PRM8R8N15N5

PFC Device Corporation

150V Single N-Channel MOSFET

Major ratings and characteristics

Characteristics	Values	Units
V_{DS}	150	**V**
I_D[4] (T_C=25°C)	90	**A**
Max. $R_{DS(ON)}$@V_{GS}=10V	8.8	**mΩ**
T_J Operating Junction Temperature	-55 to +150	**°C**

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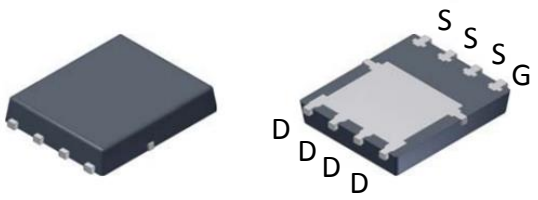
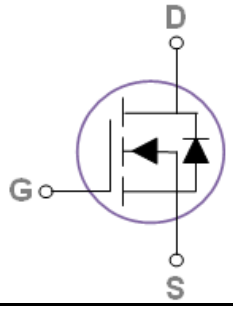


DFN 5x6



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. $R_{DS(ON)}$=8.8mΩ@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	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D[4]	Drain Current – Continuous (T_C=25˚C)	90	A
	Drain Current – Continuous (T_C=100˚C)	57	A
I_D[5]	Drain Current – Continuous (T_C=25˚C)	60	A
I_{DM}	Drain Current – Pulsed[1]	240	A
E_{AS}	Single Pulse Avalanche Energy[2]	29	mJ
I_{AS}	Single Pulse Avalanche Current[2]	12	A
P_D	Power Dissipation (T_C=25˚C)	138	W
	Power Dissipation – Derate above 25˚C	1.1	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	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	55	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.9	˚C/W

Electrical Characteristics (T_J = 25 °C unless otherwise specified)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	150	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=150V, V_{GS}=0V, T_J=25℃	---	---	1	uA
		V_{DS}=120V, V_{GS}=0V, T_J=100℃	---	---	100	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	---	7.5	8.8	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	2	3	4	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=10A	---	30	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=75V, V_{GS}=10V, I_D=22A	---	52	---	nC
Q_{gs}	Gate-Source Charge		---	22	---	
Q_{gd}	Gate-Drain Charge		---	4.1	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=75V, V_{GS}=10V, R_G=3Ω I_D=22A	---	31	---	ns
T_r	Turn-On Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	33	---	
T_f	Turn-Off Fall Time		---	10	---	
C_{iss}	Input Capacitance	V_{DS}=75V, V_{GS}=0V, f=1MHz	---	4270	---	pF
C_{oss}	Output Capacitance		---	334	---	
C_{rss}	Reverse Transfer Capacitance		---	29	---	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	0.9	---	Ω

Drain-Source Diode Characteristics

V_{SD} [3]	Source to Drain Diode Voltage	V_{GS}=0V, I_S=1A	---	---	1	V
t_{rr}	Reverse Recovery Time	I_S=20A, di/dt=100A/us	---	76	---	ns
Q_{rr}	Reverse Recovery Charge		---	208	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. L=0.4mH, R_G=25Ω,Starting T_J=25℃
3. The data tested by pulsed, pulse width ≦300us, duty cycle ≦2%.
4. Silicon limited.
5. Package limited.

2. Characteristics Curves

Ratings and Characteristics Curves **(T_A = 25℃ unless otherwise specified)**

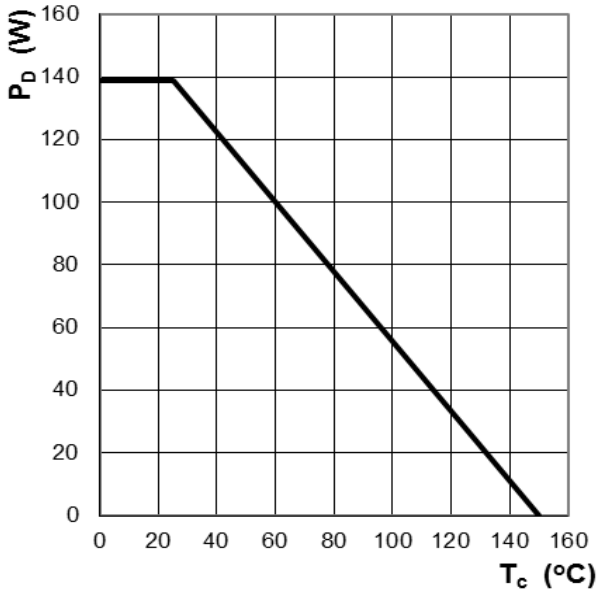


Figure 1: Power Dissipation

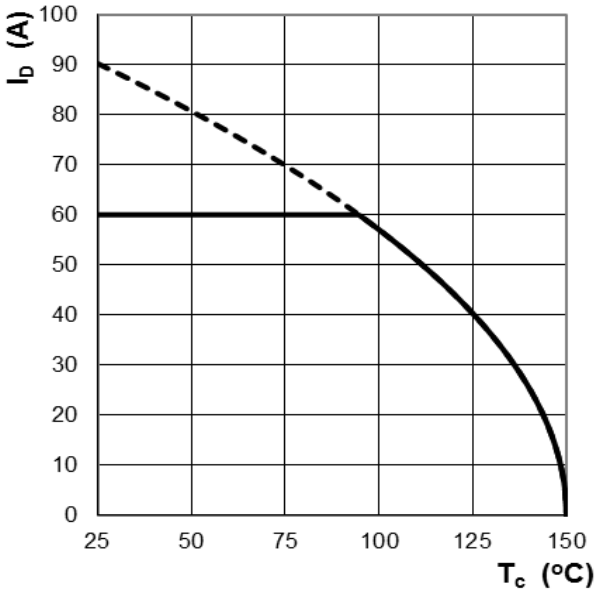


Figure 2: Continuous Drain Current vs. T_C

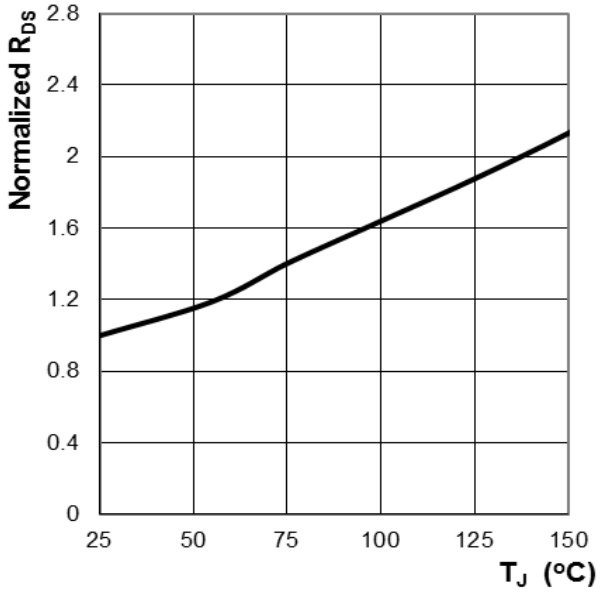


Figure 3: Normalized $R_{DS(ON)}$ vs. T_J

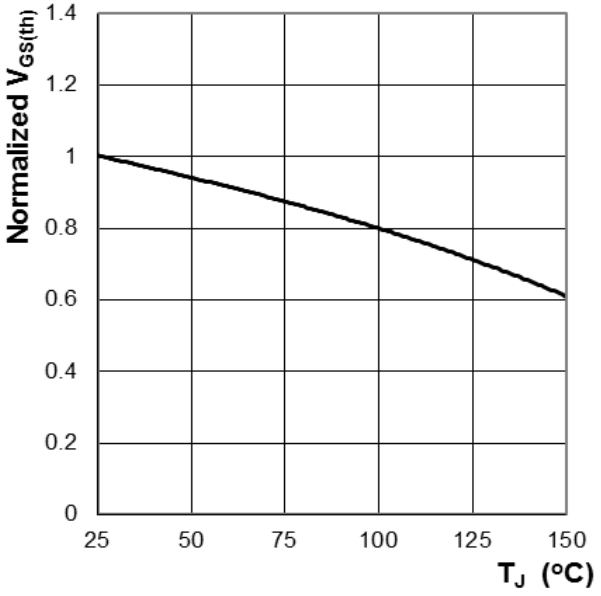


Figure 4: Normalized $V_{GS(th)}$ vs. T_J

Ratings and Characteristics Curves **(T_A = 25℃ unless otherwise specified)**

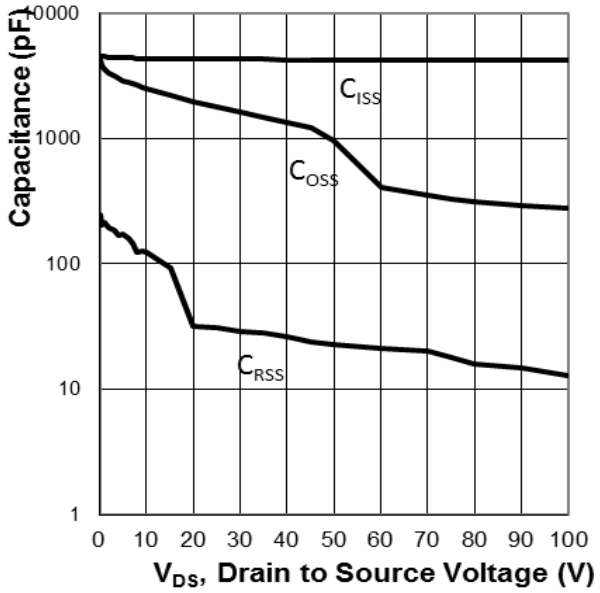


Figure 7: Typ. Capacitance Characteristics

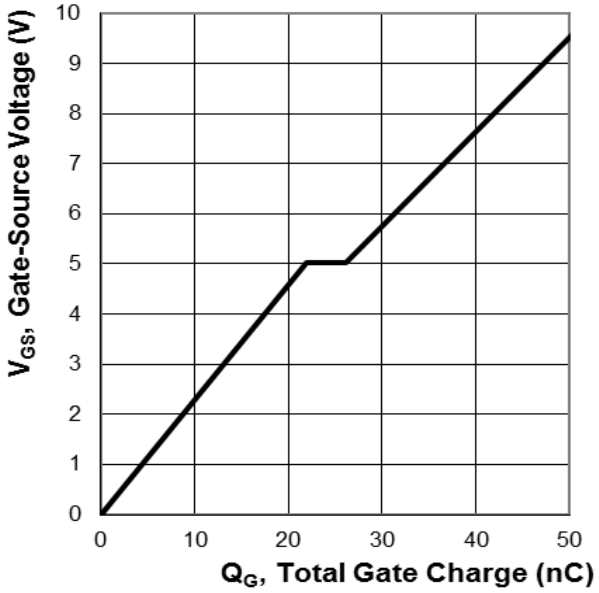


Figure 8: Typ. Gate Charge Characteristics

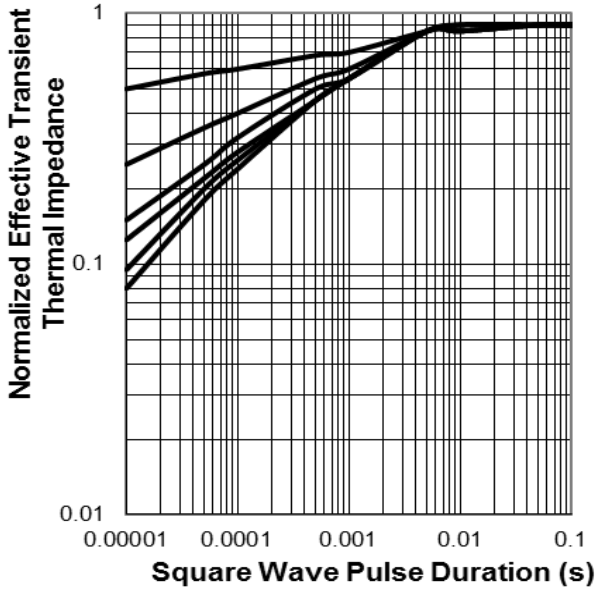


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

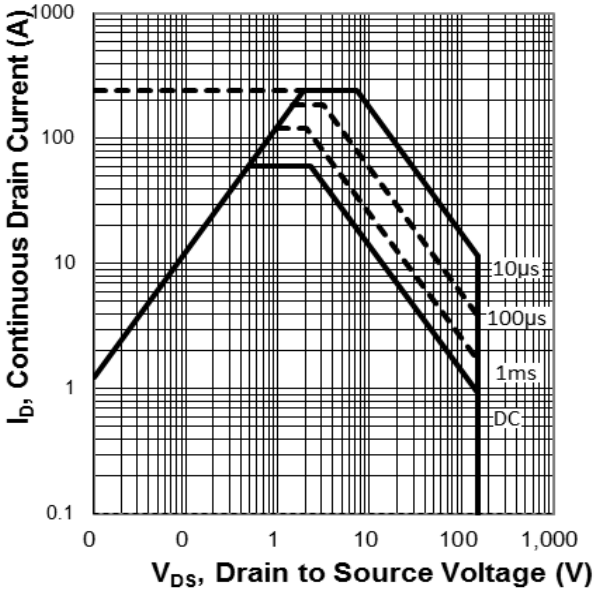


Figure 10: Maximum Safe Operation Area

3. Marking information

Top Marking Rule

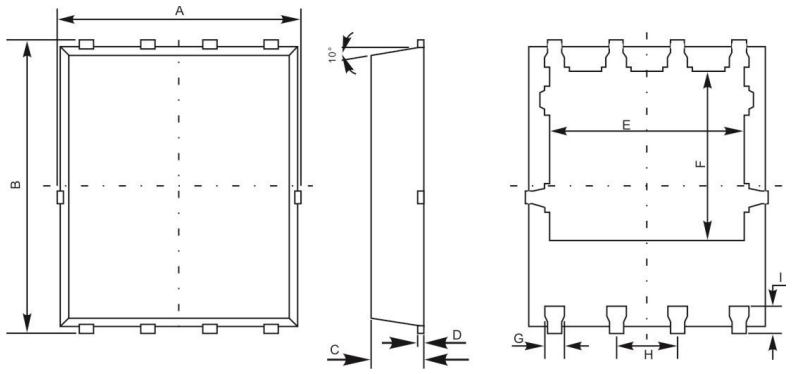
PFC PRM
8R8N15N5
YYWW ABSH

PRM8R8N15N5 = 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

DFN 5X6



Dim.	Min.	Max.
A	5.02 typ.	
B	6.15 typ.	
C	0.80	1.20
D	0.254 Ref.	
E	3.91	4.11
F	3.38	3.58
G	0.30	0.50
H	1.27 Ref.	
I	0.45	0.65
All Dimensions in millimeter		

5. Ordering information

Part Number	Package	Delivery mode
PRM8R8N15N5	DFN 5X6	3000 pcs / 13" diameter reel

Mechanical

- Molder Plastic: UL Flammability Classification Rating 94V-0
- Device Weight : 0.003 ounces (0.093grams) – DFN 5x6