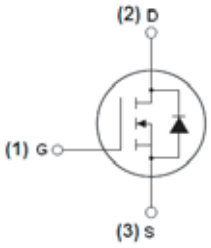
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM12N100S8

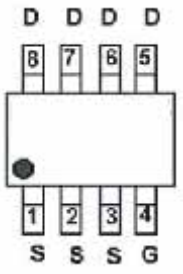
N-Channel Super Trench Power MOSFET

Description

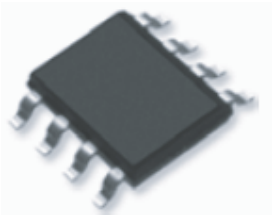
The RM12N100S8 uses **Super Trench** technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.



Schematic diagram



pin assignment



SOP-8 top view

General Features

- V_{DS} =100V,I_D =12A
  $R_{DS(ON)}$=8mΩ (typical) @ V_{GS}=10V
  $R_{DS(ON)}$=11mΩ (typical) @ V_{GS}=4.5V
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature
- Pb-free lead plating
- 100% UIS tested

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification
- Halogen-free

100% UIS TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
12N100	RM12N100S8	SOP-8	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	12	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	9	A
Maximum Power Dissipation	P_D	3.1	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient(Note 2)	$R_{\theta JA}$	40	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

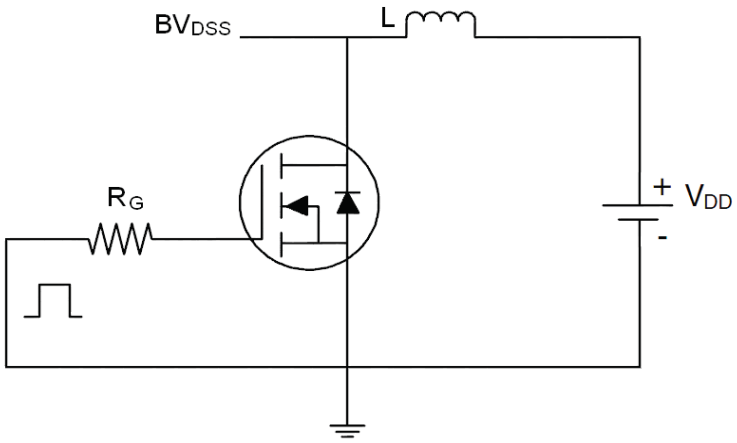
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.0	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A	-	8	10	mΩ
		V_{GS}=4.5V, I_D=12A	-	11	13.2	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=10A	-	10	-	S
Dynamic Characteristics (Note3)						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	2250	-	PF
Output Capacitance	C_{oss}		-	410	-	PF
Reverse Transfer Capacitance	C_{rss}		-	25	-	PF
Switching Characteristics (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V,I_D=1A,R_L=6Ω, R_G=1Ω,V_{GS}=10V	-	14.6	30	nS
Turn-on Rise Time	t_r		-	21.5	44	nS
Turn-Off Delay Time	$t_{d(off)}$		-	54	108	nS
Turn-Off Fall Time	t_f		-	83.3	168	nS
Total Gate Charge	Q_g	I_D=10A,V_{DD}=50V,V_{GS}=10V	-	37.8	76	nC
Gate-Source Charge	Q_{gs}		-	7.8	-	nC
Gate-Drain Charge	Q_{gd}		-	8.4	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V,I_S=10A	-	-	1.0	V

Notes:

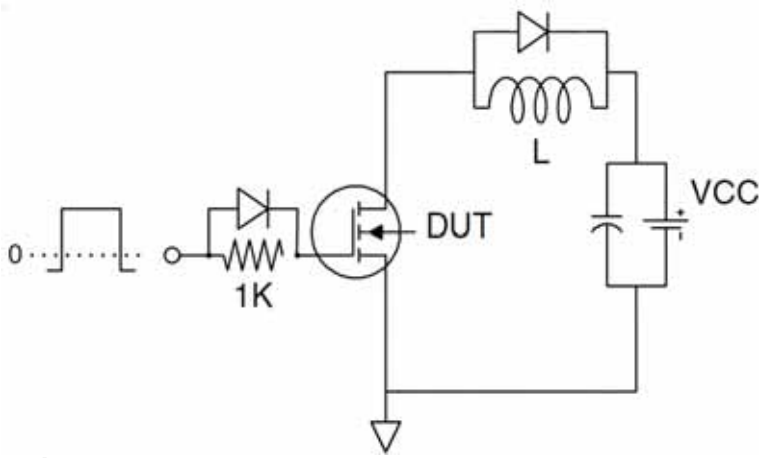
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production

Test Circuit

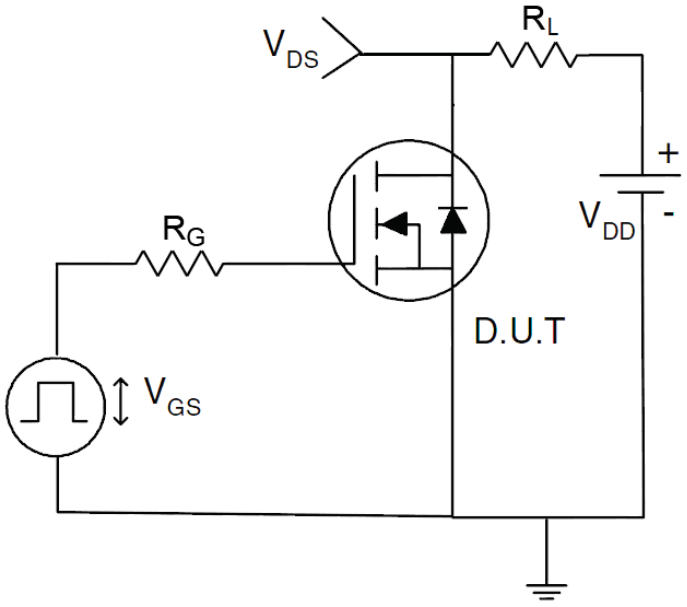
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



RATING AND CHARACTERISTICS CURVES (RM12N100S8)

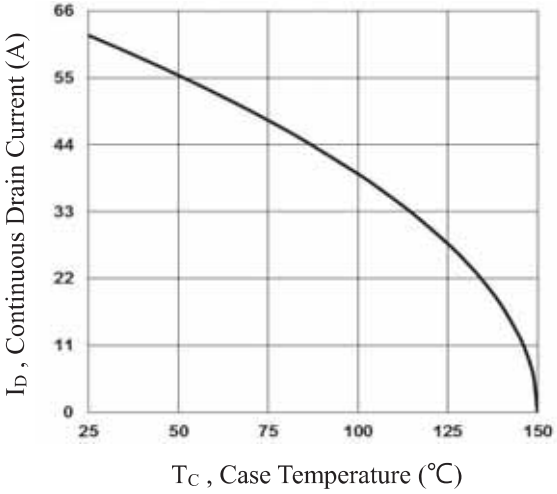


Fig.1 Continuous Drain Current vs. T_C

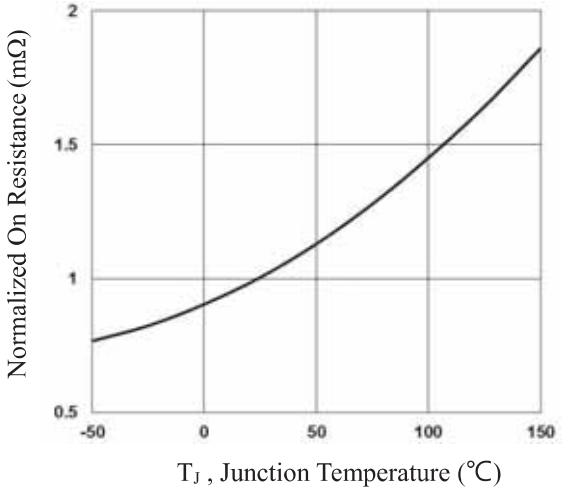


Fig.2 Normalized RDSON vs. T_J

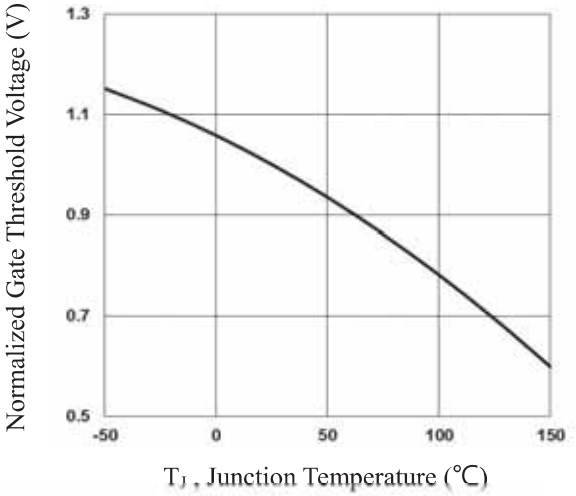


Fig.3 Normalized Vth vs. T_J

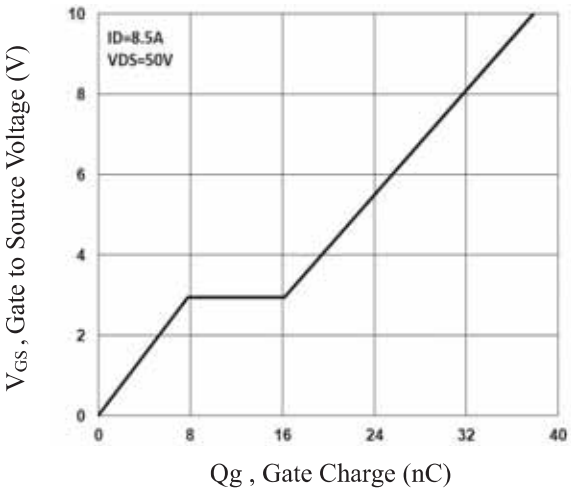


Fig.4 Gate Charge Characteristics

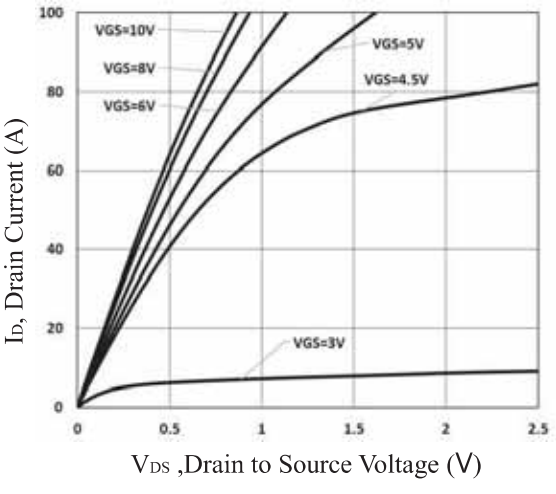


Fig.5 Typical Output Characteristics

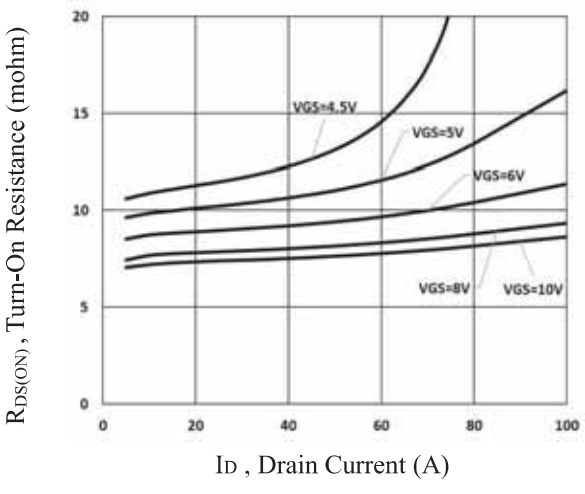


Fig.6 Turn-On Resistance vs. I_D

RATING AND CHARACTERISTICS CURVES (RM12N100S8)

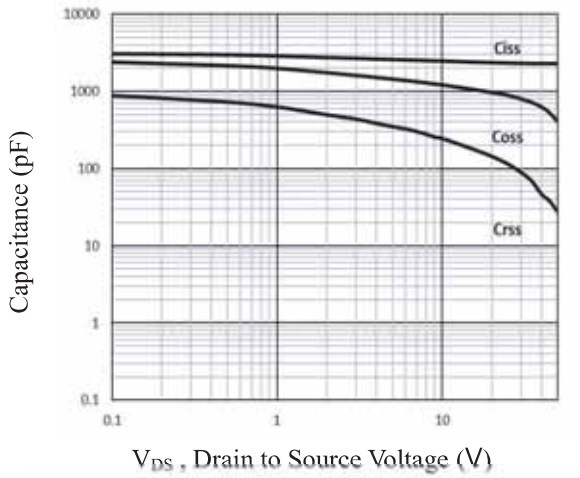


Fig.7 Capacitance Characteristics

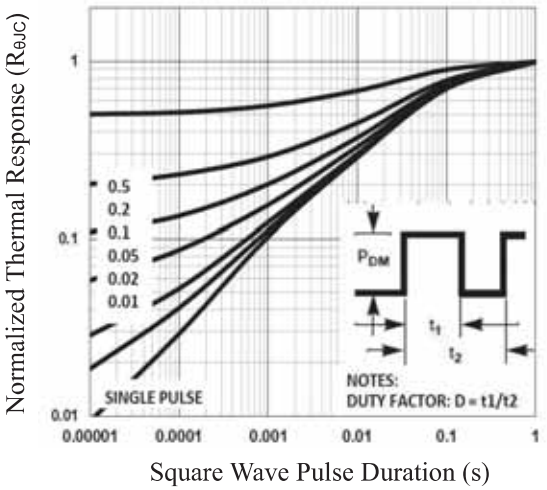


Fig.8 Normalized Transient Impedance

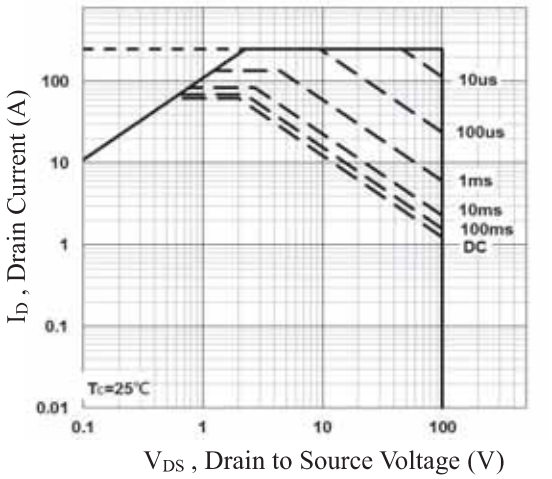


Fig.9 Maximum Safe Operation Area

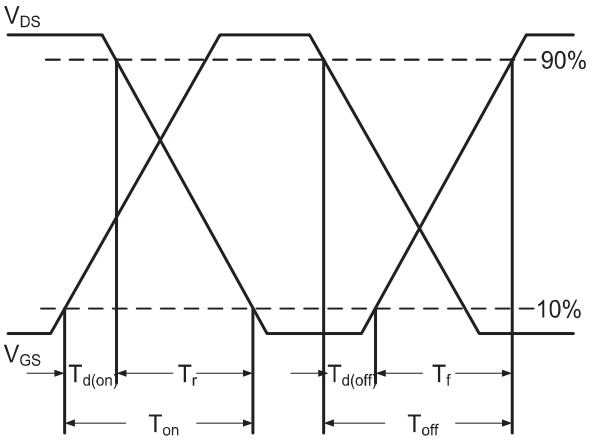


Fig.10 Switching Time Waveform

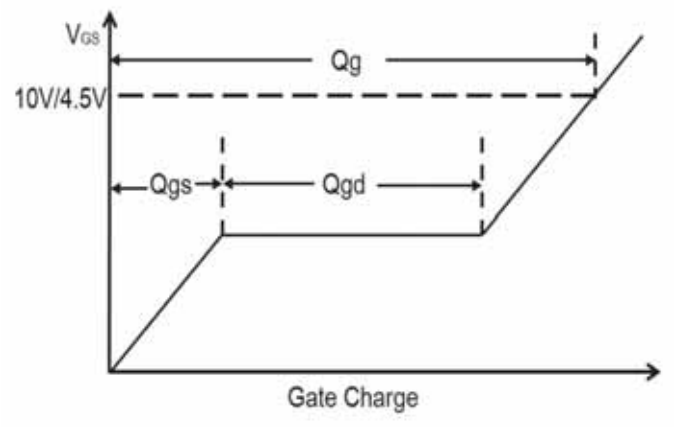
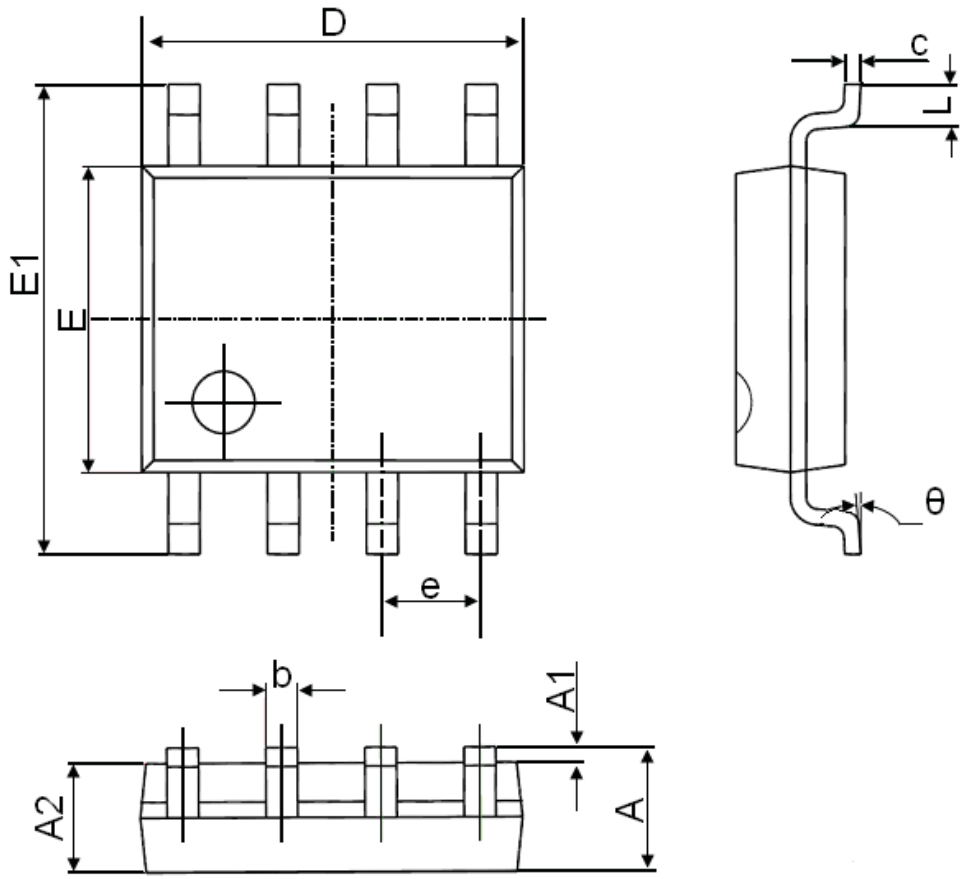


Fig.11 Gate Charge Waveform

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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