

DEVELOPMENT DATA

This data sheet contains advance information and specifications are subject to change without notice.

SAB8726

ELECTROSTATIC DISCHARGE PROTECTION

Inputs and outputs use electrostatic discharge protection in accordance with MIL-STD-883C, class A.

SENSITIVE 2.6 GHz DIVIDE-BY-2 PRESCALER

RATINGS

GENERAL DESCRIPTION

The SAB8726 is a prescaler for satellite television applications. It has an input frequency range of 1 GHz to 2.6 GHz with high input sensitivity.

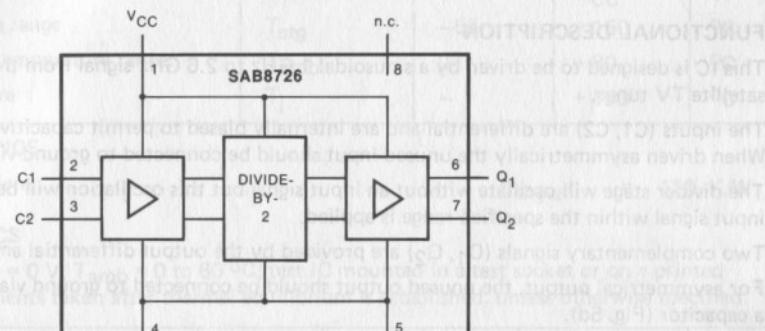


Fig. 1 Block diagram.

QUICK REFERENCE DATA

parameter	conditions	symbol	min.	typ.	max.	unit
Supply voltage	pin 1 to pins 4, 5	V _{CC}	4.5	5.0	5.5	V
Supply current	pin 1	I _{CC}	—	35	—	mA
Input frequency range	pins 2 and 3	f _i	1	—	2.6	GHz
Input sensitivity						
Input voltage (RMS value)		V _{i(rms)}	—	—	70	dBm/mV
Output voltage (RMS value)	pins 6 and 7	V _{o(rms)}	—	90	—	dBm/mV
Operating ambient temperature range		T _{amb}	0	—	80	°C

PACKAGE OUTLINE

8-lead DIL; plastic (SOT97).

PINNING

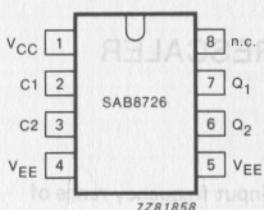


Fig. 2 Pinning diagram.

1	V _{CC}	positive supply voltage
2	C1	differential inputs
3	C2	
4	V _{EE}	ground (0 V)
5	V _{EE}	ground (0 V)
6	Q ₁	complementary outputs
7	Q ₂	
8	n.c.	not connected

FUNCTIONAL DESCRIPTION

This IC is designed to be driven by a sinusoidal 1 GHz to 2.6 GHz signal from the local-oscillator of a satellite TV tuner.

The inputs (C1, C2) are differential and are internally biased to permit capacitive coupling (Fig. 5a). When driven asymmetrically the unused input should be connected to ground via a capacitor (Fig. 5b).

The divider stage will oscillate without an input signal but this oscillation will be suppressed when an input signal within the specified range is applied.

Two complementary signals (Q₁, Q₂) are provided by the output differential amplifier stage (Fig. 5c).

For asymmetrical output, the unused output should be connected to ground via a 50 Ω resistor and a capacitor (Fig. 5d).

Fig. 1 Block diagram

Fig. 1 Block diagram

QUICK REFERENCE DATA

Pin	Unit	Max	Min	Typ	Symbol	Condition	Notes
1	V	8.0	0.0	4.0	V _{CC}	pin 1 or pin 8	Supply Voltage
2	Ain	—	—	—	—	—	Supply current
3	GHz	0.2	—	—	—	—	Input frequency range
4	V _{div}	20	—	—	(min) V _{div}	—	Input divider ratio
5	V _{div}	—	0.0	—	(min) V _{div}	—	Output divider ratio (RMS value)
6	DC	0.0	—	0	dm _T	—	Output voltage swing

ELECTROSTATIC DISCHARGE PROTECTION

Inputs and outputs have electrostatic discharge protection in accordance with specification MIL-STD-883C, class A.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

parameter	symbol	min.	max.	unit
Supply voltage (DC)	V _{CC}	—	7.0	V
Input voltage	V _i	0	V _{CC}	V
Storage temperature range	T _{stg}	-55	+ 150	°C
Operating ambient temperature range	T _{amb}	0	+ 80	°C
Junction temperature	T _j	—	+ 150	°C

THERMAL RESISTANCE

From junction to ambient

$$R_{th\ j-a} = 120 \text{ K/W}$$

DC CHARACTERISTICS

V_{CC} = 5 V ± 10%; V_{EE} = 0 V; T_{amb} = 0 to 80 °C; test IC mounted in a test socket or on a printed circuit board; measurements taken after thermal equilibrium is established; unless otherwise specified.

parameter	conditions	symbol	min.	typ.	max.	unit
Supply current		I _{CC}	—	35	45	mA
Output voltage HIGH		V _{OH}	—	—	V _{CC}	V
Output voltage LOW		V _{OL}	—	—	V _{CC} -0.4	V

AC CHARACTERISTICS

$V_{CC} = 5 \text{ V} \pm 10\%$; $T_{amb} = 0 \text{ to } +80^\circ\text{C}$; $f_{in} = 1 \text{ to } 2.6 \text{ GHz}$; unless otherwise specified

parameter	conditions	symbol	min.	typ.	max.	unit
Input						
Input frequency range		f_i	1	—	2.6	GHz
Input sensitivity						
Input voltage (RMS value)	50 Ω system					
	$f_i = 1 \text{ GHz}$	$V_i(\text{rms})$	—	—	-10/70	dBm/mV
	$f_i = 2.6 \text{ GHz}$	$V_i(\text{rms})$	—	—	-10/70	dBm/mV
Input overload voltage (RMS value)	50 Ω system					
	$f_i = 1 \text{ GHz}$	$V_i(\text{rms})$	7/500	—	—	dBm/mV
	$f_i = 2.6 \text{ GHz}$	$V_i(\text{rms})$	7/500	—	—	dBm/mV
Output						
Output voltage HIGH		V_{OH}	—	—	V_{CC}	V
Output voltage LOW		V_{OL}	—	—	$V_{CC}-0.4$	V
Output voltage level	$V_i = 0 \text{ dBm}$; $f_i = 2 \text{ GHz}$; $R_L = 50 \Omega$	V_o	—	-8/90	—	dBm/mV
Output resistance		R_o	—	50	—	Subp Ω

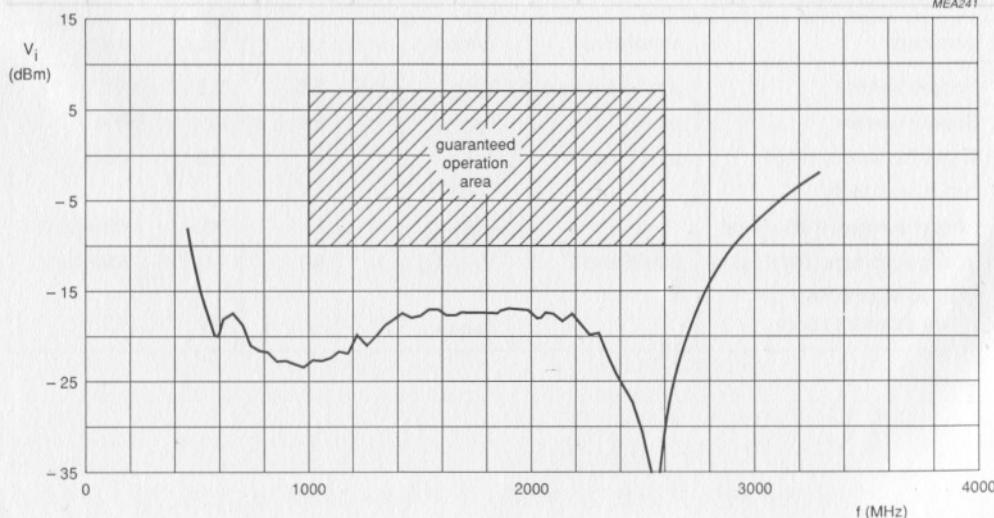


Fig.3 Typical input sensitivity curve: $V_{CC} = 5 \text{ V}$; $T_{amb} = 25^\circ\text{C}$.

FEATURES

Display

- One or two live pictures can be displayed simultaneously
- Wide range of multi-Picture-in-Picture modes available
- Six 8-bit Analog-to-Digital Converters (ADC) with clamping circuit
- Enhanced vertical resolution modes for the pictures
- Two Phase-Locked-Loop (PLL) with voltage Controlled Oscillator (VCO) and local oscillator clocks
- Three 7-bit Digital-to-Analog Converters
- 4 : 1 I : Q data format
- Data reduction factors 1 to 16, 2 and 1/2

DEVELOPMENT DATA

Different single, double and multi-PIP modes can be set manually. Several aspect ratios can be chosen. Reduction factors can be set automatically or manually.

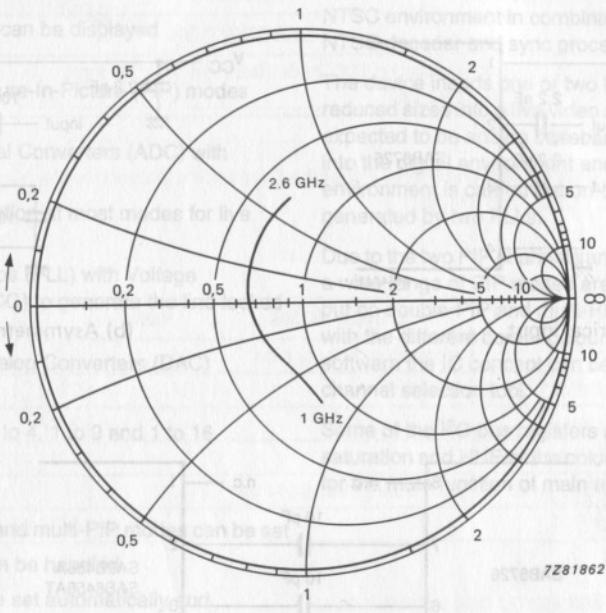
Fig. 4 Smith chart of typical input impedance: input level = -10 dBm; $V_{CC} = 5$ V; reference value = 50Ω .

- Single-PIP display position, four corners on-screen
- Multi-PIP display position, left or right on-screen
- Fine tuned display position, H (8-bit), V (6-bit)
- Fine tuned acquisition area, H (4-bit), V (4-bit)
- Channel-border and live 2IP selectable
- Eight main-border, sub-border, channel-border and background colours selectable
- Border and background brightness adjustable, 30%, 50%, 70% and 100% IR
- Several types of decoder input signals can be set
- 8-bit HUE and SAT signals (0 to 5 V) controllable by I^C-bus
- Main and sub-audio mute controllable by I^C-bus

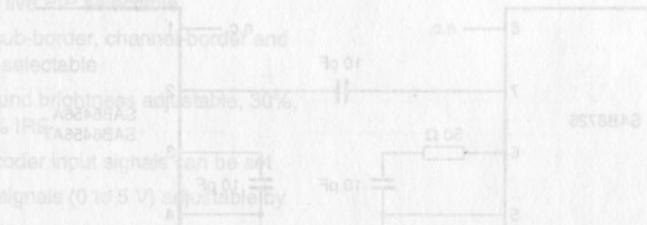
APPLICATION INFORMATION

The SAB8726 is a picture-in-picture controller for the NTSC environment in combination with the integrated video processor TCA8315.

Two live-video-channels with reduced synchronization signal. All video signals are converted to digital baseband signals. The converters are bidirectional and can go back to the analog domain. Two internal rotational clocks are used to control the large external memory offered. The emphasis is on 16-bit modes. In combination with the TCA8315, the SAB8726 is used as an excellent solution for the acquisition of video signals. There are also outputs for the main and sub-channel.



SAB8726



(b) Asymmetrical outputs

Fig. 5 Pin connection for symmetrical/asymmetrical input and output

Notes to Fig. 5

To minimize possible feedback into asymmetrical outputs it is better

APPLICATION INFORMATION

$V_{CC} = 10.0 \text{ V}$; $T_{amb} = 0 \text{ to } +80^\circ\text{C}$; $f_{in} = 1 \text{ to } 2.6 \text{ GHz}$; unless otherwise specified.

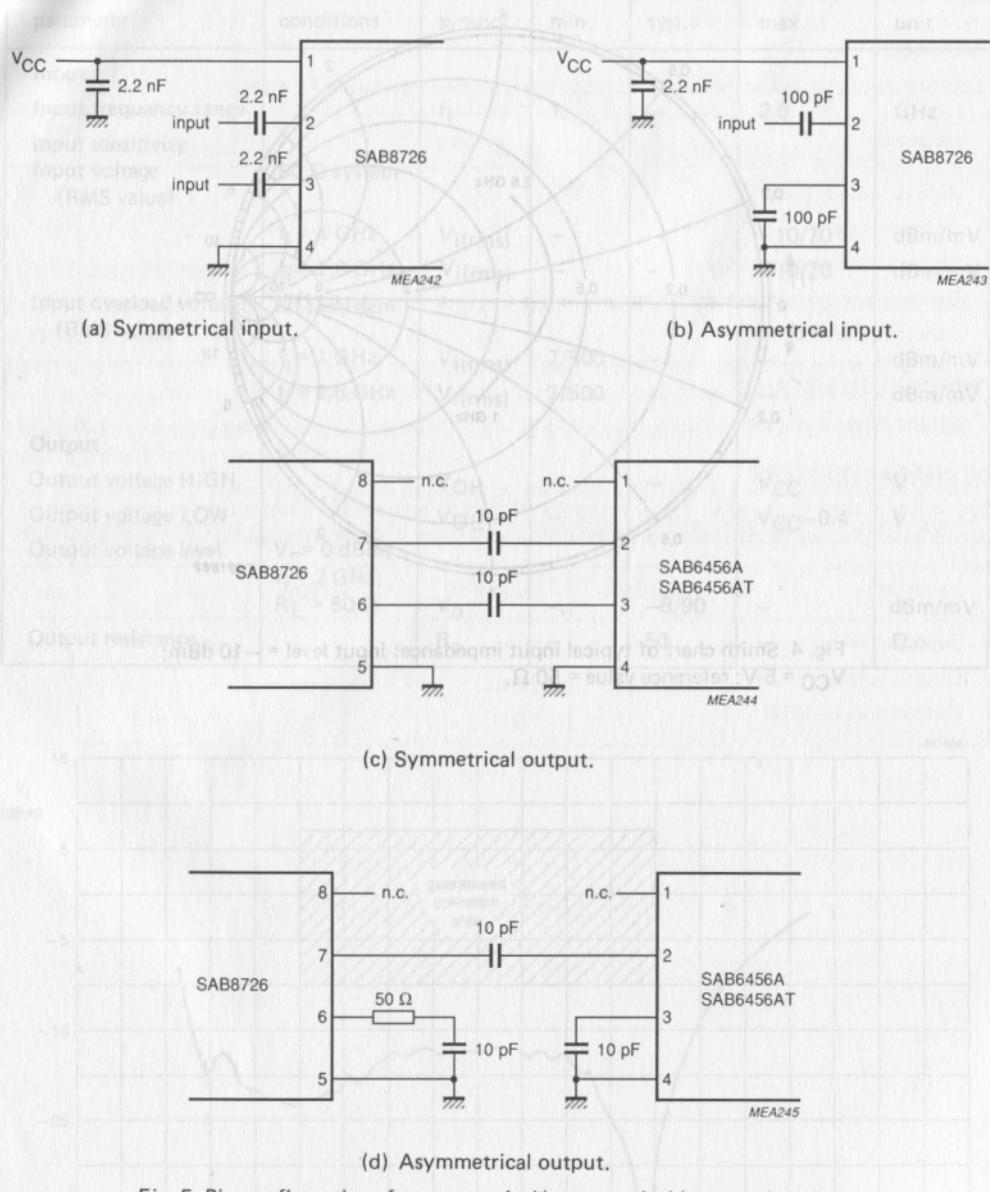


Fig. 5 Pin configurations for symmetrical/asymmetrical input and output.

Note to Fig. 5

To minimize possible harmonics the symmetrical output is preferred.