LINEAR TECHNOLOGY

LT1584/LT1585/LT1587

7A, 4.6A, 3A Low Dropout Fast Response Positive Regulators Adjustable and Fixed

FEATURES

- **Fast Transient Response**
- **Guaranteed Dropout Voltage at Multiple Currents**
- Load Regulation: 0.05% Typ
- Trimmed Current Limit
- On-Chip Thermal Limiting
- Standard 3-Pin Power Package

APPLICATIONS

- Pentium™ Processor Supplies
- PowerPC™ Supplies
- Other 2.5V to 3.6V Microprocessor Supplies
- Low Voltage Logic Supplies
- Battery-Powered Circuitry
- Post Regulator for Switching Supply

LT1585/7CM, LT1584/5/7CT	Adjustable
LT1585/7CM-3.3, LT1584/5/7CT-3.3	3.3V Fixed
LT1585CM-3.38, LT1584/5CT-3.38	3.38V Fixed
LT1585/7CM-3.45, LT1584/5/7CT-3.45	3.45V Fixed
LT1585/7CM-3.6, LT1584/5/7CT-3.6	3.6V Fixed

DESCRIPTION

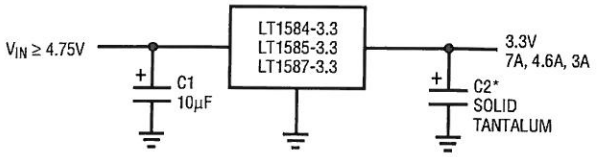
The LT®1584/LT1585/LT1587 are low dropout three-terminal regulators with 7A, 4.6A and 3A output current capability, respectively. Design has been optimized for low voltage applications where transient response and minimum input voltage are critical. Similar to the LT1083/4/5 family, it has lower dropout voltage and faster transient response. These improvements make it ideal for low voltage microprocessor applications requiring a regulated 2.5V to 3.6V output with an input supply below 7V.

Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal limiting provides protection against any combination of overload that would create excessive junction temperatures.

The LT1585/LT1587 are available in both the through-hole and surface mount versions of the industry standard 3-pin TO-220 power package. The LT1584 is available in the through-hole 3-pin TO-220 power package.

TYPICAL APPLICATION

3.3V, 7A, 4.6A, 3A Regulator

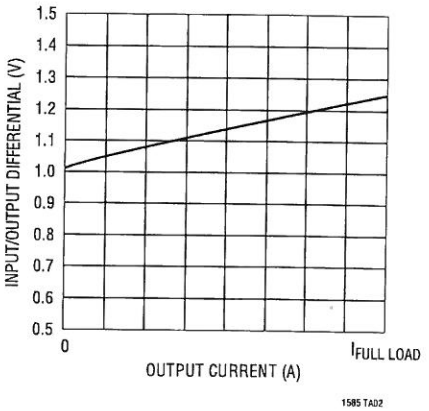


* REQUIRED FOR STABILITY
LT1584: C2 = 22µF,
LT1585/LT1587: C2 = 10µF

1585 TA01

NOTE: MICROPROCESSOR APPLICATIONS WITH LOAD TRANSIENTS OF 3.8A REQUIRE OUTPUT DECOUPLING CAPACITANCE > 1300µF ON FIXED VOLTAGE PARTS TO ACHIEVE < 50mV OF DEVIATION FROM NOMINAL OUTPUT. CONSULT FACTORY FOR DETAILS

Dropout Voltage vs Output Current



1585 TA02

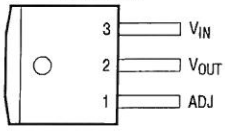
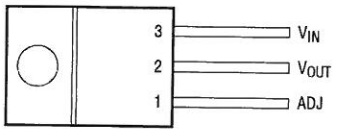
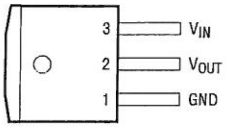
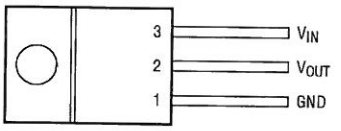
ABSOLUTE MAXIMUM RATINGS

V_{IN} 7V
Operating Junction Temperature Range
Control Section ..... 0°C to 125°C
Power Transistor ..... 0°C to 150°C
Storage Temperature Range ..... –65°C to 150°C
Lead Temperature (Soldering, 10 sec) ..... 300°C

PRECONDITIONING

100% Thermal Limit Functional Test

PACKAGE/ORDER INFORMATION

FRONT VIEW  M PACKAGE 3-LEAD PLASTIC DD PAK θ_{JA} = 30°C/W*	ORDER PART NUMBER LT1585CM LT1587CM	FRONT VIEW  T PACKAGE 3-LEAD PLASTIC TO-220 θ_{JA} = 50°C/W	ORDER PART NUMBER LT1584CT LT1585CT LT1587CT
FRONT VIEW  M PACKAGE 3-LEAD PLASTIC DD PAK θ_{JA} = 30°C/W*	LT1585CM-3.3 LT1585CM-3.38 LT1585CM-3.45 LT1585CM-3.6 LT1587CM-3.3 LT1587CM-3.45 LT1587CM-3.6	FRONT VIEW  T PACKAGE 3-LEAD PLASTIC TO-220 θ_{JA} = 50°C/W	LT1584CT-3.3 LT1585CT-3.3 LT1587CT-3.3 LT1584CT-3.38 LT1585CT-3.38 LT1584CT-3.45 LT1585CT-3.45 LT1587CT-3.45 LT1584CT-3.6 LT1585CT-3.6 LT1587CT-3.6

* With package soldered to 0.5 square inch copper area over backside ground plane or internal power plane. θ_{JA} can vary from 20°C/W to >40°C/W with other mounting techniques.

Consult factory for Industrial and Military grade parts.

ELECTRICAL CHARACTERISTICS

PARAMETER		CONDITIONS		MIN	TYP	MAX	UNITS
Reference Voltage	LT1584 LT1585 LT1587	$1.5V \le (V_{IN} - V_{OUT}) \le 3V$, $10mA \le I_{OUT} \le 7A$ $1.5V \le (V_{IN} - V_{OUT}) \le 5.75V$, $10mA \le I_{OUT} \le 4.6A$, $T_J \ge 25°C$ $1.5V \le (V_{IN} - V_{OUT}) \le 5.75V$, $10mA \le I_{OUT} \le 4A$, $T_J < 25°C$ $1.5V \le (V_{IN} - V_{OUT}) \le 5.75V$, $10mA \le I_{OUT} \le 3A$	●	1.225 (–2%)	1.250	1.275 (+2%)	V
Output Voltage	LT1584-3.3 LT1585-3.3 LT1587-3.3	$4.75V \le V_{IN} \le 6.3V$, $0mA \le I_{OUT} \le 7A$ $4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 4.6A$, $T_J \ge 25°C$ $4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 4A$, $T_J < 25°C$ $4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 3A$	●	3.235 (–2%)	3.300	3.365 (+2%)	V
	LT1584-3.38 LT1585-3.38	$4.75V \le V_{IN} \le 6.38V$, $0mA \le I_{OUT} \le 7A$ $4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 4A$	●	3.313 (–2%)	3.380	3.465 (+2.5%)	V
	LT1584-3.45 LT1585-3.45 LT1587-3.45	$4.75V \le V_{IN} \le 6.45V$, $0mA \le I_{OUT} \le 7A$ $4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 4A$ $4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 3A$	●	3.381 (–2%)	3.450	3.519 (+2%)	V
	LT1584-3.6 LT1584-3.6 LT1584-3.6 LT1584-3.6	$4.75V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 6A$ $4.80V \le V_{IN} \le 7V$, $0mA \le I_{OUT} \le 6A$ $4.80V \le V_{IN} \le 6.6V$, $0mA \le I_{OUT} \le 7A$ $4.85V \le V_{IN} \le 6.6V$, $0mA \le I_{OUT} \le 7A$	● ● ● ●	3.400 (–5.5%) 3.450 (–4%) 3.431 (–4.7%) 3.481 (–3.3%)	3.600 3.600 3.600 3.600	3.672 (+2%) 3.672 (+2%) 3.672 (+2%) 3.672 (+2%)	V V V V