TP2019 Series

Low Power, Low Dropout, RF - Linear Regulators

General Description

The TP2019 series low -power, low-noise, low-dropout, CMOS linear voltage regulators operate from a 2.5V to 5.5V input voltage. They are the perfect choice for low voltage, low power applications. A low ground current makes this part attractive for battery operated power systems. The TP2019 series also offer ultra-low dropout voltage to prolong battery life in portable electronics. Systems requiring a quiet voltage sources, such as RF applications, will benefit from the TP2019 series ultra-low output noise ($30uV_{RMS}$) and high PSRR. An external noise bypass capacitor connected to the device's BP pin can further reduce the noise level.

The output voltage is preset to voltages in the range of 1.2V to 5.0V. Other features include a 10nA logic-controlled shutdown mode, foldback current limit and thermal shutdown protection.

The TP2019 is available in Green SC70-5 packages . It operates over an ambient temperature range of -40°C to +85°C.

Features

- Low Output Noise
- Low Dropout Voltage
- Thermal-Overload Protection
- Output Current Limit
- High PSRR(74dB at 1kHz)
- 10nA Logic-Controlled Shutdown
- Available in Multiple output Voltage Versions
- Fixed Outputs of 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 2.85V, 3.0V and 3.3V
- Adjustable Output from 1.2V to 5.0V
- -40°C to 85°C Operating Temperature Range
- Available in Green SC70-5 Packages

Applications

Cellular Telephones
Cordless Telephones
PCMCIA Cards
Modems
MP3 Player
Hand-Held Instruments
Portable/Battery-Powered Equipment

Ordering Information

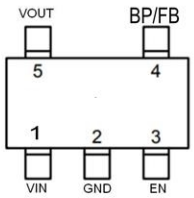
TP2019-3.0YC5

YC5:SC70-5 Package

Output voltage: 12=1.2V
15=1.5V
18=1.8V
30=3.0V
33=3.3V
XX=X.XV

PIN CONFIGURATION

SC70-5



PIN	NAME	FUNCTION
1	IN	Regulator Input. Supply voltage can range from 2.5V to 5.5V. Bypass with a 1uF capacitor to GND.
2	GND	Ground.
3	EN	Shutdown Input. A logic low reduces the supply current to 10nA. Connect to IN for normal operation.
4	BP	Reference-Noise Bypass (fixed voltage version only). Bypass with a low-leakage 0.01uF ceramic capacitor for reduced noise at the output.
	FB	Adjustable Voltage Version Only. This is used to set the output voltage of the device.
5	OUT	Regulator Output.

Absolute Maximum Rating (T_A=25°C unless otherwise noted)

IN to GND.....-0.3V to 6V
EN to GND.....-0.3V to V_{IN}
OUT, BP/FB to GND.....-0.3V to (V_{IN}+0.3V)
Output Short-Circuit Duration.....Infinite
Power Dissipation, P_D@T_A=25℃
SOT-23-5.....0.4W
SC70-5.....0.3W
Package Thermal Resistance
SOT-23-5, θ_{JA}.....260℃/W
SC70-5, θ_{JA}.....330℃/W
Junction Temperature.....150℃
Operating Temperature Range.....-40℃ to +85℃
Storage Temperature Range.....-65℃ to 150℃
Lead Temperature (Soldering, 10 sec).....260℃
ESD Susceptibility
HBM.....2000V
MM.....200V

NOTE:

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. Broadchip recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

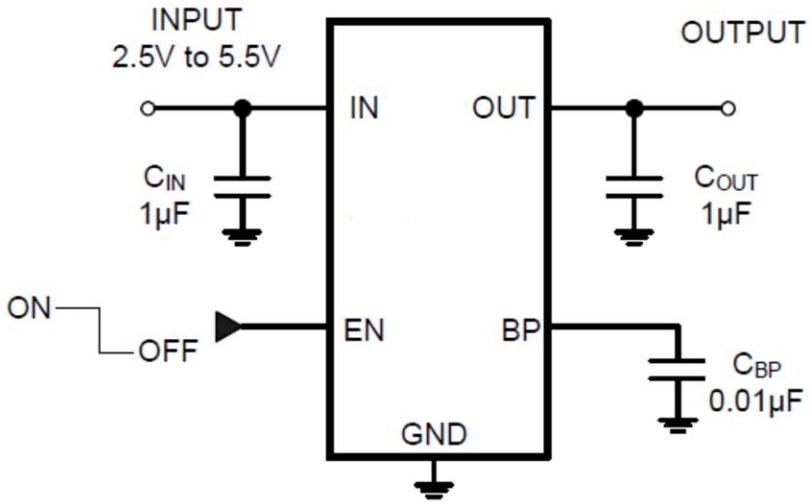
Broadchip reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time. Please contact Broadchip sales office to get the latest datasheet.

Electrical Characteristics (T =25°C unless otherwise noted)

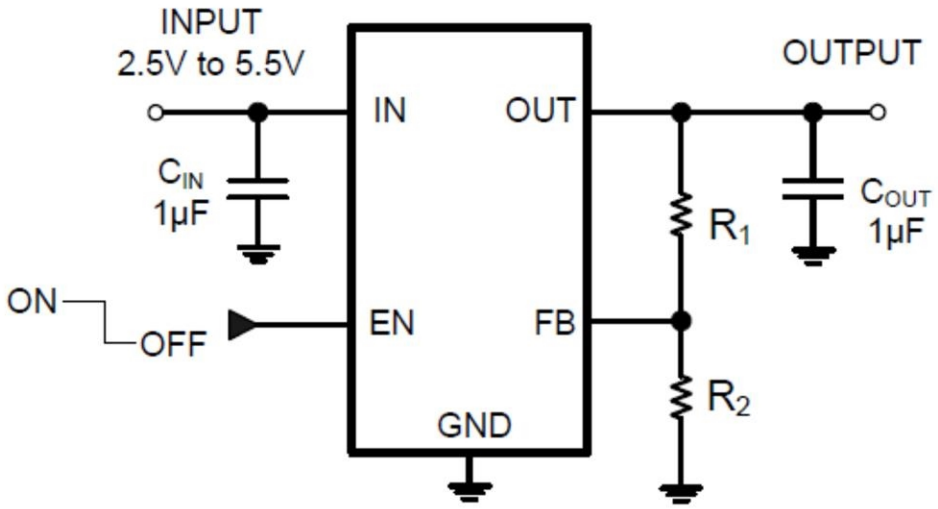
(V_{IN}= $V_{OUT(NOMINAL)}$+0.5V[1], Full = -40℃ to +85℃, unless otherwise specified.)

PARAMETER	SYM	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}		2.5		5.5	V
Output Voltage Accuracy[1]		I_{OUT}=0.1mA	-2.5		2.5	%
Maximum Output Current		SOT-23-5		300		mA
		V_{OUT}=1.2V,1.5V,1.8V, SC70-5		150		
		V_{OUT}>2V, SC70-5		250		
Current Limit	I_{LIM}			800		mA
Ground Pin Current	I_Q	No load, EN=2V		100	200	uA
Dropout Voltage[2]		I_{OUT}=1mA		0.9		mV
		I_{OUT}=300mA		270	400	
Line Regulation	ΔV_{LNR}	V_{IN}=2.5V or (V_{OUT}+0.5V) to 5.5V, I_{OUT}=1mA		0.02	0.05	%/V
Load Regulation	ΔV_{LDR}	I_{OUT}=0.1mA to 300mA, C_{OUT}=1uF, V_{OUT}>2V		0.002	0.005	%/mA
		I_{OUT}=0.1mA to 300mA, C_{OUT}=1uF, V_{OUT}≤2V		0.004	0.008	
Output Voltage Noise	e_n	f=10Hz to 100kHz, C_{BP}=0.01uF, C_{OUT}=10uF		30		uV_{RMS}
Power Supply Rejection Ratio	PSRR	C_{BP}=0.1uF, I_{LOAD}=50mA, C_{OUT}=1uF, V_{IN}=V_{OUT}+1V, f=217Hz		77		dB
		f=1kHz		74		
SHUTDWON[3]						
EN Input Threshold	V_{IH}	V_{IN}=2.5V to 5.5V, V_{EN}=-0.3V to V_{IN}	1.5			V
	V_{IL}				0.3	
EN Input Bias Current	$I_{B(SHDN)}$	EN=0V or EN=5.5V		0.01	1	uA
Shutdown Supply Current	$I_{Q(SHDN)}$	EN=0.4V		0.01		uA
Shutdown Exit Delay[4]		C_{BP}=0.01uF, C_{OUT}=1uF, No Load		30		us
THERMAL PROTECTION						
Thermal Shutdown Temperature	T_{SHDN}			150		°C
Thermal Shutdown Hysteresis	ΔT_{SHDN}			15		°C

TYPICAL APPLICATION



C_{BP}(nF)	Shutdown Exit Delay(us) V_{OUT}=2.8V, V_{IN}=3.3V, EN=0V to 2V			PSRR(dB) at 217Hz V_{OUT}=2.8V, V_{IN}=V_{OUT}+1V		
	I_{LOAD}=50mA	I_{LOAD}=150mA	I_{LOAD}=300mA	I_{LOAD}=50mA	I_{LOAD}=150mA	I_{LOAD}=300mA
None	21.5	21.5	21	71.1	64.4	55
0.001	21.5	21.5	22	71.1	64.6	55.1
0.01	22	22.5	22.5	71.6	64.7	55.2
0.1	22.5	23	23	71.7	64.8	55.4
1	25	27	28.5	72.1	65.2	55.9
10	30	35	39	74.3	68.8	59.6
100	265	280	300	77	73.7	63.1



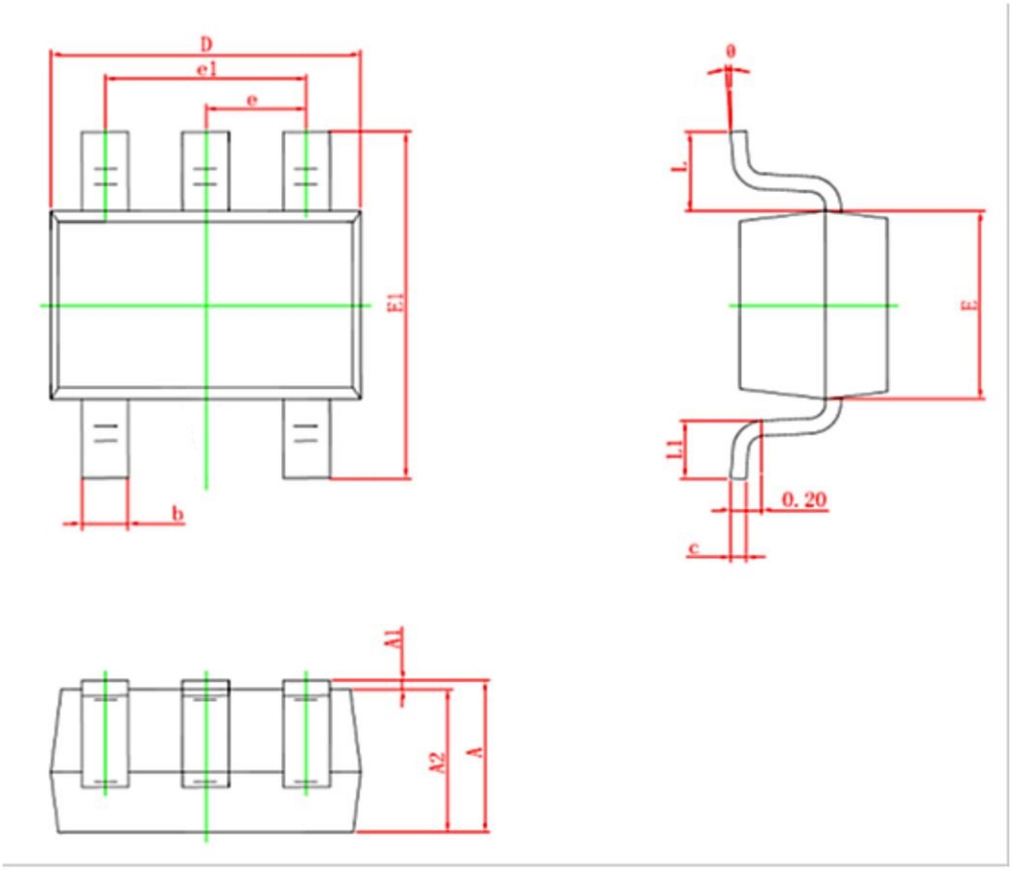
Standard 1% Resistor Values for Common Output Voltages of Adjustable Voltage Version

VOUT (V)	R1 (kΩ)	R2 (kΩ)
1.2	0	63.4
1.5	10.5	42.2
1.8	34	63.4
2.8	84.5	63.4
3.0	63.4	42.2
3.3	73.2	42.2
3.6	84.5	42.2
4.2	105	42.2

NOTE: VOUT = (R1 + R2)/ R2 × 1.207

Package information

SC70-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.110	0.175	0.004	0.007
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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