

# Video output amplifier

# TDA6106Q

### FEATURES

- No external heatsink required
- Black current measurement output for Automatic Black current Stabilization (ABS)
- Internal 2.5 V reference circuit
- Internal protection against positive appearing CRT flashover discharges
- Single supply voltage of 200 V
- Simple application with a variety of colour decoders
- Controlled switch-off behaviour.

### GENERAL DESCRIPTION

The TDA6106Q is a monolithic video output amplifier with a 6 MHz bandwidth and is contained in a 9-lead plastic DIL-bent-SIL medium power package. The device uses high-voltage DMOS technology and is intended to drive the cathode of a CRT. To obtain maximum performance, the amplifier should be used with black current control.

### ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA6106Q	DBS9MPF	plastic DIL-bent-SIL medium power package with fin; 9 leads	SOT111-1

### BLOCK DIAGRAM

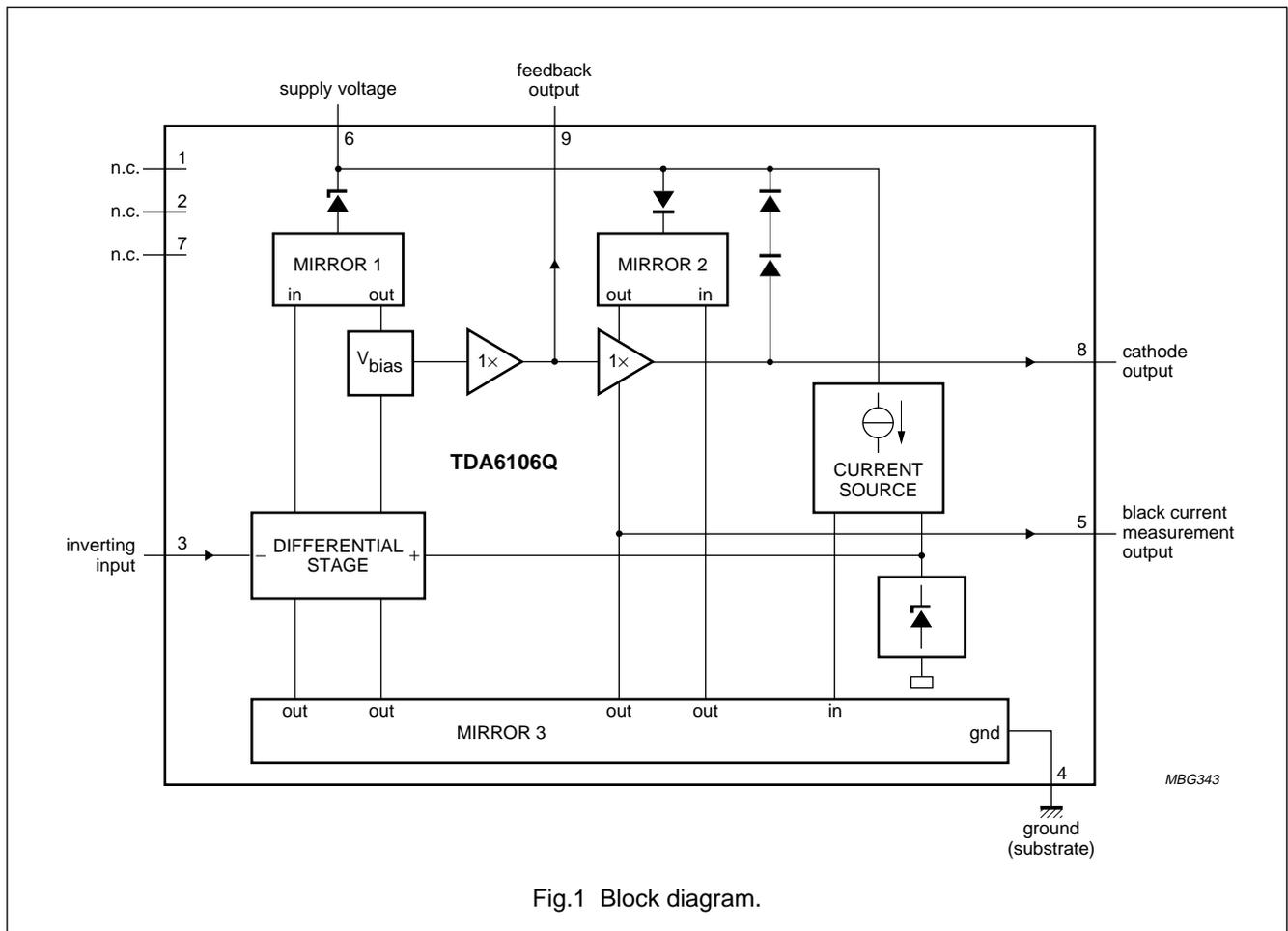


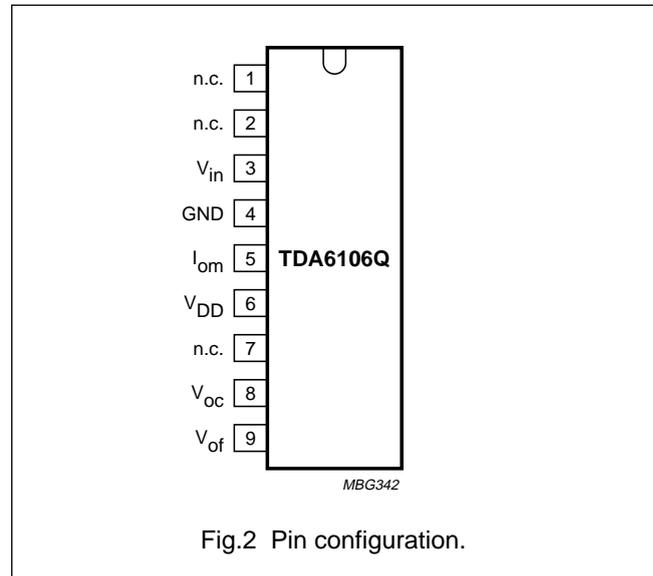
Fig.1 Block diagram.

## Video output amplifier

## TDA6106Q

## PINNING

SYMBOL	PIN	DESCRIPTION
n.c.	1	not connected
n.c.	2	not connected
$V_{in}$	3	inverting input voltage
GND	4	ground, substrate
$I_{om}$	5	black current measurement output
$V_{DD}$	6	supply voltage
n.c.	7	not connected
$V_{oc}$	8	cathode output voltage
$V_{of}$	9	feedback output voltage



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134); voltages with respect to pin 4 (ground) unless otherwise specified; currents specified as in Fig.1.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DD}$	supply voltage		0	250	V
$V_{in}$	inverting input voltage		0	8	V
$V_{om}$	black current measurement output voltage		0	6	V
$V_{oc}$	cathode DC output voltage		0	$V_{DD}$	V
$V_{of}$	feedback output voltage		0	$V_{DD}$	V
$I_{oc(l)}$	low non-repetitive peak cathode output current	flashover discharge = 100 $\mu$ C; note 1	0	5	A
$I_{oc(h)}$	high non-repetitive peak cathode output current	flashover discharge = 100 nC; note 2	0	10	A
$P_{max}$	maximum power dissipation		0	tbf	W
$T_{stg}$	storage temperature		-55	+150	$^{\circ}$ C
$T_j$	junction temperature		-20	+150	$^{\circ}$ C
$V_{esd}$	electrostatic discharge	note 3	-2000	+2000	V
		note 4	-300	+300	V

## Notes

- The cathode output is protected against peak currents (caused by positive voltage peaks during high-resistance flash) of 5 A maximum with a charge content of 100  $\mu$ C.
- The cathode output is also protected against peak currents (caused by positive voltage peaks during low-resistance flash) of 10 A maximum with a charge content of 100 nC.
- Human body model: equivalent to discharging a 100 pF capacitor through a 1.5 k $\Omega$  resistor.
- Machine model: equivalent to discharging a 200 pF capacitor through a 0  $\Omega$  resistor.

## Video output amplifier

## TDA6106Q

**HANDLING**

Inputs and outputs are protected against electrostatic discharge in normal handling. However, to be totally safe, it is desirable to take normal precautions appropriate to handling MOS devices (see "Handling MOS Devices").

**QUALITY SPECIFICATION**

Quality specification "SNW-FQ-611 part E" is applicable, except for ESD Human body model see Chapter "Limiting values", and can be found in the "Quality reference handbook" (ordering number 9397 750 00192).

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER <sup>(1)</sup>	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient in free air	56	K/W
R <sub>th j-c</sub>	thermal resistance from junction to case	12	K/W

**Note**

- External heatsink not required.

**CHARACTERISTICS**

Operating range: T<sub>amb</sub> = -20 to +65 °C; V<sub>DD</sub> = 180 to 210 V (see note 1), V<sub>om</sub> = 1.4 to 6 V.

Test conditions: T<sub>amb</sub> = 25 °C; V<sub>DD</sub> = 200 V; V<sub>om</sub> = 4 V; C<sub>L</sub> = 10 pF (C<sub>L</sub> consists of parasitic and cathode capacitance); measured in test circuit of Fig.5; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>DD</sub>	quiescent voltage supply current	V <sub>ocDC</sub> = 100 V	2.8	3.0	3.3	mA
I <sub>bias</sub>	input bias current (pin 3)	V <sub>ocDC</sub> = 100 V	0	–	20	μA
V <sub>int</sub>	internal reference voltage input stage	V <sub>ocDC</sub> = 100 V	–	2.5	–	V
I <sub>om(os)</sub>	offset current of black current measurement output	I <sub>oc</sub> = 0 μA; V <sub>in</sub> = 1.5 to +3.5 V; V <sub>om</sub> = 1.4 to 6 V	–10	0	+10	μA
ΔV <sub>Tint</sub>	temperature drift of internal reference voltage input stage	V <sub>ocDC</sub> = 100 V	–	0.5	–	mV/K
$\frac{\Delta I_{om}}{\Delta I_{oc}}$	linearity of current transfer	I <sub>oc</sub> = -10 μA to 3 mA; V <sub>in</sub> = 1.5 to +3.5 V; V <sub>om</sub> = 1.4 to 6 V	0.9	1.0	1.1	
I <sub>of(max)</sub>	maximum peak output current (pin 9)	V <sub>oc</sub> = 20 V to V <sub>DD</sub> - 30 V	–	25	–	mA
V <sub>oc(min)</sub>	minimum output voltage (pin 8)	V <sub>in</sub> = 3.5 V	–	7	12	V
V <sub>oc(max)</sub>	maximum output voltage (pin 8)	V <sub>in</sub> = 1.5 V	V <sub>DD</sub> - 14	V <sub>DD</sub> - 10	–	V
GB	gain bandwidth product of open-loop gain V <sub>os</sub> /V <sub>i, dm</sub>	f = 500 kHz; V <sub>ocDC</sub> = 100 V	–	0.52	–	GHz
BW <sub>S</sub>	small signal bandwidth	V <sub>ocAC</sub> = 60 V (p-p); V <sub>ocDC</sub> = 100 V	5	6	–	MHz
BW <sub>L</sub>	large signal bandwidth	V <sub>ocAC</sub> = 100 V (p-p); V <sub>ocDC</sub> = 100 V	4.7	5.7	–	MHz

## Video output amplifier

## TDA6106Q

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$t_{pd}$	cathode output propagation delay time 50% input to 50% output	$V_{oc} = 50$ to 150 V square wave; $f < 1$ MHz; $t_{rin} = t_{fin} = 40$ ns; see Figs 3 and 4	38	49	60	ns
$t_r$	cathode output rise time 10% output to 90% output	$V_{oc} = 50$ to 150 V square wave; $f < 1$ MHz; $t_{fin} = 40$ ns; see Fig.4	62	74	87	ns
$t_f$	cathode output fall time 90% output to 10% output	$V_{oc} = 150$ to 50 V square wave; $f < 1$ MHz; $t_{rin} = 40$ ns; see Fig.4	62	74	87	ns
$t_s$	settling time 50% input to (99% < output < 101%)	$V_{oc} = 50$ to 150 V square wave; $f < 1$ MHz; $t_{rin} = t_{fin} = 40$ ns; see Figs 3 and 4	–	–	350	ns
SR	slew rate between 50 and 150 V	$V_{in} = 2$ V (p-p) square wave; $f < 1$ MHz; $t_{rin} = t_{fin} = 40$ ns	–	1200	–	V/ $\mu$ s
$O_v$	cathode output voltage overshoot	$V_{oc} = 50$ to 150 V square wave; $f < 1$ MHz; $t_{rin} = t_{fin} = 40$ ns; see Figs 3 and 4	–	1	–	%
PSRR	power supply rejection ratio	$f < 50$ kHz; note 2	–	60	–	dB

**Notes**

1. The rating of supply voltage is 250 V, but because of flash the maximum operating range for supply voltage is 210 V.
2. PSSR: The ratio of the change in supply voltage to the change in input voltage when there is no change in output voltage.