

U 2531 B

Monolithic Integrated Circuit

Application: Frontend amplifier for infrared remote control systems with carrier frequencies between 20 and 50 kHz

Features:

- o Low power consumption, typ. 1 mA
- o Supply voltage range: 7 V ... 14 V
- o On-chip voltage stabilisation
- o A signal detector activates a 6 V supply voltage output to power external components
- o Filter characteristics and gain are specified by few external components
- o Compensation of the photodiode capacitance
- o Specially selected AC and DC impedance makes the circuit insensitive against constant light levels

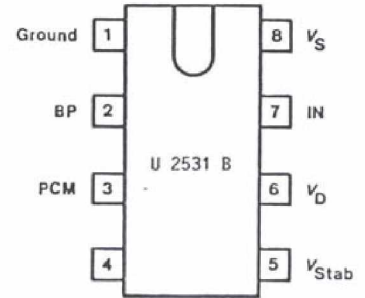


Fig. 2 Pin configuration

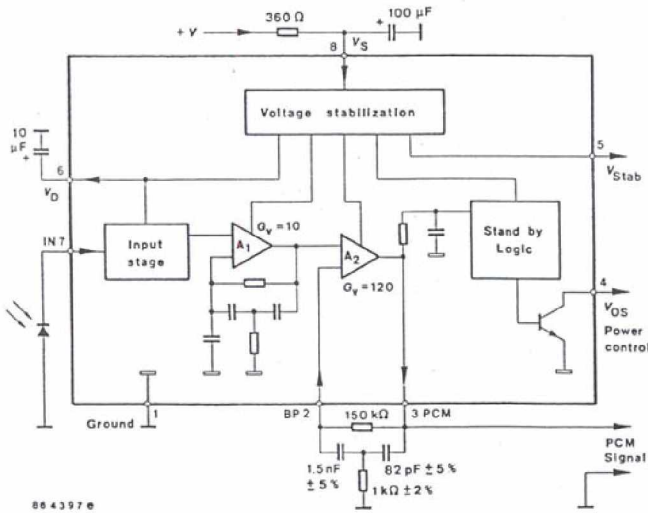


Fig. 1 Block diagramm

Pin	Function	Description
1	GND	Circuit GND potential
2	BP	Inverting input of amplifier 2. In conjunction with the PCM pin and a feedback network, it allows the gain adjustment and implementation of the filter function
3	PCM	Output of amplifier 2. The signal at the PCM pin is the regenerated PCM signal which can be fed to the remote control decoder.
4	TEST	
5	VStab	Regulated voltage output (typ. 6 V)
6	VD	A capacitor at the VD pin removes the ripple from the photo diodes bias voltage
7	IN	PCM signal input. This pin is connected to the photo diode. The voltage swing across the diode is kept small to avoid high charging currents of the junction capacitance. This allows the IC to receive 4 usec pulses! The selected ac input impedance (300 kΩ) and dc input impedance (8 kΩ) feature a high immunity against constant light levels at the diode.
8	VS	Supply voltage connection.

Absolute maximum ratings

Reference point Pin 1, unless otherwise specified

Parameter	Pin	Symbol	Min.	Typ.	Max.	Unit
Supply voltage range	Pin 8	V_S	- 0.3		14	V
Supply currents	Pin 8	I_S		10		mA
Input voltages	Pin 2,7	V_I	- 0.3		6	V
	Pin 4	V_I	- 0.3		16	V
Output currents	Pin 3,4,5,6	I_O		± 5		mA
Power dissipation		P_{tot}		180		mW
	$T_{amb} = 105^\circ\text{C}$			125		$^\circ\text{C}$
Junction temperature		T_j		125		$^\circ\text{C}$
Storage temperature range		T_{stg}	- 20		125	$^\circ\text{C}$
Ambient temperature range		T_{amb}	0		70	$^\circ\text{C}$

Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Junction ambient	R_{thJA}			110	K/W

Electrical characteristics

$V_S = 7\text{ V to }14\text{ V}$, $T_{amb} = 0 \dots 70^\circ\text{C}$, reference point pin 1, unless otherwise specified

Parameter	Pin	Symbol	Min.	Typ.	Max.	Unit
Supply currents	Pin 8	I_S	0.65	1.1	1.55	mA
$V_S = 8\text{ V}$, Pin 5 n.c., $T_{amb} = 25^\circ\text{C}$						
Output voltage, regulated	Pin 5	V_{stab}	5.5		6.5	V
$I_{Stab} = 200\ \mu\text{A}$						
Regulated photodiode supply voltage	Pin 6	V_D	5.0		5.7	V
Output current	Pin 7	I_O	0.5		1.5	mA
$V_D = 0\text{ V}$						
AC output impedance	Pin 3	r		300		Ω

Parameter	Symbol	Min.	Typ.	Max.
Amplifier 1 (Fig. 3)				
Voltage gain	G_{V1}	6:0		14
$T_{amb} = 25^\circ\text{C}$, $f_{IN} = 36\text{ kHz}$				
Amplifier 2 (Fig. 4)				
Voltage gain	G_{V2}		120	
$T_{amb} = 25^\circ\text{C}$, $f_{IN} = 36\text{ kHz}$				
Attenuation at	$f_a = 30\text{ kHz}$	-3		dB
	$f_m = 36\text{ kHz}$		0	dB
	$f_b = 42\text{ kHz}$	-3		dB

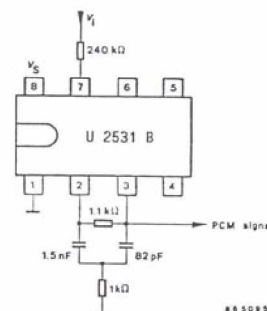


Fig. 3 Test circuit for amplifier 1

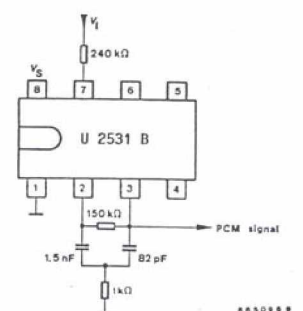


Fig. 4: Test circuit for amplifier