PRM065P03T3

PFC Device Corporation

30V Single P-Channel MOSFET

Major ratings and characteristics

Characteristics	Values	Units
V_{DS}	-30	**V**
I_D[5] (T_C=25°C)	-4.1	**A**
Max. $R_{DS(ON)}$@V_{GS}=-10V	65	**mΩ**
Max. $R_{DS(ON)}$@V_{GS}=-4.5V	75	**mΩ**
T_J Operating Junction Temperature	-55 to +150	**°C**

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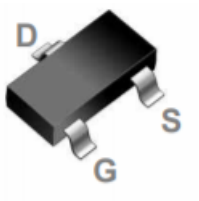
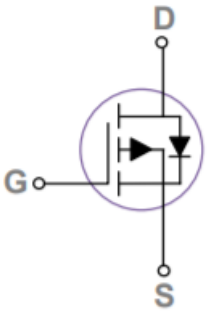


SOT23-3S



General Description

The P-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.

Features

- Max. $R_{DS(ON)}$=65mΩ@V_{GS}=-10V
- Improved dv/dt capability
- Fast switching
- 100% E_{AS} Guaranteed
- Green Device Available

Typical Applications

- Charger Adapter
- Power Tools
- LED Lighting

1. Characteristics

Maximum Ratings Characteristics (T_A = 25 °C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±12	V
I_D[5]	Drain Current – Continuous (T_C=25˚C)	-4.1	A
	Drain Current – Continuous (T_C=100˚C)	-2.6	A
I_{DM}	Drain Current – Pulsed[1]	-16.4	A
E_{AS}	Single Pulse Avalanche Energy[2]	4.6	mJ
I_{AS}	Single Pulse Avalanche Current[2]	9.6	A
P_D	Power Dissipation (T_C=25˚C)	1.56	W
	Power Dissipation – Derate above 25˚C	0.012	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	---	130	˚C/W
$R_{\theta JL}$	Thermal Resistance Junction to Lead	---	80	˚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	-30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V, V_{GS}=0V, T_J=25°C	---	---	-1	uA
		V_{DS}=-20V, V_{GS}=0V, T_J=125°C	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12, V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-4A	---	55	65	mΩ
		V_{GS}=-4.5V, I_D=-3A	---	65	75	mΩ
		V_{GS}=-2.5V, I_D=-2A		85	100	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250uA	-0.4	---	-0.9	V
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-5A	---	16	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-4A	---	7	---	nC
Q_{gs}	Gate-Source Charge[3,4]		---	1.2	---	
Q_{gd}	Gate-Drain Charge[3,4]		---	2	---	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=-15V, V_{GS}=-10V, R_G=6Ω I_D=-1A	---	3.8	---	ns
T_r	Turn-On Rise Time[3,4]		---	21	---	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		---	48	---	
T_f	Turn-Off Fall Time[3,4]		---	34	---	
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	---	660	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	56	---	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	11	---	Ω

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	V_{GS}=0V, I_S=-1A	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. VDD=50V, VGS=10V, L=0.1mH, RG=25Ω, Starting TJ=25℃
3. The data tested by pulsed , pulse width ≦300us , duty cycle ≦2%.
4. Essentially independent of operating temperature.
5. Silicon limited.

2. Characteristics Curves

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

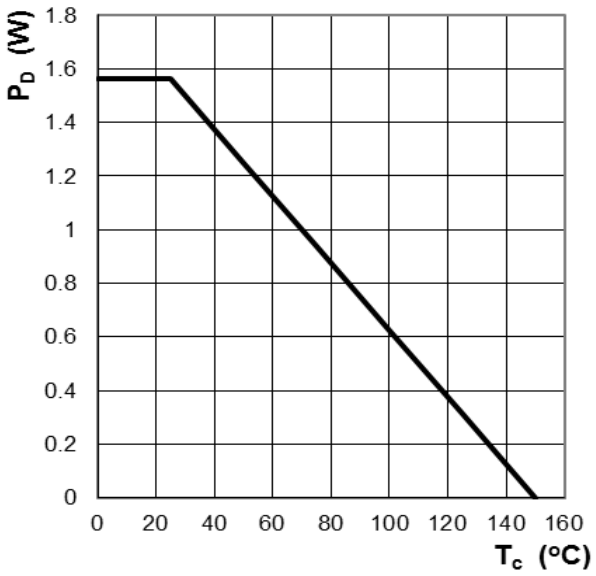


Figure 1: Power Dissipation

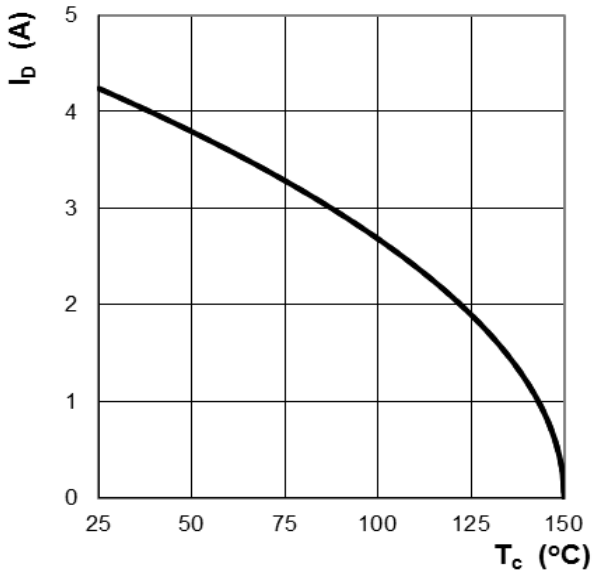


Figure 2: Continuous Drain Current vs. T_C

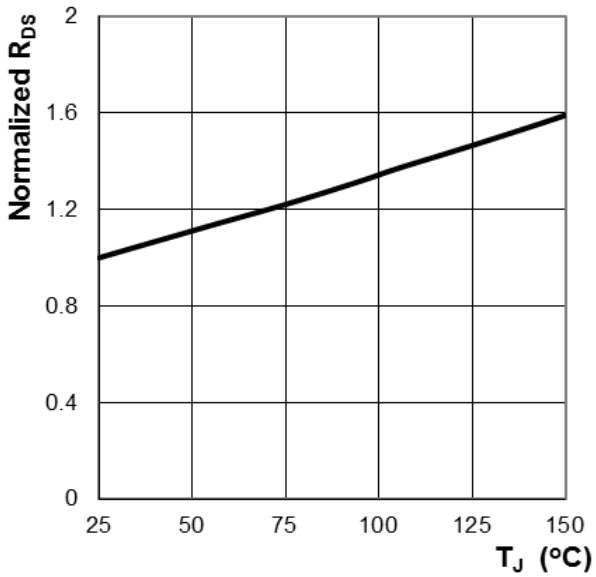


Figure 3: Normalized $R_{DS(ON)}$ vs. T_J

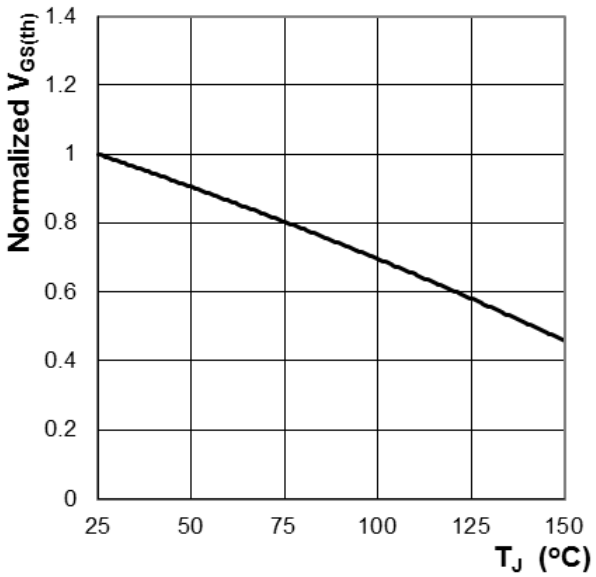


Figure 4: Normalized Vth vs. T_J

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

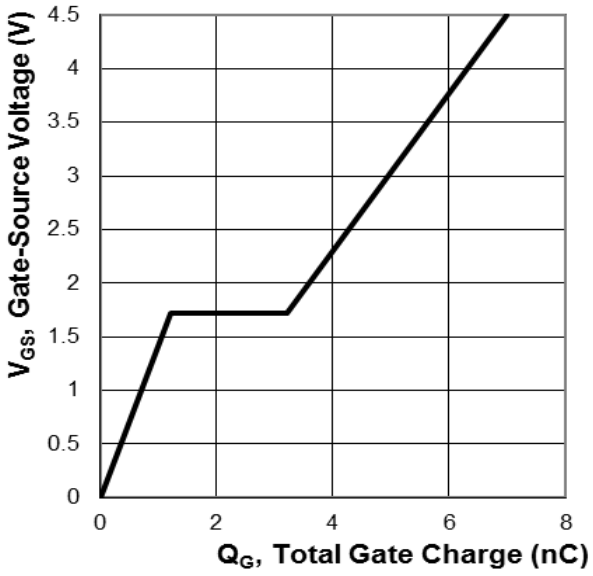


Figure 5: Typ. Gate Charge Characteristics

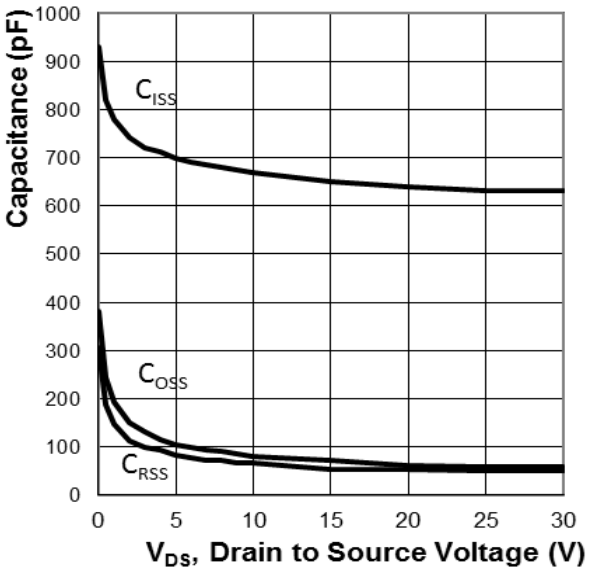


Figure 6: Typ. Capacitance Characteristics

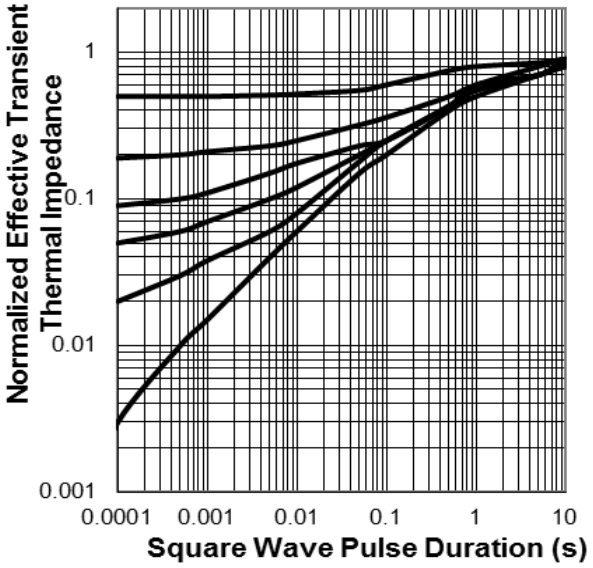


Figure 7: Normalized Thermal Transient Impedance, Junction-to-Case

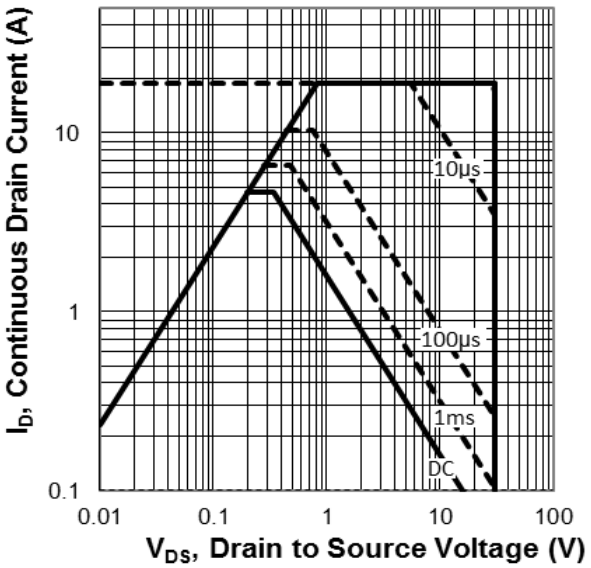


Figure 8: Maximum Safe Operation Area

3. Marking information

Top Marking Rule

PYWAB

PYWAB = Product Type Marking Code

P = Part name code

Y = Year code

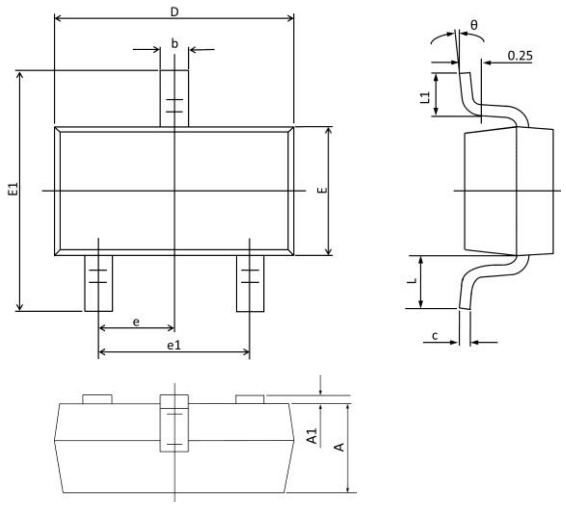
W = Week code

AB = Assembly code

4. Package information

Package Outline Dimensions millimeters

SOT23-3S



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°

5. Ordering information

Part Number	Package	Delivery mode
PRM065P03T3	SOT-23S	3000 pcs / 13" diameter reel

Mechanical

- Molder Plastic: UL Flammability Classification Rating 94V-0
- Device Weight : 0.00029 ounces (0.0082grams) – SOT-23S