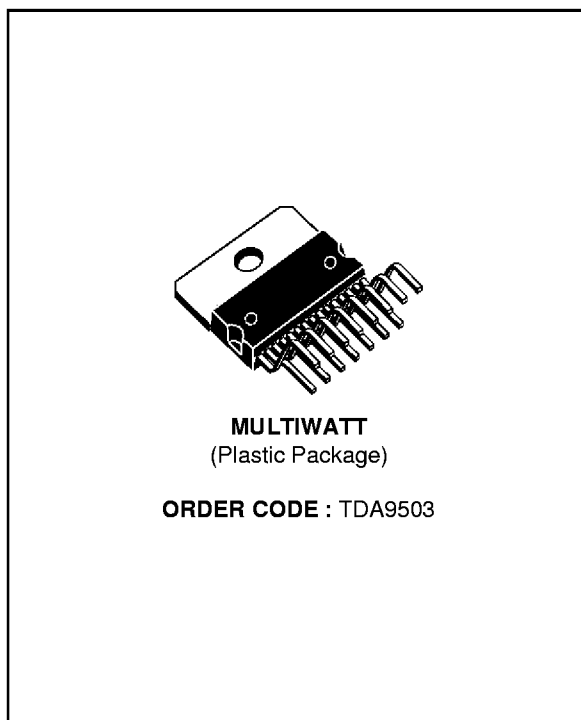


**TRIPLE HIGH VOLTAGE VIDEO AMPLIFIER**

PRODUCT PREVIEW

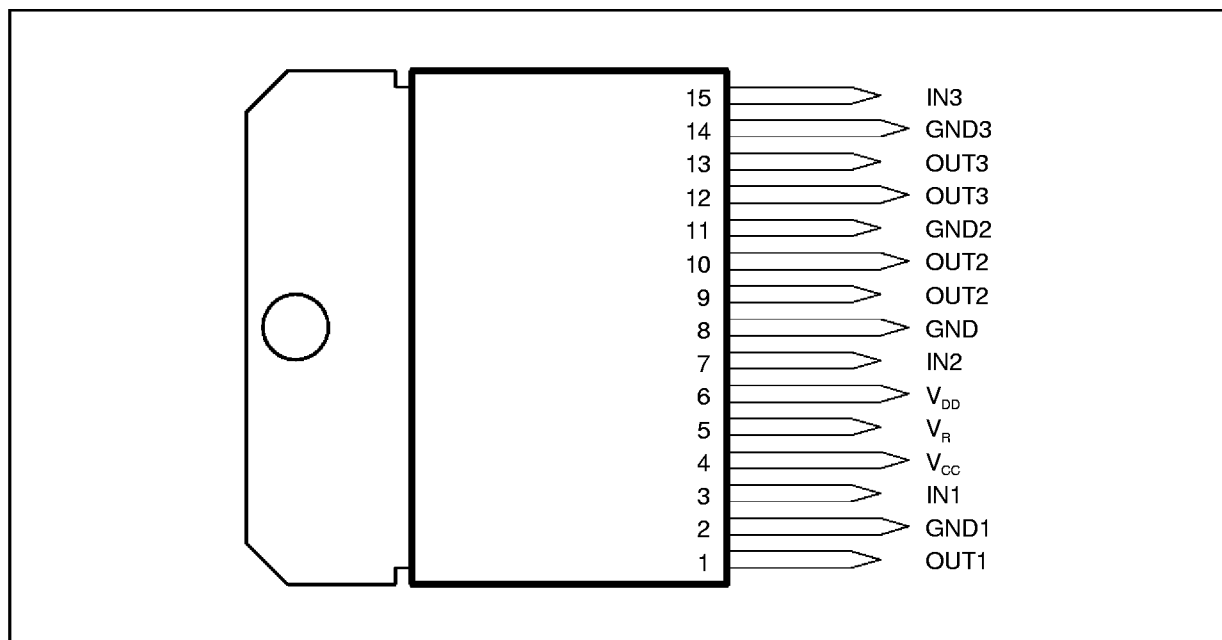
- TRIPLE CHANNELS VIDEO AMPLIFIER
- BANDWIDTH : 40MHz TYPICAL
- RISE AND FALL TIME : 9ns TYPICAL
- SUPPLY VOLTAGE : 90V



**DESCRIPTION**

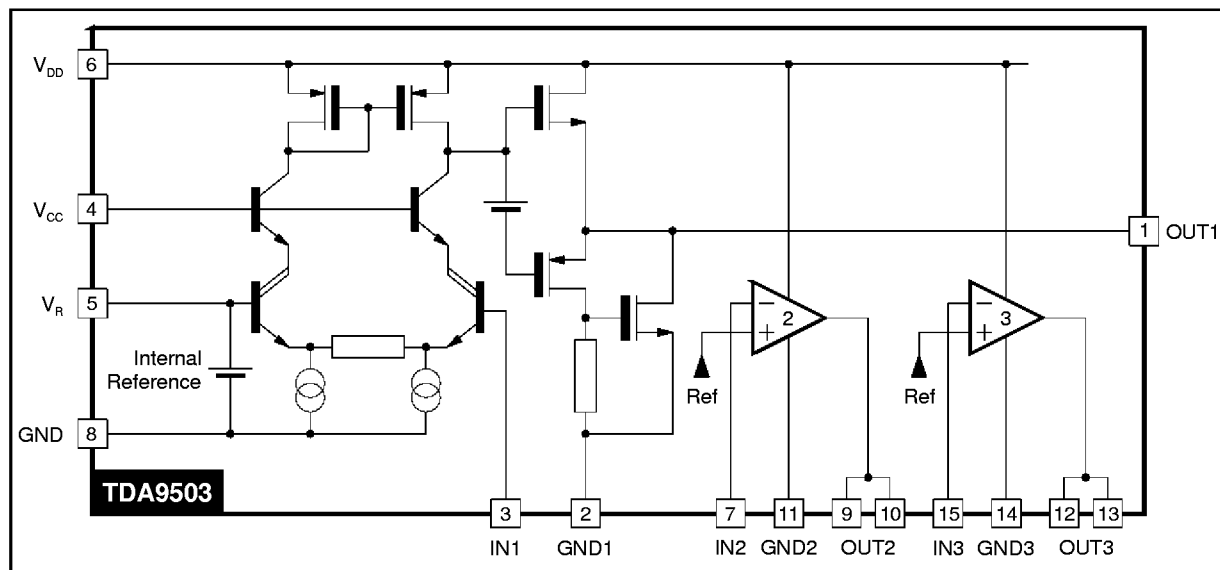
The TDA9503 includes 3 video amplifiers designed with a high voltage bipolar/CMOS/DMOS technology (BCD). It drives directly cathodes of a monitor and is protected against flashovers. It is available in multiwatt package.

**PIN CONNECTIONS**



9503-01.EPS

**BLOCK DIAGRAM**



9503-02.EPS

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_{OUT}, V_{DD}$	Supply High Voltage	100	V
$V_{CC}$	Supply Low Voltage	20	V
$I_{OD}$	Output Current to $V_{DD}$	protected	mA
$I_{OG}$	Output Current to Ground (pulsed < 50 $\mu$ s)		
$I_j$	Input Current	50	mA
$T_j$	Junction Temperature	150	$^{\circ}$ C
$T_{oper}$	Operating Ambient Temperature	0, +70	$^{\circ}$ C
$T_{stg}$	Storage Temperature	-20, +150	$^{\circ}$ C

9503-01.TBL

**THERMAL DATA**

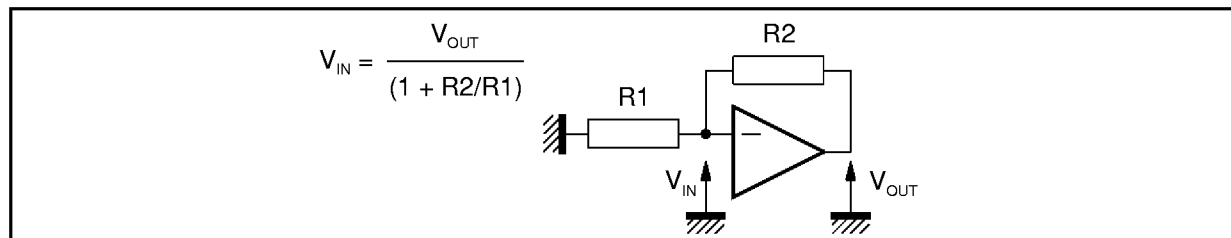
Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-Case Thermal Resistance	Max. 3	$^{\circ}$ C/W
$R_{th(j-a)}$	Junction-Ambient Thermal Resistance	Typ. 35	$^{\circ}$ C/W

9503-01.TBL

**ELECTRICAL CHARACTERISTICS** ( $V_{CC} = 12V$ ,  $V_{DD} = 90V$ ,  $T_{amb} = 25^{\circ}C$ , unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{DD}$	High Supply Voltage (Pin 6)		20		90	V
$V_{CC}$	Low Supply Voltage (Pin 4)		10	12	15	V
$I_{DD}$	High Voltage Supply Internal DC Current (without current due to the feedback network)	$V_{OUT} = 50V$		24		mA
$I_{CC}$	Low Voltage Supply Internal DC Current			20		mA
$V_R$	Internal Reference	Measured on Pin 5		3.5		V
$V_{IN}$	Typical Input Voltage	$V_{OUT} = 50V$		3.8		V
$dV_{IN}/dV_{CC}$	Drift of Input Voltage versus $V_{CC}$				TBD	%
$dV_{IN}/dT$	Drift of Input Voltage versus Temperature	See Figure 1			TBD	mV/°C
$V_{SATH}$	High Output Saturation Voltage	$I_O = -60mA$		$V_{DD} - 6.5$		V
$V_{SATL}$	Low Output Saturation Voltage	$I_O = 60mA$		17		V
BW	Bandwidth at -3dB	$C_{LOAD} = 10pF$ , $R_{protect} = 200\Omega$ , $V_{OUT} = 50V$ , $\Delta V_{OUT} = 40V_{PP}$ , Feedback gain = 20 See Figure 2		40		MHz
$t_R, t_F$	Rise and Fall Time	Measured between 10% & 90% of output pulse, $C_{LOAD} = 10pF$ , $R_{protect} = 200\Omega$ , $V_{OUT} = 50V$ , $\Delta V_{OUT} = 40V_{PP}$		9		ns
$G_O$	Open Loop Gain	$V_{OUT} = 50V$		57		dB
$I_{IB}$	Input Bias Current (Pin 1)	$V_{OUT} = 50V$		10		$\mu A$
$R_{IN}$	Input Resistance		TBD	200		k $\Omega$
CT	Crosstalk between Video channel	$\Delta V_{OUT} = 20V_{PP}$ , $V_{IN} = 1V_{PP}$ , $f_{IN} = 1MHz$		TBD		dB

9503-03.TBL

**Figure 1** : Measurement of Input Voltage

9503-03.EPS

**TYPICAL APPLICATION**

The TDA9503 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.

**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. For a single amplifier, the input-output capacitance, in parallel with the relatively high feedback resistance, leads to an integrator response. This parasitic capacitor has to be compensated by another capacitor connected in parallel on input serial gain resistor. A well matched compensation allows to use the full bandwidth of the TDA9503. In other cases the system has an integrator response with lower bandwidth, or a differentiator response with too much ringing.

A low parasitic capacitance (0.3pF) feedback resistor and HF isolated printed wires are necessary.

**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<sub>PP</sub> output signal, the typical power dissipation is about 2.3W, for V<sub>DD</sub> = 90V.

In first approximation, the dynamic dissipation is :

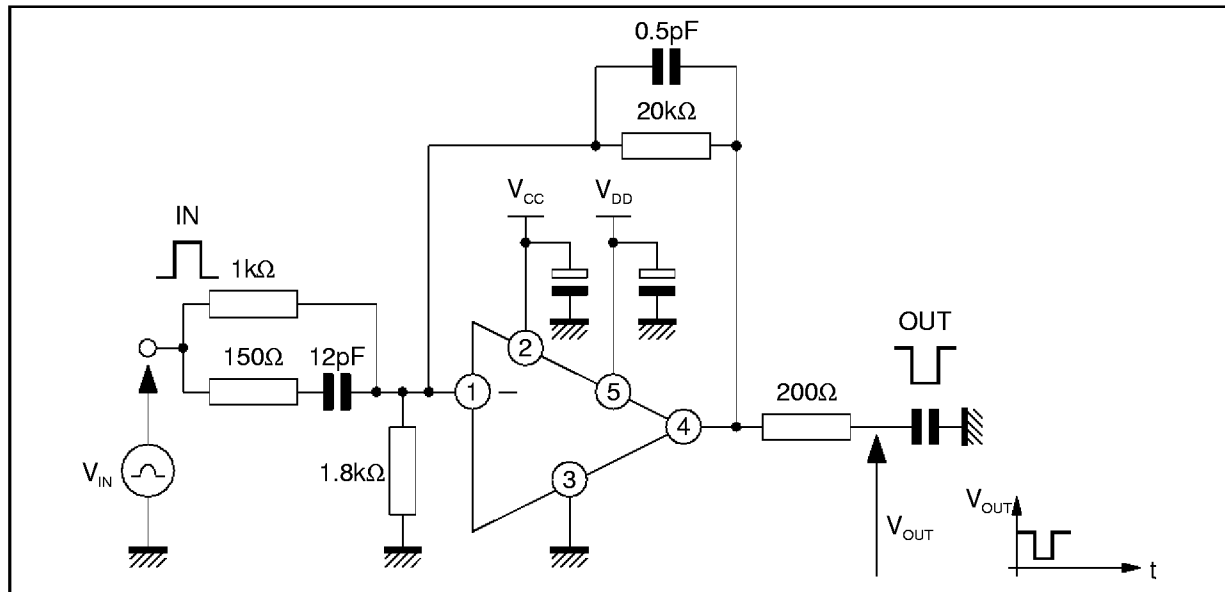
$$P_D = V_{DD} \times C_{LOAD} \times \Delta V_{OUT} \times f \times 3$$

and the total dissipation is :

$$P = V_{DD} \times C_{LOAD} \times \Delta V_{OUT} \times f \times 3 + V_{DD} \times I_{DD} + V_{CC} \times I_{CC} - (V_{DD} - \sqrt{V_{OUT}}) \times \frac{\sqrt{V_{OUT}}}{R_{FEEDBACK}} \times 3$$

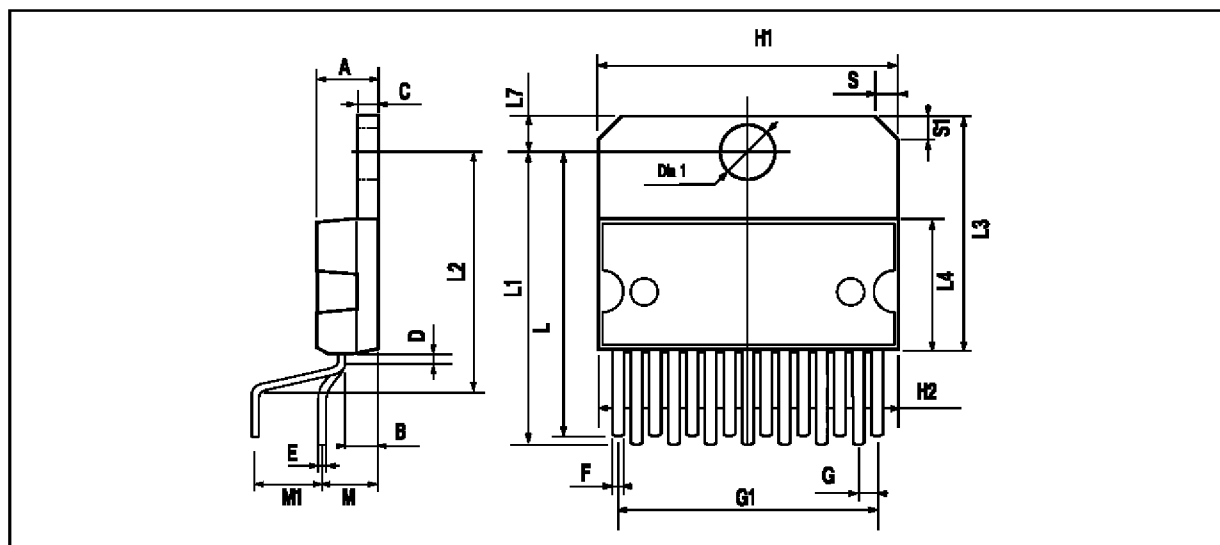
with f = pixel frequency

**Figure 2** : Typical Evaluation Schematic



9503-04.EPS

## PACKAGE MECHANICAL DATA : 15 PINS - PLASTIC MULTIWATT



PM-MW15V.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.02	1.27	1.52	0.040	0.050	0.060
G1	17.53	17.78	18.03	0.690	0.700	0.710
H1	19.6			0.772		
H2			20.2			0.795
L	21.9	22.2	22.5	0.862	0.874	0.886
L1	21.7	22.1	22.5	0.854	0.870	0.886
L2	17.65		18.1	0.695		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.25	4.55	4.85	0.167	0.179	0.191
M1	4.63	5.08	5.53	0.182	0.200	0.218
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia. 1	3.65		3.85	0.144		0.152

MW15V.TBL

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