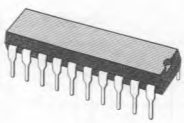
SGS-THOMSON MICROELECTRONICS

TEA6415

BUS CONTROLLED VIDEO MATRIX SWITCH

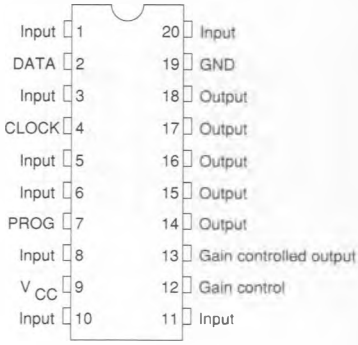
ADVANCE DATA

- 15MHz BANDWIDTH
- CASCADABLE WITH ANOTHER TEA6415 (internal address can be changed by pin 7 voltage)
- 8 INPUTS (CVBS, RGB, MAC, chroma...)
- 6 OUTPUTS (one gain controlled output)
- POSSIBILITY OF MAC SIGNAL FOR EACH INPUT BY SWITCHING-OFF THE CLAMP WITH AN EXTERNAL RESISTOR BRIDGE
- BUS CONTROLLED
- 6.5dB GAIN BETWEEN ANY INPUT AND OUTPUT
- - 55dB CROSSTALK AT 5MHz
- FULLY PROTECTED AGAINST ESD



TEA6415
DIP20
(Plastic Package)

PIN CONNECTIONS



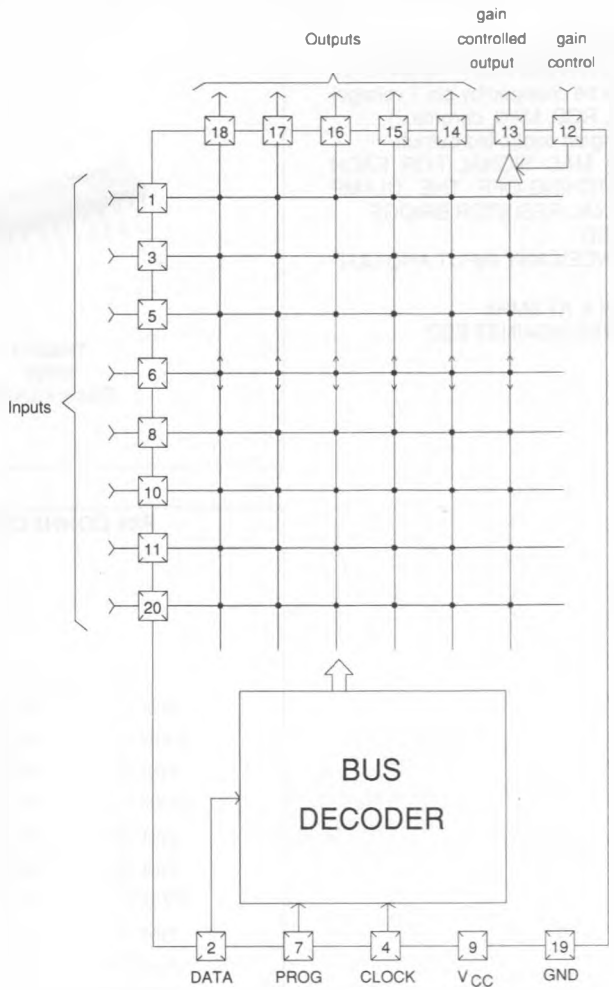
E88TEA6415-01

DESCRIPTION

The TEA6415 switches 8 input VIDEO sources on 6 outputs. Each output can be switched on only one of each input but it is possible to have the same input connected to several outputs. The gain controlled output must be connected to an unclamped input. All the switching possibilities are changed through the S–Bus.

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

BLOCK DIAGRAM



E88TEA6415-02

Note : When any input is not used, it must be bypassed to ground through a 220nF capacitor, so as to avoid degrading the crosstalk.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{CC}	Supply Voltage	Pin 9	11.5	V
T_{amb}	Operating Ambient Temperature Range		0 to 70	°C
T_{stg}	Storage Temperature Range		– 20 to 150	°C

THERMAL DATA

$R_{th\ (j-a)}$	Junction-ambient Thermal Resistance	80	°C/W

ELECTRICAL CHARACTERISTICS

T_{amb} = 25°C, V_{CC} = 10V, R_{load} = 10kΩ, C_{load} = 3pF (unless otherwise specified)

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_{CC}	Power Supply Voltage	Pin 9	7	10	11	V
I_{CC}	Power Supply Current (without load on outputs ; V_{CC} = 10V)			37	45	mA

GAIN CONTROLLED OUTPUT (pin 13 ; forced input DC level = 5V with an external resistor bridge on the selected input ; see application diagram)

Symbol	Parameter		Min.	Typ.	Max.	Unit
	Dynamic	Pin 13	3			V_{pp}
	Output Impedance			120	150	Ω
	Minimum Gain ($I_{control}$ on pin 12 = – 0.8mA)		– 10	– 9	– 8	dB
	Nominal Gain ($I_{control}$ = 0 ; V_{in} = 1Vpp)		5.5	6.5	7.5	dB
	Maximum Gain ($I_{control}$ on pin 12 = 0.8mA)		12	13	14	dB
	Bandwidth (– 3dB attenuation)		7	10		MHz
	Crosstalk (f = 5MHz)			– 55		dB
	DC Level		5.7	6	6.3	V

GAIN CONTROL

Symbol	Parameter		Min.	Typ.	Max.	Unit
	Nominal Gain Voltage	Pin 12	3.7	4	4.3	V
	Impedance		0.8	1	1.2	kΩ
	Max. Gain Control Current (for gain max. – 0.5dB)		0.04	0.1	0.2	mA
	Min. Gain Control Current (for gain min. + 0.5dB)		– 0.3	– 0.2	– 0.14	mA

ELECTRICAL CHARACTERISTICS (continued)

INPUTS

Symbol	Parameter	Min.	Typ.	Max.	Unit
	Max. Signal Amplitude (CVBS signal)	2			V_{pp}
	Input Current (per output connected, input voltage = $5V_{DC}$) (this current is X6 when all outputs are connected on the input)		1	2	µA
	DC Level	3.3	3.6	3.9	V
	DC Level Shift (temperature from 0 to 70°C)			100	mV

OUTPUTS (V_{in} = $1V_{pp}$ for all dynamic tests)

Symbol	Parameter	Min.	Typ.	Max.	Unit
	Dynamic Pins 14-15-16-17-18	4			V_{pp}
	Output Impedance		25	50	Ω
	Gain	5.5	6.5	7.5	dB
	Bandwidth (– 1dB attenuation)	7	10		MHz
	Crosstalk (f = 5MHz)		– 55		dB
	DC Level	2.9	3.2	3.5	V

PROGRAMMATION INPUT (pin 7)

Symbol	Parameter	Min.	Typ.	Max.	Unit
	Threshold Voltage		2		V

GENERAL DESCRIPTION

The main function of the IC is to switch 8 input video sources on 6 outputs.

Each output can be switched on only one of each input.

On each input an alignment of the lowest level of the signal is made (bottom of synch. top for CVBS or black level for RGB signals).

Each nominal gain between any input and output is 6.5dB. For D2MAC signal the alignment is switched off by forcing with an external resistor bridge, 5 VDC on the input.

Each input can be used as a normal input or as a MAC input (with external resistor bridge).

All the switching possibilities are changed through the BUS.

Driving 75Ω load needs an external transistor.

On the output (pin 13) the gain is controlled in the range + 13dB - 9dB in order to adjust the output level to 2 Vpp. The nominal gain (6.5dB) is obtained when pin 12 is DC not connected and AC grounded. The gain is controlled by varying current on pin 12.

It is possible to have the same input connected to several outputs.

The starting configuration (power supply from 0 to 8V) is undetermined.

6 words of 8 bits are necessary to determine one configuration.

BUS SELECTIONS (S–Bus)

2nd byte of transmission

ADDRESS MSB	DATA LSB	Selected Output	
0 0 0 0 0	X X X	pin 18	Output is selected by address bits
0 0 1 0 0	X X X	pin 14	
0 0 0 1 0	X X X	pin 15	
0 0 1 1 0	– – –	not used	
0 0 0 0 1	X X X	pin 17	
0 0 1 0 1	X X X	pin 13	
0 0 0 1 1	X X X	pin 15	
0 0 1 1 1	– – –	not used	

	Selected Input		
0 0 X X X	0 0 0	pin 5	Input is selected by data bits
0 0 X X X	1 0 0	pin 8	
0 0 X X X	0 1 0	pin 3	
0 0 X X X	1 1 0	pin 20	
0 0 X X X	0 0 1	pin 6	
0 0 X X X	1 0 1	pin 10	
0 0 X X X	0 1 1	pin 1	
0 0 X X X	1 1 1	pin 11	

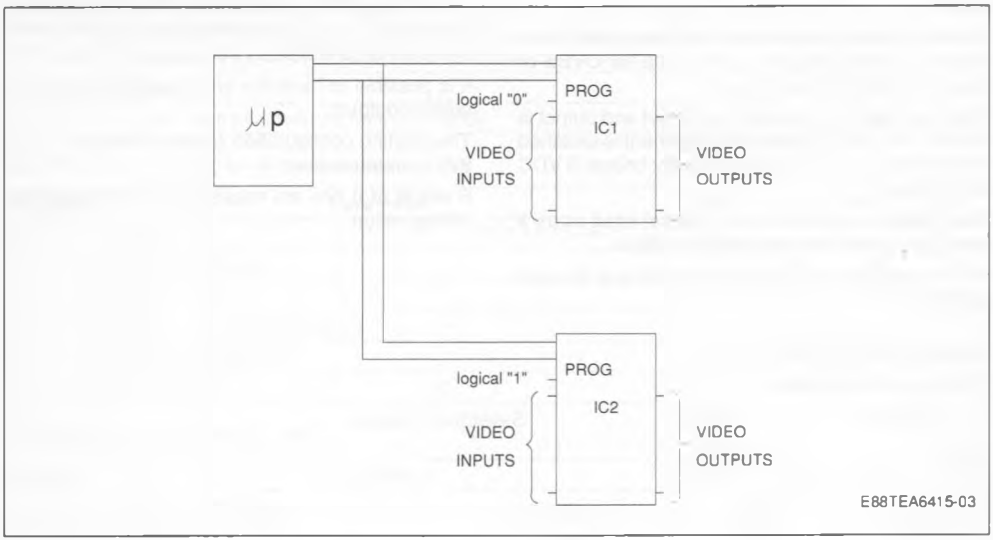
Example : 00100 101 connect pin 10 (input) to pin 14 (output).
(Equals 25 in hexadecimal).

Adress byte (1st byte of transmission)

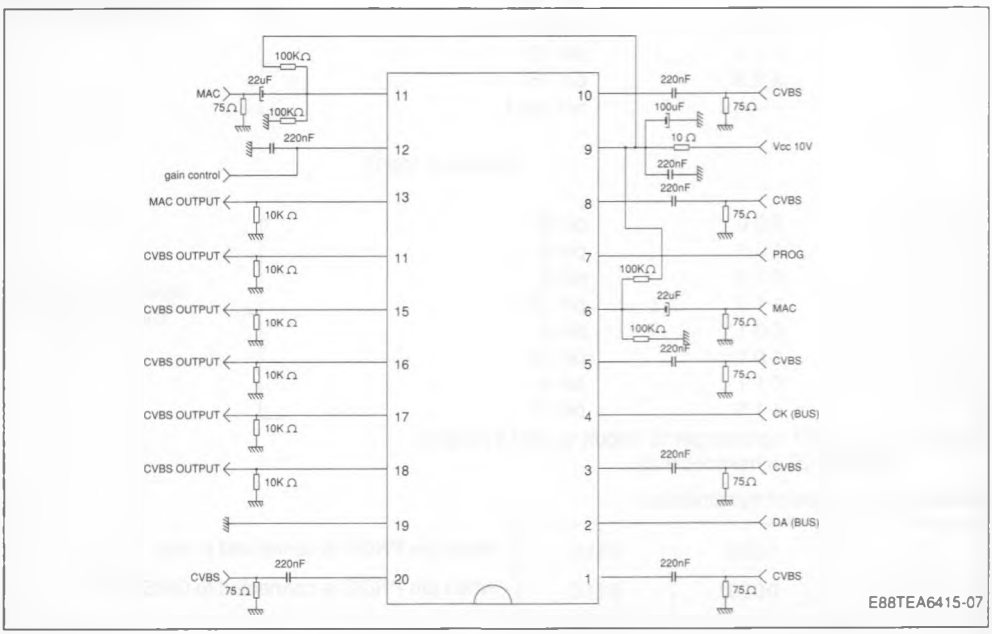
86	1000	0110	when pin PROG is connected to V_{CC}
06	0000	0110	when pin PROG is connected to GROUND

USE WITH ANOTHER TEA6415

The programmation input (PROG) permits to operate with two TEA6415 in parallel and to select them indepently through the S–Bus without modifying the address byte. Consequently, the switch capabilities are doubled or IC1 and IC2 can be cascaded.



TYPICAL APPLICATION



Note : When any input is not used, it must be bypassed to ground through a 220nF capacitor, so as to avoid degrading the crosstalk.

PACKAGE MECHANICAL DATA

20 PINS - Plastic Dip