CYT8117 1A Positive Voltage Regulator

CYT
2023.04.20
001

General Description

The CYT8117-ADJ and CYT8117-1.2,1.5,-1.8, -2.5, -3.3 and -5.0 are low dropout three-terminal regulators with 1A output current capability. These devices have been optimized for low voltage where transient response and minimum input voltage are critical.

On-chip thermal limiting provides protection against any combination of overload and ambient temperatures that would create excessive junction temperatures.

Unlike PNP type regulators where up to 10% of the output current is wasted as quiescent current, the quiescent current of the CYT8117 flows into the load, increasing efficiency.

The CYT8117 series regulators are available in the industry-standard SOT-223 power packages.

Electric Characteristics

Unless otherwise stated, T_A=25°C, Normal junction temperature range -40°C to 125°C.

Description	symbol	Conditions	Min.	Typ.	Max.	Unit
Reference Voltage	V_{REF}	CYT8117-ADJ, I_{OUT}=10mA, V_{IN}-V_{OUT}=2V, T_J=25°C, 10mA≤I_{OUT}≤1A, 1.4V≤V_{IN}-V_{OUT}≤10V	1.231 1.225	1.250 1.250	1.268 1.275	V
Output Voltage	V_{OUT}	CYT8117-1.2 , I_{OUT}=10mA, V_{IN}=3.2V , T_J=25℃, 10mA≤I_{OUT}≤1A, 3.0V≤V_{IN}≤10V	1.176 1.152	1.200 1.200	1.224 1.248	V
		CYT8117-1.5, I_{OUT}=10mA, V_{IN}=3.5V , T_J=25°C, 10mA≤I_{OUT}≤1A, 3.0V≤V_{IN}≤10V	1.477 1.470	1.500 1.500	1.522 1.530	V
		CYT8117-1.8, I_{OUT}=10mA, V_{IN}=3.8V, T_J=25°C , 0 mA≤I_{OUT}≤1A, 3.2V≤V_{IN}≤10V	1.773 1.746	1.800 1.800	1.827 1.854	V
		CYT8117-2.5, I_{OUT}=10mA, V_{IN}=4.5V, T_J=25°C, 0 mA≤I_{OUT}≤1A, 3.9V≤V_{IN} ≤10V	2.462 2.450	2.500 2.500	2.538 2.550	V
		CYT8117-3.3, I_{OUT}=10mA, V_{IN}=5.0V, T_J=25°C, 0 mA≤I_{OUT}≤1A, 4.75V≤V_{IN}≤10V	3.250 3.235	3.300 3.300	3.349 3.365	V
		CYT8117-5.0, I_{OUT}=10mA, V_{IN}=7.0V, T_J=25°C , 0 mA≤I_{OUT}≤1A, 6.5V≤V_{IN}≤12V	4.925 4.900	5.500 5.000	5.075 5.100	V
Output Voltage Stability	T_{SOUT}	-	-	0.3	-	%
Line Regulation	R_{LINE}	V_{INMIN} ≤V_{IN}≤ 12V, V_{OUT}=Fixed/Adj, I_{OUT}=10mA	-	6	15	mV
Load Regulation	R_{LOAD}	10mA≤I_{OUT}≤1A, V_{OUT}=Fixed/Adj	-	6	18	mV
Dropout Voltage	V_{Drop}	I_{OUT}=100mA I_{OUT}=500mA I_{OUT}=1A	-	1.00 1.05 1.20	1.20 1.25 1.30	V
Quiescent Current	I_Q	4.25V≤V_{IN}≤ 6.5V	-	5	10	mA
Ripple Rejection	P_{SRR}	f_{RIPPLE}=120Hz, (V_{IN}-V_{OUT})=3V, V_{RIPPLE}=1V_{PP}	50	60	-	dB
Adjust Pin Current	I_{ADJ}	-	-	60	120	μA
Adjust Pin Current Change	-	0mA≤ I_{OUT}≤800mA, 1.4V≤V_{IN}-V_{OUT}≤10V	-	0.2	5	μA

Electrical Characteristics (Continue)

Description	symbol	Conditions	Min.	Typ.	Max.	Unit
Temperature Protection Point	T_{SD}	-	-	150	-	°C
Current Limit Protection Point	I_{limit}	-	1.4	1.6	1.8	A
Temperature Stability	-	-	-	0.5	-	%
Long-Term Stability	-	T_A=125°C，1000Hrs	-	0.3	-	%
RMS Output Noise	-	% of V_{OUT}，10Hz≤f≤10kHz	-	0.005	-	%
Thermal Resistance, Finless	θ_{JA}	-	-	120	-	°C/W
Thermal Resistance, Junction to Case	θ_{JC}	-	-	15	-	°C/W

Absolute Maximum Ratings

Parameter	Min.	Max.	Unit
V_{IN}	-	18	V
(V_{IN}– V_{OUT}) * I_{OUT}	-	See Figure 1	-
Operating Junction Temperature Range	0	125	℃
Storage Temperature Range	-65	150	℃
Lead Temperature (Soldering, 10 sec.)	-	300	℃

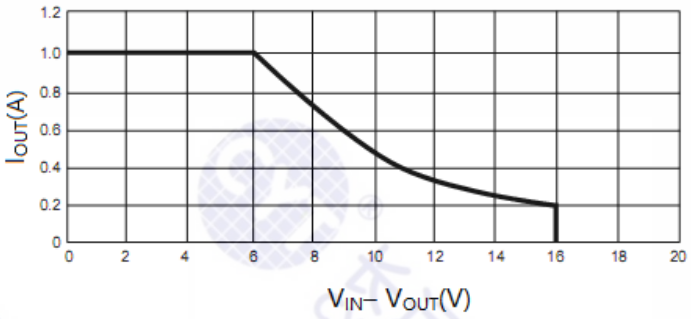
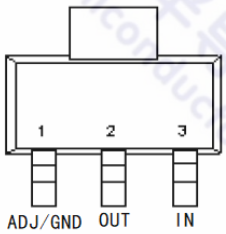


Figure 1. Absolute Maximum Safe Operating Area

Pin Diagram(Top View)



SOT-223

Block Diagram