# MC10195

Hex Inverter/Buffer

The MC10195 is a Hex Buffer Inverter which is built using six EXCLUSIVE NOR gates. There is a common input to these gates which when placed low or left open allows them to act as inverters. With the common input connected to a high logic level the MC10195 is a hex buffer, useful for high fanout clock driving and reducing stub lengths on long bus lines.

- P_D = 200 mW typ/pkg (No Load)
- t_{pd} = 2.8 ns typ (B–Q)
- t_{pd} = 3.8 ns typ (A–Q)
- t_r, t_f = 2.5 ns typ (20%–80%)

LOGIC DIAGRAM

V_{CC1} = PIN 1
V_{CC2} = PIN 16
V_{EE} = PIN 8
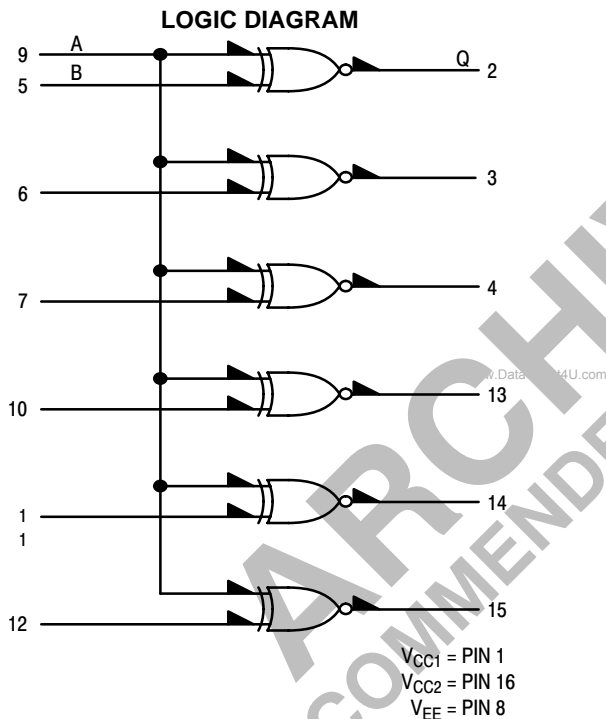
TRUTH TABLE

Inputs		Output
A	**B**	**Q**
L	L	H
L	H	L
H	L	L
H	H	H

ON Semiconductor

http://onsemi.com

MARKING DIAGRAMS
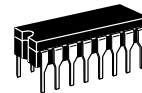
CDIP–16
L SUFFIX
CASE 620

MC10195L
AWLYYWW
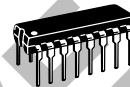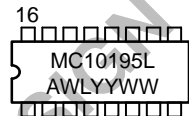
PDIP–16
P SUFFIX
CASE 648

MC10195P
AWLYYWW

PLCC–20
FN SUFFIX
CASE 775

10195
AWLYYWW
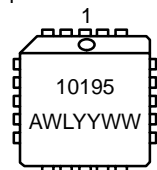
A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week

DIP PIN ASSIGNMENT

V_{CC1}	1	16	V_{CC2}
Q1	2	15	Q6
Q2	3	14	Q5
Q3	4	13	Q4
B1	5	12	B6
B2	6	11	B5
B3	7	10	B4
V_{EE}	8	9	A
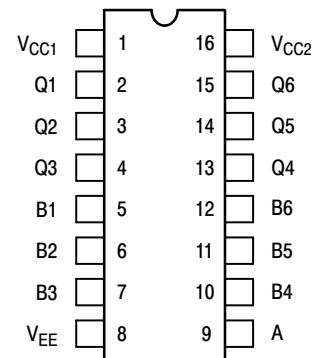
Pin assignment is for Dual–in–Line Package. For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).

ORDERING INFORMATION

Device	Package	Shipping
MC10195L	CDIP–16	25 Units / Rail
MC10195P	PDIP–16	25 Units / Rail
MC10195FN	PLCC–20	46 Units / Rail

MC10195

ELECTRICAL CHARACTERISTICS

Characteristic		Symbol	Pin Under Test	Test Limits							Unit
				−30°C		+25°C			+85°C		
				Min	Max	Min	Typ	Max	Min	Max	
Power Supply Drain Current		I_E	8		54		39	49		54	mAdc
Input Current		I_{inH}	5 9		425 460			265 290		265 290	µAdc
		I_{inL}	5	0.5		0.5			0.3		µAdc
Output Voltage	Logic 1	V_{OH}	2	−1.060	−0.890	−0.960		−0.810	−0.890	−0.700	Vdc
Output Voltage	Logic 0	V_{OL}	2	−1.890	−1.675	−1.850		−1.650	−1.825	−1.615	Vdc
Threshold Voltage	Logic 1	V_{OHA}	2	−1.080		−0.980			−0.910		Vdc
Threshold Voltage	Logic 0	V_{OLA}	2		−1.655			−1.630		−1.595	Vdc
Switching Times (50Ω Load)											ns
Propagation Delay		t_{5+2-} t_{7-4+} t_{10+13+} t_{11-14-} t_{9-14-}	2 4 13 14 14	1.1 1.1 1.1 1.1 1.1	4.2 4.2 4.2 4.2 5.2	1.1 1.1 1.1 1.1 1.1	2.8 2.8 2.8 2.8 3.8	4.0 4.0 4.0 4.0 5.0	1.1 1.1 1.1 1.1 1.1	4.4 4.4 4.4 4.4 5.4	
Rise Time	(20 to 80%)	t_{2+}	2	1.1	4.7	1.1	2.5	4.5	1.1	5.0	
Fall Time	(20 to 80%)	t_{2-}	2	1.1	4.7	1.1	2.5	4.5	1.1	5.0	

ELECTRICAL CHARACTERISTICS (continued)

				TEST VOLTAGE VALUES (Volts)					
		@ Test Temperature		V_{IHmax}	V_{ILmin}	V_{IHAmin}	V_{ILAmax}	V_{EE}	
		−30°C		−0.890	−1.890	−1.205	−1.500	−5.2	
		+25°C		−0.810	−1.850	−1.105	−1.475	−5.2	
		+85°C		−0.700	−1.825	−1.035	−1.440	−5.2	
			Pin Under Test	TEST VOLTAGE APPLIED TO PINS LISTED BELOW					
Characteristic		Symbol		V_{IHmax}	V_{ILmin}	V_{IHAmin}	V_{ILAmax}	V_{EE}	(V_{CC}) Gnd
Power Supply Drain Current		I_E	8					8	1, 16
Input Current		I_{inH}	5 9	5 9				8 8	1, 16 1, 16
		I_{inL}	5		5			8	1, 16
Output Voltage	Logic 1	V_{OH}	2					8	1, 16
Output Voltage	Logic 0	V_{OL}	2	9				8	1, 16
Threshold Voltage	Logic 1	V_{OHA}	2				5	8	1, 16
Threshold Voltage	Logic 0	V_{OLA}	2			5		8	1, 16
Switching Times	(50Ω Load)					Pulse In	Pulse Out	−3.2 V	+2.0 V
Propagation Delay		t_{5+2-} t_{7-4+} t_{10+13+} t_{11-14-} t_{9-14-}	2 4 13 14 14			5 7 10 11 9	2 4 13 14 14	8 8 8 8 8	1, 16 1, 16 1, 16 1, 16 1, 16
Rise Time	(20 to 80%)	t_{2+}	2			5	2	8	1, 16
Fall Time	(20 to 80%)	t_{2-}	2			5	2	8	1, 16

Each MECL 10,000 series circuit has been designed to meet the dc specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 linear fpm is maintained. Outputs are terminated through a 50–ohm resistor to −2.0 volts. Test procedures are shown for only one gate. The other gates are tested in the same manner.

MC10195

PACKAGE DIMENSIONS

PLCC–20
FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 775–02
ISSUE C

VIEW D–D

VIEW S

SEATING PLANE

VIEW S
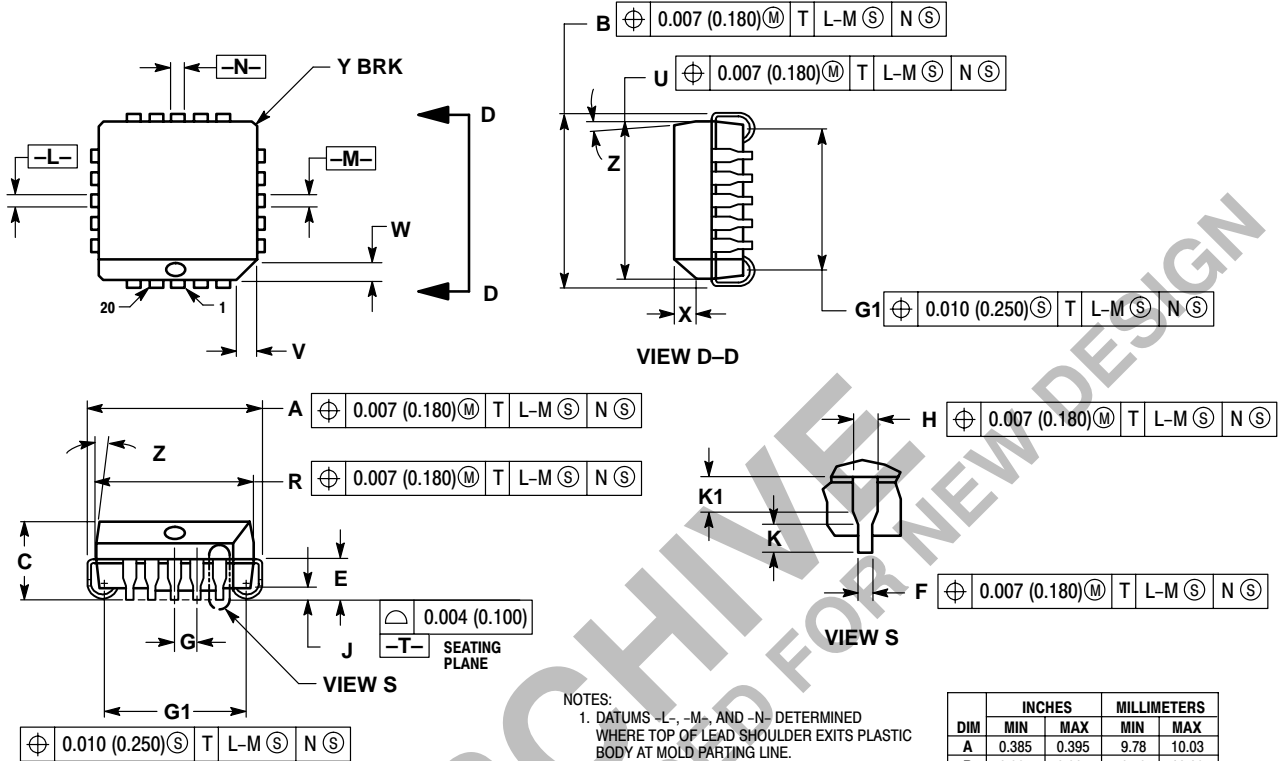
NOTES:
1. DATUMS –L–, –M–, AND –N– DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM –T–, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.385	0.395	9.78	10.03
B	0.385	0.395	9.78	10.03
C	0.165	0.180	4.20	4.57
E	0.090	0.110	2.29	2.79
F	0.013	0.019	0.33	0.48
G	0.050 BSC		1.27 BSC	
H	0.026	0.032	0.66	0.81
J	0.020	---	0.51	---
K	0.025	---	0.64	---
R	0.350	0.356	8.89	9.04
U	0.350	0.356	8.89	9.04
V	0.042	0.048	1.07	1.21
W	0.042	0.048	1.07	1.21
X	0.042	0.056	1.07	1.42
Y	---	0.020	---	0.50
Z	2 °	10 °	2 °	10 °
G1	0.310	0.330	7.88	8.38
K1	0.040	---	1.02	---

CDIP–16
L SUFFIX
CERAMIC DIP PACKAGE
CASE 620–10
ISSUE T

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
4. DIMENSION F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.750	0.785	19.05	19.93
B	0.240	0.295	6.10	7.49
C	---	0.200	---	5.08
D	0.015	0.020	0.39	0.50
E	0.050 BSC		1.27 BSC	
F	0.055	0.065	1.40	1.65
G	0.100 BSC		2.54 BSC	
H	0.008	0.015	0.21	0.38
K	0.125	0.170	3.18	4.31
L	0.300 BSC		7.62 BSC	
M	0 °	15 °	0 °	15 °
N	0.020	0.040	0.51	1.01

PDIP–16
P SUFFIX
PLASTIC DIP PACKAGE
CASE 648–08
ISSUE R

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0 °	10 °	0 °	10 °
S	0.020	0.040	0.51	1.01