

KS54AHCT 242/243
KS74AHCT

Quad Bus Transceivers
with 3-State Outputs

T-52-31

Preliminary Specifications

FEATURES

- 2-Way Asynchronous Communication Between Data Buses
- Function, pin-out, speed and drive compatibility with 54/74ALS logic family
- Low power consumption characteristic of CMOS
- 3-State outputs with high drive current (I_{OL} = 24 mA @ V_{OL} = 0.5V) for direct bus interface
- Inputs and outputs interface directly with TTL, NMOS and CMOS devices
- Wide operating voltage range: 4.5V to 5.5V
- Characterized for operation over industrial and military temperature ranges:
 KS74AHCT: -40°C to +85°C
 KS54AHCT: -55°C to +125°C
- Package options include plastic "small outline" packages, standard plastic and ceramic 300-mil DIPs

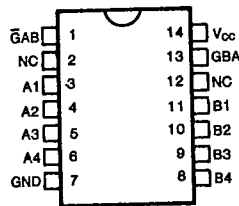
DESCRIPTION

These four-data line transceivers are designed for asynchronous two-way communications between data buses.

These devices provide speeds and drive capability equivalent to their ALSTTL counterparts and yet maintain CMOS power levels. The input and output voltage levels allow direct interface with TTL, NMOS and CMOS devices without any external components.

All inputs and outputs are protected from damage due to static discharge by internal diode clamps to V_{CC} and ground.

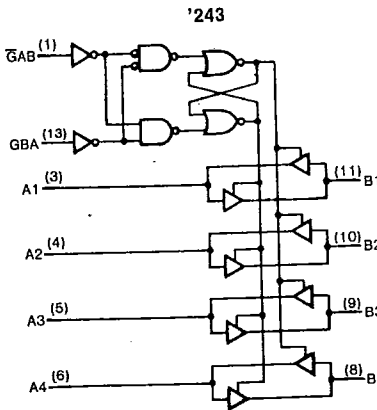
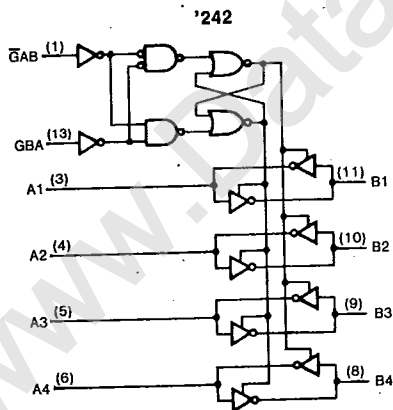
PIN CONFIGURATION



FUNCTION TABLE

INPUTS		'242	'243
GAB	GBA		
L	L	A to B	A to B
H	H	B to A	B to A
H	L	Isolation	Isolation
L	H	Isolation	Isolation

LOGIC DIAGRAMS



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Absolute Maximum Ratings*

Supply Voltage Range V_{CC} -0.5V to +7V
 DC Input Diode Current, I_{IK}
 ($V_I < -0.5V$ or $V_I > V_{CC} + 0.5V$) ± 20 mA
 DC Output Diode Current, I_{OK}
 ($V_O < -0.5V$ or $V_O > V_{CC} + 0.5V$) ± 20 mA
 Continuous Output Current Per Pin, I_O
 ($-0.5V < V_O < V_{CC} + 0.5V$) ± 70 mA
 Continuous Current Through
 V_{CC} or GND pins ± 250 mA
 Storage Temperature Range, T_{stg} -65°C to +150°C
 Power Dissipation Per Package, P_d † 500 mW

* Absolute Maximum Ratings are those values beyond which permanent damage to the device may occur. These are stress ratings only and functional operation of the device at or beyond them is not implied. Long exposure to these conditions may affect device reliability.

† Power Dissipation temperature derating:
 Plastic Package (N): -12mW/°C from 65°C to 85°C
 Ceramic Package (J): -12mW/°C from 100°C to 125°C

Recommended Operating Conditions

Supply Voltage, V_{CC} 4.5V to 5.5V
 DC Input & Output Voltages*, V_{IN} , V_{OUT} 0V to V_{CC}
 Operating Temperature*
 Range KS74AHCT: -40°C to +85°C
 KS54AHCT: -55°C to +125°C
 Input Rise & Fall Times, t_r , t_f Max 500 ns

* Unused inputs must always be tied to an appropriate logic voltage level (either V_{CC} or GND)

DC ELECTRICAL CHARACTERISTICS ($V_{CC}=5V \pm 10\%$ Unless Otherwise Specified)

Characteristic	Symbol	Test Conditions	$T_a = 25^\circ C$		KS74AHCT	KS54AHCT	Unit
			Typ	Guaranteed Limits		$T_a = -40^\circ C$ to $+85^\circ C$	
Minimum High-Level Input Voltage	V_{IH}			2.0	2.0	2.0	V
Maximum Low-Level Input Voltage	V_{IL}			0.8	0.8	0.8	V
Minimum High-Level Output Voltage	V_{OH}	$V_{IN}=V_{IH}$ or V_{IL} $I_O = -20\mu A$ $I_O = -6mA$	V_{CC} 4.2	$V_{CC} - 0.1$ 3.98	$V_{CC} - 0.1$ 3.84	$V_{CC} - 0.1$ 3.7	V
Maximum Low-Level Output Voltage	V_{OL}	$V_{IN}=V_{IH}$ or V_{IL} $I_O = 20\mu A$ $I_O = 12mA$ $I_O = 24mA$	0	0.1 0.26 0.39	0.1 0.33 0.5	0.1 0.4	V
Maximum Input Current	I_{IN}	$V_{IN}=V_{CC}$ or GND		± 0.1	± 1.0	± 1.0	μA
Maximum 3-State Leakage Current	I_{OZ}	Output Enable = V_{IH} $V_{OUT}=V_{CC}$ or GND		± 0.5	± 5.0	± 10.0	μA
Maximum Quiescent Supply Current	I_{CC}	$V_{IN}=V_{CC}$ or GND $I_{OUT}=0\mu A$		8.0	80.0	160.0	μA
Additional Worst Case Supply Current	ΔI_{CC}	per input pin $V_I = 2.4V$ other inputs: at V_{CC} or GND $I_{OUT}=0\mu A$		2.7	2.9	3.0	mA

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AC ELECTRICAL CHARACTERISTICS (Input $t_r, t_f < 2$ ns), AHCT242, AHCT243

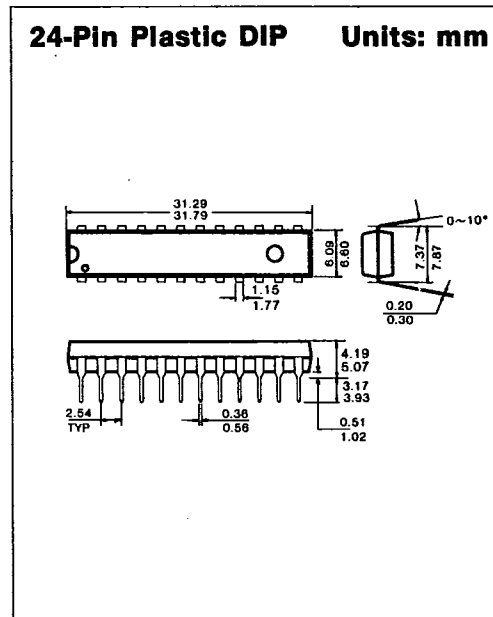
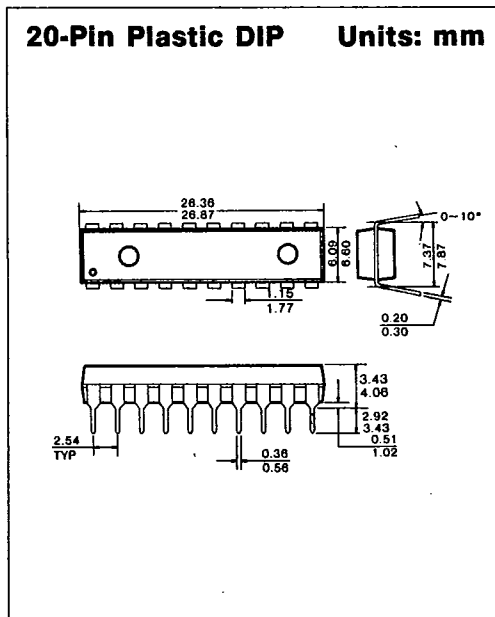
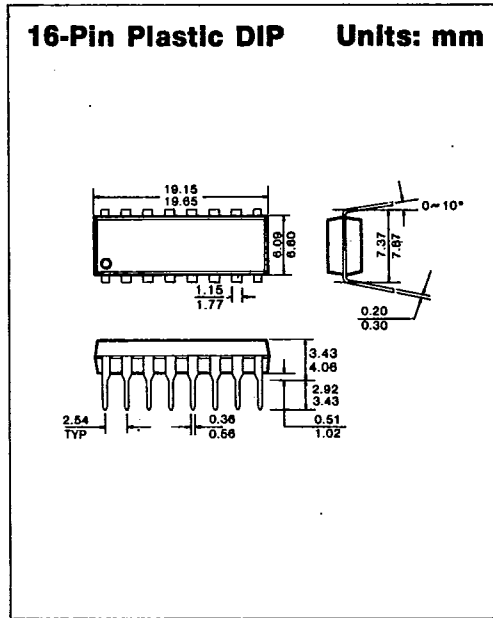
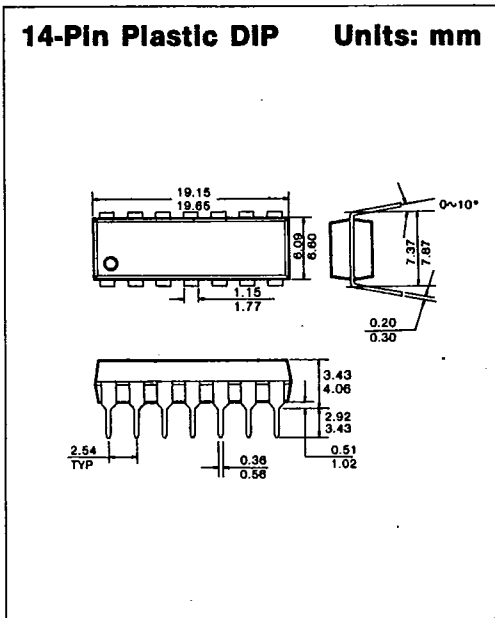
Characteristic	Symbol	Conditions†	T _a = 25°C	KS74AHCT		KS54AHCT		Unit	
			V _{CC} = 5.0V	T _a = -40°C to +85°C V _{CC} = 5.0V ± 10%		T _a = -55°C to +125°C V _{CC} = 5.0V ± 10%			
			Typ	Min	Max	Min	Max		
Propagation Delay, A to B or B to A	t _{PLH}	C _L = 50pF	7		11		15	ns	
		C _L = 150pF	10		16		21		
	t _{PHL}	C _L = 50pF	7		11		15		
		C _L = 150pF	10		16		21		
Output Enable Time GAB to B, GBA to A	t _{pZH}	R _L = 1kΩ	C _L = 50pF	12		20		25	ns
			C _L = 150pF	15		25		21	
	t _{pZL}	C _L = 50pF	12		20		25		
		C _L = 150pF	15		25		21		
Output Disable Time, GAB to B, GBA to A	t _{pHZ}	R _L = 1kΩ	12		20		25	ns	
	t _{pLZ}	C _L = 50pF	12		20		25		
Input Capacitance	C _{IN}		5					pF	
Output Capacitance	C _{OUT}	Output Disabled	10					pF	
Power Dissipation Capacitance* (per stage)	C _{PD}	Output Enabled	30					pF	
		Output Disabled	5						

* C_{PD} determines the no-load dynamic power dissipation: P_D = C_{PD} V_{CC}² f + I_{CC} V_{CC}.
 † For AC switching test circuits and timing waveforms see section 2.

PACKAGE DIMENSIONS

T-90-20

1. PLASTIC PACKAGES

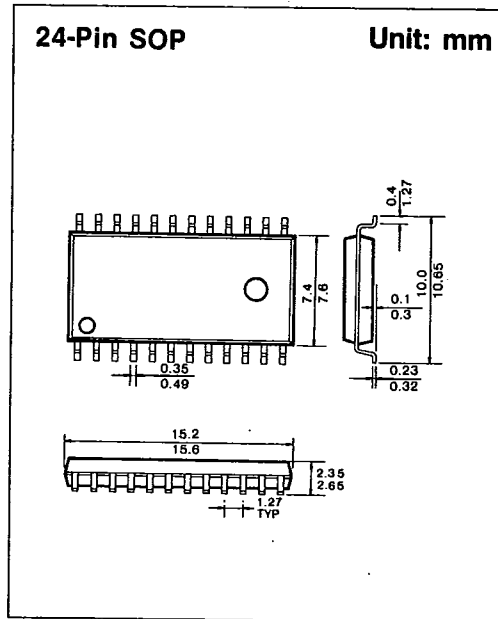
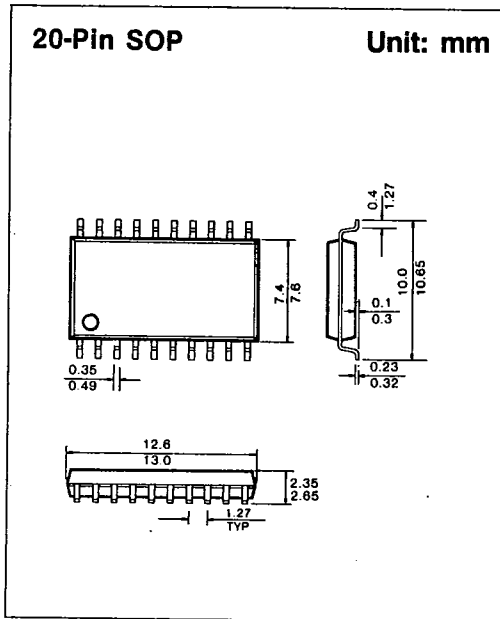
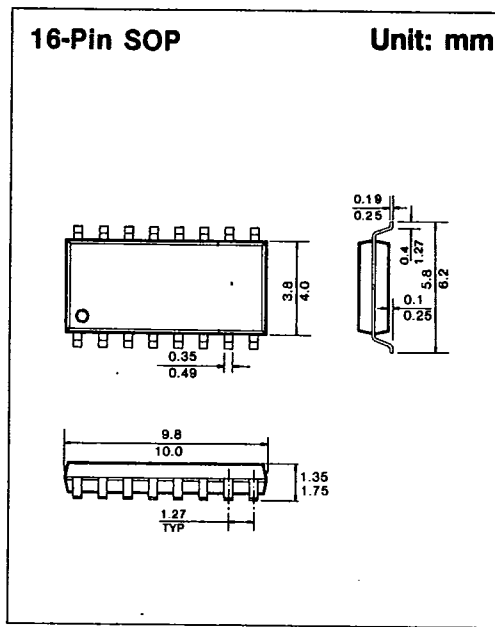
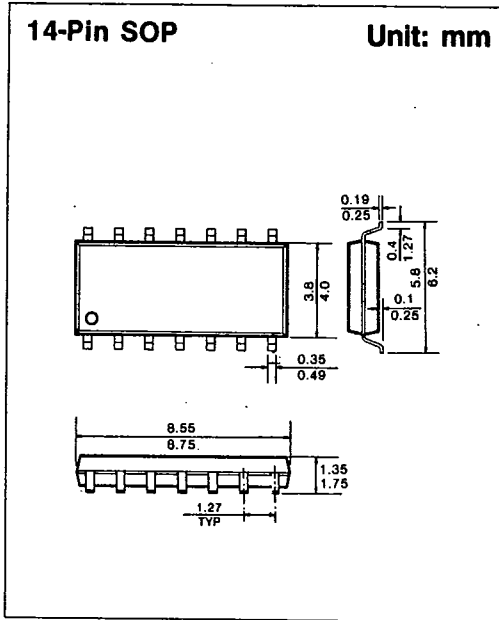


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PACKAGE DIMENSIONS

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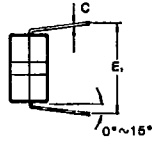
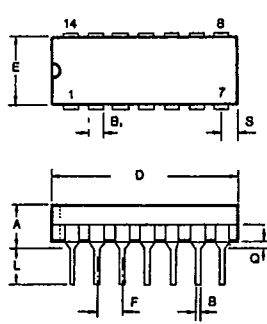


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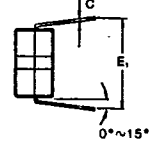
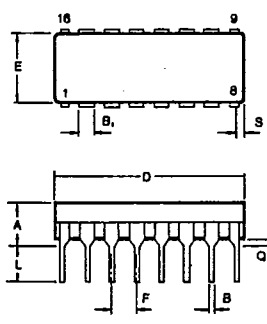
2. CERAMIC PACKAGES

14-Pin Ceramic DIP Units: mm



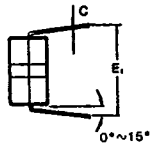
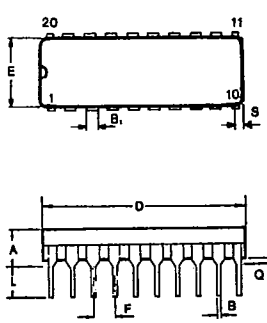
Dim	Millimeters	
	Min	Max
A	—	5.08
B	0.38	0.58
B1	1.40	1.78
C	0.20	0.38
D	18.16	19.58
E	8.10	7.49
E1	7.62	10.03
F	2.54	
L	3.18	4.19
Q	0.51	1.02
S	1.91	2.29

16-Pin Ceramic DIP Units: mm



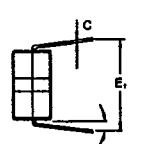
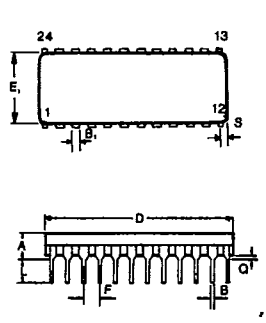
Dim	Millimeters	
	Min	Max
A	—	5.08
B	0.38	0.58
B1	1.40	1.78
C	0.20	0.38
D	19.05	19.94
E	8.10	7.49
E1	7.62	10.03
F	2.54	
L	3.18	4.19
Q	0.51	1.02
S	0.51	1.14

20-Pin Ceramic DIP Units: mm



Dim	Millimeters	
	Min	Max
A	4.06	5.08
B	0.38	0.53
B1	1.14	1.52
C	0.20	0.38
D	25.78	26.93
E	8.10	8.60
E1	7.77	7.88
F	2.54	
L	3.73	4.01
Q	0.38	0.89
S	0.51	1.14

24-Pin Ceramic DIP Units: mm



Dim	Millimeters	
	Min	Max
A	4.06	5.08
B	0.38	0.53
B1	1.14	1.52
C	0.20	0.38
D	31.50	32.84
E	7.24	7.75
E1	7.77	7.98
F	2.54	
L	3.73	4.01
Q	0.508	1.778
S	1.85	1.93

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