General Description

The PM300XX Series is a three-terminal positive voltage regulator made using a CMOS process. The output voltage is fixed internally. The PM300XX Series has higher accuracy of output voltage (±2.0%) and needs a smaller input/output voltage difference (V_{dif}=0.15 V when I_{out} is 100 mA for PM30050) than the PM300XX Series, so battery-powered portable equipment can have a higher capacity and a longer service life.

Features

- Low current consumption: 1.5 μA typ.
- Small input/output voltage difference
  (Ex: PM30050: 0.15 V typ. I_{OUT}=100 mA)
- High accuracy of output voltage:±2.0%
- Wide operating voltage range: 20 V max.
- TO-92-3 or SOT-89-3 or SOT23-3 plastic package

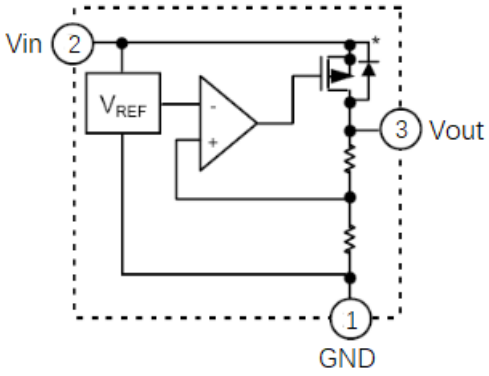
Selection Table

Model No	Package	Output Voltage	Marking
PM30021T	TO-92	2.1V	PM30021T
PM30021Q	SOT-89-3		K21XXX
PM30021S	SOT-23-3		K21XXX
PM30023T	TO-92	2.3V	PM30023T
PM30023Q	SOT-89-3		K23XXX
PM30023S	SOT-23-3		K23XXX
PM30025T	TO-92	2.5V	PM30025T
PM30025Q	SOT-89-3		K25XXX
PM30025S	SOT-23-3		K25XXX
PM30028T	TO-92	2.8V	PM30028T
PM30028Q	SOT-89-3		K28XXX
PM30028S	SOT-23-3		K28XXX
PM30030T	TO-92	3.0V	PM30030T
PM30030Q	SOT-89-3		K30XXX
PM30030S	SOT-23-3		K30XXX
PM30033T	TO-92	3.3V	PM30033T
PM30033Q	SOT-89-3		K33XXX
PM30033S	SOT-23-3		K33XXX
PM30036T	TO-92	3.6V	PM30036T
PM30036Q	SOT-89-3		K36XXX
PM30036S	SOT-23-3		K36XXX
PM30040T	TO-92	4.0V	PM30040T
PM30040Q	SOT-89-3		K40XXX
PM30040S	SOT-23-3		K40XXX
PM30044T	TO-92	4.4V	PM30044T
PM30044Q	SOT-89-3		K44XXX

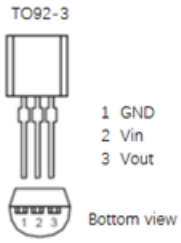
PM30044S	SOT-23-3		K44XXX
PM30050T	TO-92	5.0V	PM30050T
PM30050Q	SOT-89-3		K50XXX
PM30050S	SOT-23-3		K50XXX
PM30090T	TO-92	9.0V	PM30090T
PM30090Q	SOT-89-3		K90XXX
PM30090S	SOT-23-3		K90XXX

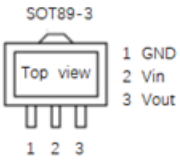
*The Output voltage and marking can be customized

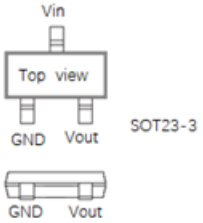
Block Diagram



Pin Assignment







Absolute Maximum Ratings

Supply Voltage	-0.3V to 20V		Storage Temperature	-50ºC to +125ºC
Power Consumption (SOT89-3)	500mW		Operating Temperature	-40ºC to +85ºC
Power Consumption (TO-92-3)	500mW		Output Current	300mA
Power Consumption (SOT23-3)	200mW			

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Electrical Characteristics

PM30021, +2.1V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	4.1V	I_{OUT}=10mA	2.058	2.100	2.142	V
I_{OUT}	Output Current	4.1V	—		300	—	mA
ΔV_{OUT}	Load Regulation	4.1V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	45	55	mV
I_{SS}	Current Consumption	4.1V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	3.1V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.1V	I_{OUT}=10mA -40°C<Ta<85°C	—	±100	—	ppm/℃

PM30023, +2.3V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	4.3V	I_{OUT}=10mA	2.254	2.300	2.346	V
I_{OUT}	Output Current	4.3V	—		300	—	mA
ΔV_{OUT}	Load Regulation	4.3V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	40	55	mV
I_{SS}	Current Consumption	4.3V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	3.3V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.3V	I_{OUT}=10mA -40°C<Ta<85°C	—	±100	—	ppm/℃

PM30025, +2.5V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	4.5V	I_{OUT}=10mA	2.450	2.500	2.550	V
I_{OUT}	Output Current	4.5V	—		300	—	mA
ΔV_{OUT}	Load Regulation	4.5V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	35	55	mV
I_{SS}	Current Consumption	4.5V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} X V_{OUT}}$	Line Regulation	—	3.5V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.5V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30028, +2.8V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	4.8V	I_{OUT}=10mA	2.744	2.800	2.856	V
I_{OUT}	Output Current	4.8V	—		300	—	mA
ΔV_{OUT}	Load Regulation	4.8V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	30	55	mV
I_{SS}	Current Consumption	4.8V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} X V_{OUT}}$	Line Regulation	—	3.8V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.8V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30030, +3.0V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	5.0V	I_{OUT}=10mA	2.940	3.000	3.060	V
I_{OUT}	Output Current	5.0V	—		300	—	mA
ΔV_{OUT}	Load Regulation	5.0V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	210	300	mV
I_{SS}	Current Consumption	5.0V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} X V_{OUT}}$	Line Regulation	—	4.0V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.0V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30033, +3.3V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	5.3V	I_{OUT}=10mA	3.234	3.300	3.366	V
I_{OUT}	Output Current	5.3V	—		300	—	mA
ΔV_{OUT}	Load Regulation	5.3V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	195	300	mV
I_{SS}	Current Consumption	5.3V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} X V_{OUT}}$	Line Regulation	—	4.3V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.3V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30036, +3.6V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	5.6V	I_{OUT}=10mA	3.528	3.600	3.672	V
I_{OUT}	Output Current	5.6V	—		300	—	mA
ΔV_{OUT}	Load Regulation	5.6V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	180	300	mV
I_{SS}	Current Consumption	5.6V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} X V_{OUT}}$	Line Regulation	—	4.6V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.6V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30040, +4.0V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	6.0V	I_{OUT}=10mA	3.920	4.000	4.080	V
I_{OUT}	Output Current	6.0V	—		300	—	mA
ΔV_{OUT}	Load Regulation	6.0V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	170	300	mV
I_{SS}	Current Consumption	6.0V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} X V_{OUT}}$	Line Regulation	—	5.0V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	6.0V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30044, +4.4V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	6.4V	I_{OUT}=10mA	4.312	4.400	4.488	V
I_{OUT}	Output Current	6.4V	—		300	—	mA
ΔV_{OUT}	Load Regulation	6.4V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	160	300	mV
I_{SS}	Current Consumption	6.4V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	5.4V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	6.4V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

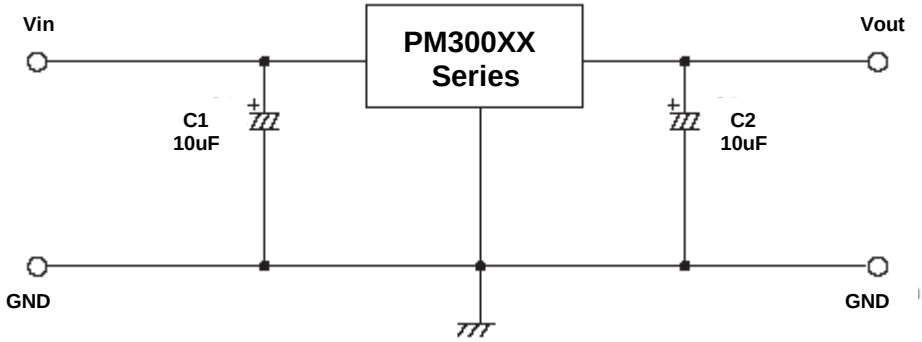
PM30050, +5.0V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	7.0V	I_{OUT}=10mA	4.900	5.000	5.100	V
I_{OUT}	Output Current	7.0V	—		300	—	mA
ΔV_{OUT}	Load Regulation	7.0V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	150	300	mV
I_{SS}	Current Consumption	7.0V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	6.0V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	7.0V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

PM30090, +9.0V Output Type Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	11V	I_{OUT}=10mA	8.820	9.000	9.180	V
I_{OUT}	Output Current	11V	—		300	—	mA
ΔV_{OUT}	Load Regulation	11V	1mA≤I_{OUT}≤300mA		37	100	mV
V_{DIF}	Voltage Drop	—	I_{OUT} =100mA	—	130	300	mV
I_{SS}	Current Consumption	11V	No load	—	1.5	3	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	10.0V≤V_{IN}≤20V I_{OUT}=1mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	I_{OUT}=1mA	—	—	20	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	11V	I_{OUT}=10mA -40°C<Ta<+85°C	—	±100	—	ppm/℃

Application Circuits



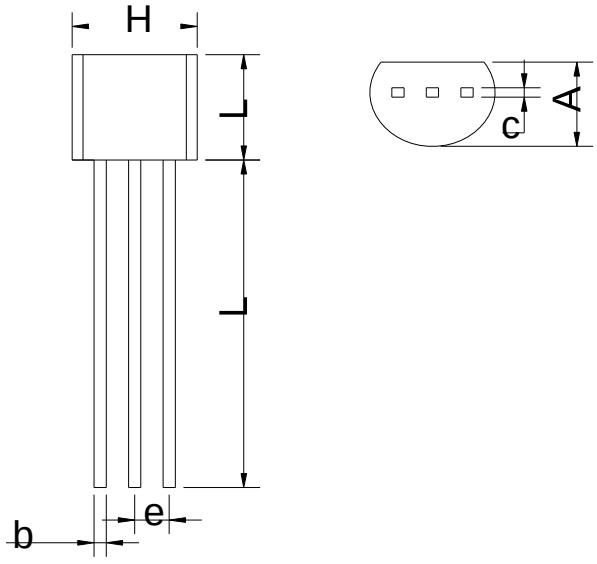
Note:

1, Capacitance should be located as close as possible to the Vin and Vout pins

2, Pay attention to the input / output voltage and load current conditions to avoid the power consumption inside the IC exceeding the maximum power dissipation allowed by the package.

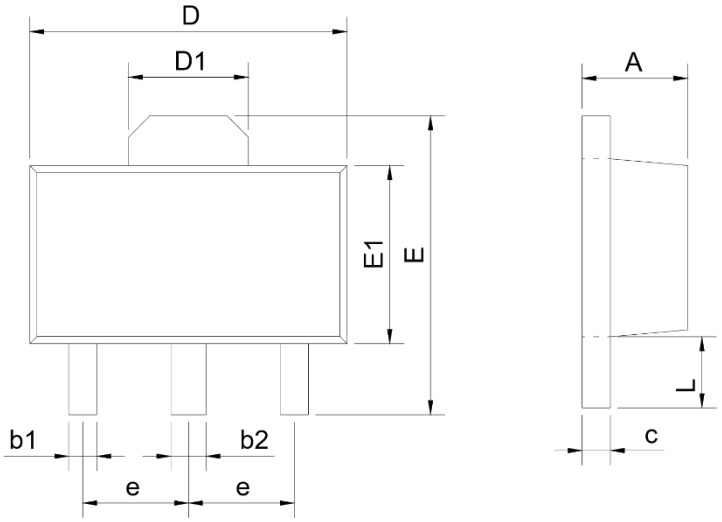
Packaging and Dimensions

TO92-3



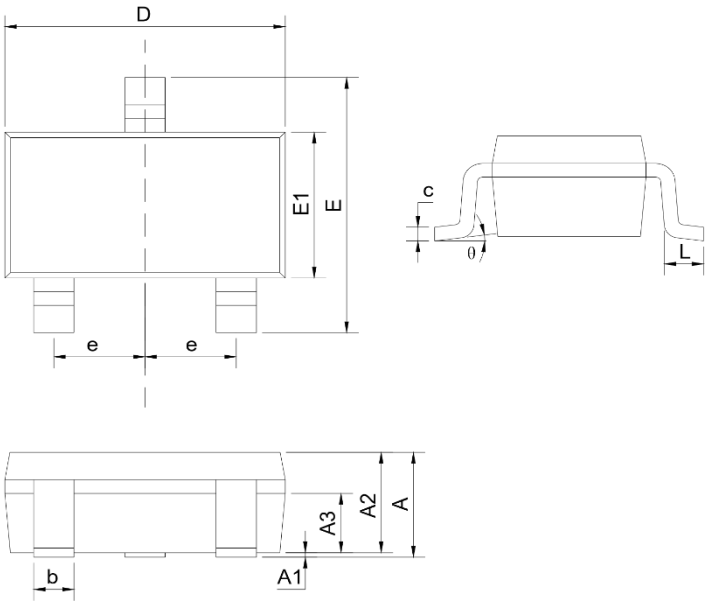
SYMBOL	mm	
	min	max
A	3.40	3.80
b	0.40	0.50
c	0.35	0.45
e	1.27BSC	
H	4.40	4.80
L	13.00	15.00
L1	4.30	4.70

SOT89-3



SYMBOL	mm	
	min	max
A	1.40	1.60
b1	0.35	0.50
b2	0.45	0.60
c	0.36	0.46
D	4.30	4.70
D1	1.40	1.80
E	4.00	4.40
E1	2.30	2.70
e	1.50BSC	
L	0.80	1.20

SOT23-3



SYMBOL	mm	
	min	max
A		1.35
A1	0.04	0.15
A2	1.00	1.20
A3	0.55	0.75
b	0.38	0.48
c	0.10	0.25
D	2.72	3.12
E	2.60	3.00
E1	1.40	1.80
e	0.95BSC	
L	0.30	0.60
θ	0	8°