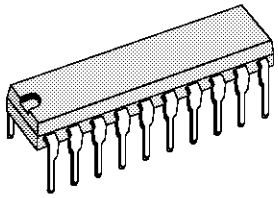
SGS-THOMSON MICROELECTRONICS

TEA6416

BUS-CONTROLLED VIDEO MATRIX SWITCH

- 15MHz BANDWIDTH
- CASCADABLE WITH ANOTHER TEA6416 (INTERNAL ADDRESS CAN BE CHANGED BY PIN 7 VOLTAGE)
- 8 INPUTS (CVBS, RGB, MAC, CHROMA...)
- 6 OUTPUTS
- EACH INPUT INTERNALLY BIASED@ $V_{CC}/2$ BY RESISTOR NETWORK
- BUS CONTROLLED
- 6.5dB GAIN BETWEEN ANY INPUT AND OUTPUT
- - 50dB CROSSTALK AT 5MHz
- FULLY ESD PROTECTED



DIP20
(Plastic Package)

ORDER CODE : TEA6416

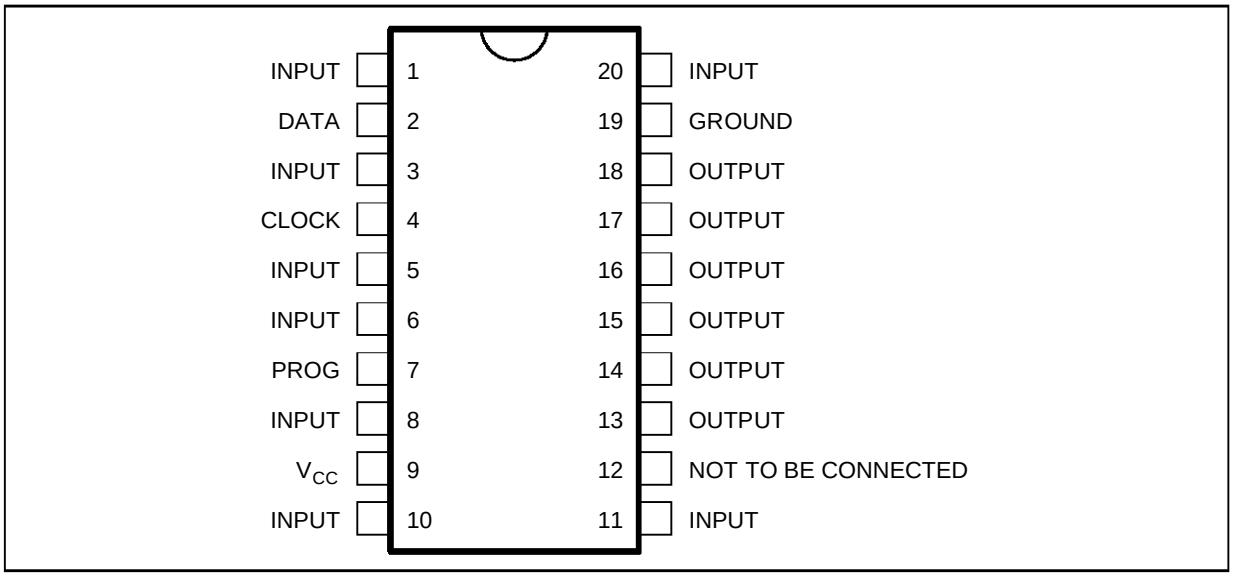
DESCRIPTION

The main function of the TEA6416 is to switch 8 video input sources on the 6 outputs.

Each output can be switched to only one of the inputs whereas but any same input may be connected to several outputs.

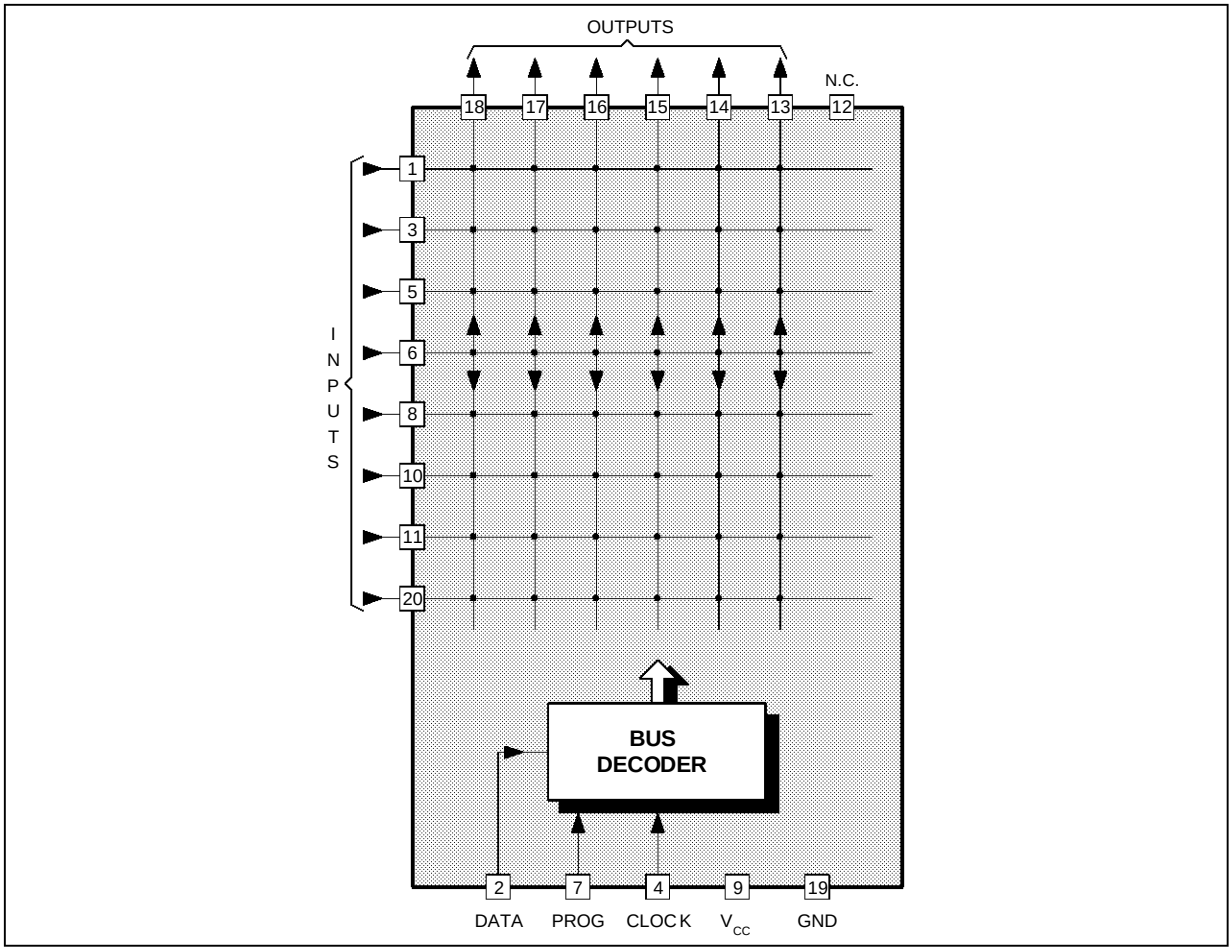
All the switching possibilities are controlled through the I^2C Bus.

PIN CONNECTIONS



6416-01.EPS

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage (pin 9)	13	V
T_A	Operating Ambient Temperature Range	0 to +70	^oC
T_{stg}	Storage Temperature Range	-20 to +150	^oC

6416-01.TBL

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction-Ambient Thermal Resistance	80	$^oC/W$

6416-02.TBL

ELECTRICAL CHARACTERISTICS

$T_A = 25^oC$, $V_{CC} = 10V$, $R_{LOAD} = 10k\Omega$, $C_{LOAD} = 3pF$ (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{CC}	Supply Voltage (pin 9)	8	10	11	V
I_{CC}	Power Supply Current (without load on outputs ; V_{CC}=10V)	20	30	40	mA

6416-03.TBL

ELECTRICAL CHARACTERISTICS (continued)

$T_A = 25^oC$, $V_{CC} = 10V$, $R_{LOAD} = 10k\Omega$, $C_{LOAD} = 3pF$ (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
INPUTS					
	Maximum Signal Amplitude (CVBS signal)	2	2.5		V_{PP}
	Input Resistance	30	45		kΩ
	DC Level (1 input linked with 1 output)	4.75	5	5.25	V
	DC Level Shift (temperature from 0 to 70^oC)		5	100	mV
OUTPUTS ($V_{IN} = 1V_{PP}$ for all dynamic tests) Pins 13 - 14 - 15 - 16 - 17 - 18					
	Dynamic	4.5	5.5		V_{PP}
	Output Impedance		25	50	Ω
	Gain	5.5	6.5	7.5	dB
	Bandwidth ● -1dB attenuation ● -3dB attenuation	7	10 15		MHz MHz
	Crosstalk (f = 5MHz)		-50		dB
	DC level (1 input linked with 1 output)	5.2	5.7	6.2	V
I^2C BUS INPUT : DATA, CLOCK, PROG (Pins 2 - 4 - 7)					
	Threshold Voltage	1.5		2	

6416-04.TBL

GENERAL DESCRIPTION

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

Each output can be switched on only one of each input. Each input is connected to $V_{CC}/2$ through a resistive network (no clamp on sync. bottom).

Each nominal gain between any input and output is 6.5dB. All the switching possibilities are changed through the BUS.

Driving 75Ω load needs an external transistor.

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

The starting configuration upon power on (power supply : 0 to 10V) is undetermined. In this case, 6 words of 16 bits are necessary to determine one configuration. In other case, 1 word of 16 bits is necessary to determine one configuration.

BUS SELECTIONS (I^2C-BUS) - 2nd byte of transmission

ADDRESS - MSB	**DATA** - LSB	**Selected Output**	
00000	XXX	pin 18	Output is selected by address bits
00100	XXX	pin 14	
00010	XXX	pin 16	
00110	- - -	Not used	
00001	XXX	pin 17	
00101	XXX	pin13	
00011	XXX	pin 15	
00111	- - -	Not used	
		Selected Input	
00XXX	000	pin 5	Input is selected by data bits
00XXX	100	pin 8	
00XXX	010	pin 3	
00XXX	110	pin 20	
00XXX	001	pin 6	
00XXX	101	pin 10	
00XXX	011	pin 1	
00XXX	111	pin 11	

6416-05.TBL

Example : 00100 101 connects 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 ground
06	0000	0110	When pin PROG is connected to V_{CC}

6416-06.TBL

IN / OUT PIN CONFIGURATION

Figure 1 : Input Configuration

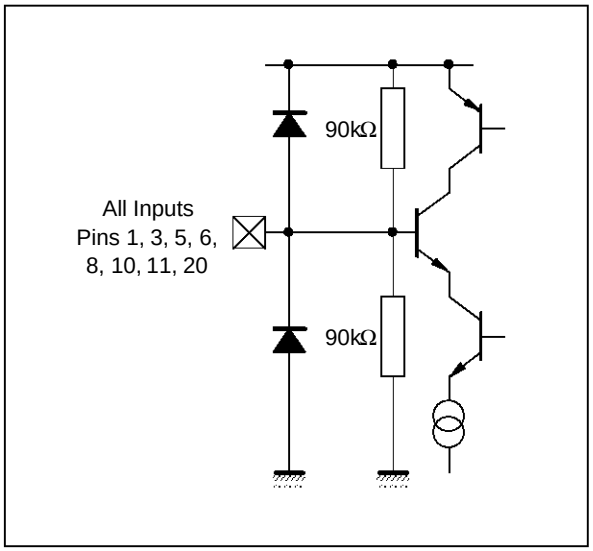


Figure 2 : Output Configuration

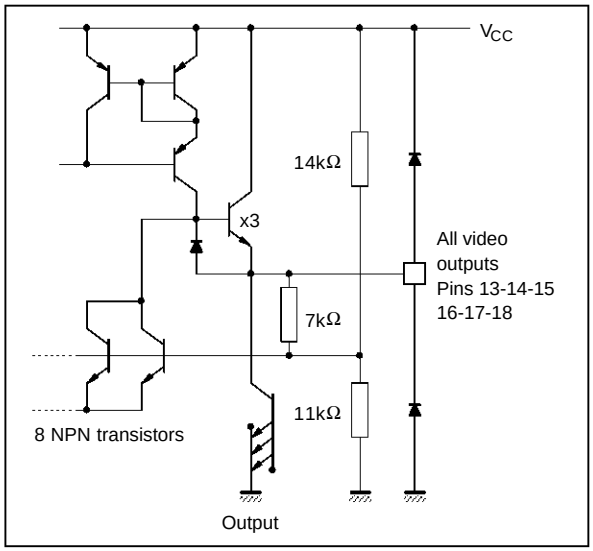


Figure 3 : Bus I/O Configuration

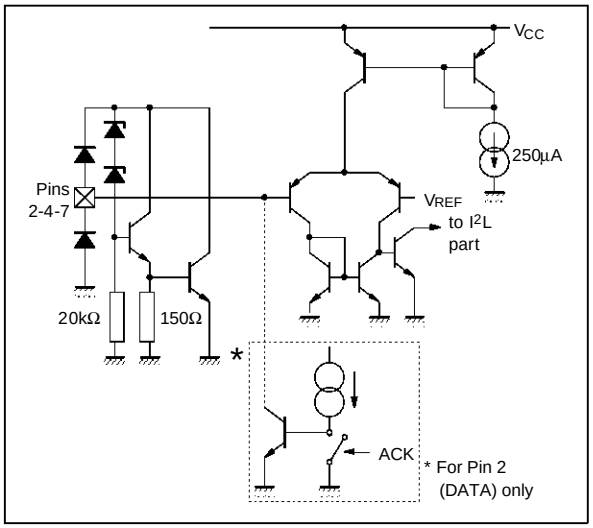
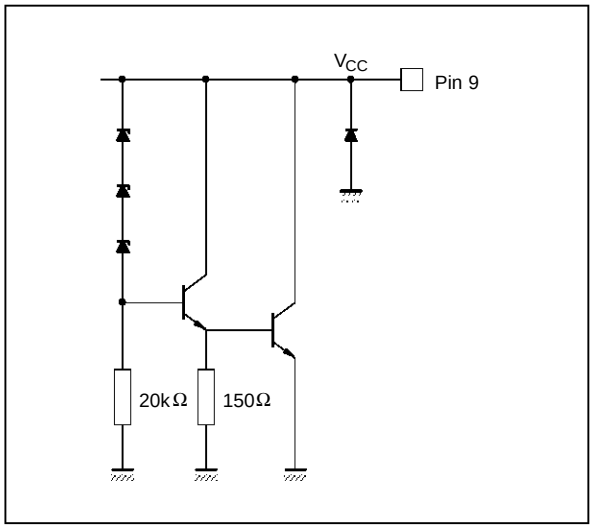
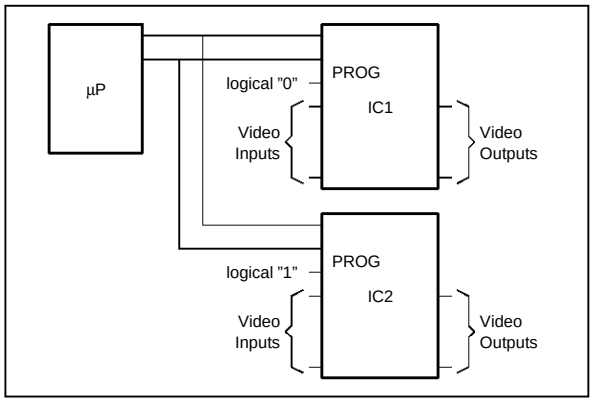


Figure 4 : V_{CC} Pin Configuration

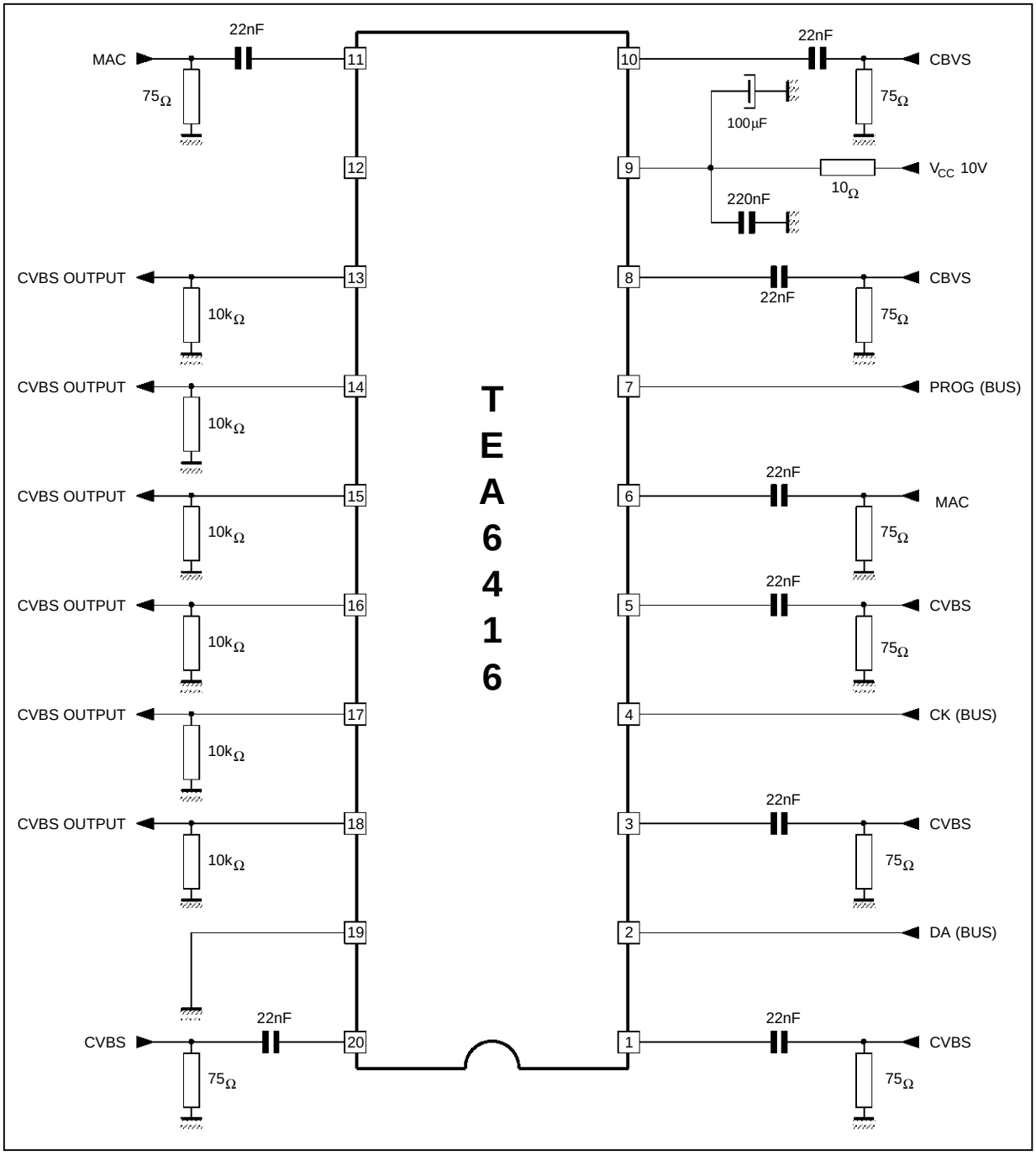


USE WITH AN OTHER TEA6416

The programmation input (PROG) permits to operate with two TEA6416 in parallel and to select them independantly through the I^2C-BUS without modifying the adress byte. Consequently, the switch capabilities are doubled or IC1 and IC2 can be cascaded.



TYPICAL APPLICATION



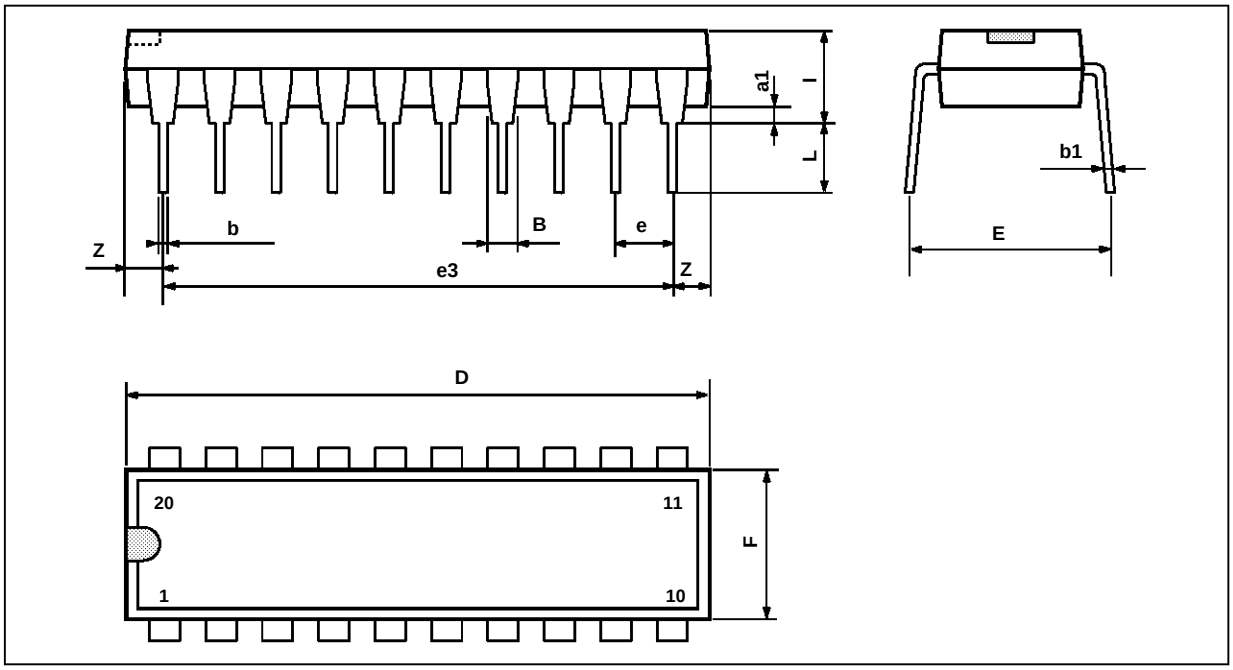
CROSSTALK IMPROVEMENT

1 - When any input is not used, it must be bypassed to ground through a 22nF capacitor.

2 - An important improvement can be achieved considering the input crosstalk by means of the application (see technical note).

PACKAGE MECHANICAL DATA

20 PINS – PLASTIC DIP



PM-DIP20.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
i			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053

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