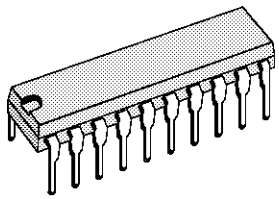
SGS-THOMSON MICROELECTRONICS

TDA9201

WIDE BAND VIDEO PREAMPLIFIER

PRELIMINARY DATA

- CURRENT OUTPUT (up to 300mA)
- 120MHz (-3dB) BANDWIDTH
- 3nsec RISE/FALL TIME
- BRIGHTNESS AND CONTRAST DC CONTROLLED
- INTERNAL CLAMPING PULSE GENERATOR
- CONTRAST PRE-ADJUST FOR COLOR MONITOR APPLICATION
- INTERNAL REFERENCE VOLTAGE GENERATOR
- BLANKING PULSE INPUT
- POS/NEG SYNC POLARITY INPUT



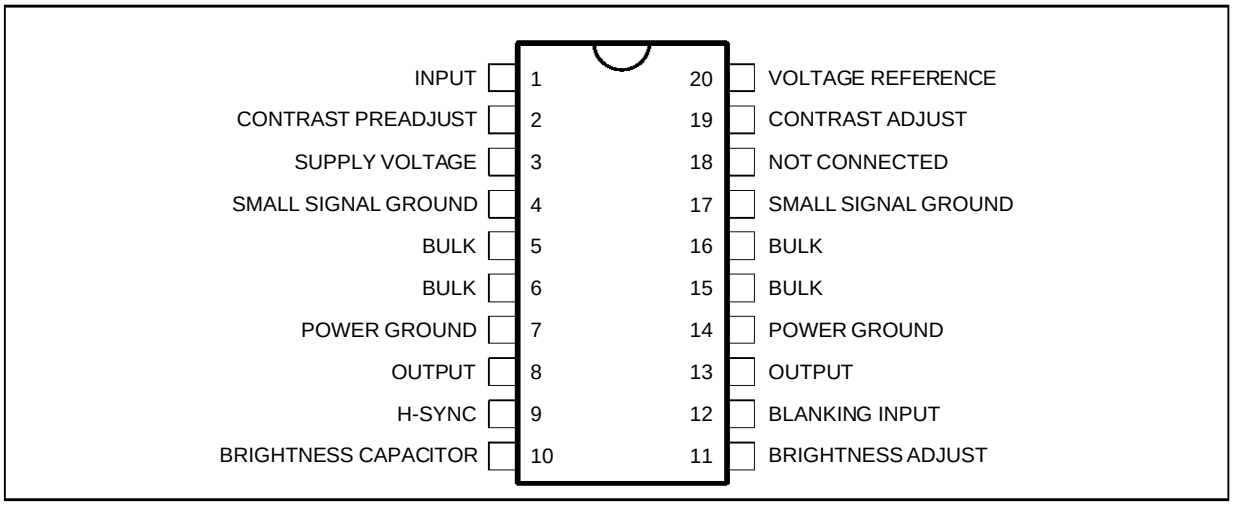
POWERDIP20
(Plastic Package)

ORDER CODE : TDA9201

DESCRIPTION

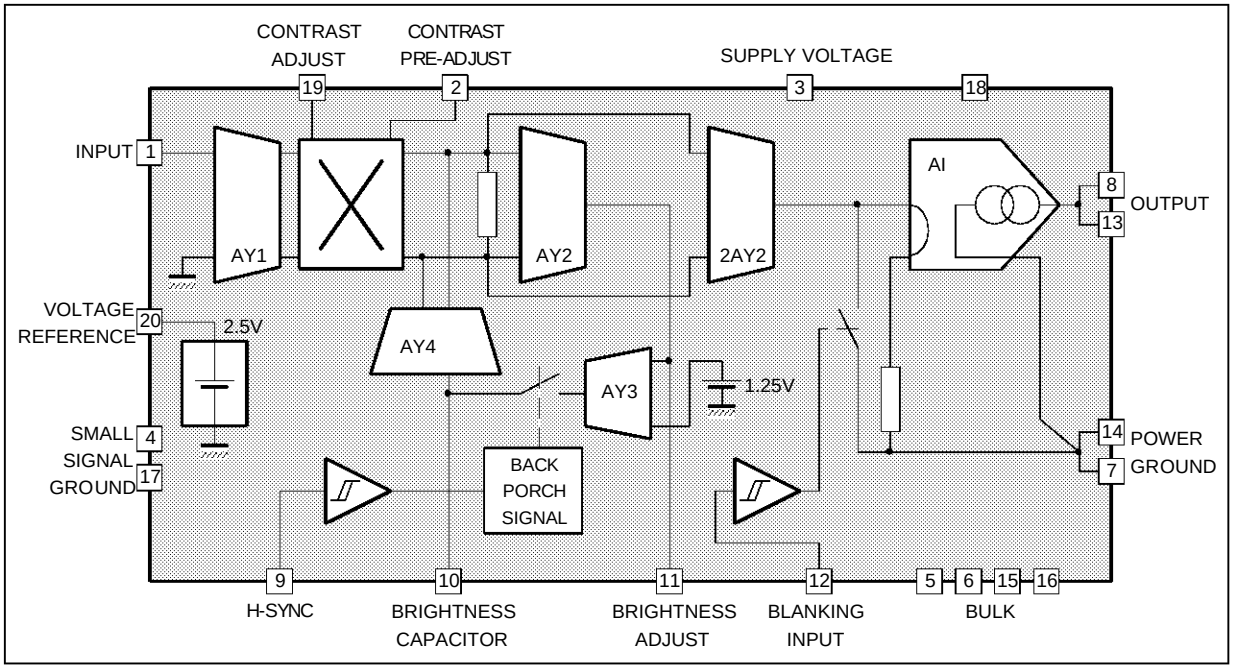
The TDA9201 is a wide band video amplifier intended for high resolution monochrome or color monitors.
The BRIGHTNESS and CONTRAST are DC controlled.
The brightness loop includes a comparator gated by an internally generated pulse.
Thanks to the contrast pre-adjust pin, this device is well suited for color application too.
The output stage structure (A class current output), allows to use a very cheap high voltage amplifier using only one transistor.

PIN CONNECTIONS



This advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_S	Power Supply (Pin 3)		8	V
I_{OUT}	Output Current		350	mA
V_{IN}	Voltage at any Input Pin		-0.3, V_S	V
T_j	Junction Temperature		0, +150	^oC
T_{stg}	Storage Temperature		-40, +150	^oC
P_{max}	Power Dissipation	$T_{PINS} = 90^oC$ $T_{amb} = 70^oC$	4.3 1	W W

9201-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ (j-P)}$	Junction-Pins Thermal Resistance	Max.	14	$^oC/W$
$R_{th\ (j-a)}$	Junction-ambient Thermal Resistance	Max.	80*	$^oC/W$

9201-02.TBL

* Obtained with GND pins soldered to printed board with minimum area.

DC ELECTRICAL CHARACTERISTICS (V_S = 5V and T_{amb} = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Supply Voltage Range	Pin 3	4.5	5	5.5	V
I_S	Supply Current	V_S = 5V, Pin 3		82	100	mA
V_{REF}	Voltage Reference	I_{20} = 0, Pin 20	2.30	2.42	2.55	V
I_{REF}	Max. Current from Pin 20 to ground	Pin 20			5	mA
V_1	Input DC Level	Pin 1	0.7	0.8	0.9	V
R_1	Input Impedance	Pin 1		10		kΩ
I_2	Cont Pre-adjust Current from Pin 2 to ground		0.3	0.5	0.7	mA
V_{CONT}	Voltage Range on Contrast Adjust	Pin 19	0		V_2	V
I_{BRTX}	Current for Max. Brigthness (100mA on output pin)	Current from Pin 11 to ground (see Figure 1)		340		µA
I_{BRTI}	Current for Min. Brigthness (100mA on output pin)	Current from Pin 11 to ground (see Figure 1)		64		µA
I_{offs}	DC Offset Current on Pin 11	Pin 11		± 50		µA
V_{OI}	Min. Output Voltage for normal operating	Pin 13 or/and 8	3.5			V

9201-03.TBL

AC ELECTRICAL CHARACTERISTICS (V_S = 5V and T_{amb} = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{DI}	Max. Peak-to-peak Input Voltage	Pin 1 (without sync)			1	V
$V_{th\ H}$	Sync. and Blank Inputs Threshold Voltage (Pins 9 and 12)	Low level High Level	 2		0.8	V V
I_{SYNC}	Current On Sync. Input (Pin 9)	Low level High Level			1 5	µA µA
I_{BLANK}	Current On Blank Input (Pin 12)	Low level High Level			-50 1	µA µA
BLK_{D1}	Delay between Blanking Pulse begining and Output Inhibition	Pins 8, 12 and 13			40	nsec
BLK_{D2}	Delay between End of Blanking Pulse and Output Current Switching on	Pins 8, 12 and 13			30	nsec
I_{OBLK}	Output Current during Blanking Pulse	Pins 8 and 13 (see note 1)			100	µA
I_{OR}	Output Current Range Outside of Blanking	Pins 8 and 13 (see note 1)	300			mA
dI_O	Max. Peak-to-peak Output Current	Pins 8 and 13 (see note 1)			225	mA
BW	Min. Small Signal Bandwidth (-3dB) (see note 2)	V_{CONT} = 0.8V, V_{IN} = 100mV_{PP}, I_{OUTDC} = 50mA (BRT), V_{preset} = 2V	120			MHz
t_F, t_R	Output Current Rise and Fall Time (10 to 90%) (see note 2)	Pins 8 and 13 (see note 1)			3	ns

INTERNAL BACK POARCH CLAMPING PULSE GENERATOR

I_{10}	Gated Current on Brightness Capacitor	Measured on Pin 10, 500ns after end of H-sync on Pin 9		500		µA
SPW1	Max. Sync Pulse Width	Pin 9			5	µs
SPW2	Min. Sync Pulse Width	Pin 9	1			µs
BPW	Back Poarch Pulse Width	Internal Pulse		1	1.3	µs

9201-04.TBL

Notes : 1. V_{CONT} = 0, I_{BRT} adjusted for having $I_{OUT\,DC}$ = 50mA outside of BLK.

2. This parameter is not tested in production but is guaranteed by the design and qualify by means of corner lots during the qualification of the product in SGS-THOMSON. This parameter is measured on a AC testing board as described in Figure 2.

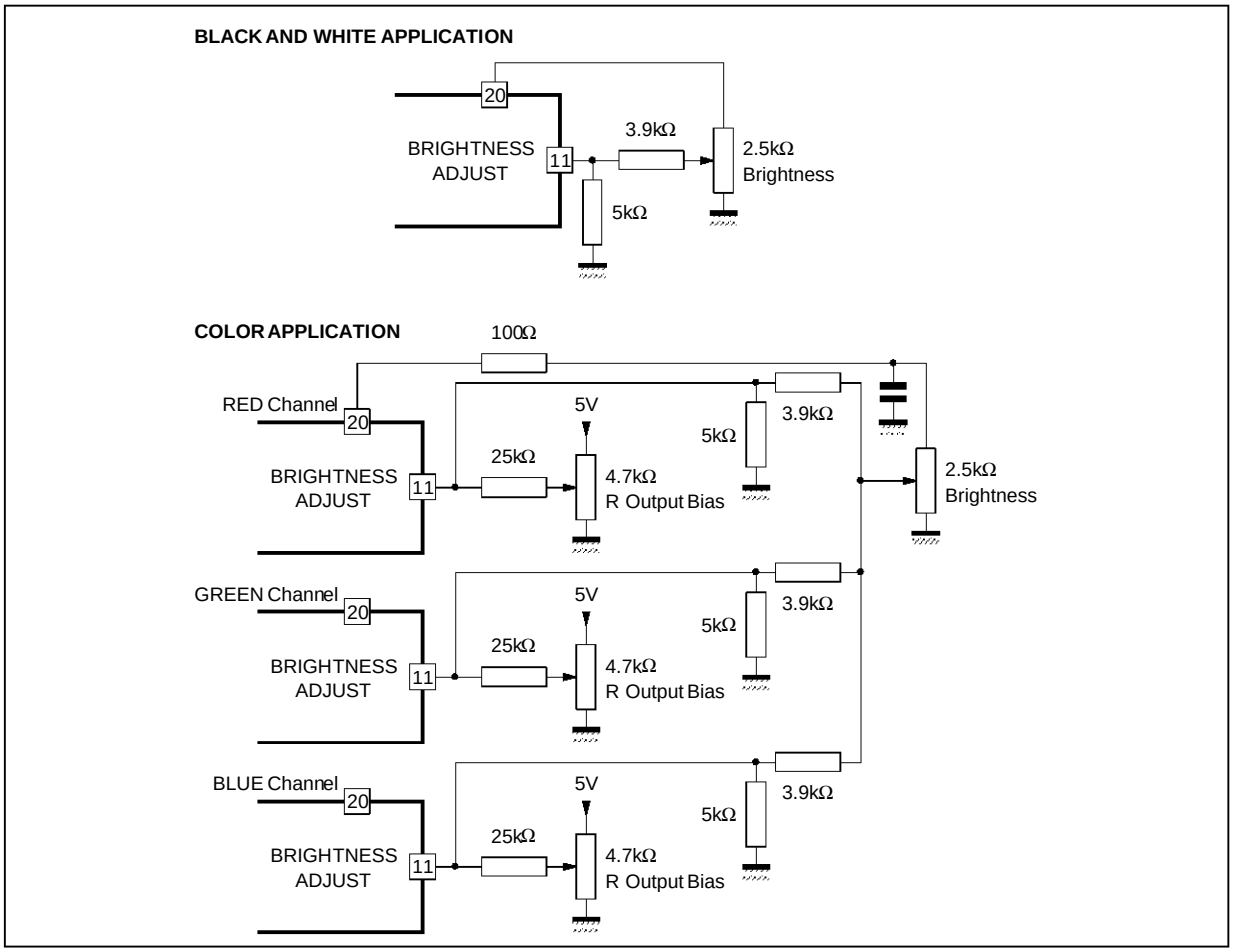
AC ELECTRICAL CHARACTERISTICS (continued)

V_S = 5V and T_{amb} = 25°C, unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
TYPICAL CONTRAST CHARACTERISTICS						
$G_{Nom.}$	Gain Reference Value	V_{IN} = 1V_{PP}, V_{CONT} = 0.8V, Precontrast is presetted for having I_{OUT} = 125mA_{PP}		0		dB
GL1		V_{CONT} = 0.2 (V_{IN} = 1V_{PP})	-12.46	-11.86	-11.26	dB
GL2		V_{CONT} = 0.4 (V_{IN} = 1V_{PP})	-5.9	-5.6	-5.3	dB
GL3		V_{CONT} = 1.2 (V_{IN} = 1V_{PP})	2.85	3.15	3.45	dB
GL4		V_{CONT} = 1.6 (V_{IN} = 1V_{PP})	4.95	5.55	6.15	dB
GL5		V_{CONT} = 0 (V_{IN} = 1V_{PP})	-35			dB
BRIGHTNESS CHARACTERISTICS						
BRTx	Max. DC Current on Output				100	mA
BRTi	Min. DC Current on Output	for full bandwidth	10			mA
GBRT	Brightness Control Characteristic $I_{out\ DC}$ / $\|I_{11}\|$	DC current output versus $\|I_{11}\|$ (I_{11} in Pin 11 flows from Pin 11 to GND)		326		
V_2	Voltage Range		0		V_{REF}	V
V_{nom}	Voltage for Odb Adjustment (G_{nom})	V_2		2		V

9201-05.TBL

Figure 1 : Details of Brightness Adjustment



9201-03.EPS

Figure 2 : AC Test Circuit for BW and Rt/Ft

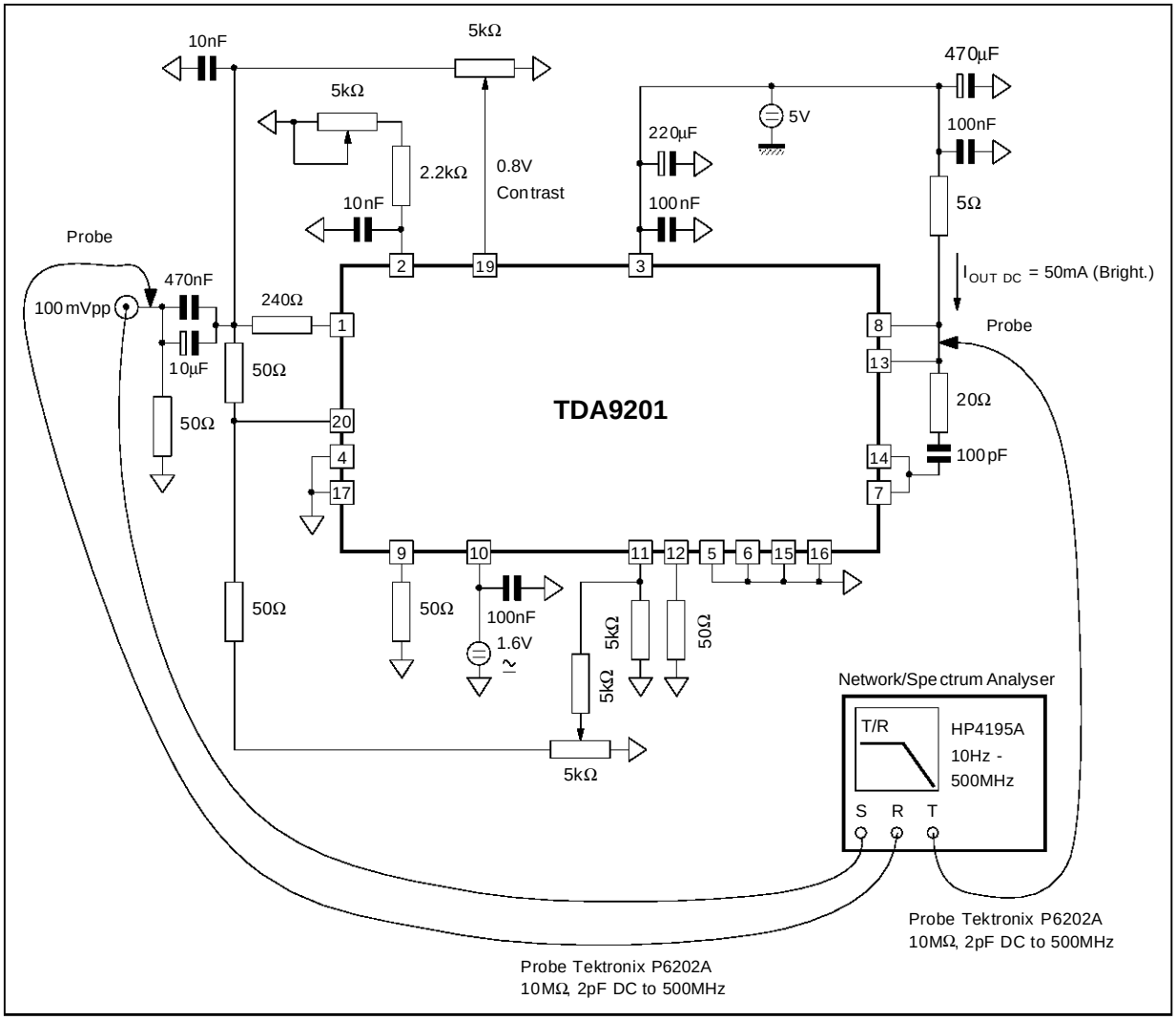


Figure 3 : Typical Gain versus Contrast Voltage Characteristic

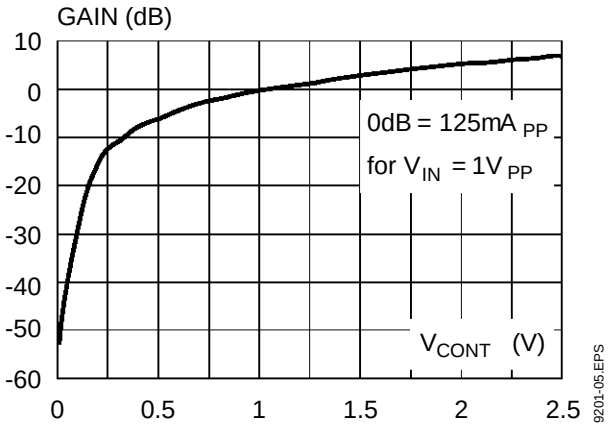


Figure 4 : V_{preset} versus Contrast Voltage for 0dB

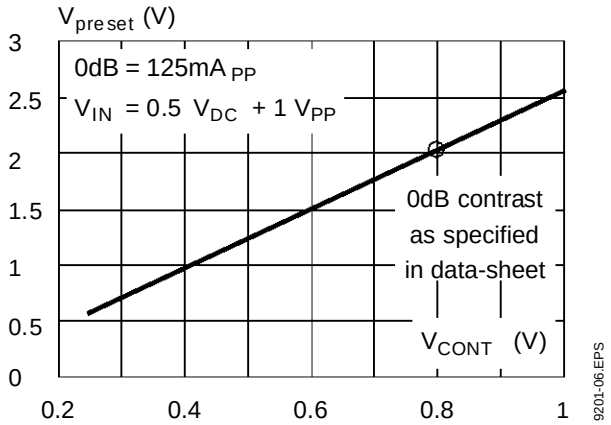


Figure 5 : Typical Application Circuit

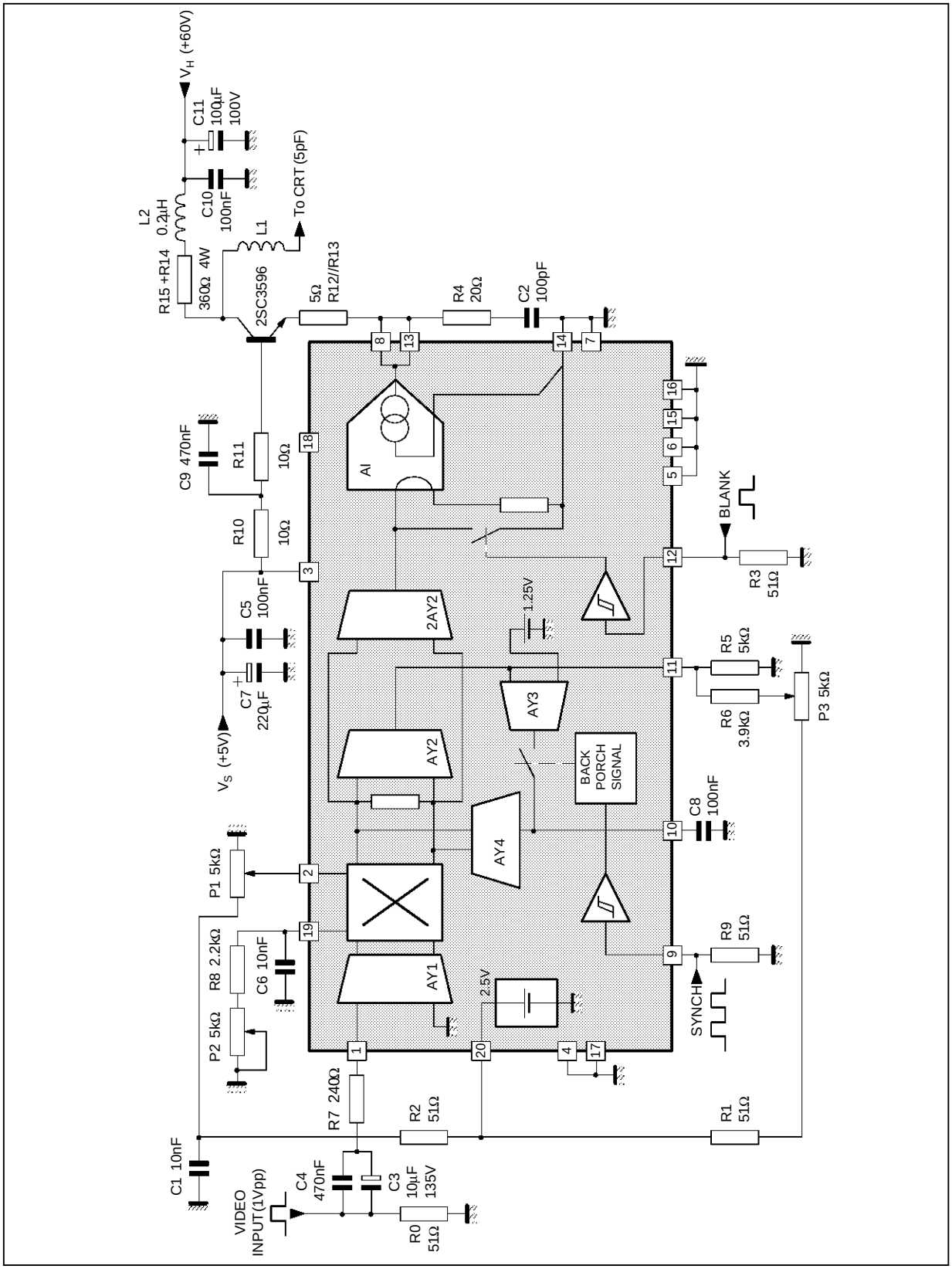


Figure 6 : Components Side

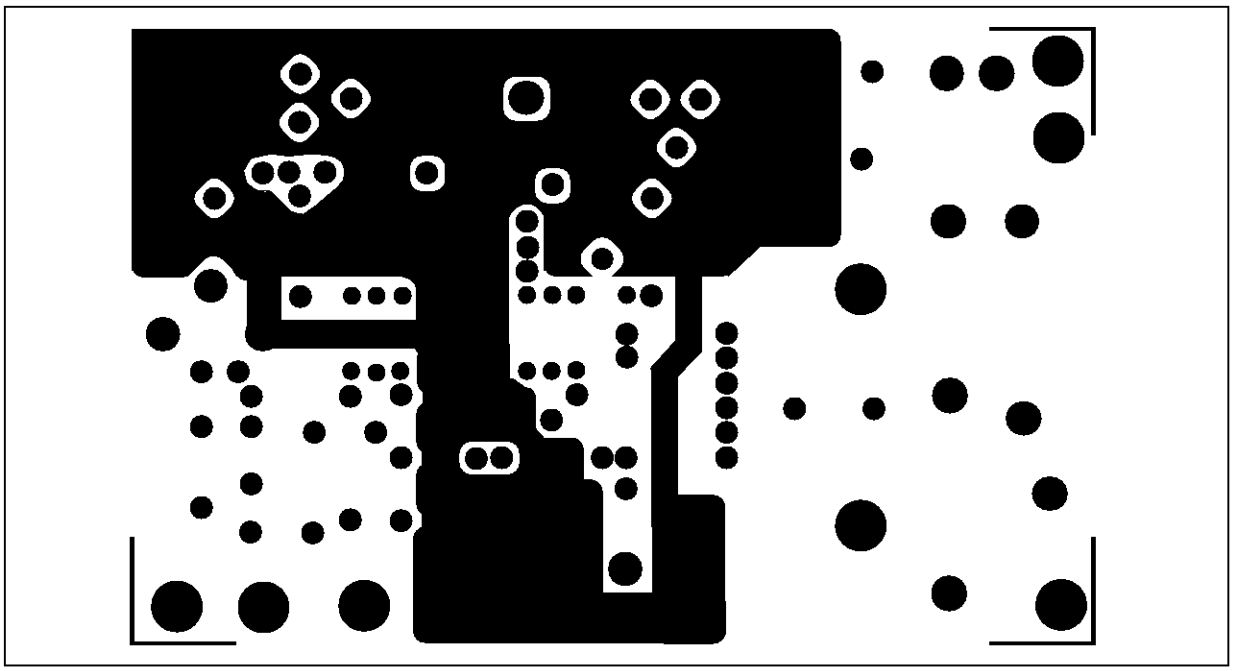


Figure 7 : Solder Side

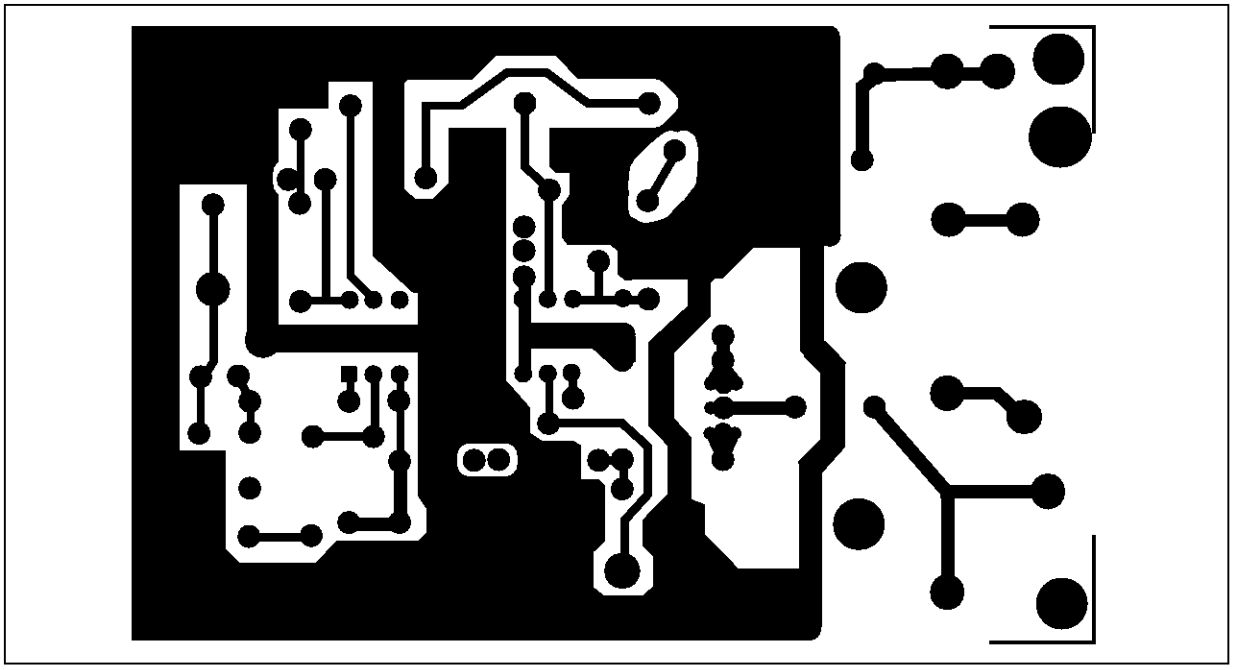
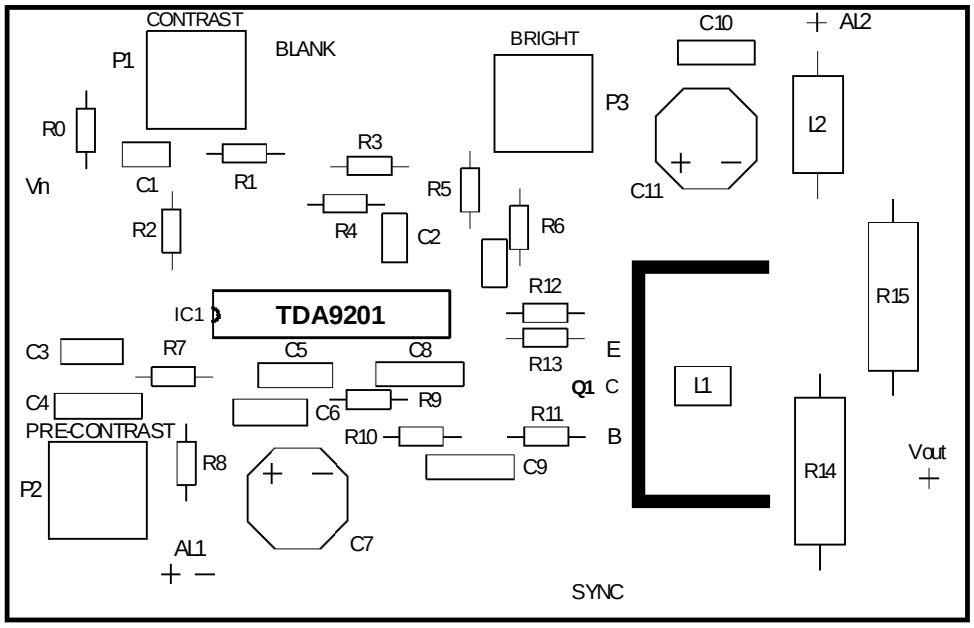


Figure 8 : Assy-plan



9201-10.EPS

COMPONENT LIST

Component	Value
R0, R1, R2, R3, R9	51Ω
R4	20Ω
R5, R6	5.1kΩ
R7	240Ω
R8	2.2kΩ
R10, R11, R12, R13	10Ω
R14, R15	180Ω, 3W
P1, P2, P3	5kΩ
C1, C6	10nF
C2	100pF

Component	Value
C3	10µF/35V Tantale
C4, C9	470nF
C5, C8, C10	100nF
C7	220µF/25V
C11	100µF/100V
L1	Strap
L2	0.2µH
Q1	2SC3596E
IC1	TDA9201

9201-06.TBL

Figure 9 : Output Signal on CRT (bright. and cont.) White Vertical Line on Screen

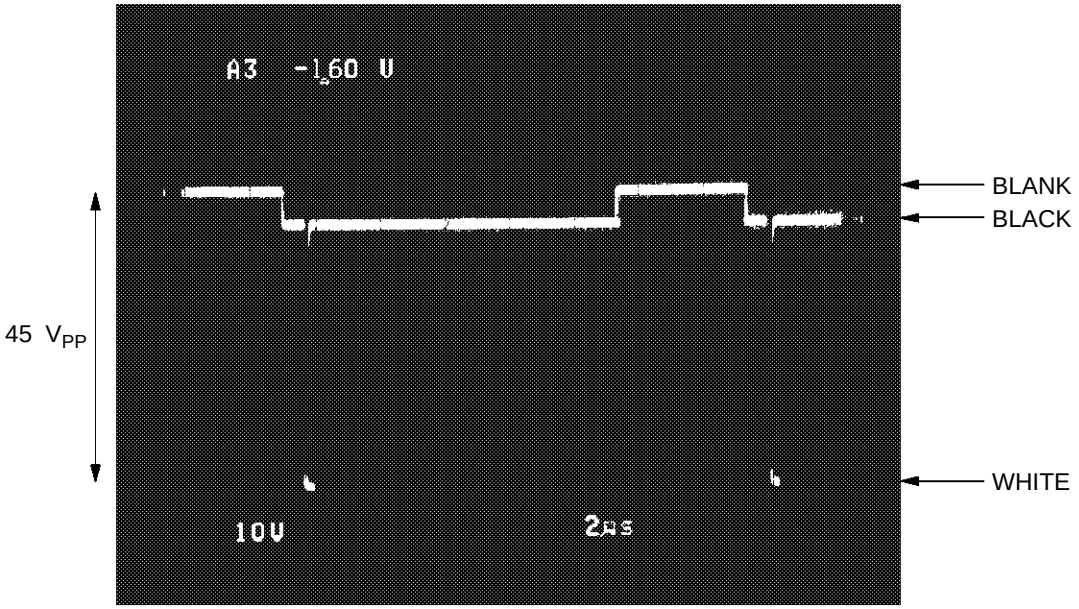


Figure 10 : 1. Input Video (500mV_{PP})
2. Output to CRT 40V_{PP}-12ns (one pixel), 150mA, pixel rate 83MHz, BW ≅ 120MHz

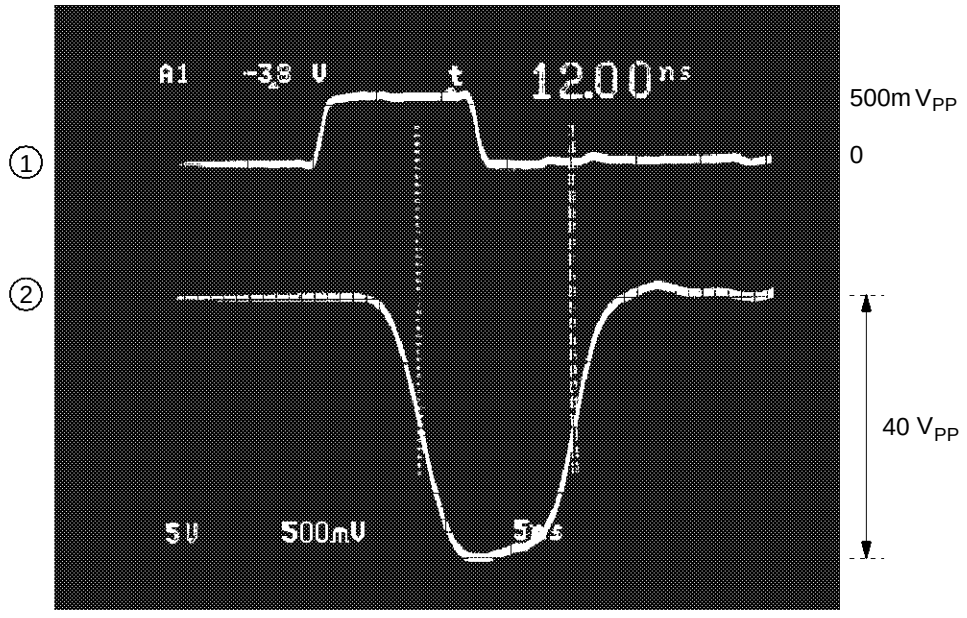
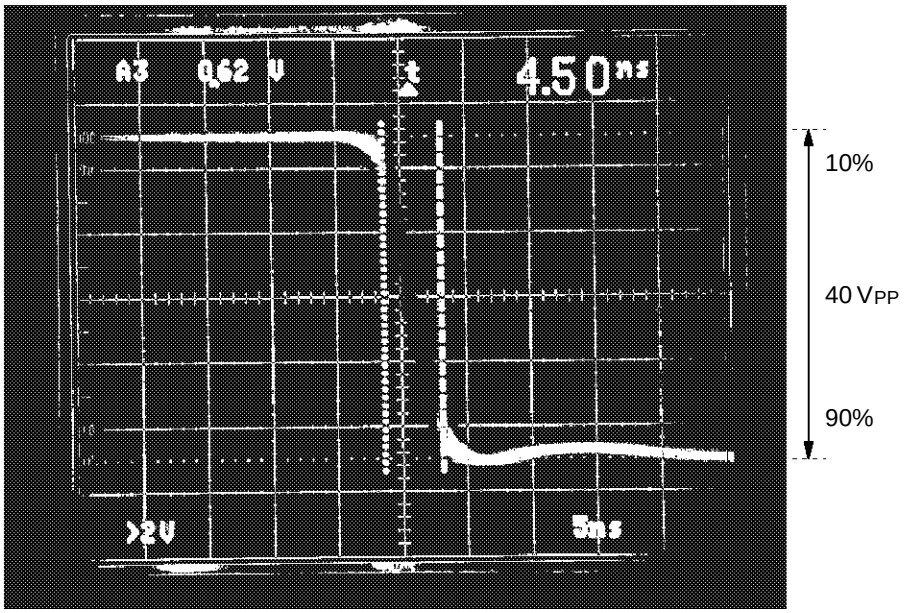
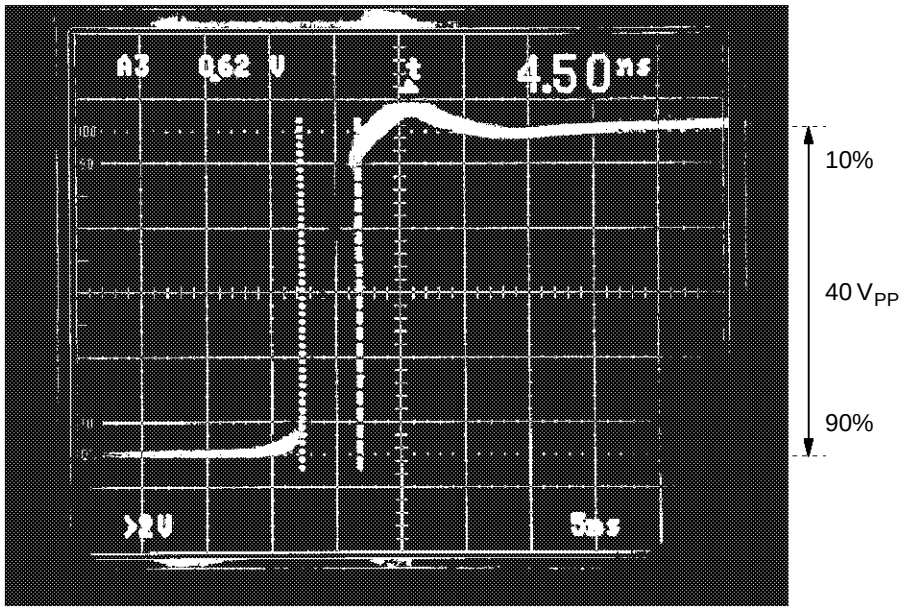


Figure 11 : Fall Time (see test conditions, Figure 13)



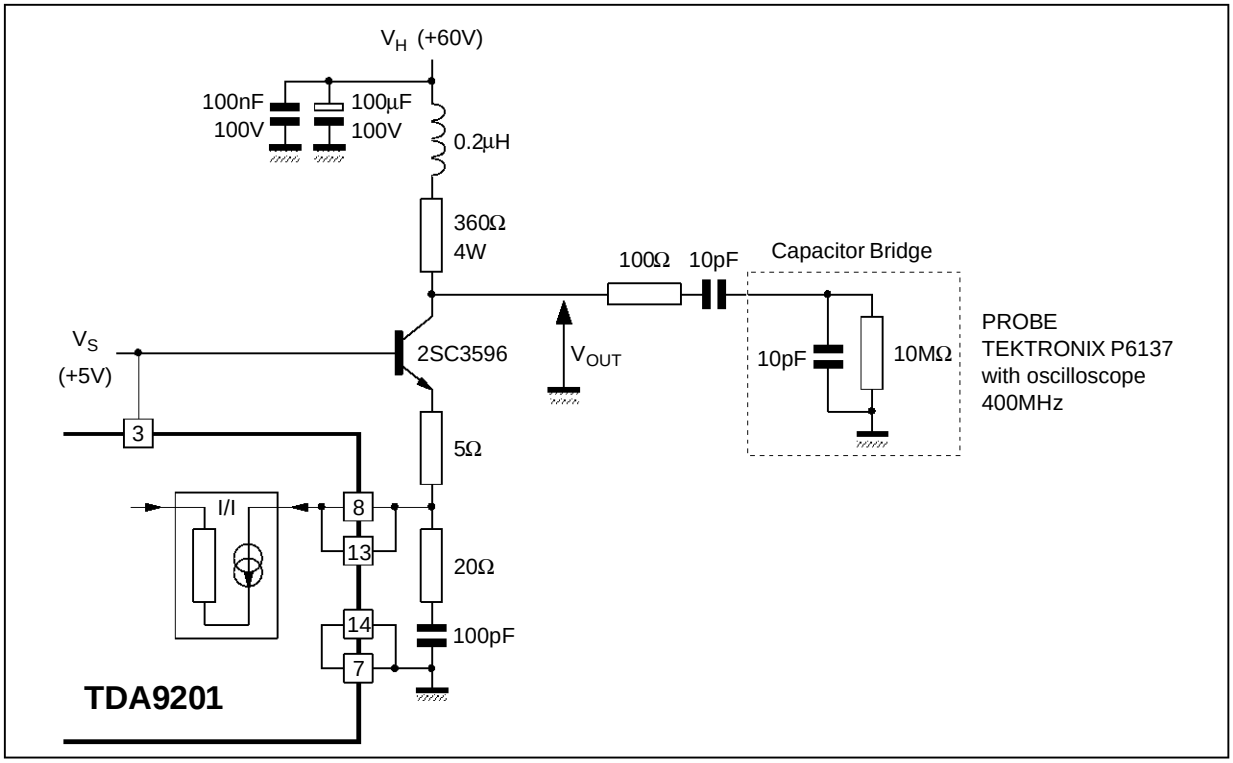
9201-13.EPS

Figure 12 : Rise Time (see test conditions, Figure 13)



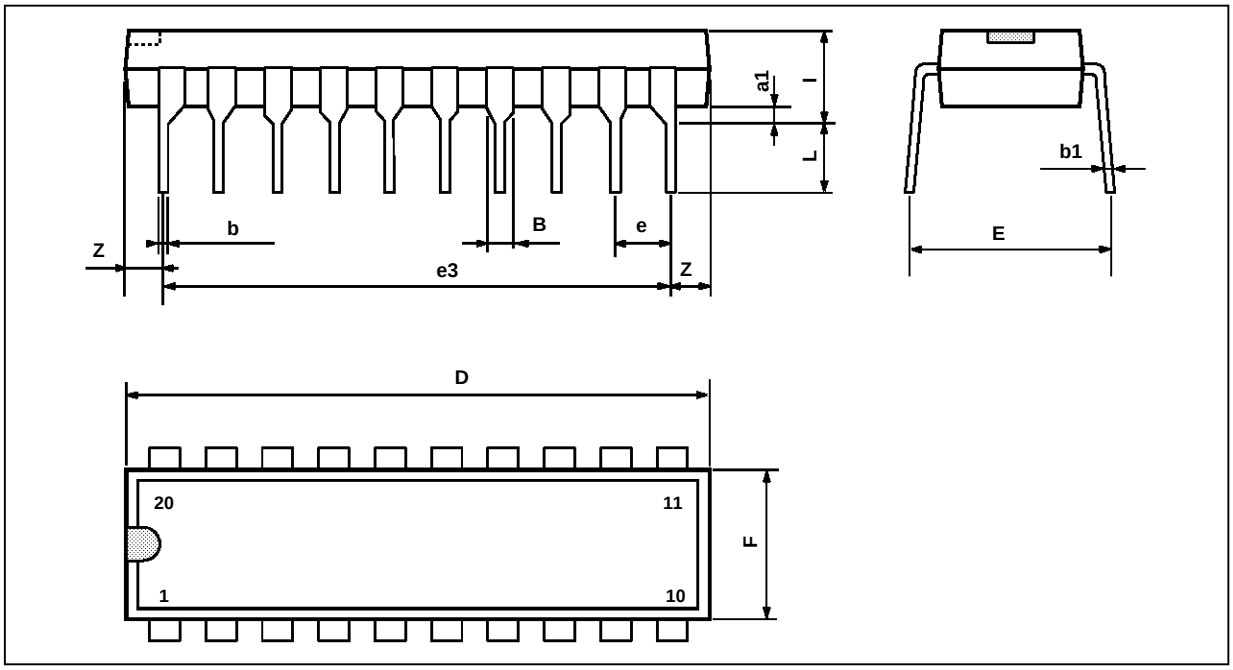
9201-14.EPS

Figure 13 : Measurement Conditions



PACKAGE MECHANICAL DATA

20 PINS - PLASTIC POWERDIP



PMDIP20W.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.85		1.4	0.033		0.055
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			24.8			0.976
E		8.8			0.346	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

DIP20PW.TBL

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No licence is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I^2C Components of SGS-THOMSON Microelectronics, conveys a license under the Philips I^2C Patent. Rights to use these components in a I^2C system, is granted provided that the system conforms to the I^2C Standard Specifications as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.