

PRM012N06S8

PFC Device Corporation

60V Single N-Channel MOSFET

Major ratings and characteristics

Characteristics	Values	Units
V_{DS}	60	V
I _D (T _A =25°C)	10	Α
Max. R _{DS(ON)}	12	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.

PRM012N06S8 DDDDD SSOP-8

Typical Applications

- Charger Adapter
- Power Tools
- LED Lighting

Features

- Max. $R_{DS(ON)}=12m\Omega@V_{GS}=10V$
- 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)	10	Α
I _D	Drain Current – Continuous (T _A =100°C)	6.3	Α
I _{DM}	Drain Current – Pulsed ¹	40	Α
E _{AS}	Single Pulse Avalanche Energy ²	34	mJ
I _{AS}	Single Pulse Avalanche Current ²	26	Α
ь	Power Dissipation (T _A =25°C)		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



Version 4.2 2 / 8

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	Dunin Course Lookens Courset	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	N) Static Drain-Source On-Resistance	V_{GS} =10V, I_D =5A		10	12	mΩ
$R_{DS(ON)}$		V _{GS} =4.5V, I _D =4A		12	15	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_{D}=250uA$	1.0	1.6	2.5	V
g_{fs}	Forward Transconductance	V_{DS} =5V, I_{D} =5A	-	29	ł	S

Dynamic and switching Characteristics

Q_q	Total Gate Charge ^{3, 4}		 39	
Q_{qs}	Gate-Source Charge ^{3, 4}	V _{DS} =30V, V _{GS} =10V, I _D =10A	 6	 nC
Q_{gd}	Gate-Drain Charge ^{3, 4}		 7.5	
T _{d(on)}	Turn-On Delay Time ^{3, 4}		 13	
T _r	Turn-On Rise Time ^{3, 4}	V_{DD} =30V, V_{GS} =10V, R_{G} =6 Ω	 54	 nc
$T_{d(off)}$	Turn-Off Delay Time ^{3, 4}		 40	 ns
T_f	Turn-Off Fall Time ^{3, 4}		 51	
C _{iss}	Input Capacitance		 2300	
C _{oss}	Output Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	 150	 pF
C_{rss}	Reverse Transfer Capacitance		 80	
R_{g}	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	 1.6	 Ω

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	V_{GS} =0V, I_{S} =10A			1.5	V
t _{rr}	Reverse Recovery Time	L _104 di/dt_1004/ug	-	16		ns
Q_{rr}	Reverse Recovery Charge	I _S =10A, di/dt=100A/us		6		nC

Note:

- 1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
- 2. V_{DD} =50V, V_{GS} =10V, L=0.1mH, I_{AS} =26A, R_G =25 Ω , Starting T_J =25 $^{\circ}$ C
- 3. The data tested by pulsed, pulse width \leq 300us, duty cycle \leq 2%.
- 4. Essentially independent of operating temperature.



Version 4.2 3 / 8

2. Characteristics Curves

Ratings and Characteristics Curves

($T_A = 25^{\circ}C$ unless otherwise specified)

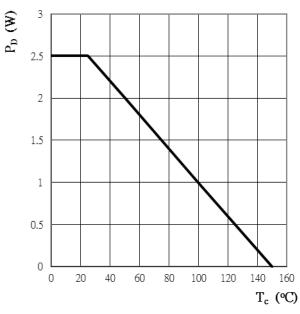


Figure 1: Power Dissipation

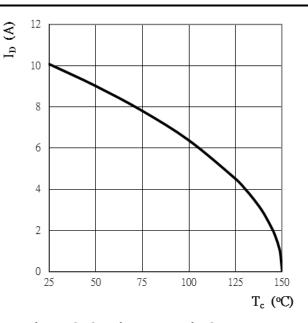


Figure 2: Continuous Drain Current vs. T_C

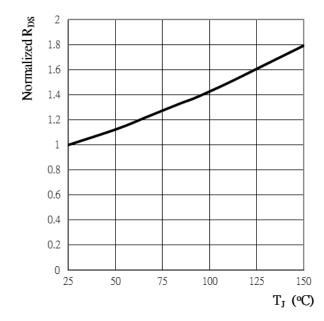


Figure 3: Normalized R_{DS(ON)} vs. T_J

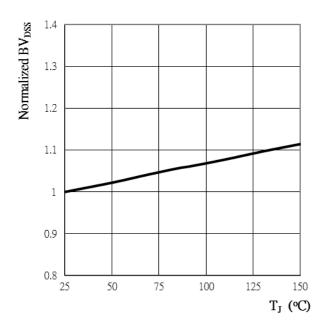


Figure 4: Normalized BV_{DSS} vs. T_J

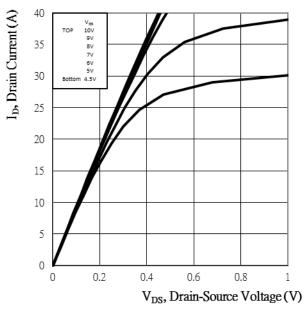


Version 4.2 4 / 8

Characteristics PRM012N06S8

Ratings and Characteristics Curves

(T_A = 25° unless otherwise specified)

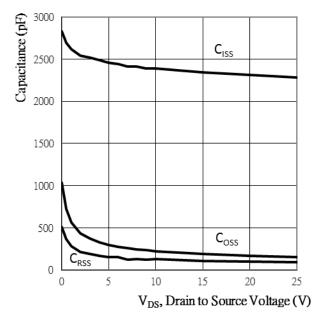


30 Current (A)

10 Drain Current (A)

Figure 5: On-Region Characteristics

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



(N) 30 12 10 10 8 8 4 4 2 4 50 Q_G, Total Gate Charge (nC)

Figure 7: Typ. Capacitance Characteristics

Figure 8: Typ. Gate Charge Characteristics



Version 4.2 5 / 8

Characteristics PRM012N06S8

Ratings and Characteristics Curves

($T_A = 25^{\circ}C$ unless otherwise specified)

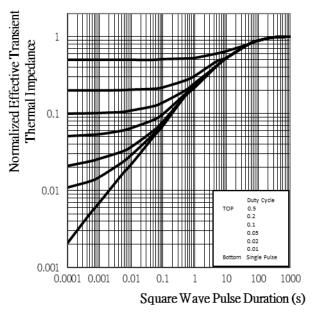


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

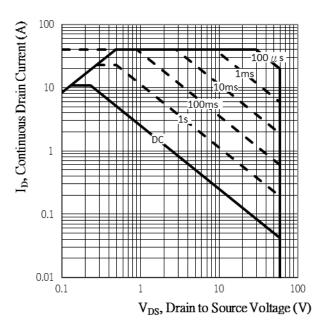


Figure 10: Maximum Safe Operation Area



Version 4.2 6 / 8

3. Marking information

Top Marking Rule

PFC PRM
012N06S8
YYWW ABSH

PRM012N06S8 = Product Type Marking Code

YYWW = Date Code

YY = Last two digits of year

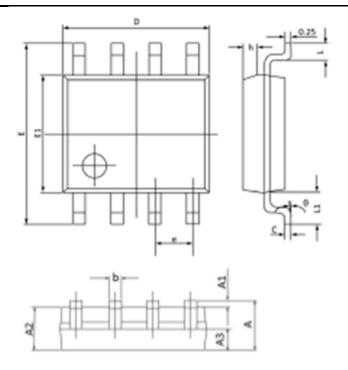
WW = Week code

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					



Version 4.2 7 / 8

5. Ordering information

Part Number	Package	Delivery mode
PRM012N06S8	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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Version 4.2 8 / 8