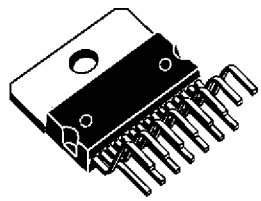
SGS-THOMSON MICROELECTRONICS

TDA9503

TRIPLE HIGH VOLTAGE VIDEO AMPLIFIER

PRODUCT PREVIEW

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



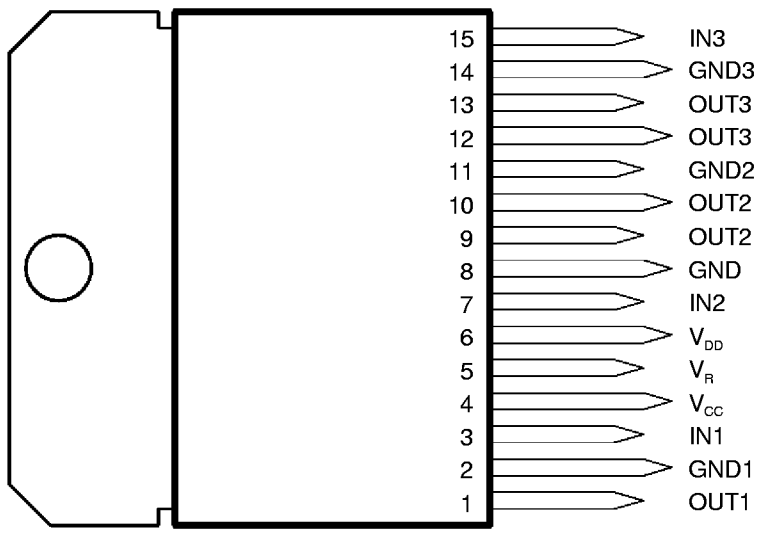
MULTIWATT
(Plastic Package)

ORDER CODE : TDA9503

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



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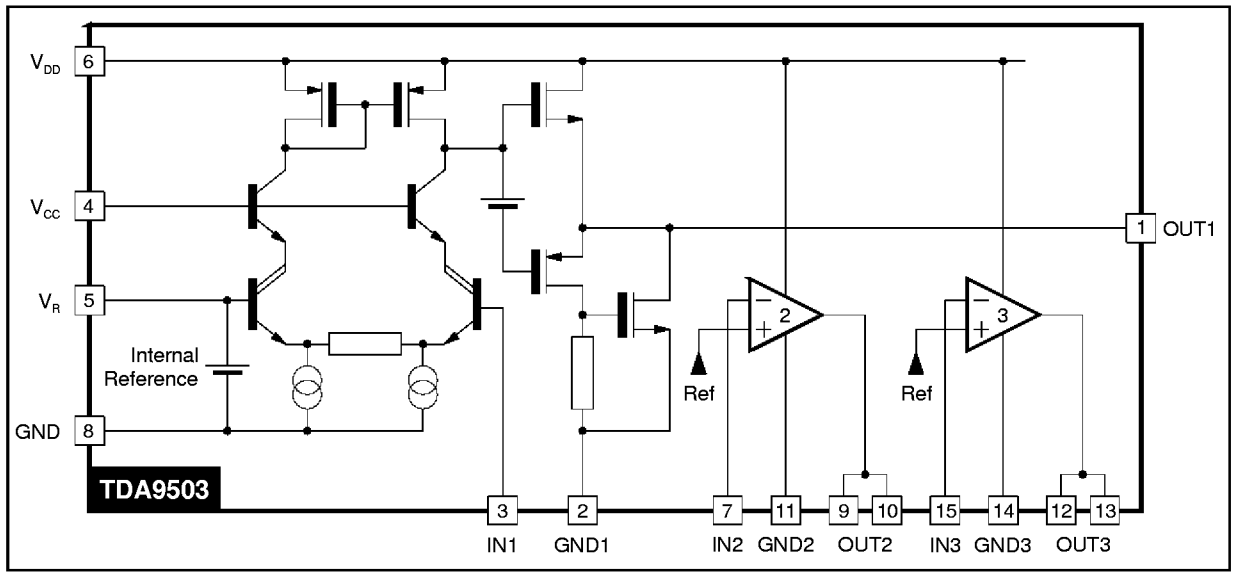
BLOCK DIAGRAM



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} I_{OG}	Output Current to V_{DD} Output Current to Ground (pulsed < 50µs)	protected 80	mA
I_j	Input Current	50	mA
T_j	Junction Temperature	150	°C
T_{oper}	Operating Ambient Temperature	0, +70	°C
T_{stg}	Storage Temperature	-20, +150	°C

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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.	35	°C/W

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ELECTRICAL CHARACTERISTICS (V_{CC} = 12V, V_{DD} = 90V, T_{amb} = 25°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, Rprotect = 200Ω, V_{OUT}= 50V, ΔV_{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, Rprotect = 200Ω, V_{OUT} = 50V, ΔV_{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		µA
R_{IN}	Input Resistance		TBD	200		kΩ
CT	Crosstalk between Video channel	ΔV_{OUT} = $20V_{PP}$, V_{IN} = $1V_{PP}$, f_{IN} = 1MHz		TBD		dB

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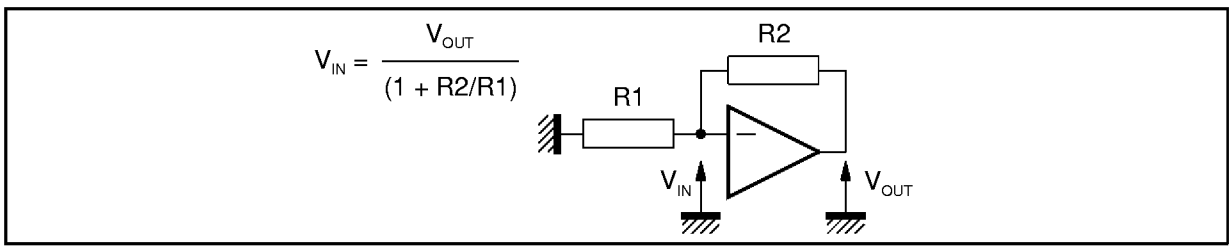
Figure 1 : Measurement of Input Voltage



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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 imput 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_{PP} output signal, the typical power dissipation is about 2.3W, for V_{DD} = 90V.

In first approximation, the dynamic dissipation is :

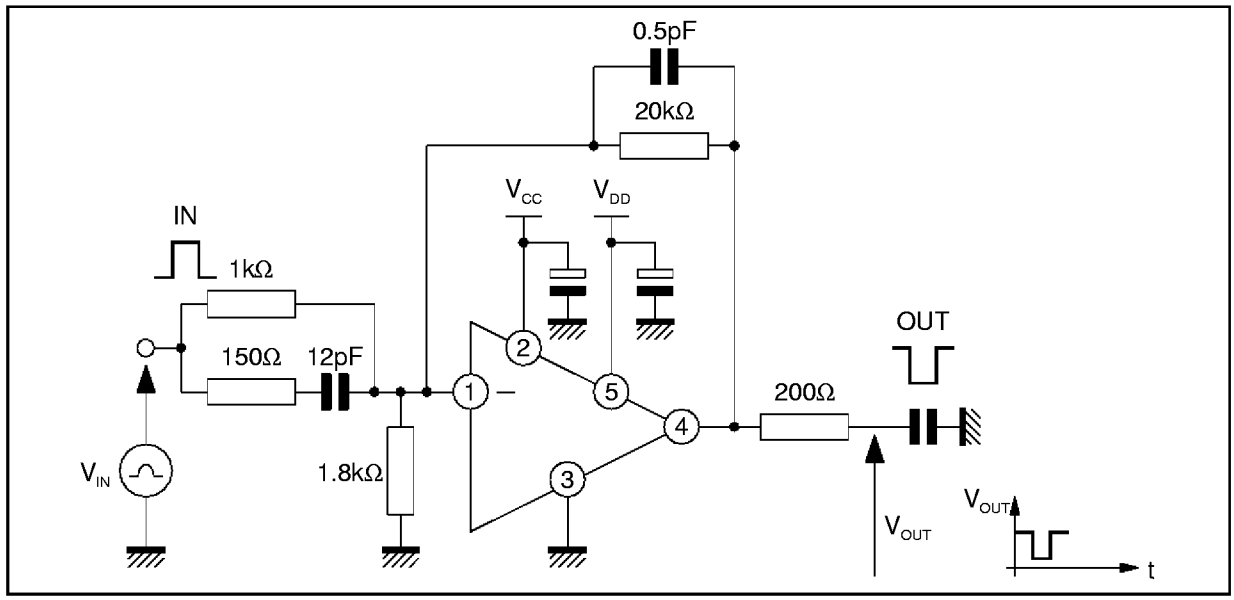
$$P_D = V_{DD} \times C_{LOAD} \times \Delta V_{OUT} \times f \times 3$$

and the total dissipation is :

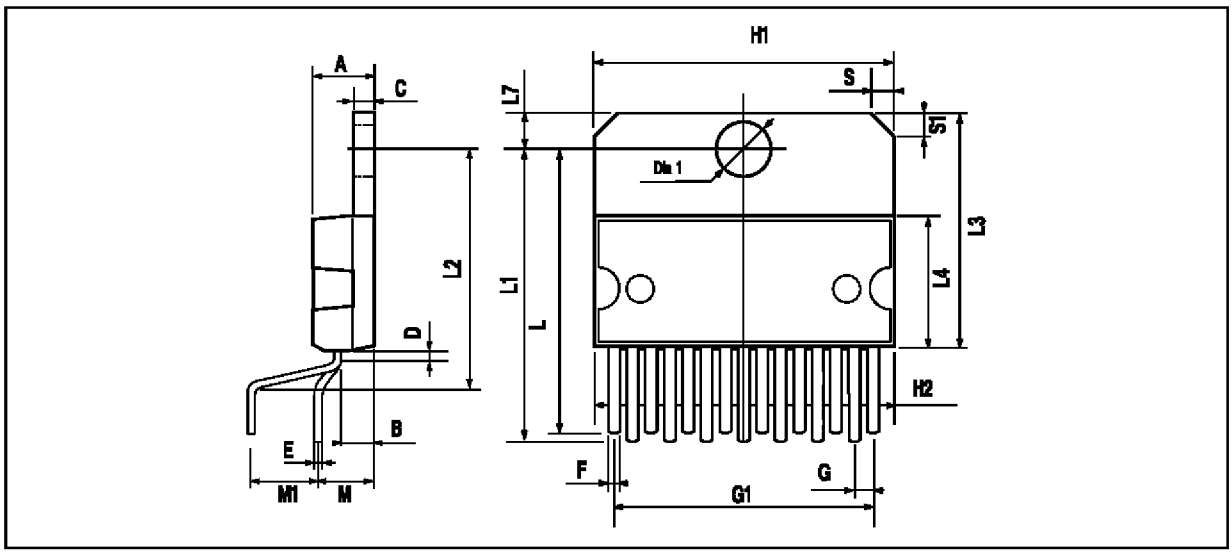
$$P = V_{DD} \times C_{LOAD} \times \Delta V_{OUT} \times f \times 3 + V_{DD} \times I_{DD} + V_{CC} \times I_{CC} - (V_{DD} - \overline{V_{OUT}}) \times \frac{\overline{V_{OUT}}}{R_{FEEDBACK}} \times 3$$

with f = pixel frequency

Figure 2 : Typical Evaluation Schematic



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

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