

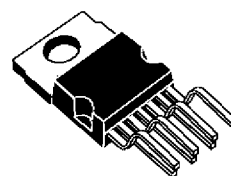
DC COUPLING HIGH VOLTAGE VIDEO AMPLIFIER

PRODUCT PREVIEW

- BANDWIDTH : 40MHz TYPICAL
- RISE AND FALL TIME : 9ns TYPICAL
- SUPPLY VOLTAGE : 110V
- FLASH-OVER PROTECTION
- POWER DISSIPATION : 3.0W
- ESD PROTECTED

DESCRIPTION

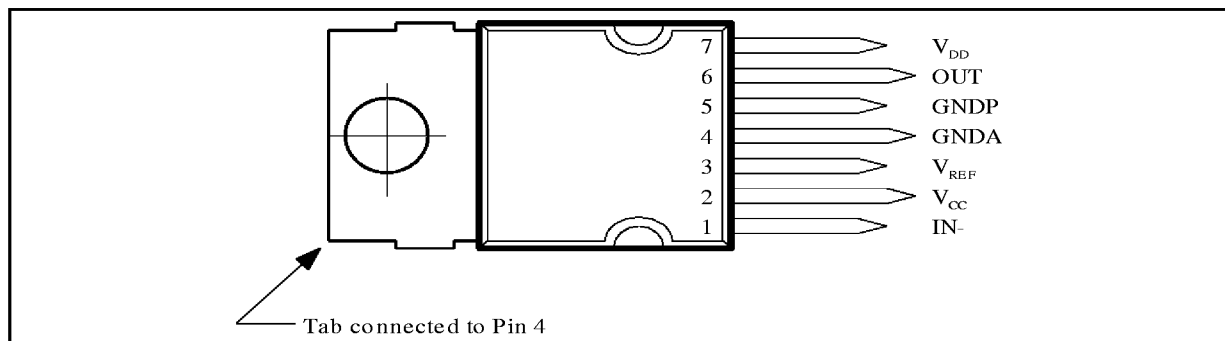
The TDA9511 includes a video amplifier designed with a high voltage bipolar/CMOS/DMOS technology (BCD). It drives in DC coupling one cathode of a monitor and is protected against flashovers. It is available in Heptawatt package.



HEPTAWATT
(Plastic Package)

ORDER CODE : TDA9511

PIN CONNECTIONS

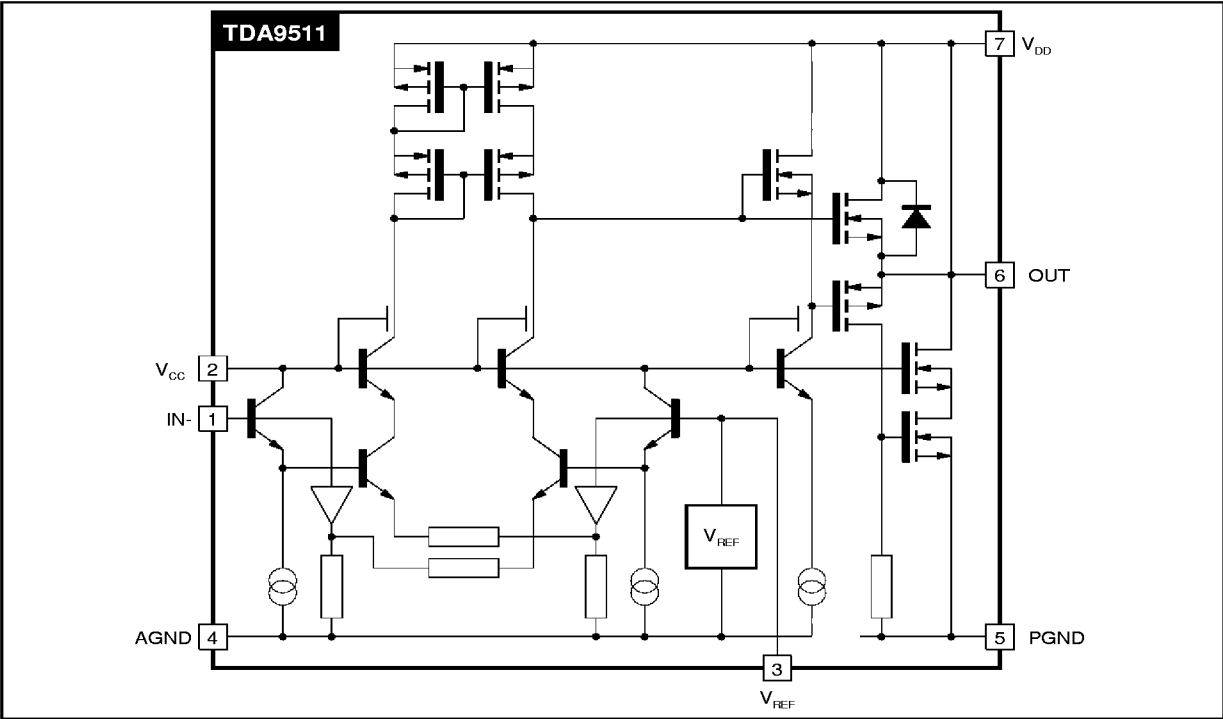


PIN CONFIGURATION

Pin N	Symbol	Function
1	IN-	Input of the amplifier
2	V _{CC}	Low Voltage Power Supply (12V Typ.)
3	V _{REF}	Internal Voltage Reference (3.3V)
4	GNDA	Analog Ground
5	GNDP	Power Ground
6	OUT	Output driving the cathode
7	V _{DD}	High Voltage Power Supply (110V Max.)

TDA9511

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DD}	Supply High Voltage (Pin 7)	120	V
V_{CC}	Supply Low Voltage (Pin 2)	20	V
I_{OD}	Output Current to V_{DD} (Pin 6)	protected	mA
I_{OG}	Output Current to Ground (Pin 6) (see Note 1)	80	mA
I_j	Input Current (Pin 1)	50	mA
T_j	Junction Temperature	150	°C
T_{oper}	Operating Ambient Temperature	0, +70	°C
T_{stg}	Storage Temperature	-20, +150	°C

Note 1 : Pulsed current $t \leq 50\mu s$

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-Case Thermal Resistance	Max. 3	°C/W
$R_{th(j-a)}$	Junction-Ambient Thermal Resistance	Typ. 70	°C/W

ELECTRICAL CHARACTERISTICS ($V_{CC} = 12V$, $V_{DD} = 110V$, $T_{amb} = 25^{\circ}C$, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DD}	High Supply Voltage (Pin 7)		20		110	V
V_{CC}	Low Supply Voltage (Pin 2)		10	12	15	V
I_{DD}	DC Current of High Voltage Supply (without feedback current)	$V_{OUT} = 60V$		7		mA
I_{CC}	Low Voltage Supply Internal DC Current			15		mA
V_{REF}	Internal Reference (Pin 3)			3.3		V
dV_{REF}/dV_{CC}	Drift of Reference Voltage versus V_{CC}			0.12		%/V
dV_{REF}/dT	Drift of Reference Voltage versus Temperature			TBD		mV/ $^{\circ}C$
V_{SATH}	High Output Saturation Voltage (Pin 6)	$I_O = -60mA$		$V_{DD} - 15$		V
V_{SATL}	Low Output Saturation Voltage (Pin 6)	$I_O = 60mA$		17		V
BW	Bandwidth at -3dB	Measured on CRT cathodes. $C_{LOAD} = 10pF$, $R_{protect} = 220\Omega$, $V_{OUT} = 60V$, $\Delta V_{OUT} = 20V_{PP}$, Feedback gain = 20		40		MHz
t_R , t_F	Rise and Fall Time	Measured between 10% & 90% of output pulse, $C_{LOAD} = 10pF$, $R_{protect} = 220\Omega$, $V_{OUT} = 60V$, $\Delta V_{OUT} = 40V_{PP}$		9		ns
G_O	Open Loop Gain	$V_{OUT} = 60V$		65		dB
	Open Loop Gain Temperature Coefficient			TBD		dB/ $^{\circ}C$
I_{IB}	Input Bias Current (Pin 1)	$V_{OUT} = 60V$		TBD		μA
	Input Bias Temperature Coefficient			TBD		nA/ $^{\circ}C$
R_{IN}	Input Resistance	See Note 2	TBD	200		k Ω

Note 2 : Characterized and not tested.

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TYPICAL APPLICATION

The TDA9511 is composed of different parts :

- A differential amplifier, the gain of which is fixed by external feedback resistors ;
- An integrated voltage reference designed with a bandgap ;
- A protection diode against CRT arc discharges.

PC board lay-out

The best performances of the high voltage video amplifier will be obtained only with a carefully designed PC board. Output to input capacitances are of particular importance.

Power dissipation

The power dissipation consists of a static part and a dynamic part. The static dissipation varies with

the output voltage and the feedback resistor. The dynamic power dissipation increases with the pixel frequency.

For a signal frequency of 40MHz and 40V_{PP} output signal, the typical power dissipation is about 3.0W, for V_{DD} = 110V.

In first approximation, the dynamic dissipation is :

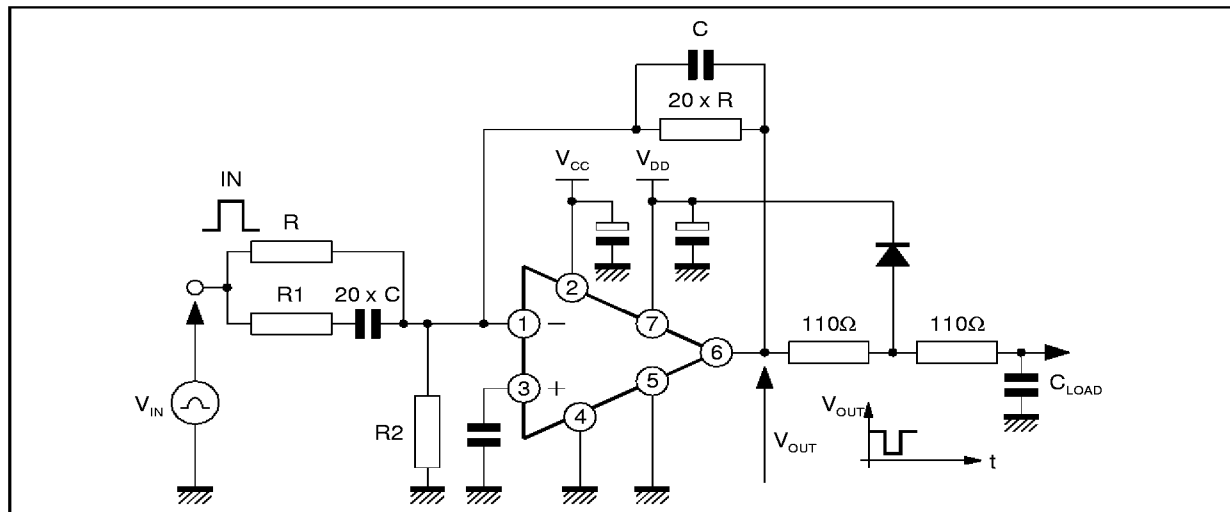
$$P_D = V_{DD} * C_{LOAD} * \Delta V_{OUT} * f$$

and the total dissipation is :

$$P = V_{DD} * C_{LOAD} * \Delta V_{OUT} * f + V_{DD} * I_{DD} + V_{CC} * I_{CC} - (V_{DD} - V_{OUT}) \frac{V_{OUT}}{R_{FEEDBACK}}$$

with f = pixel frequency

$$P = 110V \times 10pF \times 40V \times 40MHz + 110V \times 7mA + 12 \times 20mA - 60^2V/20k\Omega = 2.95W$$

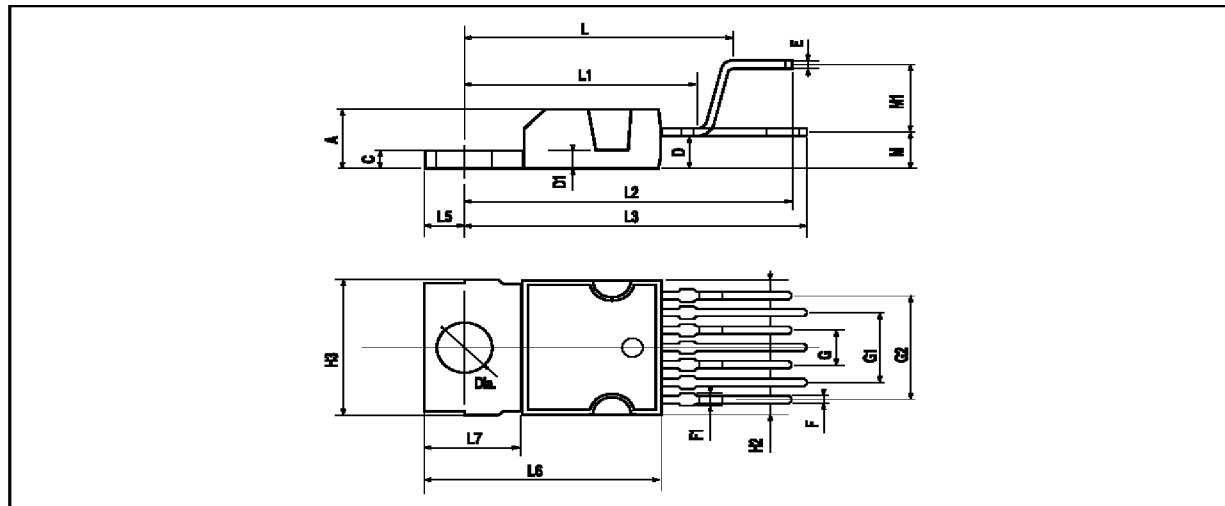


R1 and R2 are in the range of some hundreds ohms.

R is in the range of 1kΩ.

C must be lower than 1pF taking into account all the parasitic capacitors

PACKAGE MECHANICAL DATA : 7 PINS - PLASTIC HEPTAWATT



PM-HEPTVEPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		16.97			0.668	
L1		14.92			0.587	
L2		21.54			0.848	
L3		22.62			0.891	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		2.8			0.110	
M1		5.08			0.200	
Dia.	3.65		3.85	0.144		0.152

HEPTV.TBL

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