

Features

- Low Power Consumption:1.0uA (Typ.)
- Maximum Output Current:200mA
- Small Dropout Voltage
- 210mV@100mA (Vout=2.8V)
- 430mV@200mA (Vout=2.8V)
- Input Voltage Range:1.5V~8V
- Output Voltage Range:1.1V~5.5V (customized on command in 0.1V steps)
- Highly Accurate: $\pm 2\%$ ($\pm 1\%$ customized)
- Output Current Limit

General Description

TP164C series is a group of positive voltage output, low power consumption, low dropout voltage, three terminal regulator. It can provide 200mA output current when input / output voltage differential drops to 430mV (Vout = 2.8V) , The very low power consumption of TP164C (Iq=1.0uA) can greatly improve natural life of batteries.

TP164C can provide output value in the range of 1.1V~5.5V in 0.1V steps. It also can be customized on command.

Applications

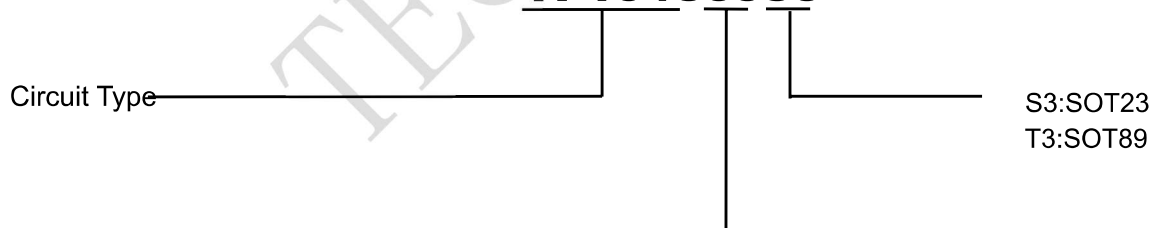
- Battery Powered equipment
- Power Management of MP3、PDA、DSC、Mouse、PS2 Games
- Reference Voltage Source Regulation after Switching Power

TP164C includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

TP164C has well load transient response and good temperature characteristic, And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

Ordering Information

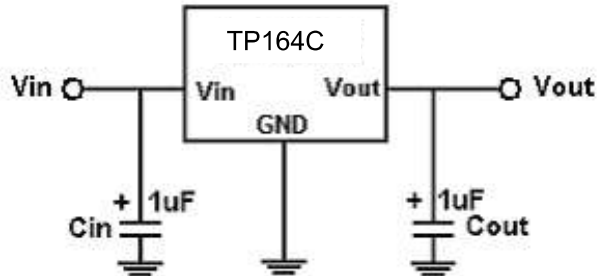
TP164C33S3



Output Versions

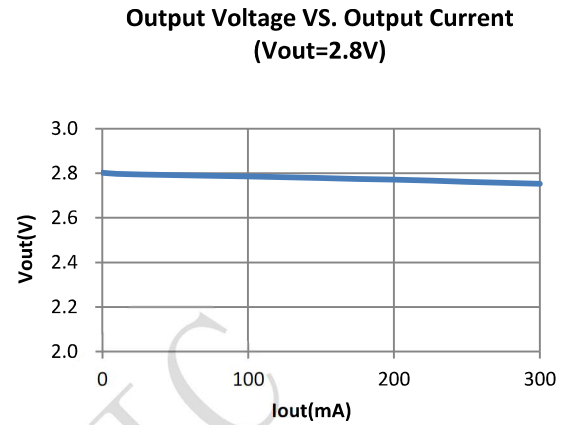
Blank:ADJ
12=1.2V
15=1.5V
18=1.8V
30=3.0V
33=3.3V
50=5.0V
XX=X.XV

TYPICAL APPLICATION

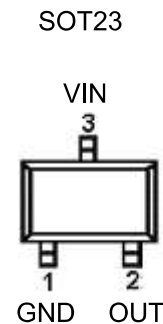
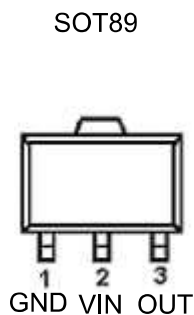


Note: Input capacitor ($C_{in}=1\mu F$) and Output capacitor ($C_{out}=1\mu F$) are recommended in all application circuit. Ceramic capacitor is recommended.

ELECTRICAL CHARACTERISTICS



PIN CONFIGURATION



GND	Ground Pin
Vin	Supply Voltage Input
Vout	Output Voltage
EN	Chip Enable
NC	No Connection

Absolute Maximum Rating

Parameter		Value
Max Input Voltage		10V
Operating Junction Temperature(Tj)		125°C
Ambient Temperature(Ta)		-40°C -85°C
Power Dissipation	SOT-23-3	250mW
	TSOT-23	250mW
	SOT-23-5	250mW
	SOT-89-3	500mW
	TO-92	500mW
Storage Temperature(Ts)		-40°C -150°C
Lead Temperature & Time		260°C,10S

Note:

Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

Recommended Work Conditions

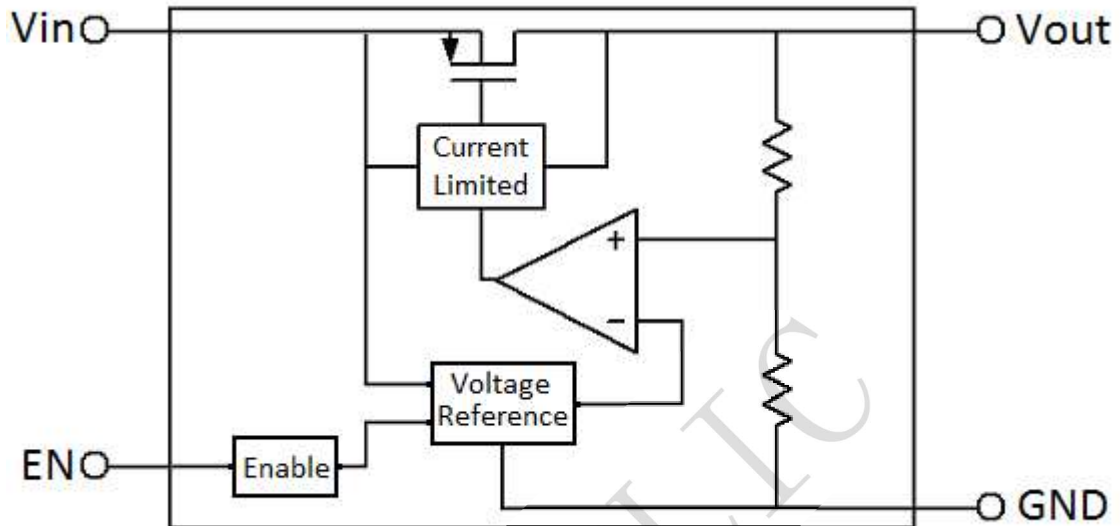
Item	Min	Recommended	Max.	Unit
Input Voltage Range			8	V
Ambient Temperature	-40		85	°C

Electrical Characteristics

(Test Conditions: Cin=1uF, Cout=1uF, TA=25°C, Unless Otherwise Specified)

Symbol	Parameter	Conditions	Min	Type	Max	Units
Vin	Input Voltage				8	V
Vout	Output Voltage		Vout x0.98		Vout X1.02	V
Iout(Max.)	Maximum Output Current	Vin-Vout=1V	200			mA
Dropout Voltage	Input-Output Voltage Differential	Iout=100mA	Vout ≤ 1.8V	600	1000	mV
			Vout ≥ 1.8V	300	600	
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	Iout=10mA 1.5V ≤ Vin ≤ 8V		0.2	0.3	%/V
ΔV_{out}	Load Regulation	Vin=Set Vout+1V 1mA ≤ Iout ≤ 100mA		20	40	mV
Iq	Quiescent Current	Vin=Set Vout+1V		1.0	5.0	uA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficient	Iout=10mA		100		ppm/°C
Venh	CE Input Voltage "H"		1.5		Vin	V
Venl	CE Input Voltage "L"		0		0.2	V

BLOCK DIAGRAM



EXPLANATION

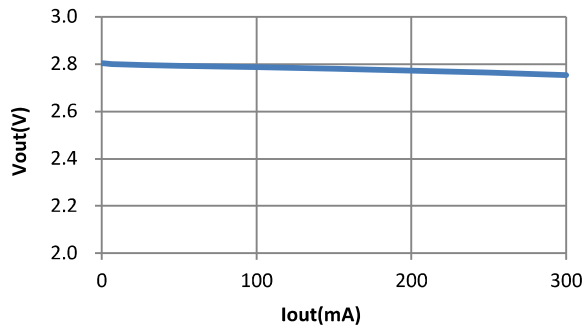
TP164C is a series of low dropout voltage and low power consumption three pins regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

Current Limit module can keep chip and power system away from danger when load current is more than 200mA.

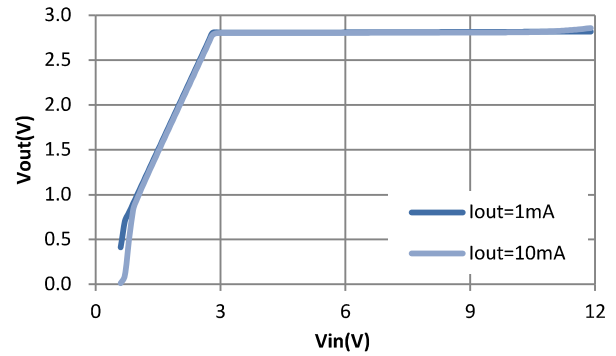
TP164C uses trimming technique to assure the accuracy of output value within $\pm 2\%$, at the same time, temperature compensation is elaborately considered in this chip, which makes TP164C's temperature coefficient within 100ppm/ $^{\circ}\text{C}$.

TYPICAL PERFORMANCE CHARACTERISTICS

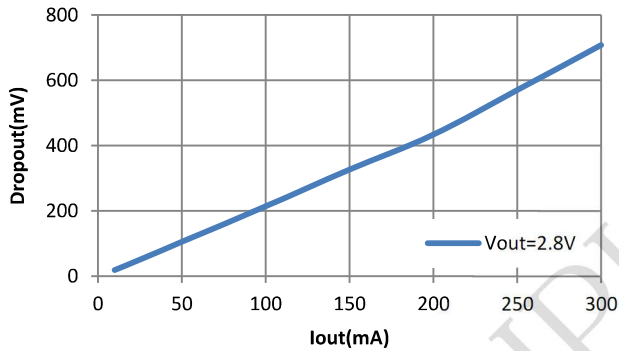
1. Load regulation (Vin=4V)



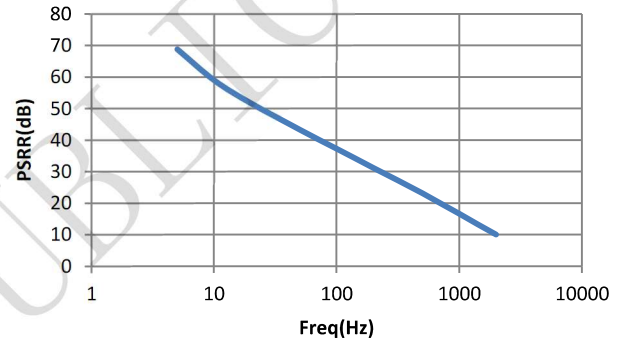
2. Line regulation



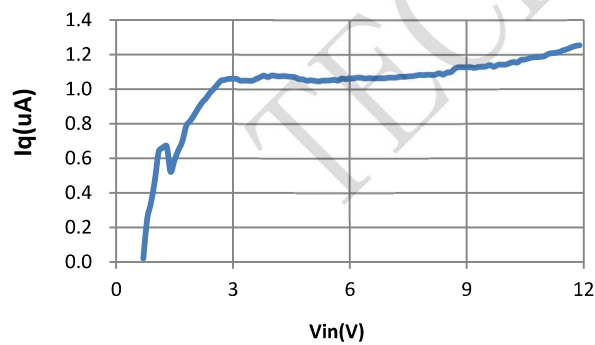
3. Dropout Voltage



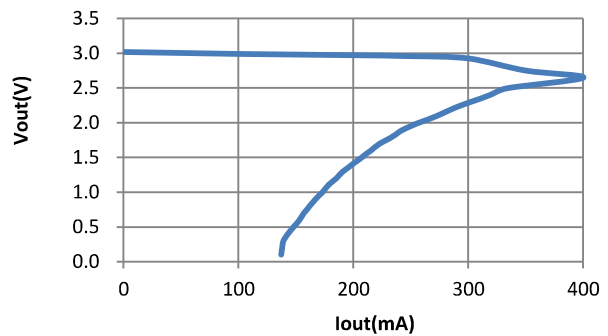
4. PSRR



5. Iq (Vout=2.8V)

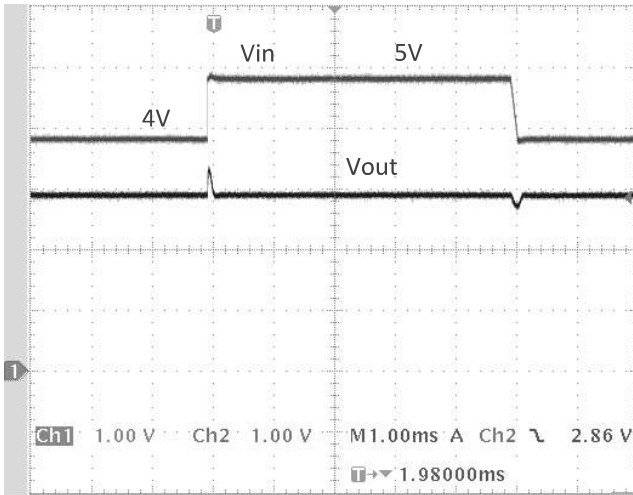


6. Current limit



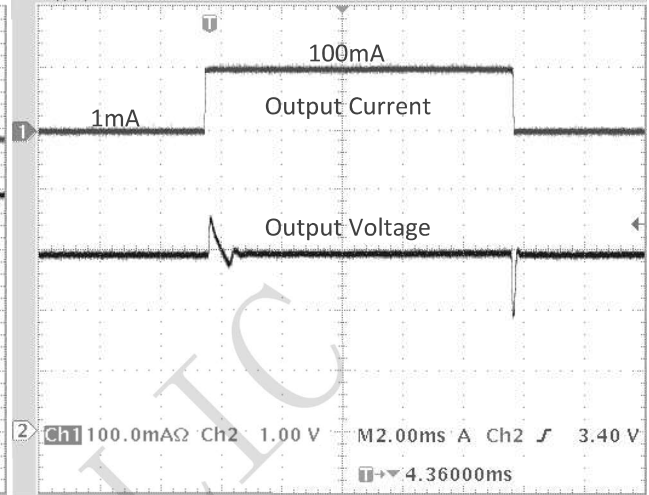
7. Line transient response

$C_{in}=C_{out}=1\mu F$ $I_{out}=10mA$ $V_{out}=2.8V$

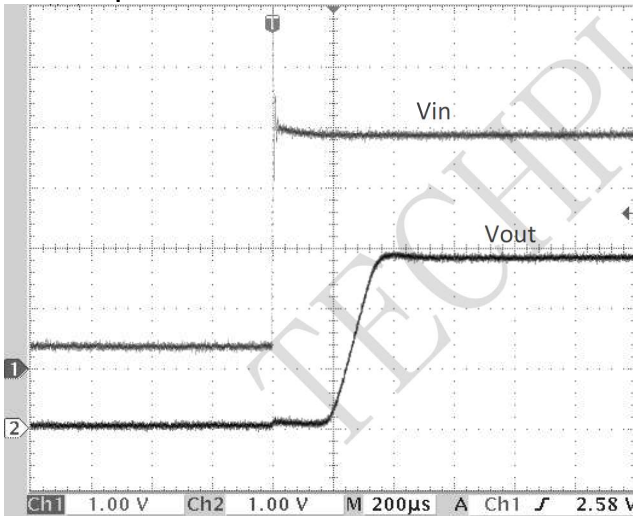


8. Load transient response

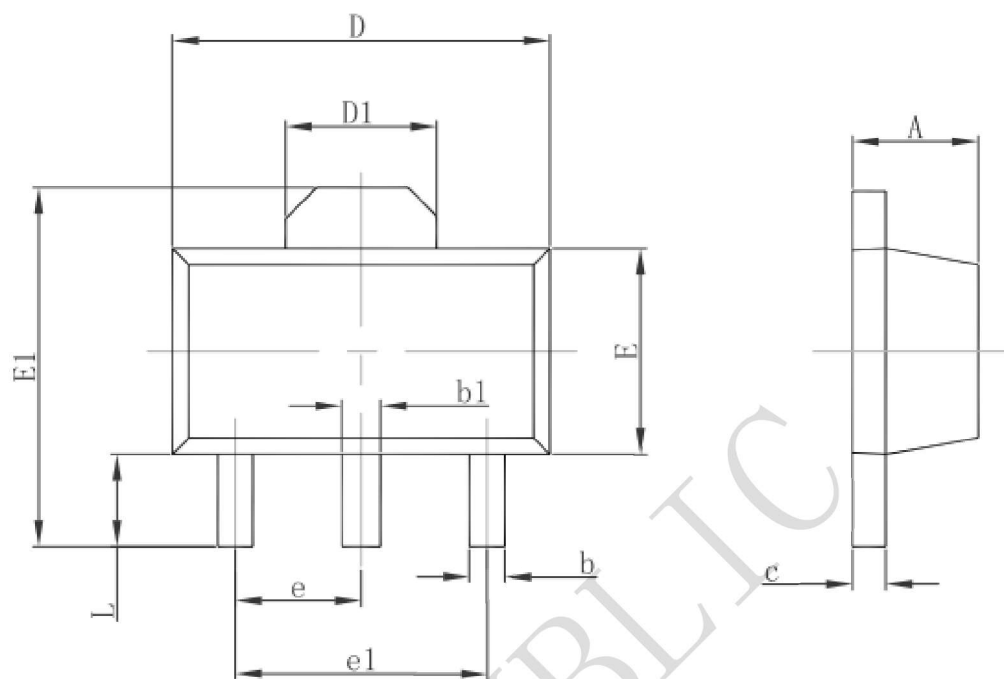
$C_{in}=C_{out}=1\mu F$ $V_{in}=4V$ $V_{out}=2.8V$



9. Start up

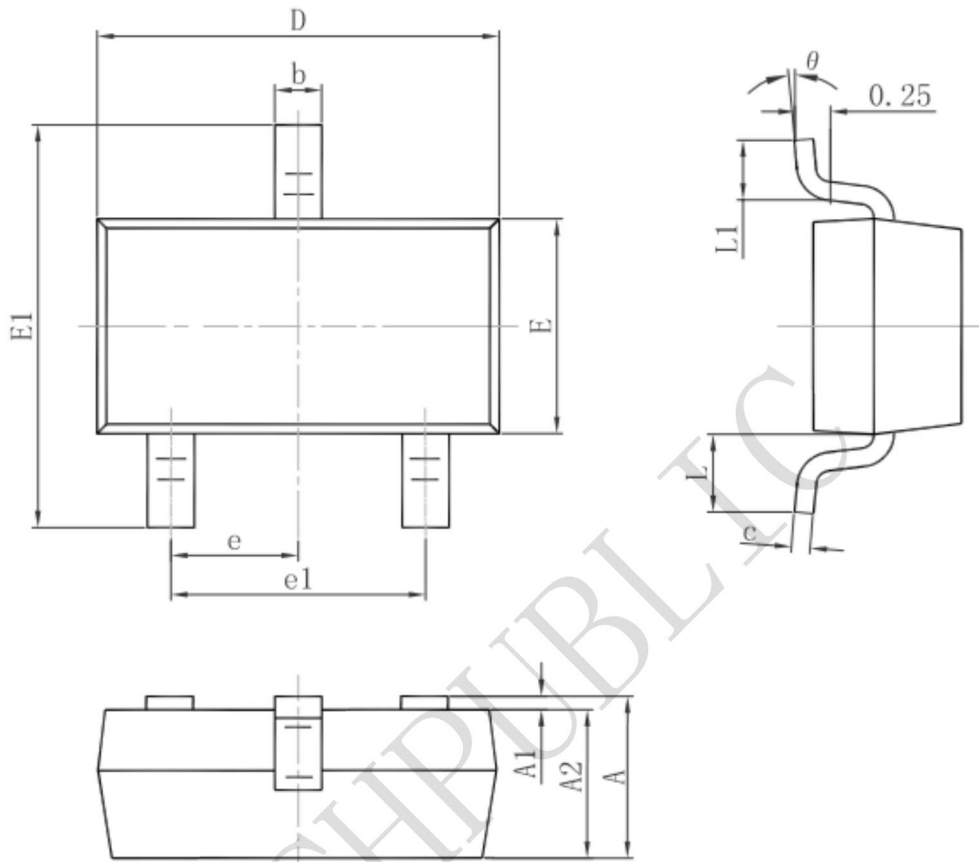


3-pin SOT89 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

3-pin SOT23 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
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	0°	8°	0°	8°