

VERTICAL DEFLECTION CIRCUIT

GENERAL DESCRIPTION

The TDA2655B is a monolithic integrated circuit for vertical deflection in colour television receivers with 90° picture tubes.

Features

- Synchronization circuit
- Vertical oscillator; 50/60 Hz switch
- Sawtooth generator with buffer stage
- Preamplifier with fed-out inputs
- Output stage with thermal and short-circuit protection
- Flyback generator
- Blanking pulse generator with guard circuit
- Voltage stabilizer
- Frequency detector with memory and storage

QUICK REFERENCE DATA

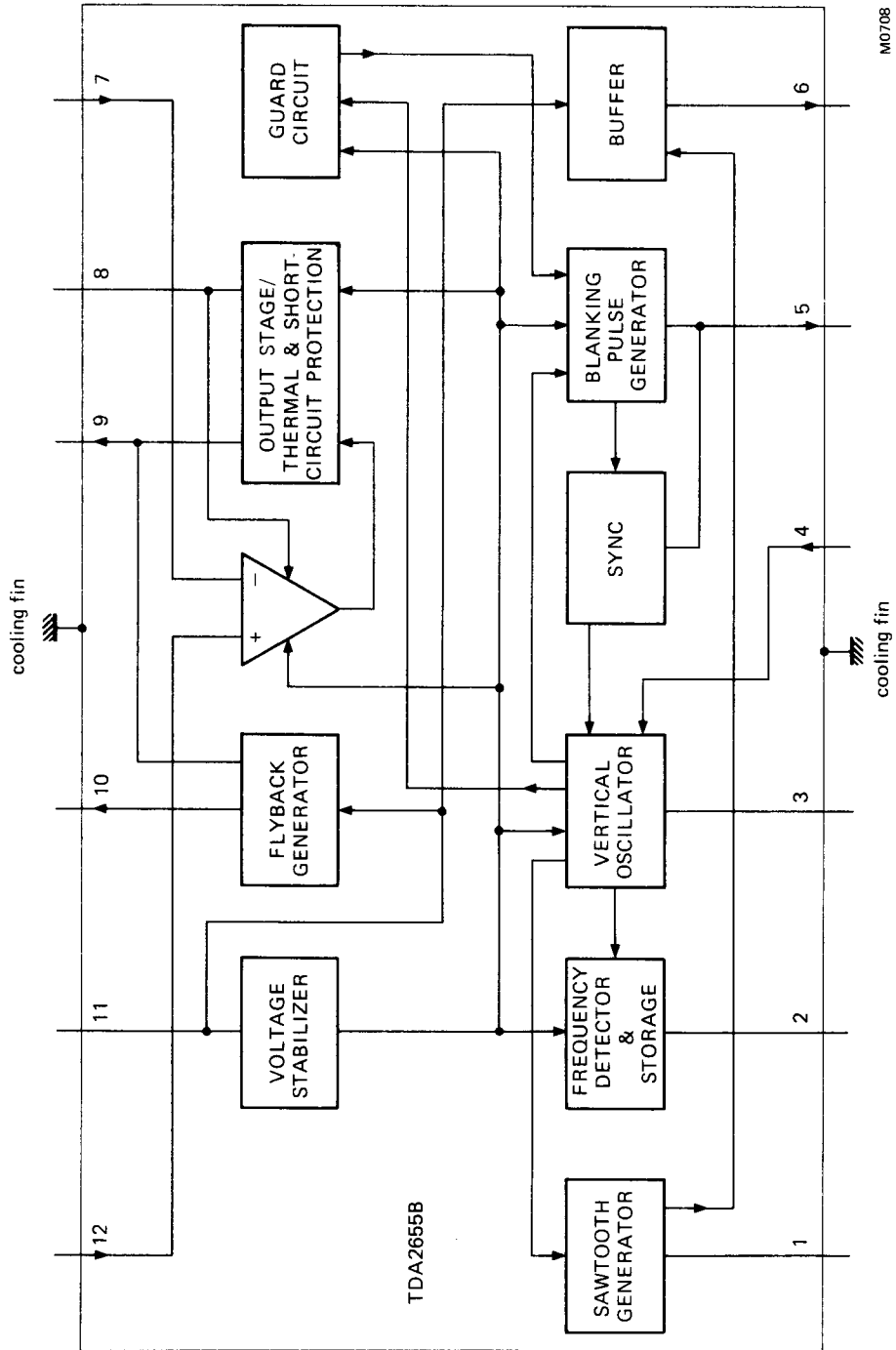
For 90° deflection; measured with respect to cooling fin (ground)

			concept 1*	concept 2*	
System supply voltages	V _{P1}	typ.	22	22	V
	V _{P2}	typ.	12	—	V
System supply currents	I _{P1}	typ.	135	140	mA
	-I _{P2}	typ.	8	—	mA
Deflection current (peak-to-peak value)	I _{g(p-p)}	typ.	450	450	mA
Synchronization input voltage (peak-to-peak value)	V _{5(p-p)}	min.	1	1	V

*Concept 1: with two supply voltages ; concept 2: with one supply voltage. (See also Figs 2 and 3).

PACKAGE OUTLINE

12-lead DIL; plastic with metal cooling fin (SOT150).



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Fig. 1 Block diagram.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134)

Voltages

with respect to cooling fin (ground)

Supply voltage (pin 11)	$V_{11} = V_p$	max.	40	V
Supply voltage output stage (pin 8)	V_8	max.	60	V
Pin 9	V_9	max.	60	V
	$-V_9$	max.	0	V
Pin 10	V_{10}	max.	40	V
Pin 3	V_3	max.	7	V
Pin 1	V_1	max.	40	V
Pin 6	V_6	max.	7	V
Pins 7 and 12	$V_7; V_{12}$	max.	24	V

Currents

Pin 10	I_{10}	max.	1,2	A
	$-I_{10}$	max.	1,5	A
Pin 5	$\pm I_5$	max.	10	mA
Pin 2	I_2	max.	3	mA
Pin 1	I_1	max.	50	mA
	$-I_1$	max.	0,1	mA
Pin 6	$-I_6$	max.	5	mA
Pin 4	$-I_4$	max.	1	mA
Pin 8, pin 9 and cooling fin		internally limited by the short-circuit protection circuit		

Temperatures

Total power dissipation	internally limited by the short-circuit protection circuit		
Storage temperature range	T_{stg}	-55 to +150 °C	
Operating ambient temperature range	T_{amb}	0 °C to limiting values	

PINNING

pin number	function	pin number	function
1.	sawtooth capacitor	7.	feedback input
2.	frequency storage information	8.	positive supply of output stage
3.	oscillator capacitor	9.	output
4.	oscillator resistor (adjustment)	10.	flyback generator output
5.	synchronization input/blanking output	11.	positive supply (V_p)
6.	sawtooth buffer stage output	12.	preamplifier input

CHARACTERISTICS

$V_P = 22\text{ V}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$; these characteristics are measured with respect to cooling fin (ground), unless otherwise specified.

parameter	symbol	min.	typ.	max.	unit
Supply voltage/output stage					
Supply voltage	$V_{11} = V_P$	9	—	30	V
Output voltage at $I_g = 0,75\text{ A}$	V_g	—	1,2	1,4	V
at $-I_g = 0,75\text{ A}$	V_g	$(V_P - 1,9)$	$(V_P - 1,7)$	—	V
Flyback generator output voltage at $I_{10} = 0,75\text{ A}$	V_{10}	—	$(V_P - 2,0)$	—	V
Supply currents (without load)					
pin 11	I_{11}	—	10	—	mA
pin 8	I_g	—	3	—	mA
Output current	$\pm I_g$	—	—	1,2	A
Flyback generator peak current	$\pm I_{10}$	—	—	1,2	A
Feedback					
Preamplifier quiescent input currents	$-I_7 = -I_{12}$	—	0,1	—	μA
Synchronization					
Sync input voltage range	V_5	1,0	—	—	V
Synchronizing range		—	28	—	%
Oscillator/sawtooth generator					
Frequency setting input voltage	V_4	6	—	9	V
Sawtooth generator output voltage (peak value)	$V_{1(m)}$	0	$(V_P - 2)$	—	V
Sawtooth generator output current	I_1	—	—	30	mA
Sawtooth generator leakage current	$-I_1$	2	—	—	μA
Oscillator temperature dependency $T_{\text{case}} = 20\text{ to }100\text{ }^\circ\text{C}$	$(\Delta f/f)/\Delta T_{\text{case}}$	—	10^{-4}	—	K^{-1}
Oscillator voltage dependency $V_P = 10\text{ to }30\text{ V}$	$(\Delta f/f)/\Delta V_P$	—	10^{-3}	—	V^{-1}
Blanking pulse generator					
Output voltage (at $I_5 = 1\text{ mA}$)	V_5	—	20	—	V
Output resistance	R_5	—	410	—	Ω
Output current (at $V_P = 21\text{ V}$)	$-I_5$	—	—	5	mA
Blanking pulse duration at 50 Hz sync	t_b	1,33	1,4	1,47	ms
50/60 Hz frequency detector					
Output saturation voltage (LOW level for 50 Hz)	V_2	—	1	—	V
Leakage current	I_2	—	1	—	μA

parameter	symbol	min.	typ.	max.	unit
Buffer stage					
Output voltage	$V_{6(m)}$	0	$(V_P - 1)$	—	V
Output current	$-I_6$	—	—	4	mA
Thermal resistance					
From junction to case (cooling fin)	$R_{th\ j-c}$	—	—	15	K/W
Junction temperature					
Switching point thermal protection	T_j	142	150	158	°C

APPLICATION INFORMATION

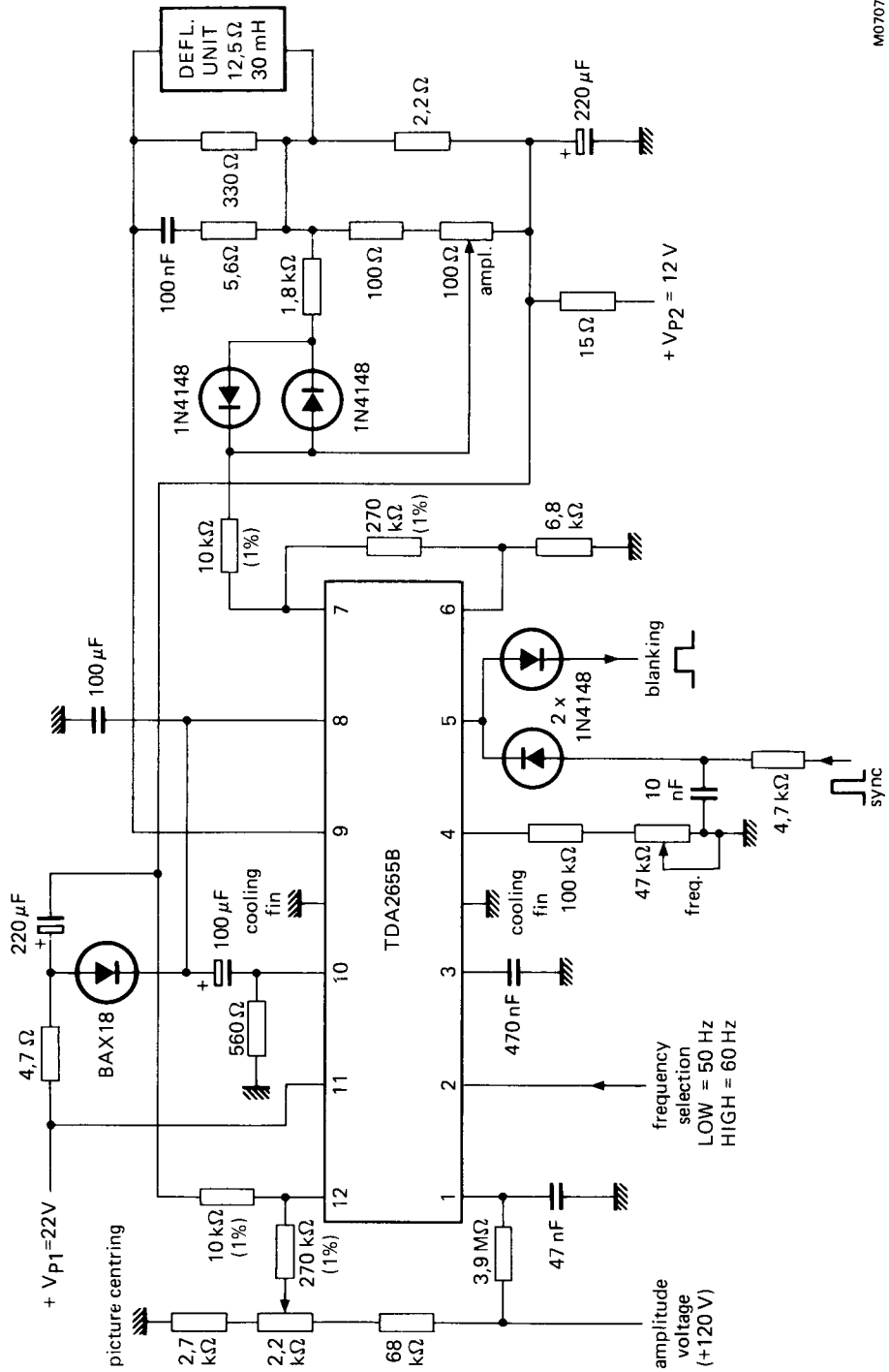
The following application data is obtained from measurements made on the circuits shown in Figs 2 and 3, application circuits for 90° deflection systems. Measurements are made with respect to the cooling fin (ground).

			Fig. 2 concept 1*	Fig. 3 concept 2*	
System supply voltages	V_{P1}	typ.	22	22	V
	V_{P2}	typ.	12	—	V
Supply currents	I_{P1}	typ.	135	140	mA
	$-I_{P2}$	typ.	8	—	mA
Output voltage (d.c. value)	V_g	typ.	12,2	13,8	V
Output voltage (peak-to-peak value)	$V_{g(p-p)}$	typ.	42	43	V
Output current (peak value)	$-I_{g(m)}$	typ.	450	450	mA
Deflection current (peak-to-peak value)	$I_{defl\ (p-p)}$	typ.	850	850	mA
Flyback time	t_{fl}	typ.	0,9	1,0	ms
Oscillator frequency adjustment without sync	f_o	typ.	46,5	46,5	Hz
Total power dissipation per package (see note)	P_{tot}	max.	1,8	1,8	W
Ambient temperature	T_{amb}	max.	70	70	°C
Thermal resistance (junction to ambient)	$R_{th\ j-a}$	max.	40	40	K/W

*Concept 1 : with two supply voltages; concept 2 : with one supply voltage.

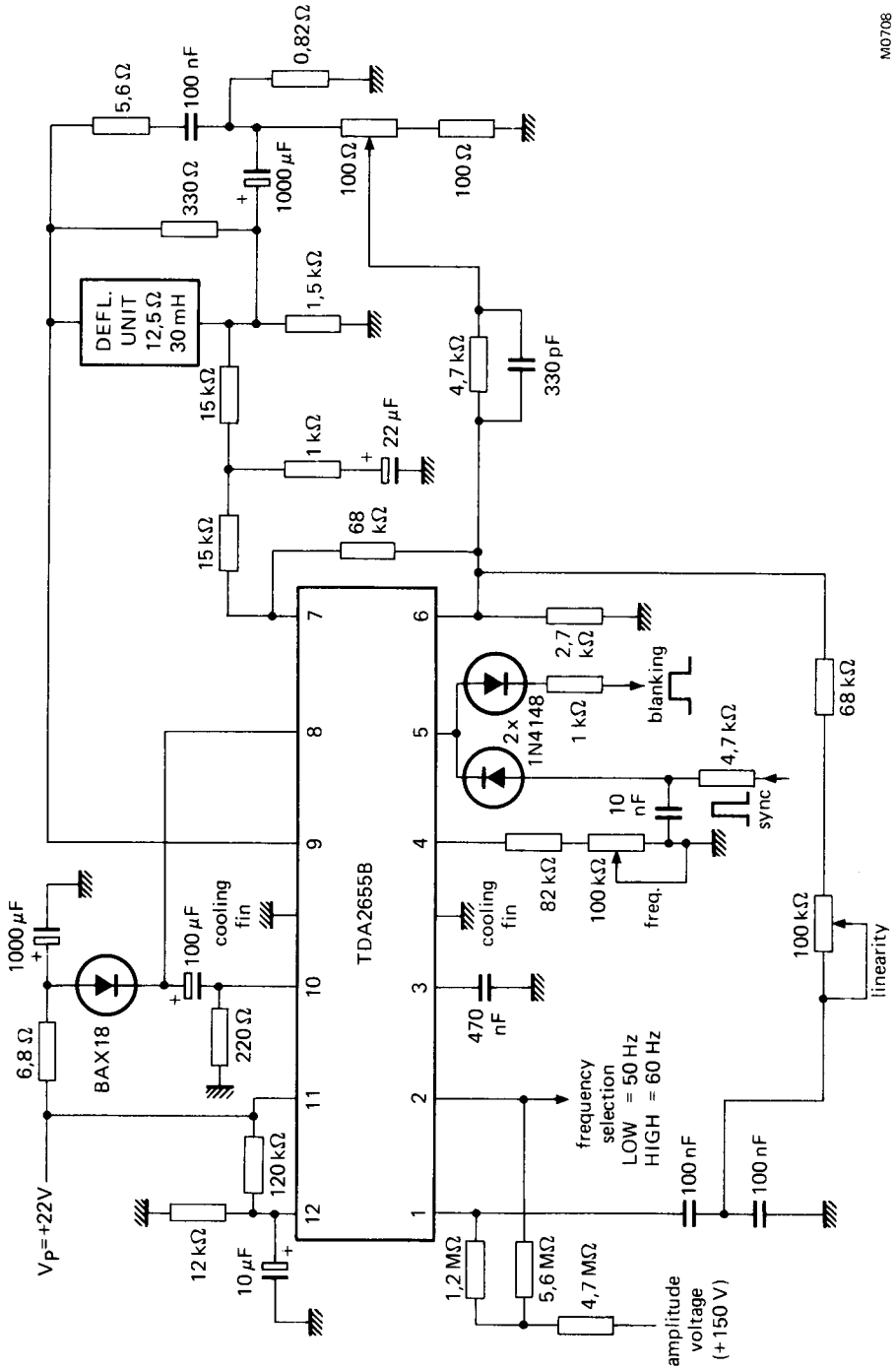
Note

Calculated with ΔV_{P1} of +5% and ΔR_{defl} of -7%.



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Fig. 2 Typical application circuit with two supply voltages; for use with 90° picture tubes.



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Fig. 3 Typical application circuit for a single supply voltage, for use with 90° picture tubes.