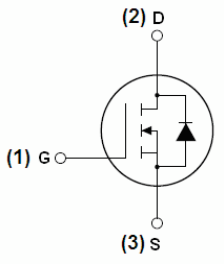
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RMP5N50LD

N-Channel Enhancement Mode Power MOSFET

General Features

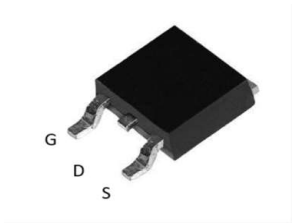
- V_{DS} =500V,I_D =5A
  $R_{DS(ON)}$ <1.6Ω@ V_{GS}=10V
- Low on-resistance
- Fast switching
- High input resistance
- RoHS Compliant



Schematic diagram

Application

- Electronic ballast
- Electronic transformer
- Switch mode power supply
- Halogen-free



TO-252

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
5N50	RMP5N50LD	TO-252	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current-Continuous	I_D	7	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	5.1	A
Pulsed Drain Current	I_{DM}	20	A
Power Dissipation	P_{tot}	75	W
Single pulse avalanche energy (Note 5)	E_{AS}	215	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

2024-03/126
REV:O

Thermal Characteristic

Thermal Resistance,Junction-to-Case(Note 2)	$R_{\theta JC}$	1.67	℃/W
Thermal Resistance,Junction-to-Ambient(Note 2)	$R_{\theta JA}$	110	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	500	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=500V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	-	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.5A	-	1.35	1.6	Ω
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	557	-	PF
Output Capacitance	C_{oss}		-	80.2	-	PF
Reverse Transfer Capacitance	C_{rss}		-	4.2	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=250V, I_D=5.0A R_G=10Ω	-	10.4	-	nS
Turn-on Rise Time	t_r		-	33.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	29.2	-	nS
Turn-Off Fall Time	t_f		-	12.9	-	nS
Total Gate Charge	Q_g	V_{DS}=400V,I_D=5.0A, V_{GS}=10V	-	12.7	-	nC
Gate-Source Charge	Q_{gs}		-	3.9	-	nC
Gate-Drain Charge	Q_{gd}		-	4.6	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=5.0A	-	-	1.5	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =5.0A di/dt = 100A/μs(Note3)	-	319.2	-	nS
Reverse Recovery Charge	Qrr		-	1.6	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : Tj=25℃,VDD=50V,Ias=5.0A,L=24mH,Rg=25 Ω

RATING AND CHARACTERISTICS CURVES (RMP5N50LD)

Fig.1 Typical Out Characteristics

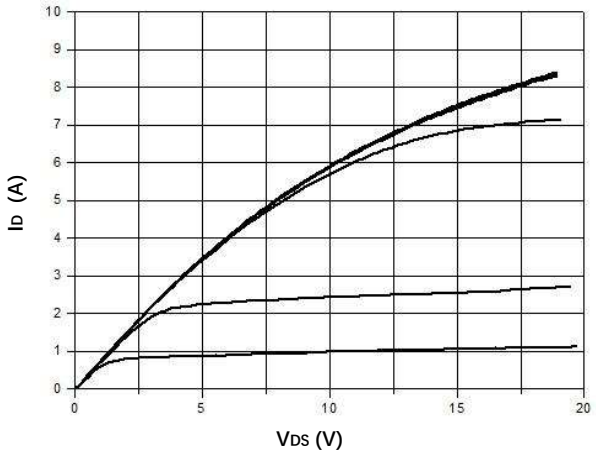


Fig.2 Typical Transfer Characteristics

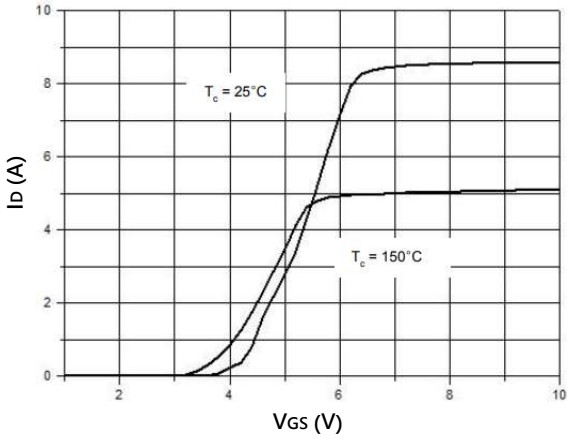


Fig.3 On-Resistance vs. Drain Current

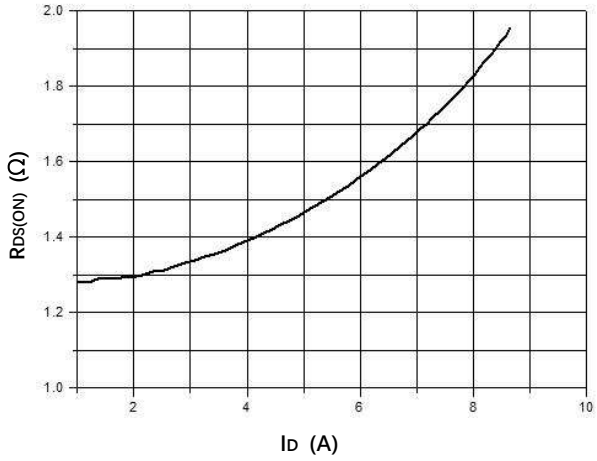


Fig.4 Threshold Voltage vs. Temperature

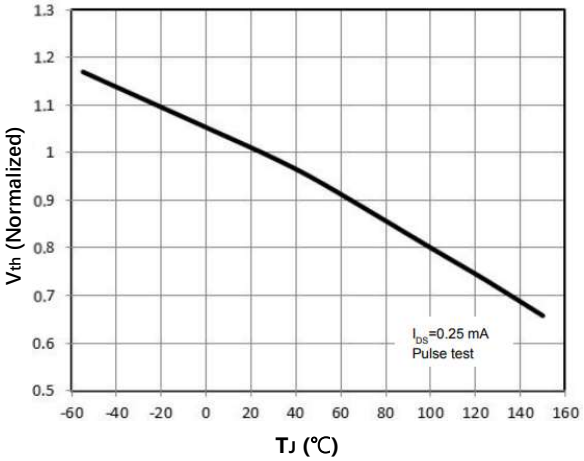


Fig.5 Breakdown Voltage vs. Temperature

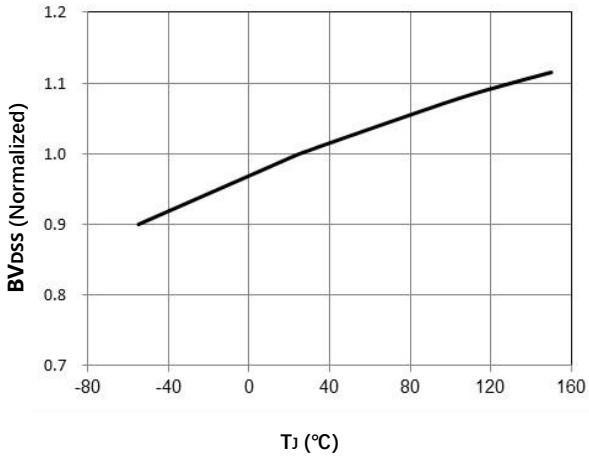
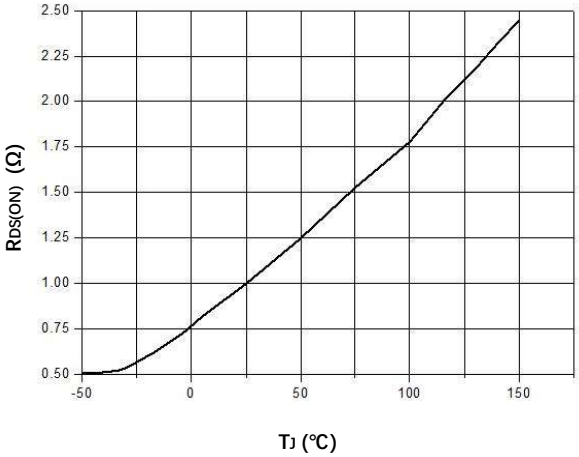


Fig.6 On-Resistance vs. Temperature



RATING AND CHARACTERISTICS CURVES (RMP5N50LD)

Fig.7 Capacitance Characteristics

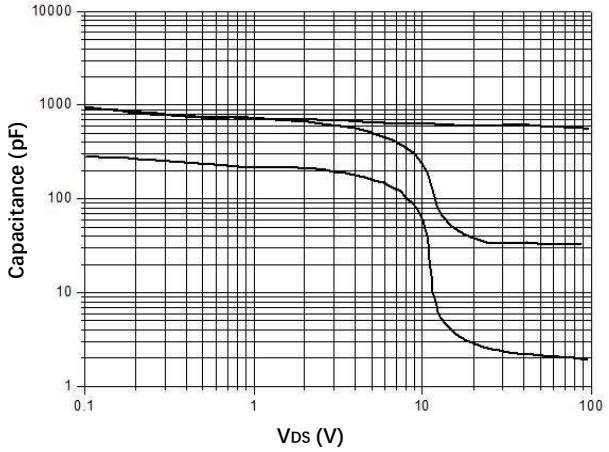


Fig.8 Gate Charge Characteristics

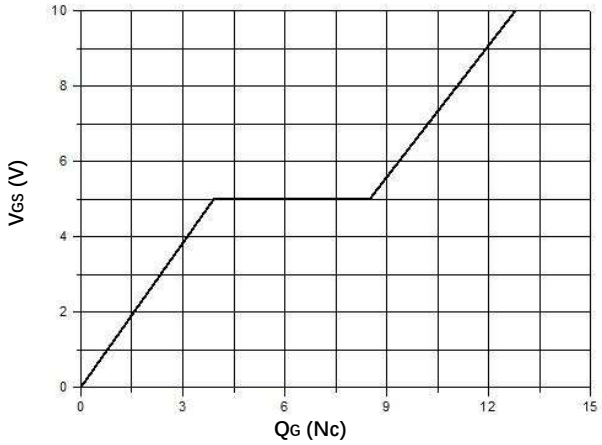


Fig.9 Maximum Safe Operating Area

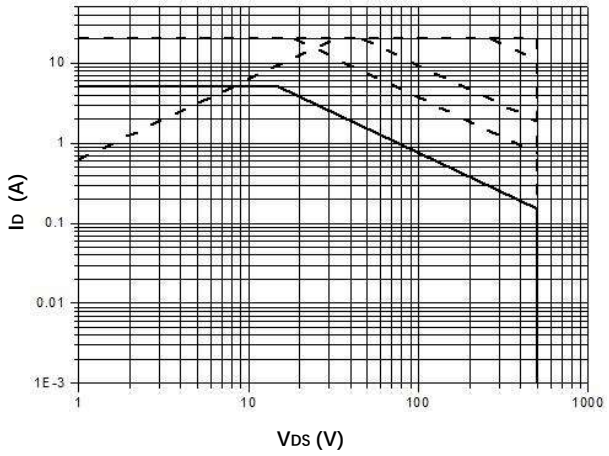


Fig.10 Power Dissipation vs. Temperature

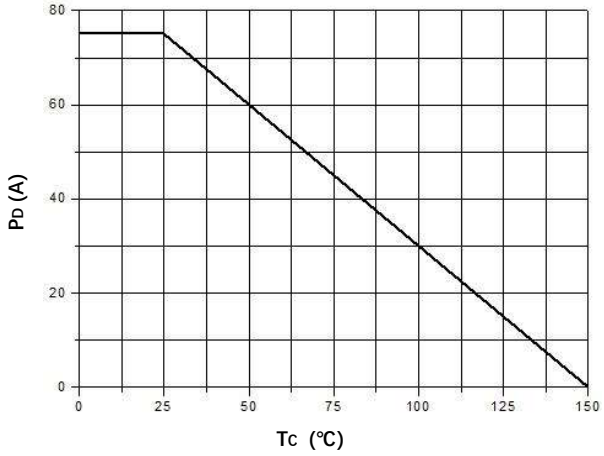


Fig.11 Continuous Drain Current vs. Temperature

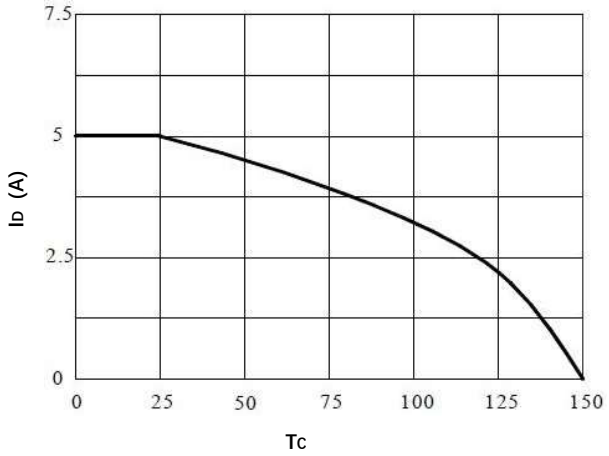
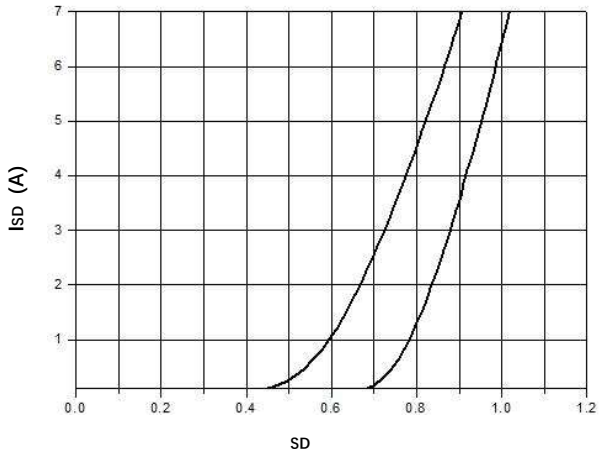
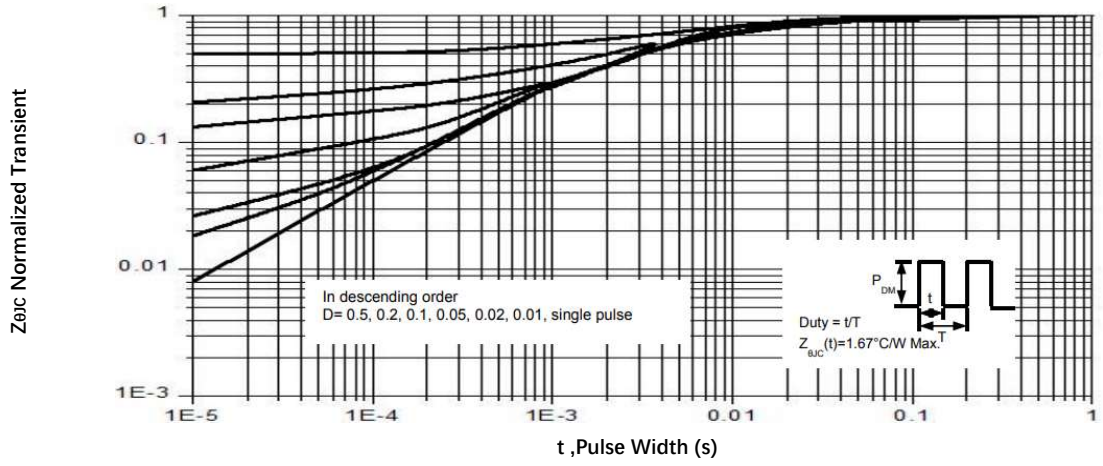


Fig.12 Body Diode Transfer Characteristics

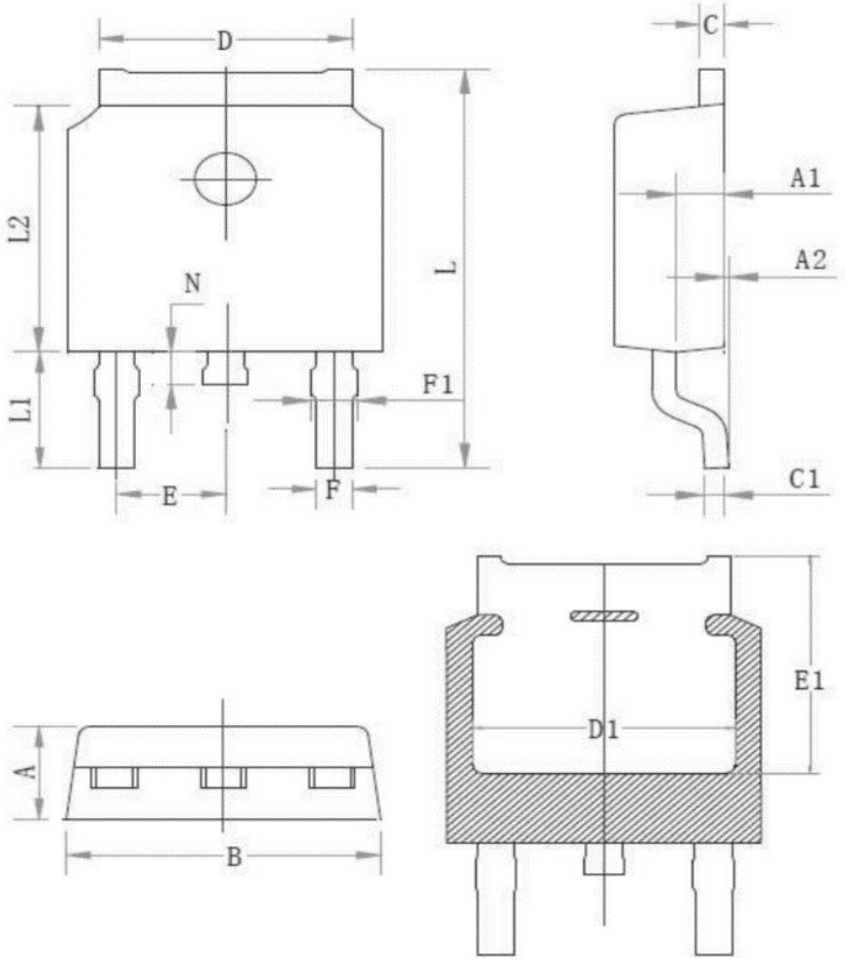


RATING AND CHARACTERISTICS CURVES (RMP5N50LD)

Fig.15 Transient Thermal Impendance,Junction to Case, TO-252



TO-252 Package Information



Symbol	Min.	Max.	Symbol	Min.	Max.
A	2.2	2.4	E	2.286 TYP	
A1	0.91	1.11	E1	4.95	5.35
A2		0.25	F	0.66	0.86
B	6.5	6.7	F1	0.7	0.95
C	0.4	0.6	L	9.7	10.1
C1	0.4	0.6	L1	2.67	3.07
D	5.15	5.45	L2	6.0	6.2
D1	5.1	5.4	N	0.6	1.0

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