

# Magnetic Amplifier Controller

## FEATURES

- Independent 1% Reference
- Two Uncommitted, Identical Operational Amplifiers
- 100mA Reset Current Source with -120V Capability
- 5V to 40V Analog Operation
- 5W DIL Package

## DESCRIPTION

The UC1838A family of magnetic amplifier controllers contains the circuitry to generate and amplify a low-level analog error signal along with a high voltage-compliant current source. This source will provide the reset current necessary to enable a magnetic amplifier to regulate and control a power supply output in the range of 2A to 20A.

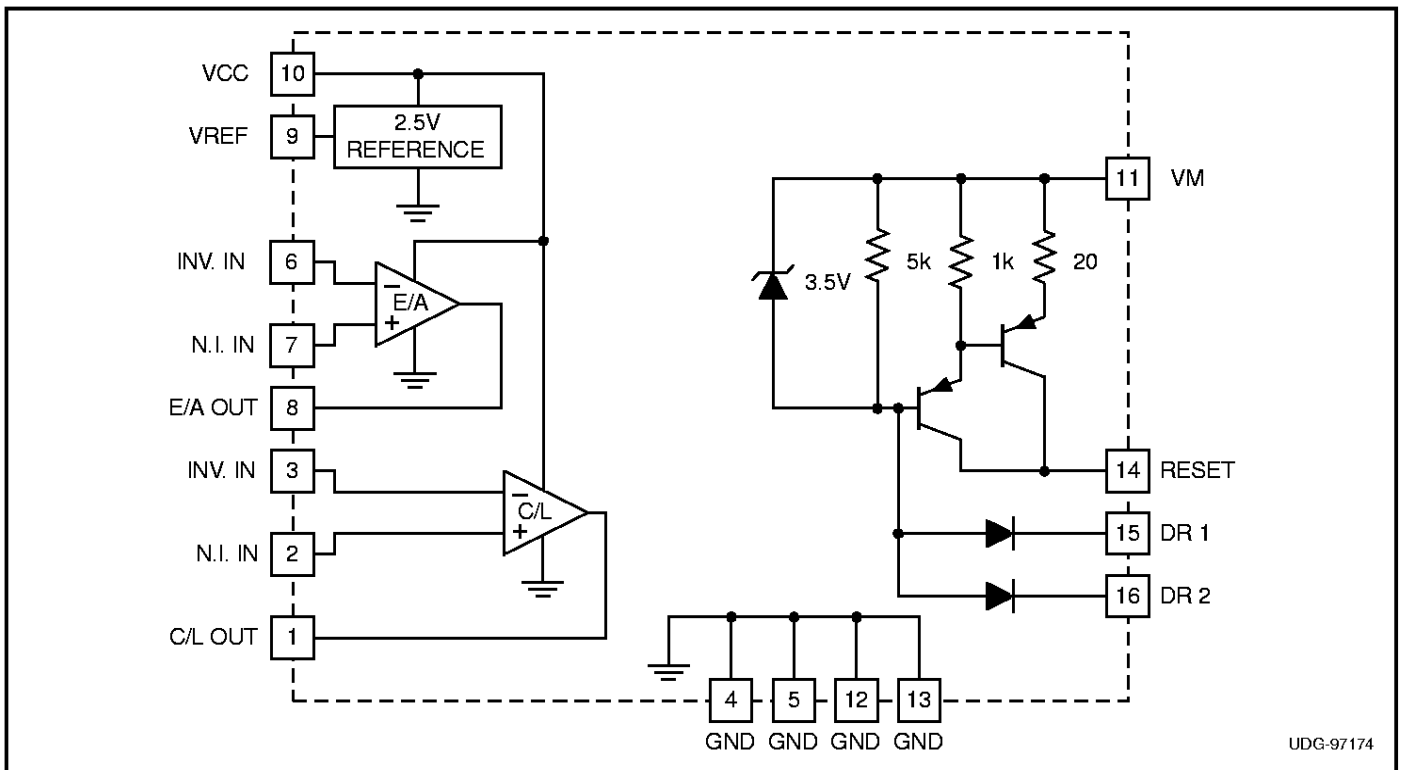
By controlling the reset current to a magnetic amplifier, this device will define the amount of volt-seconds the magnetic amplifier will block before switching to the conducting state. Magnetic amplifiers are ideal for post-regulators for multiple-output power supplies where each output can be independently controlled with efficiencies up to 99%. With a square or pulse-width-modulated input voltage, a magnetic amplifier will block a portion of this input waveform, allowing just enough to pass to provide a regulated output. With the UC1838A, only the magnetic amplifier coil, three diodes, and an output L-C filter are necessary to implement a complete closed-loop regulator.

The UC1838A contains a precision 2.5V reference, two uncommitted high-gain op amps and a high-gain PNP-equivalent current source which can deliver up to 100mA of magnetic amplifier reset current and with -120 volt capability.

These devices are available in a plastic "bat-wing" DIP for operation over a -20°C to +85°C temperature range and, with reduced power, in a hermetically sealed cerdip for -55°C to +125°C operation. Surface mount versions are also available.

This improved "A" version replaced the non "A" version formerly introduced.

## BLOCK DIAGRAM



UDG-97174

### ABSOLUTE MAXIMUM RATINGS

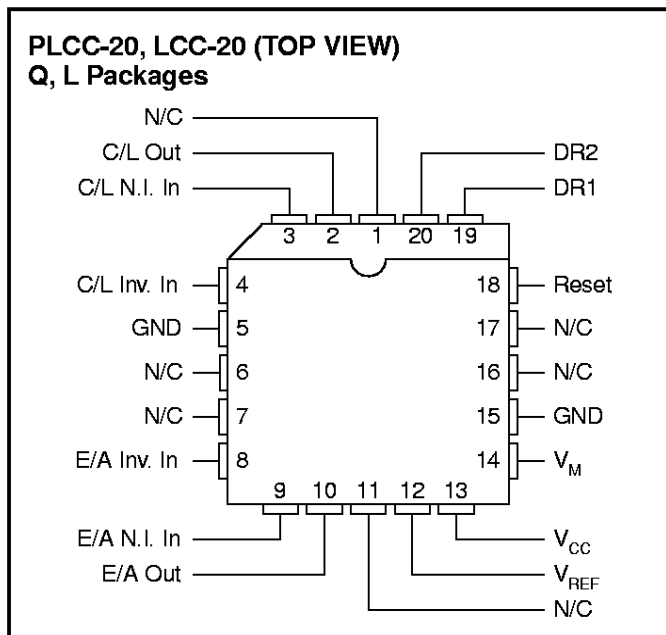
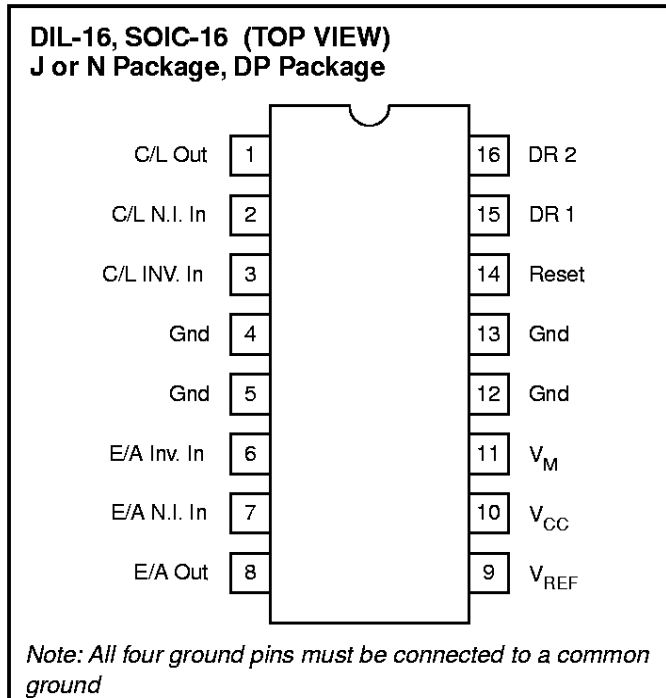
Supply Voltage, $V_{CC}$ .....	40V
Magnetic Amp. Source Voltage, $V_M$ .....	40V
Reset Output Voltage, $V_R$ .....	-120V
Total Current Source Voltage, $V_M - V_R$ .....	-140V
Amplifier Input Range .....	-0.3V to $V_{CC}$
Reset Input Current, $I_{DR}$ .....	-10mA
Power Dissipation at $T_A = 25^\circ\text{C}$	
Q, N, DP Package .....	2W
J, L Package .....	1W
Power Dissipation at T (leads/case) = $25^\circ\text{C}$	
Q, N, DP Package .....	5W
J, L Package .....	2W
Operating Temperature Range .....	$-55^\circ\text{C}$ to $+125^\circ\text{C}$
Storage Temperature Range .....	$-65^\circ\text{C}$ to $+150^\circ\text{C}$
Lead Temperature (Soldering, 10 sec) .....	$300^\circ\text{C}$

Note: All voltages are with respect to ground pins. All currents are positive into the specified terminal. Consult Packaging section of Databook for thermal limitations and considerations of package.

### ORDERING INFORMATION

	TEMPERATURE RANGE	PACKAGE
UC1838AJ	$-55^\circ\text{C}$ to $+125^\circ\text{C}$	Ceramic Dip
UC1838AL		CLCC
UC2838ADP	$-20^\circ\text{C}$ to $+85^\circ\text{C}$	Power SOIC
UC2838AN		Plastic Dip
UC2838AQ		PLCC
UC3838ADP	$0^\circ\text{C}$ to $+70^\circ\text{C}$	Power SOIC
UC3838AN		Plastic Dip
UC3838AQ		PLCC

### CONNECTION DIAGRAMS





APPLICATION INFORMATION

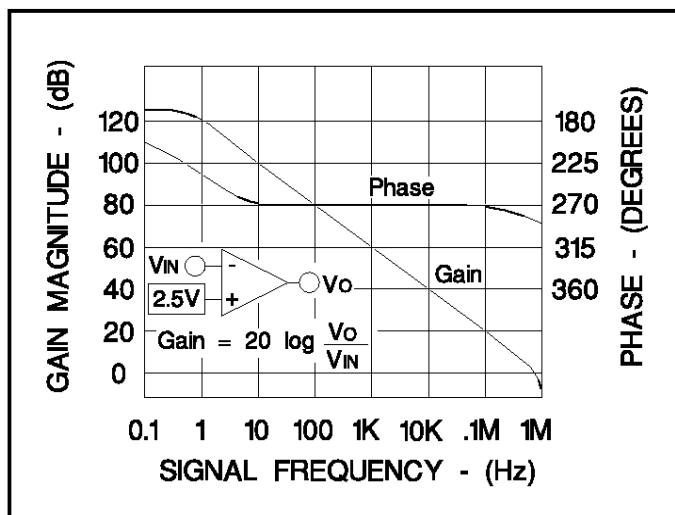


Figure 1. Amplifier open loop response.

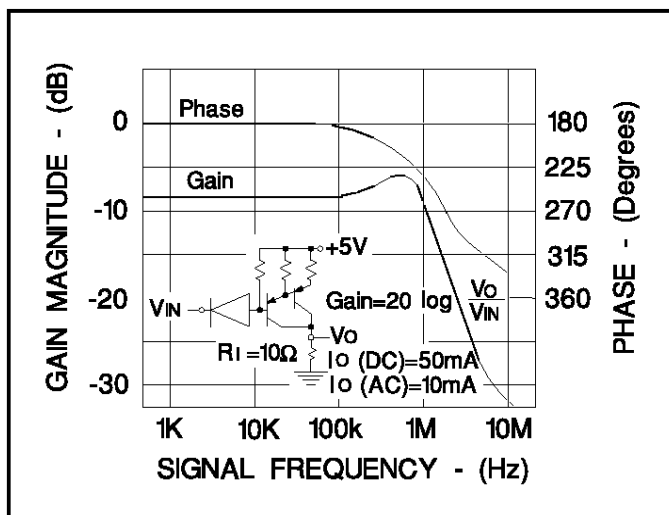


Figure 4. Reset driver response.

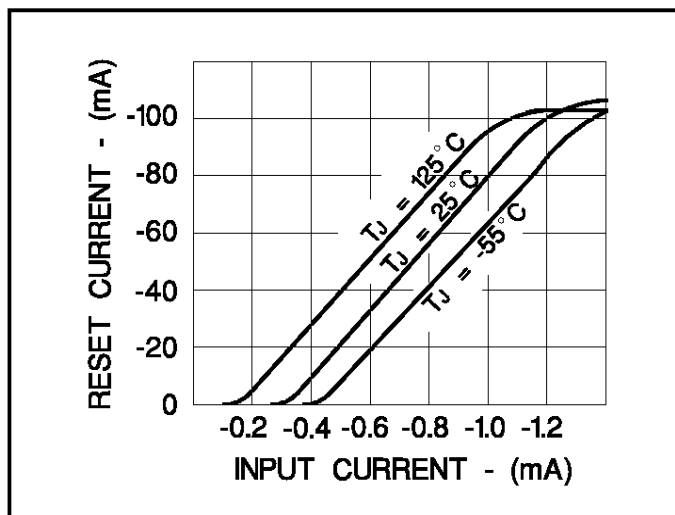


Figure 2. Reset driver-input current.

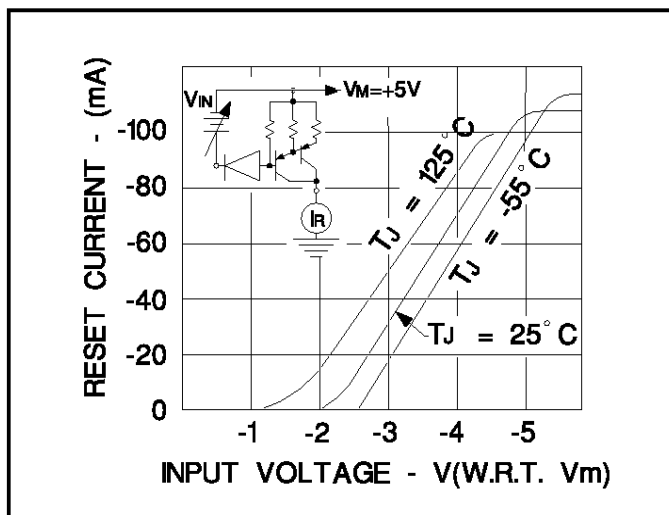


Figure 5. Reset driver-input voltage.

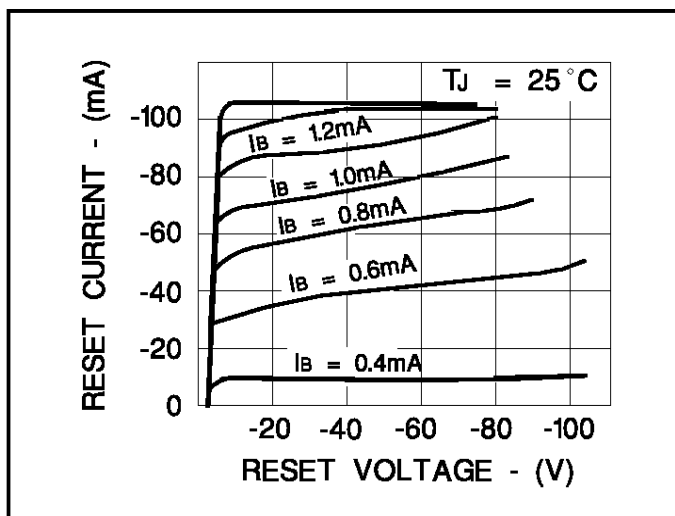


Figure 3. Reset driver-output impedance.

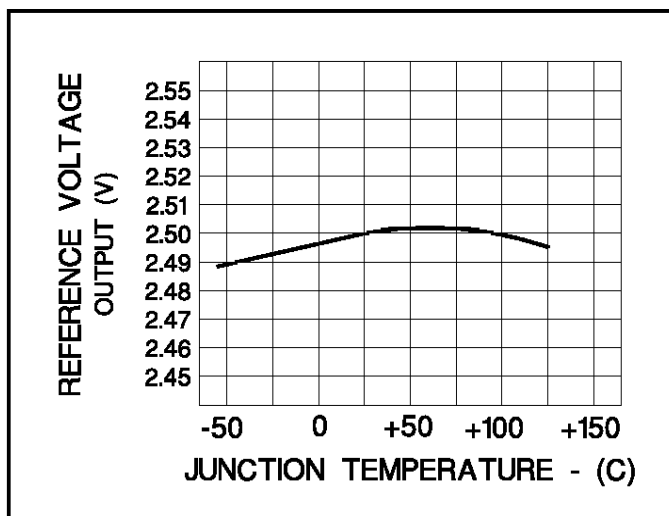


Figure 6. Reference temperature coefficient.