

PRM9R0N06S8

PFC Device Corporation

60V Single N-Channel MOSFET

Major ratings and characteristics

Characteristics	Values	Units
V_{DS}	60	٧
I _D (T _A =25°C)	13	Α
Max. R _{DS(ON)} @V _{GS} =10V	9	mΩ
Max. R _{DS(ON)} @V _{GS} =4.5V	11.5	mΩ
T _J Operating Junction Temperature	-55 to +150	°C

General Description

The N-Channel enhancement mode power field effect transistor is using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. The device is well suited for high efficiency fast switching applications.

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Typical Applications

- Charger Adapter
- Power Tools
- LED Lighting

Features

- Max. R_{DS(ON)}=9mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% E_{AS} Guaranteed
- Green Device Available

1. Characteristics

Maximum Ratings Characteristics

($T_A = 25$ °C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
	Drain Current – Continuous (T _A =25°C)	13	Α
I _D	Drain Current – Continuous (T _A =100°C)	8.2	А
I _{DM}	Drain Current – Pulsed ¹	52	А
E _{AS}	Single Pulse Avalanche Energy ²	31	mJ
I _{AS}	Single Pulse Avalanche Current ²	25	А
В	Power Dissipation (T _A =25°C)	2.5	W
P _D	Power Dissipation – Derate above 25°C	0.02	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Unit
$R_{\theta,JA}$	Thermal Resistance Junction to Ambient		50	°C/W



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Electrical Characteristics

(T_J = 25 °C unless otherwise specified)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60			V
1	Dania Corres I solve as Crement	V _{DS} =60V, V _{GS} =0V, T _J =25°C			1	uA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =125°C			250	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA

On Characteristics

D	Static Drain-Source On-Resistance	V_{GS} =10V, I_D =6A			9	$m\Omega$
$R_{DS(ON)}$		V _{GS} =4.5V, I _D =3A			11.5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1	3.0	>
g_{fs}	Forward Transconductance	V_{DS} =5V, I_{D} =6A	1	25	I	S

Dynamic and switching Characteristics

	Dynamic and Switching Characteristics					
Q_{q}	Total Gate Charge ^{3, 4}			23		
Q_{qs}	Gate-Source Charge ^{3, 4}	V_{DS} =30V, V_{GS} =10V, I_{D} =13A		4.6		nC
Q_gd	Gate-Drain Charge ^{3, 4}			3.5		
$T_{d(on)}$	Turn-On Delay Time ^{3, 4}			10		
T _r	Turn-On Rise Time ^{3, 4}	V_{DD} =30V, V_{GS} =10V, R_{G} =6 Ω		52		no
$T_{d(off)}$	Turn-Off Delay Time ^{3, 4}			28		ns
T_f	Turn-Off Fall Time ^{3, 4}			49		
C _{iss}	Input Capacitance			1320		
C _{oss}	Output Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz		430	-	pF
C_{rss}	Reverse Transfer Capacitance			35		
R_{g}	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.7		Ω

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$V_{GS}=0V$, $I_{S}=13A$	 	1.5	V
t _{rr}	Reverse Recovery Time	1 _12	 29		ns
Q_{rr}	Reverse Recovery Charge	I _S =13A, di/dt=100A/us	 14		nC

Note:

- 1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
- 2. L=0.1mH, $R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3. The data tested by pulsed, pulse width ≤300us, duty cycle ≤2%.
- 4. Essentially independent of operating temperature.



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2. Characteristics Curves

Ratings and Characteristics Curves

(T_A = 25° unless otherwise specified)

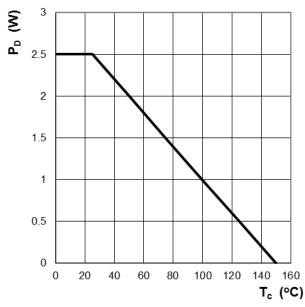


Figure 1: Power Dissipation

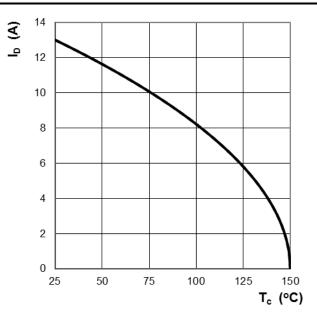


Figure 2: Continuous Drain Current vs. T_C

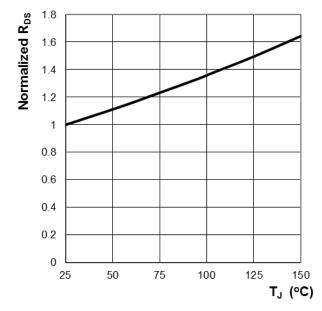


Figure 3: Normalized R_{DS(ON)} vs. T_J

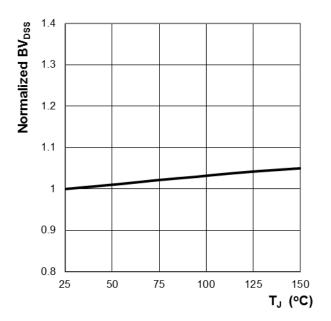


Figure 4: Normalized BV_{DSS} vs. T_J



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Ratings and Characteristics Curves

(T_A = 25° unless otherwise specified)

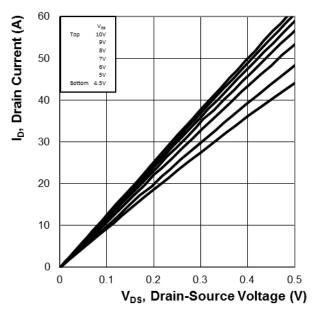


Figure 5: On-Region Characteristics

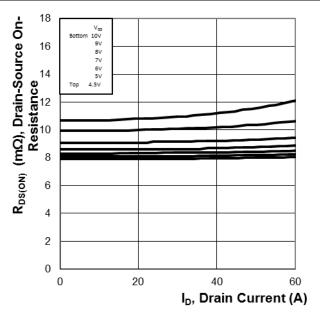


Figure 6: Typ. R_{DS} Variation vs. I_D and V_{GS}

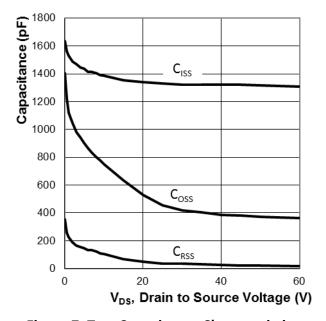


Figure 7: Typ. Capacitance Characteristics

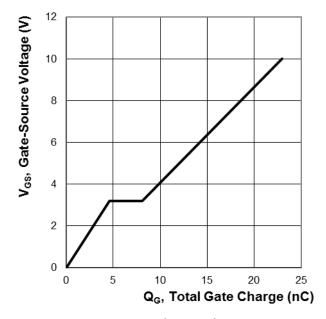


Figure 8: Typ. Gate Charge Characteristics



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Characteristics PRM9R0N06S8

Ratings and Characteristics Curves

(T_A = 25°C unless otherwise specified)

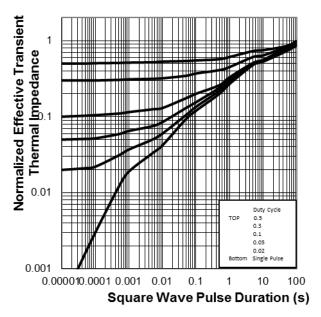


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

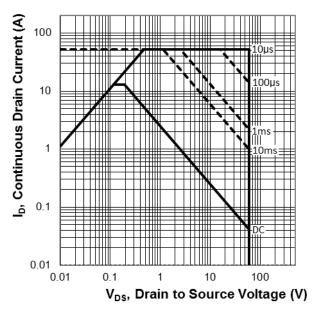


Figure 10: Maximum Safe Operation Area



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3. Marking information

Top Marking Rule

PFC PRM 9R0N06S8 YYWW ABSH

PRM9R0N06S8 = Product Type Marking Code

YYWW = Date Code

YY = Last two digits of year

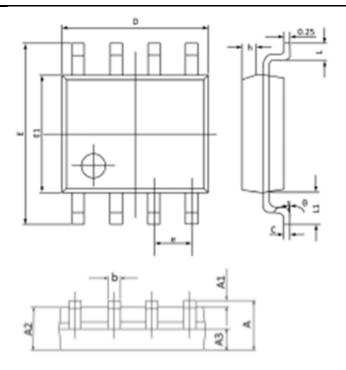
WW = Week code

ABS = Assembly code

H = Halogen Free (N/A = common molding compound)

4. Package information

Package Outline Dimensions millimeters



Dim.	Min. Max.				
A	1.35	1.75			
Al	0.10	0.25			
A2	1.30				
A3	0.60	0.70			
b	0.35	0.49			
С	0.18 0.26				
D	4.70 5.10				
E	5.80 6.20				
E1	3.70 4.10				
e	1.27	BSC			
h	0.25	0.50			
L	0.40 0.90				
Ll	1.05 BSC				
θ	0° 8°				
All Dimensions in mm					



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5. Ordering information

Part Number	Package	Delivery mode
PRM9R0N06S8	SOP-8	3000 pcs / 13" diameter reel

Mechanical

■ Molder Plastic: UL Flammability Classification Rating 94V-0

Device Weight: 0.005 ounces (0.15grams) – SOP-8

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