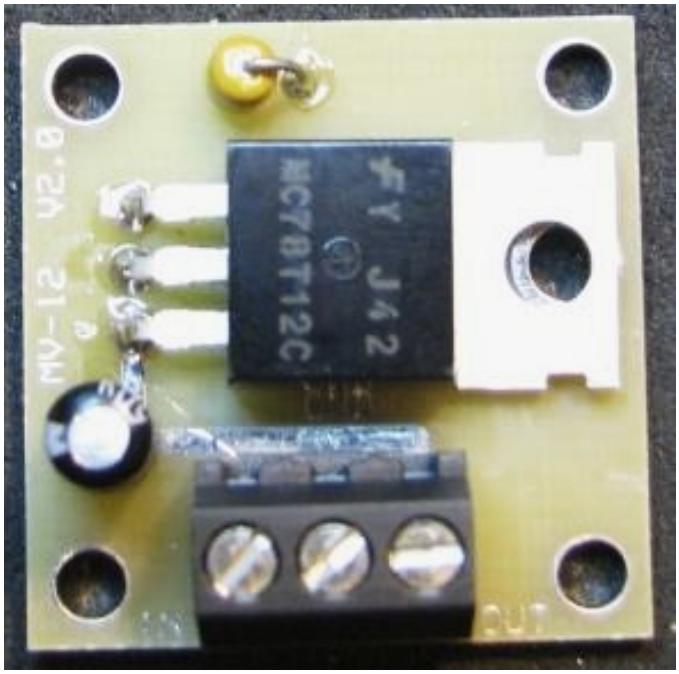
MICRO-VOLT 12 Version 2.0



The Micro-Volt 12, Version 2.0 is a simple regulated power supply capable of supplying pulsed, 12 volt regulated power at currents in excess of 3 Amperes. The device may be used in continuous draw modes to supply quiescent power with a current draw in excess of 1 ampere without adding additional heat-sinking. This makes it ideal for application like the Micro-Trak transmitters, where standby power is moderate with pulsed power requirement of several Amperes during transmission.

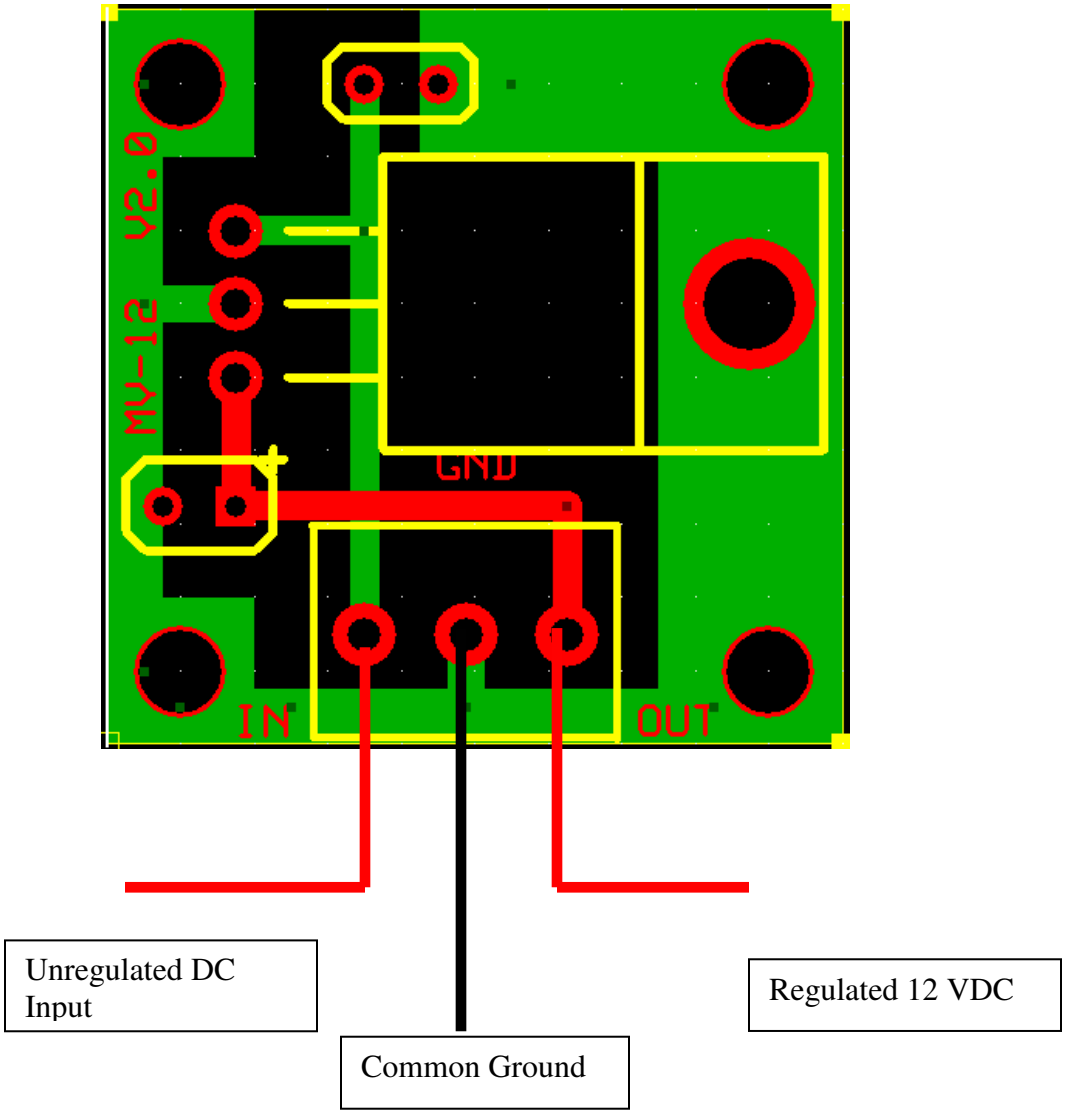
Unlike the previous generation of Micro-Volt 12, this power supply does not utilize an on-board LED to indicate power. This LED was superfluous and added heat and lighting in areas where it was not always desirable. An overview of the features of the Micro-Volt include:

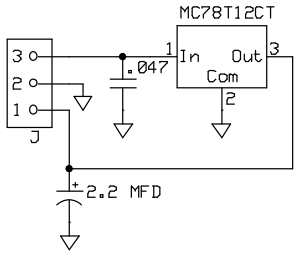
- **Output Current in Excess of 3.0A**
- **Output Transistor Safe Operating Area Compensation**
- **Power Dissipation: 25W**
- **Internal Short Circuit Current Limiting**
- **Internal Thermal Overload Protection**
- **Output Voltage Offered in 4% Tolerance**
- **Output Voltage 12 V**

The Micro-Volt 12 does not have any special front-end polarity protection, to minimize power losses associated with steering diodes or similar circuitry. Care must be taken not to apply reverse polarity voltages to the device.

The Printed Circuit board is designed with a common ground, so be cognizant of this when installing the device in vehicles or applications where there may be ground loops or positive grounds. The mounting screw holes in each corner are connected to ground, as is the regulator tab. Note that although there is a hole in the PC board that may be used to connect the voltage regulator to the board, no screw is required or included.

Printed Circuit Board





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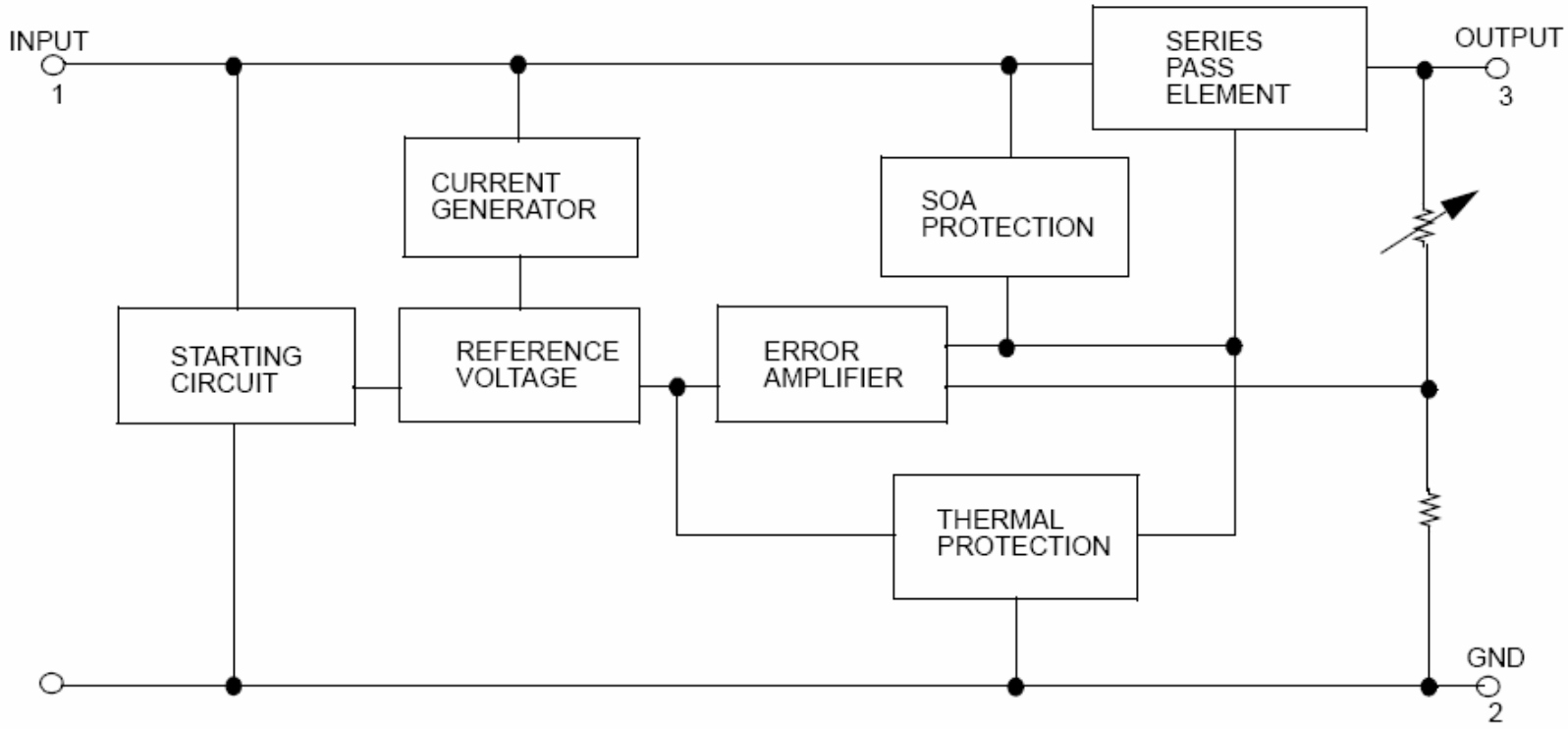
Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage (for V_O = 5V to 12V) (for V_O = 15V)	V_I	35 40	V V
Power Dissipation	PD	Internally limited	-
Thermal Resistance, Junction to Air (Note1, 2) Ta = +25°C	RθJA	65	°C/W
Thermal Resistance, Junction to Case (Note1) Tc = +25°C	RθJC	2.5	°C/W
Operating Junction Temperature Range	T_J	0 ~ +125	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Note:

1. Thermal resistance test board
   Size: 76.2mm * 114.3mm * 1.6mm(1S0P)
   JEDEC standard: JESD51-3, JESD51-7
2. Assume no ambient airflow.

Electrical Characteristics(KA78T05)

(V_I = 10V, I_O = 3.0 A, 0°C ≤ T_J ≤ +125°C, Po ≤ P_{MAX} (Note3), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vo	5mA ≤ Io ≤ 3.0A, T_J = +25°C 7.3V ≤ VI ≤ 20V, 5mA ≤ Io ≤ 2.0A	4.8 4.75	5.0 5.0	5.2 5.25	V
Line Regulation (Note4)	ΔV_O	7.2V ≤ VI ≤ 35V, Io=5mA, T_J = +25°C 7.2V ≤ VI ≤ 35V, Io=1.0A, T_J = +25°C 7.5V ≤ VI ≤ 20V, Io =2.0A, T_J = +25°C 8.0V ≤ VI ≤ 12V, Io =3.0A, T_J = +25°C	-	3.0	25	mV
Load Regulation (Note4)	ΔV_O	5mA ≤ Io ≤ 3.0A, T_J = +25°C 5mA ≤ Io ≤ 3.0A	-	10 15	30 80	mV mV
Thermal Regulation	REGT	Pulse =10ms, P = 20W TA = +25°C	-	0.002	0.03	%Vo/W
Quiescent Current	I_Q	5mA ≤ Io ≤ 3.0A, T_J = +25°C 5mA ≤ Io ≤ 3.0A	-	3.5 4.0	5.0 6.0	mA mA
Quiescent Current Change	ΔI_Q	7.2V ≤ VI ≤ 35V, Io = 5mA T_J = +25°C ; 7.5V ≤ VI ≤ 20V, Io =2.0A ; 5mA ≤ Io ≤ 3.0A, T_J = +25°C	-	0.1	0.8	mA
Ripple Rejection	RR	f = 120Hz, 8V ≤ VI ≤ 18V, Io = 2.0A T_J = +25°C	-	75	-	dB
Dropout Voltage	V_D	Io = 3A ,T_J = +25°C	-	2.2	2.5	V
Output Noise Voltage	VN	TA = +25°C, 10Hz ≤ f ≤ 100kHz	-	10	-	μV/Vo
Peak Output Current	IPK	TA = +25°C	-	5.0	-	A
Output Resistance	Ro	f = 1.0kHz	-	2.0	-	mΩ
Short Circuit Current Limit	Isc	VI = 35V, T_J =+25°C	-	1.5	2.5	A
Average Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta T$	Io = 5.0mA	-	0.2	-	mV/°C

Note:

3. Although power dissipation is internally limited, specifications apply only for P_O ≤ Pmax, Pmax = 25W
4. Load and line regulation are specified at constant junction temperature. Change in Vo due heating effects must be taken into account separately. Pulse testing with low duty is used.