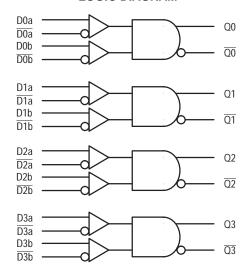
Quad 2-Input Differential AND/NAND

The MC10EP105 is a quad 2-input differential AND/NAND gate. Each gate is functionally equivalent to the EP05 and LVEL05 devices. With AC performance much faster than the LVEL05 device, the EP105 is ideal for applications requiring the fastest AC performance available. All V_{CC} and V_{EE} pins must be externally connected to power supply to guarantee proper operation.

- 275ps Typical Propagation Delay
- High Bandwidth to 3 Ghz Typical
- ECL mode: 0V V_{CC} with $V_{EE} = -3.0V$ to -5.5V
- PECL mode: 3.0V to 5.5V V_{CC} with $V_{EE} = 0V$
- Internal Input Pulldown Resistors
- ESD Protection: >4KV HBM, >100V MM
- New Differential Input Common Mode Range
- Moisture Sensitivity Level 2
 For Additional Information, See Application Note AND8003/D
- Flammability Rating: UL-94 code V-0 @ 1/8", Oxygen Index 28 to 34
- Transistor Count = 444 devices

LOGIC DIAGRAM





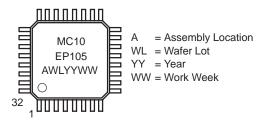
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32-LEAD TQFP FA SUFFIX CASE 873A

MARKING DIAGRAM*



*For additional information, see Application Note AND8002/D

PIN DESCRIPTION							
PIN	FUNCTION						
Dna, Dnb, Dna, Dnb	ECL Data Inputs						
Qn, Qn	ECL Data Outputs						
VBB	Reference Voltage Output						
VCC	Positive Supply						
VEE	Negative, 0 Supply						

TRUTH TABLE

Dna	Dnb	Dna	Dnb	Qn	Qn
L L H	ΗЦΗ	ΗΗLL	HLHL	L L H	H H H L

ORDERING INFORMATION

Device	Package	Shipping
MC10EP105FA	TQFP	250 Units/Tray
MC10EP105FAR2	TQFP	2000 Tape & Reel

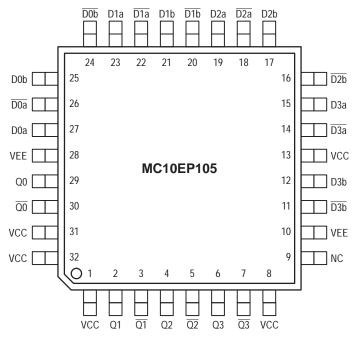


Figure 1. 32–Lead TQFP Pinout (Top View)

Warning: All V_{CC} and V_{EE} pins must be externally connected to Power Supply to guarantee proper operation.

MAXIMUM RATINGS*

Symbol	Parameter		Value	Unit	
VEE	Power Supply (V _{CC} = 0V)	Power Supply (V _{CC} = 0V)			
V _{CC}	Power Supply (V _{EE} = 0V)		6.0 to 0	VDC	
VI	Input Voltage (V _{CC} = 0V, V _I not more negative that	an V _{EE})	-6.0 to 0	VDC	
VI	Input Voltage (VEE = 0V, VI not more positive than	6.0 to 0	VDC		
l _{out}	Output Current	Continuous Surge	50 100	mA	
TA	Operating Temperature Range		-40 to +85	°C	
T _{stg}	Storage Temperature		-65 to +150	°C	
θЈА	Thermal Resistance (Junction–to–Ambient)	Still Air 500lfpm	80 55	°C/W	
θJC	Thermal Resistance (Junction-to-Case)		12 to 17	°C/W	
T _{sol}	Solder Temperature (<2 to 3 Seconds: 245°C desi	ired)	265	°C	

 $^{^{\}star}$ Maximum Ratings are those values beyond which damage to the device may occur.

DC CHARACTERISTICS, ECL/LVECL ($V_{CC} = 0V$; $V_{EE} = -5.5V$ to -3.0V) (Note 4.)

			–40°C			25°C			85°C		
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
IEE	Power Supply Current (Note 1.)	45	58	75	45	59	75	45	60	75	mA
VOH	Output HIGH Voltage (Note 2.)	-1135	-1060	-885	-1070	-945	-820	-1010	-885	-760	mV
VOL	Output LOW Voltage (Note 2.)	-1995	-1810	-1685	-1995	-1745	-1620	-1995	-1685	-1560	mV
VIH	Input HIGH Voltage Single Ended	-1210		-885	-1145		-820	-1085		-760	mV
VIL	Input LOW Voltage Single Ended	-1935		-1610	-1870		-1545	-1810		-1485	mV
VIHCMR	Input HIGH Voltage Common Mode Range (Note 3.)	VEE	+2.0	0.0	VEE	+2.0	0.0	VEE	+2.0	0.0	V
ΊΗ	Input HIGH Current			150			150			150	μΑ
IIL	Input LOW Current DDD	0.5 -150			0.5 -150			0.5 -150			μА

NOTE: 10EP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500lfpm is maintained.

- V_{CC} = 0V, V_{EE} = V_{EEmin} to V_{EEmax}, all other pins floating.
 All loading with 50 ohms to V_{CC}-2.0 volts.
 V_{IHCMR} min varies 1:1 with V_{EE}, max varies 1:1 with V_{CC}.
 Input and output parameters vary 1:1 with V_{CC}.

DC CHARACTERISTICS, LVPECL ($V_{CC} = 3.3V \pm 0.3V$, $V_{EE} = 0V$) (Note 8.)

			–40°C			25°C			85°C		
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
IEE	Power Supply Current (Note 5.)	45	58	75	45	59	75	45	60	75	mA
VOH	Output HIGH Voltage (Note 6.)	2165	2240	2415	2230	2355	2480	2290	2415	2540	mV
VOL	Output LOW Voltage (Note 6.)	1305	1490	1615	1305	1555	1680	1305	1615	1740	mV
VIH	Input HIGH Voltage Single Ended	2090		2415	2155		2480	2215		2540	mV
VIL	Input LOW Voltage Single Ended	1365		1690	1430		1755	1490		1815	mV
VIHCMR	Input HIGH Voltage Common Mode Range (Note 7.)	2.0		3.3	2.0		3.3	2.0		3.3	V
lН	Input HIGH Current			150			150			150	μΑ
IIL	Input LOW Current DDD	0.5 -150			0.5 -150			0.5 -150			μА

NOTE: 10EP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500lfpm is maintained.

- 5. $V_{CC} = 3.3V$, $V_{EE} = 0V$, all other pins floating.
- 6. All loading with 50 ohms to V_{CC}-2.0 volts.
- 7. V_{IHCMR} min varies 1:1 with V_{EE} , max varies 1:1 with V_{CC} . 8. Input and output parameters vary 1:1 with V_{CC} .

DC CHARACTERISTICS, PECL ($V_{CC} = 5.0V \pm 0.5V$, $V_{EE} = 0V$) (Note 12.)

			–40°C			25°C			85°C		
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
IEE	Power Supply Current (Note 9.)	45	58	75	45	59	75	45	60	75	mA
Vон	Output HIGH Voltage (Note 10.)	3865	3940	4115	3930	4055	4180	3990	4115	4240	mV
VOL	Output LOW Voltage (Note 10.)	3005	3190	3315	3005	3255	3380	3005	3315	3440	mV
VIH	Input HIGH Voltage Single Ended	3790		4115	3855		4180	3915		4240	mV
VIL	Input LOW Voltage Single Ended	3065		3390	3130		3455	3190		3515	mV
VIHCMR	Input HIGH Voltage Common Mode Range (Note 11.)	2.0		5.0	2.0		5.0	2.0		5.0	V
lн	Input HIGH Current			150			150			150	μΑ
IIL	Input LOW Current DD	0.5 -150			0.5 -150			0.5 -150			μА

NOTE: 10EP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500lfpm is maintained.

AC CHARACTERISTICS ($V_{CC} = 0V$; $V_{EE} = -3.0V$ to -5.5V) or ($V_{CC} = 3.0V$ to 5.5V; $V_{EE} = 0V$)

		–40°C		25°C			85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
f _{max}	Maximum Toggle Frequency (Note 13.)		3.0			3.0			3.0		GHz
tPLH, tPHL	Propagation Delay to Output Differential	150	250	350	175	275	375	200	300	400	ps
^t SKEW	Duty Cycle Skew (Note 14.)		5.0			5.0	20		5.0	20	ps
^t JITTER	Cycle-to-Cycle Jitter		TBD			TBD			TBD		ps
VPP	Input Voltage Swing (Diff.)	150	800	1200	150	800	1200	150	800	1200	mV
t _r t _f	Output Rise/Fall Times Q (20% – 80%)	100	150	200	120	170	220	150	200	250	ps

^{13.} F_{max} guaranteed for functionality only. V_{OL} and V_{OH} levels are guaranteed at DC only.

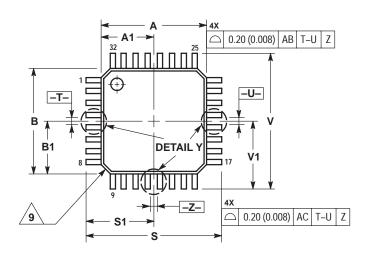
^{9.} $V_{CC} = 5.0V$, $V_{EE} = 0V$, all other pins floating. 10. All loading with 50 ohms to V_{CC} -2.0 volts. 11. V_{IHCMR} min varies 1:1 with V_{EE} , max varies 1:1 with V_{CC} . 12. Input and output parameters vary 1:1 with V_{CC} .

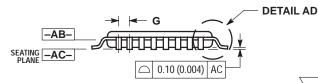
^{14.} Skew is measured between outputs under identical transitions. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.

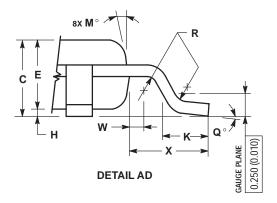
PACKAGE DIMENSIONS

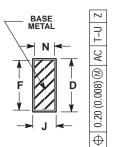
TQFP FA SUFFIX

32-LEAD PLASTIC PACKAGE CASE 873A-02 ISSUE A

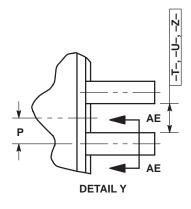








SECTION AE-AE



NOTES:

- 11. DIMENSIONING AND TOLERANCING PER ANSI
 Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DATUM PLANE -AB- IS LOCATED AT BOTTOM
 OF LEAD AND IS COINCIDENT WITH THE LEAD
 WHERE THE LEAD EXITS THE PLASTIC BODY AT
 THE BOTTOM OF THE PARTING LINE.
 4. DATUMS -T., -U., AND -Z. TO BE
 DETERMINED AT DATUM PLANE -AB-.
 5. DIMENSIONS S AND Y TO RE DETERMINED AT
 5. DIMENSIONS S AND Y TO RE DETERMINED AT
- DE TERMINED AT DATUM PLANE -AB-.
 5. DIMENSIONS S AND V TO BE DETERMINED AT
 SEATING PLANE -AC-.
 6. DIMENSIONS A AND B DO NOT INCLUDE
 MOLD PROTRUSION. ALLOWABLE PROTRUSION
 IS 0.250 (0.010) PER SIDE. DIMENSIONS A AND B
- DO INCLUDE MOLD MISMATCH AND ARE
 DETERMINED AT DATUM PLANE -AB-.
 TO DIMENSION D DOES NOT INCLUDE DAMBAR
 PROTRUSION. DAMBAR PROTRUSION SHALL NOT CAUSE THE D DIMENSION TO EXCEED 0.520 (0.020).
- u.520 (J.020).

 8. MINIMUM SOLDER PLATE THICKNESS SHALL BE 0.0076 (0.0003).

 9. EXACT SHAPE OF EACH CORNER MAY VARY FROM DEPICTION.

	MILLIN	METERS	INC	HES			
DIM	MIN	MAX	MIN	MAX			
Α	7.000	BSC	0.276	BSC			
A1	3.500	BSC	0.138	BSC			
В	7.000	BSC	0.276	BSC			
B1	3.500	BSC	0.138	BSC			
С	1.400	1.600	0.055	0.063			
D	0.300	0.450	0.012	0.018			
Ε	1.350	1.450	0.053	0.057			
F	0.300	0.400	0.012	0.016			
G	0.800	BSC	0.031 BSC				
Н	0.050	0.150	0.002	0.006			
J	0.090	0.200	0.004	0.008			
K	0.500	0.700	0.020	0.028			
M	12°	REF	12° REF				
N	0.090	0.160	0.004	0.006			
P	0.400		0.016 BSC				
Q	1°	5°	1°	5°			
R	0.150	0.250	0.006	0.010			
S	9.000	BSC	0.354	BSC			
S1	4.500	BSC	0.177	BSC			
V	9.000	BSC	0.354 BSC				
V1	4.500	BSC	0.177 BSC				
W	0.200	REF	0.008	REF			
Х	1.000	REF	0.039	REF			

Notes

Notes

MC10FP105

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