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L4957A

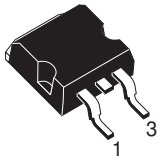
Up to 5A ULDO linear regulator

General features

- 1.5V, 1.8V, 2.5V and 3.3V fixed output voltage
- 3V to 14V input voltage range
- 200mΩ $R_{DS(on)}$ typical @ t_J = 125°C
- 0.6V max. drop-out at 2A
- Excellent load regulation
- 0.6mA quiescent current at any load
- Short circuit protection
- Thermal shutdown

Applications

- Mother boards
- Processor I/O & supplies
- Low voltage memory & chip set supplies
- Graphic & sound cards
- Low voltage logic supplies
- Post regulator for SMPS



D^2PAK

Description

The L4957AD devices are **U**ltra **L**ow **D**rop **O**utput linear regulators with an internal N-channel MOSFET of 200mΩ particulary suitable for low voltage/low dropout applications.

Operating with a input voltage from 3V to 14V they are capable to deliver up to 5A.

The devices are ideal for use as one of the supplies required by processor, for example they are the cost effective and efficient solution for conversion from 3.3V (rail bus) to 2.5V @ 2.5A or to 1.5V with high current rating.

Fast response transient minimise the output capacitor value. A minimum of 22µF assures the stability in all load conditions.

The on-chip trimming technique offers a tighter voltage reference tolerance (with ± 2% including line and load variation) beside to ensure a controlled short circuit current. Thermal shutdown provides protection against overload conditions that creates excessive junction temperature.

Order codes

Part number	
Tube	**Tape and Reel**
L4957AD1.5	L4957AD1.5TR
L4957AD1.8	L4957AD1.8TR
L4957AD2.5	L4957AD2.5TR
L4957AD3.3	L4957AD3.3TR

Contents

1 Block diagram and typical application

Figure 1. Block diagram

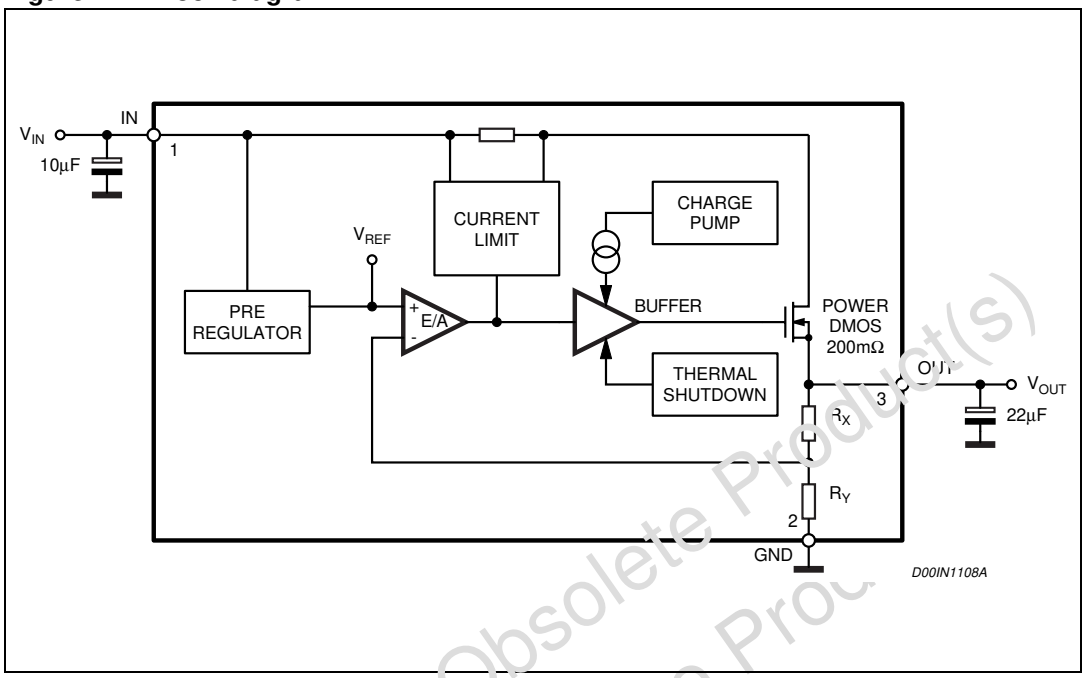
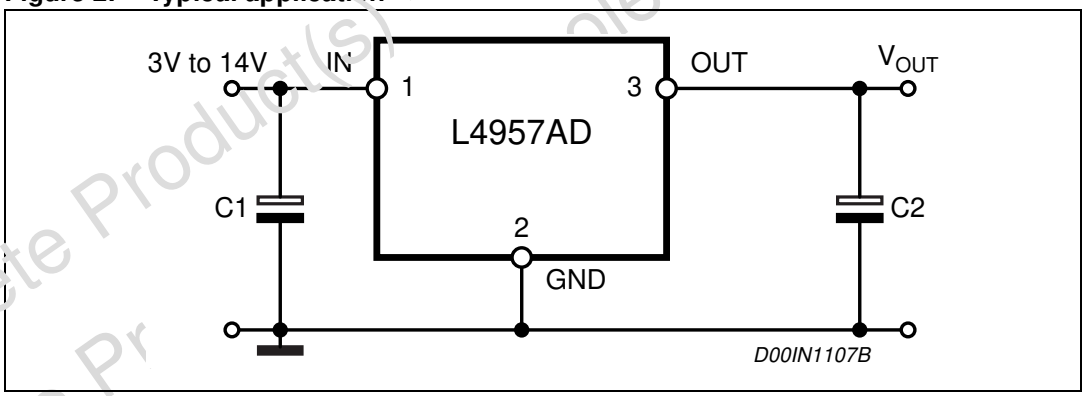


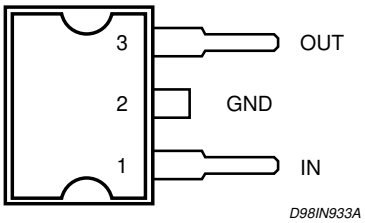
Figure 2. Typical application



2 Pin description

2.1 Pin connection

Figure 3. Pin connection (top view)



D^2PAK

2.2 Pin description

Table 1. Pin description

Name	Pin N°	Description
1	IN	Unregulated input voltage; this pin must be bypassed with a capacitor larger than 10µF.
2	GND	To connect to Ground to get 1.5V, 1.8V, 2.5V or 3.3V output.
3	OUT	Regulated output voltage. A minimum bypass capacitor of 22µF is required to insure stability.

3 Maximum ratings

3.1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{IN}	Supply input voltage	16	V
T_J	Junction temperature	-40 to +150	°C
T_{STG}	Storage temperature	-40 to +150	°C

3.2 Thermal data

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Maximum thermal resistance junction-case	3	°C/W
R_{thJA}	Maximum thermal resistance junction-ambient	60	°C/W
	Thermal Shutdown Typ.	150	°C
	Thermal Hysteresis Typ.	29	°C

4 Electrical characteristics

Table 4. Electrical Characteristcs (T_J = 25°C, V_{IN} = 5V, unless otherwise specified)

Symbol	Parameter	Test condition	Min	Typ	Max	Unit
V_{IN}	Operating Supply Voltage		3		14	V
V_O	Output Voltage	3.15V < V_{IN} < 5.25V; I_O = 0.1A	1.485	1.5	1.515	V
		V_{IN} = 3.3V ±5%; 0.1A < I_O < 5A (1)	1.47	1.5	1.53	V
		V_{IN} = 3.3V ±5% I_O = 0.1A V_{IN} = 5V ±5%	1.782	1.8	1.818	V
		V_{IN} = 3.3V ±5% (0.1A < I_O< 4.5A) (1) V_{IN} = 5V ±5% 0.1A < I_O< 5A	1.764	1.8	1.836	V
		V_{IN} = 3.3V ±5% I_O = 0.1A V_{IN} = 5V ±5%	2.475	2.5	2.525	V
		V_{IN} = 3.3V ±5% (0.1A < I_O < 2.2A) (1) V_{IN} = 5V ±5% 0.1A < I_O < 5A	2.45	2.5	2.55	V
		V_{IN} = 5V ±5% I_O = 0.1A	3.267	3.3	3.333	V
		V_{IN} = 5V ±5% 0.1A < I_O< 5A (1)	3.234	3.3	3.366	V
$R_{DS(on)}$	Drain-Source ON Resistance	(1)			300	mΩ
I_O	Current Limiting	(1)	5.1	6.3	7.5	A
I_Q	Quiescent Current	3V < V_{IN}< 14V (1)		0.6	2	mA
	Ripple Rejection	f = 120Hz, I_O = 1A V_{IN} = 5V ΔV_{IN} = $2V_{PP}$	60	75		dB

1. Specifications referred to T_J from 0°C to +125°C.

Figure 4. Line regulation vs. junction temperature

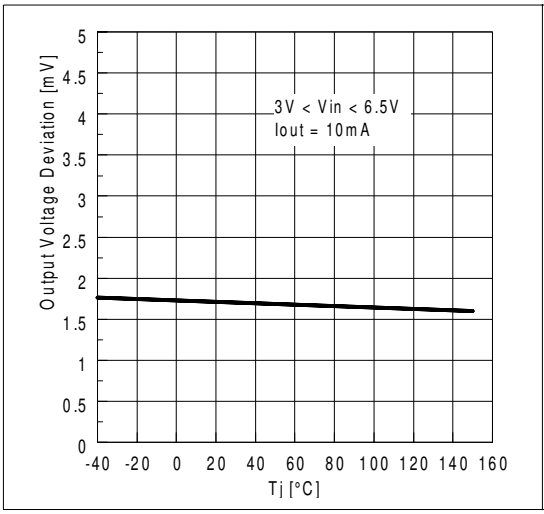


Figure 5. Load regulation

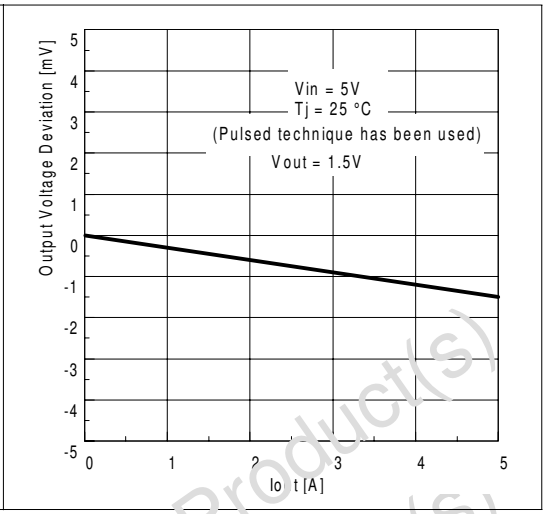


Figure 6. Maximum output current vs. junction temperature

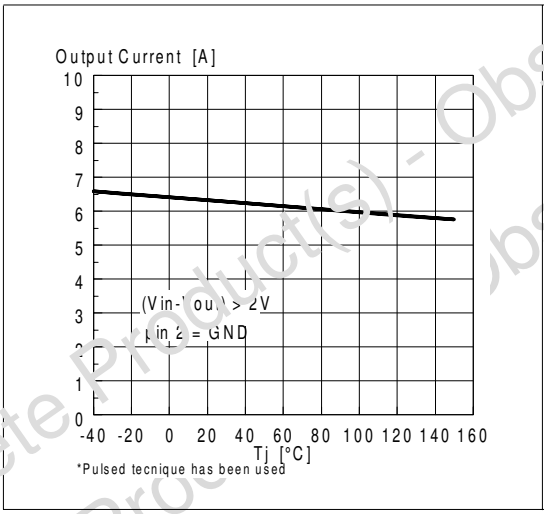


Figure 7. DC operating area

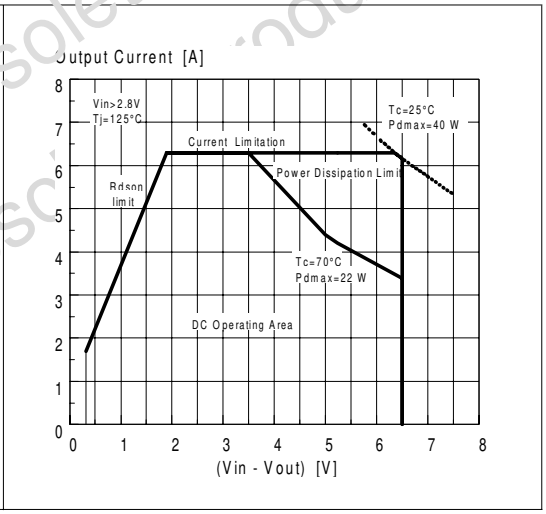


Figure 8. Ripple rejection vs. frequency

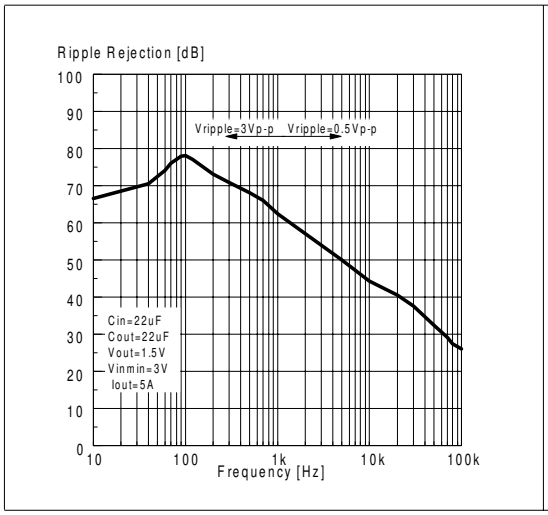


Figure 9. Output voltage vs. output current (V_{OUT} = 1.5V)

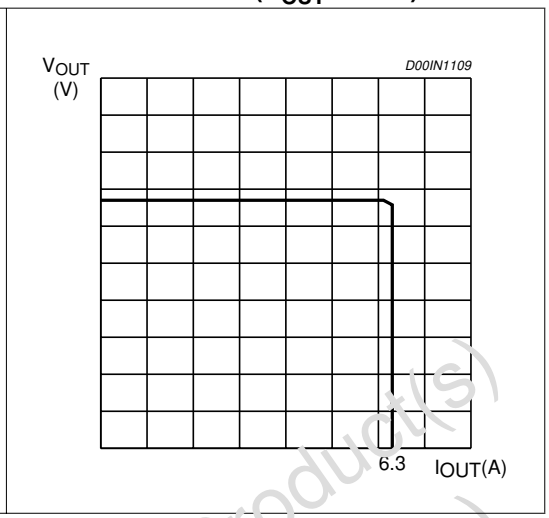
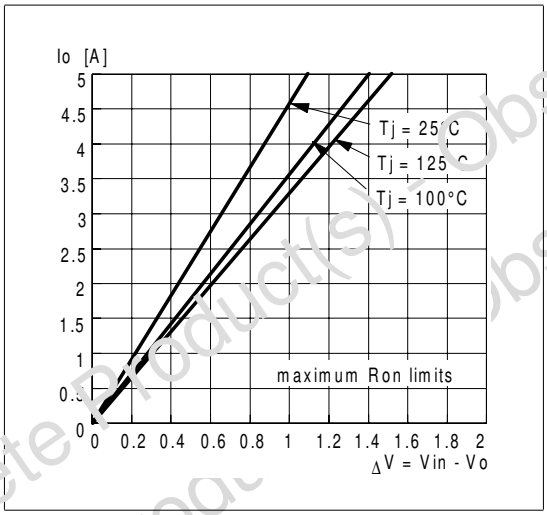


Figure 10. Maximum output current vs. junction temperature



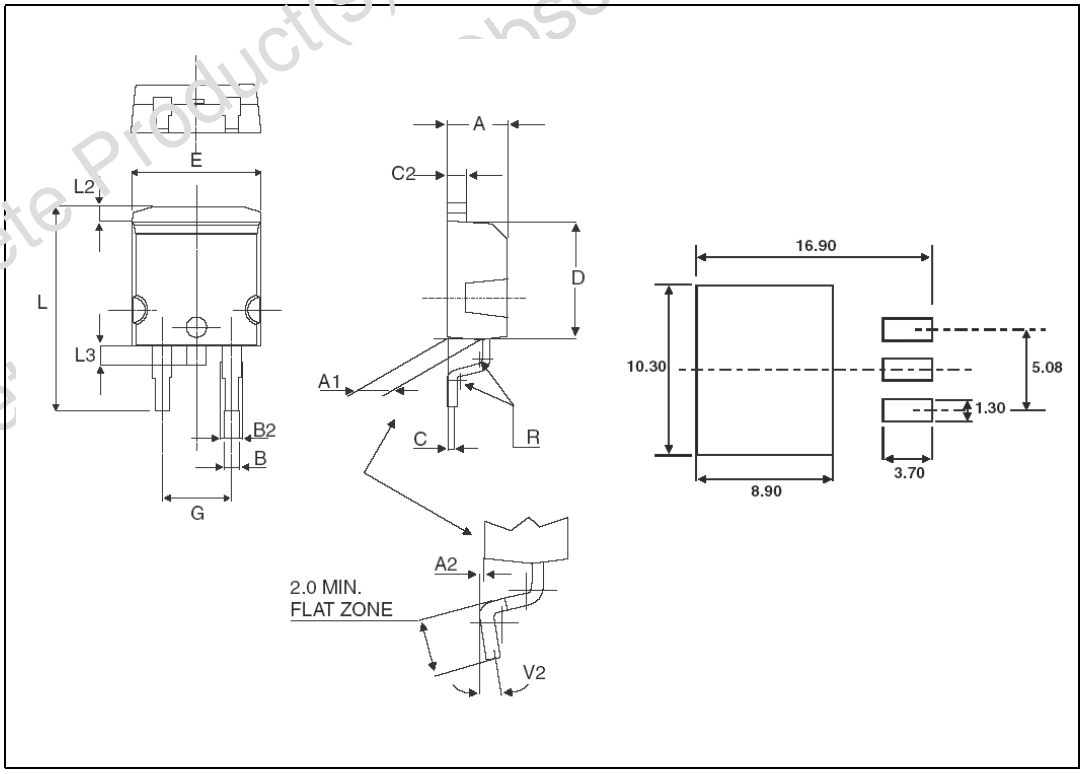
5 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Table 5. D²PAK Mechanical data

Dim.	mm.			inch		
	Min	Typ	Max	Min	Typ	Max
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25	1.40		0.049	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.40	0.050		0.055
L3	1.40		1.75	0.055		0.069
R		0.40			0.016	
V2	0°		8°	0°		8°

Figure 11. Package dimensions



6 Revision history

Table 6. Revision history

Date	Revision	Changes
12-Feb-2002	5	Removed the L4957AV part number and its references in the whole document
20-Apr-2006	6	New template