FAIRCHILD
A Schlumberger Company

MIL-STD-883
July 1986—Rev 2[5]

μA78M08QB 3-Terminal Positive Voltage Regulator

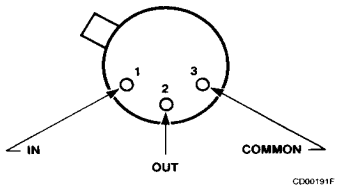
Aerospace and Defense Data Sheet
Linear Products

Description

The μA78M08QB 3-Terminal Medium Current Positive Voltage Regulator is constructed using the Fairchild Planar Epitaxial process. This regulator employs internal current-limiting, thermal shutdown and safe-area compensation, making it essentially indestructible. If adequate heat sinking is provided, it can deliver in excess of 500 mA output current. It is intended as a fixed voltage regulator in a wide range of applications including local, on-card regulation for elimination of noise and distribution problems associated with single point regulation. In addition to use as a fixed voltage regulator, this device can be used with external components to obtain adjustable output voltages and currents.[6]

- **Output Current In Excess Of 0.5 A**
- **No External Components**
- **Internal Thermal Overload Protection**
- **Internal Short Circuit Current-Limiting**
- **Output Transistor Safe-Area Compensation**

Connection Diagram
3-Lead TO-39 Can
(Top View)



Lead 3 connected to case.

Order Information

Part No.	Case/ Finish	Package Code Mil-M-38510, Appendix C
μA78M08HMQB	XC	3-Lead Can

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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]	0.18 W
Can With Heat Sink[11]	0.5 W
Input Voltage	35 V

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: $P_D \leq 4$ W.
9. Internally limited.
10. Rating applies to ambient temperatures up to 125°C. Above 125°C, derate linearly at 140°C/W.
11. Rating applies to ambient temperatures up to 125°C. Above 125°C, derate linearly at 50°C/W.

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

μA78M08QB
Electrical Characteristics $V_I = 14$ V, $I_L = 350$ mA, $C_I = 0.33$ μF, $C_O = 0.1$ μF, unless otherwise specified.[7]

Symbol	Characteristic	Condition		Min	Max	Unit	Note	Subgrp
V_O	Output Voltage[8]			7.7	8.3	V	1	1
		5.0 mA ≤ I_L ≤ 350 mA	V_I = 11.5 V	7.6	8.4	V	1	1,2,3
			V_I = 23 V	7.6	8.4	V	1	1,2,3
$\Delta V_O/\Delta T$	Average Temperature Coefficient of Output Voltage	I_L = 5.0 mA, 25°C ≤ T_A ≤ 125°C			2.5	mV/°C	4	2
		I_L = 5.0 mA, −55°C ≤ T_A ≤ 25°C			2.5	mV/°C	4	3
$V_{R\ LINE}$	Line Regulation	10.5 V ≤ V_I ≤ 25 V, I_L = 200 mA			60	mV	1	1
		11 V ≤ V_I ≤ 20 V, I_L = 200 mA			30	mV	1	1
$V_{R\ LOAD}$	Load Regulation	5.0 mA ≤ I_L ≤ 500 mA			80	mV	1	1
		5.0 mA ≤ I_L ≤ 200 mA			40	mV	1	1
I_{SCD}	Standby Current Drain				7.0	mA	1	1
ΔI_{SCD} (LINE)	Standby Current Drain Change (vs Line Voltage)	11.5 V ≤ V_I ≤ 25 V, I_L = 200 mA			0.8	mA	1	1,2,3
ΔI_{SCD} (LOAD)	Standby Current Drain Change (vs Load Current)	5.0 mA ≤ I_L ≤ 350 mA			0.5	mA	1	1,2,3
V_{DO}	Dropout Voltage				2.5	V	1	1
I_{OS}	Output Short Circuit Current	V_I = 35 V			1.0	A	1	1
I_{OL}	Overload Current	V_I = 15 V		0.5	2.0	A	1	1
$\Delta V_I/\Delta V_O$	Ripple Rejection	V_I = 14 V, I_L = 125 mA, e_i = 1.0 V_{rms}, f = 2400 Hz		56		dB	1	4
N_O	Noise	V_I = 14 V, I_L = 50 mA, 10 Hz ≤ f ≤ 10 kHz			175	μV_{rms}	4	9

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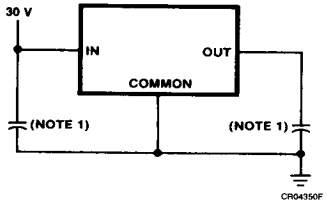
Primary Burn-In Circuit



Note
1. Capacitor value necessary to suppress oscillations.

Equivalent Circuit