SGS-THOMSON MICROELECTRONICS

L4941 - 4941X

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

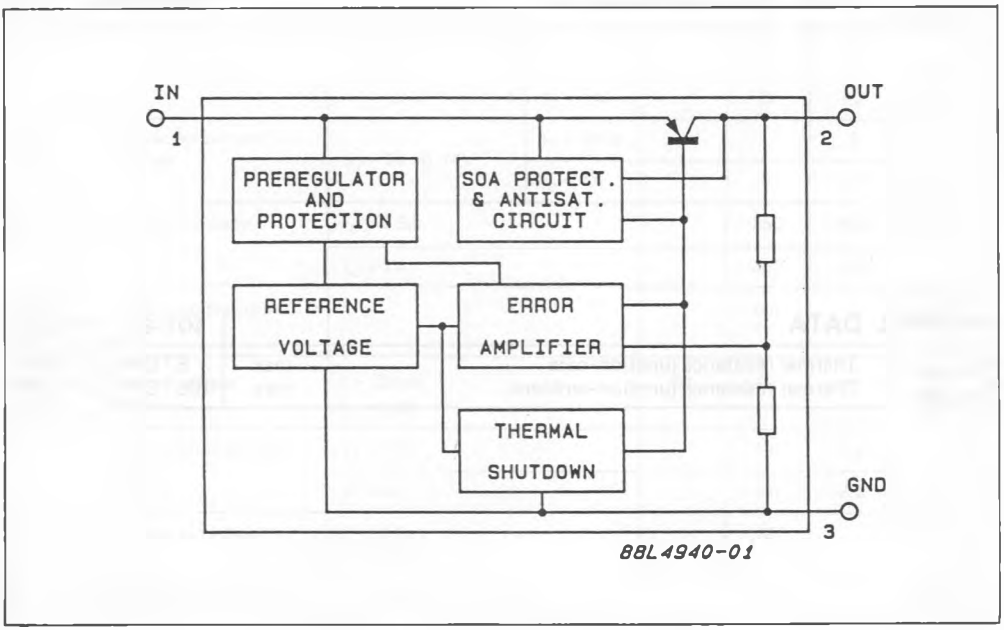
SOT-82 TO-220

ORDER CODE: L4941 (TO-220)
L4941X (SOT-82)

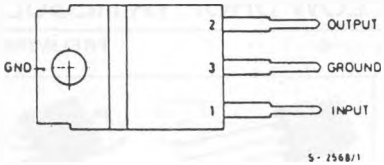
INTRODUCTION

The L4941/X is a three terminal 5V positive regulator available in TO-220 and SOT-82 packages; 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 employes internal current limiting, antisaturation circuit, thermal shutdown and safe area protection.

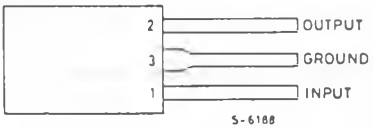
BLOCK DIAGRAM



PIN CONNECTIONS



TO-220



SOT-82

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

			SOT-82	TO-220
$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	8 °C/W	3 °C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	100 °C/W	50 °C/W

TEST CIRCUITS

Fig. 1 - DC Parameters

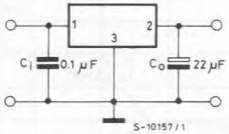


Fig. 2 - Load Regulation

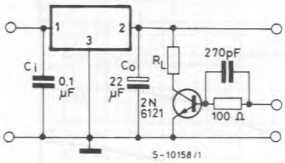
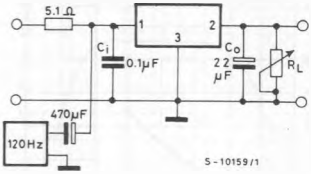


Fig. 3 - Ripple Rejection



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		µV/V_o

Fig. 4 - Dropout voltage vs. output current

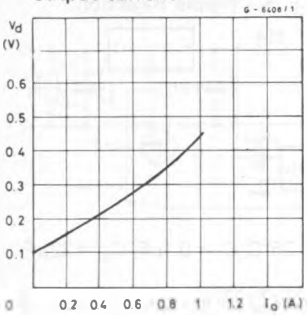


Fig. 5 - Dropout voltage vs. temperature

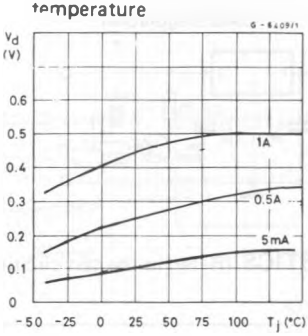


Fig. 6 - Output voltage vs. temperature

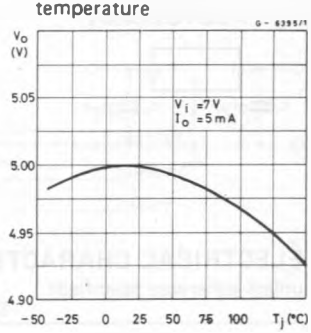


Fig. 7 - Quiescent current vs. temperature

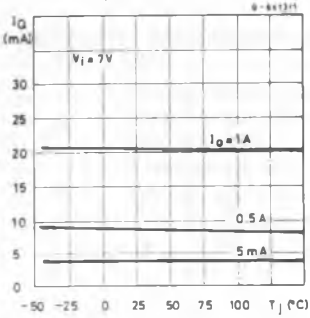


Fig. 8 - Quiescent current vs. input voltage

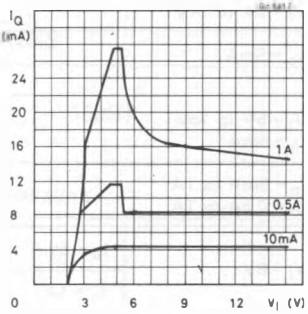


Fig. 9 - Quiescent current vs. output current

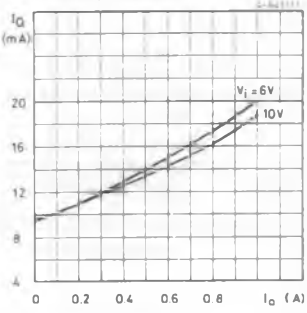


Fig. 10 - Short circuit current vs. temperature

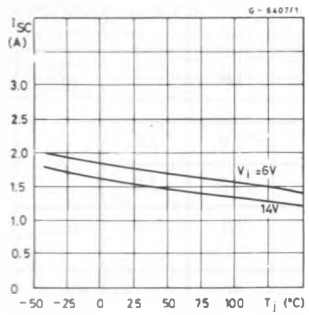


Fig. 11 - Peak output current vs. input/output differential voltage

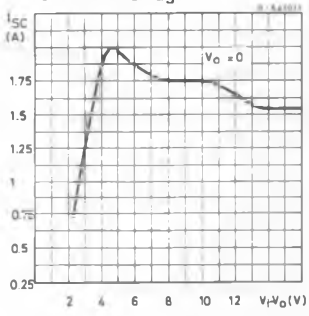


Fig. 12 - Low voltage behavior

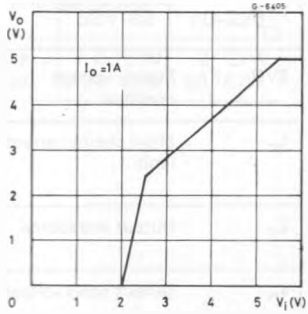


Fig. 13 - Supply voltage rejection vs. frequency

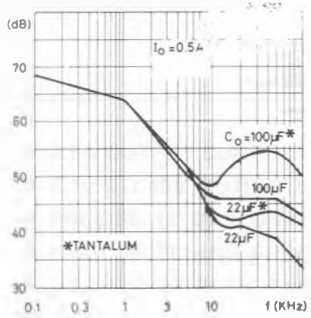


Fig. 14 - Supply voltage rejection vs. output current

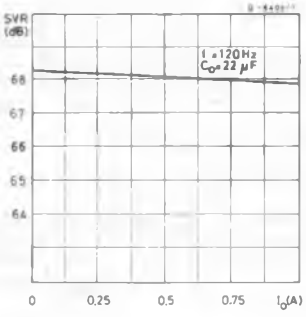


Fig. 15 - Load dump characteristics

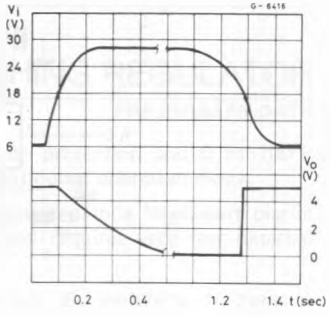


Fig. 16 - Line transient response

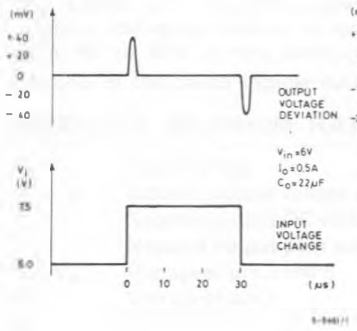


Fig. 17 - Load transunt response

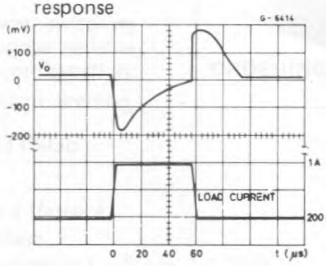


Fig. 18 - Totale power dissipation (TO-220)

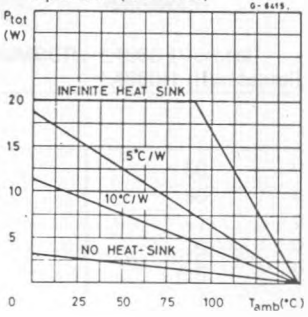
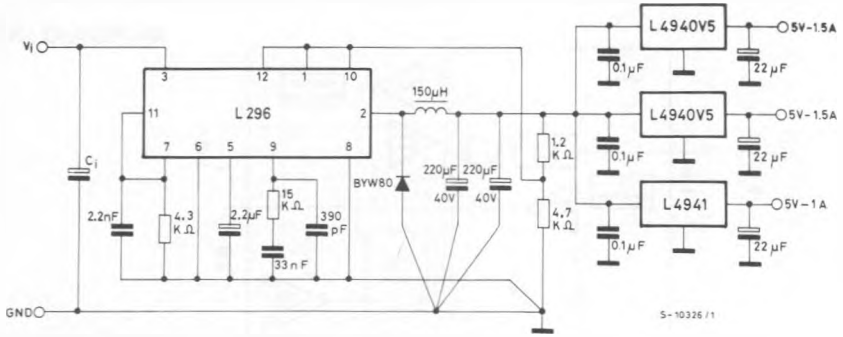


Fig. 19 - Distributed supply with on-card L4940 and L4941 low-drop regulators



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