	Pulsed Drain Current at (TC=25°C, tp limited by Tjmax)	352	A
E_{AS}	Single Pulse Avalanche Energy (RG=25Ω, L=0.5mH)	169	mJ
V_{GS}	Gate-Source voltage	±25	V
P_{tot}	Power Dissipation (TC=25°C)	117	W
T_j & T_{stg}	Operating junction and Storage Temperature	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Thermal Resistance, Junction-to-Case	-	-	1.07	$^{\circ}\text{C}/\text{W}$
R_{thJA}	Thermal Resistance, Junction-to-Ambient(min. footprint)	-	-	80	

Electrical Characteristics (at $T_j = 25^{\circ}\text{C}$, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-to-Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	80	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.4	3	3.6	V
I_{DSS}	Zero gate voltage drain current	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$	$T_j = 25^{\circ}\text{C}$	-	0.05	μA
			$T_j = 125^{\circ}\text{C}$	-	5	
I_{GSS}	Gate-to-Source Leakage Current	$V_{GS} = 25\text{V}, V_{DS} = 0\text{V}$	-	10	100	nA
$R_{DS(on)}$	Drain-source on-state resistance	$V_{GS} = 10\text{V}, I_D = 40\text{A}$	$T_j = 25^{\circ}\text{C}$	-	5.8	m Ω
			$T_j = 150^{\circ}\text{C}$	-	11.4	
g_{fs}	Transconductance	$V_{DS} = 5\text{V}, I_D = 40\text{A}$	-	41	-	S

Electrical Characteristics (at $T_j = 25^{\circ}\text{C}$, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 40\text{V}, f = 1.0\text{MHz}$	-	6533	-	pF
C_{oss}	Output Capacitance		-	338	-	
C_{rss}	Reverse Transfer Capacitance		-	165	-	
Q_g	Gate Total Charge	$V_{GS} = 10\text{V}, V_{DS} = 40\text{V}, I_D = 40\text{A}, f = 1.0\text{MHz}$	-	119	-	nC
Q_{gs}	Gate -Source Charge		-	42	-	
Q_{gd}	Gate Drain Charge		-	33	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 40\text{V}, V_{GS} = 10\text{V}, R_G = 2.7\Omega$	-	23	-	ns
t_r	Rise Time		-	84	-	
$t_{d(off)}$	Turn-off Delay Time		-	48	-	
t_f	Fall Time		-	64	-	
R_G	Gate resistance	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1.0\text{MHz}$	-	0.8	-	Ω
V_{SD}	Body Diode Forward Voltage	$I_{SD} = 40\text{A}, V_{GS} = 0\text{V}$	-	0.9	1.4	V
t_{rr}	Body Diode Reverse Recovery Time	$I_f = 40\text{A}, di/dt = 100\text{A}/\mu\text{s}$	-	38	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	63	-	nC

Typical Operating Characteristics

Fig 1: Output Characteristics

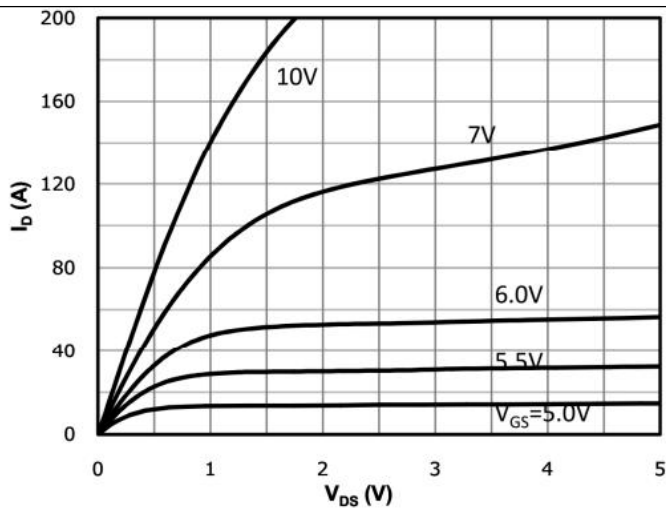


Fig 2: Transfer Characteristics

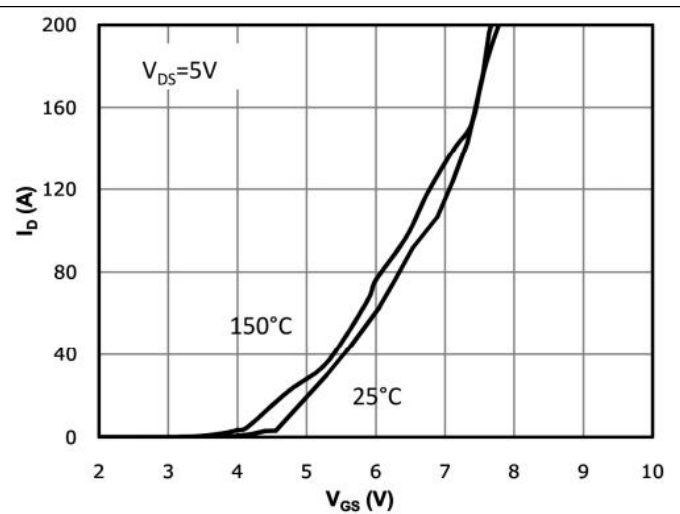


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

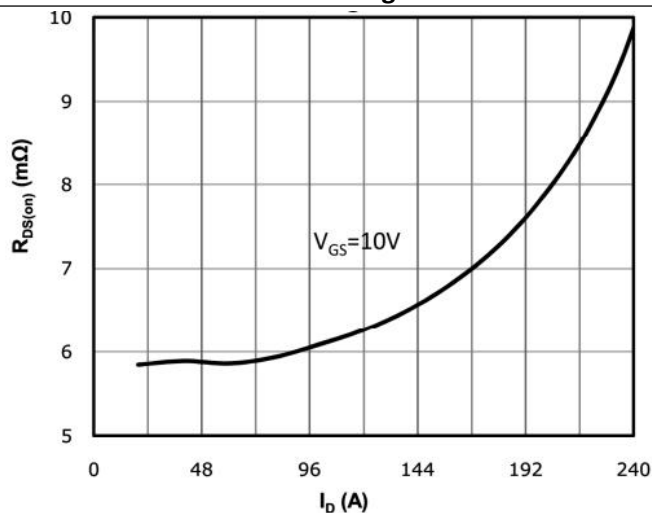


Fig 4: $R_{DS(on)}$ vs Gate Voltage

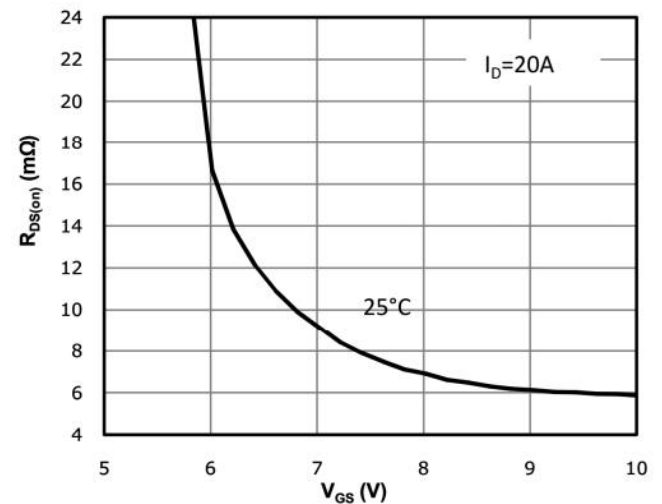


Fig 5: $R_{DS(on)}$ vs Temperature

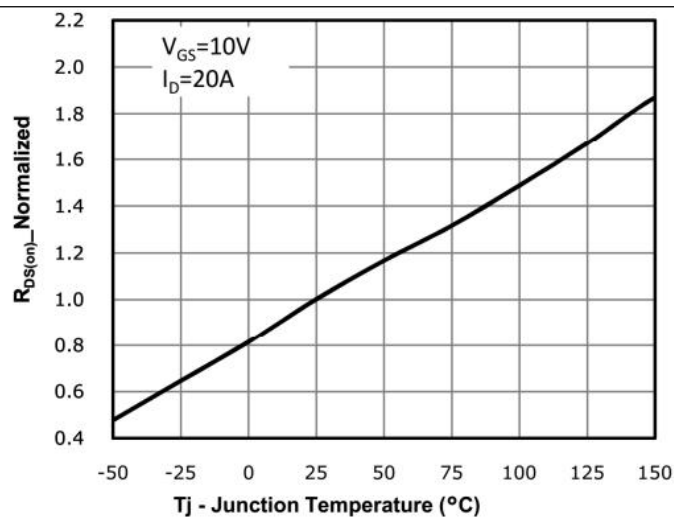
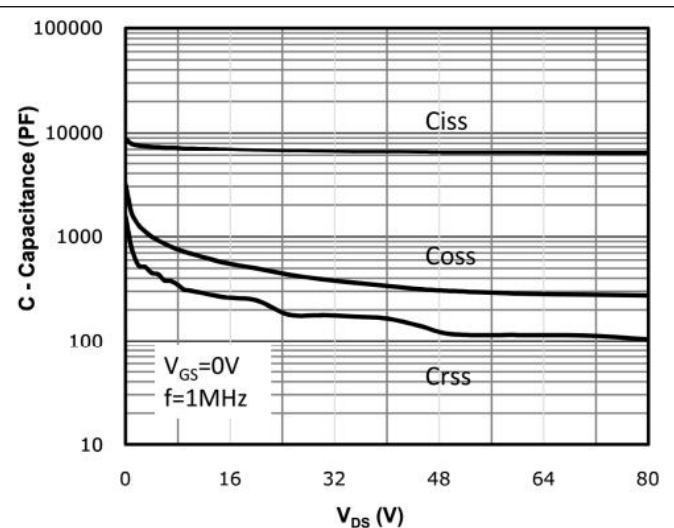


Fig 6: Capacitance Characteristics



Typical Operating Characteristics

Fig 7: Gate Charge Characteristics

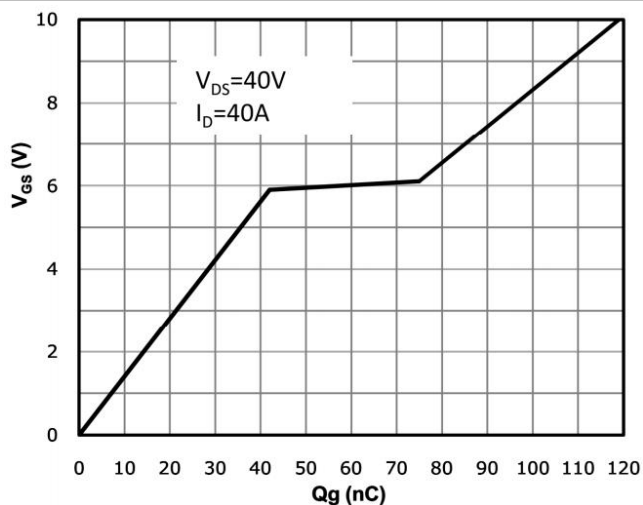


Fig 8: Body-diode Forward Characteristics

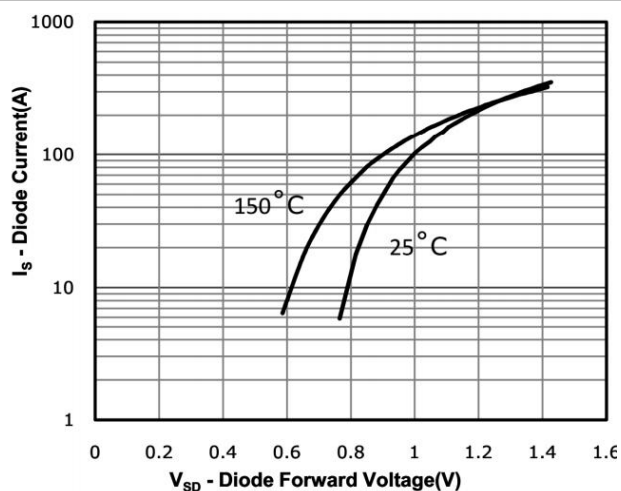


Fig 9: Power Dissipation

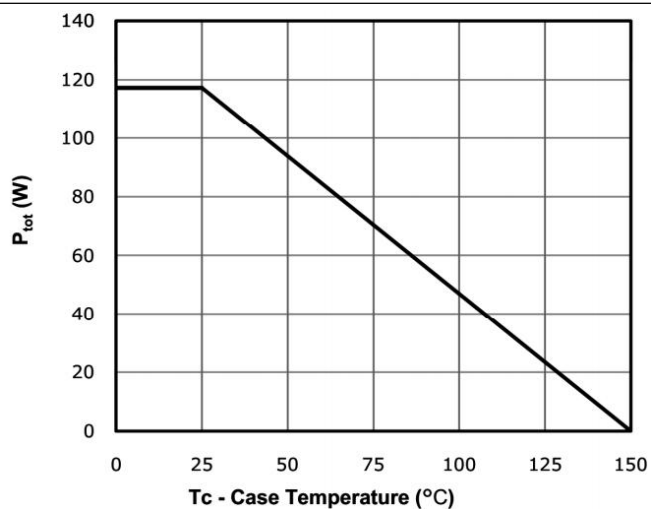


Fig 10: Drain Current Derating

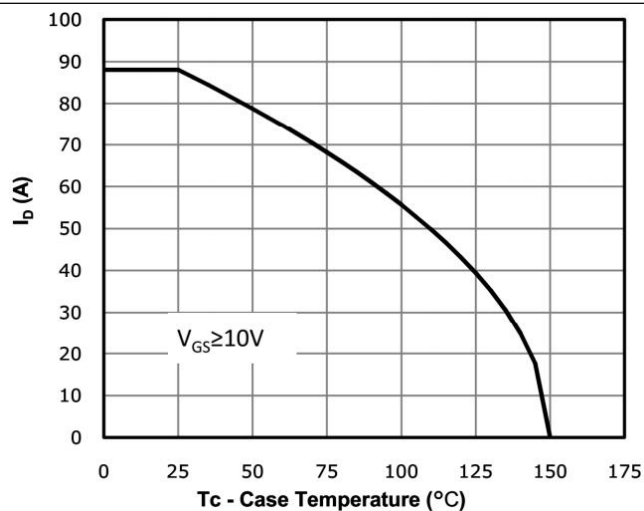
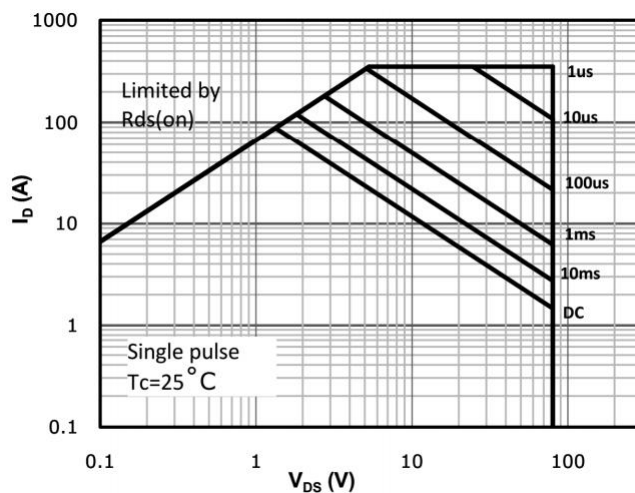
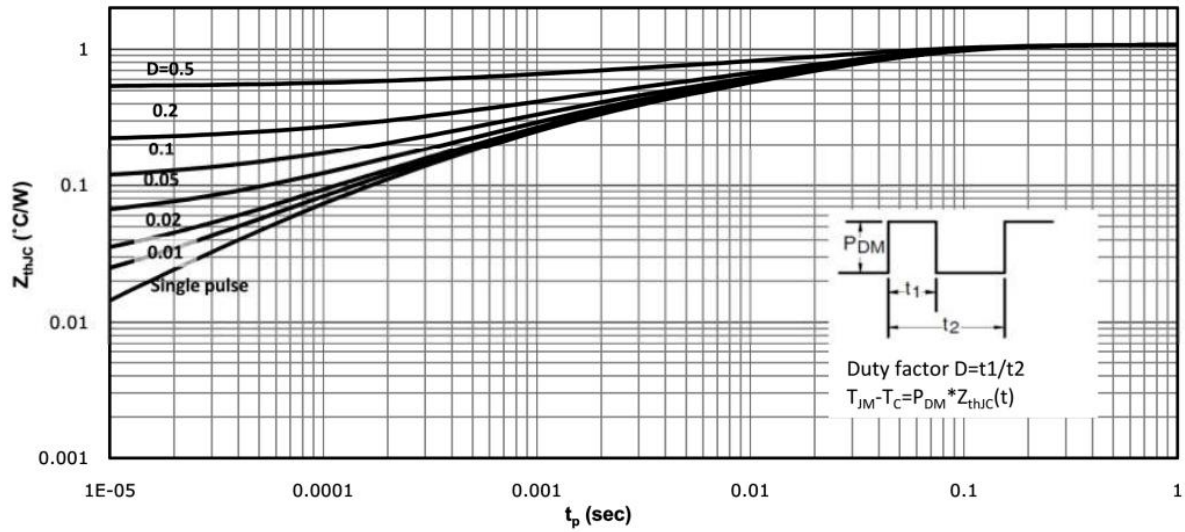


Fig 11: Safe Operating Area



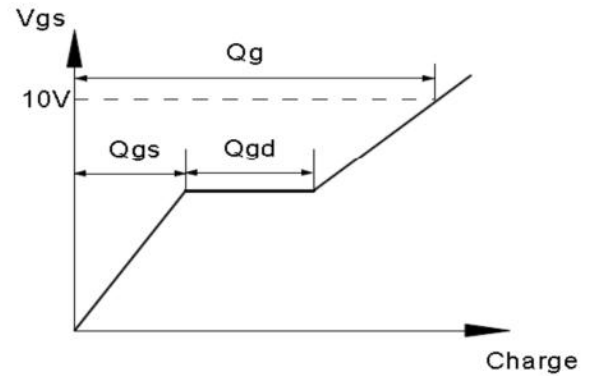
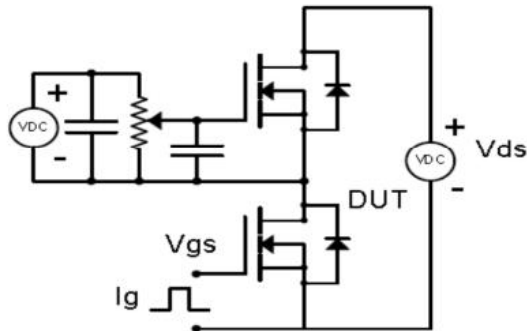
Typical Operating Characteristics

Fig 12: Max.Transient Thermal Impedance

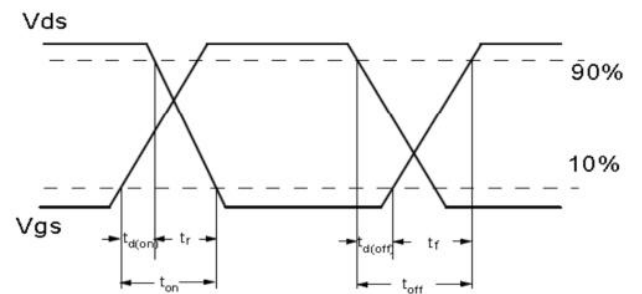
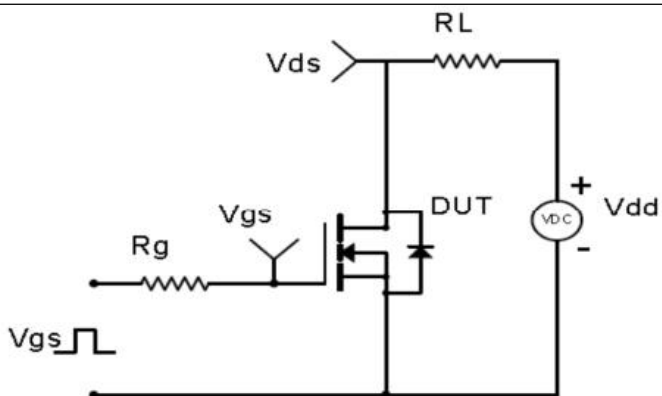


Test Circuit and Waveform

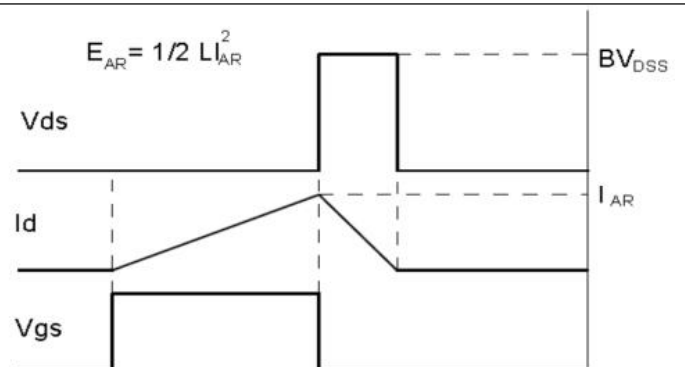
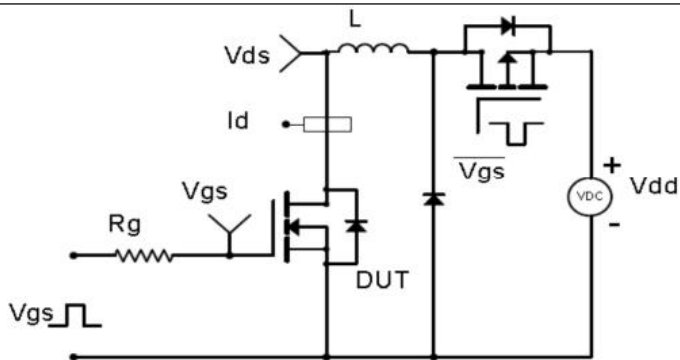
Gate Charge Test Circuit & Waveform



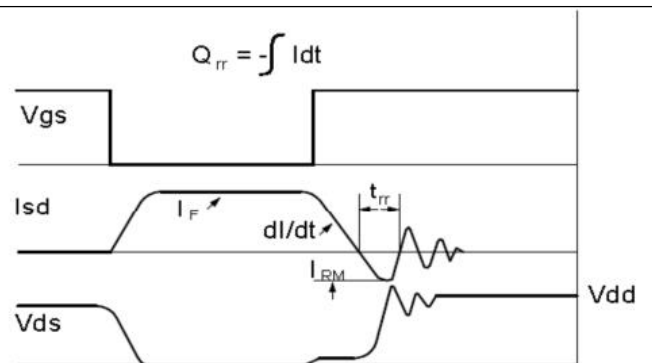
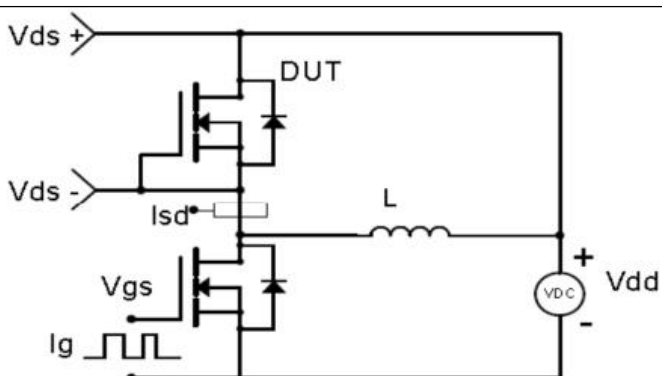
Resistive Switching Test Circuit & Waveforms



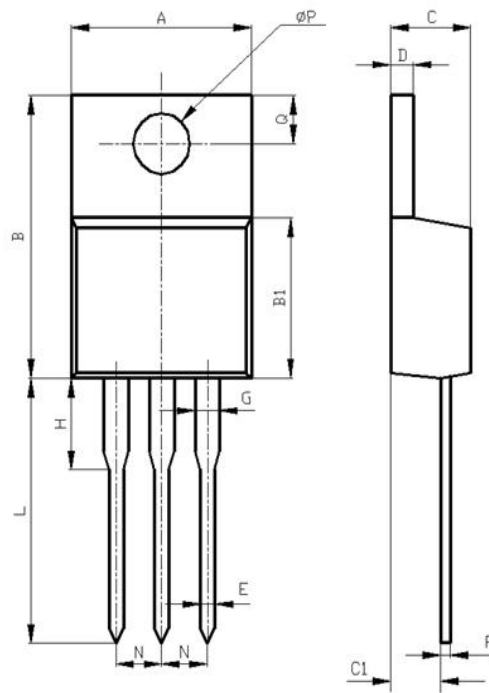
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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



迈诺斯科技

MPG100N08

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.

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