Linear Regulator

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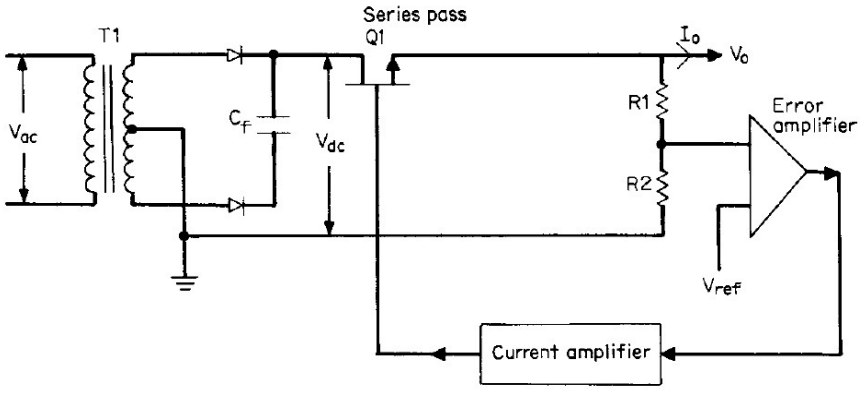
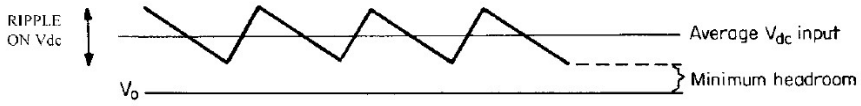
The linear regulator Circuit



Input and Output Waveforms



The waveform shows the ripple normally present on the unregulated DC input (V_{dc}).

A minimum input-output voltage differential (headroom) of at least 2.5 V is required

Linear Regulator Limitations

- A lower regulated voltage from a higher input.
- No isolation between input and output.
- 50-Hz transformer high weight and volume.
- The efficiency is very low.
- Large heat sinks required.

Output voltage and Efficiency

V_o	I_o, A	$V_{dc(min)'}$ V	$V_{dc(max)'}$ V	Headroom, max, V	$P_{in(max)'}$ W	$P_{out_{(max)'}}$ W	Dissipation $Q1_{max}$	Efficiency, % $P_o/P_{in(max)}$
5.0	10	7.5	10.1	5.1	101	50	51	50
15.0	10	17.5	23.7	8.7	237	150	87	63
30.0	10	32.5	44.0	14	440	300	140	68

at lower DC output voltages the efficiency will be very low