

## Silicon N-Channel Power MOSFET

### Description

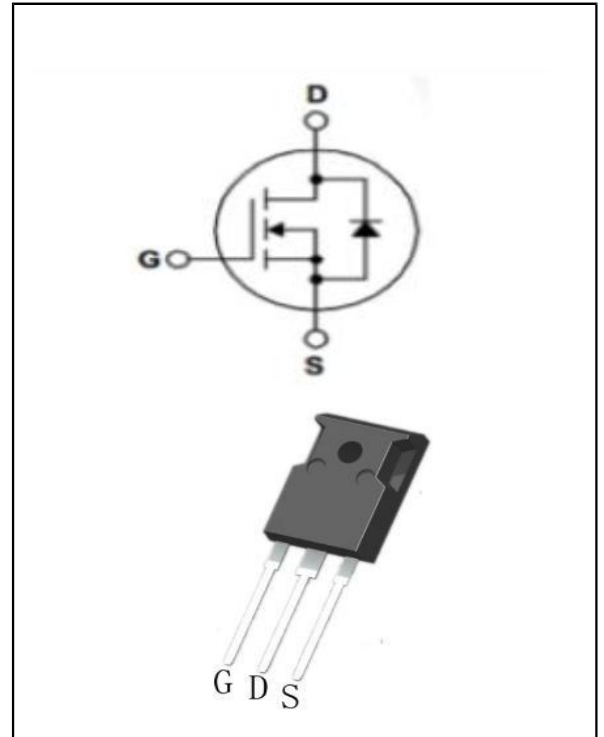
The MD200N08 uses advanced technology and design to provide excellent  $R_{DS(ON)}$ . It can be used in a wide variety of applications.

### General Features

- ①  $V_{DS} = 80V, I_D = 200A, R_{DS(ON)} < 4m\Omega @ V_{GS}=10V$
- ② High density cell design for lower  $R_{dson}$
- ③ Fully characterized avalanche voltage and current
- ④ Good stability and uniformity with high EAS
- ⑤ Excellent package for good heat dissipation

### Application

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



### Package Marking And Ordering Information:

Ordering Codes	Package	Product Code	Packing
MD200N08	TO-247	MD200N08	Tube

### Absolute Maximum Ratings @ $T_a=25^\circ C$ (unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	80	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	200	A
Drain Current-Pulsed <sup>(Note 1)</sup>	$I_{DM}$	800	A
Maximum Power Dissipation( $T_c=25^\circ C$ )	$P_D$	270	W
Single pulse avalanche energy <sup>(Note 2)</sup>	$E_{AS}$	1600	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 175	$^\circ C$

### Thermal Characteristic

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.41	$^\circ C/W$
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**Electrical Characteristics (TA=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	80	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
Drain-Source On-State Resistance <sup>(Note 3)</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	-	3.5	4	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =15A	-	17	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	13200	-	pF
Output Capacitance	C <sub>oss</sub>		-	-950	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	810	-	pF
<b>Switching Characteristics</b> <sup>(Note 4)</sup>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =40V, I <sub>D</sub> =40A, V <sub>GS</sub> =10V, R <sub>GEN</sub> =3Ω	-	26	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	20	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	50	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	18	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =64V, I <sub>D</sub> =80A V <sub>GS</sub> =10V	-	257	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	76	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	80	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =80A	-	-	1.2	V

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. E<sub>AS</sub> condition : T<sub>j</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=1Ω
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Characteristics Curves

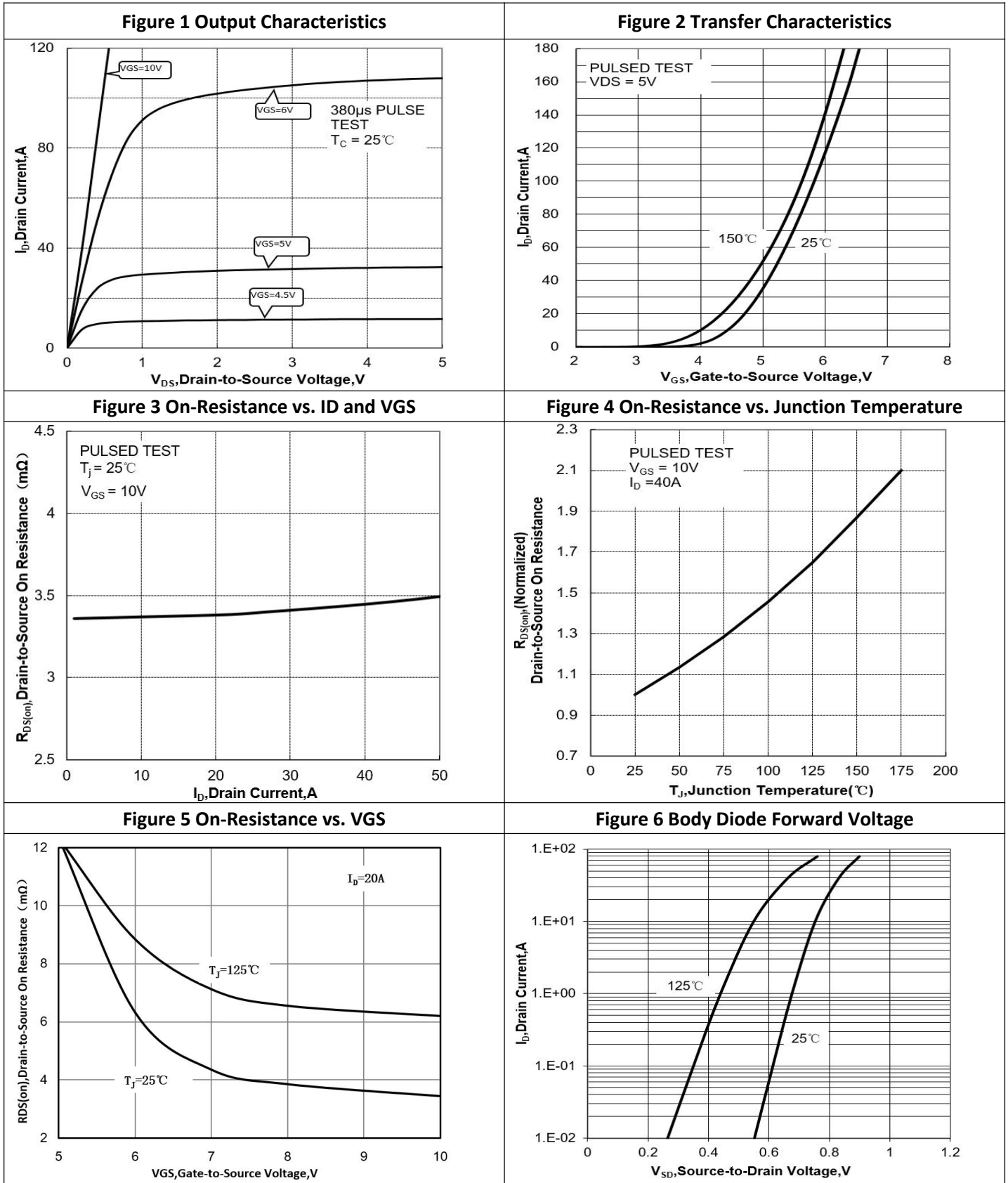


Figure 7 Gate-Charge Characteristics

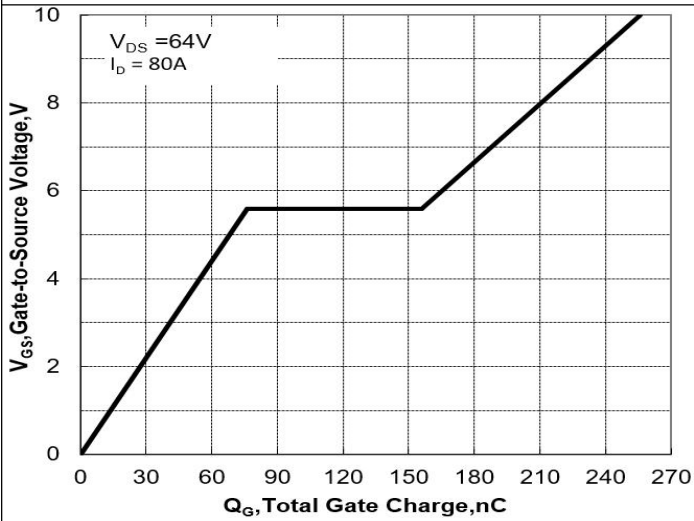


Figure 8 Capacitance Characteristics

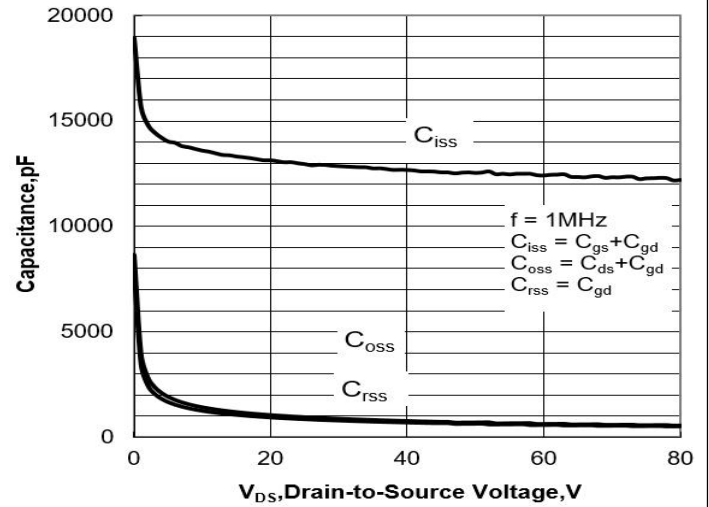


Figure 9 Maximum Forward Biased Safe Operation Area

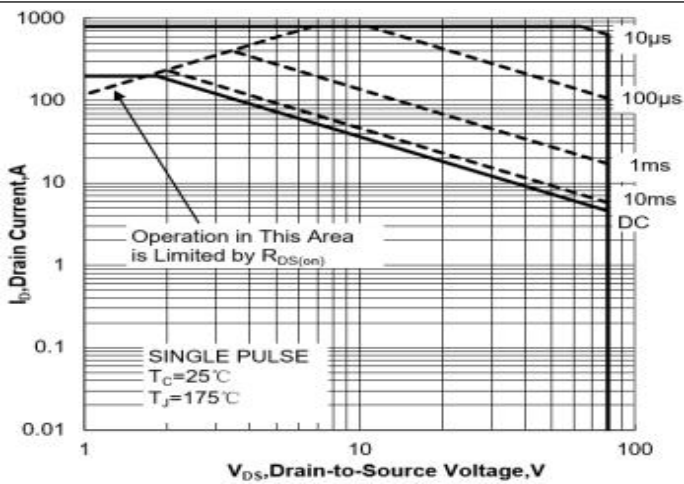


Figure 10 Single Pulse Power Rating Junction-to-Ambient

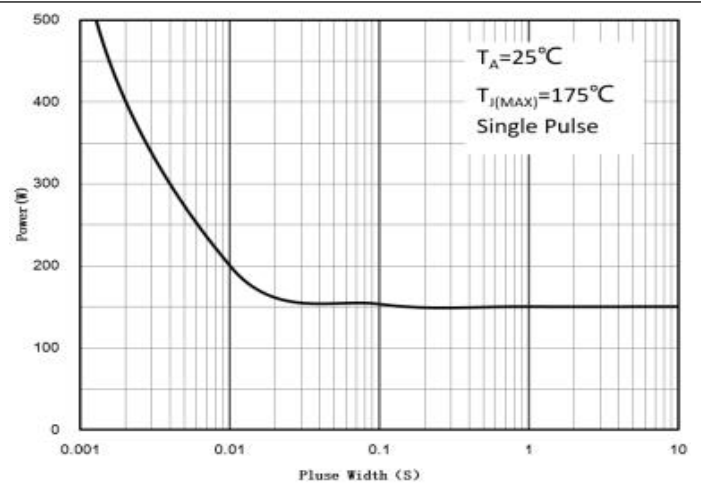
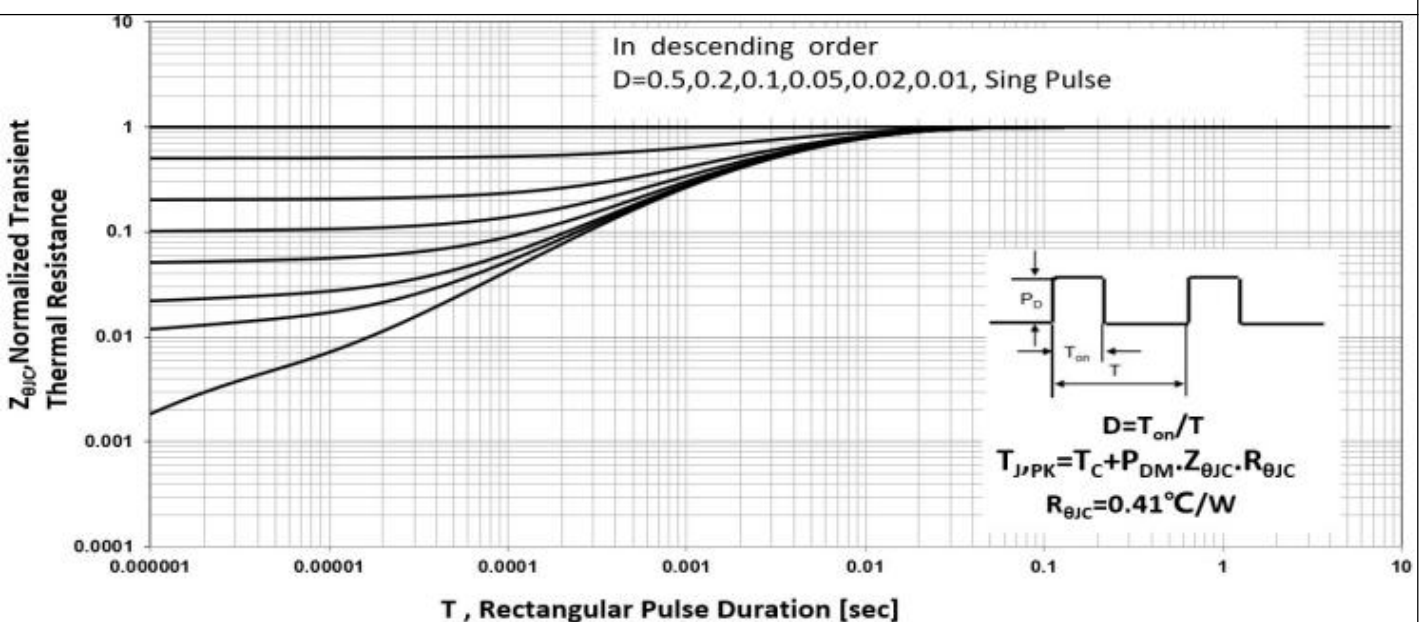
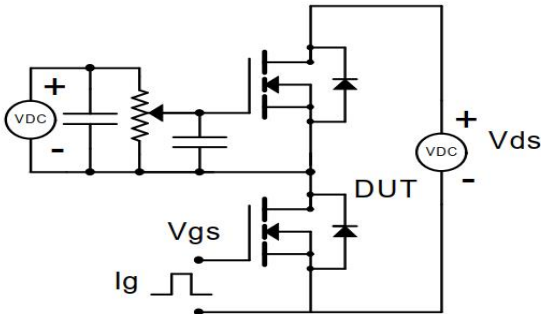
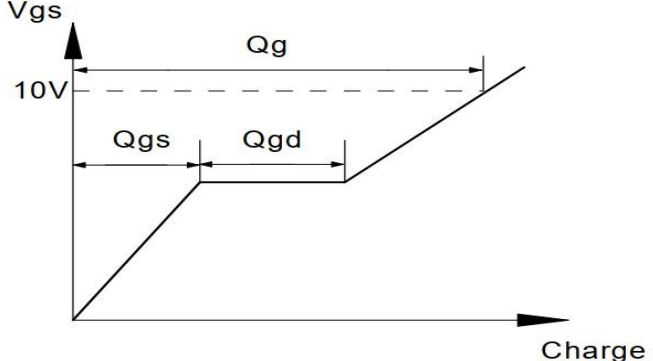
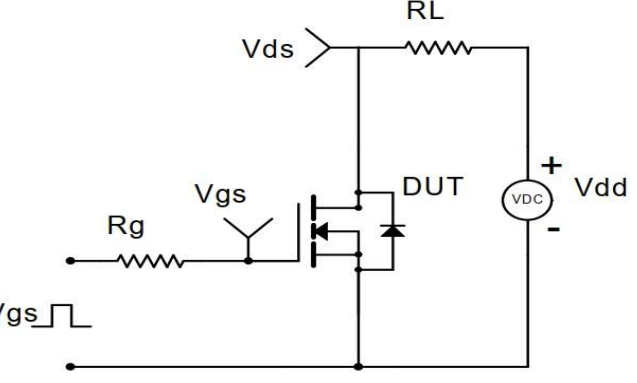
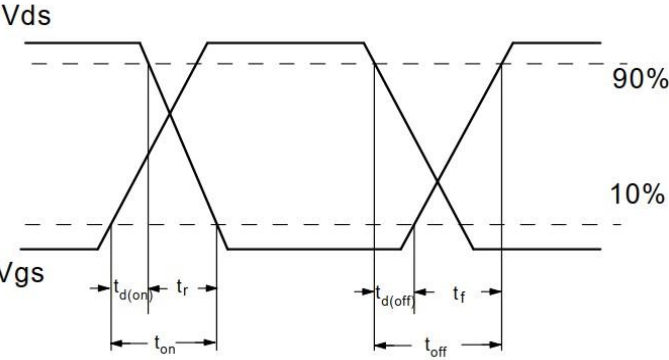
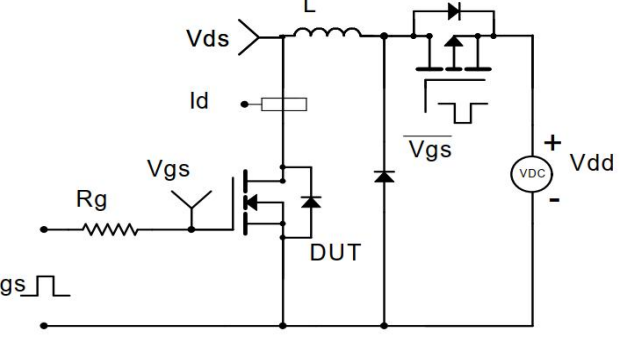
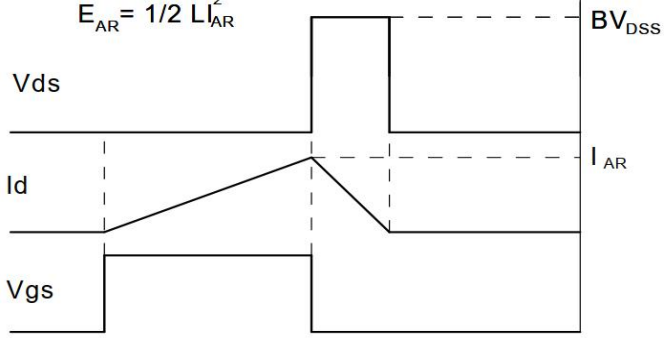
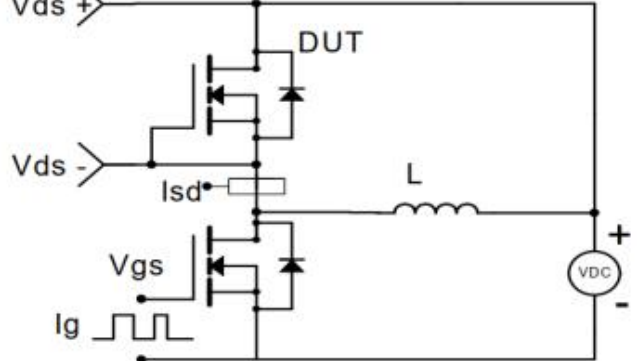
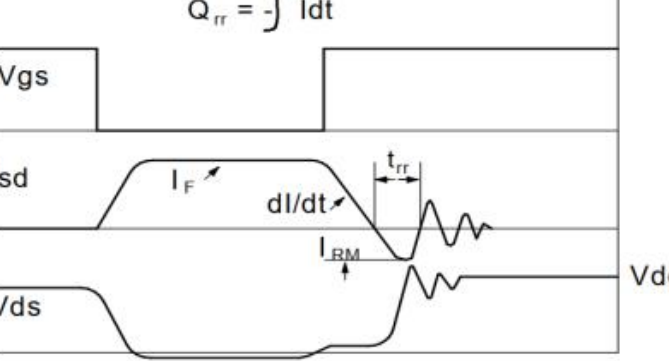


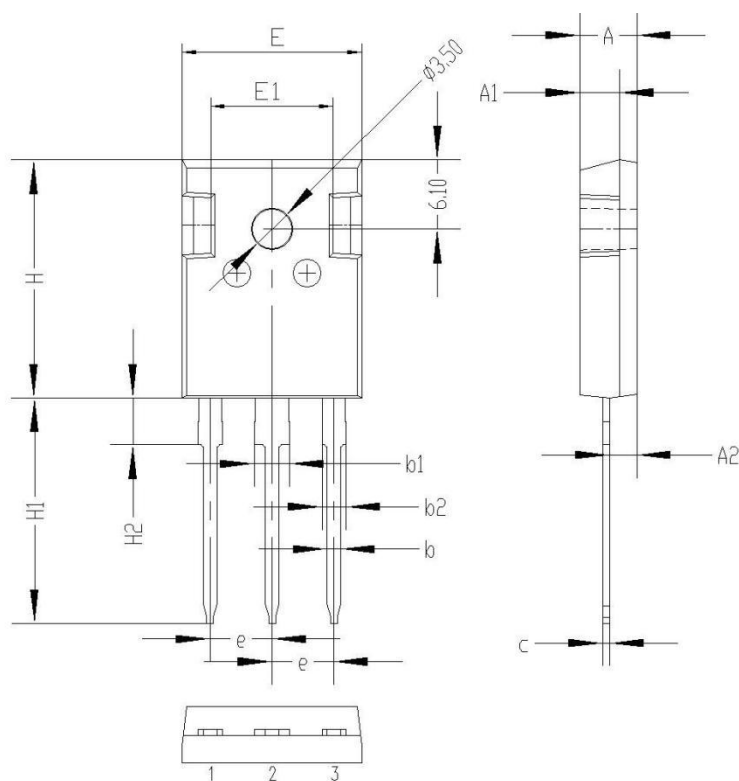
Figure 11 Normalized Maximum Transient Thermal Impedance



**Test Circuit and Waveform**

Gate Charge Test Circuit	Gate Charge Test Waveform
	
Resistive Switching Test Circuit	Resistive Switching Test Waveforms
	
Unclamped Inductive Switching (UIS) Test Circuit	Unclamped Inductive Switching (UIS) Test Waveforms
	
Diode Recovery Test Circuit	Diode Recovery Test Waveforms
	

Package Description



Symbol	Unit mm		
	Min	Typ	Max
A	4.8	5.00	5.20
A1	3.3	3.5	3.7
A2	2.20	2.40	2.60
b	1.00	1.2	1.40
b1	2.90	3.10	3.30
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
e	5.25	5.45	5.65
E	15.2	15.7	16.2
H	20.8	21	21.2
H1	19.5	20.0	20.5
H2	3.9	4.1	4.3
G	5.9	6.1	6.3
$\Phi P$	3.30	3.50	3.70



**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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