

PRM012N08D

PFC Device Corporation

75V Single N-Channel MOSFET

Major ratings and characteristics

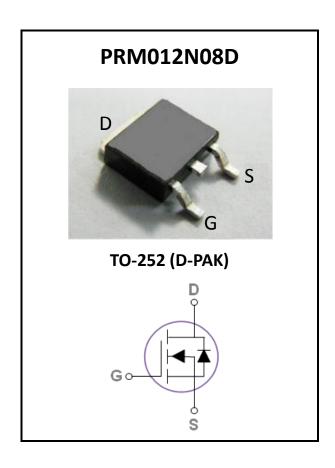
Characteristics	Values	Units
V_{DS}	75	٧
$I_D^6 (T_C=25^{\circ}C)$	50	Α
Max. R _{DS(ON)} @V _{GS} =10V	12	mΩ
Max. R _{DS(ON)} @V _{GS} =4.5V	14.5	mΩ
T _J Operating Junction Temperature	-55 to +150	°C

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.

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	75	V
V_{GS}	Gate-Source Voltage	±20	V
I_D^{5}	Drain Current – Continuous (T _C =25°C)	57	Α
ıD	Drain Current – Continuous (T _C =100°C)	36.1	А
I_D^6	Drain Current – Continuous (T _C =25°C)	50	А
I_{DM}	Drain Current – Pulsed ¹	160	Α
E_AS	Single Pulse Avalanche Energy ²	45	mJ
I _{AS}	Single Pulse Avalanche Current ²	30	Α
D	Power Dissipation (T _C =25°C)	83	W
P_D	Power Dissipation – Derate above 25°C	0.66	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
TJ	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol Parameter		Тур.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient		62	°C/W
Reic	Thermal Resistance Junction to Case		1.5	°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	75			V
	V _{DS} =75V, V _{GS} =0V, T _J =25°C			1	uA	
IDSS	I _{DSS} Drain-Source Leakage Current	V _{DS} =75V, 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

В	D	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A			12	mΩ
	NDS(ON) Static Dialit-Source Off-Resistance	V _{GS} =4.5V, I _D =10A			14.5	mΩ	
	$V_{GS(th)}$	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	ł	2.5	V
	g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A		50	-	S

Dynamic and switching Characteristics

Q_{g}	Total Gate Charge ^{3,4}	V _{DS} =40V, V _{GS} =10V, I _D =20A	 58	
Q_{qs}	Gate-Source Charge ^{3, 4}		 8.5	 nC
Q_{gd}	Gate-Drain Charge ^{3, 4}		 16	
$T_{d(on)}$	Turn-On Delay Time ^{3, 4}	V_{DD} =40V, V_{GS} =10V, R_{G} =6 Ω I_{D} =20A	 15	
T_r	Turn-On Rise Time ^{3, 4}		 36	 ns
$T_{d(off)}$	Turn-Off Delay Time ^{3, 4}		 46	 115
T_f	Turn-Off Fall Time ^{3, 4}		 56	
C _{iss}	Input Capacitance		 3200	
C _{oss}	Output Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	 200	 pF
C_{rss}	Reverse Transfer Capacitance		 130	
R_{g}	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	 0.7	 Ω

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$V_{GS}=0V$, $I_{S}=20A$	 	1.5	V
t _{rr}	Reverse Recovery Time	I _s =20A, di/dt=100A/us	 19		ns
Q_{rr}	Reverse Recovery Charge	1 _S =20A, ul/ul=100A/uS	 7		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 \leq 300us, duty cycle \leq 2%.
- 4. Essentially independent of operating temperature.
- 5. Silicon limited.
- 6. Package limited.



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2. Characteristics Curves

Ratings and Characteristics Curves

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

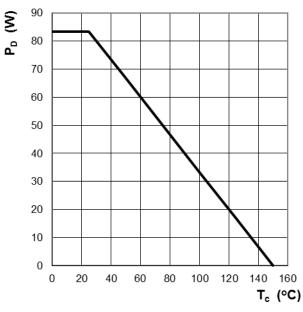


Figure 1: Power Dissipation

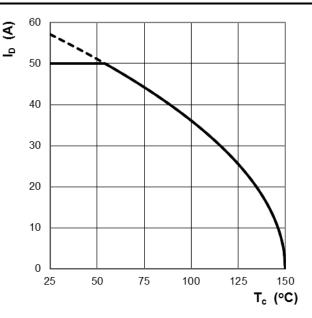


Figure 2: Continuous Drain Current vs. T_C

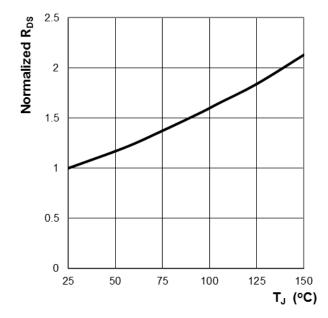


Figure 3: Normalized R_{DS(ON)} vs. T_J

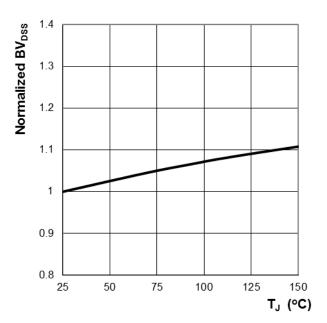


Figure 4: Normalized BV_{DSS} vs. T_J



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Ratings and Characteristics Curves

(T_A = 25° unless otherwise specified)

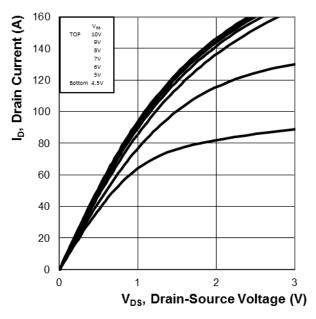


Figure 5: On-Region Characteristics

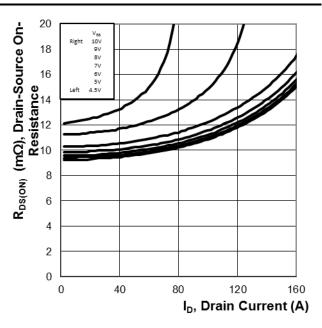


Figure 6: Typ. R_{DS} Variation vs. I_D and V_{GS}

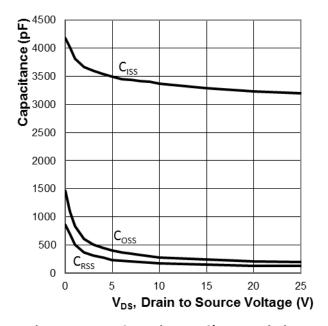


Figure 7: Typ. Capacitance Characteristics

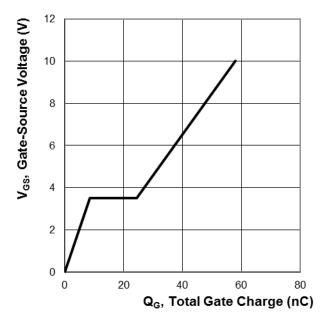


Figure 8: Typ. Gate Charge Characteristics



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Ratings and Characteristics Curves

(T_A = 25°C unless otherwise specified)

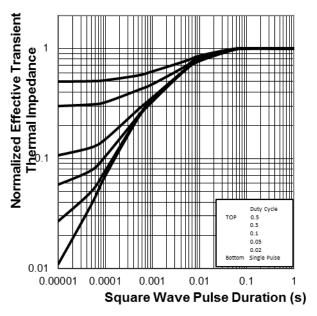


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

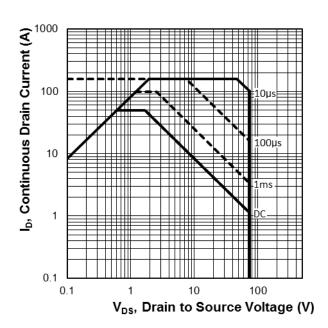


Figure 10: Maximum Safe Operation Area



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3. Marking information

Top Marking Rule

PFC PRM 012N08D YYWW ABSH PRM012N08D = Product Type Marking Code

YYWW = Date Code

YY = Last two digits of year

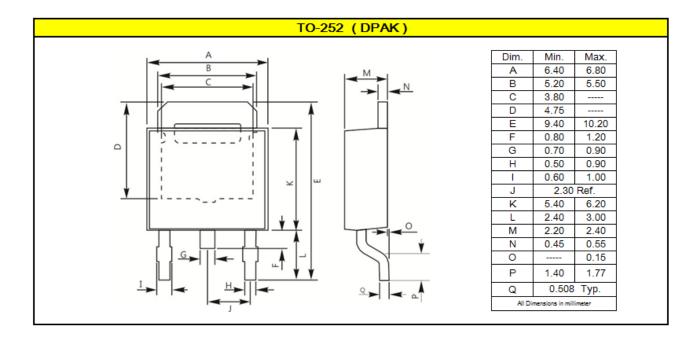
WW = Week code

ABS = Assembly code

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

4. Package information

Package Outline Dimensions millimeters





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5. Ordering information

Part Number	Package	Delivery mode
PRM012N08D	TO-252 (D-PAK)	2500 pcs / 13" diameter reel

Mechanical

Molder Plastic: UL Flammability Classification Rating 94V-0

Device Weight: 0.01 ounces (0.3grams) - TO-252 (D-PAK)

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