RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RMP7N80TI
RMP7N80T2

N-CHANNEL ENHANCEMENT MODE MOSFET

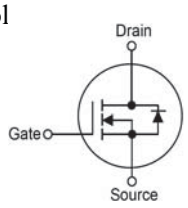
General Description

RMP7N80 is an N-channel enhancement mode MOSFET,which uses the self-aligned planar process and improved terminal technology,reducing the conduction loss, enhancing the avalanche energy.

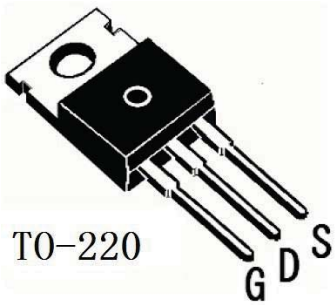
MAIN CHARACTERISTICS

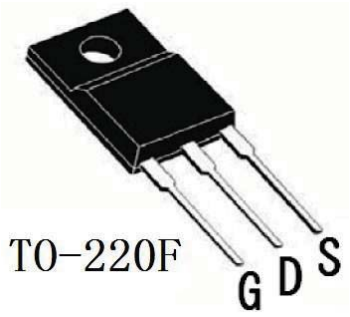
V_{DSS}	800	V
I_D	7.0	A
$R_{DS(ON)}$	2.0	Ω
Crss	12	pF

Symbol



Package





FEATURES

- Low Crss
- Low gate charge
- Fast switching
- Improved ESD capability
- Improved dv/dt capability
- 100% avalanche energy test

APPLICATIONS

- High efficiency swith mode power supplies
- Electronic lamp ballasts
- UPS

Package Marking And Ordering Information

Device	Device Package	Marking
RMP7N80TI	TO-220F	7N80
RMP7N80T2	TO-220	7N80

2016-11
REV:O27

ABSOLUTE MAXIMUM RATINGS (Tc =25℃)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V_{DSS}		800	V
Continues Drain Current	I_D	Tc=25℃	7*	A
		Tc=100℃	4.0*	
Plused Drain Current (note 1)	I_{DM}		28	A
Gate-to-Source Voltage	V_{GS}		±30	V
Single Pulsed Avalanche Energy (note2)	E_{AS}		418	mJ
Avalanche Current (note 1)	I_{AR}		7.0	A
Repetitive Avalanche Energy (note 1)	E_{AR}		18	mJ
Peak Diode Recovery (note 3)	dv/dt		4.5	V/ns
Power Dissipation	P_D Tc=25℃	TO-220	140	W
		TO-220F	49	
Power Dissipation Derating Factor	$P_{D(DF)}$ Above 25℃	TO-220	1.12	W/℃
		TO-220F	0.39	
Operating and Storage Temperature Range	T_J，T_{STG}		150，-55～+150	℃
Maximum Temperature for Soldering	T_L		300	℃

THERMAL CHARACTERIASTIC

Parameter	Symbol		Max	Unit
Thermal Resistance，Junction to Case	Rth(j-c)	TO-220	0.89	℃/W
		TO-220F	2.55	
Thermal Resistance，Junction to Ambient	Rth(j-A)	TO-220	62.5	℃/W
		TO-220F	62.5	

＊ Drain current limited by maximum junction temperature

Off-Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	800	-	-	V
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA, referenced to 25℃	-	0.7	-	V/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=800V,V_{GS}=0V, T_C=25℃	-	-	10	μA
		V_{DS}=640V, T_C=125℃	-	-	100	
Gate-body leakage current, forward	I_{GSSF}	V_{DS}=0V, V_{GS} =30V	-	-	100	nA
Gate-body leakage current, reverse	I_{GSSR}	V_{DS}=0V, V_{GS} = -30V	-	-	-100	nA

On-Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D=250μA	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=3.5A	-	1.6	2.0	Ω
Forward Transconductance	g_{fs}	V_{DS} = 40V, I_D=3.5A (note4)	-	5.0	-	S

Dynamic Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS} =0V, f=1.0MHZ	-	1300	1690	pF
Output capacitance	C_{oss}		-	125	160	pF
Reverse transfer capacitance	C_{rss}		-	12	15	pF

Switching Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Turn-On delay time	$t_{d(on)}$	V_{DD}=400V, I_D=7A, R_G=25Ω (note 4，5)	-	35	80	ns
Turn-On rise time	t_r		-	100	210	ns
Turn-Off delay tim e	$t_{d(off)}$		-	50	110	ns
Turn-Off Fall time	t_f		-	60	130	ns
Total Gate Charge	Qg	V_{DS}=640V , I_D=7A, V_{GS}=10V (note 4，5)	-	27	35	nC
Gate-Source charge	Qgs		-	8.2	-	nC
Gate-Drain charge	Qgd		-	11	-	nC

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	28	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=7A	-	-	1.4	V
Reverse recovery time	t_{rr}	V_{GS}=0V, I_S=7A dI_F/dt=100A/μs (note 4)	-	650	-	ns
Reverse recovery charge	Q_{rr}		-	7.0	-	μC

Notes:

1：Pulse width limited by maximum junction temperature

2：L=16mH, I_{AS}=7A, V_{DD}=50V, R_G=25Ω, Starting T_J =25℃

3：I_{SD} ≤7A, di/dt ≤300A/μs, V_{DD}≤BV_{DSS}, Starting T_J =25℃

4：Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

5：Essentially independent of operating temperature

RATING AND CHARACTERISTICS CURVES (RMP7N80TI/T2)

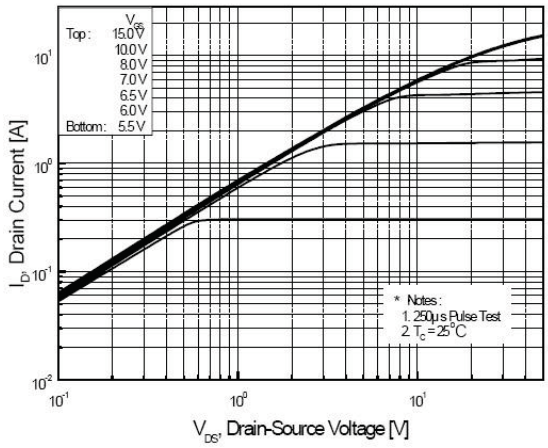


Fig. 1 On-State Characteristics

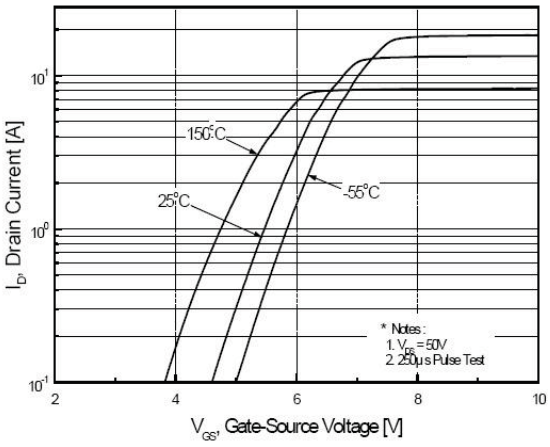


Fig. 2 Transfer Characteristics

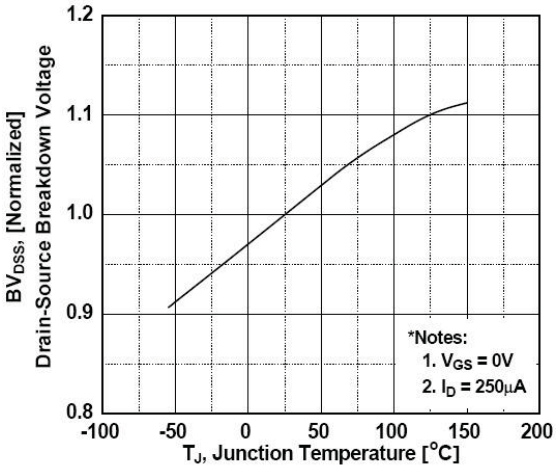


Fig. 3 Breakdown Voltage Variation vs Temperature

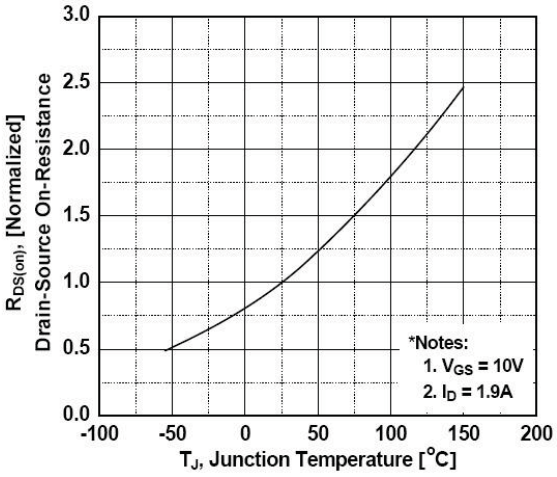


Fig. 4 On-Resistance Variation vs Temperature

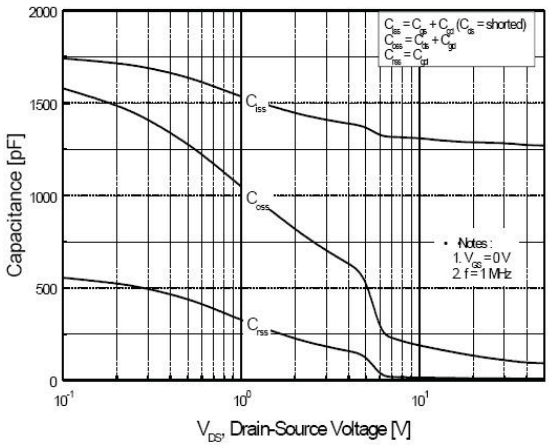


Fig. 5 Capacitance Characteristics

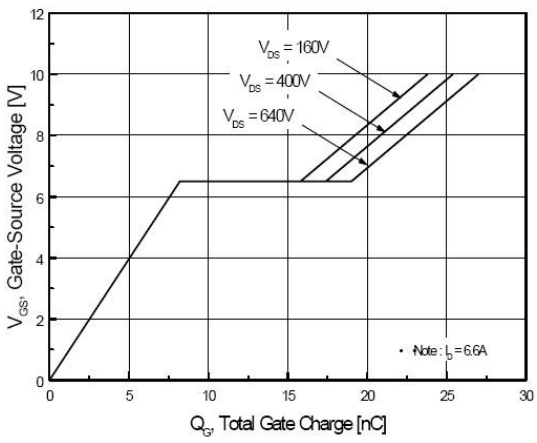


Fig. 6 Gate Charge Characteristics

RATING AND CHARACTERISTICS CURVES (RMP7N80TI/T2)

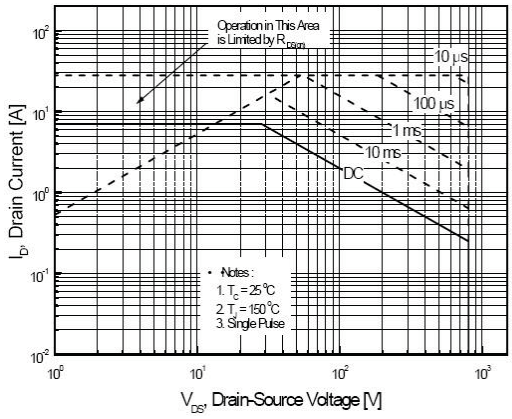


Fig. 7 Maximum Safe Operating Area

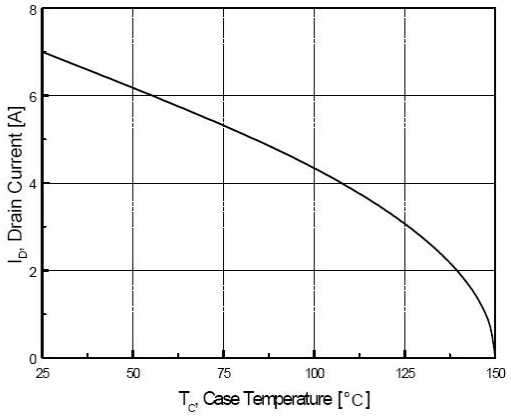


Fig. 8 Maximum Drain Current vs Case Temperature

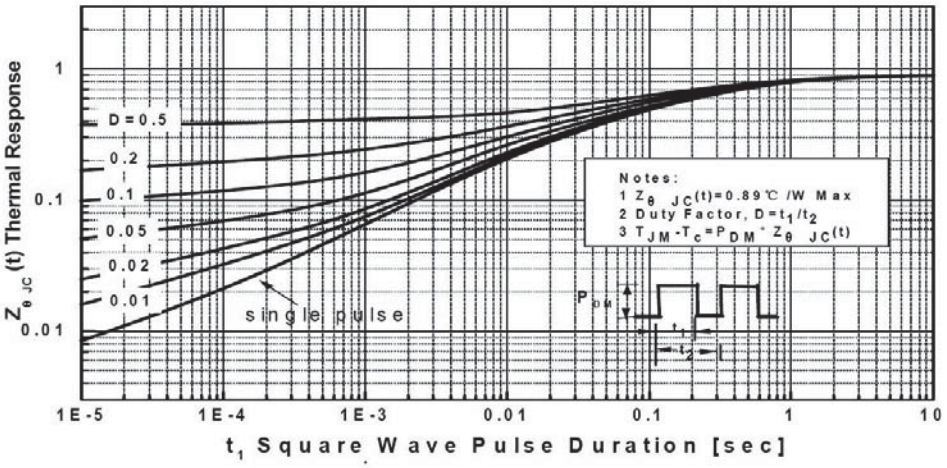


Fig. 9 Transient Thermal Response Curve(TO-220)

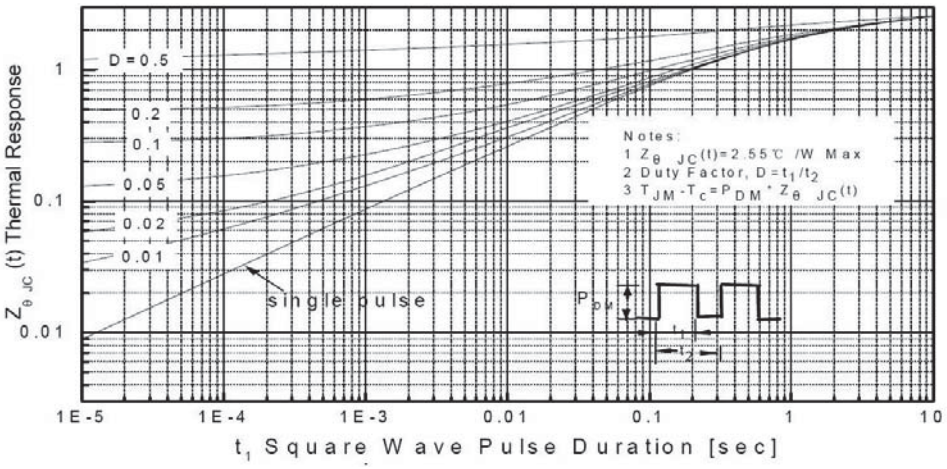


Fig. 10 Transient Thermal Response Curve(TO-220F)

TEST CIRCUITS AND WAVEFORMS

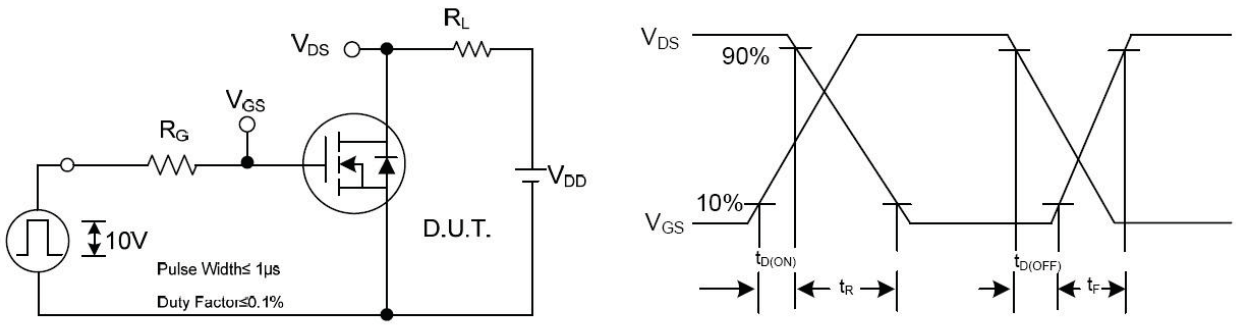


Fig.11 Resistive Switching Test Circuit & Waveforms

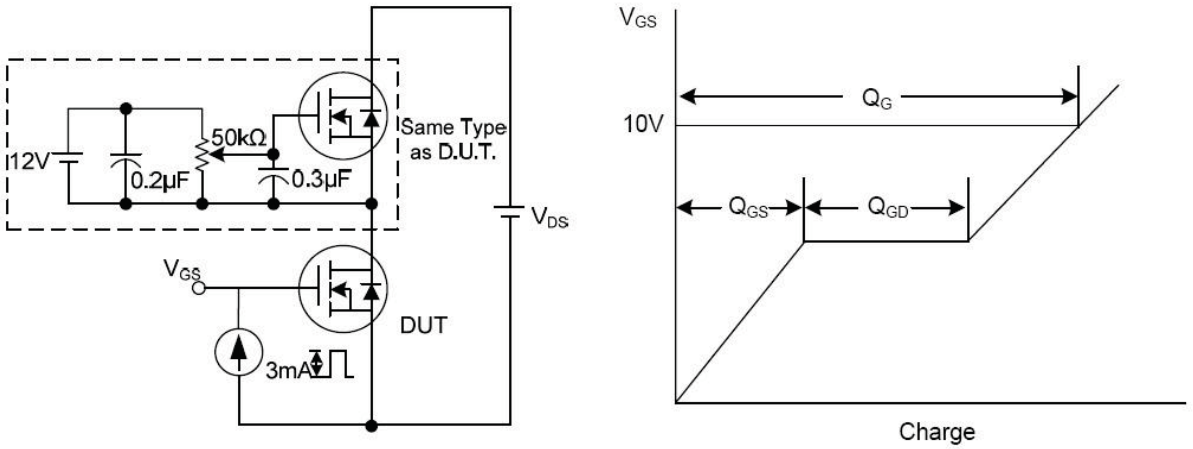


Fig.12 Gate Charge Test Circuit & Waveform

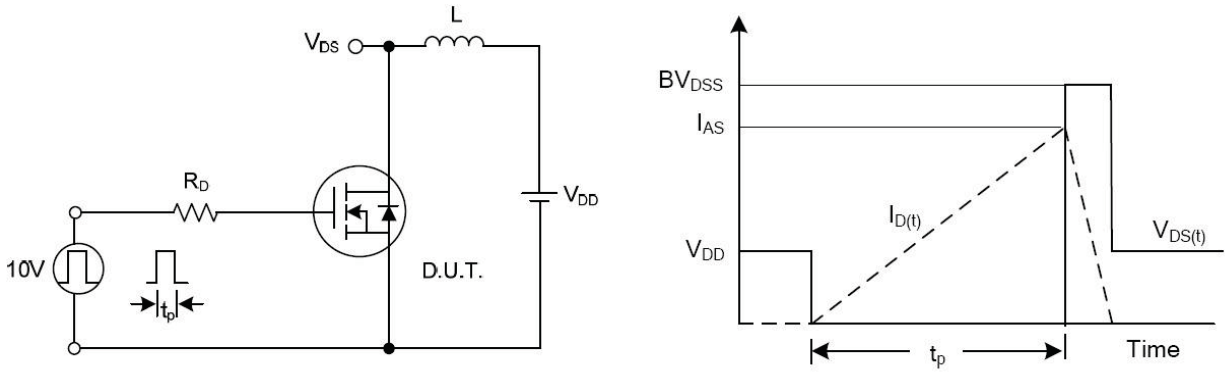
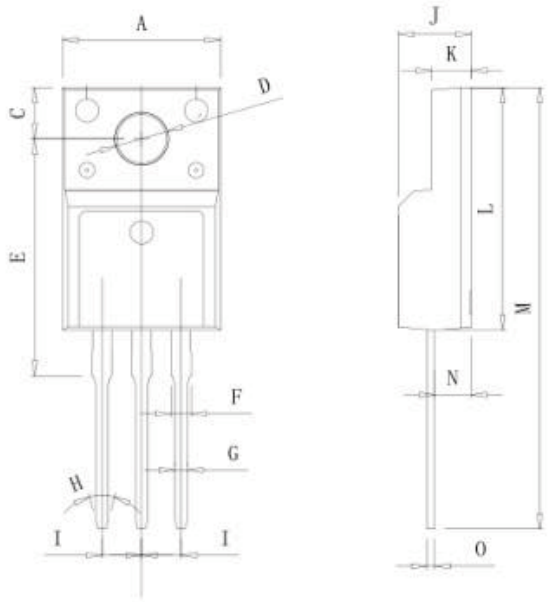


Fig.13 Unclamped Inductive Switching Test Circuit & Waveforms

TPACKAGE MECHANICAL DATA

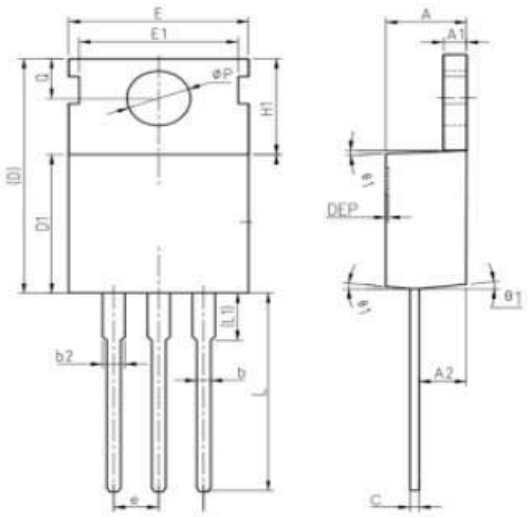
TO-220F 外形尺寸



单位：MM

SYMBOL	MILLIMETERS		SYMBOL	MILLIMETERS	
	Min	Max		Min	Max
A	9.96	10.36	K	2.34	2.74
J	4.5	4.9	O	0.4	0.6
M	28	29.6	G	0.7	0.9
E	15.4	15.6	D	2.9	3.3
L	15.5	16.1	C	3.25	3.5
N	2.2	2.9	I	2.54 TYP	
F		1.4			

TO-220A 外形尺寸



单位：MM

SYMBOL	MILLIMETERS		SYMBOL	MILLIMETERS	
	Min	Max		Min	Max
A	4.2	4.8	C	0.4	0.6
D1	8.9	9.4	b	0.7	0.9
E	9.7	10.3	A1	1.2	1.4
H1	6.3	6.9	Q	2.7	2.9
b2	1.27	1.43	A2	2.3	2.5
ΦP	3.6	3.9	e	2.54 TYP	
D	15.5	15.7			