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LINEAR
INTEGRATED
CIRCUITS

TYPES RM4193, RC4193
MICROPOWER SWITCHING REGULATOR

D2718, SEPTEMBER 1983

- High Efficiency . . . 80% Typ
- Low Bias Current . . . 135 μ A
- Adjustable Output . . . 2.5 V to 24 V
- Output Current . . . 150 mA
- Internal Reference . . . 1.3 V \pm 5%
- Remote Shutdown Capabilities
- Interchangeable with Raytheon RM4193 and RC4193

description

The RM4193 and RC4193 are monolithic micropower switching regulators designed to provide all the functions required to make a complete low-power switching regulator primarily for battery operated instruments. The RM4193 and RC4193 offer the system designer the flexibility of tailoring the circuit to the application. Typical applications include step-up switching regulation, step-down switching regulation, and inverting switch regulation. The devices each contain a 1.3-volt temperature-compensated band-gap reference, an adjustable free-running oscillator, voltage comparator, low battery detection circuitry, and a 150-millampere output-switch transistor.

For most applications, these regulators can achieve up to 80% efficiency while operating over a wide supply voltage range from 2.4 volts to 24 volts at an ultra-low bias current drain of 135 microamperes. The RM4193 and RC4193 have an adjustable 100-hertz to 160-kilohertz free-running oscillator that provides the drive circuitry for the on-chip 150-millampere output-switch transistor. An external capacitor on pin 2 determines the oscillator frequency.

The low-battery detection circuitry contains an open-collector output transistor that can be used to activate a liquid crystal display whenever the battery voltage drops below a programmed level. This programmed level is determined by the selection of external resistors connected to pin 1.

The regulator will shut off when pin 6 (IC) is below 0.5 volt. The shut-off feature is useful in battery-backup applications requiring operation only when the line power is removed. Another use of this feature is connecting a zener diode between pin 6 and the battery line to shut down the regulator whenever the battery voltage drops below a predetermined level.

The RM4193 will be characterized for operation over the full military temperature range of -55°C to 125°C . The RC4193 will be characterized for operation from 0°C to 70°C .

functional block diagram

