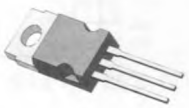
VERY LOW DROP 1A REGULATOR

PRELIMINARY DATA

- LOW DROPOUT VOLTAGE (450mV TYP AT 1A)
- VERY LOW QUIESCENT CURRENT
- THERMAL SHUTDOWN
- SHORT CIRCUIT PROTECTION
- REVERSE POLARITY PROTECTION



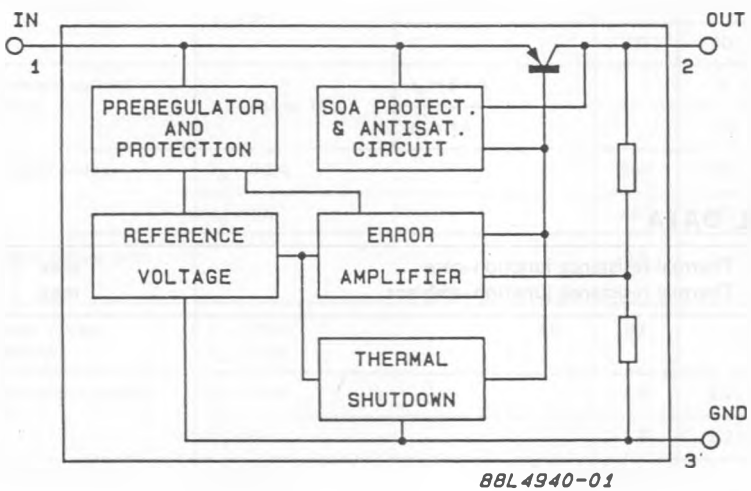
TO-220

ORDERING NUMBER: L4941

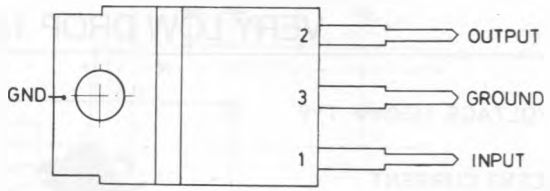
INTRODUCTION

The L4941 is a three terminal 5V positive regulator available in TO-220 package, making it useful in a wide range of the industrial and consumer applications. Thanks to its very low input/output voltage drop, this device is particularly suitable for battery powered equipment, reducing consumption and prolonging battery life. It employs internal current limiting, anti-saturation circuit, thermal shut-down and safe area protection.

BLOCK DIAGRAM



CONNECTION DIAGRAM
(Top view)



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ABSOLUTE MAXIMUM RATINGS

V_i	Forward input voltage	30	V
V_{iR}	Reverse input voltage (R_O = 100Ω)	-15	V
I_O	Output current	Internally limited	
P_{tot}	Power dissipation	Internally limited	
T_j, T_{stg}	Junction and storage temperature	-40 to 150	°C

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	3	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	50	°C/W

TEST CIRCUITS

Fig. 1 - DC Parameters

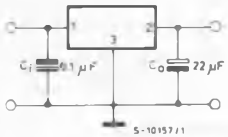


Fig. 2 - Load Regulation

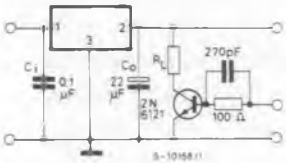
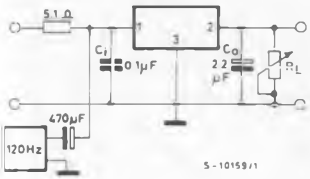


Fig. 3 - Ripple Rejection



ELECTRICAL CHARACTERISTICS (Refer to the test circuits $T_j = 25°C$, $C_i = 0.1\mu F$, $C_o = 22\mu F$, unless otherwise specified)

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
OUTPUT VOLTAGE					5		
INPUT VOLTAGE (unless otherwise specified)					7		
V_o	Output voltage	I_o = 5mA to 1A V_i = 6V to 14V		4.8	5	5.2	V
V_i	Operating input voltage	I_o = 5mA				16	V
ΔV_o	Line regulation	V_i = 6V to 16V I_o = 5mA			5	20	mV
ΔV_o	Load regulation	I_o = 5mA to 1A I_o = 0.5A to 1A			8 5	20 15	mV
I_Q	Quiescent current	V_i = 6V	I_o = 5mA		4	8	mA
			I_o = 1A		20	40	
ΔI_Q	Quiescent current change	V_i = 6V to 14V	I_o = 5mA			3	mA
			I_o = 1A			-10	
V_d	Dropout voltage	I_o = 0.5A			250	450	mV
		I_o = 1A			450	700	
$\frac{\Delta V_o}{\Delta T}$	Output voltage drift				0.6		mV/°C
SVR	Supply voltage rejection	f = 120Hz I_o = 0.5A		58	68		dB
I_{sc}	Short circuit current limit	V_i = 14V			1.6	2.0	A
		V_i = 6V			1.8	2.2	
Z_o	Output impedance	f = 1KHz I_o = 0.5A			30		mΩ
e_N	Output noise voltage	B = 100Hz to 100KHz			30		$\mu V/V_o$

Fig. 4 - Dropout voltage vs. output current

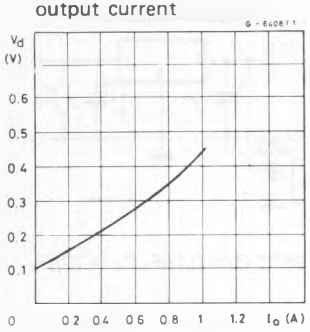


Fig. 5 - Dropout voltage vs. temperature

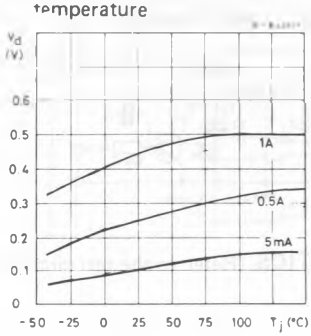


Fig. 6 - Output voltage vs. temperature

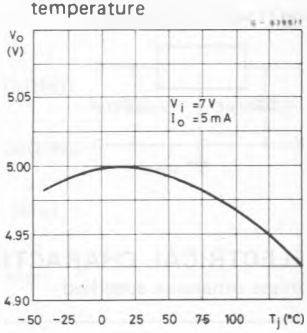


Fig. 7 - Quiescent current vs. temperature

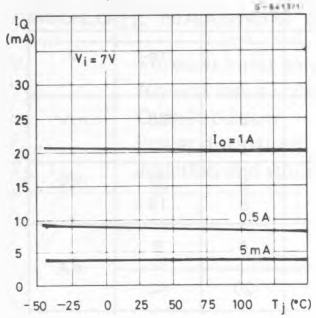


Fig. 8 - Quiescent current vs. input voltage

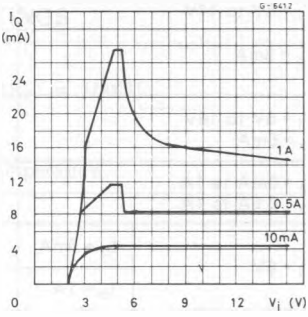


Fig. 9 - Quiescent current vs. output current

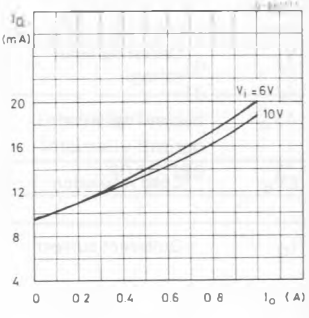


Fig. 10 - Short circuit current vs. temperature

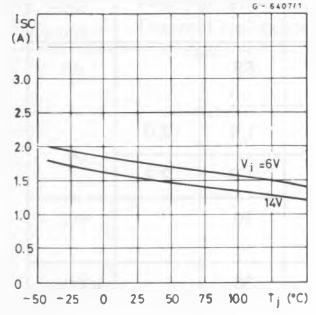


Fig. 11 - Peak output current vs. input/output differential voltage

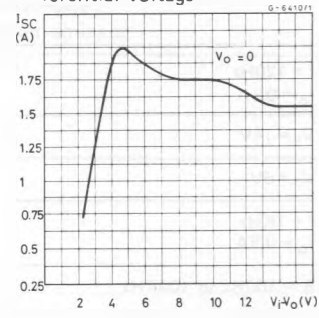


Fig. 12 - Low voltage behavior

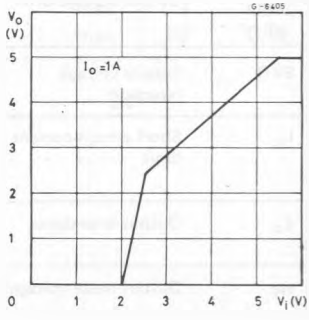


Fig. 13 - Supply voltage rejection vs. frequency

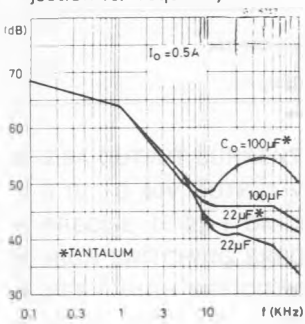


Fig. 14 - Supply voltage rejection vs. output current

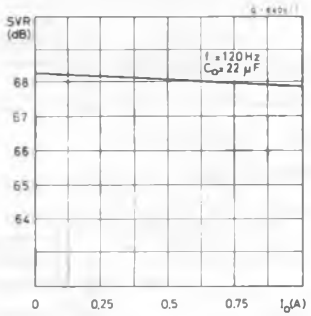


Fig. 15 - Load dump characteristics

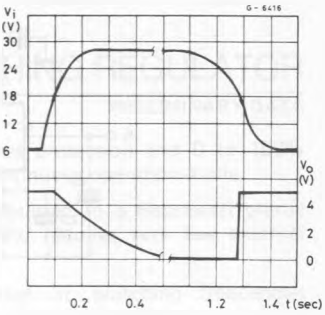


Fig. 16 - Line transient response

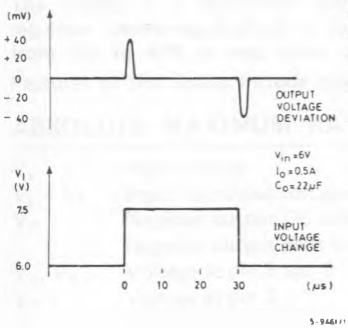


Fig. 17 - Load transunt response

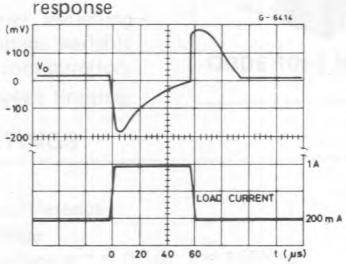


Fig. 18 - Totale power dissipation

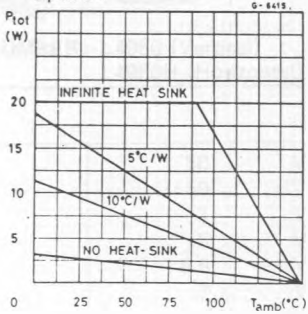
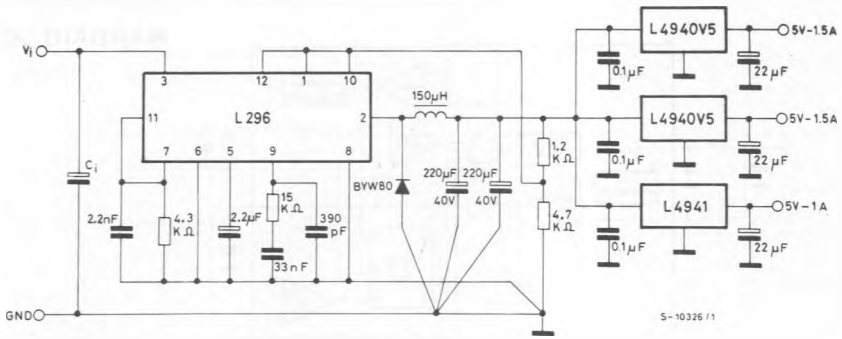


Fig. 19 - Distributed supply with on-card L4940 and L4941 low-drop regulators



ADVANTAGES OF THESE APPLICATIONS ARE:

- On card regulation with short circuit and thermal protection on each output.
- Very high total system efficiency due to the switching preregulation and very low-drop postregulations.

Fig. 20 - Distributed supply with on-card L4940 and L4941 low-drop regulators