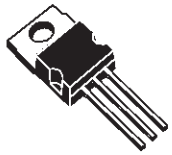
L4957

UP TO 5A ULDO LINEAR REGULATOR

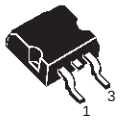
PRODUCT PREVIEW

- 1.5V AND 2.5V FIXED OUTPUT VOLTAGE
- 3V TO 7V INPUT VOLTAGE RANGE
- 200mΩ Rdson
- 0.6V max. DROP-OUT AT 2A
- EXCELLENT LOAD REGULATION
- 0.6mA QUIESCENT CURRENT AT ANY LOAD
- SHORT CIRCUIT PROTECTION WITH FOLD-BACK
- THERMAL SHUTDOWN

MULTIPOWER BCD TECHNOLOGY



Versawatt TO-220



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ORDERING NUMBERS:

L4957V1.5	**L4957D1.5**
L4957V2.5	**L4957D2.5**

APPLICATIONS

- MOTHER BOARDS
- PROCESSOR I/O & SUPPLIES
- LOW VOLTAGE MEMORY & CHIP SET SUPPLIES
- GRAPHIC & SOUND CARDS
- LOW VOLTAGE LOGIC SUPPLIES
- POST REGULATOR FOR SMPS

DESCRIPTION

The L4957 devices are **U**ltra **L**ow **D**rop **O**utput linear regulators with an internal N-channel MOS of 200mΩ particulary suitable for low voltage/low dropout applications.

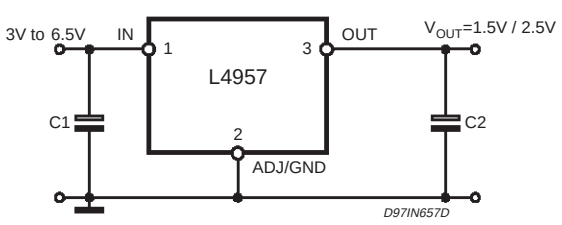
Operating with a input voltage from 3V to 6.5V they are capable to deliver up to 5A at 1.5V or 2.5V fixed output voltages. Adding an external divider between output and ground adjustments of the output voltages are possible (fig. 7).

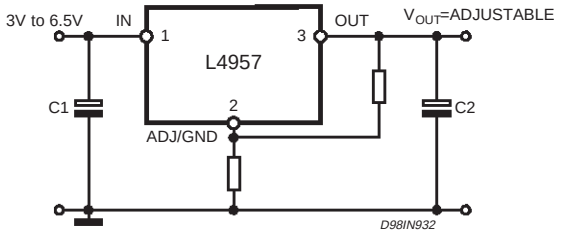
The devices are ideal for use as one of the supplies required by processor, for example they are the cost effective and efficient solution for conversion from 3.3V (rail bus) to 2.5V @ 2.5A or to 1.5V with high current rating (up to 5A).

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.

TYPICAL APPLICATIONS

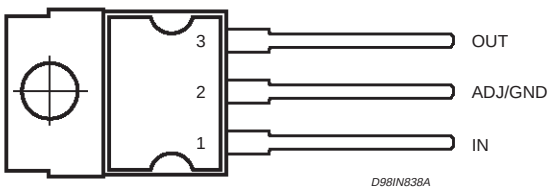




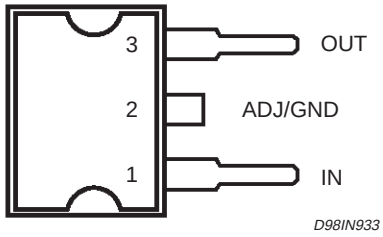
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{IN}	Supply Input Voltage	7	V
T_j	Junction Temperature	-40 to +150	°C
T_{stg}	Storage Temperature	-40 to +150	°C

PINS CONNECTION



Versawatt (TO220)



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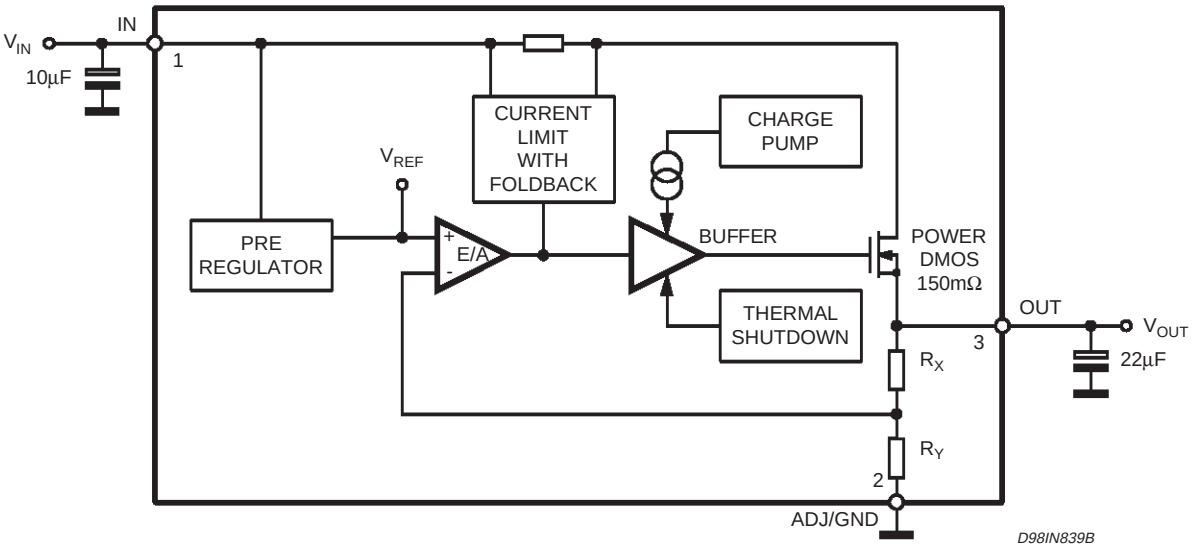
BLOCK DIAGRAM



PIN FUNCTIONS

Pin N°	Name	Function
1	IN	Unregulated input voltage; this pin must be bypassed with a capacitor larger than 10µF.
2	GND/ ADJ	To connect to Ground to get 1.5V or 2.5V output. To connect to an external divider to get output adjustable voltages.
3	OUT	Regulated output voltage. A minimum bypass capacitor of 22µF is required to insure stability.

THERMAL DATA

Symbol	Parameter		TO220	D2PAK	Unit
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max.	2.5	3	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max.	50	60	°C/W
	Thermal Shutdown	Typ.	150		°C
	Thermal Hysteresis	Typ.	20		°C

L4957 - ELECTRICAL CHARACTERISTICS (T_j = 25°C, V_{in} = 5V, unless otherwise specified).
● = Specifications referred to T_J from 0°C to +125°C.

Symbol	Parameter	Test Condition		Min.	Typ.	Max.	Unit
V_{IN}	Operating Supply Voltage			3		6.5	V
V_O	Output Voltage (1)	**For L4957V1.5/D1.5** 0.1A < I_O < 5A; 3V < V_{IN} < 6.5V 3V < V_{IN} < 6.5V; 0.1A < I_O < 5A	 ●	 1.47 1.455	 1.5 1.5	 1.53 1.545	 V V
		For L4957V2.5/D2.5 0.1A < I_O < 5A; 3V < V_{IN} < 6.5V 3V < V_{IN} < 6.5V; 0.1A < I_O < 5A	 ●	 2.45 2.425	 2.5 2.5	 2.55 2.575	 V V
ΔV_O	Load regulation (1)	0.1A < IO < 5A			2	10	mV
R_{DSON}	Drain-Source ON Resistance		●		200	300	mΩ
I_O	Current Limiting	90% V_O	●	5.1	6.3	7.5	A
	Short Circuit Current	V_O = 0V	●		1.8		A
I_Q	Quiescent Current	0.1A < I_O < 5A	●		0.6		mA
	Ripple Rejection	f = 120Hz, I_O = 5A V_{IN} = 5V ΔV_{IN} = $2V_{PP}$		60	75		dB

(1) ADJ/GND connected to ground.

Figure 1: Line Regulation vs. Junction Temperature

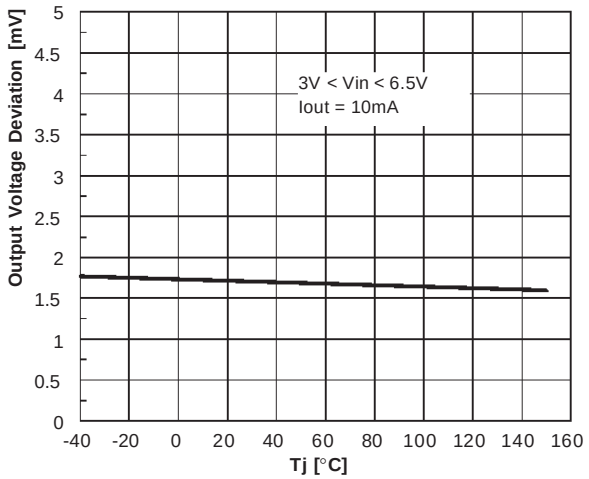


Figure 2: Load Regulation

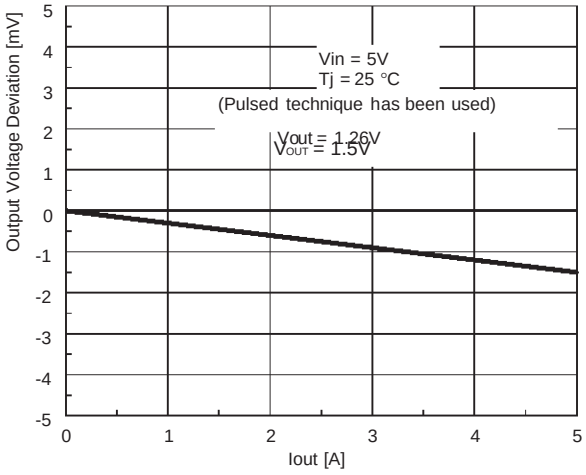
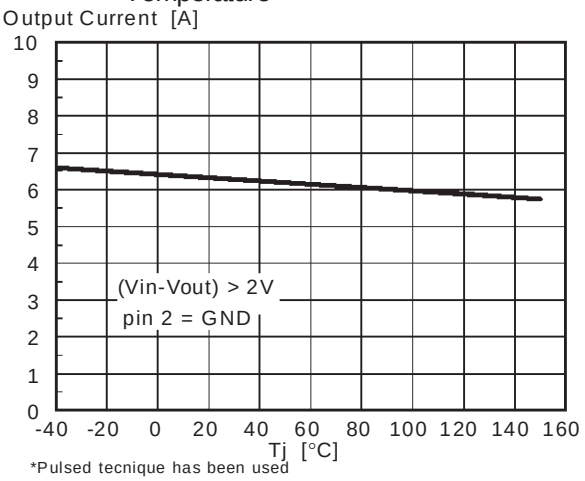


Figure 3: Maximum Output Current vs. Junction Temperature



*Pulsed tecnique has been used

Figure 4: DC Operating Area

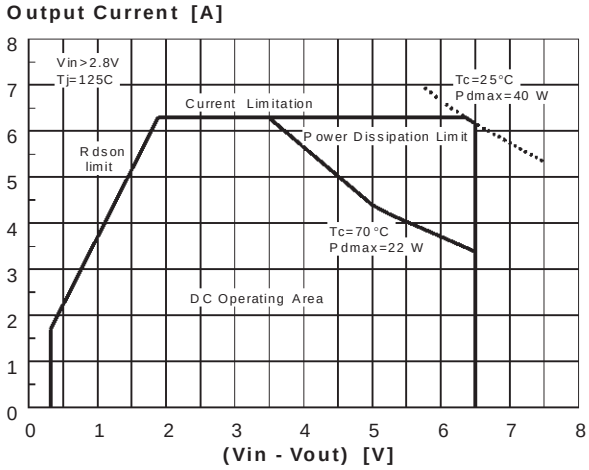


Figure 5: Ripple Rejection vs. Frequency

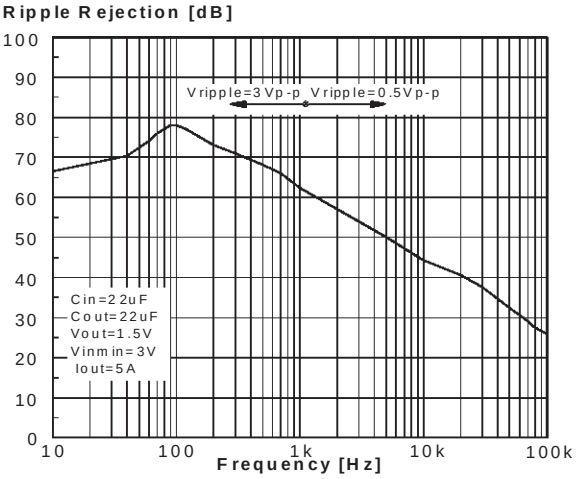
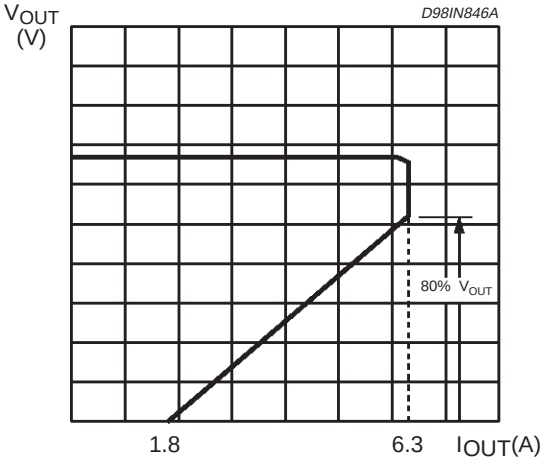


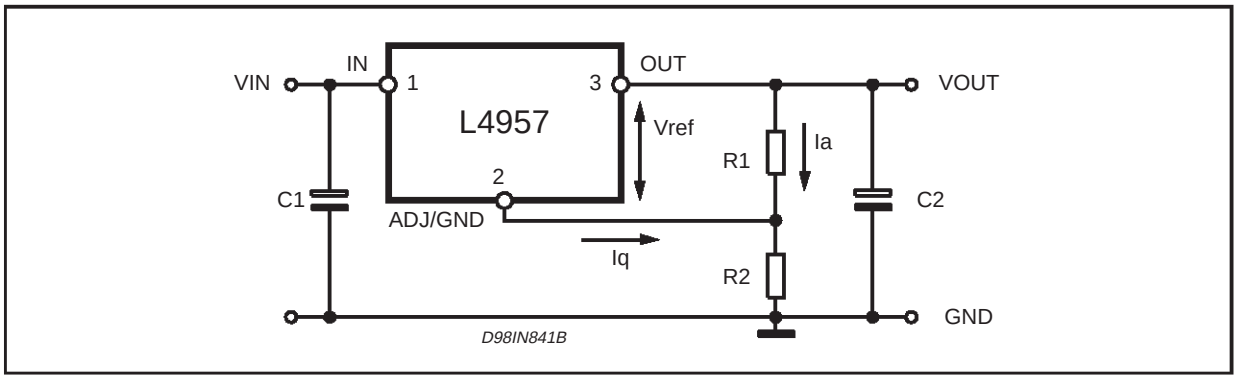
Figure 6: Output Voltage vs. Output Current. (V_{OUT} = 1.5V)



ADJUSTABLE OUTPUT VOLTAGE APPLICATIONS

Adjustable output voltages can be obtained adding a sample external voltage divider (see Fig. 7).

Figure 7.



Keeping a minimum difference of 2.8V between Vin and ADJ/GND pins, the possible outputs are:

Table 1. Reference Voltage.

	Input Voltage Bus Rail		
	3.3V ±5%	**5.0V ±5%**	
L4957V1.5 L4957D1.5	1.5V≤V_{out}≤1.8V(*)	1.5V≤V_{out}≤2.5V	Adj. Volt. Range
L4957V2.5 L4957D2.5	2.5V at 2A max.	2.5V≤V_{out}≤3.3V(*)	

(*) Maximum Output Current at 1.8V and 3.3V is 4.5A.

The output voltage Vout is given by:

$$V_{out} = V_{ref} (1 + R2/R1) + I_q \cdot R2$$

Where V_{ref} = 1.5V/2.5V (L4957V1.5/L4957V2.5), I_q = quiescent current.

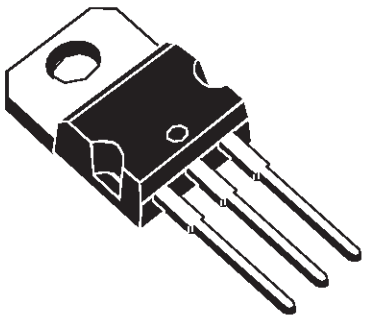
Placing a resistor (R1) between out and ADJ/GND pins a constant current flows through this resistor and down through R2 setting the output voltage.

To minimise the output voltage tollerance we recommend a current (I_a) of 10mA.

Example: a V_{out} of 1.8V is obtained using L4957V1.5 with R1 = 150Ω and R2 = 28Ω.

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.40		2.70	0.094		0.106
H2	10.0		10.4	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.20		6.60	0.244		0.260
L9	3.50		3.93	0.137		0.154
M		2.6			0.102	
Dia	3.75		3.85	0.147		0.151

OUTLINE AND MECHANICAL DATA



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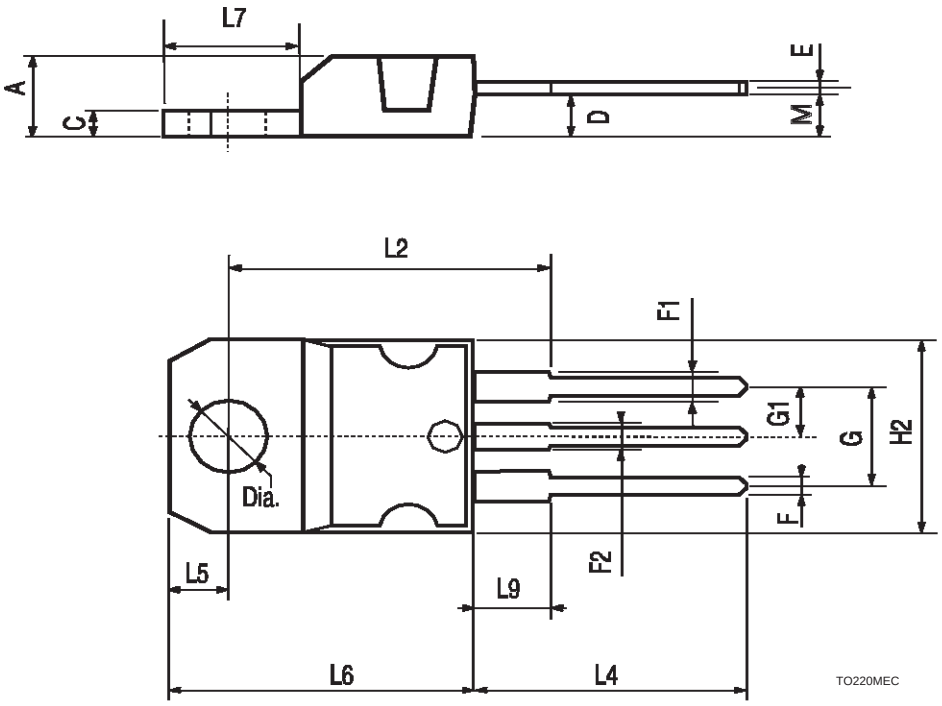
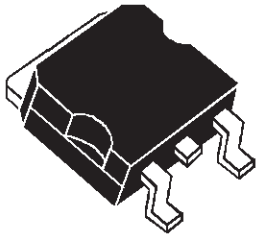


REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25	1.40		0.049	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	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°

OUTLINE AND MECHANICAL DATA



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