

Baseband Delay Line (64 μ s)

Description

The U3660M is an integrated baseband delay line circuit. It provides a delay of 64 μ s for the color difference signals, $\pm(R-Y)$ and $\pm(B-Y)$, in multi-standard TVs.

Features

- One line delay time, addition of delayed and non-delayed output signals
- Adjustment-free application, VCO without external components
- Handles negative or positive colour-difference input signals
- Clamping of ac-coupled input signals [$\pm(R-Y)$ and $\pm(B-Y)$]
- Line-locked by the sandcastle pulse
- No crosstalk between SECAM colour carriers (diaphoty)
- Comb filtering functions for NTSC colour-difference signals
- Correction of phase errors in the PAL system

Block Diagram

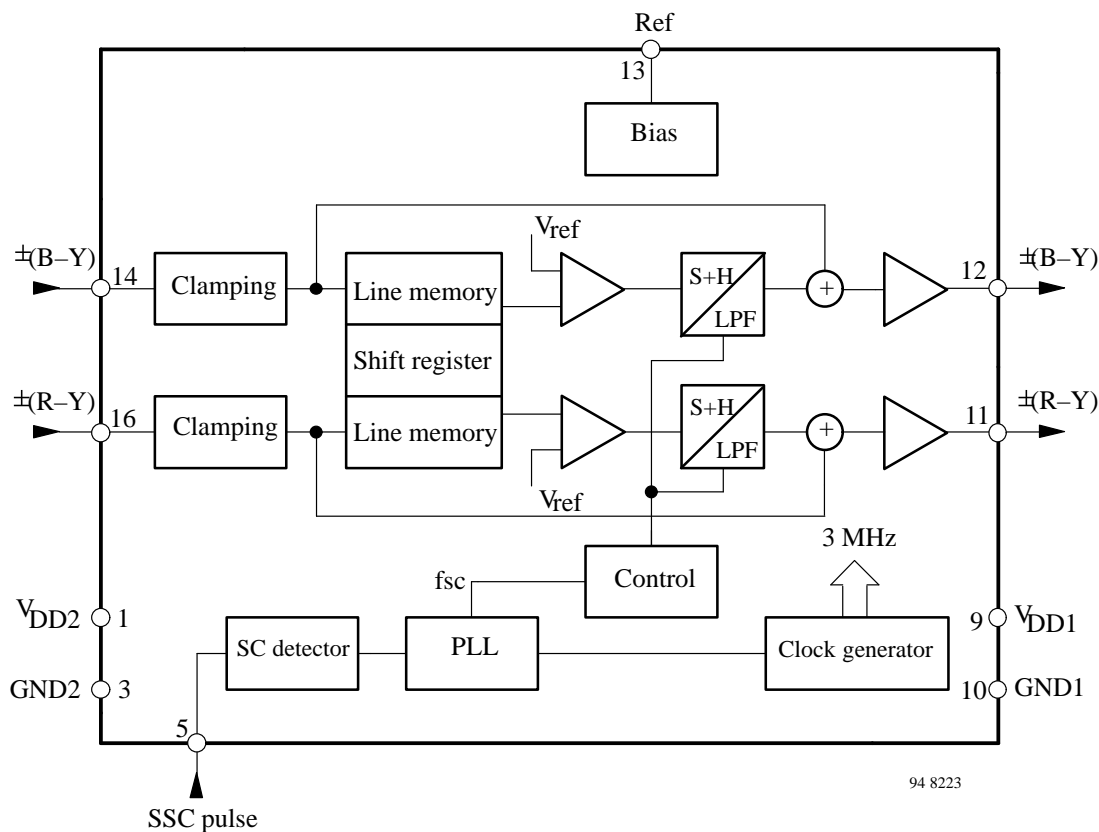
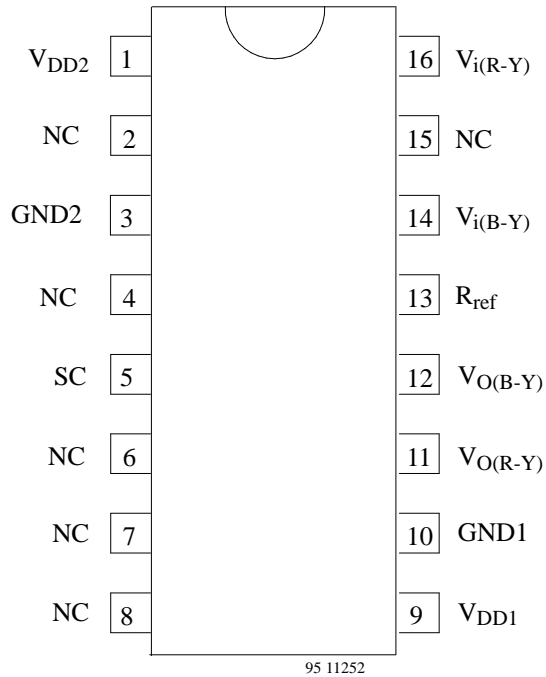


Figure 1. Block diagram

Pin Description



Pin	Symbol	Function
1	V _{DD2}	Supply voltage for digital part
2	NC	Not connected
3	GND2	Ground for digital part
4	NC	Not connected
5	SC	Sandcastle pulse input
6	NC	Not connected
7	NC	Not connected
8	NC	Not connected
9	V _{DD1}	Supply voltage for analog part
10	GND1	Ground for analog part
11	V _{O(R-Y)}	±(R-Y) output signal
12	V _{O(B-Y)}	±(B-Y) output signal
13	R _{ref}	Resistor for internal reference
14	V _{i(B-Y)}	±(B-Y) input signal
15	NC	Not connected
16	V _{i(R-Y)}	±(R-B) input signal

Figure 2. Connection diagram

Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Supply voltage (Pin 9)	V _{DD1}	-0.5 to +7	V
Supply voltage (Pin 1)	V _{DD2}	-0.5 to +7	V
Voltage at Pins 5, 11, 12, 14 and 16	V _n	-0.5 to V _S	V
Output current, Pins 11 and 12	I _{out}	20	mA
Max. power dissipation	P	1.1	W
Storage temperature range	T _{stg}	-25 to +150	°C
Electrostatic protection* for input/output pins		±200	V

* MIL standard 883D, method 3015.7 machine model (all power pins connected together).

Operating Range

Parameters	Symbol	Value	Unit
Supply voltage range (Pins 1 and 9)	V _S	4.5 to 6.0	V
Ambient temperature range	T _{amb}	0 to +70	°C

Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient	R _{thJA}	80	K/W

Electrical Characteristics

$V_{DD} = 5.0\text{ V}$, $T_{amb} = +25^{\circ}\text{C}$, reference point Pin 3 and Pin 10 connected together, super-sandcastle frequency of 15.625 kHz; unless otherwise specified.

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
DC-supply Pins 1 and 9						
Supply voltage (analog part)	Pin 9	V_{DD1}	4.5	5.0	6.0	V
Supply voltage (digital part)	Pin 1	V_{DD2}	4.5	5.0	6.0	V
Supply current (analog part)	Pin 9	I_{S1}		3.5	8.0	mA
Supply current (digital part)	Pin 1	I_{S2}		1	2	mA
Power dissipation		P		30	60	mW
Colour-difference input signals Pins 14 and 16						
Input signal $\pm(\text{R-Y})$ PAL and NTSC $\pm(\text{B-Y})$ PAL and NTSC $\pm(\text{R-Y})$ SECAM $\pm(\text{B-Y})$ SECAM	(peak-to-peak value) Pin 16 Pin 14 Pin 16 Pin 14	V_i V_i V_i V_i		0.525 0.665 1.05 1.33	1.0 1.0 2.0 2.0	V V V V
Input resistance	Pins 14 and 16	$R_{14, 16}$			40	k Ω
Input capacitance	Pins 14 and 16	$C_{14, 16}$			10	pF
Input clamping voltage	non color input level during clamping, Pins 14 and 16	$V_{14, 16}$		1.45		V
Colour-difference output signals Pins 11 and 12						
Output signal $\pm(\text{R-Y})$ at Pin 11 $\pm(\text{B-Y})$ at Pin 12	(peak-to-peak value) all standards all standards	V_O V_O		1.05 1.33		V V
Ratio of output amplitudes at equal input signals		$\frac{V_{11}}{V_{12}}$	-0.4	0	+0.4	dB
DC output voltage	Pins 11 and 12	$V_{11, 12}$		3.0		V
Output resistance	Pins 11 and 12	$R_{11, 12}$			400	Ω
Gain for PAL and NTSC	ratio V_O/V_i	G_v	5.5	6.0	6.5	dB
Gain for SECAM	ratio V_O/V_i	G_v	-1.0	0	+1.0	dB
Ratio of output signals on Pins 11 and 12 for adjacent time samples at constant input signals	$V_i 14,16 = 1.33\text{ V}$ (peak-to-peak value) SECAM signals	$\frac{V_{(n)}}{V_{(n+1)}}$	-0.1		+0.1	dB
Noise voltage (RMS value, Pins 11 and 12)	$V_i 14,16 = 0$ $R_{Gen} < 300\ \Omega$ $f = 10\text{ kHz to }1\text{ MHz}$	V_{noise}			1.2	mV
Delay of delayed signals		t_d	63.94	64.0	64.06	μs
Delay of non-delayed signals		t_d		85		ns

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Transient time of delayed signal at Pin 11 respectively Pin 12	300 ns transient of SECAM input signal, $C_{load} = 22 \text{ pF}$	t_{tr}		550		ns
Transient time of non-delayed signal at Pin 11 respectively Pin 12	300 ns transient of SECAM input signal, $C_{load} = 22 \text{ pF}$	t_{tr}		350		ns
Sandcastle pulse input Pin 5						
Sandcastle frequency		f_{SC}	14.0	15.625	17.0	kHz
Top pulse voltage	the leading edge of the burst-key pulse is used for timing	V_5	3		7	V
Internal slicing level		V_{slice}	$V_5 - 2.0$	$V_5 - 1.5$	$V_5 - 1.0$	V
Input current		I_5			10	μA
Input capacitance		C_5			10	pF

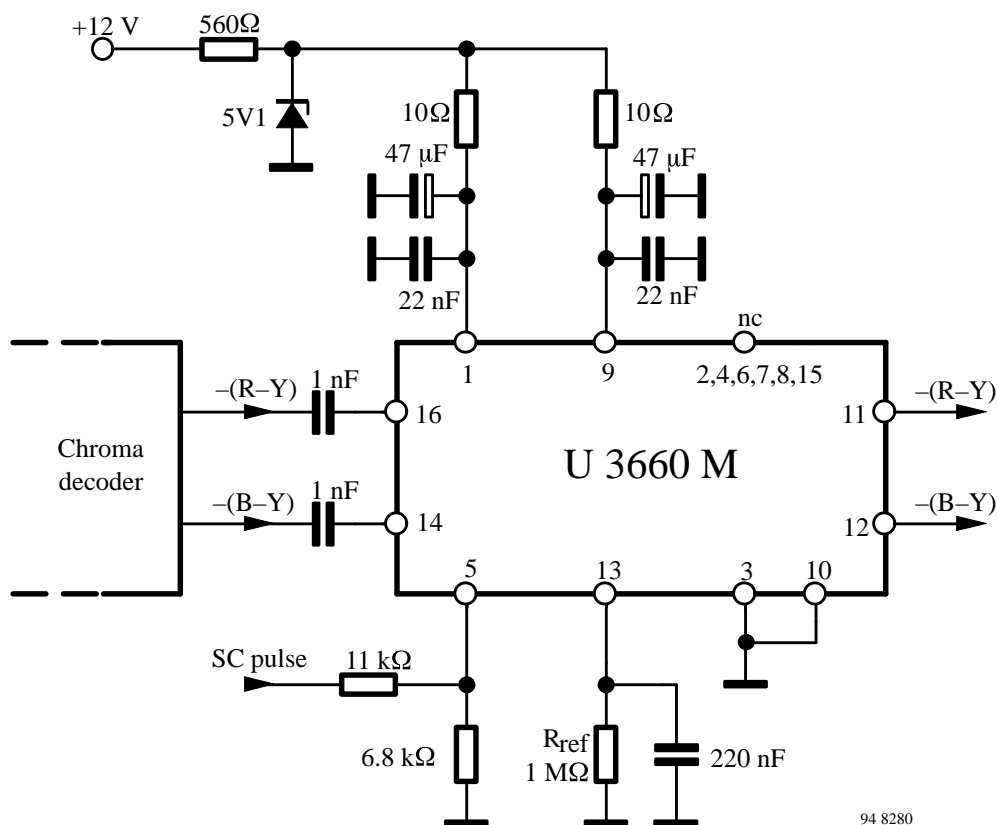


Figure 3. Typical application circuit

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Internal Pin Circuits

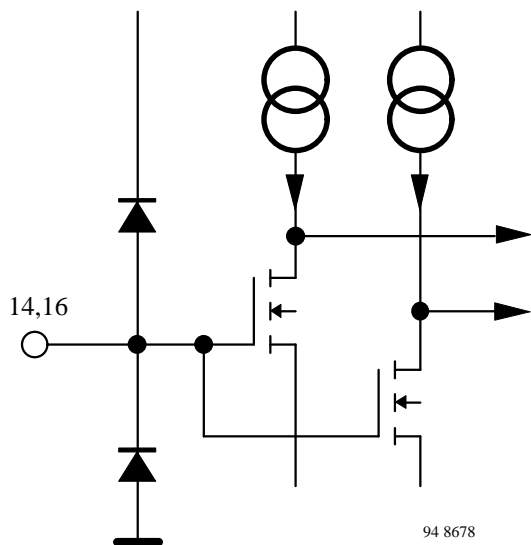


Figure 4. Colour difference signal inputs

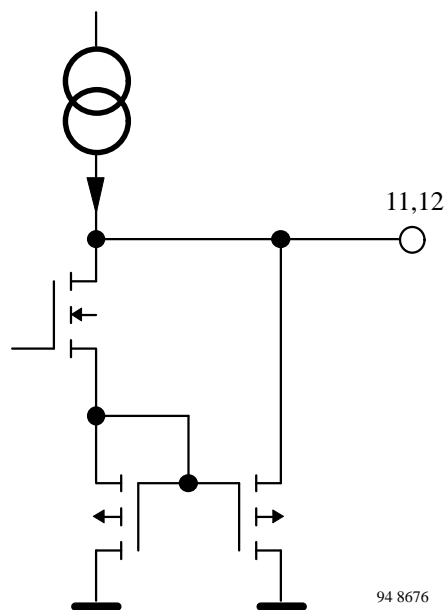


Figure 5. Colour difference signal outputs

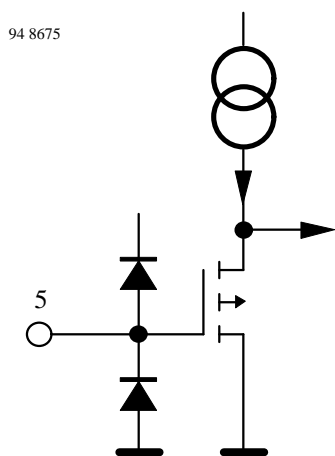


Figure 6. Sandcastle pulse input

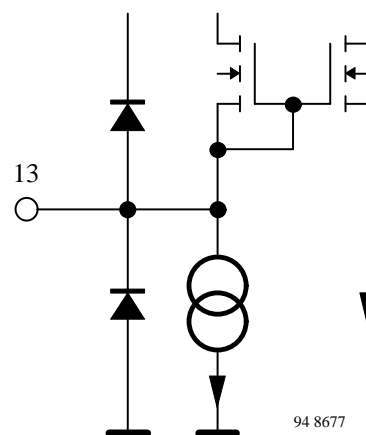
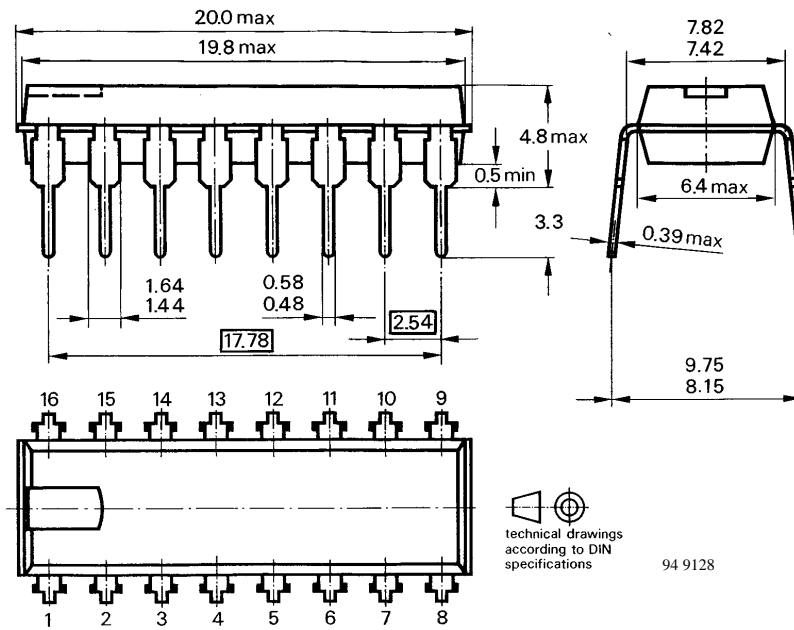


Figure 7. Internal reference voltage

Dimensions in mm

Package: DIP16



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2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

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3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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