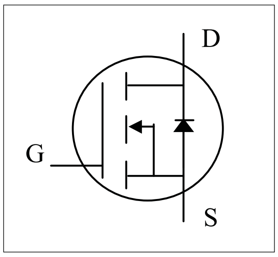
RECTRON
SEMICONDUCTOR
TECHNICAL SPECIFICATION

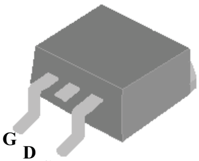
RMN65N600LD

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **100% R_g & UIS Test**
- ▼ **Low t_{rr} / Q_{rr}**
- ▼ **Simple Drive Requirement**
- ▼ **RoHS Compliant & Halogen-Free**



BV_{DSS}	650V
$R_{DS(ON)}$	0.6Ω
I_D[3]	7A



TO-252(H)

Description

RMN65N600LD is from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	$\pm$20	V
V_{GS}	Gate-Source Voltage, AC (f > 1Hz)	$\pm$30	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V[3]	7	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V[3]	4.4	A
I_{DM}	Pulsed Drain Current[1]	16.4	A
dv/dt	MOSFET dv/dt Ruggedness (V_{DS} = 0 …480V)	40	V/ns
P_D@T_C=25℃	Total Power Dissipation	56.8	W
P_D@T_A=25℃	Total Power Dissipation[6]	2	W
E_{AS}	Single Pulse Avalanche Energy[4]	50	mJ
dv/dt	Peak Diode Recovery dv/dt[5]	15	V/ns
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	2.2	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[6]	62.5	℃/W

2019-12/99
REV:O

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	650	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=2A	-	-	0.6	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2	-	5	V
g_{fs}	Forward Transconductance	V_{DS}=15V, I_D=2A	-	3.6	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=520V, V_{GS}=0V	-	-	100	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=$\pm$20V, V_{DS}=0V	-	-	$\pm$1	uA
Q_g	Total Gate Charge	I_D=2A	-	20.5	32.8	nC
Q_{gs}	Gate-Source Charge	V_{DS}=520V	-	4.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	9.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=300V	-	11	-	ns
t_r	Rise Time	I_D=2A	-	7	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	31	-	ns
t_f	Fall Time	V_{GS}=10V	-	13	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	650	1040	pF
C_{oss}	Output Capacitance	V_{DS}=100V	-	26	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	5	-	pF
R_g	Gate Resistance	f=1.0MHz	-	3.5	7	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=2A, V_{GS}=0V	-	-	1.5	V
t_{rr}	Reverse Recovery Time	I_S=3.2A, V_{GS}=0V	-	100	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	460	-	nC

Notes:

1.Pulse width limited by max. junction temperature.

2.Pulse test

3.Limited by max. junction temperature. Maximum duty cycle D=0.75

4.Starting T_j=25°C , V_{DD}=90V , L=100mH , R_G=25Ω

5.$I_{SD} \leqq I_D$, $V_{DD} \leqq BV_{DSS}$, starting T_J = 25°C

6.Surface mounted on 1 in^2 copper pad of FR4 board

RATING AND CHARACTERISTICS CURVES (RMN65N600LD)

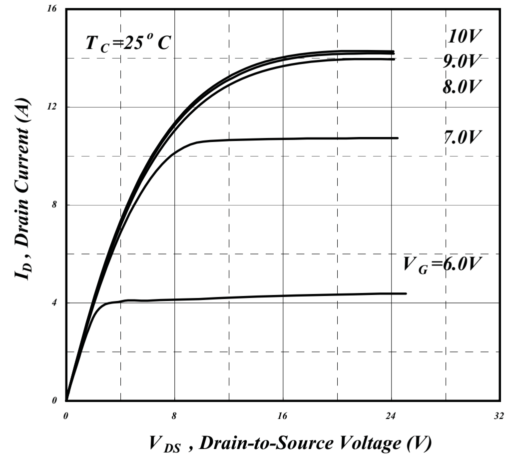


Fig 1. Typical Output Characteristics

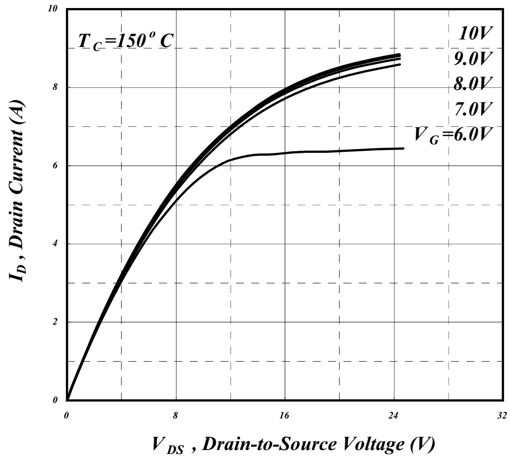


Fig 2. Typical Output Characteristics

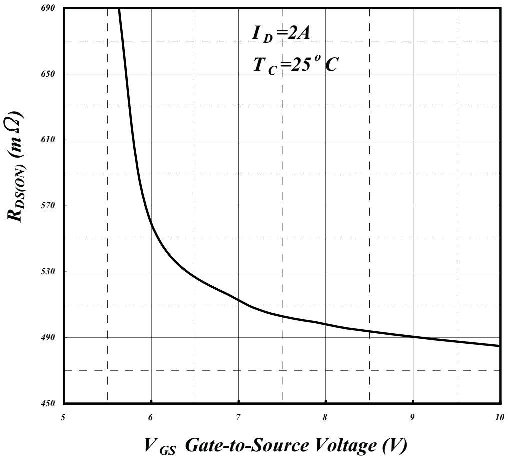


Fig 3. On-Resistance v.s. Gate Voltage

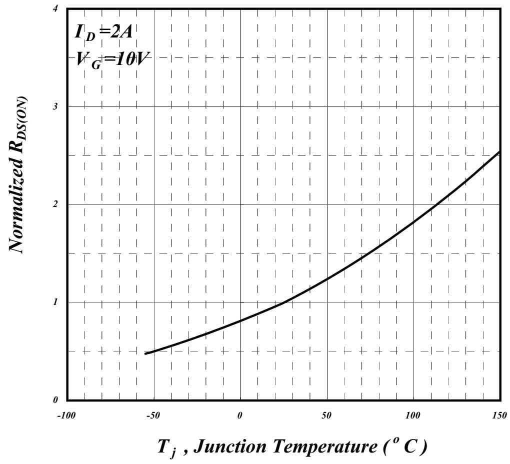


Fig 4. Normalized On-Resistance v.s. Junction Temperature

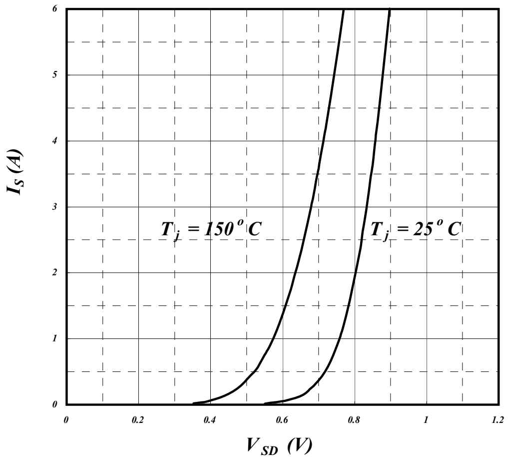


Fig 5. Forward Characteristic of Reverse Diode

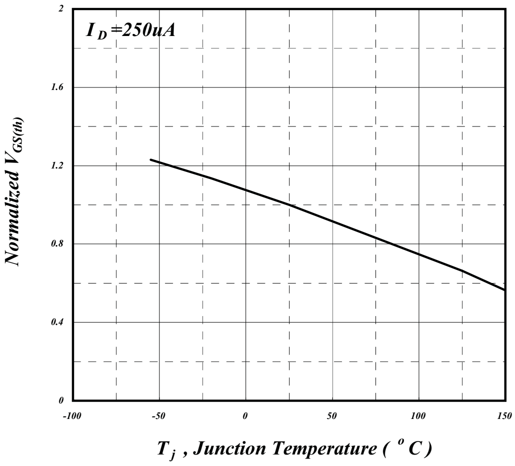


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

RATING AND CHARACTERISTICS CURVES (RMN65N600LD)

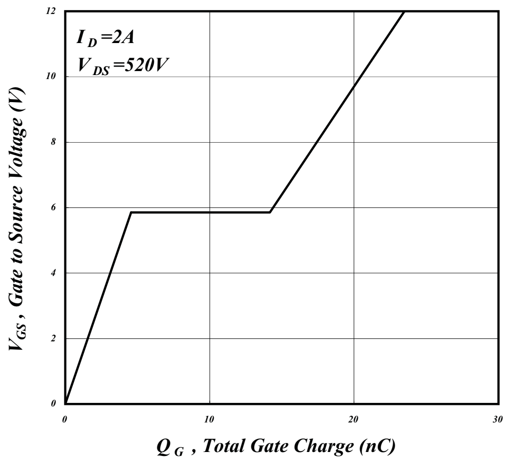


Fig 7. Gate Charge Characteristics

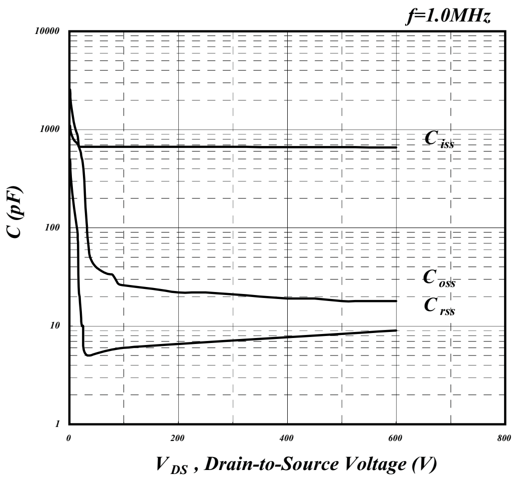


Fig 8. Typical Capacitance Characteristics

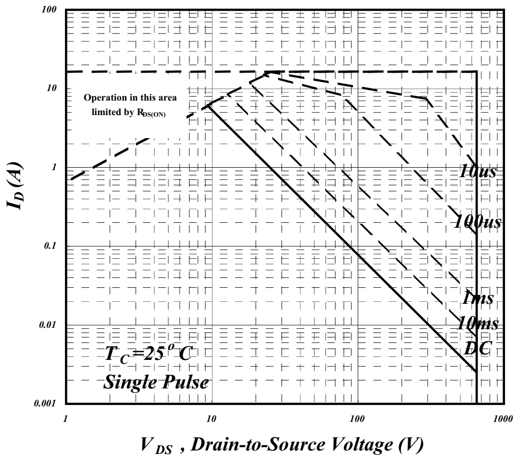


Fig 9. Maximum Safe Operating Area

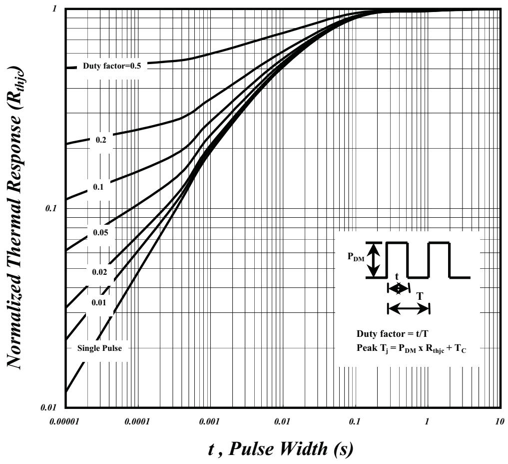


Fig10. Effective Transient Thermal Impedance

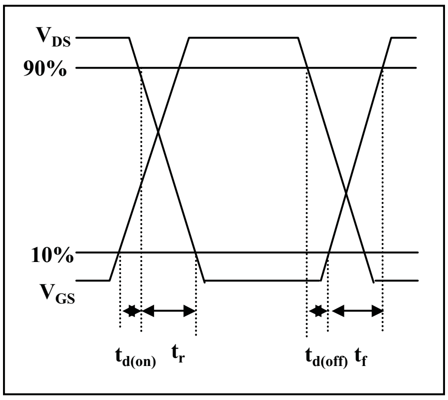


Fig 11. Switching Time Waveform

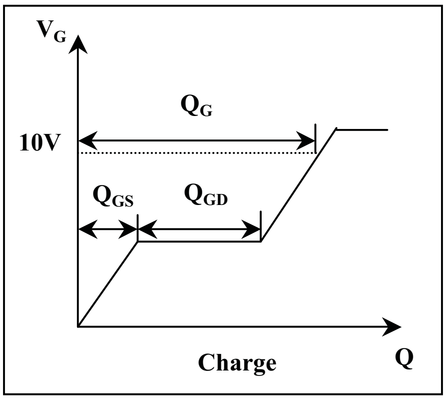


Fig 12. Gate Charge Waveform

RATING AND CHARACTERISTICS CURVES (RMN65N600LD)

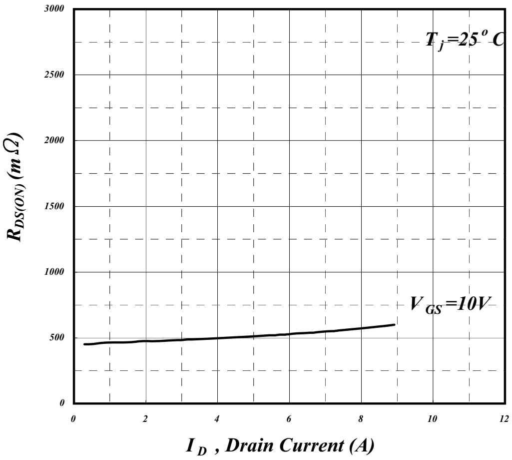


Fig 13. Typ. Drain-Source on State Resistance

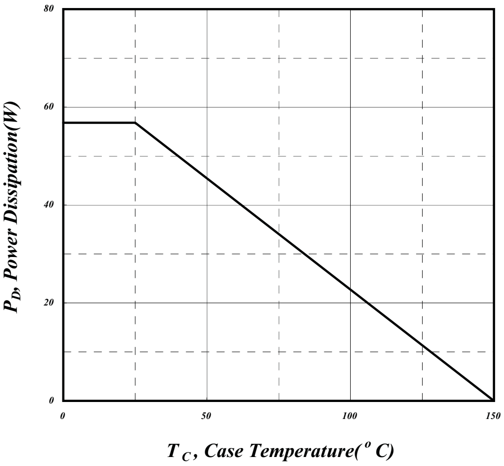
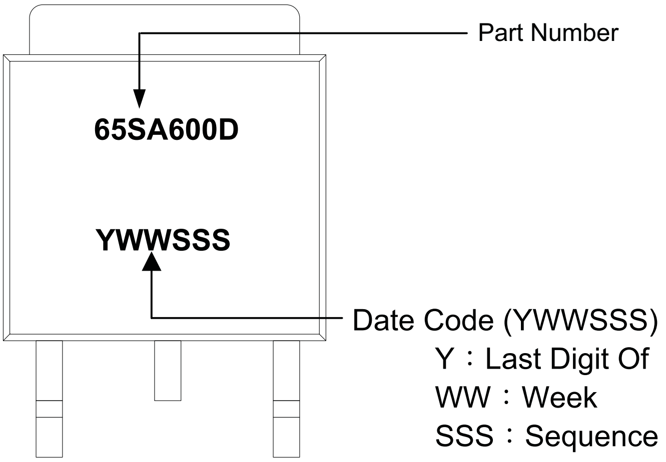


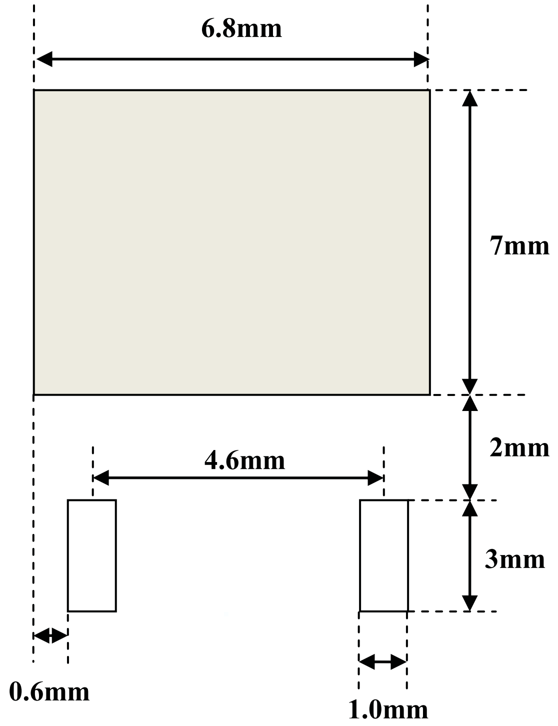
Fig 14. Total Power Dissipation

MARKING INFORMATION

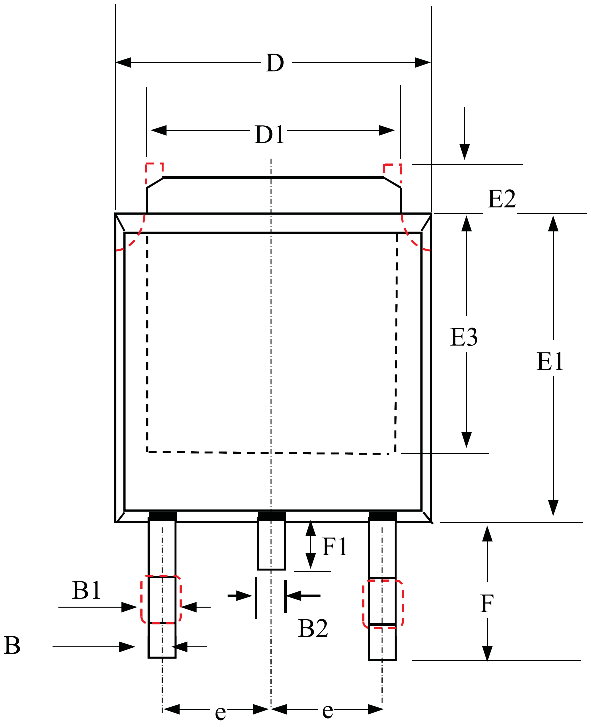


Y：Last Digit Of The Year
WW：Week
SSS：Sequence

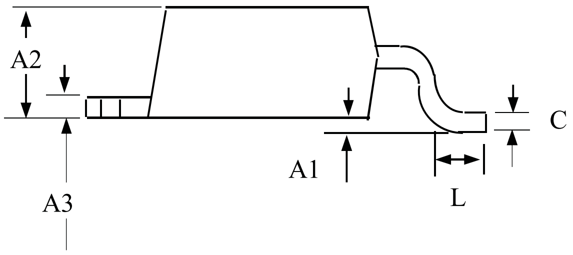
TO-252 FOOTPRINT：



Package Outline : TO-252



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	2.10	2.30	2.50
A3	0.40	0.50	0.65
B	0.40	0.70	1.00
B1	0.50	0.85	1.20
D	6.00	6.50	6.80
D1	4.80	5.35	5.90
E3	4.00 (ref.)		
F	2.00	2.63	3.05
F1	0.50	0.85	1.20
E1	5.00	5.70	6.30
E2	0.50	1.10	1.80
e	2.3 (ref)		
C	0.35	0.525	0.70
A1	0.00	—	0.25
B2	—	—	1.25
L	0.90	1.34	1.78



1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

3. Thermal PAD, Body and Pin contour is for reference, it may has little difference by option.

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