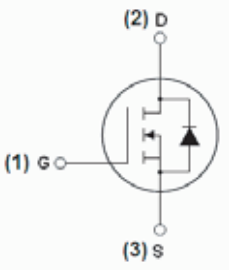
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM12N100LD

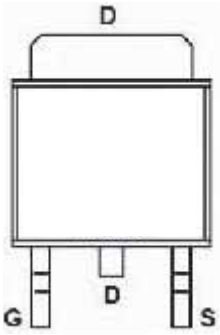
N-Channel Enhancement Mode Power MOSFET

Description

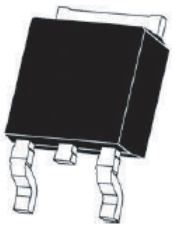
The RM12N100LD uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.



Schematic diagram



Marking and pin assignment



TO-252 -2Ltop view

General Features

- V_{DS} = 100V,I_D =12A
  $R_{DS(ON)}$ < 112mΩ @ V_{GS}=10V
  $R_{DS(ON)}$ < 120mΩ @ V_{GS}=4.5V
- Special process technology for high ESD capability
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Halogen-free
- P/N suffix V means AEC-Q101 qualified, e.g:RM12N100LDV

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

100% UIS TESTED!
100% ΔVds TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
12N100	RM12N100LD	TO-252-2L	-	-	-

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

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current-Continuous	12	A
I_D (100℃)	Drain Current-Continuous(TC=100℃)	7.7	A
I_{DM}	Pulsed Drain Current	24	A
P_D	Maximum Power Dissipation	34.7	W
E_{AS}	Single pulse avalanche energy (Note 5)	256	mJ
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

Thermal Characteristic

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 2)	3.6	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =80V,V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	-	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D =10A	-	-	112	mΩ
		V_{GS}=4.5V, I_D =10A	-	-	120	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V,I_D=10A	-	13	-	S
Dynamic Characteristics (Note4)						
C_{lss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	-	1535	-	PF
C_{oss}	Output Capacitance		-	60	-	PF
C_{rss}	Reverse Transfer Capacitance		-	37	-	PF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,R_L=5Ω V_{GS}=10V,R_{GEN}= 3.3 Ω	-	4.2	-	nS
t_r	Turn-on Rise Time		-	8.2	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	35.6	-	nS
t_f	Turn-Off Fall Time		-	9.6	-	nS
Q_g	Total Gate Charge	V_{DS}=80V,I_D=10A, V_{GS}=10V	-	26.2	-	nC
Q_{gs}	Gate-Source Charge		-	4.6	-	nC
Q_{gd}	Gate-Drain Charge		-	5.1	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	V_{GS}=0V,I_S=10A	-	-	1.2	V
I_S	Diode Forward Current (Note 2)	-	-	-	12	A
t_{rr}	Reverse Recovery Time	TJ = 25°C, IF = 10A di/dt = 100A/μs (Note3)	-	37	-	nS
Qrr	Reverse Recovery Charge		-	27.3	-	nC
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

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℃,V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω, I_{AS}=32A

RATING AND CHARACTERISTICS CURVES (RM12N100LD)

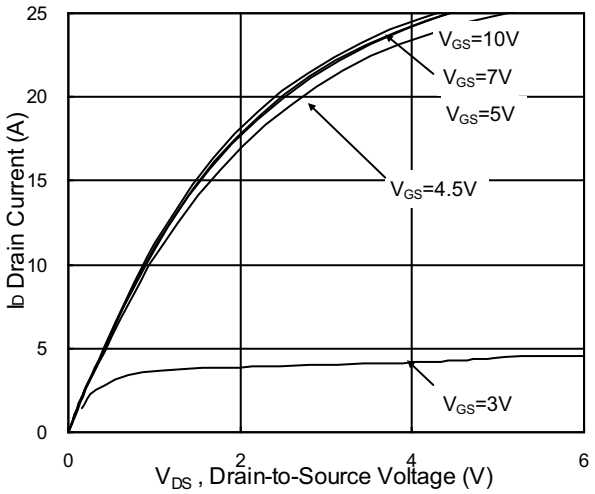


Fig.1 Typical Output Characteristics

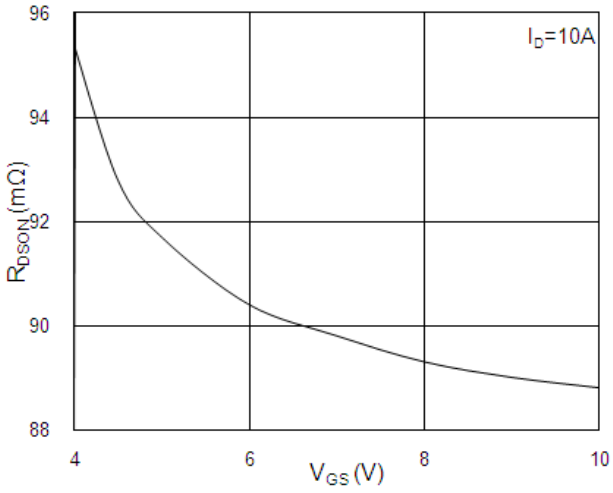


Fig.2 On-Resistance vs. Gate-Source

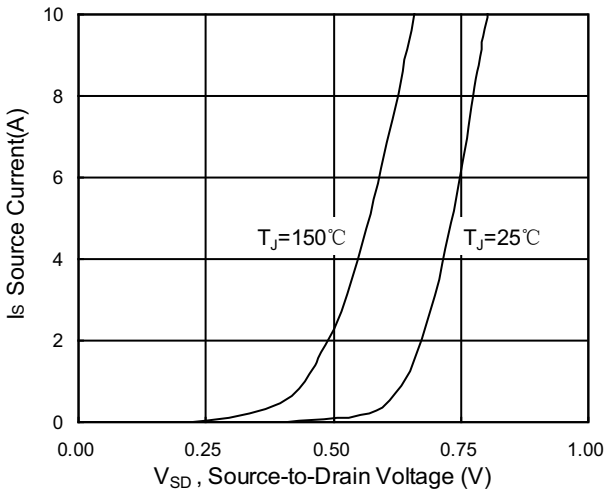


Fig.3 Forward Characteristics Of Reverse

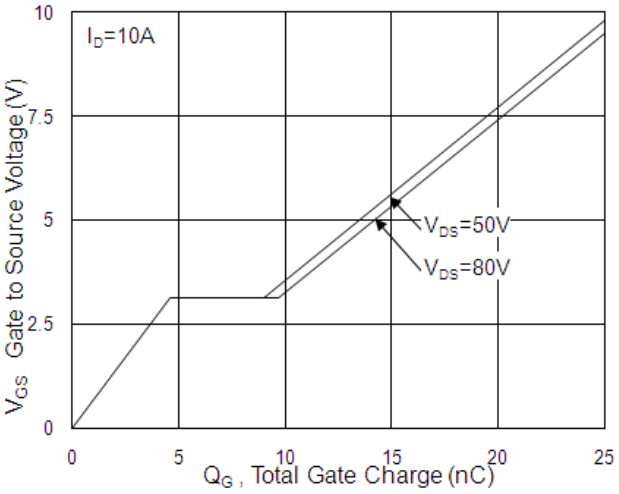


Fig.4 Gate-Charge Characteristics

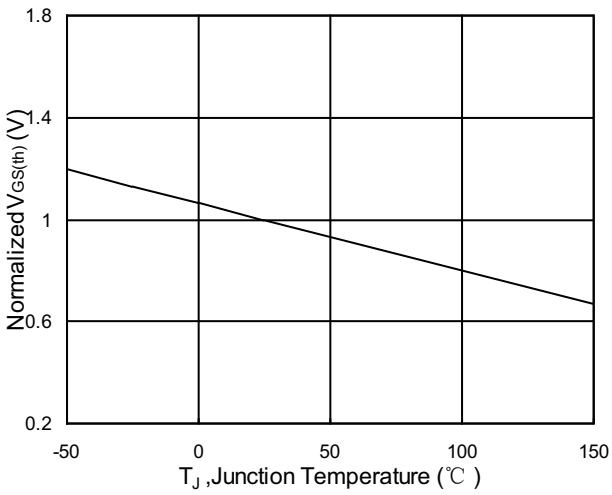


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

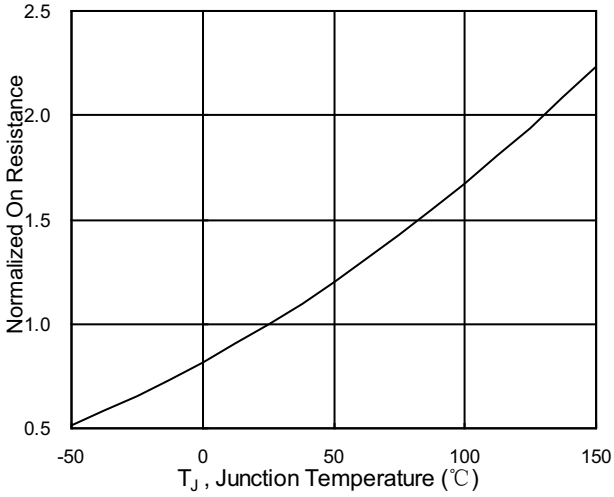


Fig.6 Normalized R_{DSON} vs. T_J

RATING AND CHARACTERISTICS CURVES (RM12N100LD)

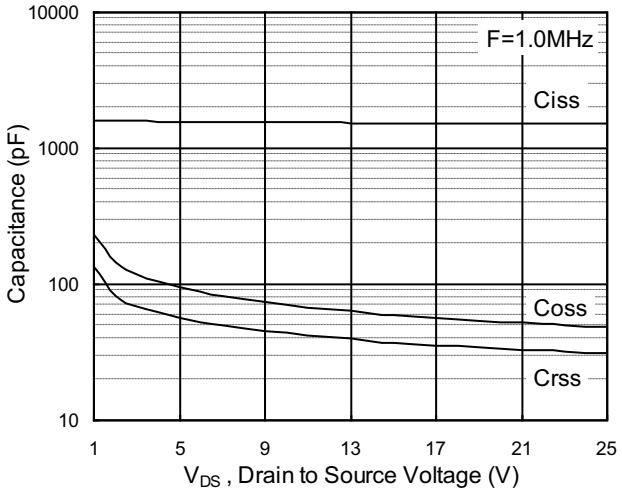


Fig.7 Capacitance

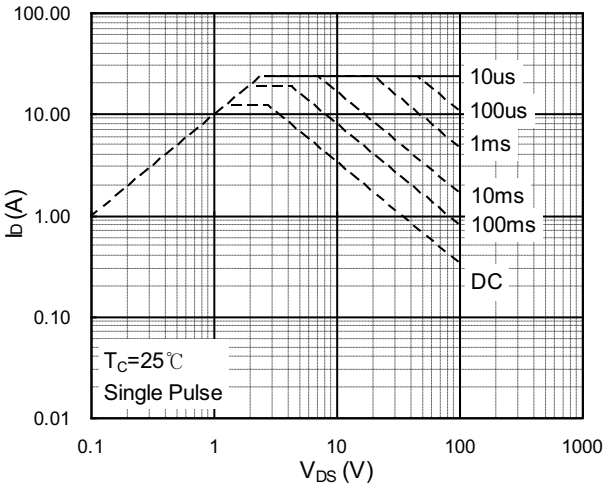


Fig.8 Safe Operating Area

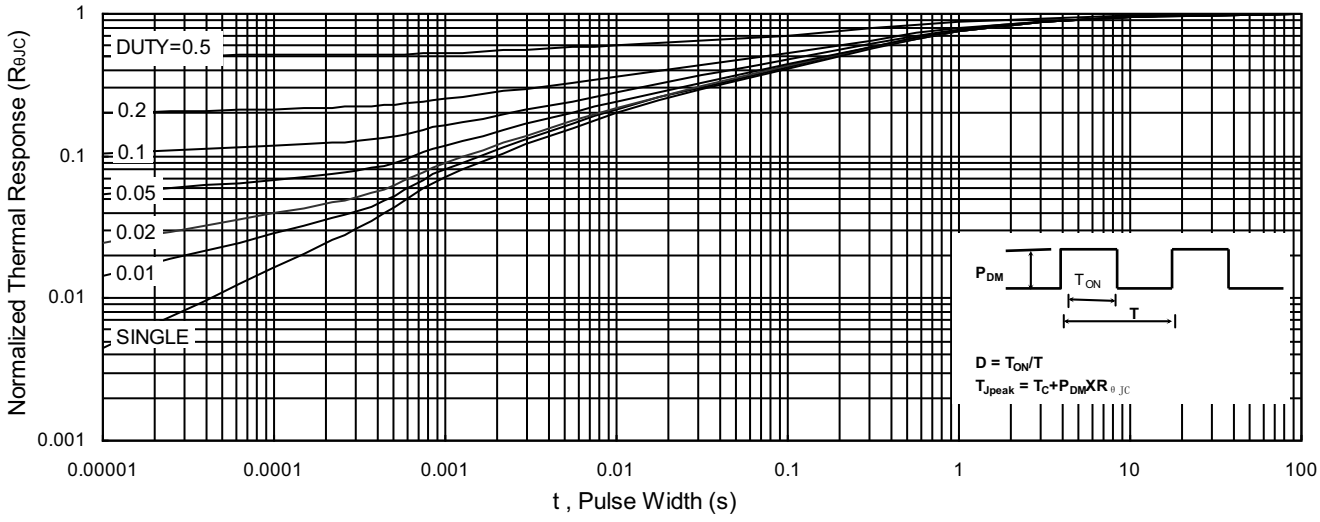


Fig.9 Normalized Maximum Transient Thermal Impedance

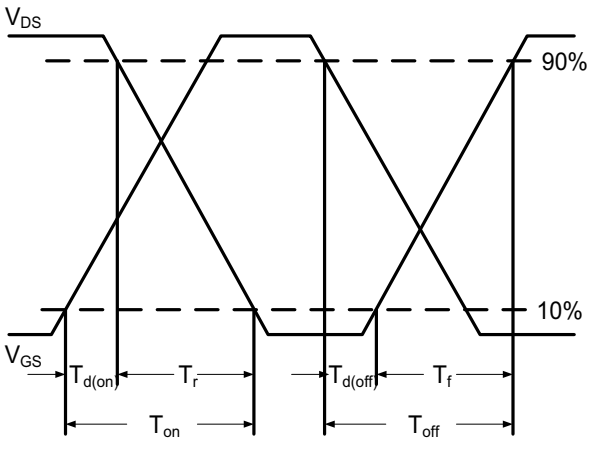


Fig.10 Switching Time Waveform

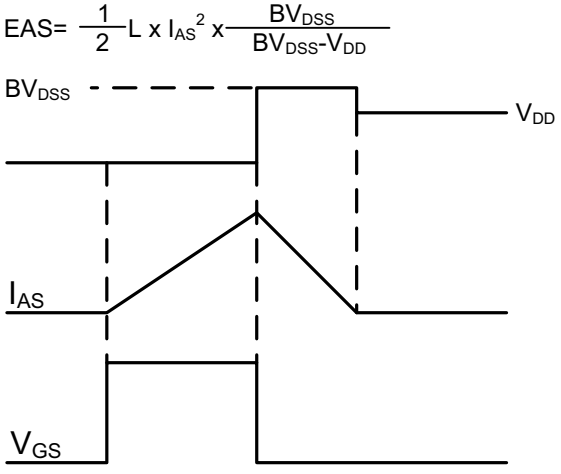
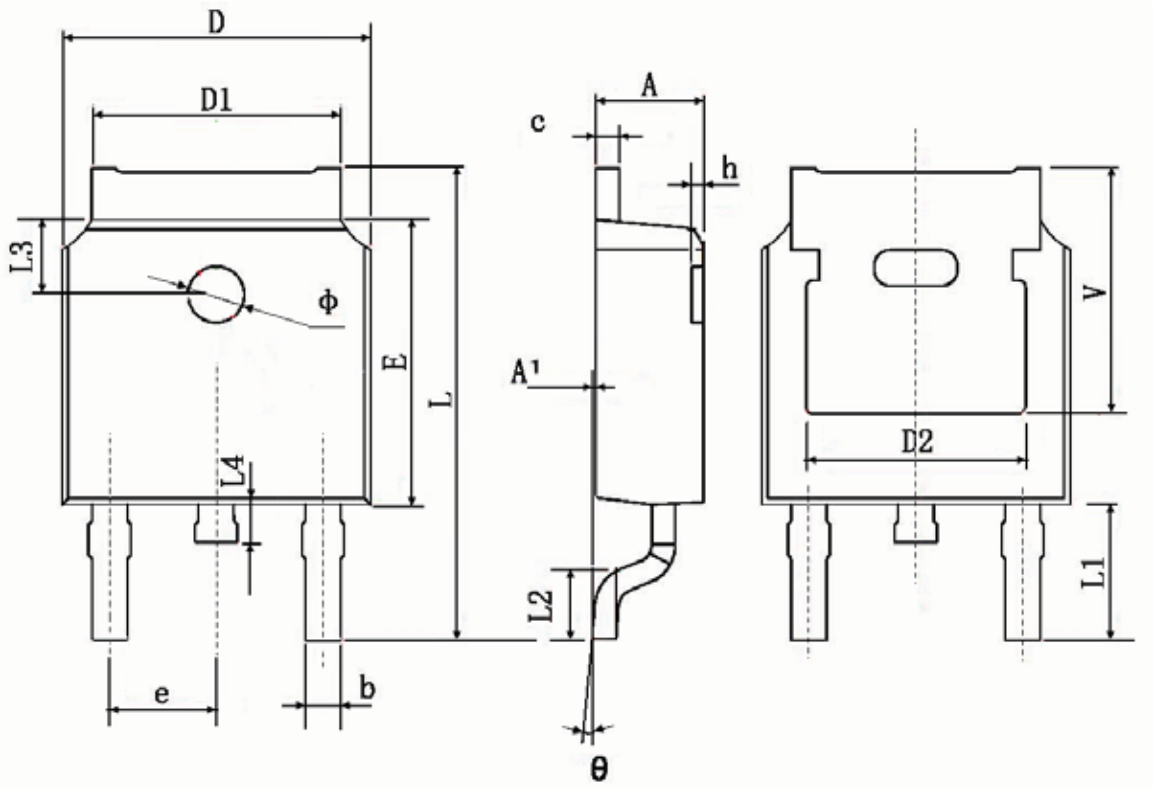


Fig.11 Unclamped Inductive Switching Waveform

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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