PRM012N06CT

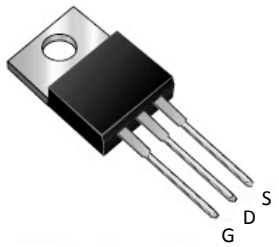
PFC Device Corporation

60V Single N-Channel MOSFET

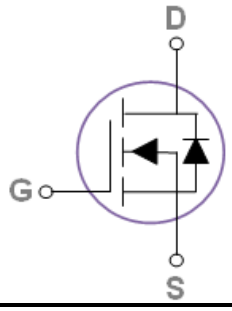
Major ratings and characteristics

Characteristics	Values	Units
V_{DS}	60	**V**
I_D (T_C=25˚C)	70	**A**
Max. $R_{DS(ON)}$	12	**mΩ**
T_J Operating Junction Temperature	-55 to +150	**°C**

PRM012N06CT



TO-220AB



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. $R_{DS(ON)}$=12mΩ@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
I_D	Drain Current – Continuous (T_C=25˚C)	70	A
	Drain Current – Continuous (T_C=100˚C)	44	A
I_{DM}	Drain Current – Pulsed[1]	160	A
E_{AS}	Single Pulse Avalanche Energy[2]	34	mJ
I_{AS}	Single Pulse Avalanche Current[2]	26	A
P_D	Power Dissipation (T_C=25˚C)	125	W
	Power Dissipation – Derate above 25˚C	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	---	62	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	1.0	˚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	60	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V, V_{GS}=0V, T_J=25°C	---	---	1	uA
		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

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	---	10	12	mΩ
		V_{GS}=4.5V, I_D=10A	---	12	15	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	1.0	1.6	3.0	V
gfs	Forward Transconductance	V_{DS}=5V, I_D=20A	---	80	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=30V, V_{GS}=10V, I_D=20A	---	38	---	nC
Q_{gs}	Gate-Source Charge		---	5.5	---	
Q_{gd}	Gate-Drain Charge		---	8.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, V_{GS}=10V, R_G=6Ω I_D=20A	---	11	---	ns
T_r	Turn-On Rise Time		---	46	---	
$T_{d(off)}$	Turn-Off Delay Time		---	39	---	
T_f	Turn-Off Fall Time		---	79	---	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	2300	---	pF
C_{oss}	Output Capacitance		---	150	---	
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} [3]	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	---	8	---	ns
Q_{rr}	Reverse Recovery Charge		---	1	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. L=0.1mH, R_G=25Ω, Starting T_J=25°C
3. The data tested by pulsed , pulse width ≦300us, duty cycle ≦2%.

2. Characteristics Curves

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

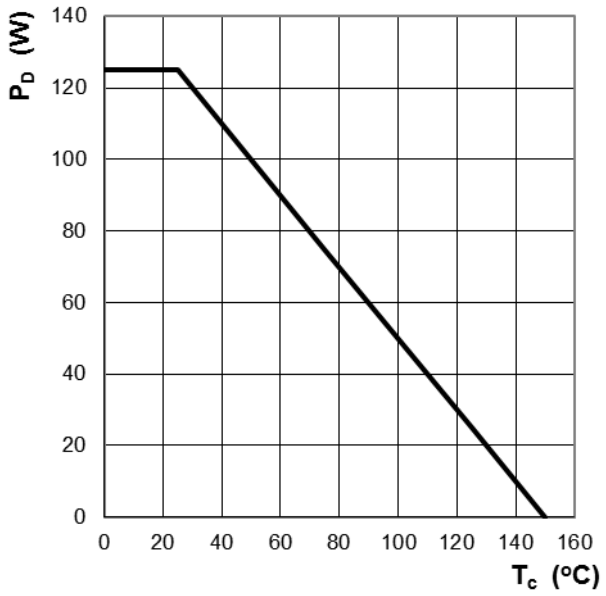


Figure 1: Power Dissipation

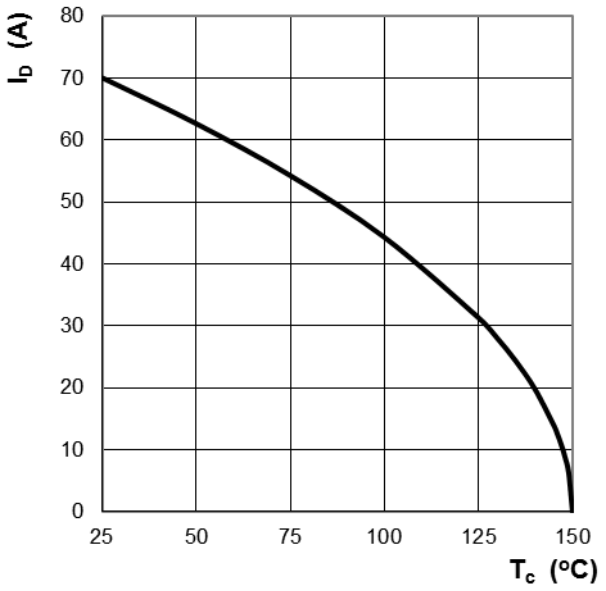


Figure 2: Continuous Drain Current vs. T_C

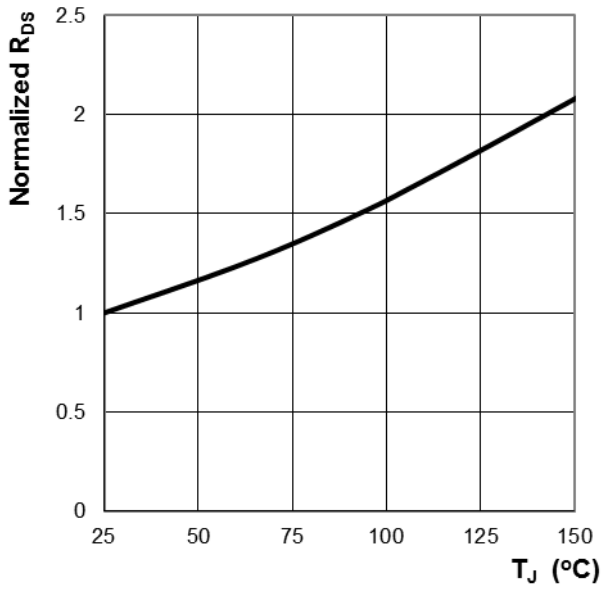


Figure 3: Normalized $R_{DS(ON)}$ vs. T_J

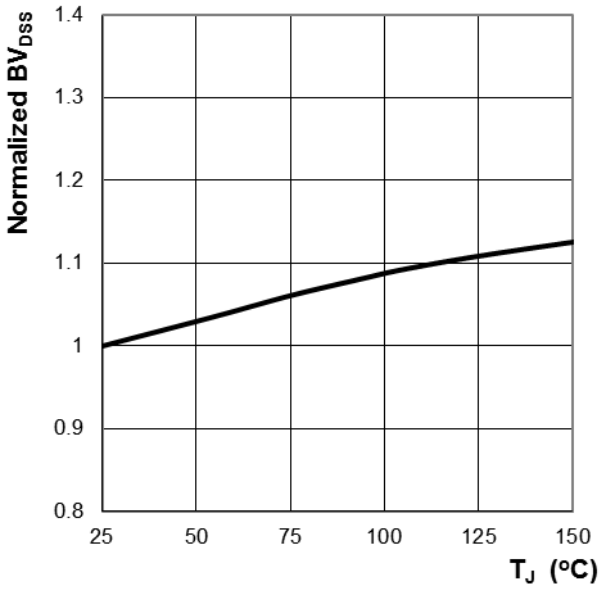


Figure 4: Normalized BV_{DSS} vs. T_J

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

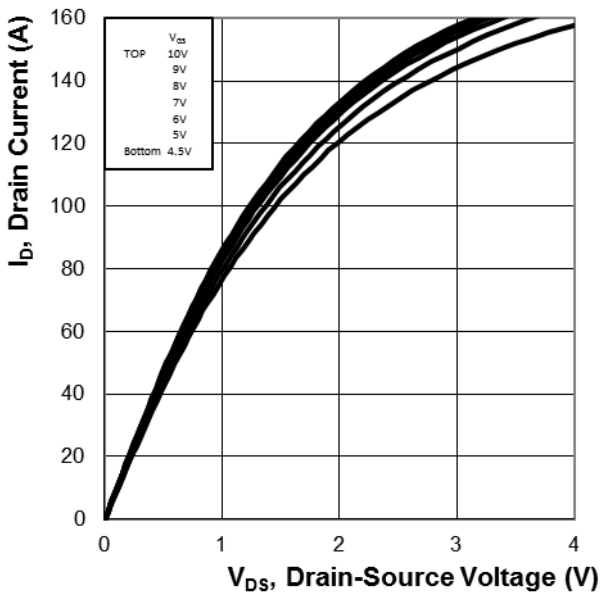


Figure 5: On-Region Characteristics

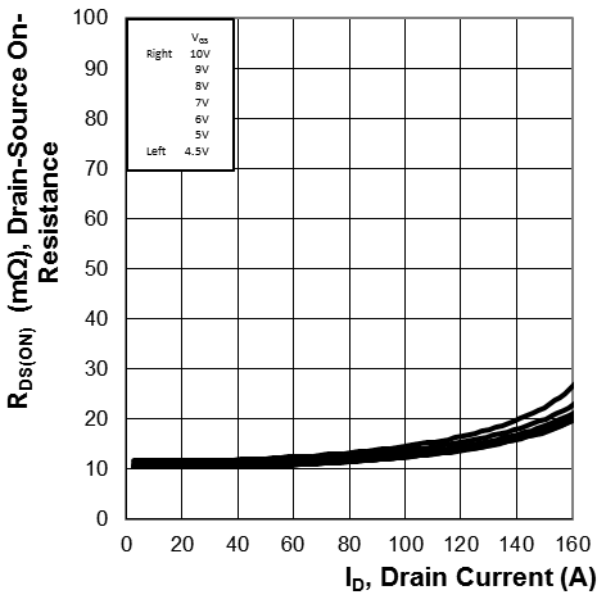


Figure 6: Typ. R_{DS} Variation vs. I_D and V_{GS}

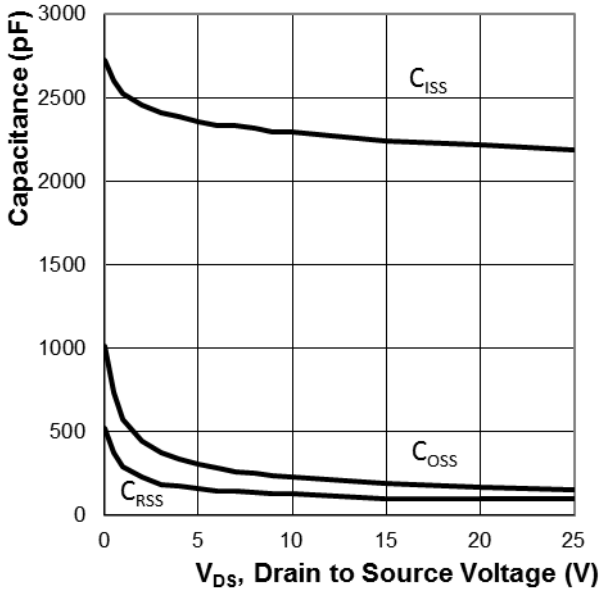


Figure 7: Typ. Capacitance Characteristics

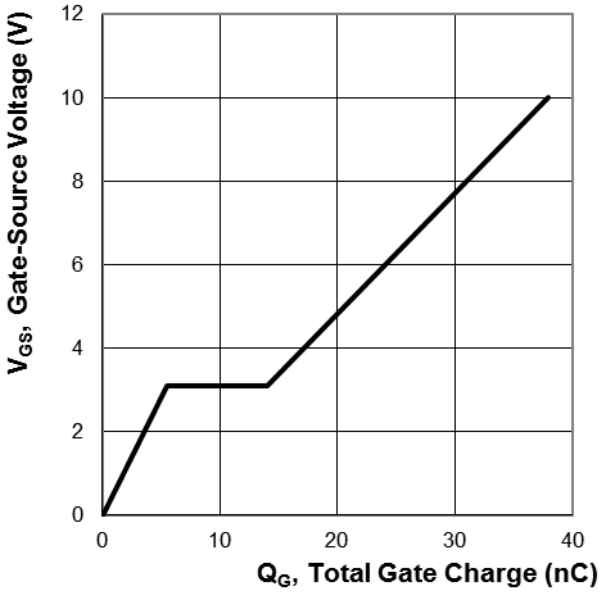


Figure 8: Typ. Gate Charge Characteristics

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

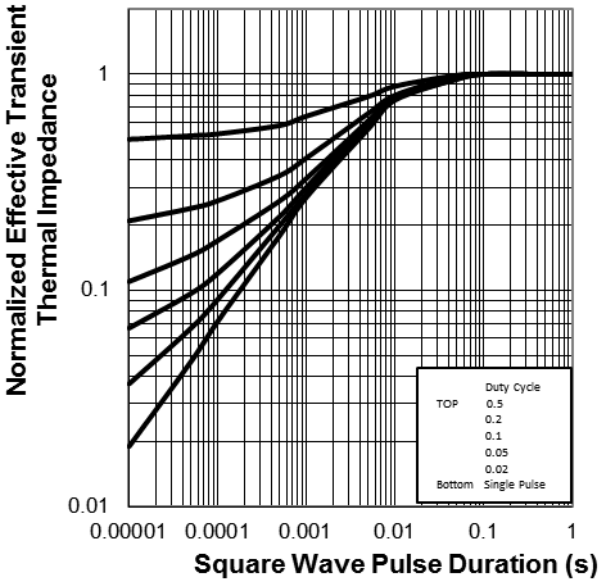


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

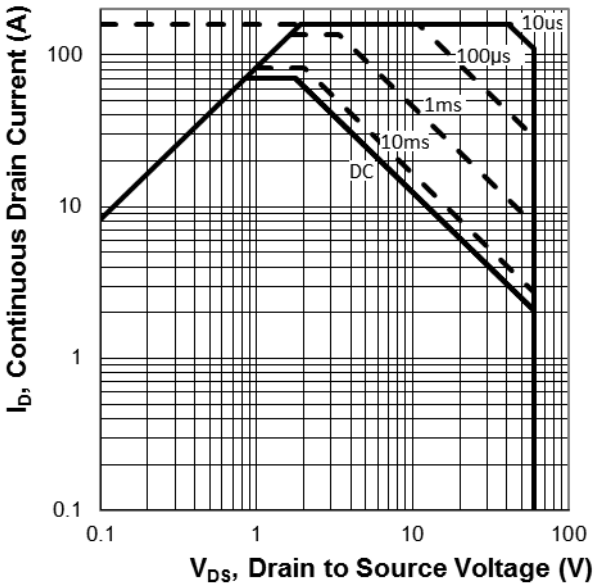


Figure 10: Maximum Safe Operation Area

3. Marking information

Top Marking Rule

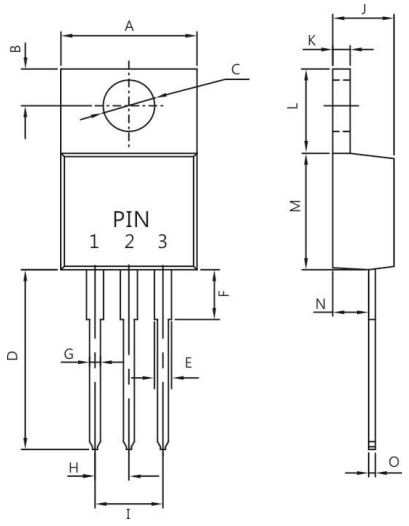
PFC PRM
012N06CT
YYWW ABSH

PRM012N06CT = 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

TO-220AB



Dim.	Min.	Max.
A	-----	10.50
B	2.50	3.50
C	3.50	4.10
D	13.10	13.90
E	1.15	1.49
F	-----	4.50
G	0.65	0.95
H	2.29	2.79
I	4.80	5.30
J	4.40	4.80
K	1.14	1.40
L	5.84	6.86
M	8.50	9.60
N	2.03	2.92
O	0.30	0.64
All Dimensions in millimeter		

5. Ordering information

Part Number	Package	Delivery mode
PRM012N06CT	TO-220AB	50 pcs / Tube

Mechanical

- Molder Plastic: UL Flammability Classification Rating 94V-0
- Device Weight : 0.07 ounces (1.96grams) - TO-220AB
- Mounting Torque : Recommended 4~5 kg-cm