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APPLICATION NOTE 4417

Transceiver IC Generates $\pm 30V$

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Abstract: This application note explains how an RS-232 transceiver and a few external components can be combined to generate supply rails up to $\pm 30V$. The MAX202 transceiver is featured in the design.

This design idea appeared in the July 20, 2006 issue of *Electronic Design* magazine.

When applications require only a few millamps of supply current, an RS-232 transceiver IC (here, the [MAX202](#)) and a few external components can generate bipolar supply rails up to $\pm 30V$. This capability is useful in $\pm 15V$ op-amp circuits that provide, for example, meter drive, LCD bias, and gas-detector bias.

In the standard application for which it was designed, the internal charge pump of the MAX202 generates $\pm 10V$ for driving an RS-232 line. In **Figure 1** the IC's transmit section drives an external charge pump that generates up to $\pm 30V$. Modifications allow the circuit to generate other voltages, such as $\pm 20V$. With the addition of external linear regulators it can produce $\pm 15V$ for bipolar op-amp circuits.

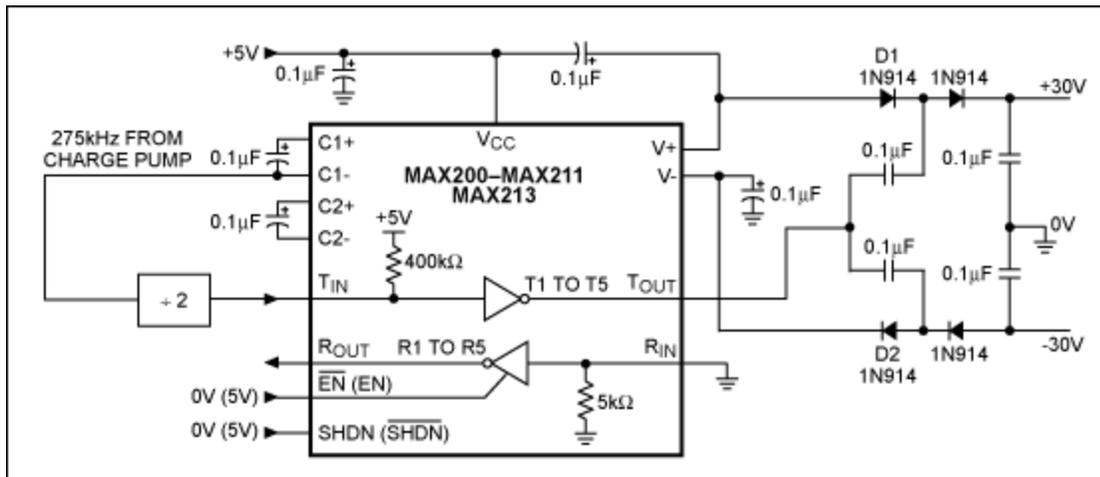


Figure 1. This RS-232 transceiver drives an external charge pump, which provides $\pm 30V$ supply voltages at a few millamps.

The maximum operating frequency for the external charge pump is approximately 120kHz, so a JK flip-flop (or other divide-by-2 circuit connected between +5V and ground) is inserted in the oscillator line to lower the frequency applied to the pump. Lower voltages can be obtained ($\pm 20V$, for example) by connecting the anode of D1 and the cathode of D2 to ground instead of $\pm 10V$.

Related Parts

MAX200	+5V, RS-232 Transceivers with 0.1 μ F External Capacitors	Free Samples
MAX211	+5V, RS-232 Transceivers with 0.1 μ F External Capacitors	Free Samples
MAX213	+5V, RS-232 Transceivers with 0.1 μ F External Capacitors	Free Samples

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