



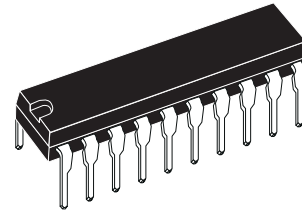
# TEA6425

## VIDEO CELLULAR MATRIX

- 6 Video Inputs - 8 Video Outputs
- 2 Internal Selectable YC Adders
- 15MHz Bandwidth @ -3dB
- Selectable 0.5/6.5dB Gain FOR EACH Output
- High Impedance Switch for each Output (3-state operation)
- Programmable Clamp Mode on each Input (sync bottom or average value)
- -60dB Crosstalk @ 5MHz
- 4 Sub-address Capability
- I<sup>2</sup>C Bus Control

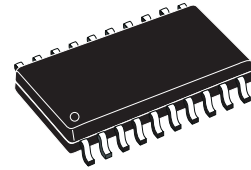
### DESCRIPTION

This device is intended for switching between video and chroma signals such as CVBS, SVHS, baseband CVBS, MAC. Each input clamp mode, each output gain, all switching are controlled through the I<sup>2</sup>C bus. The 8 outputs can be set separately in high impedance state, to enable parallel DC connection of several devices (up to 4).



**DIP20**  
**(Plastic Package)**

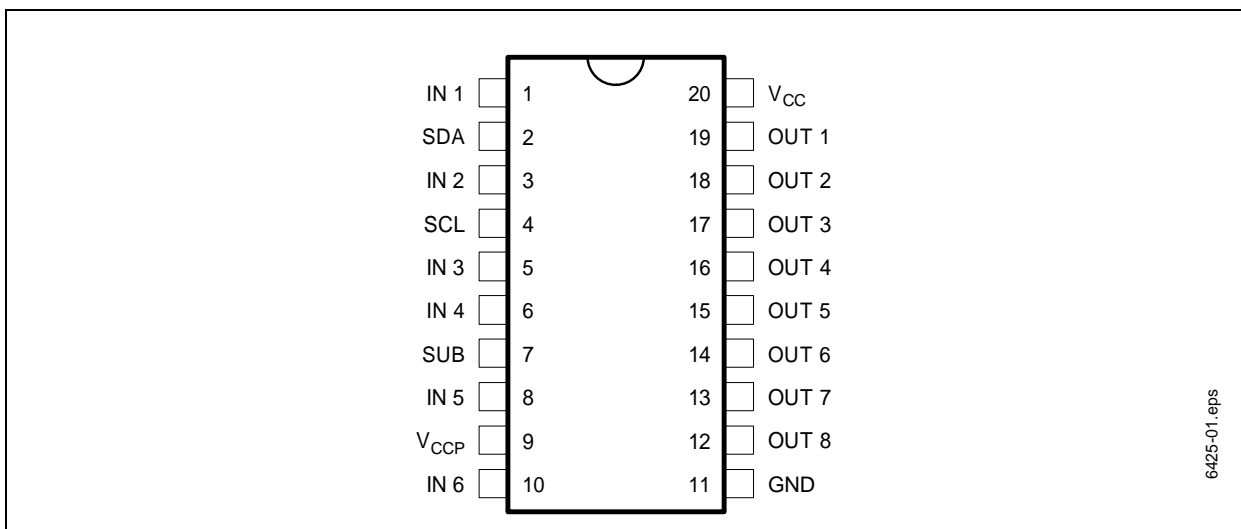
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**(Plastic Micropackage)**

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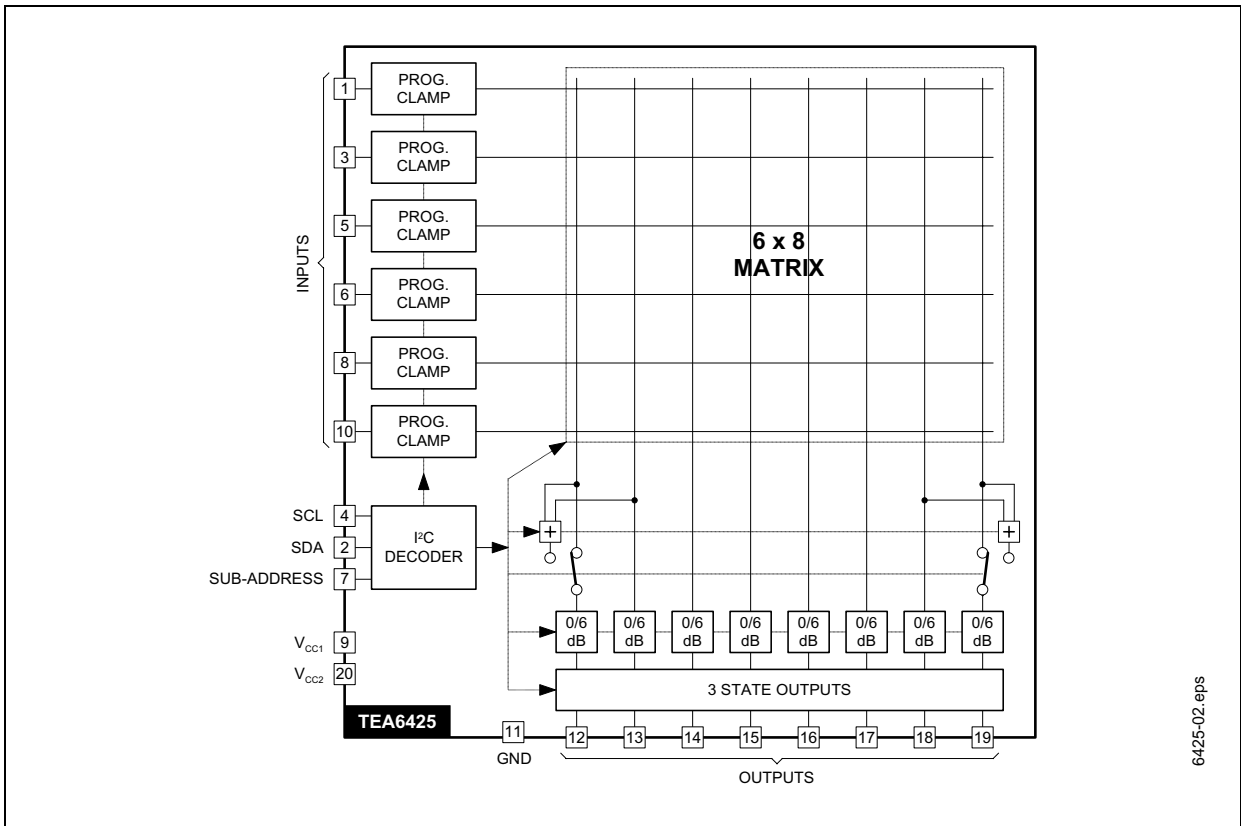
**Figure 1. Pin Connections**



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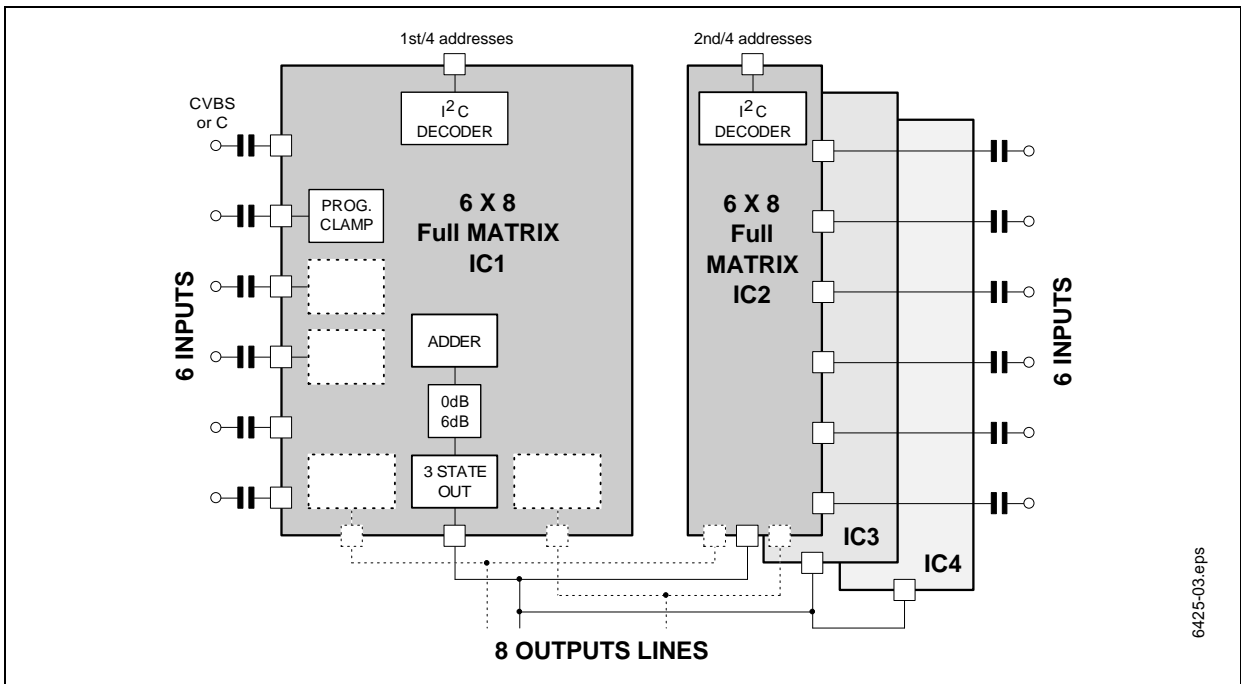
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Figure 2. Block Diagram



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Figure 3. Cellular Matrix Connections



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**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	12	V
$V_I$	Voltage at Pin i to GND	0, $V_{CC}$	V
$T_{oper}$	Operating Ambient Temperature	0, + 70	°C
$T_{stg}$	Storage Temperature	-20, + 150	°C

**THERMAL DATA**

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction-ambient Thermal Resistance	Min. 80	°C/W

**ELECTRICAL CHARACTERISTICS** ( $V_{CC} = 8V$ ,  $T_{amb} = 25^{\circ}C$ ,  $V_{IN} = 1V$ , Gain = 6.5dB,  $C_{load} = 20pF$ ,  $R_{load} = 4.7k\Omega$ ; Gain condition, clamp and 3-state are controlled by I<sup>2</sup>C bus, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>SUPPLY</b>						
$V_{CC}$	Supply Voltage		7.2	8	8.8	V
$I_{CC}$	Supply Current			45	60	mA
RR	Supply Voltage Rejection	f = 1kHz	40	46		dB
<b>VIDEO INPUTS (clamping at bottom sync level)</b>						
$V_{IN}$	Max. Signal Amplitude	Clamp Active	2			$V_{PP}$
$V_{clamp}$	Clamp Level	Clamp Active	1.7	2	2.3	V
$V_{DC}$	Input DC Level	Clamp Inactive	2.7	3	3.3	V
$I_{IN}$	Leakage Current	1 input connected to 1 output		2	5	μA
$I_{clamp}$	Clamp Current	$V_{clamp} - 200mV$		0.9	3	mA
<b>VIDEO OUTPUTS</b>						
$R_{OUT}$	Output Resistance			15	50	W
$Z_{HI}$	Output "off" Impedance	no load	50			kΩ
$C_{HI}$	$C_{OUT}$ in 3-state	no load		3		pF
G1	Voltage Gain	f = 100kHz	0	0.5	1	dB
G2	Voltage Gain	f = 100kHz	6	6.5	7	dB
$V_{sync}$	Top Level Sync (Y or CVBS)	G = 6.5dB, Clamp Active	1	1.25	2	V
$V_{bias}$	Output Mean Level (chroma)	G = 0.5dB, Clamp Inactive	2	2.4	3	V
		G = 6.5dB, Clamp Inactive	3	3.4	4	V
	Isolation "off" State	f = 5MHz	60			dB
	Crosstalk Attenuation between Channels	f = 5MHz	50	60		dB
B	Bandwidth	$C_{load} = 20pF$ , G = 6.5dB at ± 0.5dB at ± 1dB at - 3dB		5 10 21		MHz

**FUNCTIONAL DESCRIPTION**

This device is controlled via the I<sup>2</sup>C bus. 4 addresses can be selected by a 4-level detector on Pin 7, thus enabling parallel connection of 4 devices.

Via the I<sup>2</sup>C bus :

- The input signals can be clamped at their negative peak (top sync).
- The gain factor of the outputs can be selected between 0.5 and 6.5dB.

– Each of the 6 inputs can be connected to the 8 outputs.

– Each output can individually be set in a high impedance state.

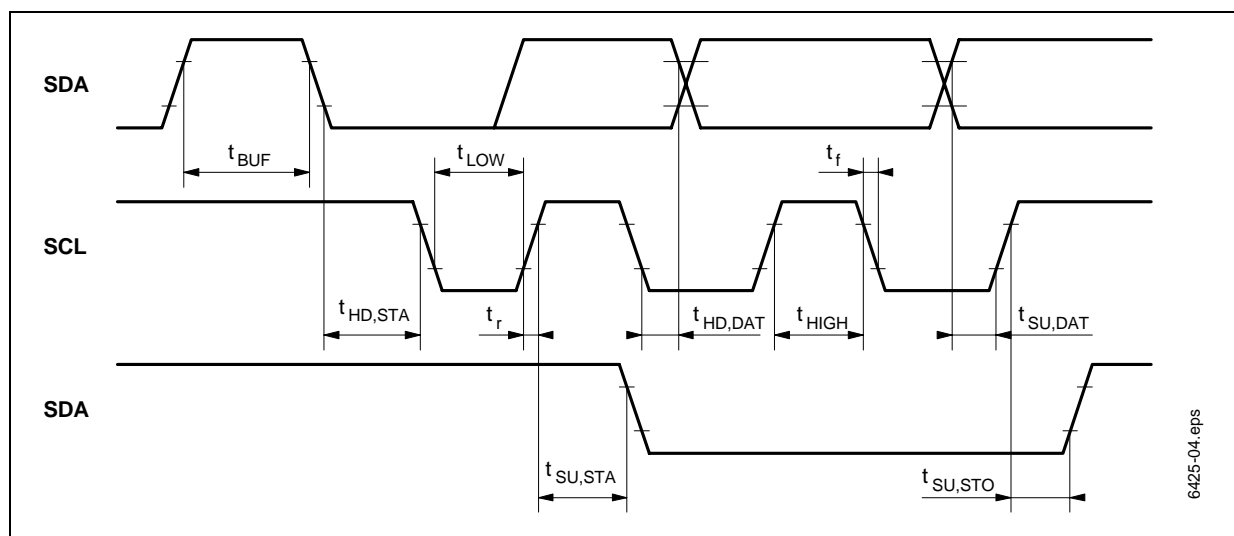
Two internal SVHS mixers will add the selected Y and C inputs. Two dedicated outputs will have the option to select this added signal also.

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**I<sup>2</sup>C BUS CHARACTERISTICS**

Symbol	Parameter	Test Conditions	Standard Mode		Fast Mode		Unit
			Min.	Max.	Min.	Max.	
<b>SCL</b>							
V <sub>IL</sub>	Low Level Input Voltage		- 0.3	+ 1.5	- 0.3	+ 1.5	V
V <sub>IH</sub>	High Level Input Voltage		3.0	V <sub>CC</sub> + 0.5	3.0	V <sub>CC</sub> + 0.5	V
I <sub>LI</sub>	Input Leakage Current	V <sub>I</sub> = 0 to V <sub>DD</sub>	- 10	+ 10	- 10	+ 10	μA
f <sub>SCL</sub>	Clock Frequency		0	100	0	400	kHz
t <sub>R</sub>	Input Rise Time	1.5V to 3V		1000		300	ns
t <sub>F</sub>	Input Fall Time	1.5V to 3V		300		300	ns
C <sub>I</sub>	Input Capacitance			10		10	pF
<b>SDA</b>							
V <sub>IL</sub>	Low Level Input Voltage		- 0.3	+ 1.5	- 0.3	+ 1.5	V
V <sub>IH</sub>	High Level Input Voltage		3.0	V <sub>CC</sub> + 0.5	3.0	V <sub>CC</sub> + 0.5	V
I <sub>LI</sub>	Input Leakage Current	V <sub>I</sub> = 0 to V <sub>DD</sub>	- 10	+ 10	- 10	+ 10	μA
C <sub>I</sub>	Input Capacitance			10		10	pF
t <sub>R</sub>	Input Rise Time	1.5V to 3V		1000		300	ns
t <sub>F</sub>	Input Fall Time	1.5V to 3V		300		300	ns
V <sub>OL</sub>	Low Level Output Voltage	I <sub>OL</sub> = 3mA		0.4		0.4	V
t <sub>F</sub>	Output Fall Time	3V to 1.5V		250		250	ns
C <sub>L</sub>	Load Capacitance			400		400	pF
<b>TIMING</b>							
t <sub>LOW</sub>	Clock Low Period		4.7		1.3		μs
t <sub>HIGH</sub>	Clock High Period		4.0		0.6		μs
t <sub>SU, DAT</sub>	Data Set-up Time		250		100		ns
t <sub>HD, DAT</sub>	Data Hold Time		0	340	0	340	ns
t <sub>SU, STO</sub>	Set-up Time from Clock High to Stop		4.0		0.6		μs
t <sub>BUF</sub>	Start Set-up Time following a Stop		4.7		1.3		μs
t <sub>HD, STA</sub>	Start Hold Time		4.0		0.6		μs
t <sub>SU, STA</sub>	Start Set-up Time following Clock Low-to High Transition		4.7		0.6		μs

**Figure 4. I<sup>2</sup>C Bus Timing**



**I<sup>2</sup>C BUS SELECTION****I<sup>2</sup>C Bus Slave Address**

Address	A6	A5	A4	A3	A2	A1	A0	R/W
Value	1	0	0	1	0	A 1	A0	0

**I<sup>2</sup>C Sub-Address**

Symbol	Parameter	Conditions	Pin 7 Voltage (Typ)	Unit
Vsub	Slave address HEXA	Sub-address (see note)		
		A1      A0		
1	90	0      0	GND	V
2	96	1      1	V <sub>CC</sub>	V
3	94	1      0	1/3	V <sub>CC</sub>
4	92	0      1	2/3	V <sub>CC</sub>

**Note:** The first 3 levels are defined by connecting the sub-address pin to the appropriate level. Sub-address 4 will be selected when this pin is left open.

**1st Data Byte**

	b7	b6	b5	b4	b3	b2	b1	b0	Selected Output
	a2	a1	a0	*	*	*	*	I	
Output Select	0	0	0	*	*	*	*	0	OUT1
	0	0	1	*	*	*	*	0	OUT2
	0	1	0	*	*	*	*	0	OUT3
	0	1	1	*	*	*	*	0	OUT4
	1	0	0	*	*	*	*	0	OUT5
	1	0	1	*	*	*	*	0	OUT6
	1	1	0	*	*	*	*	0	OUT7
	1	1	1	*	*	*	*	0	OUT8

**2nd Data Byte**

	b7	b6	b5	b4	b3	b2	b1	b0	Selected Output
	a2	a1	a0	*	*	*	*	I	
Input Select	0	0	0	*	*	*	*	1	IN1
	0	0	1	*	*	*	*	1	IN2
	0	1	0	*	*	*	*	1	IN3
	0	1	1	*	*	*	*	1	IN4
	1	0	0	*	*	*	*	1	IN5
	1	0	1	*	*	*	*	1	IN6
Clamp	*	*	*	0	*	*	*	1	Free
Gain	*	*	*	1	*	*	*	1	Clamped
	*	*	*	*	0	*	*	1	0.5dB
Mixer	*	*	*	*	1	*	*	1	6.5dB
	*	*	*	*	*	0	*	1	Disabled
Tri-state	*	*	*	*	*	*	0	1	Enabled
	*	*	*	*	*	*	1	1	Low impedance Tri-state

**Power-on-Reset**

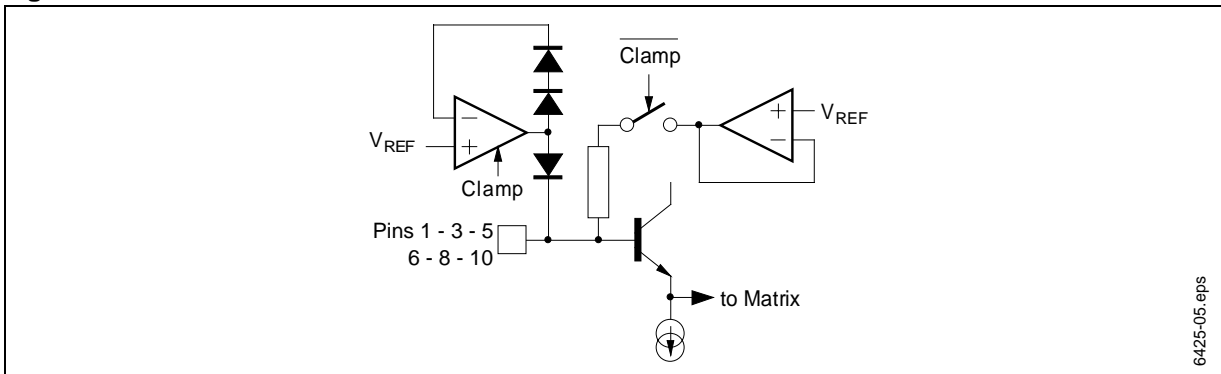
When active: outputs in 3-state, inputs are clamped

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Reset	Start of Reset	Incr. V <sub>CC</sub>			2.5	V
		Decr. V <sub>CC</sub>			4.2	V
	End of Reset	Incr. V <sub>CC</sub>	4.5			V

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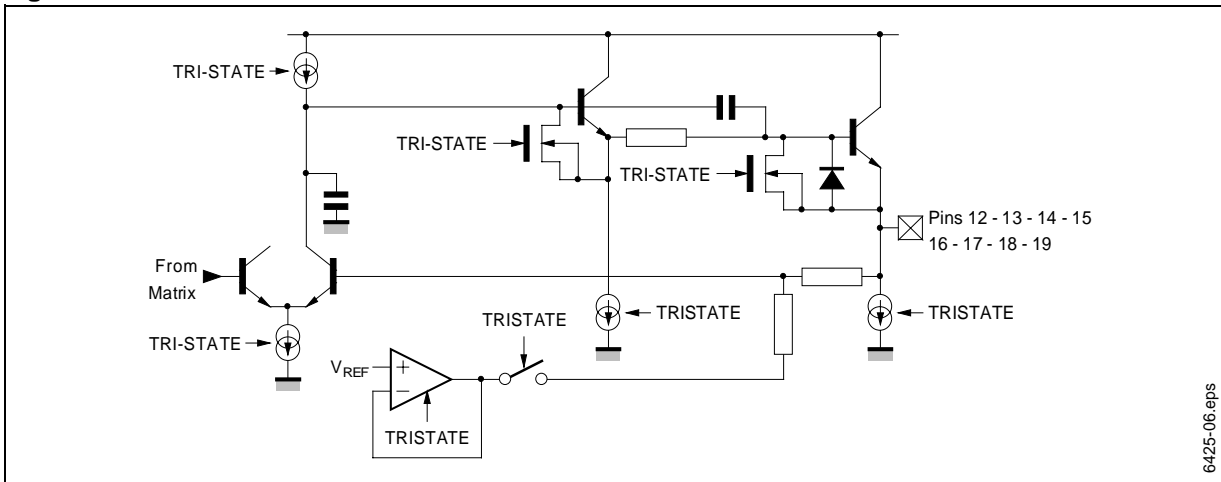
PIN CONFIGURATIONS

Figure 5. Video IN



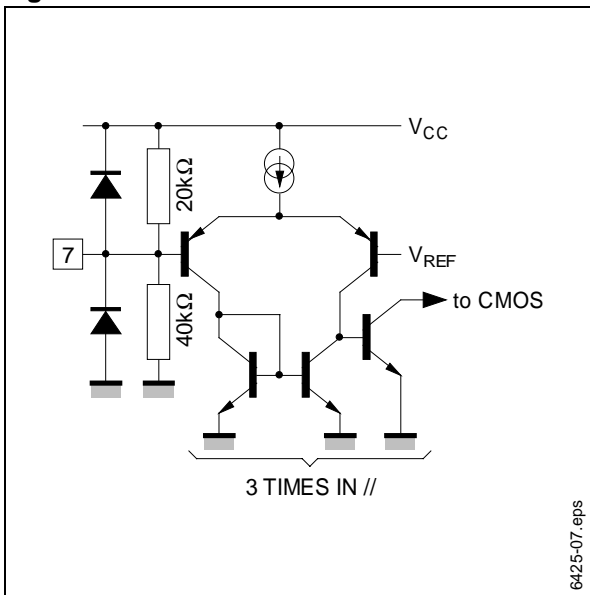
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Figure 6. Video OUT



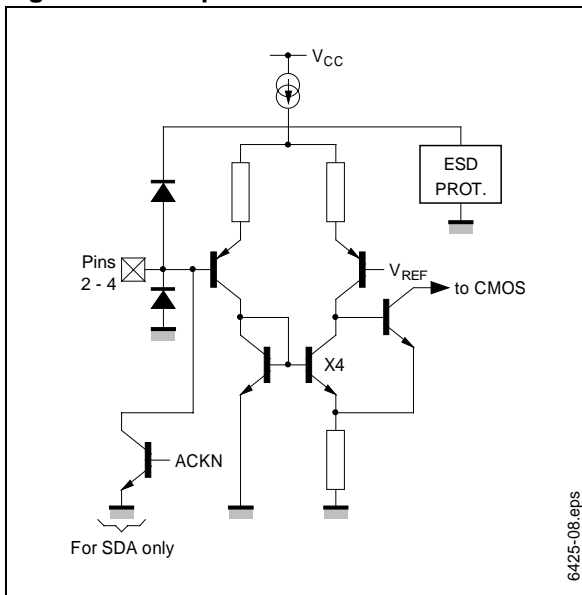
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Figure 7. PROG Pin



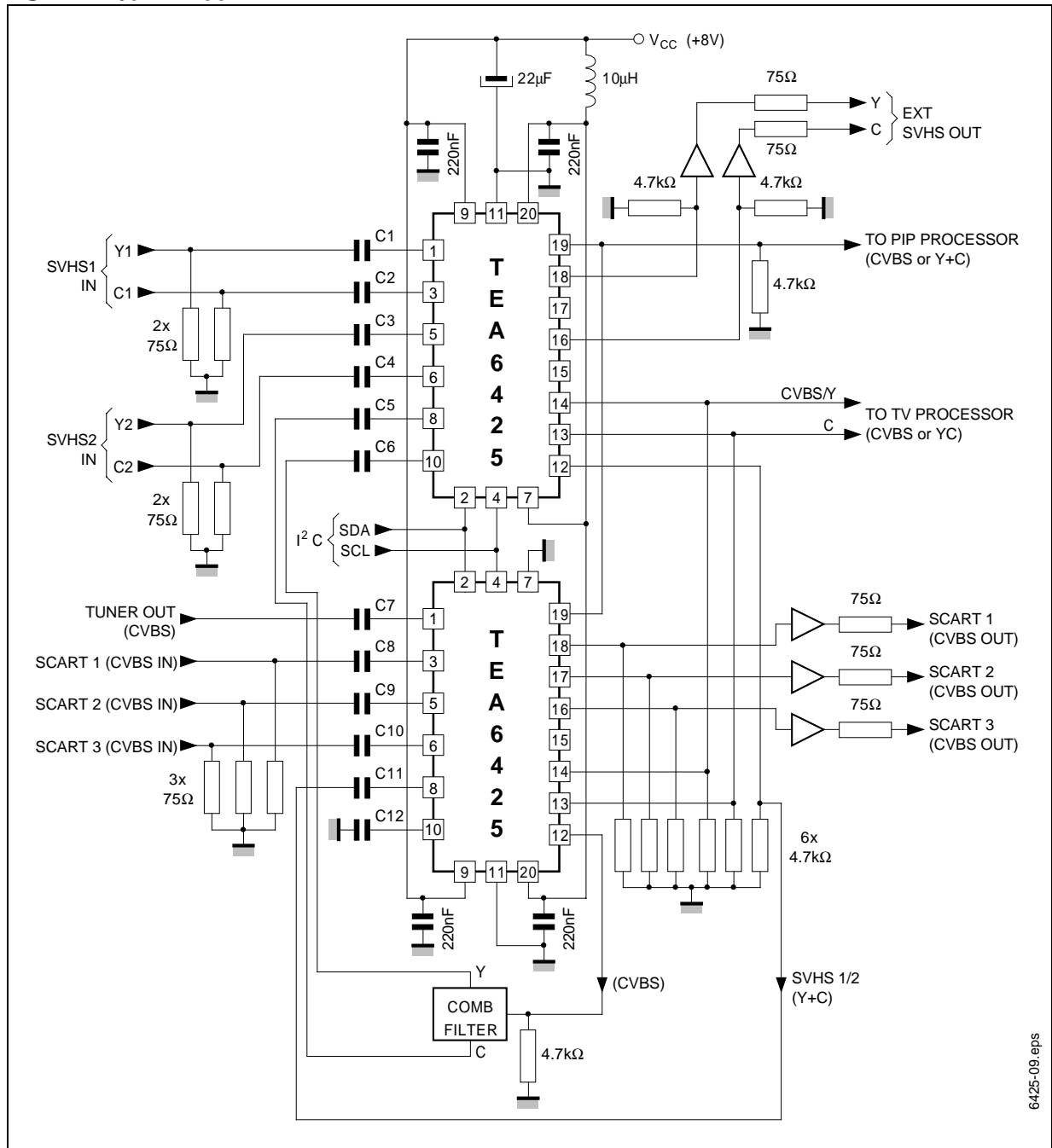
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Figure 8. Bus Inputs



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Figure 9. Typical Application

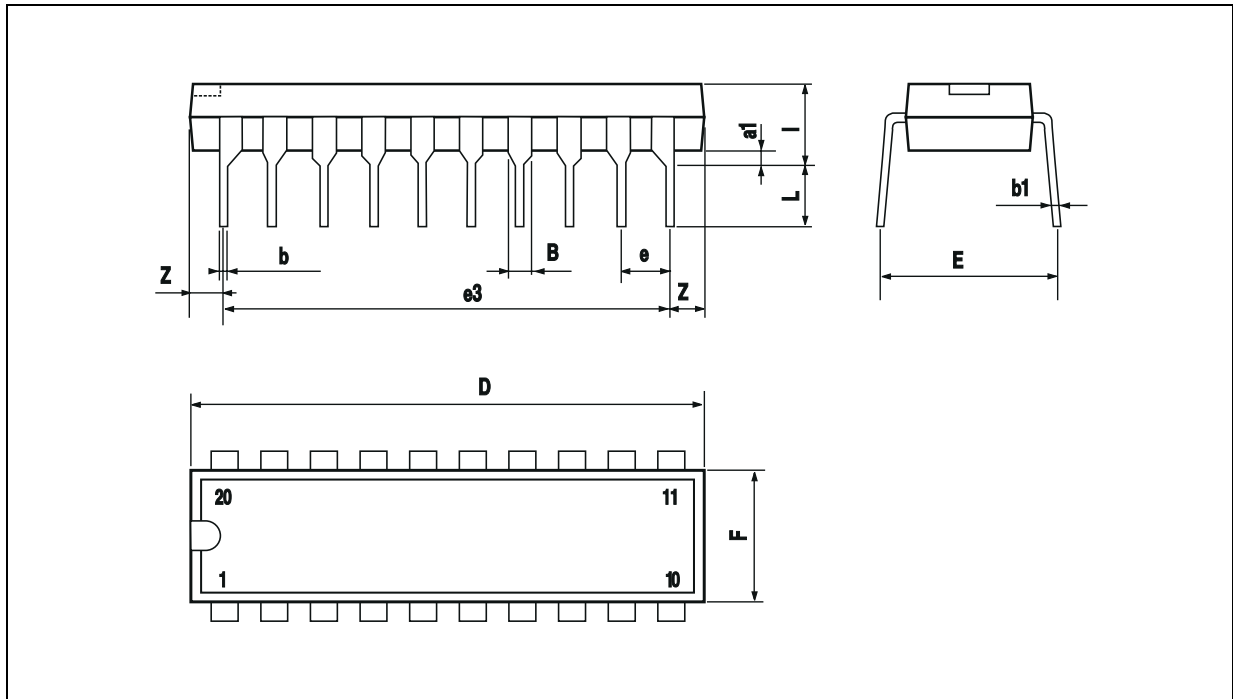


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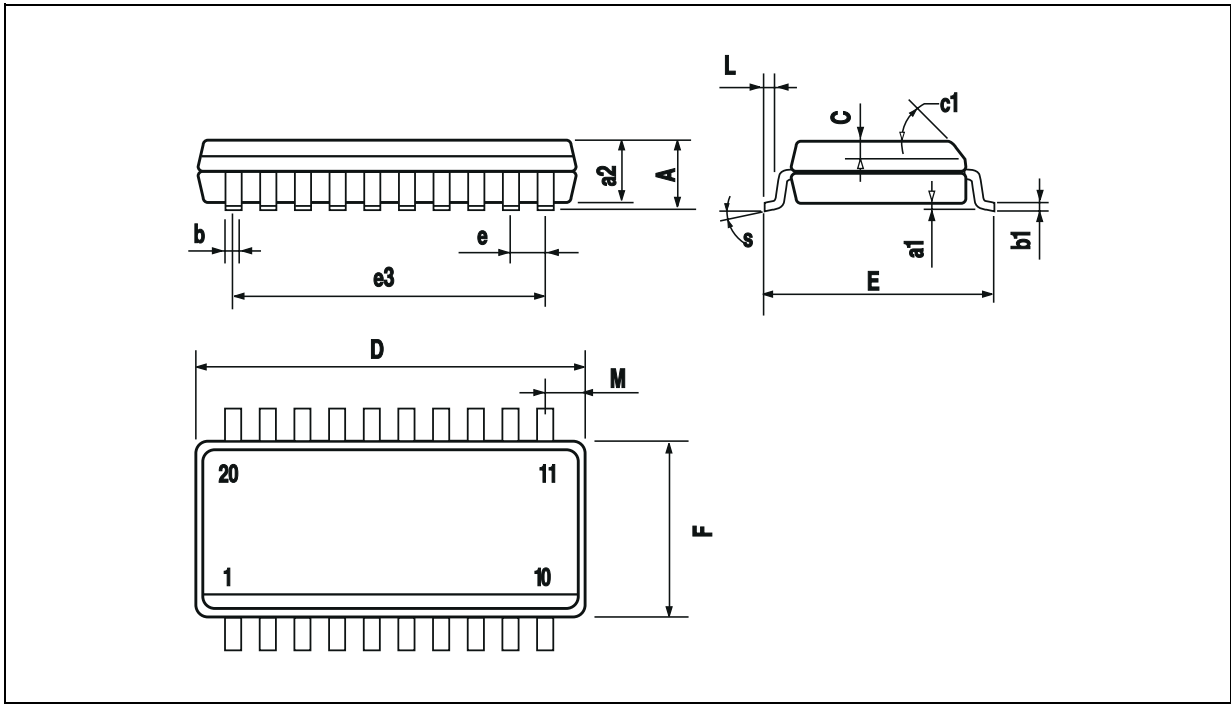
**PACKAGE MECHANICAL DATA**

20 PINS - PLASTIC DIP

**Figure 10. 20-Pin Package**





**PACKAGE MECHANICAL DATA (Cont'd)****20 PINS - PLASTIC MICROPACKAGE****Figure 11. 20-Pin Package**

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