TDA3652
Vertical Deflection

Product Specification

Linear Products

DESCRIPTION

The TDA3652 is an integrated power output circuit for vertical deflection in systems with deflection currents up to $3A_{p.p.}$.

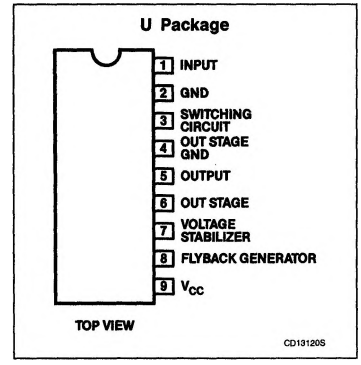
FEATURES

- **Driver**
- **Output stage and protection circuits**
- **Flyback generator**
- **Voltage stabilizer**

APPLICATIONS

- **Video monitors**
- **TV receivers**

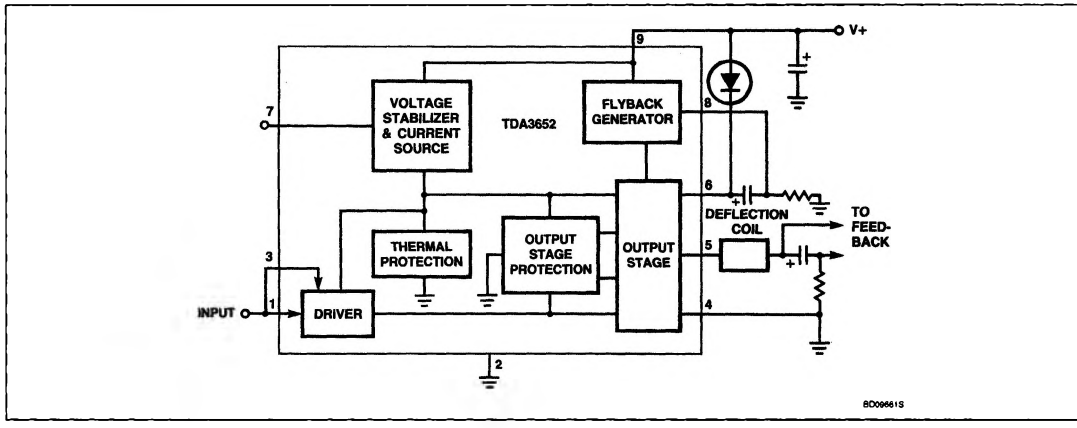
PIN CONFIGURATION



ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE
9-Pin Plastic SIP (SOT-131B)	−25°C to +65°C	TDA3652U
9-Pin Plastic SIP Bent to DIP (SOT-157B)	−25°C to +65°C	TDA3652QU

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
Voltages (Pins 4 and 2 externally connected to ground)			
V_{5-4}	Output voltage (Pin 5)	55	V
$V_{9-4} = V_{CC}$	Supply voltage (Pin 9)	40	V
V_{6-4}	Supply voltage output stage (Pin 6)	55	V
V_{1-2}	Driver input voltage (Pin 1)	V_{CC}	V[1]
V_{3-2}	Switching circuit input voltage (Pin 3)	5.6	V
Currents			
$\pm I_{5RM}$	Repetitive peak output current (Pin 5)	1.5	A
$\pm I_{5SM}$	Non-repetitive peak output current (Pin 5)	3	A[2]
I_{8RM}	Repetitive peak flyback generator output current (Pin 8)	−1.5 +1.6	A A
$\pm I_{8SM}$	Non-repetitive peak flyback generator output current (Pin 8)	3	A[2]
Temperatures			
T_{STG}	Storage temperature range	−65 to +150	°C
T_A	Operating ambient temperature range	−25 to +65	°C
T_J	Operating junction temperature range	−25 to +150	°C

NOTES:

1. The maximum input voltage should not exceed the supply voltage (V_{CC} at Pin 9). In most applications Pin 1 is connected to Pin 3; the maximum input voltage should then not exceed 5.6V.
2. Non-repetitive duty factor maximum 3.3%.

DC AND AC ELECTRICAL CHARACTERISTICS

V_{CC} = 26V; T_A = 25°C; Pins 4 and 2 externally connected to ground, unless otherwise specified.

SYMBOL	PARAMETER	LIMITS			UNIT
		Min	Typ	Max	
Supply					
V_{CC}	Supply voltage (Pin 9)	10		40	V[1]
V_{6-4}	Supply voltage output stage (Pin 6)			55	V[1]
I_{CC}	Supply current (no load and no quiescent current) (Pin 9)		9	12	mA
I_4	Quiescent current (see Figure 1)	25	40	65	mA
ΔI_4	Variation of quiescent current with temperature		−0.04		mA/°C
Output current					
$I_{5(P-P)}$	Output current (Pin 5) (peak-to-peak value)		2.5	3.0	A
$-I_8$	Output current flyback generator (Pin 8)		1.35	1.6	A
I_8	Output current flyback generator (Pin 8)		1.25	1.5	A
Output voltage					
V_{5-4M}	Peak voltage during flyback			55	V
$-V_{5-6SAT}$	Saturation voltage to supply at $-I_5$ = 1.5A		2.5	3.0	V
V_{5-4SAT}	Saturation voltage to ground at I_5 = 1.5A		2.5	3.0	V
$-V_{5-6SAT}$	Saturation voltage to supply at $-I_5$ = 1A		2.2	2.7	V
V_{5-4SAT}	Saturation voltage to ground at I_5 = 1A		2.2	2.7	V
Flyback generator					
V_{9-8SAT}	Saturation voltage at $-I_8$ = 1.6A		1.6	2.1	V
V_{8-9SAT}	Saturation voltage at I_8 = 1.5A		2.5	3.0	V
V_{9-8SAT}	Saturation voltage at $-I_8$ = 1.1A		1.4	1.9	V
V_{8-9SAT}	Saturation voltage at I_8 = 1A		2.3	2.8	V
V_{5-9}	Flyback generator active	4			V
$-I_8$	Leakage current at Pin 8		5	100	μA
$I_{1(P-P)}$	Input current for I_5 = 4A at Pin 1 (peak-to-peak value)	190	240	400	μA
V_{1-2}	Input voltage during scan (Pin 1)	1.3	2.0	3.5	V
I_3	Input current during scan (Pin 3)	0.01		2.5	mA
V_{3-2}	Input voltage during scan (Pin 3)	0.9		5.6	V
V_{3-2}	Input voltage during flyback (Pin 3)	0		0.2	V
General data					
T_J	Junction temperature of switching on the thermal protection	158	175	192	°C
θ_{JMB}	Thermal resistance from junction to mounting base			4	°C/W
P_{TOT}	Total power dissipation	see Figure 2			
G_O	Open-loop gain at 1kHz		36		dB
f_R	Frequency response (−3dB) at R_L = 1kΩ		50		kHz

NOTE:
1. The maximum supply voltage should be chosen such that during flyback the voltage at Pin 5 does not exceed 55V.

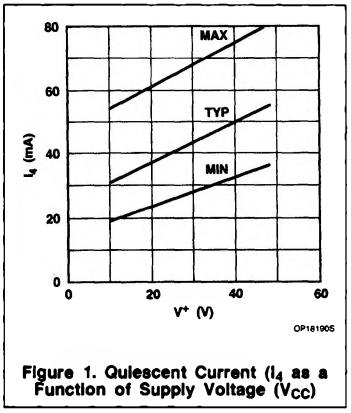


Figure 1. Quiescent Current (I_4 as a Function of Supply Voltage (V_{CC})

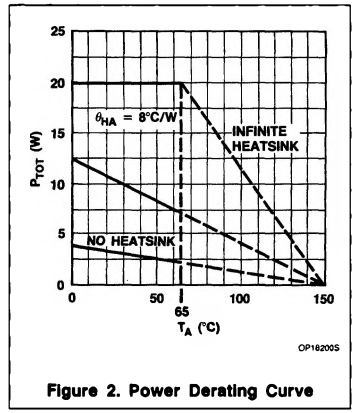


Figure 2. Power Derating Curve

APPLICATION INFORMATION

The function is described beside the corresponding pin number.

1 Driver — This is the input for the driver of the output stage.

2 Negative Supply (Ground)

3 Switching Circuit — This pin is normally connected externally to Pin 1. It is also possible to use this pin to drive the switching circuit for different applications. This switching circuit rapidly turns off the lower output stage at the end of scan and also allows for a quick start of the flyback generator.

4 Output Stage Ground

5, 6 Output Stage and Protection Circuits — Pin 5 is the output pin and Pin 6 is the output stage supply pin. The output stage is a class-B type with each transistor capable of delivering 1.5A maximum. The "upper" output transistor is protected against short-circuit currents to ground. The base of the "lower" power transistor is connected to ground during flyback and so it is protected against too high flyback pulses which may occur during adjustments. In addition, the output transistors are protected by a special layout of the internal circuit. The circuit is protected thermally against excessive dissipation by a circuit which operates at temperatures of 175°C and upwards, causing the output current to drop to a value such that the dissipation cannot increase.

7 Voltage Stabilizer — The internal voltage stabilizer provides a stabilized supply voltage of 6V for drive of the output stage, so the drive current is not influenced by the various voltages of different applications.

8, 9 Flyback Generator — Pin 8 is the output pin of the flyback generator. Depending on the value of the external resistor at Pin 8, the capacitor at Pin 6 will be charged to a fixed level during the scan period. The maximum height of the level is equal to the supply voltage at Pin 9 (V_{CC}). When the flyback starts and the flyback pulse at Pin 5 exceeds the supply voltage, the flyback generator is activated and then the supply voltage is connected in series (via Pin 8) with the voltage across the capacitor. The voltage at the supply pin (Pin 6) of the output stage will then be not more than twice the supply voltage.