

N-Channel Enhancement Mode Power MOSFET

Description

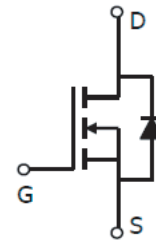
The RM10N100S8 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

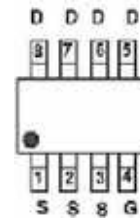
- $V_{DS} = 100V, I_D = 10A$
 $R_{DS(ON)} < 14m\Omega @ V_{GS}=10V$
 $R_{DS(ON)} < 21m\Omega @ V_{GS}=4.5V$
- Special process technology for high ESD capability
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current

Application

- DC/DC Primary Side Switch
- Telecom/Server
- Synchronous Rectification
- Halogen-free



Schematic diagram



Marking and pin assignment



SOP-8 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
10N100	RM10N100S8	SOP-8	Ø330mm	12mm	2500 units

Absolute Maximum Ratings ($T_A=25^\circ C$ 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	10	A
Drain Current-Continuous($T_C=100^\circ C$)	$I_D(100^\circ C)$	7	A
Pulsed Drain Current	I_{DM}	70	A
Maximum Power Dissipation	P_D	3.1	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	40	$^\circ C/W$
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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

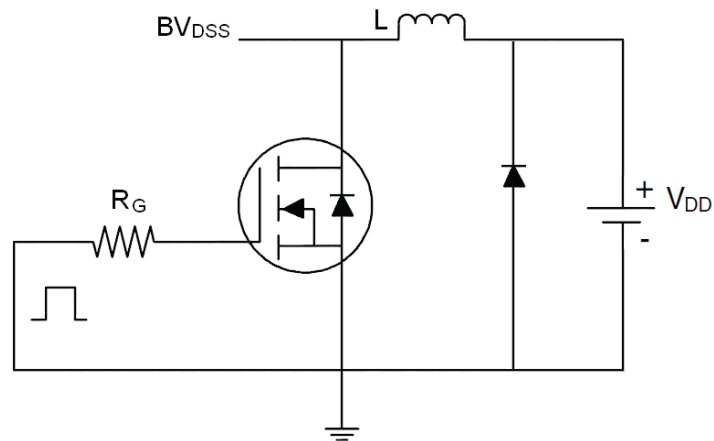
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics ^(Note2)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	12	14	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	18	21	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=10A$	-	10	-	S
Dynamic Characteristics ^(Note3)						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V,$ $F=1.0MHz$	-	1640	-	PF
Output Capacitance	C_{oss}		-	240	-	PF
Reverse Transfer Capacitance	C_{rss}		-	4	-	PF
Switching Characteristics ^(Note 3)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=50V, I_D=1A, R_L=6\Omega,$ $R_G=1\Omega, V_{GS}=10V$	-	14.2	-	nS
Turn-on Rise Time	t_r		-	20.8	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	42	-	nS
Turn-Off Fall Time	t_f		-	30	-	nS
Total Gate Charge	Q_g	$I_D=10A, V_{DD}=50V, V_{GS}=10V$	-	27.8	-	nC
Gate-Source Charge	Q_{gs}		-	3.5	-	nC
Gate-Drain Charge	Q_{gd}		-	8.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 2)	V_{SD}	$V_{GS}=0V, I_S=10A$	-	-	1.0	V

Notes:

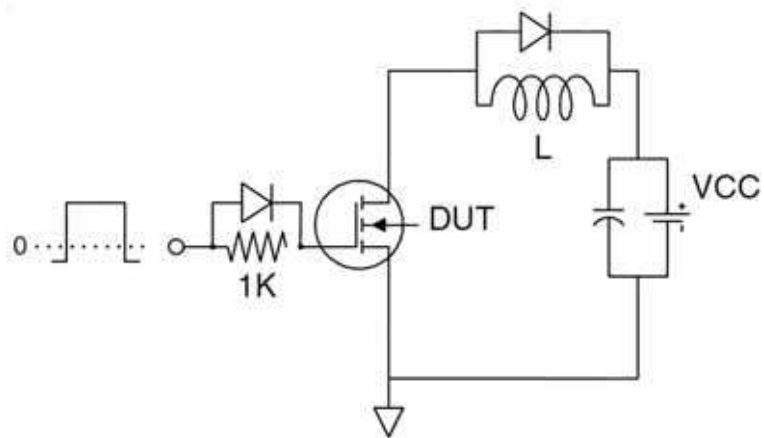
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Guaranteed by design, not subject to production

Test Circuit

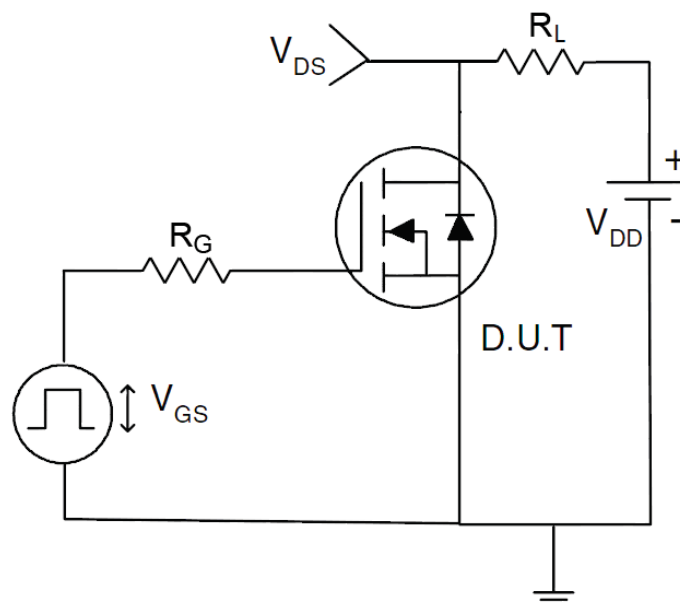
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



RATING AND CHARACTERISTICS CURVES (RM10N100S8)

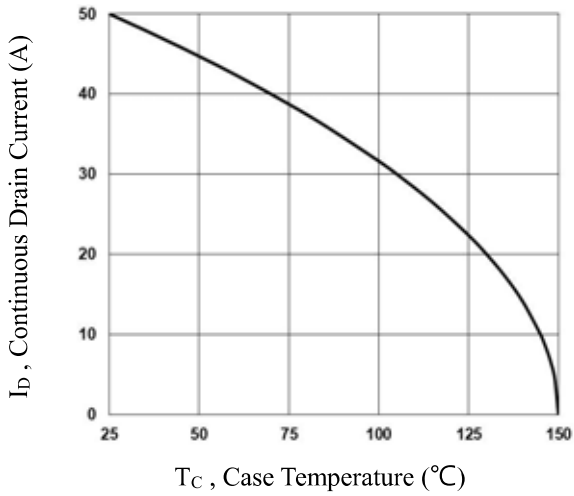


Fig.1 Continuous Drain Current vs. T_C

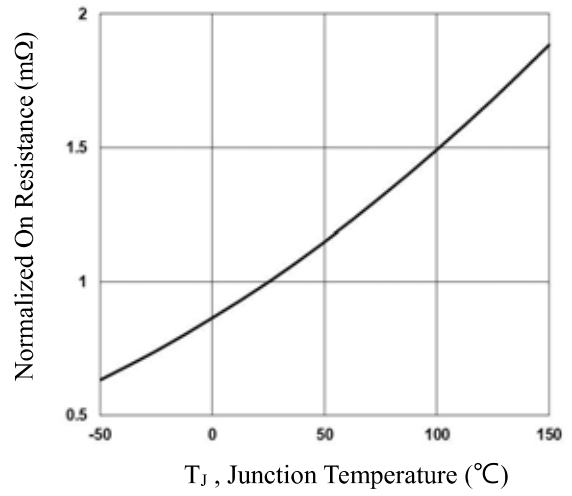


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

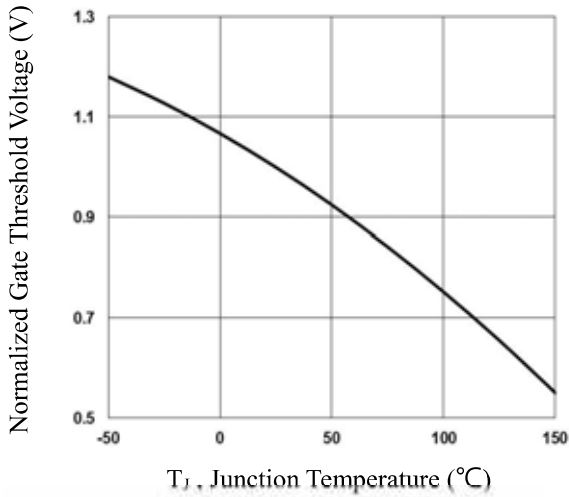


Fig.3 Normalized V_{th} vs. T_J

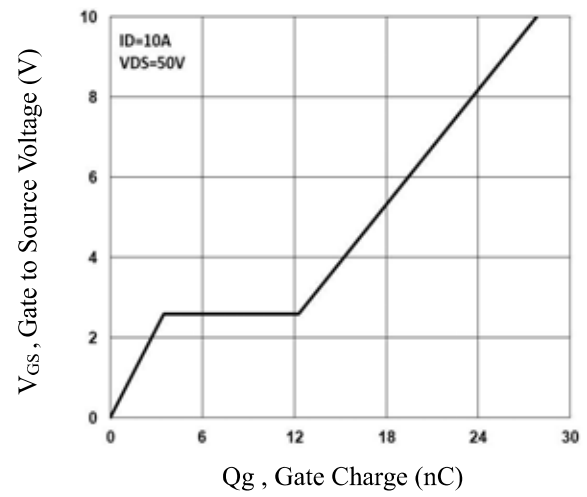


Fig.4 Gate Charge Characteristics

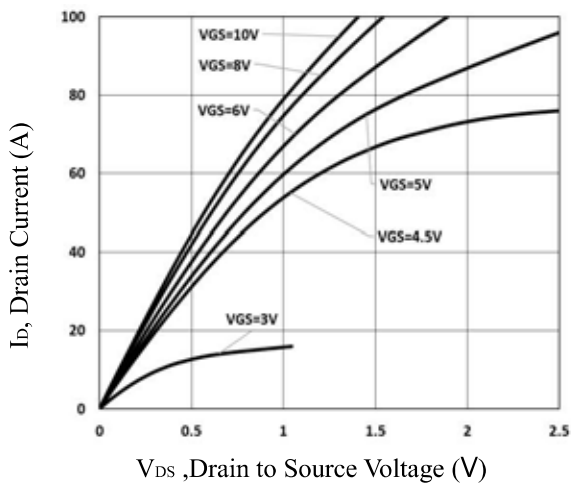


Fig.5 Typical Output Characteristics

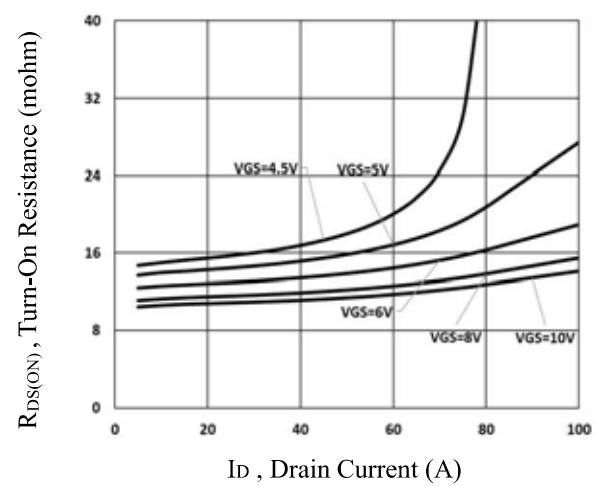


Fig.6 Turn-On Resistance vs. I_D

RATING AND CHARACTERISTICS CURVES (RM10N100S8)

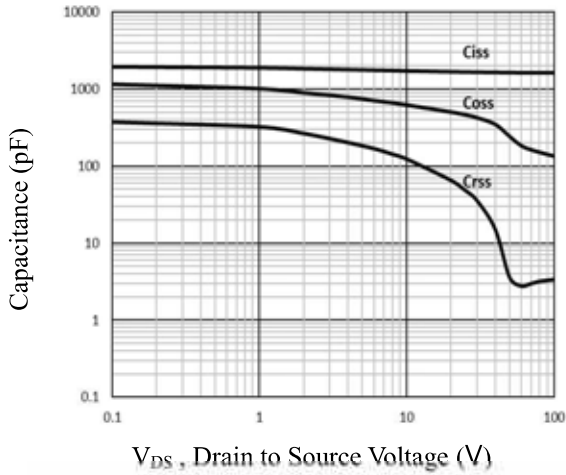


Fig.7 Capacitance Characteristics

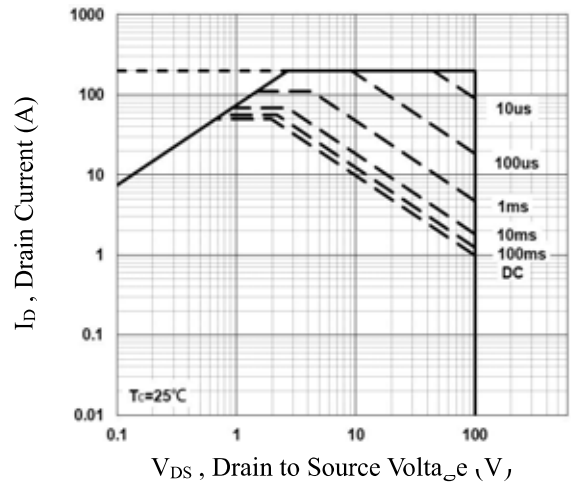


Fig.9 Maximum Safe Operation Area

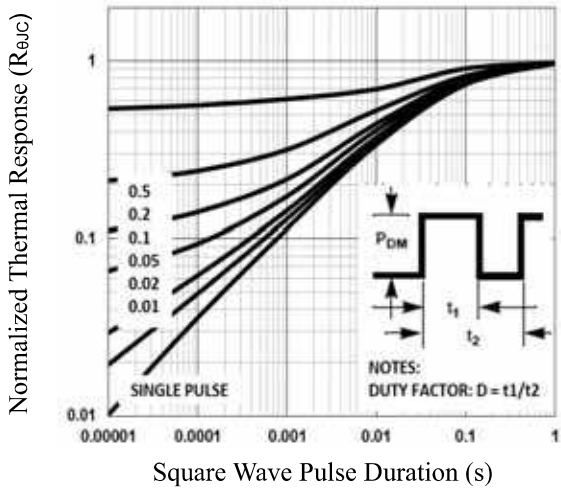


Fig.8 Normalized Transient Impedance

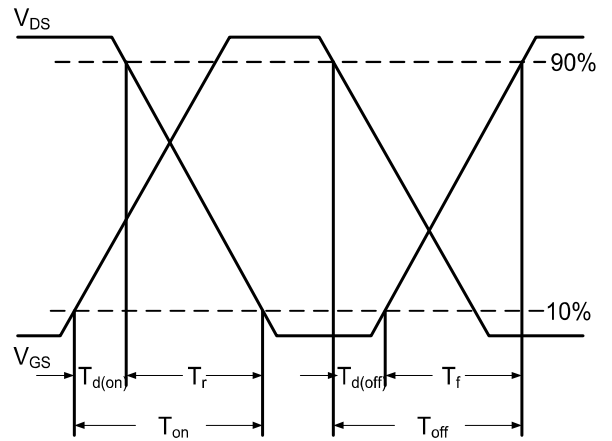


Fig.10 Switching Time Waveform

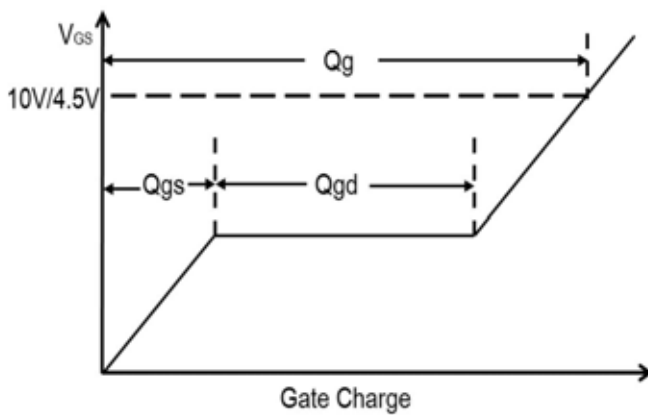
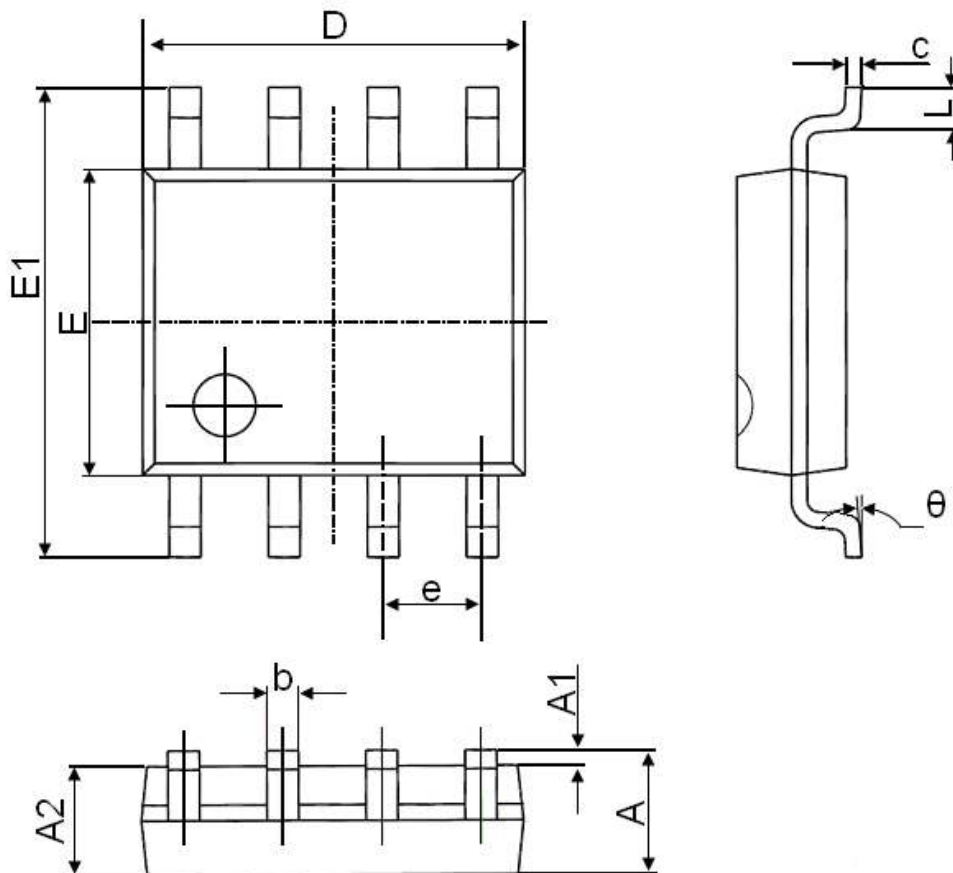


Fig.11 Gate Charge Waveform

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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