

LOW POWER SCHOTTKY TTL-54/74 LS SERIES

DESIGN CONSIDERATIONS

SUPPLY VOLTAGE —	+5V ±10% T54 SERIES +5V ±5% T74 SERIES
NOISE MARGIN —	V _{IL} 0.7V, V _{IH} 2.0V, V _{OL} 0.4V, V _{OH} 2.5V T54 SERIES V _{IL} 0.8V, V _{IH} 2.0V, V _{OL} 0.5V, V _{OH} 2.7V T74 SERIES
INPUT LOADING —	THE 74LS00 INPUT LOADING IS I _{IL} 0.36mA (LOW INPUT) AND I _{IH} 20μA (HIGH INPUT)
OUTPUT DRIVE —	THE 74LS00 OUTPUT DRIVE IS I _{OL} 8.0mA (SINK) AND I _{OH} 400μA (SOURCE)
FAN OUT —	FAN OUT IS THE MEASURE OF THE ABILITY OF AN LSTTL DEVICE TO DRIVE OTHER DEVICES WITHIN THE FAMILY AND IS NORMALIZED AROUND THE INPUT REQUIREMENTS OF THE 74LS00. E.G. THE 74LS00 I _{OL} IS 8.0 mA AND THUS COULD SINK 8.0/0.36 = 22 GATE INPUTS AND WITH I _{OH} 400μA COULD DRIVE 400/20 = 20 GATE INPUTS. THE DEVICE CAN DRIVE 20 GATES IN BOTH STATES AND IS SAID TO HAVE A FANOUT OF 20.

ORDERING NUMBERS

T54LSXXD2 FOR DUAL IN-LINE CERAMIC PACKAGE	-55°C TO +125°C
T74LSXXB1 FOR DUAL IN-LINE PLASTIC PACKAGE	0°C TO +70°C
T74LSXXD1 FOR DUAL IN-LINE CERAMIC PACKAGE	0°C TO +70°C
T74LSXXM FOR SO PLASTIC MICROPACKAGE	0°C TO +70°C

BURNED-IN DEVICES and/or special screening of this family available upon request. Please contact your SGS representative for further information.



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NUMERICAL DEVICE LISTING

DEVICE TYPE	FUNCTION	FAN OUT	PINS	PACKAGE *		
				PLASTIC		CERAMIC
				STD-DIP	SO	
T54LS/T74LS00	QUAD 2-INPUT NAND GATE	20	14	B	M	D
T54LS/T74LS02	QUAD 2-INPUT NOR GATE	20	14	B	M	D
T54LS/T74LS03	QUAD 2-INPUT NAND GATE (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS04	HEX INVERTER	20	14	B	M	D
T54LS/T74LS05	HEX INVERTER (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS08	QUAD 2-INPUT AND GATE	20	14	B	M	D
T54LS/T74LS09	QUAD 2-INPUT AND GATE (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS10	TRIPLE 3-INPUT NAND GATE	20	14	B	M	D
T54LS/T74LS11	TRIPLE 3-INPUT AND GATE	20	14	B	M	D
T54LS/T74LS13	DUAL 4-INPUT SCHMITT TRIGGER	20	14	B	M	D
T54LS/T74LS14	HEX SCHMITT TRIGGER	20	14	B	M	D
T54LS/T74LS15	TRIPLE 3-INPUT AND GATE (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS20	DUAL 4-INPUT NAND GATE	20	14	B	M	D
T54LS/T74LS21	DUAL 4-INPUT AND GATE	20	14	B	M	D
T54LS/T74LS22	DUAL 4-INPUT NAND GATE (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS26	QUAD 2-INPUT NAND (HIGH VOLTAGE)	20	14	B	M	D
T54LS/T74LS27	TRIPLE 3-INPUT NOR GATE	20	14	B	M	D
T54LS/T74LS28	QUAD 2-INPUT NOR BUFFER	20	14	B	M	D
T54LS/T74LS30	8-INPUT NAND GATE	20	14	B	M	D
T54LS/T74LS32	QUAD 2-INPUT OR GATE	20	14	B	M	D
T54LS/T74LS33	QUAD 2-INPUT NOR (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS37	QUAD 2-INPUT NAND BUFFER	20	14	B	M	D
T54LS/T74LS38	QUAD 2-INPUT NAND BUFFER (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS40	DUAL 4-INPUT NAND BUFFER	20	14	B	M	D
T54LS/T74LS42	1-OF-10 DECODER	20	16	B	M	D
T54LS/T74LS51	DUAL AND-OR-INVERT GATE	20	14	B	M	D
T54LS/T74LS54	2-3-3-2-INPUT	20	14	B	M	D
T54LS/T74LS55	2-WIDE 4-INPUT	20	14	B	M	D
T54LS/T74LS74	DUAL D FLIP-FLOP	20	14	B	M	D
T54LS/T74LS83	4-BIT FULL ADDER	20	16	B	M	D
T54LS/T74LS86	QUAD EXCLUSIVE OR GATE	20	14	B	M	D
T54LS/T74LS90	DECADE COUNTER	20	14	B	M	D
T54LS/T74LS92	DIVIDE-BY-12 COUNTER	20	14	B	M	D
T54LS/T74LS93	4-BIT BINARY COUNTER	20	14	B	M	D
T54LS/T74LS95	4-BIT SHIFT REGISTER	20	14	B	M	D
T54LS/T74LS109	DUAL JK EDGE-TRIGGERED FLIP-FLOP	20	16	B	M	D
T54LS/T74LS112	DUAL JK EDGE-TRIGGERED FLIP-FLOP	20	16	B	M	D
T54LS/T74LS113	DUAL JK EDGE-TRIGGERED FLIP-FLOP	20	14	B	M	D
T54LS/T74LS114	DUAL JK EDGE-TRIGGERED FLIP-FLOP	20	14	B	M	D
T54LS/T74LS125	QUAD 3-STATE BUFFER (LOW ENABLE)	20	14	B	M	D
T54LS/T74LS126	QUAD 3-STATE BUFFER (HIGH ENABLE)	20	14	B	M	D
T54LS/T74LS132	QUAD 2-INPUT SCHMITT TRIGGER	20	14	B	M	D
T54LS/T74LS133	13-INPUT NAND GATE	20	16	B	M	D
T54LS/T74LS136	QUAD EXCLUSIVE OR (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS138	1-OF-8 DECODER/DEMULTIPLXER	20	16	B	M	D
T54LS/T74LS139	DUAL 1-OF-4 DECODER/DEMULTIPLXER	20	16	B	M	D
T54LS/T74LS151	8-INPUT MULTIPLEXER	20	16	B	M	D
T54LS/T74LS152	8-INPUT MULTIPLEXER	20	14	B	M	D
T54LS/T74LS153	DUAL 4-INPUT MULTIPLEXER	20	14	B	M	D
T54LS/T74LS155	DUAL 1-OF-4 DECODER	20	16	B	M	D
T54LS/T74LS156	DUAL 1-OF-4 DECODER (OPEN COLLECTOR)	20	16	B	M	D
T54LS/T74LS157	QUAD 2-INPUT MULTIPLEXER (NON-INVERTING)	20	16	B	M	D

*REFER TO PACKAGE OUTLINE DRAWINGS PAGES 57-58

LOW POWER SCHOTTKY TTL-54/74 LS SERIES

NUMERICAL DEVICE LISTING (CONT.)

DEVICE TYPE	FUNCTION	FAN OUT	PINS	PACKAGE*		
				PLASTIC		CERAMIC
				STD-DIP	SO	
T54LS/T74LS158	QUAD 2-INPUT MULTIPLEXER (INVERTING)	20	16	B	M	D
T54LS/T74LS160	BCD DECADE COUNTER, ASYNCHRONOUS RESET	20	16	B		D
T54LS/T74LS161	4-BIT BINARY COUNTER, ASYNCHRONOUS RESET	20	16	B		D
T54LS/T74LS162	BCD DECADE COUNTER, SYNCHRONOUS RESET	20	16	B		D
T54LS/T74LS163	4-BIT BINARY COUNTER, SYNCHRONOUS RESET	20	16	B		D
T54LS/T74LS164	8-BIT SHIFT REGISTER (SERIAL-IN PARALLEL-OUT)	20	14	B		D
T54LS/T74LS168	UP/DOWN DECADE COUNTER	20	16	B		D
T54LS/T74LS169	UP/DOWN BINARY COUNTER	20	16	B		D
T54LS/T74LS170	4x4 REGISTER FILE (OPEN COLLECTOR)	20	16	B	M	D
T54LS/T74LS174	HEX D-TYPE FLIP-FLOP WITH CLEAR	20	16	B	M	D
T54LS/T74LS175	QUAD D-TYPE FLIP-FLOP WITH CLEAR	20	16	B	M	D
T54LS/T74LS181	4-BIT ALU	20	24	B		D
T54LS/T74LS190	UP/DOWN DECADE COUNTER	20	16	B	M	D
T54LS/T74LS191	UP/DOWN BINARY COUNTER	20	16	B	M	D
T54LS/T74LS192	UP/DOWN DECADE COUNTER	20	16	B	M	D
T54LS/T74LS193	UP/DOWN BINARY COUNTER	20	16	B	M	D
T54LS/T74LS194	4-BIT RIGHT/LEFT SHIFT REGISTER	20	16	B	M	D
T54LS/T74LS195	4-BIT SHIFT REGISTER	20	16	B	M	D
T54LS/T74LS196	DECADE COUNTER	20	14	B	M	D
T54LS/T74LS197	4-BIT BINARY COUNTER	20	14	B	M	D
T54LS/T74LS251	8-INPUT MULTIPLEXER (3-STATE)	20	16	B	M	D
T54LS/T74LS253	DUAL 4-INPUT MULTIPLEXER (3-STATE)	20	16	B	M	D
T54LS/T74LS256	DUAL 4-BIT ADDRESSABLE LATCH	20	16	B	M	D
T54LS/T74LS257	QUAD 2-INPUT MULTIPLEXER (3-STATE)	20	16	B	M	D
T54LS/T74LS258	QUAD 2-INPUT MULTIPLEXER (3-STATE)	20	16	B	M	D
T54LS/T74LS259	8-BIT ADDRESSABLE LATCH	15	16	B	M	D
T54LS/T74LS260	DUAL 5-INPUT NOR GATE	20	14	B	M	D
T54LS/T74LS266	QUAD EXCLUSIVE NOR (OPEN COLLECTOR)	20	14	B	M	D
T54LS/T74LS273	OCTAL D-TYPE FLIP-FLOP WITH MASTER RESET	20	20	B		D
T54LS/T74LS279	QUAD SET-RESET LATCH	20	16	B	M	D
T54LS/T74LS283	4-BIT FULL ADDER (ROTATE LS83)	20	16	B	M	D
T54LS/T74LS290	DECADE COUNTER	20	14	B	M	D
T54LS/T74LS293	4-BINARY COUNTER	20	14	B	M	D
T54LS/T74LS295	4-BIT SHIFT REGISTER (3-STATE)	20	14	B	M	D
T54LS/T74LS298	QUAD 2-INPUT MULTIPLEXER WITH OUTPUT LATCHES	20	16	B	M	D
T54LS/T74LS352	4-INPUT MULTIPLEXER	20	16	B	M	D
T54LS/T74LS353	DUAL 4-INPUT MULTIPLEXER (3-STATE LS352)	20	16	B	M	D
T54LS/T74LS365	HEX BUFFER WITH COMMON ENABLE (3-STATE)	20	16	B	M	D
T54LS/T74LS366	HEX INVERTER WITH COMMON ENABLE (3-STATE)	20	16	B	M	D
T54LS/T74LS367	HEX BUFFER, 4-BIT AND 2-BIT (3-STATE)	20	16	B	M	D
T54LS/T74LS368	HEX INVERTER, 4-BIT AND 2-BIT (3-STATE)	20	16	B	M	D
T54LS/T74LS373	OCTAL TRANSPARENT LATCH	20	20	B		D
T54LS/T74LS374	OCTAL D-TYPE FLIP-FLOP	20	20	B		D
T54LS/T74LS377	OCTAL D-TYPE FLIP-FLOP WITH ENABLE	20	20	B		D
T54LS/T74LS378	HEX D-TYPE FLIP-FLOP WITH ENABLE	20	16	B	M	D
T54LS/T74LS379	4-BIT D-TYPE FLIP-FLOP WITH ENABLE	20	16	B	M	D
T54LS/T74LS390	DUAL DECADE COUNTER	20	16	B	M	D
T54LS/T74LS393	DUAL 4-BIT BINARY COUNTER	20	14	B	M	D
T54LS/T74LS395	4-BIT SHIFT REGISTER (3-STATE)	20	16	B	M	D
T54LS/T74LS490	DUAL DECADE COUNTER	20	16	B	M	D
T54LS/T74LS670	4x4 REGISTER FILE (3-STATE)	20	16	B	M	D

*REFER TO PACKAGE OUTLINE DRAWINGS PAGES 57-58



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FUNCTION SELECTOR GUIDE

FUNCTION	DEVICE TYPE
NAND GATES	
QUAD 2-INPUT	T74/54LS00
QUAD 2-INPUT OPEN-COLLECTOR	T74/54LS03
HEX INVERTER	T74/54LS04
HEX INVERTER OPEN-COLLECTOR	T74/54LS05
TRIPLE 3-INPUT	T74/54LS10
DUAL 4-INPUT SCHMITT TRIGGER	T74/54LS13
HEX SCHMITT TRIGGER	T74/54LS14
DUAL 4-INPUT	T74/54LS20
DUAL 4-INPUT OPEN COLLECTOR	T74/54LS22
QUAD 2-INPUT HIGH VOLTAGE	T74/54LS26
8-INPUT	T74/54LS30
QUAD 2-INPUT BUFFER	T74/54LS37
QUAD 2-INPUT BUFFER OPEN-COLLECTOR	T74/54LS38
DUAL 4-INPUT BUFFER	T74/54LS40
QUAD 2-INPUT SCHMITT	T74/54LS132
13-INPUT	T74/54LS133
NOR GATES	
QUAD 2-INPUT	T74/54LS02
TRIPLE 3-INPUT	T74/54LS27
QUAD 2-INPUT BUFFER	T74/54LS28
QUAD 2-INPUT OPEN COLLECTOR	T74/54LS33
DUAL 5-INPUT	T74/54LS260
AND GATES	
QUAD 2-INPUT AND GATE	T74/54LS08
QUAD 2-INPUT AND GATE OPEN-COLLECTOR	T74/54LS09
TRIPLE 3-INPUT AND GATE	T74/54LS11
TRIPLE 3-INPUT AND GATE OPEN COLLECTOR	T74/54LS15
DUAL 4-INPUT AND GATE	T74/54LS21
OR GATES	
QUAD 2-INPUT	T74/54LS32
EXCLUSIVE-OR-GATES	
QUAD	T74/54LS86
QUAD OPEN COLLECTOR	T74/54LS136
EXCLUSIVE-NOR-GATES	
QUAD 2-INPUT OPEN COLLECTOR	T74/54LS266
AND-OR-INVERTER GATES	
DUAL	T74/54LS51
2-3-3-2 INPUT	T74/54LS54
2 WIDE 4-INPUT	T74/54LS55
BUFFERS AND INVERTERS	
QUAD 3-STATE BUFFER (LOW ENABLE)	T74/54LS125
QUAD 3-STATE BUFFER (HIGH ENABLE)	T74/54LS126
HEX BUFFER, 3-STATE, COMMON ENABLE	T74/54LS365
HEX INVERTER, 3-STATE, COMMON ENABLE	T74/54LS366
HEX BUFFER, 3-STATE, 4-BIT AND 2-BIT	T74/54LS367
HEX INVERTER, 3-STATE, 4-BIT AND 2-BIT	T74/54LS368

FUNCTION	DEVICE TYPE
FLIP-FLOPS	
DUAL D	T74/54LS74
DUAL J, K	T74/54LS109
DUAL J, K EDGE-TRIGGER	T74/54LS112
DUAL J, K EDGE-TRIGGER	T74/54LS113
DUAL J, K EDGE-TRIGGER	T74/54LS114
HEX D WITH CLEAR	T74/54LS174
QUAD WITH CLEAR	T74/54LS175
OCTAL D-TYPE	T74/54LS273
QUAD 2 MULTIPLEXER WITH OUTPUT REGISTER	T74/54LS298
HEX D-TYPE	T74/54LS378
4-BIT	T74/54LS379
LATCHES	
4x4 REGISTER FILE	T74/54LS170
4 BIT D	T74/54LS197
DUAL 4-BIT ADDRESSABLE	T74/54LS256
QUAD-SET-RESET	T74/54LS279
OCTAL TRANSPARENT	T74/54LS373
4x4 REGISTER FILE WITH 3-STATE OUTPUTS	T74/54LS670
MULTIPLEXERS	
8-INPUT	T74/54LS151
8-INPUT	T74/54LS152
DUAL 4-INPUT	T74/54LS153
QUAD 2-INPUT	T74/54LS157
QUAD 2-INPUT	T74/54LS158
DUAL 4-INPUT	T74/54LS253
QUAD 2-INPUT, 3-STATE (NON INV.)	T74/54LS257
QUAD 2-INPUT, 3-STATE (INV.)	T74/54LS258
QUAD 2 WITH OUTPUT REGISTER	T74/54LS298
DUAL 4-INPUT	T74/54LS352
DUAL 4-INPUT	T74/54LS353
DECODERS/DEMULPLEXERS	
1 OF 10 DECODER	T74/54LS42
1 OF 8	T74/54LS138
DUAL 1-OF-4	T74/54LS139
DUAL 1-OF-4 DECODER OPEN-COLLECTOR	T74/54LS156
DUAL 1-OF-4	T74/54LS256
8 BIT ADDRESSABLE	T74/54LS259
REGISTERS	
PARALLEL IN/PARALLEL OUT	T74/54LS95
8-BIT PARALLEL TO SERIAL CONVERTER	T74/54LS165
4x4 REGISTER FILE	T74/54LS170
HEX D FLIP-FLOP WITH CLEAR	T74/54LS174
QUAD FLIP-FLOP WITH CLEAR	T74/54LS175
4-BIT SHIFT REGISTER	T74/54LS195
8-BIT REGISTER	T74/54LS273
4-BIT SHIFT REGISTER, 3-STAGE	T74/54LS295
QUAD 2 MULTIPLEXER WITH OUTPUT REGISTER	T74/54LS298
OCTAL D-TYPE FLIP-FLOP	T74/54LS374
OCTAL D FLIP-FLOP	T74/54LS377
PARALLEL D REGISTER	T74/54LS378
QUAD PARALLEL REGISTER	T74/54LS379
4-BIT SHIFT REGISTER WITH 3-STATE OUTPUTS	T74/54LS395
4x4 REGISTER FILE WITH 3-STATE OUTPUTS	T74/54LS670

*REFER TO PACKAGE OUTLINE DRAWINGS PAGES 57-58

LOW POWER SCHOTTKY TTL-54/74 LS SERIES

FUNCTION SELECTOR GUIDE

FUNCTION	DEVICE TYPE
COUNTERS	
DECADE	T74/54LS90
DIVIDE-BY-TWELVE	T74/54LS92
DIVIDE-BY-SIXTEEN COUNTER	T74/54LS93
BCD DECODER ASYNC. RESET	T74/54LS160
4-BIT BINARY ASYNC.	T74/54LS161
BCD DECADE SYNC. RESET	T74/54LS162
4-BIT BINARY SYNC. RESET	T74/54LS163
SYNCHRONOUS BIDIRECTIONAL BCD DECADE	T74/54LS168
SYNCHRONOUS BIDIRECTIONAL MODULO-16 BINARY	T74/54LS169
UP/DOWN DECADE	T74/54LS190
UP/DOWN BINARY	T74/54LS191
PRESETTABLE 4-BIT BINARY UP/DOWN	T74/54LS192
UP/DOWN BINARY	T74/54LS193
DECADE	T74/54LS196
4-BIT BINARY	T74/54LS197
BCD DECADE	T74/54LS290
MODULO-16 BINARY	T74/54LS293
DUAL DECADE	T74/54LS390
DUAL 4-STAGE BINARY	T74/54LS393
DUAL DECADE	T74/54LS490
ARITHMETIC UNITS	
4-BIT FULL ADDER	T74/54LS83
4-BIT ALU	T74/54LS181
4-BIT FULL ADDER	T74/54LS283

*REFER TO PACKAGE OUTLINE DRAWINGS PAGES 57-58



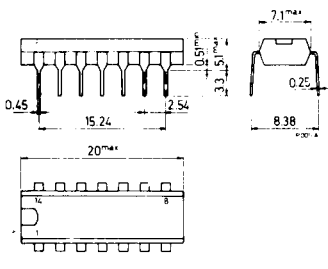
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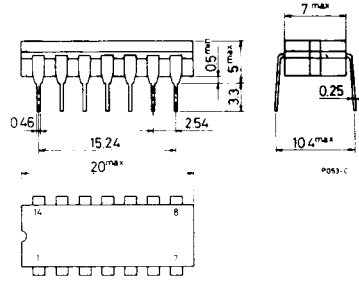
PACKAGE OUTLINE DRAWINGS

ALL DIMENSIONS IN MILLIMETERS (MULTIPLY BY 3.937×10^{-2} TO OBTAIN INCHES)

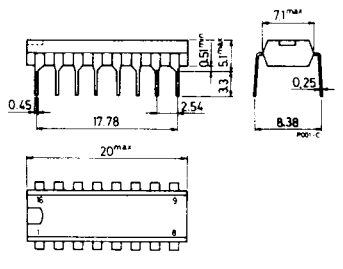
14 LEAD PLASTIC DIP (SUFFIX B)



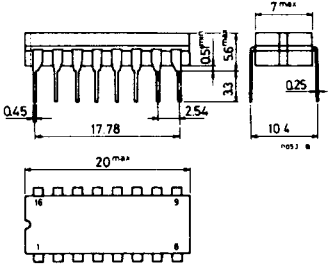
14 LEAD CERAMIC DIP (SUFFIX D)



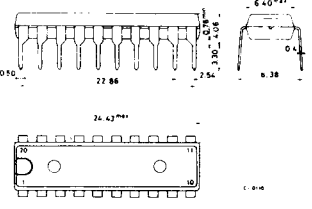
16 LEAD PLASTIC DIP (SUFFIX B)



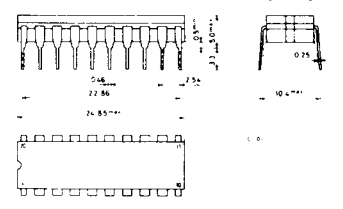
16 LEAD CERAMIC DIP (SUFFIX D)



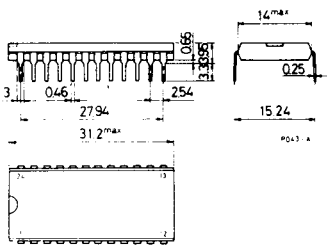
20 LEAD PLASTIC DIP (SUFFIX B)



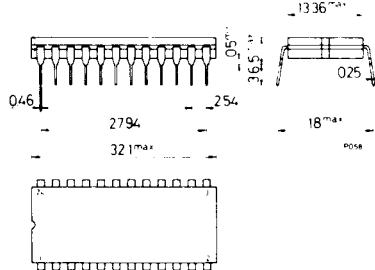
20 LEAD CERAMIC DIP (SUFFIX D)



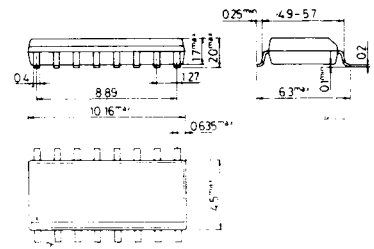
24 LEAD PLASTIC DIP (SUFFIX B)



24 LEAD CERAMIC DIP (SUFFIX D)



SO-14. 14 LEAD PLASTIC MICROPACKAGE

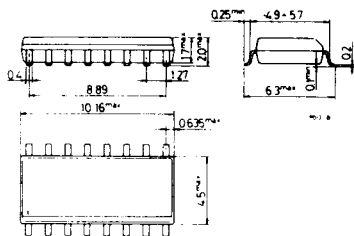


LOW POWER SCHOTTKY TTL-54/74 LS SERIES

PACKAGE OUTLINE DRAWINGS

ALL DIMENSIONS IN MILLIMETERS (MULTIPLY BY 3.937×10^2 TO OBTAIN INCHES)

90-16.16 LEAD PLASTIC MICROPACKAGE



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