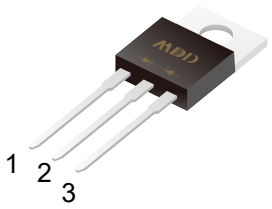
MDD80N07P

70V N-Channel Enhancement Mode MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$Max	I_D Max
70V	9mΩ@10V	80A

TO-220-3L



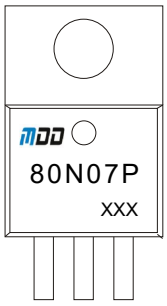
General Features

- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate Charge
- Lead free product is acquired

Application

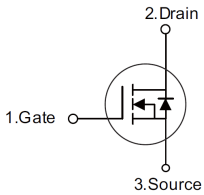
- Load Switch
- PWM Application
- Power management

Marking



XXX: Date Code

Equivalent Circuit



Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	70	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	80	A
Pulsed Drain Current (Note1)	I_{DM}	320	A
Avalanche Energy Single Pulsed (Note 2)	E_{AS}	121	mJ
Power Dissipation	P_D	116	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.85	℃/W
Storage and Storage Temperature Rangerature	T_J, T_{stg}	-50 ~+175	℃

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25℃, V_{DD}=35V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=22A

Ta = 25℃ unless otherwise specified

Symbol	Parameter		Condition	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		V_{GS}=0V, I_D=250μA	70	--	--	V
I_{GSS}	Gate-Source Leakage Current	Forward	V_{GS}=20V, V_{DS}=0V	--	--	100	nA
		Reverse	V_{GS}=-20V, V_{DS}=0V	--	--	-100	nA
I_{DSS}	Drain-Source Leakage Current		V_{DS}=70V, V_{GS}=0V	--	--	10	uA
$V_{GS(TH)}$	Gate Threshold Voltage		V_{DS}=V_{GS}, I_D=250μA	2	--	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance(note3)		V_{GS}=10V, I_D=30A	--	7.5	9	mΩ

Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	V_{DS}=25V V_{GS}=0V f=1MHz	--	4062	--	pF
C_{oss}	Output Capacitance		--	261	--	pF
C_{rss}	Reverse Transfer Capacitance		--	231	--	pF
Q_g	Total Gate Charge	V_{DS}=30V, V_{GS}=10V, I_D=20A	--	35	--	nC
Q_{gs}	Gate Source Charge		--	11	--	nC
Q_{gd}	Gate Drain Charge		--	9	--	nC

Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$t_{d(on)}$	Turn on Delay Time	V_{DS}=30V, V_{GS} =10V, I_D=20A, R_G=6Ω	--	15	--	ns
t_r	Turn on Rise Time		--	94	--	ns
$t_{d(off)}$	Turn Off Delay Time		--	46	--	ns
t_f	Turn Off Fall Time		--	32	--	ns

Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
I_{SD}	Source drain current(Body Diode)		--	--	80	A
I_{SM}	Pulsed Current		--	--	320	A
V_{SD}	Drain-Source Diode Forward Voltage	I_S=30A, V_{GS}=0V	--	--	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_S=20A, V_{GS}=0V, dIs/dt=100A/μs	--	78	--	ns
Q_{rr}	Body Diode Reverse Recovery Charge		--	51	--	nC

Notes: Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

■ TEST CIRCUITS AND WAVEFORMS

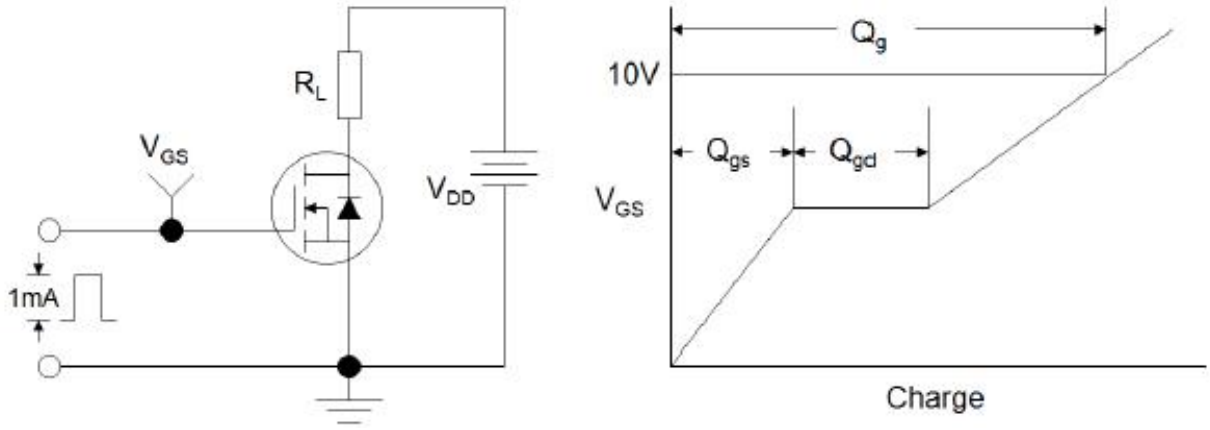


Figure1:Gate Charge Test Circuit & Waveform

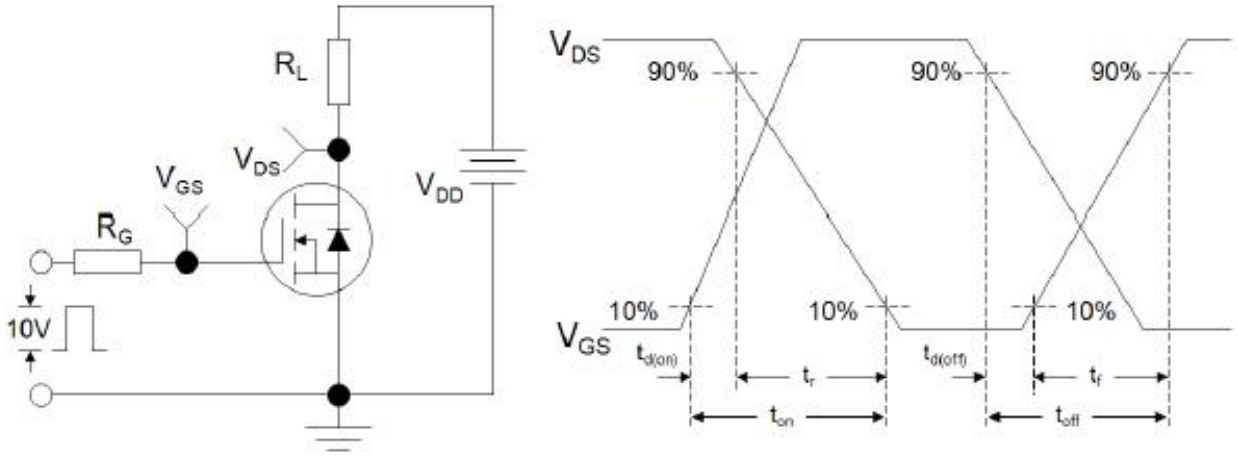


Figure 2: Resistive Switching Test Circuit & Waveforms

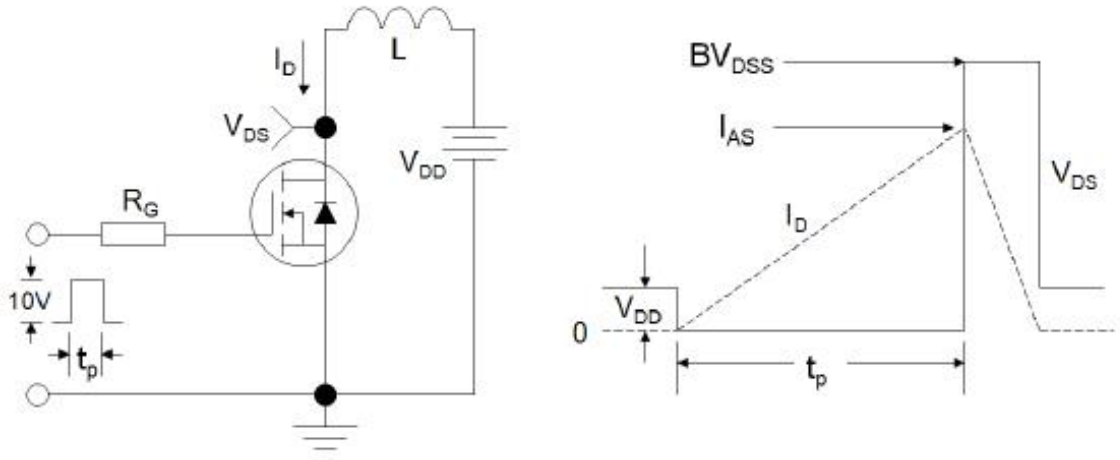


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

The curve above is for reference only.

■ TYPICAL CHARACTERISTICS

Figure1: Output Characteristics

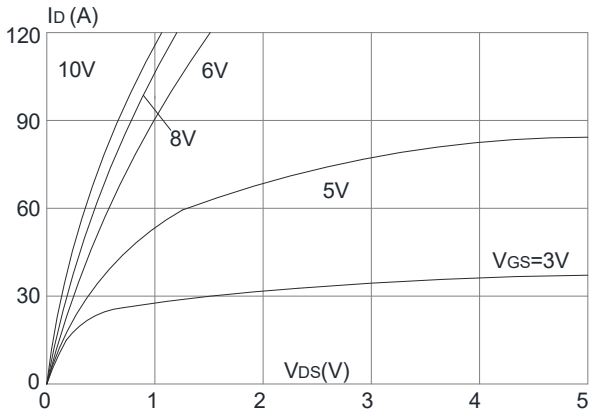


Figure 2: Typical Transfer Characteristics

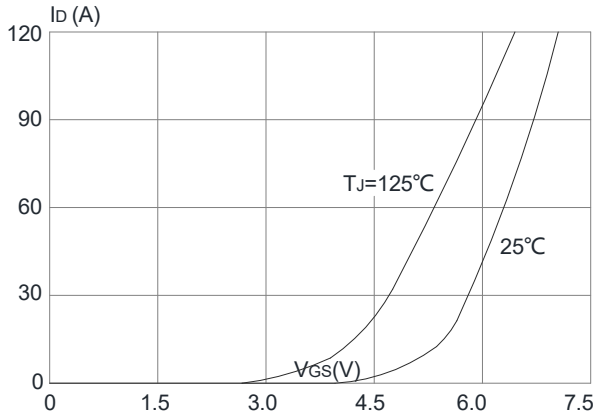


Figure 3: On-resistance vs. Drain Current

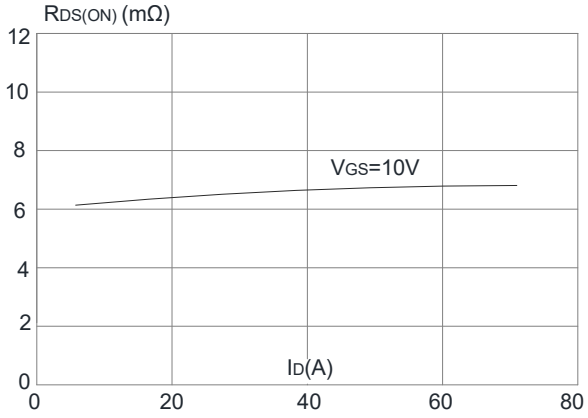


Figure 4: Body Diode Characteristics

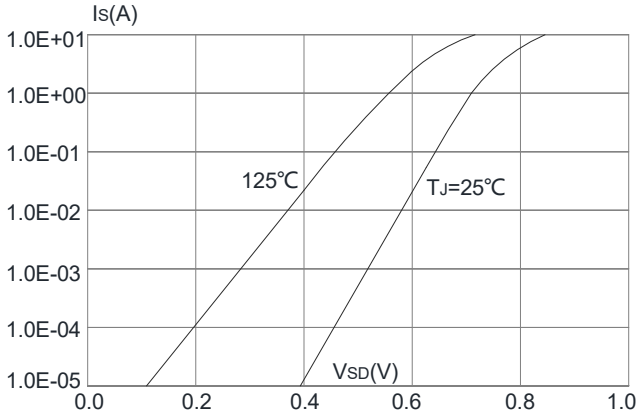


Figure 5: Gate Charge Characteristics

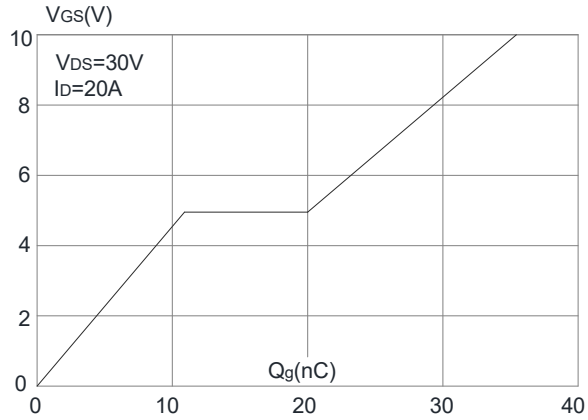


Figure 6: Capacitance Characteristics

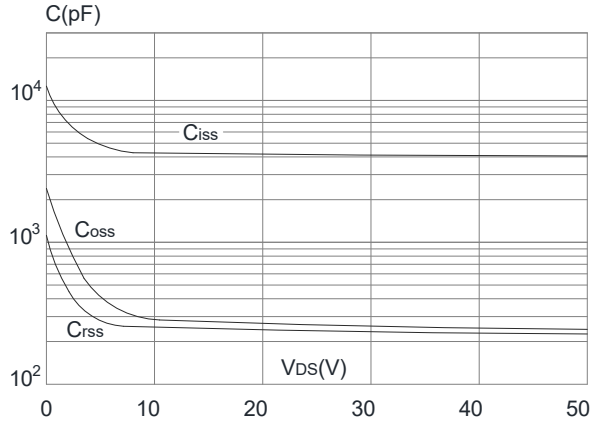


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

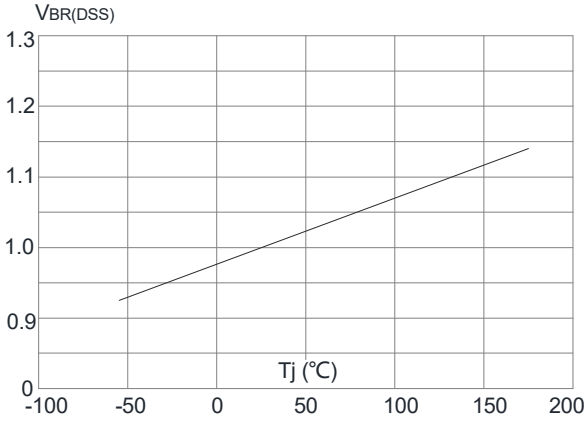


Figure 8: Normalized on Resistance vs. Junction Temperature

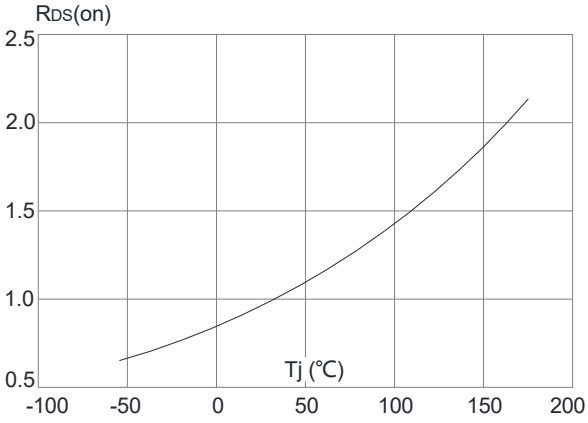


Figure 9: Maximum Safe Operating Area

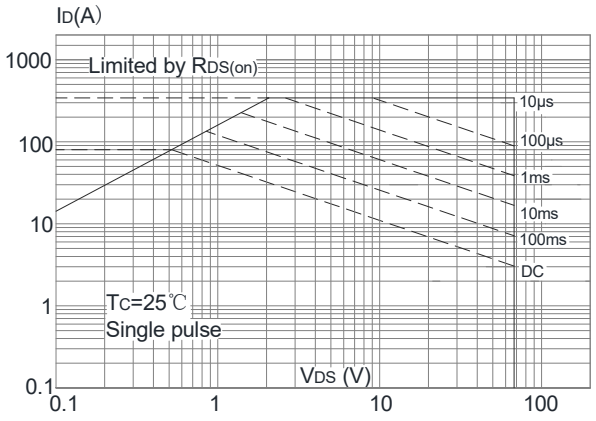


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

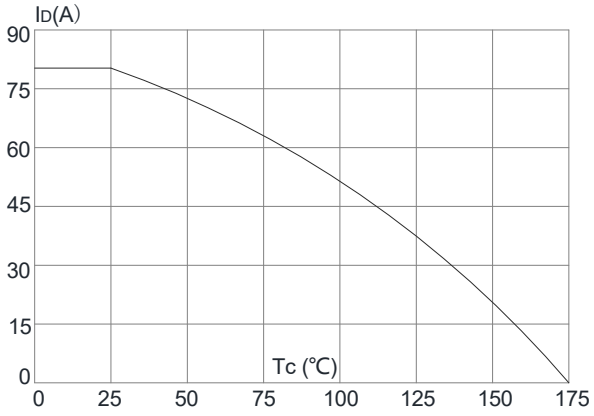
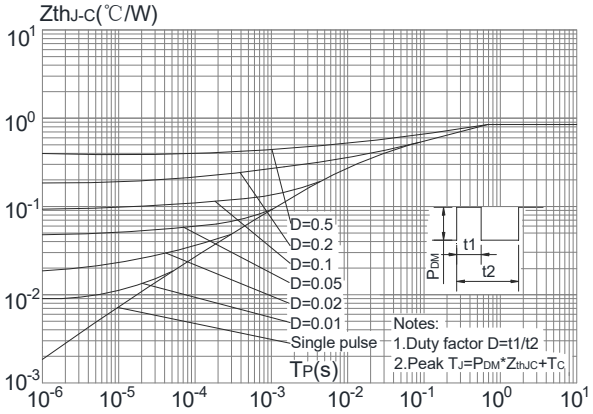
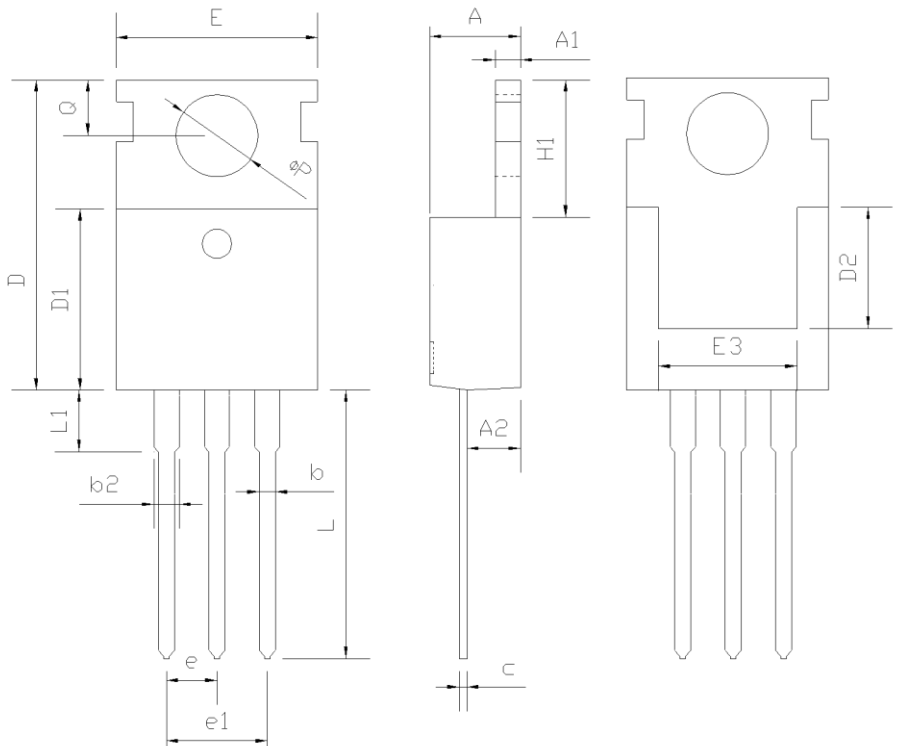


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



The curve above is for reference only.

Mechanical Dimensions for TO-220-3L



SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.45	0.50	0.60
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
ΦP	3.40	3.60	3.80
Q	2.60	2.80	3.00