Stereo Decoder according to Phase-Locked-Loop Method

TDA 1055

Preliminary data

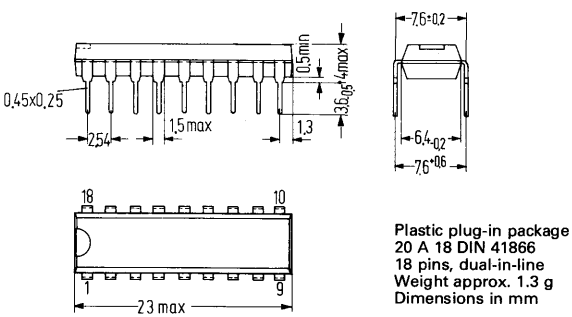
The TDA 1055 is a PLL stereo decoder. It is used in time multiplex (switch) operation or frequency multiplex (matrix) operation. The IC has an automatic pilot-dependent mono/stereo switch and a connection for the stereo-indicating lamp. The lamp current is internally limited to max. 40 mA. The adjustment of the stereo base width from stereo to mono is continuously carried out by means of the auxiliary voltage V_{aux}. V_{aux} can be derived from voltage V_{14} of TDA 1047. By means of the variable base width, this stereo decoder is best suited for car radios. The switch Mo/St serves for switching on forced mono. With the switch St-Such stereo transmitters can be selected. Mono transmitters remain mute, when the switches Mo/St and St-Such are opened. By means of the input OP, slight frequency corrections can be done according to the following formula so that height reductions are balanced. Thus, cross-talking can be improved.

$$\frac{V_q}{V_i} \approx 1 + C_i R_{i2}$$

- Deemphasis either before (matrix) or after (switch) demodulation of (L–R) signal
- Large supply voltage range
- Continuously adjustable stereo base width
- Automatic pilot-dependent stereo switch
- Mute switch of mono transmitters (Stereo-Such)
- Frequency correction of MPX signal

Type	Ordering code
TDA 1055	Q67000-A1145

Package outlines



Plastic plug-in package
20 A 18 DIN 41866
18 pins, dual-in-line
Weight approx. 1.3 g
Dimensions in mm

Absolute maximum ratings

Supply voltage	V_{cc}	18	V
Auxiliary voltage	V_{aux}	4	V
Stereo- Such voltage	$V_{st\text{-}s}$	4	V
Lamp voltage	V_{lp}	18	V
Current for stereo indication	I_{lp}	40	mA
Thermal resistance (system-air)	R_{thsa}	120	K/W
Junction temperature	T_j	150	°C
Storage temperature	T_s	–40 to +125	°C

Preliminary data

Range of operation

Supply voltage	V_{cc}	8.5 to 18	V
Ambient temperature in operation	T_{amb}	−25 to +70	°C

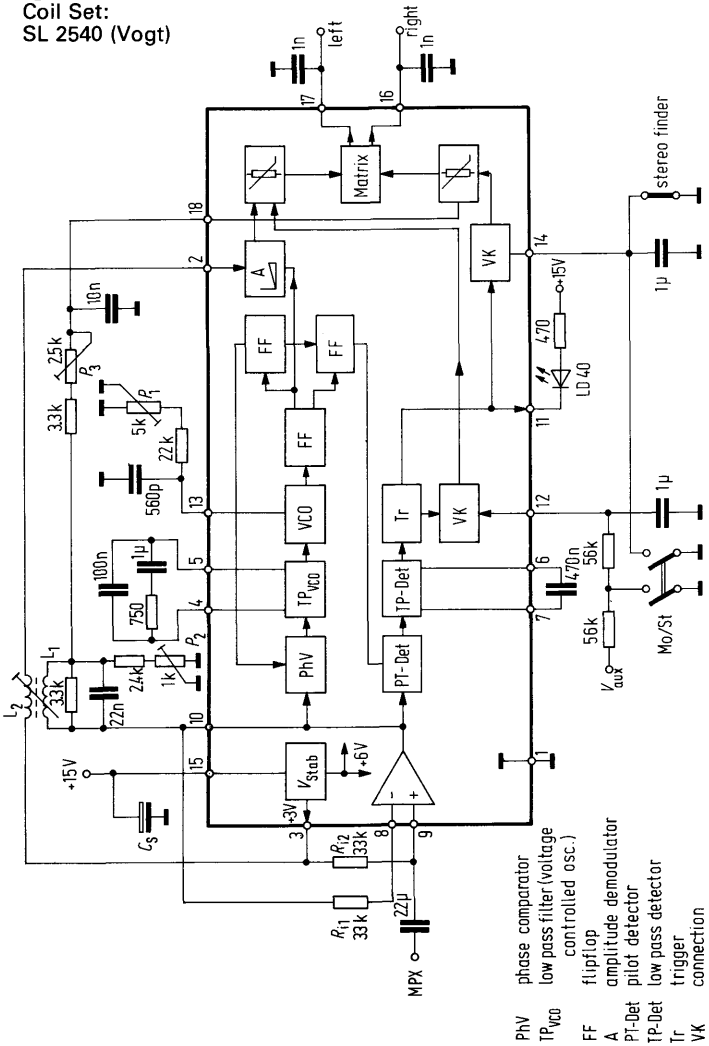
Electrical characteristics ($V_{cc} = 15\,V$, $T_{amb} = 25°C$)

Total current consumption without lamp	I_{cc}	30	mA
MPX input voltage[1])	V_i	≤3	V_{pp}
Output voltage per channel with stereo	V_q	3	V_{pp}
Input resistance	R_i	acc. external circuitry	
Output resistance	R_q	5	kΩ
Total harmonic distortion ($V_{qeff} = 1\,V$, $f = 1$ kHz)	THD	≤.3	%
Cross-talk attenuation at 1 kHz	a_{CT}	≥40 (≥40)	dB
Attenuation at 19 kHz[2])	a_{PT19}	≥30 (≥30)	dB
38 kHz[2])	a_{PT38}	≥40 (≥30)	dB
76 kHz[2])	a_{PT76}	≥50 (≥50)	dB
67 kHz (SCA signal)[2])	a_{SCA}	≥35 (≥40)	dB
Saturation voltage lamp driver ($I_{lp} = 30$ mA)	V_{sat}	≤2.0	V
Switch threshold for stereo	V_{PT}	≥10	mV_{eff}
Switch hysteresis	$H_{st/m}$	5	dB
Channel separation control range			
(L−R) = −40 dB mono	V_{aux}	<.6	V
(L−R) = 0 dB stereo	V_{aux}	>2.7	V
Control range			
(L+R) = 0 dB normal	V_{st-s}	<.7	V
(L+R) = 40 dB stereo-such.	V_{st-s}	>2.2	V

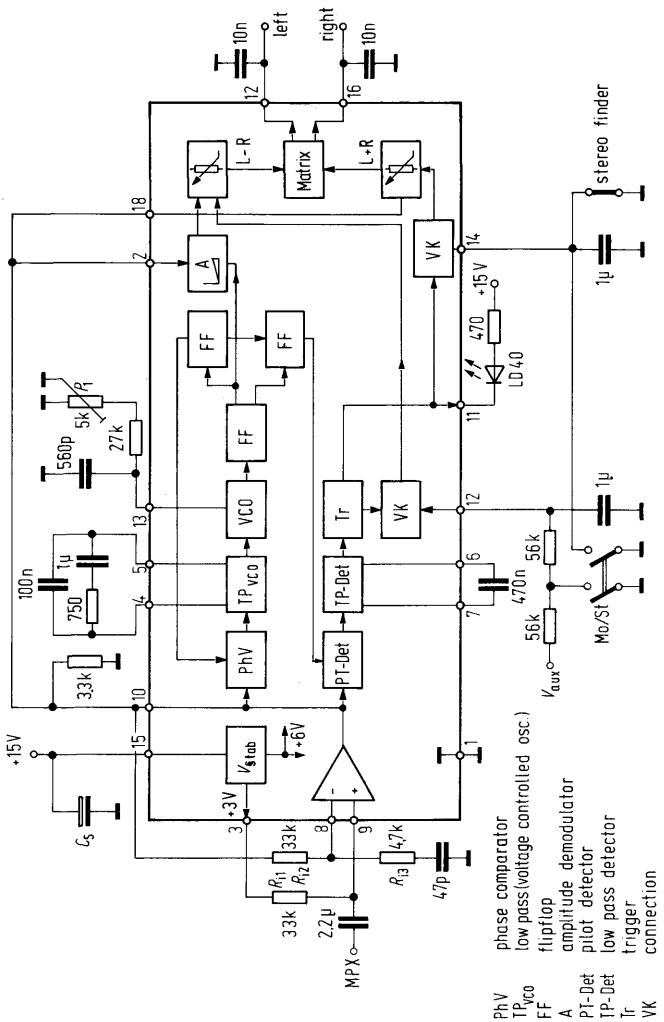
[1]) In case of OP amplification $V_{OP} = 1$ for all MPX frequencies. When height increasing the MPX signal, the OP output voltage must not exceed $V_{qMPX} = 3\,V_{pp}$.
[2]) The figures without brackets are for switch operation, those with brackets are fore matrix operation.

Matrix operation

L_1: 240 turns, 0.12 CuL
L_2: 480 turns, 0.12 CuL
Coil Set:
SL 2540 (Vogt)

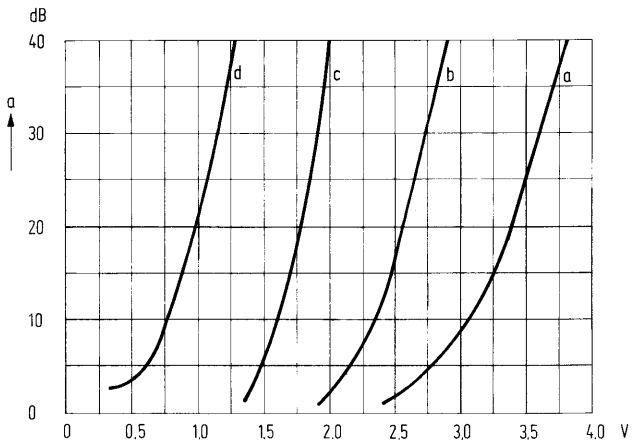


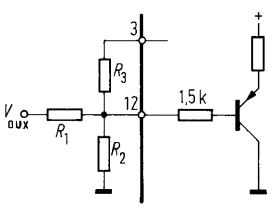
Switch operation



Channel separation depending on auxiliary voltage V_{aux}

(V_{aux} can be taken from the TDA 1047 [pin 14] as field-strength-dependent voltage)





	R_1	R_2	R_3
a	56k	56k	∞
b	56k	100k	∞
c	0	∞	∞
d	110k	∞	330