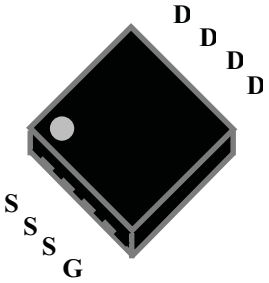
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM50N30DN

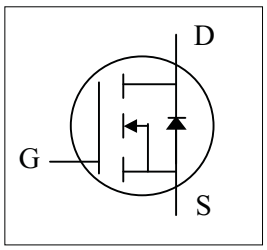
Description

RM50N30DN seriesarefromAdvancedPowerinnovateddesignand 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 DFN 3 x 3 package is special for voltage conversion application using standard infrared reflow technique with the backside heat sink to achieve the good thermal performance.



DFN 3 x 3



- **Simple Drive Requirement**
- **Small Size & Lower Profile**
- **RoHS Compliant & Halogen-Free**

BV_{DSS}	30V
$R_{DS(ON)}$	4.1mΩ
I_D	50A

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
50N30	RM50N30DN	DFN 3x3	-	-	-

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Drain Current[3], V_{GS} @ 10V	50	A
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 10V	42	A
I_{DM}	Pulsed Drain Current[1]	72	A
P_D@T_A=25℃	Total Power Dissipation	25	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	35	℃/W

2023-04/59
REV:B

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

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V,V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2.5	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =30A	-	4.1	4.8	mΩ
		V_{GS} =4.5V, I_D =20A	-	7.2	9.5	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =15V, V_{GS} =0V, f =1MHz	-	1614	-	pF
Output Capacitance	C_{oss}		-	245	-	
Reverse Transfer Capacitance	C_{rss}		-	215	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, I_D=30A, V_{GS}=10V, R_G=3Ω	-	7.5	-	ns
Turn-on rise time	t_r		-	14.5	-	
Turn-off delay time	$t_{d(off)}$		-	35.2	-	
Turn-off fall time	t_f		-	9.6	-	
Total Gate Charge	Qg	VDS=15V, ID=30A, VGS=10V	-	33.7	-	nC
Gate-Source Charge	Qgs		-	8.5	-	
Gate-Drain Charge	Qgd		-	7.5	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=1A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	70	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=15V,R_G=25Ω,L=0.5mH,I_{AS}=15A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

RATING AND CHARACTERISTICS CURVES (RM50N30DN)

Figure1: Output Characteristics

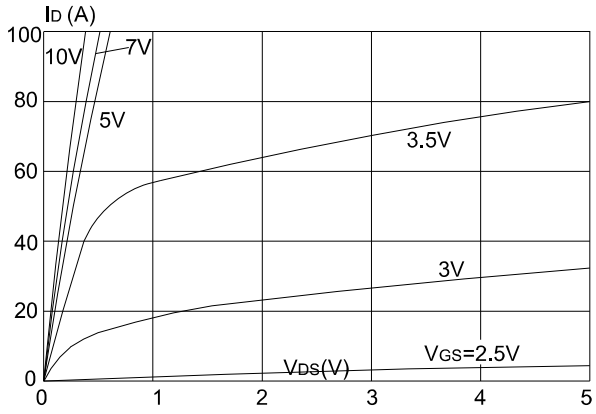


Figure 2: Typical Transfer Characteristics

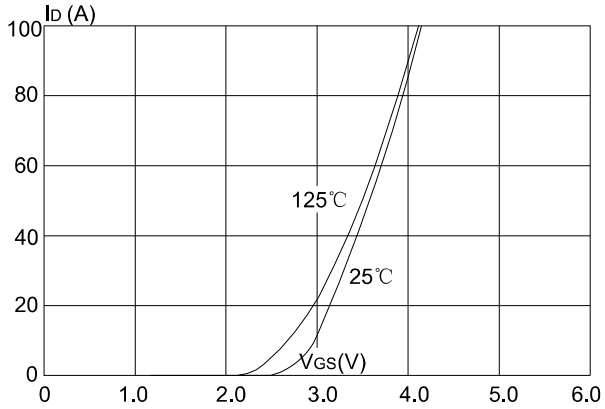


Figure 3: On-resistance vs. Drain Current

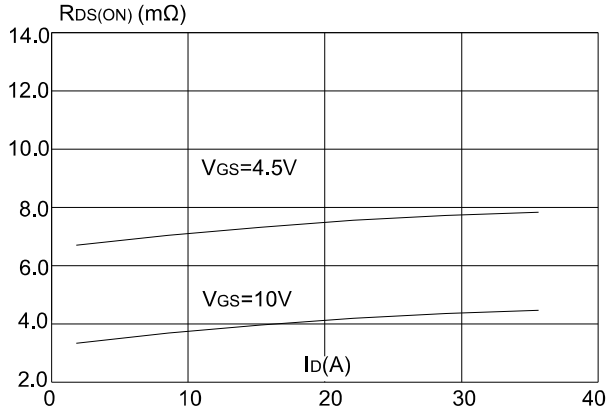


Figure 4: Body Diode Characteristics

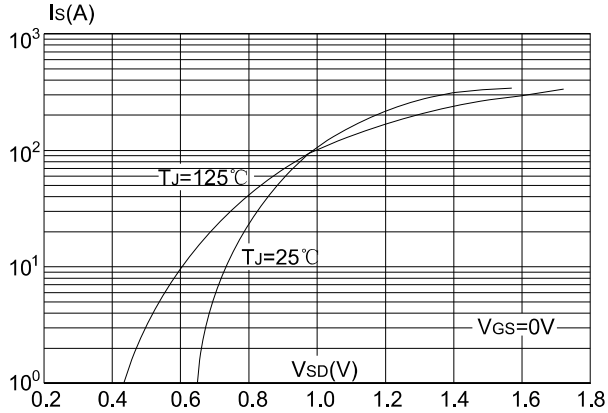


Figure 5: Gate Charge Characteristics

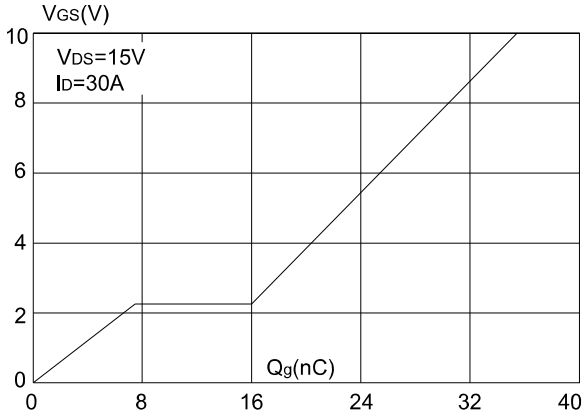
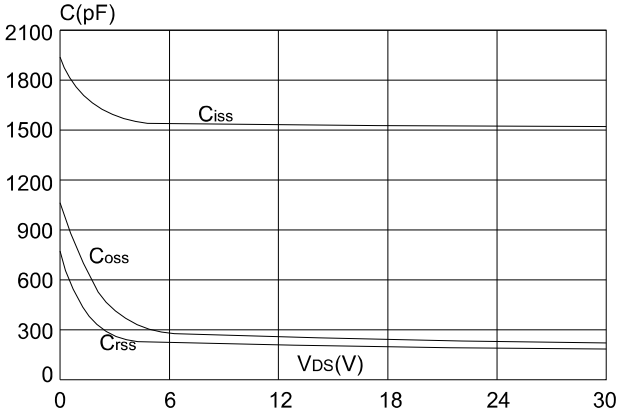


Figure 6: Capacitance Characteristics



RATING AND CHARACTERISTICS CURVES (RM50N30DN)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

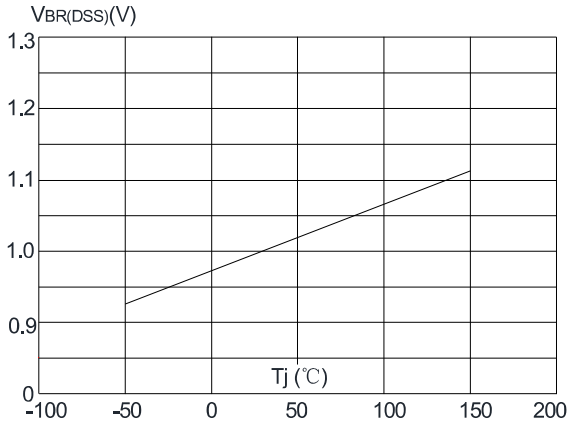


Figure 8: Normalized on Resistance vs. Junction Temperature

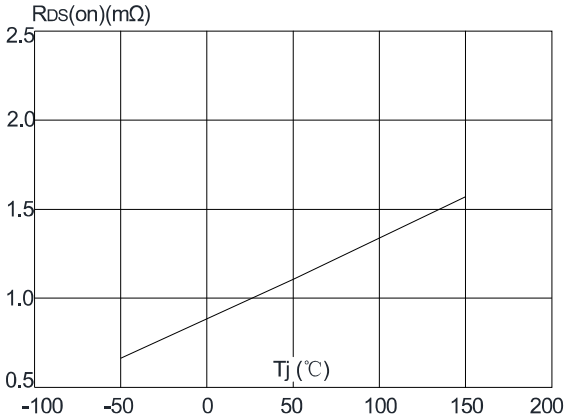


Figure 9: Maximum Safe Operating Area

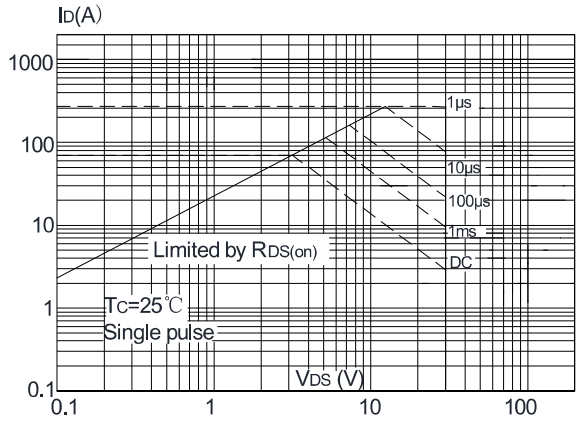


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

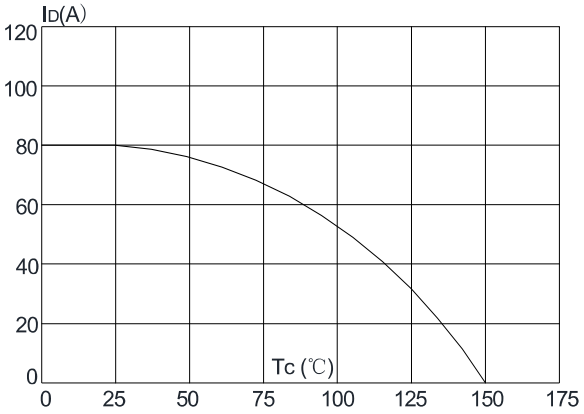
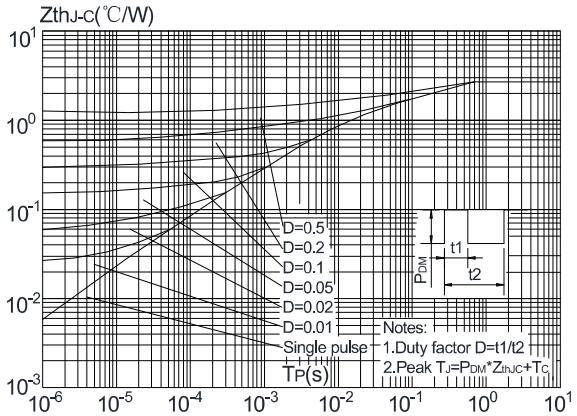
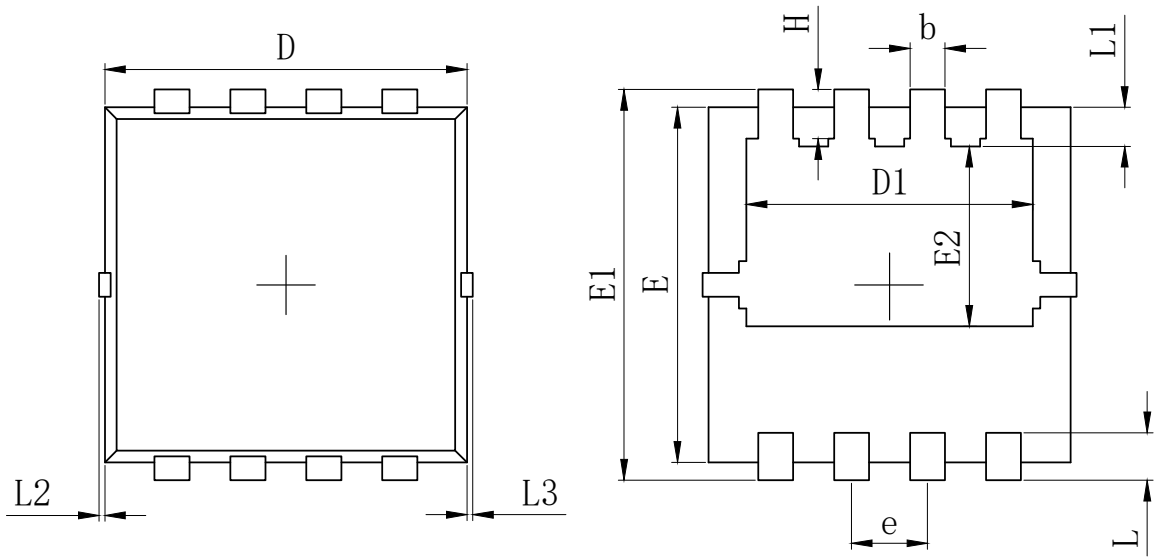
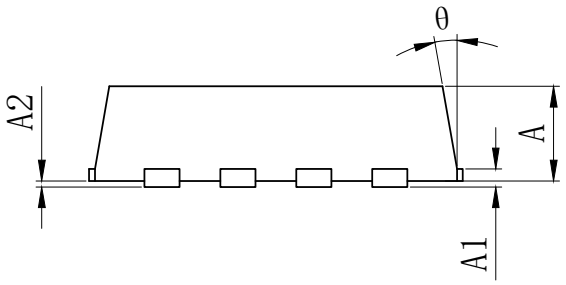


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical Data





SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0~0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0~0.100		
L3	0~0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°

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