

MAXIM

3W, +5V to $\pm 12V/\pm 15V$ DC-DC Converter Module

MAX1743

General Description

The MAX1743 converts +5V to $\pm 12V$ or $\pm 15V$, with no external components required. It supplies 125mA at $\pm 12V$ or 100mA at $\pm 15V$. Pin strapping selects $\pm 12V$ or $\pm 15V$ operation. The MAX1743 regulates both its positive and negative outputs independently to within $\pm 4%$ over all specified conditions of line voltage, load current, and temperature.

On-board cycle-by-cycle current sensing, soft-start, and undervoltage lockout ensure reliable operation. The MAX1743 module package has a standard 24-pin, 0.600" wide DIP footprint and is only 0.345" high.

Features

- ◆ High 10W/in³ Power Density (0.61W/cm³)
- ◆ No External Components Required
- ◆ Pin-Strap Selectable Output Voltage ($\pm 12V$ at 125mA or $\pm 15V$ at 100mA)
- ◆ 82% Efficiency
- ◆ 24-Pin Wide DIP Footprint, 0.345" (8.75mm) High
- ◆ Low Output Ripple
- ◆ 2.0V Reference Output
- ◆ Outputs Guaranteed to $\pm 4%$ Over All Specified Line, Load, and Temperature Conditions

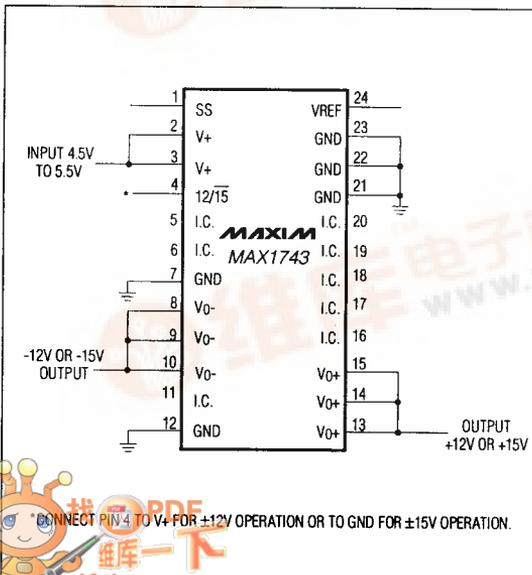
Applications

Distributed Power Systems
 Computer Peripherals
 Portable Instruments
 Industrial Controllers

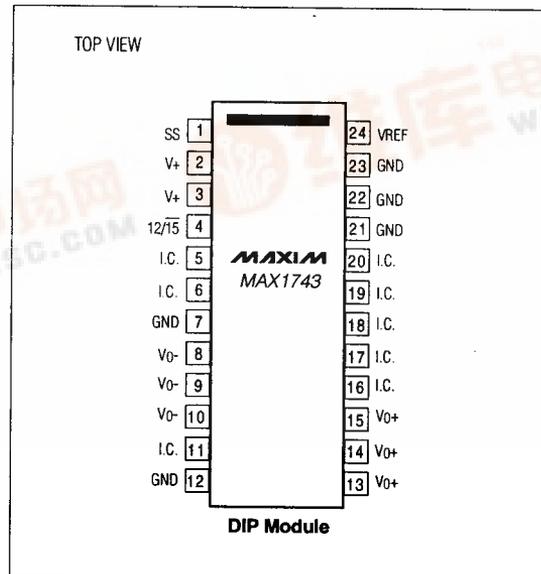
Ordering Information

PART	TEMP. RANGE	PIN-PACKAGE
MAX1743CHG	0°C to +70°C	24 DIP Module

Typical Operating Circuit



Pin Configuration



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ABSOLUTE MAXIMUM RATINGS

V+ to GND	+7V, -0.3V (±12V Mode)
	+6V, -0.3V (±15V Mode)
VO+ to GND	+17V, 0V
VO- to GND	0V, -20V
VO- to V+	0V, -23V
VREF to GND	(V+ + 0.3V), -0.3V
12/15 to GND	(V+ + 0.3V), -0.3V

VO+ Source Current	1A
VO- to GND Short-Circuit Duration	1 minute
Continuous Power Dissipation	1000mW
Operating Temperature Range	0°C to +70°C
Storage Temperature Range	-65°C to +125°C
Lead Temperature (soldering, 10sec)	+300°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

(V+ = 5.0V, TA = TMIN to TMAX, unless otherwise noted.)

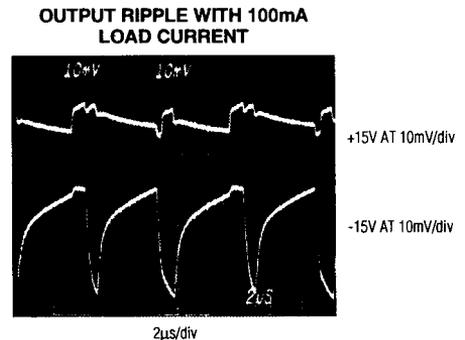
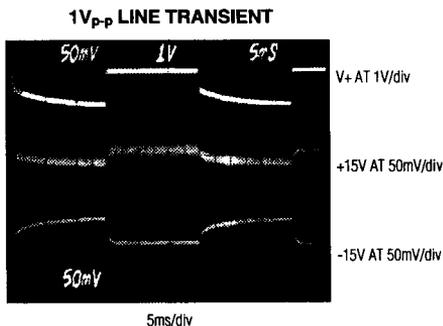
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS	
Output Voltage ±15V Mode	V+ = 4.5V to 5.5V, 0mA < ILOAD < 100mA, 12/15 = 0V	TA = +25°C	14.55	15.00	15.45	V
		TA = TMIN to TMAX	14.40	15.00	15.60	
Output Voltage ±12V Mode	V+ = 4.5V to 5.5V, 0mA < ILOAD < 125mA, 12/15 = V+	TA = +25°C	11.64	12.00	12.36	V
		TA = TMIN to TMAX	11.52	12.00	12.48	
Supply Current	VREF floating		20	30	mA	
Standby Current	(V+ - 0.5V) < VREF ≤ V+, includes VREF current		2.2	4.0	mA	
VREF Reference Voltage	IREF = 0mA	1.95	2.00	2.05	V	
Undervoltage Lockout		3.8		4.2	V	
Oscillator Frequency (Note 1)			200		kHz	
Line Regulation	V+ = 4.5V to 5.5V		0.1		%	
Load Regulation	ILOAD = 0mA to 100mA		0.5		%	
Output Ripple Peak-to-Peak (Note 2)	ILOAD = 100mA		0.3		%	

Note 1: The MAX1743 uses a fully tested MAX743 as its power switching device. The MAX743 oscillator frequency is guaranteed to be between 170kHz and 230kHz. Consult the MAX743 data sheet for more information.

Note 2: Measured with 20MHz bandwidth.

Typical Operating Characteristics

(V+ = 5.0V, TA = +25°C, unless otherwise noted.)

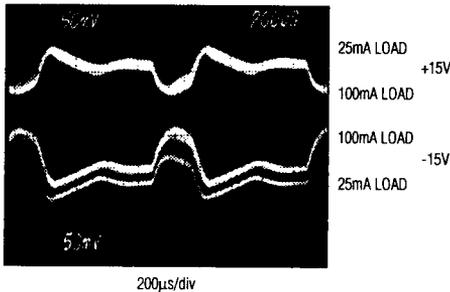


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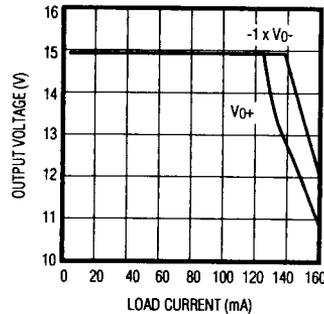
Typical Operating Characteristics

($V_+ = 5.0V$, $T_A = +25^\circ C$, unless otherwise noted.)

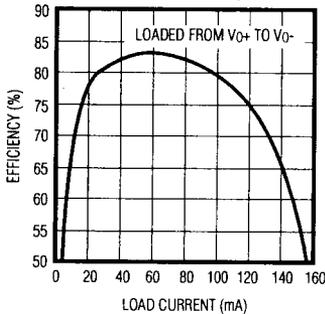
75mA LOAD TRANSIENT



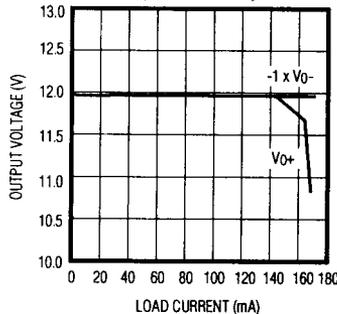
OUTPUT VOLTAGE vs. LOAD CURRENT ($\pm 15V$ MODE)



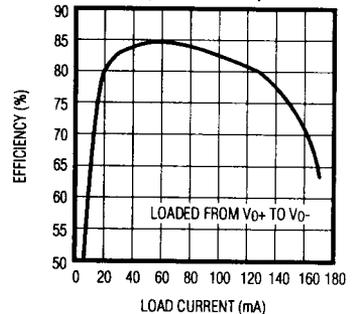
EFFICIENCY vs. LOAD CURRENT ($\pm 15V$ MODE)



OUTPUT VOLTAGE vs. LOAD CURRENT ($\pm 12V$ MODE)



EFFICIENCY vs. LOAD CURRENT ($\pm 12V$ MODE)



Pin Description

PIN	NAME	FUNCTION
1	SS	Soft-Start Pin. During power-up, the current into the V_+ pin will surge to 1.5A for approximately 2ms while the outputs reach regulation. Adding an optional 0.1 μ F capacitor from SS to GND prevents current surge, but lengthens the time until the outputs reach regulation to approximately 60ms.
2, 3	V_+	+5V Input
4	12/15	Pin-Strap Input for selecting $\pm 12V$ or $\pm 15V$. Tie 12/15 to V_+ to get a $\pm 12V$ output; tie 12/15 to GND to get a $\pm 15V$ output.
5, 6, 11, 16-20	I.C.	Internal Connection. Make no connection to these pins.
7, 12, 21, 22, 23	GND	Ground
8, 9, 10	V_{O-}	Negative Output Voltage. -12V when 12/15 = V_+ and -15V when 12/15 = 0V. This output is short-circuit protected.
13, 14, 15	V_{O+}	Positive Output Voltage. +12V when 12/15 = V_+ and +15V when 12/15 = 0V. This output is not short-circuit protected. Do not short V_{O+} to any potential less than V_+ .
24	VREF	+2.0V Reference Voltage Output. Pulling VREF up to V_+ puts the MAX1743 in a low-current standby mode with V_{O+} a Schottky diode drop below V_+ and V_{O-} at GND. See Figure 1.

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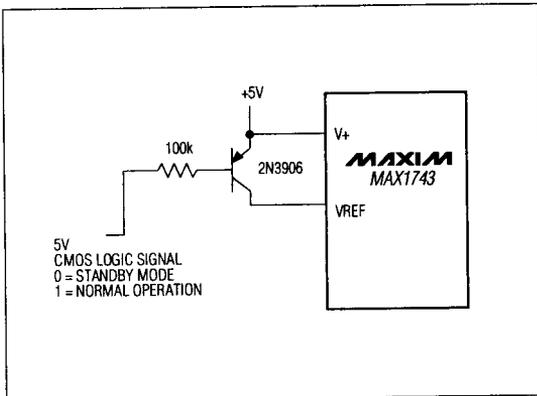


Figure 1. Standby-Mode Application Circuit