FAIRCHILD
A Schlumberger Company

MIL-STD-883
November 1985 – Rev 0[5]

μA117KQB 3-Terminal Positive Adjustable Regulator

Aerospace and Defense Data Sheet
Linear Products

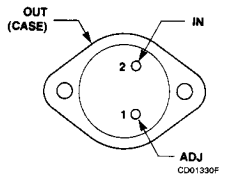
Description

The μA117KQB is a 3-terminal adjustable positive voltage regulator capable of supplying in excess of 1.5 A over an output voltage range of 1.2 V to 37 V. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage. Further, it employs internal current-limiting, thermal shutdown and safe-area compensation, making it essentially blow-out proof.

The μA117KQB serves a wide variety of applications including local, on-card regulation. This device also makes an especially simple adjustable switching regulator, and a programmable output regulator; or by connecting a fixed resistor between the adjustment and output, the μA117KQB can be used as a precision current regulator.[6]

- **Output Current In Excess Of 1.5 A**
- **Output Adjustable Between 1.2 V And 37 V**
- **Internal Thermal Overload Protection**
- **Internal Short Circuit Current-Limiting Constant Temperature**
- **Output Transistor Safe-Area Compensation**
- **Floating Operation For High Voltage Applications**

Connection Diagram
2-Lead TO-3 Can
(Top View)



Order Information

Part No.	Case/ Finish	Package Code Mil-M-38510, Appendix C
μA117KMQB	YC	2-Lead Can

13

Absolute Maximum Ratings

Storage Temperature Range	−65°C to +175°C
Operating Temperature Range	−55°C to +125°C
Lead Temperature (soldering, 60 s)	300°C
Internal Power Dissipation[9]	
Can Without Heat Sink[10]	0.71 W
Can With Heat Sink[11]	5.6 W
Input/Output Differential Voltage	40 V

Processing: MIL-STD-883, Method 5004

Burn-In: Method 1015, Condition A, PDA calculated using Method 5005, Subgroup 1

Quality Conformance Inspection: MIL-STD-883, Method 5005

Group A Electrical Tests Subgroups:

1. Static tests at 25°C
2. Static tests at 125°C
3. Static tests at −55°C
4. Dynamic tests at 25°C
9. AC tests at 25°C

Group C and D Endpoints: Group A, Subgroup 1

Notes

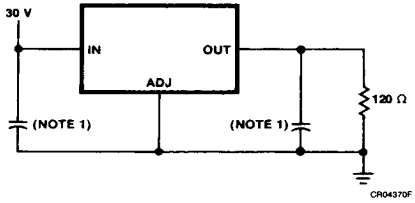
1. 100% Test and Group A
2. Group A
3. Periodic tests, Group C
4. Guaranteed but not tested
5. When changes occur, FSC will make data sheet revisions available. Contact local sales representative for the latest revision.
6. For more information on device function, refer to the Fairchild Linear Data Book Commercial Section.
7. All characteristics except line and load transient response and noise are measured using pulse techniques ($t_W \leq 10$ ms, duty cycle $\leq 5\%$). Output voltage changes due to changes in the internal temperature must be taken into account separately.
8. Conditions given will result in the following: $P_D \leq 20$ W.
9. Internally limited.
10. Rating applies to ambient temperatures up to 125°C. Above 125°C, derate linearly at 35°C/W.
11. Rating applies to ambient temperatures up to 125°C. Above 125°C, derate linearly at 4.46°C/W.

μA117KQB
Electrical Characteristics I_L = 500 mA, unless otherwise specified.[7]

Symbol	Characteristic	Condition	Min	Max	Unit	Note	Subgrp
V_O	Output Voltage[8]	V_I = 4.25 V, I_L = 5.0 mA	1.2	1.3	V	4	1
		V_I = 4.25 V, I_L = 1.5 A	1.2	1.3	V	1	1,2,3
		V_I = 41.3 V, I_L = 5.0 mA	1.2	1.3	V	1	1,2,3
		V_I = 41.3 V, I_L = 250 mA	1.2	1.3	V	1	1
$V_{R\ LINE}$	Line Regulation	4.25 V ≤ V_I ≤ 41.3 V		9.2	mV	1	1
				18.5	mV	1	2,3
$V_{R\ LOAD}$	Load Regulation	V_I = 6.25 V, V_O = V_{REF}, 10 mA ≤ I_L ≤ 1.5 A		3.8	mV	1	1
				12.5	mV	1	2,3
I_{adj}	Adjustment-Lead Current	V_I = 6.25 V		100	μA	1	1,2,3
ΔI_{adj} (LINE)	Adjustment-Lead Current Change (vs Line Voltage)	3.75 V ≤ V_I ≤ 41.3 V, I_L = 150 mA		5.0	μA	1	1,2,3
ΔI_{adj} (LOAD)	Adjustment-Lead Current Change (vs Load Current)[8]	V_I = 6.25 V, 10 mA ≤ I_L ≤ 1.5 A		5.0	μA	1	1,2,3
I_{OS}	Output Short Circuit Current	V_I = 4.25 V	1.5	3.5	A	4	1
		V_I = 40 V	0.18	1.0	A	4	1
V_{REF}	Reference Voltage[8]	4.25 V ≤ V_I ≤ 41.3 V, 10 mA ≤ I_L ≤ 1.5 A	1.2	1.3	V	1	1,2,3
I_Q	Minimum Load Current to Maintain Regulation	V_I = 41.3 V		5.0	mA	1	1,2,3
		4.25 V ≤ V_I ≤ 14.25 V	0.5	3.0	mA	4	1
I_{Max}	Maximum Output Current[8]	V_I = 12 V		1.5	A	1	1,2,3
		V_I = 41.3 V	0.25		A	1	1
V_{RTH}	Thermal Regulation	V_I = 19.5 V, I_L = 1.2 A, 0.5 ms ≤ t ≤ 20 ms	−40	40	mV	1	1
V_{START}	Voltage Start	V_I = 4.3 V	1.2	1.3	V	1	1
$\Delta V_I/\Delta V_O$	Ripple Rejection	$V_I - V_O$ = 5.0 V, I_L = 500 mA, e_i = 1.0 V_{rms}, f = 2400 Hz	65		dB	1	1,2,3
N_O	Noise	I_L = 100 mA, 10 Hz ≤ f ≤ 10 kH z		120	μV_{rms}	4	9
$\Delta V_O/\Delta V_I$	Line Transient Response	$V_I - V_O$ = 5.0 V, I_L = 10 mA, ΔV_I = 3.0 V		6.0	mV/V	4	9
$\Delta V_O/\Delta I_L$	Load Transient Response	$V_I - V_O$ = 5.0 V, I_L = 100 mA, ΔI_L = 400 mA		0.3	mV/mA	4	9
S	Long Term Stability of V_O			1.0	%/1000 hrs	4	1

13

Primary Burn-In Circuit
(38510/11704 may be used by FSC as an alternate)



Note
1. Capacitor value necessary to suppress oscillations.

Equivalent Circuit
Refer to the Fairchild Linear Data Book Commercial Section