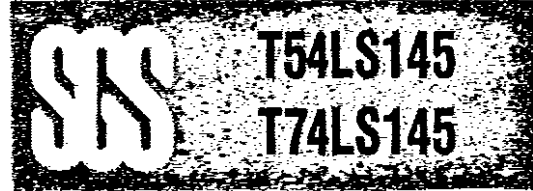


LOW POWER SCHOTTKY INTEGRATED CIRCUITS



67C 16204

D T-51-17

PRELIMINARY DATA

1-OF-10 DECODER/DRIVER OPEN COLLECTOR

DESCRIPTION

The T54LS145/T74LS145 is a 1-of-10 Decoder/Driver which accepts BCD inputs and produces outputs which drive 10 digit incandescent displays. All outputs remain off for all invalid binary input conditions. It is designed for use as indicator/relay drivers or as an open collector logic circuit driver. Each high breakdown output transistor sinks up to 80mA of current. Typical power dissipation is 35mW. This device is fully compatible with TTL families, and is ideal as a lamp or solenoid driver.

B1
Plastic Package

D1/D2
Ceramic Package

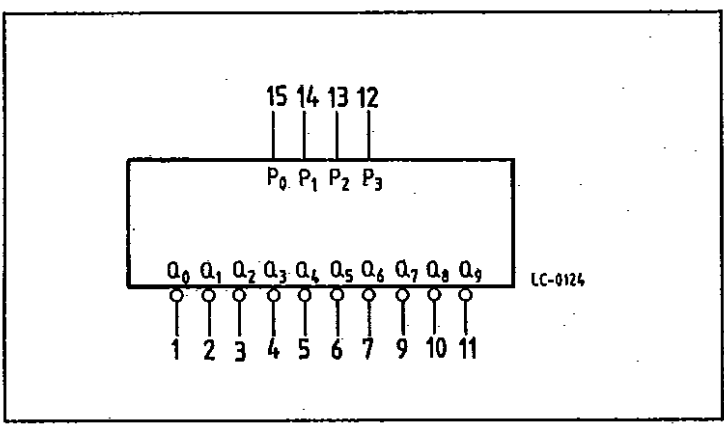
M1
Micro Package

C1
Plastic Chip Carrier

ORDERING NUMBERS:

T54LS145 D2	T74LS145 C1
T74LS145 D1	T74LS145 M1
T74LS145 B1	

- INPUT CLAMP DIODES LIMIT HIGH SPEED TERMINATION EFFECTS

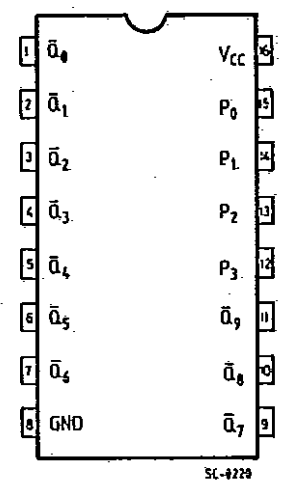


PIN NAMES

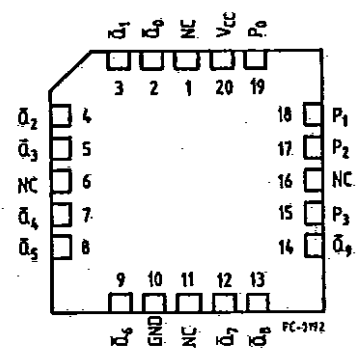
P_0, P_1, P_2, P_3	BCD Inputs
\bar{Q}_3 to \bar{Q}_9	Outputs

PIN CONNECTION (top view)

DUAL IN LINE



CHIP CARRIER



NC = No Internal Connection

TRUTH TABLE

INPUTS				OUTPUTS									
P _D	P _C	P _B	P _A	\bar{Q}_0	\bar{Q}_1	\bar{Q}_2	\bar{Q}_3	\bar{Q}_4	\bar{Q}_5	\bar{Q}_6	\bar{Q}_7	\bar{Q}_8	\bar{Q}_9
L	L	L	L	L	H	H	H	H	H	H	H	H	H
L	L	L	H	H	L	H	H	H	H	H	H	H	H
L	L	H	L	H	H	L	H	H	H	H	H	H	H
L	L	H	H	H	H	H	L	H	H	H	H	H	H
L	H	L	L	H	H	H	H	L	H	H	H	H	H
L	H	L	H	H	H	H	H	H	L	H	H	H	H
L	H	H	L	H	H	H	H	H	H	L	H	H	H
L	H	H	H	H	H	H	H	H	H	H	L	H	H
H	L	L	L	H	H	H	H	H	H	H	H	L	H
H	L	L	H	H	H	H	H	H	H	H	H	H	L
H	L	H	L	H	H	H	H	H	H	H	H	H	H
H	L	H	H	H	H	H	H	H	H	H	H	H	H
H	H	L	L	H	H	H	H	H	H	H	H	H	H
H	H	L	H	H	H	H	H	H	H	H	H	H	H
H	H	H	L	H	H	H	H	H	H	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H

H = HIGH Voltage Level
L = LOW Voltage Level

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	-0.5 to 7	V
V _I	Input Voltage, Applied to Input	-0.5 to 15	V
V _O	Output Voltage, Applied to Output	0 to 10	V
I _I	Input Current, Into Inputs	-30 to 5	mA
I _O	Output Current, Into Outputs	50	mA

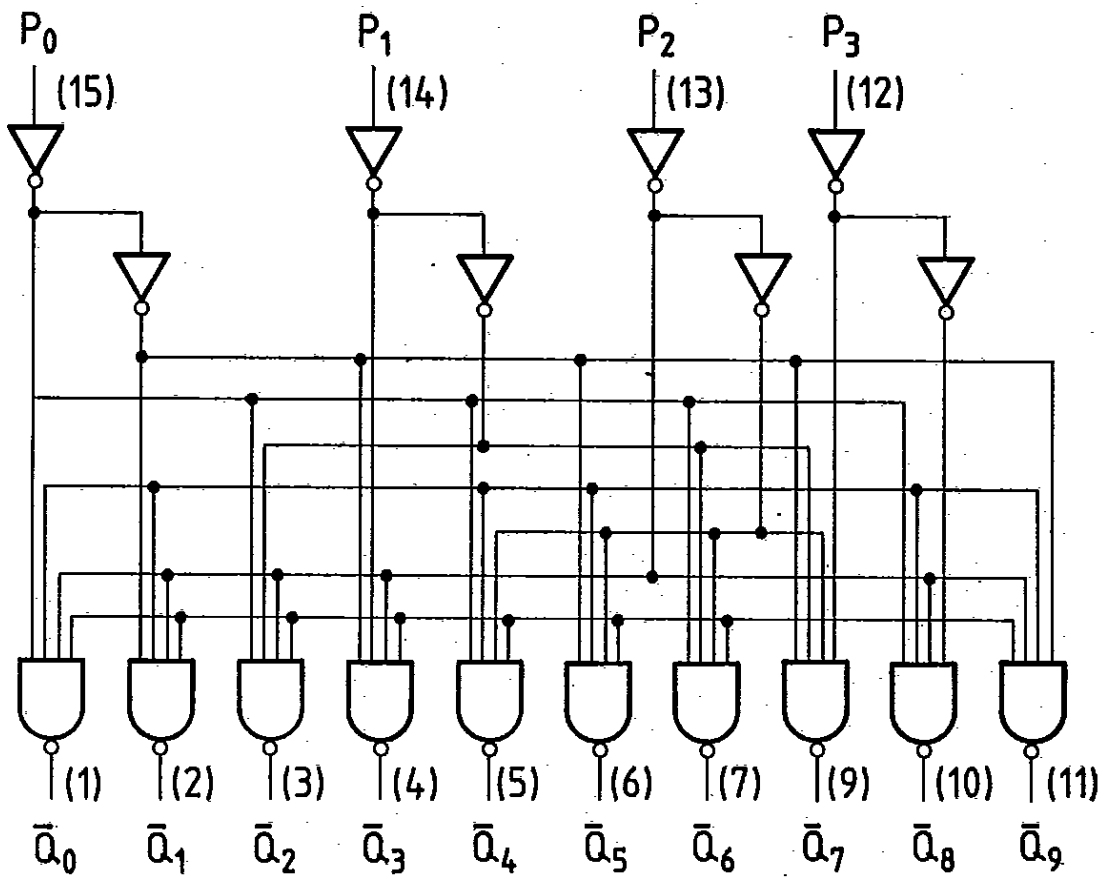
Stresses in excess of those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions in excess of those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

GUARANTEED OPERATING RANGES

Part Numbers	Supply Voltage			Temperature
	Min	Typ	Max	
T54LS145D2	4.5 V	5.0 V	5.5 V	-55°C to +125°C
T74LS145XX	4.75 V	5.0 V	5.25 V	0°C to +70°C

XX = package type.
www.DataSheet4U.com

LOGIC DIAGRAM



LC-0125

V_{CC} = Pin 16
 GND = Pin 8
 () = Pin numbers

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

Symbol	Parameter		Limits			Test Conditions (Note 1)	Units
			Min.	Typ.	Max.		
V_{IH}	Input HIGH Voltage		2.0			Guaranteed Input HIGH Voltage for all Inputs	V
V_{IL}	Input LOW Voltage	54		0.7		Guaranteed Input LOW Voltage for all Inputs	V
		74		0.8			
V_{CD}	Input Clamp Diode Voltage			-0.65	-1.5	$V_{CC} = \text{MIN}, I_{IN} = -18\text{mA}$	V
I_{OH}	Output HIGH Current	54,74			250	$V_{CC} = \text{MIN}, V_{OH} = 15\text{V}$	mA
V_{OL}	Output LOW Voltage	54,74		0.25	0.4	$I_{OL} = 12\text{mA}$	V
		74		0.35	0.5	$I_{OL} = 24\text{mA}$	
		54,74		2.3	3.0	$I_{OL} = 80\text{mA}$	
I_{IH}	Input HIGH Current				20 0.1	$V_{CC} = \text{MAX}, V_{IN} = 2.7\text{V}$ $V_{CC} = \text{MAX}, V_{IN} = 7.0\text{V}$	μA mA
I_{IL}	Input LOW Current				-0.4	$V_{CC} = \text{MAX}, V_{IN} = 0.4\text{V}$	mA
I_{CC}	Power Supply Current				13	$V_{CC} = \text{MAX}, V_{IN} = \text{GND}$	mA

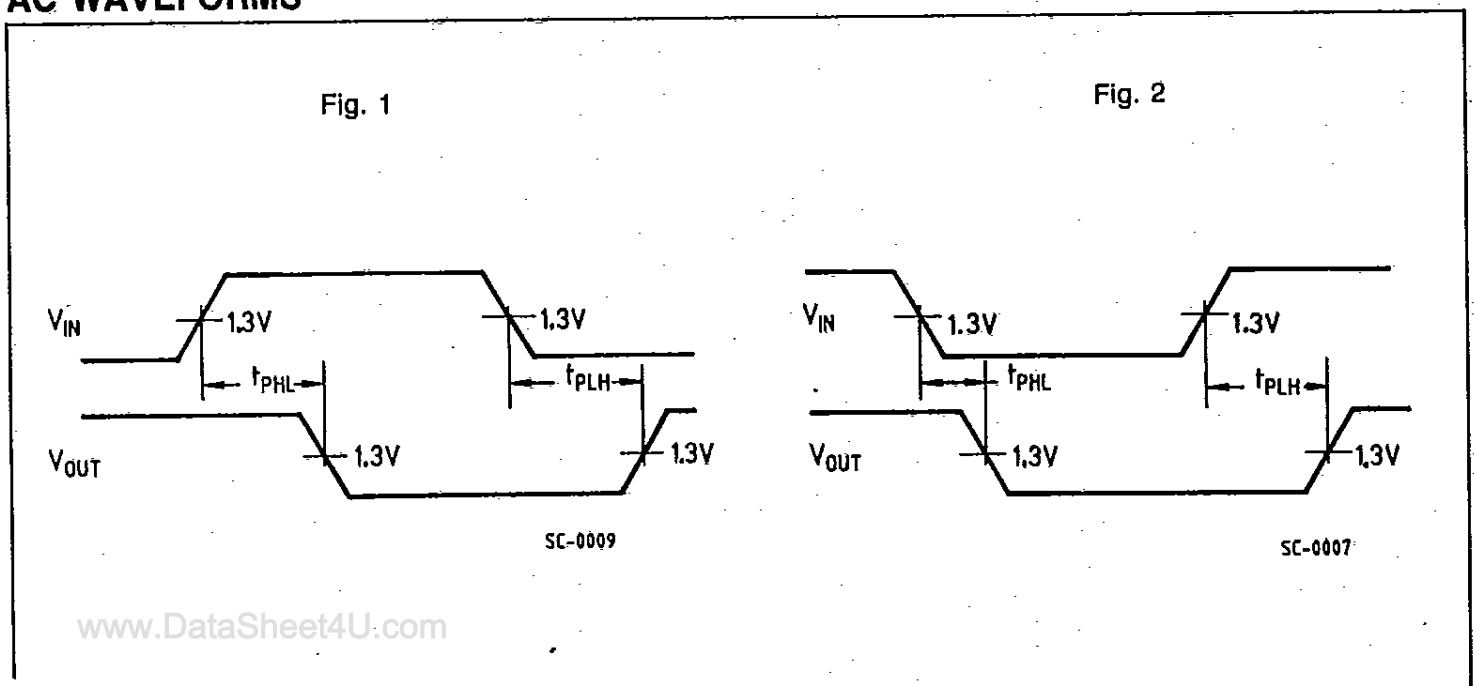
AC CHARACTERISTICS: $T_A = 25^\circ\text{C}$

Symbol	Parameter		Limits			Test Conditions	Units
			Min.	Typ.	Max.		
t_{PHL} t_{PLH}	Propagation Delay, P_n Input to Q_n Output				50 50	$V_{CC} = 5.0\text{V}$ $C_L = 45\text{pF}$	ns

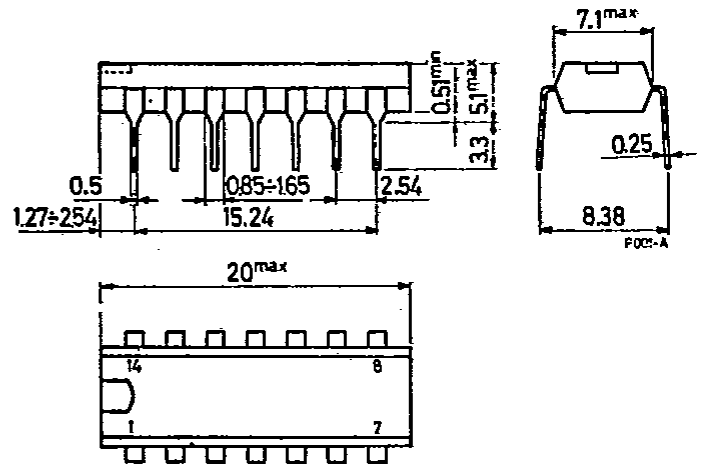
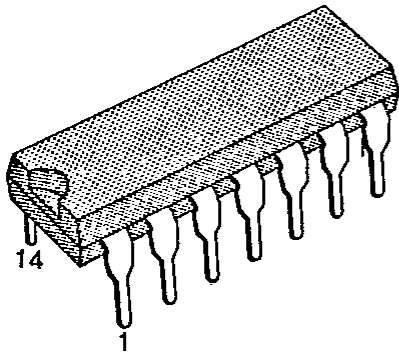
Notes:

- 1) For conditions shown as MIN or MAX, use the appropriate value specified under guaranteed operating ranges.
- 2) Typical values are at $V_{CC} = 5.0\text{V}$, $T_A = 25^\circ\text{C}$

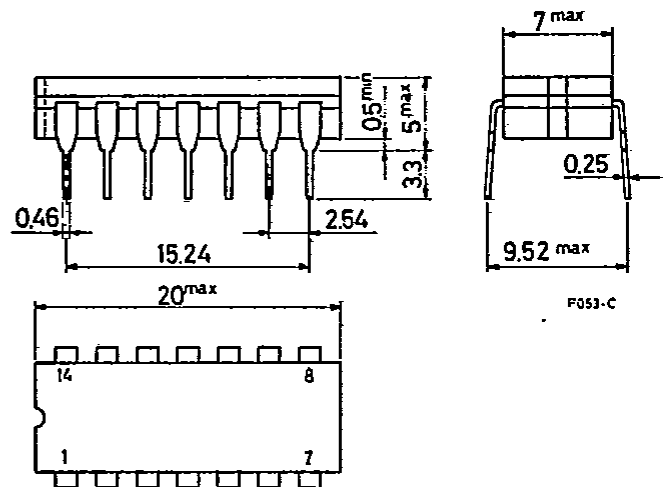
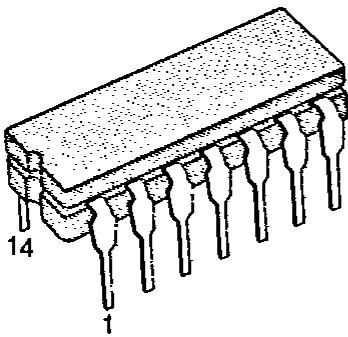
AC WAVEFORMS



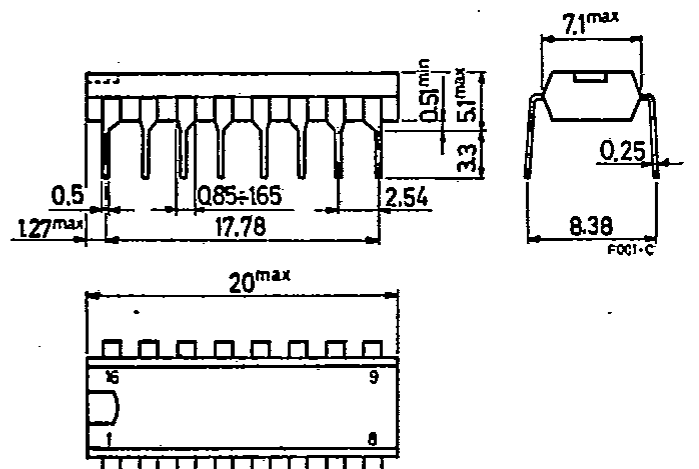
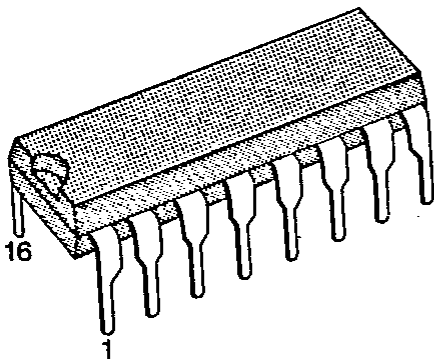
14-LEAD PLASTIC DIP



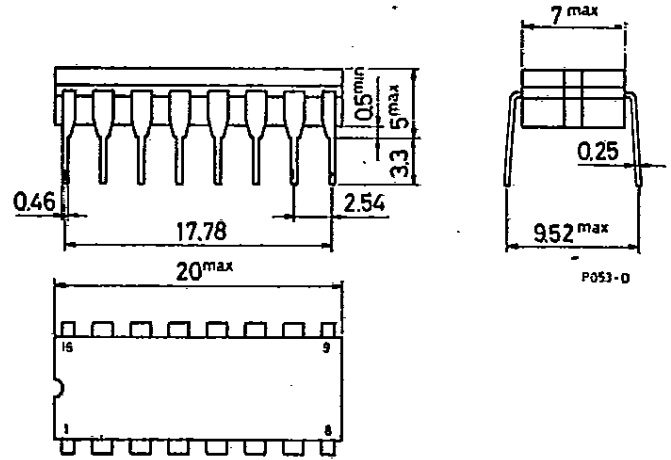
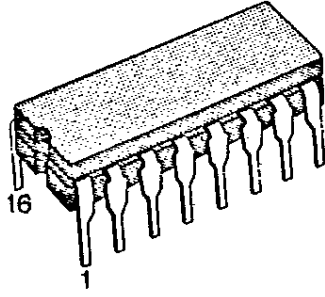
14-LEAD CERAMIC DIP



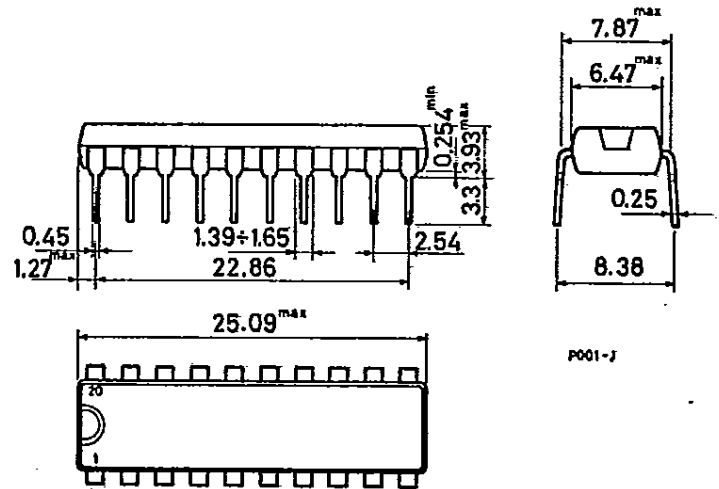
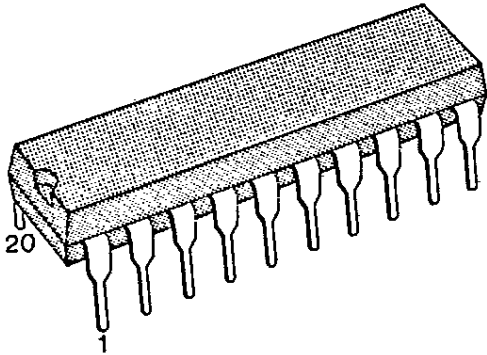
16-LEAD PLASTIC DIP



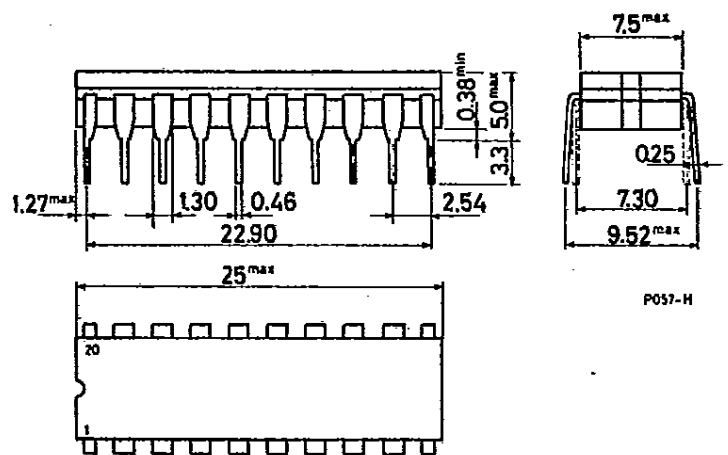
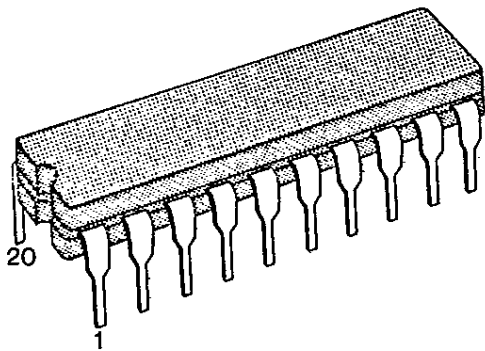
16-LEAD CERAMIC DIP



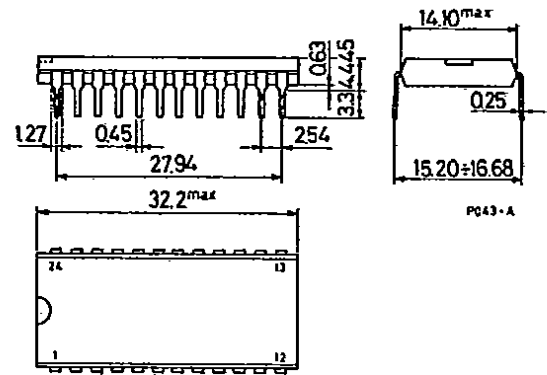
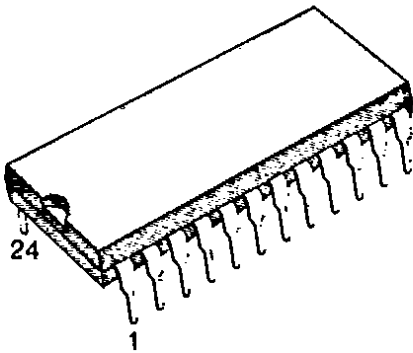
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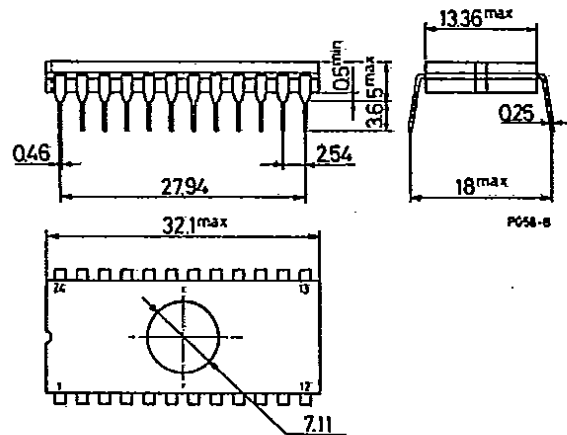
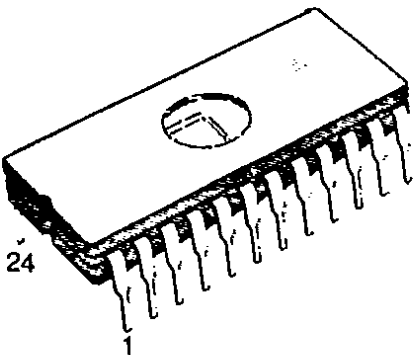
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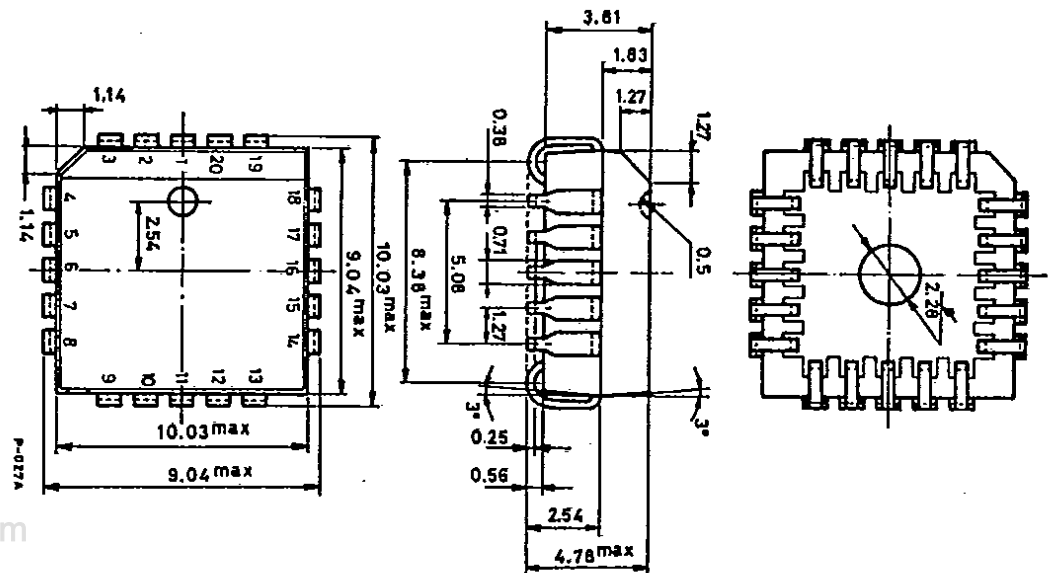
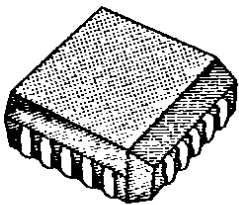
24-LEAD PLASTIC DIP



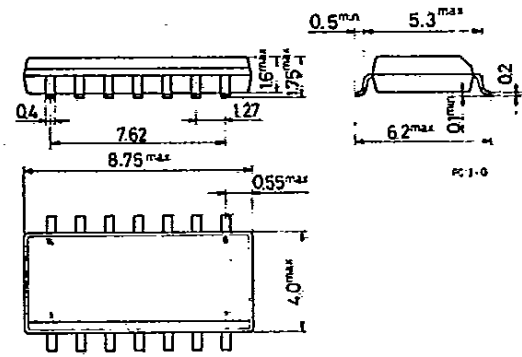
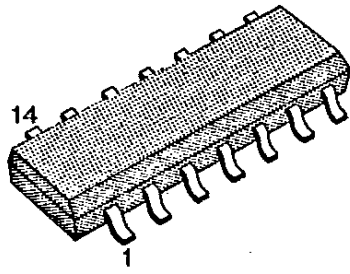
24-LEAD CERAMIC DIP



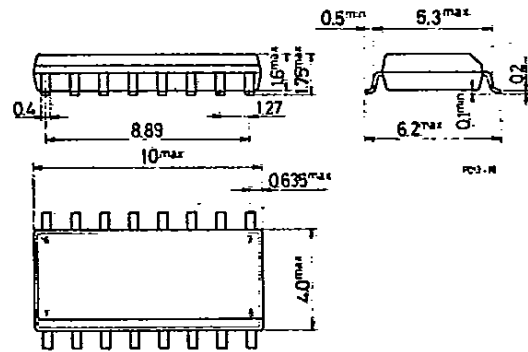
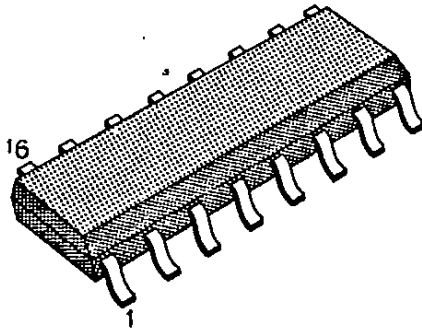
CHIP CARRIER 20 LEAD PLASTIC



14-LEAD PLASTIC DIP MICROPACKAGE



16-LEAD PLASTIC DIP MICROPACKAGE



NOTE: FOR 20-LEAD PLASTIC DIP MICROPACKAGE CONTACT SGS

Surface Mounted

67C 16548

D

T-90-20

One possible solution to the important problem of PWB minimization, is that of using surface mounted components. Integrated circuits in SO (Small Outline) packages are made up of standard chips mounted in very small plastic packages. The advantages given by using these devices are:

PWB Reduction

This is by far the most important advantage since the reduction of PWB size varies from 40 to 60% in comparison with standard board types. (See page 584 for package dimensions.)

Assembly Cost Reduction

SO Devices require no preliminary operation prior to mounting and can therefore be easily utilized in fully automatic equipment.

Increasing Reliability

The following characteristics lead to a higher level of reliability with respect to their standard packaged counter parts:

- The mounting system is fully automatic
- PWB number and the interconnections between them are reduced when the same number of devices are used.
- The high density of components on the board makes it thermally much more stable.

Noise Reduction and Improved Frequency Response

The reduction of the length of the connecting wires between the leads and the silicon guarantees a more homogeneous propagation delay between the external pins, with respect to the standard type.

Assembly Without Board Holes

The devices are placed on the board and soldered. This technology permits a higher level of tolerance in the positioning (automatic) of the device. For the standard DIP types this must be done with great accuracy due to the insertion of the leads into their holes.

