

6427525 N E C ELECTRONICS INC

05E 22478 D

BIPOLAR ANALOG INTEGRATED CIRCUIT

 μ PC317H

3-TERMINAL ADJUSTABLE REGULATOR

T-58-11-23

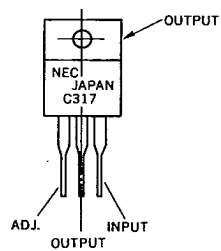
DESCRIPTION

The μ PC317H is an adjustable 3-terminal positive voltage regulator capable of supplying in excess of 1.5 A over a 1.3 V to 30 V output voltage range. Output voltage can be fixed by only two external resistors.

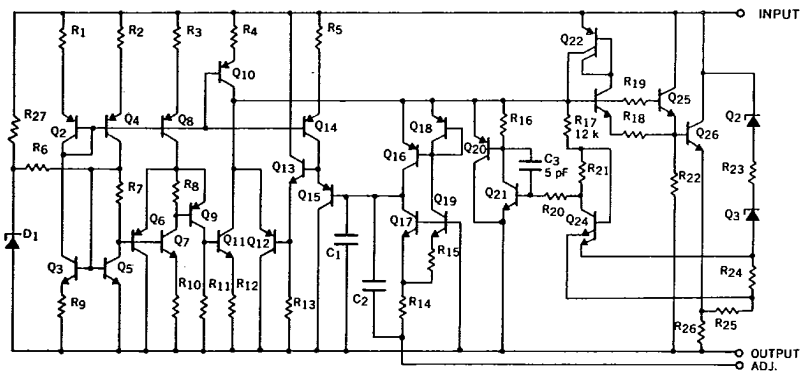
FEATURES

- Output current up to 1.5 A.
- Current limit constant with temperature.
- Internal thermal overload protection.

CONNECTION DIAGRAM



EQUIVALENT CIRCUIT



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μPC317H

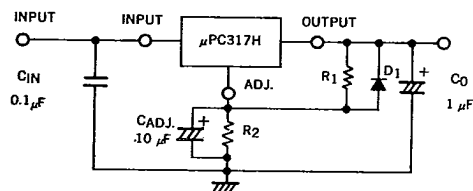
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*T-58-11-23***ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)**

Input-Output Voltage Differential	$V_{IN} - V_O$	40	V
Total Power Dissipation	P_T ($T_c = 25^\circ\text{C}$)	20 Note	W
Operating Ambient Temperature	T_{opt}	-20 to +80	$^\circ\text{C}$
Operating Junction Temperature	$T_{opt(j)}$	-20 to +150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$
Thermal Resistance (junction to case)	$R_{th(j-c)}$	4	$^\circ\text{C/W}$
Thermal Resistance (junction to ambient)	$R_{th(j-a)}$	83	$^\circ\text{C/W}$

Note : Internally limited

TYPICAL CONNECTION R_1, R_2 : resistors to set the output voltage D_1 : protection against $C_{ADJ.}$

$$V_O = \left(1 + \frac{R_2}{R_1}\right) V_{REF}$$

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RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Input-Output Voltage Differential	$V_{IN} - V_O$	3		38.7	V
Input Voltage	V_{IN}	4.3		40	V
Output Voltage	V_O	1.3		30	V
Output Current	I_O	0.01		1.5	A
Operating Junction Temperature	$T_{opt(j)}$	-20		+125	°C

ELECTRICAL CHARACTERISTICS ($V_{IN} - V_O = 5$ V, $I_O = 0.5$ A, $0^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$)

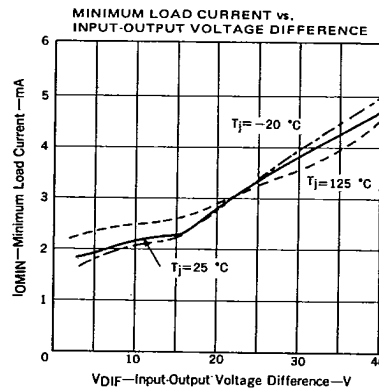
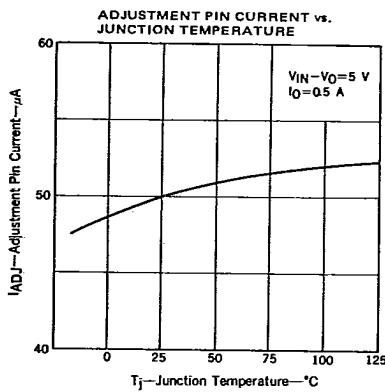
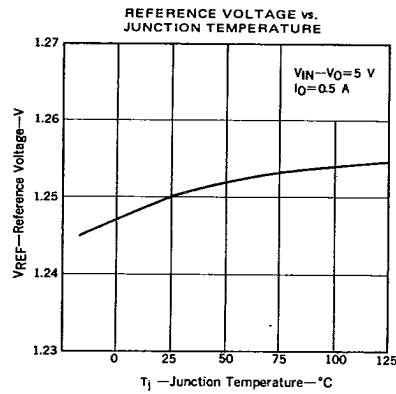
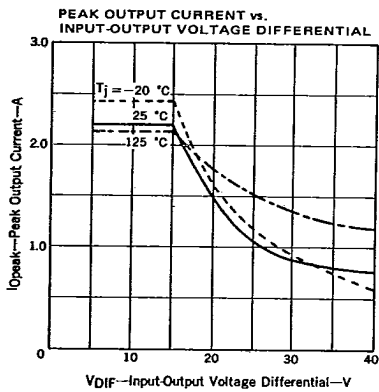
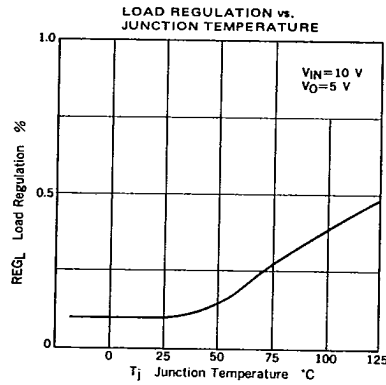
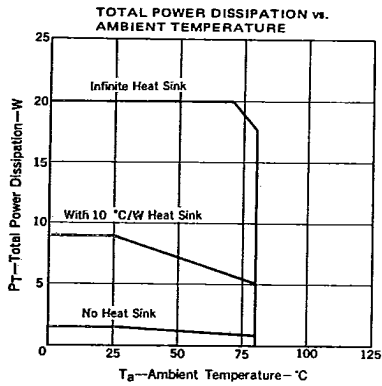
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Line Regulation	REG _{IN}		0.01	0.04	% / V	$T_a = 25^\circ\text{C}$, $3 \text{ V} \leq (V_{IN} - V_O) \leq 40 \text{ V}$, $I_O = 0.1 \text{ A}$
			0.02	0.07		$0^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$, $3 \text{ V} \leq (V_{IN} - V_O) \leq 40 \text{ V}$, $I_O = 0.1 \text{ A}$
Load Regulation	REG _L		5	25	mV	$V_O \leq 5 \text{ V}$, $T_a = 25^\circ\text{C}$
			0.1	0.5	%	$V_O \geq 5 \text{ V}$, $10 \text{ mA} \leq I_O \leq 1.5 \text{ A}$
			20	70	mV	$V_O \leq 5 \text{ V}$, $0^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$
			0.3	1.5	%	$V_O \geq 5 \text{ V}$, $10 \text{ mA} \leq I_O \leq 1.5 \text{ A}$
Thermal Regulation	REG _{TH}		0.01	0.07	% / W	$T_a = 25^\circ\text{C}$, $0.2 \text{ ms} \leq t \leq 20 \text{ ms}$
Adjustment Pin Current	I_{ADJ}		50	100	μA	
Adjustment Pin Current Change	ΔI_{ADJ}		0.4	5	μA	$10 \text{ mA} \leq I_O \leq 1.5 \text{ A}$, $3 \text{ V} \leq (V_{IN} - V_O) \leq 40 \text{ V}$, $P_T \leq 20 \text{ W}$
Reference Voltage	V_{REF}	1.20	1.25	1.30	V	$10 \text{ mA} \leq I_O \leq 1.5 \text{ A}$, $3 \text{ V} \leq (V_{IN} - V_O) \leq 40 \text{ V}$, $P_T \leq 20 \text{ W}$
Temperature Stability of V_{REF}	$\Delta V_{REF} / \Delta T$		0.7		%	$0^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$
Minimum Load Current	I_{OMIN}		4.7	10	mA	$(V_{IN} - V_O) = 40 \text{ V}$
Peak Output Current	I_{Opeak}	1.5	2.2	2.9	A	$5 \text{ V} \leq (V_{IN} - V_O) \leq 15 \text{ V}$
		0.15	0.8			$(V_{IN} - V_O) = 40 \text{ V}$
Output Noise Voltage	V_n		0.001		% (RMS)	$T_a = 25^\circ\text{C}$, $10 \text{ Hz} \leq f \leq 10 \text{ kHz}$
Ripple Rejection	RR		48		dB	$C_{ADJ} = 0$, $V_O = 10 \text{ V}$, $T_a = 25^\circ\text{C}$
		56	65			$f = 120 \text{ Hz}$, $\Delta V_{IN} = 1 \text{ V}_{r.m.s.}$, $C_{ADJ} = 10 \mu\text{F}$

* Note : Measured at constant junction temperature, using pulse testing with a low duty cycle.
PW = 10 ms, Duty Cycle $\leq 2\%$

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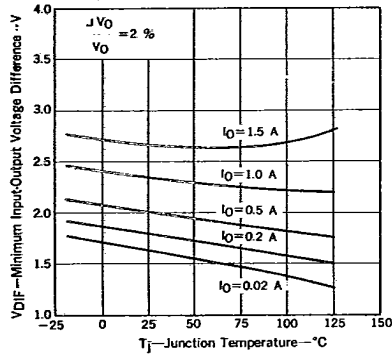
*T-58-11-23*TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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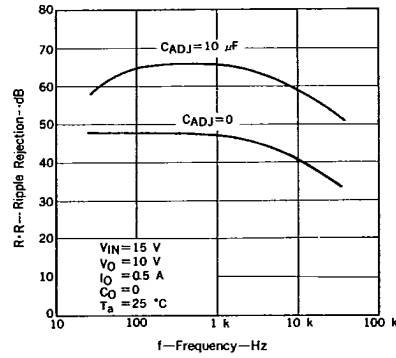
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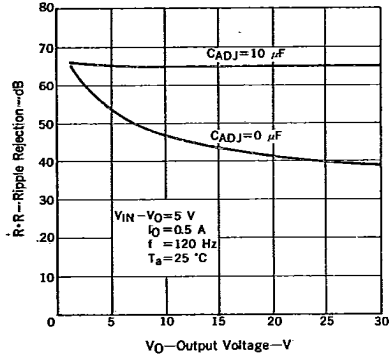
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MINIMUM INPUT-OUTPUT VOLTAGE DIFFERENCE
vs. JUNCTION TEMPERATURE

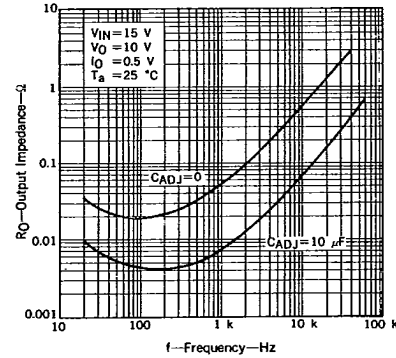
RIPPLE REJECTION vs. FREQUENCY



RIPPLE REJECTION vs. OUTPUT VOLTAGE

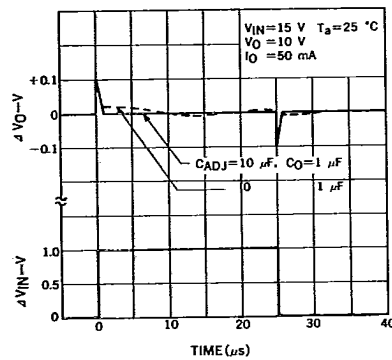


OUTPUT IMPEDANCE vs. FREQUENCY

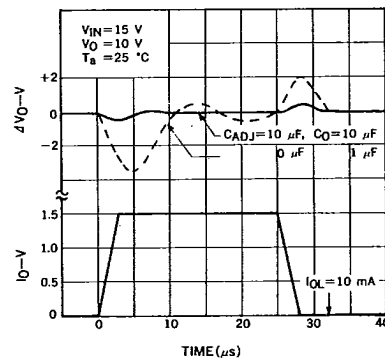


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LINE TRANSIENT RESPONSE



LOAD TRANSIENT RESPONSE

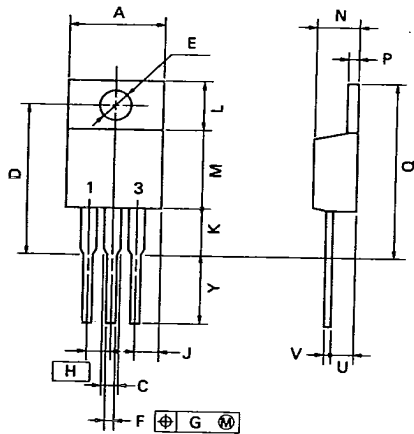


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3 PIN PLASTIC SIP (TO-220)



NOTE

Each lead centerline is located within 0.25 mm (0.01 inch) of its true position (T.P.) at maximum material condition.

P3HP-2648

ITEM	MILLIMETERS	INCHES
A	10.4 MAX.	0.41 MAX.
C	1.2 MIN.	0.047 MIN.
D	17.3 ^{+0.3}	0.681 ^{+0.012}
E	3.6 ^{+0.1}	0.142 ^{+0.004}
F	0.75 ^{+0.1}	0.03 ^{+0.004}
G	0.25	0.01
H	2.54	0.1
J	2.66 MAX.	0.105 MAX.
K	5.2 MIN.	0.205 MIN.
L	6.5 TYP.	0.256
M	8.5 TYP.	0.335
N	4.6 ^{+0.2}	0.181 ^{+0.008}
P	1.3 ^{+0.1}	0.051 ^{+0.004}
Q	22.52 MAX.	0.887 MAX.
U	3.0 MAX.	0.119 MAX.
V	0.45 ^{+0.1}	0.018 ^{+0.004}
Y	8.5 ^{+0.7}	0.335 ^{+0.028}