



PFC Device Corporation

PRM065P03T3

30V Single P-Channel MOSFET

Major ratings and characteristics

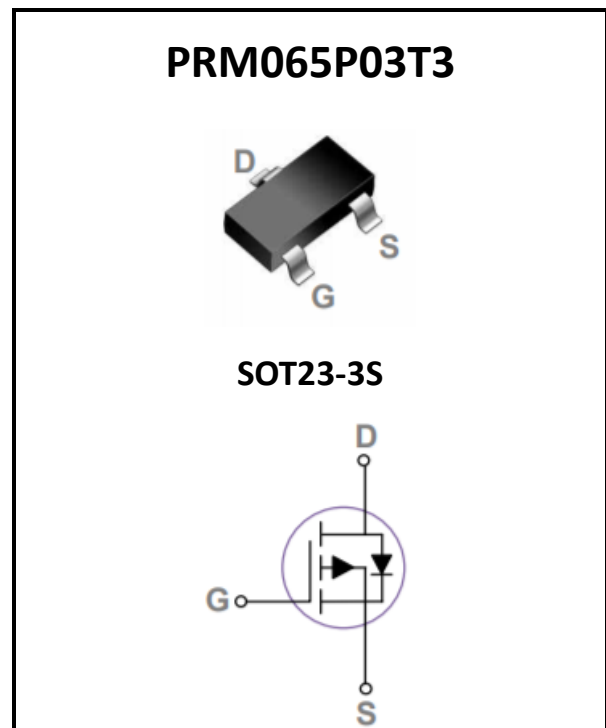
Characteristics	Values	Units
V_{DS}	-30	V
I_D^5 ($T_C=25^\circ\text{C}$)	-4.1	A
Max. $R_{DS(ON)}$ @ $V_{GS}=-10\text{V}$	65	m Ω
Max. $R_{DS(ON)}$ @ $V_{GS}=-4.5\text{V}$	75	m Ω
T_J Operating Junction Temperature	-55 to +150	$^\circ\text{C}$

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.

Typical Applications

- Charger Adapter
- Power Tools
- LED Lighting



Features

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

1. Characteristics

Maximum Ratings Characteristics ($T_A = 25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	-4.1	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	-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 ($T_C=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	130	$^\circ\text{C/W}$
$R_{\theta JL}$	Thermal Resistance Junction to Lead	---	80	$^\circ\text{C/W}$



Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-20V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-4A$	---	55	65	$m\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	65	75	$m\Omega$
		$V_{GS}=-2.5V, I_D=-2A$		85	100	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-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}	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	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	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	660	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	56	---	
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	---	11	---	Ω

Drain-Source Diode Characteristics

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

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=0.1\text{mH}, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.
5. Silicon limited.



2. Characteristics Curves

Ratings and Characteristics Curves

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

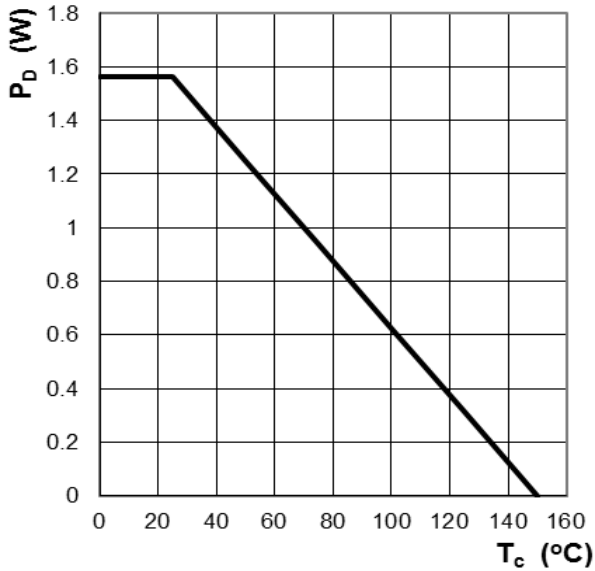


Figure 1: Power Dissipation

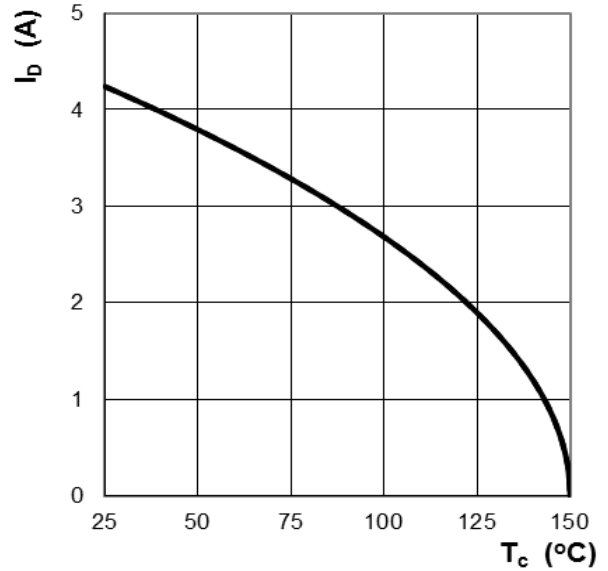


Figure 2: Continuous Drain Current vs. T_c

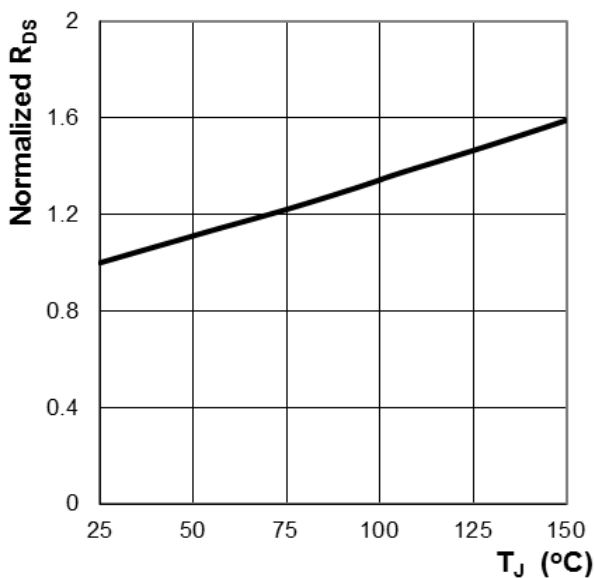


Figure 3: Normalized $R_{DS(ON)}$ vs. T_J

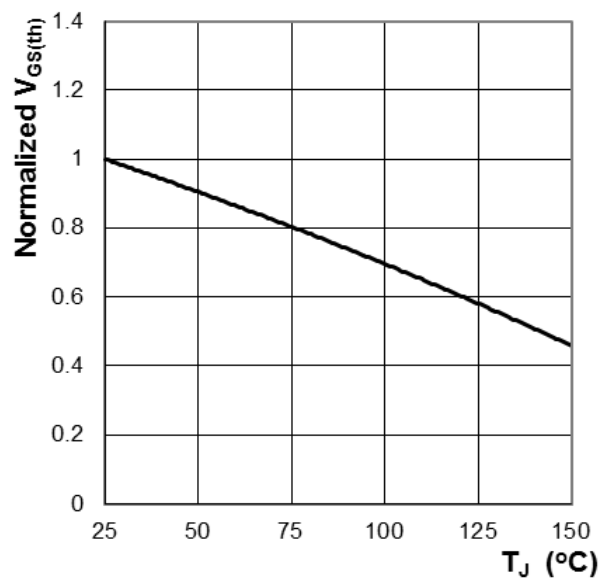


Figure 4: Normalized V_{th} vs. T_J



Ratings and Characteristics Curves

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

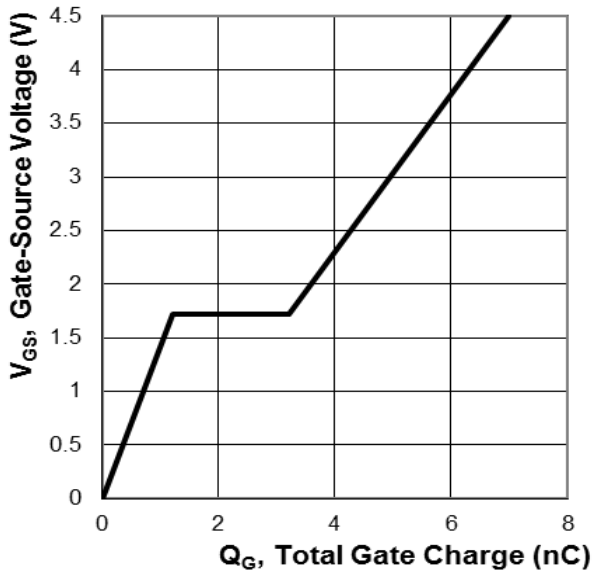


Figure 5: Typ. Gate Charge Characteristics

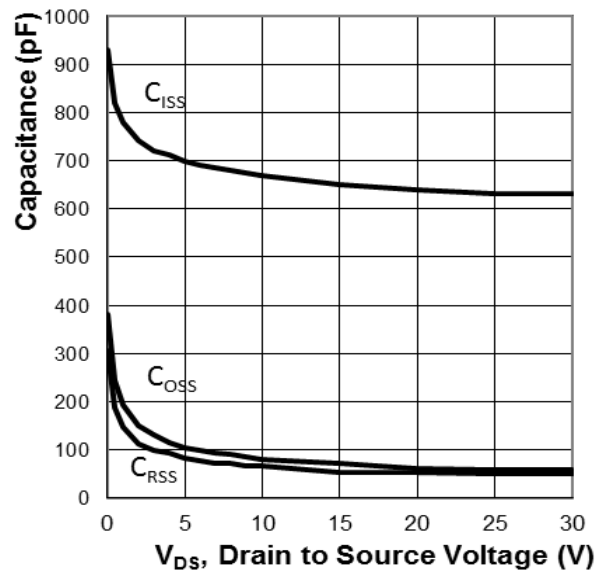


Figure 6: Typ. Capacitance Characteristics

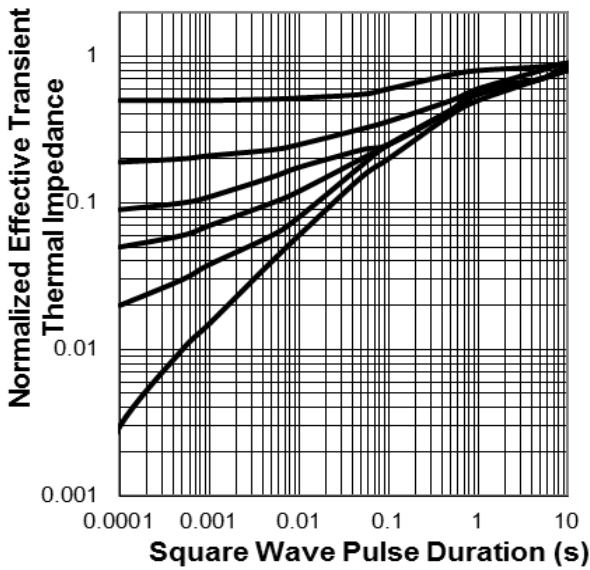


Figure 7: Normalized Thermal Transient Impedance, Junction-to-Case

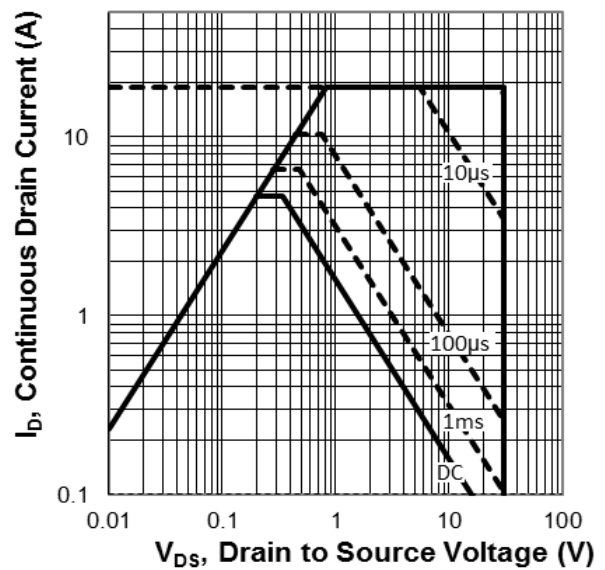


Figure 8: Maximum Safe Operation Area



3. Marking information

Top Marking Rule



PYWAB = Product Type Marking Code

P = Part name code

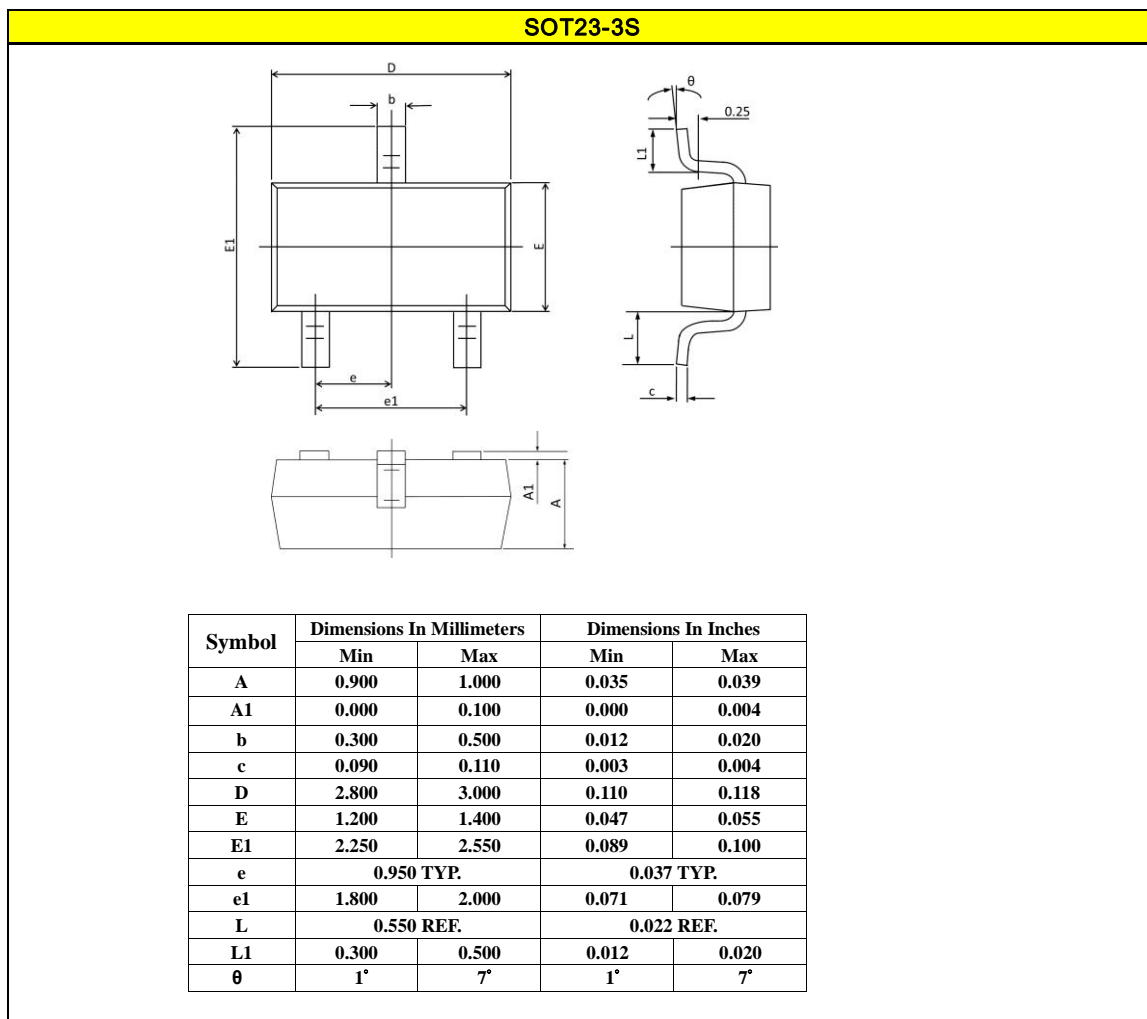
Y = Year code

W = Week code

AB = Assembly code

4. Package information

Package Outline Dimensions millimeters



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

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