

# Registered Hex ECL/TTL Translator

The MC10/100H605 is a 6-bit, registered, dual supply ECL to TTL translator. The device features differential ECL inputs for both data and clock. The TTL outputs feature balanced 24mA sink/source capabilities for driving transmission lines.

With its differential ECL inputs and TTL outputs the H605 device is ideally suited for the receive function of a HPPI bus type board-to-board interface application. The on chip registers simplify the task of synchronizing the data between the two boards.

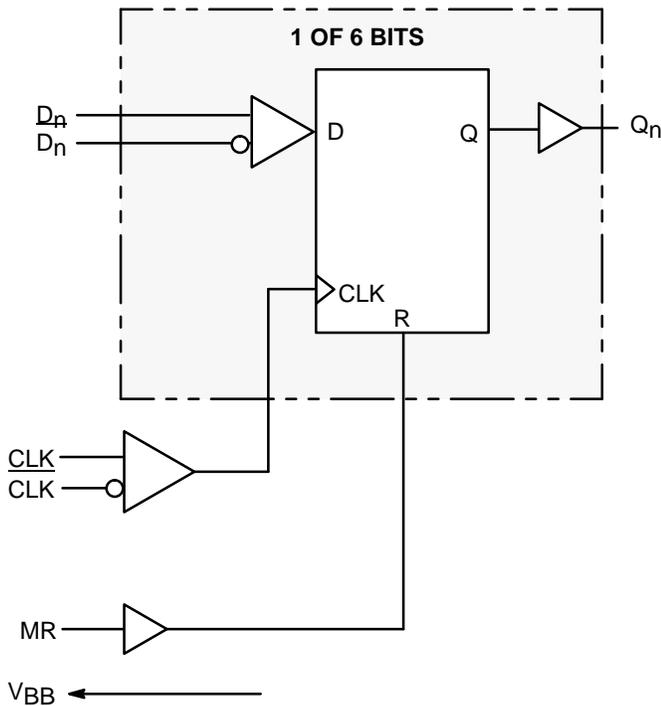
A  $V_{BB}$  reference voltage is supplied for use with single-ended data or clock. For single-ended applications the  $V_{BB}$  output should be connected to the "bar" inputs ( $D_n$  or  $CLK$ ) and bypassed to ground via a  $0.01\mu F$  capacitor. To minimize the skew of the device differential clocks should be used.

The ECL level Master Reset pin is asynchronous and common to all flip-flops. A "HIGH" on the Master Reset forces the Q outputs "LOW".

The device is available in either ECL standard: the 10H device is compatible with MECL 10H™ logic levels while the 100H device is compatible with 100K logic levels.

- Differential ECL Data and Clock Inputs
- 24mA Sink, 24mA Source TTL Outputs
- Dual Power Supply
- Multiple Power and Ground Pins to Minimize Noise
- 2.0ns Part-to-Part Skew

### LOGIC SYMBOL



## MC10H605 MC100H605



**FN SUFFIX**  
PLASTIC PACKAGE  
CASE 776-02

### PIN NAMES

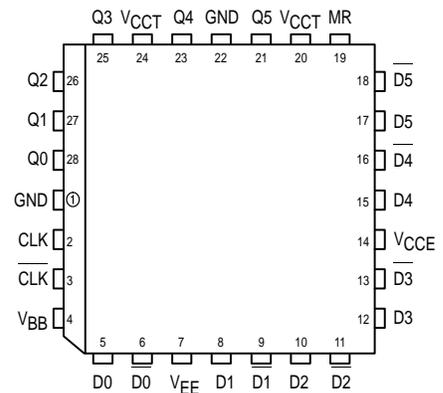
PIN	FUNCTION
$D_0$ – $D_5$	True ECL Data Inputs
$\overline{D_0}$ – $\overline{D_5}$	Inverted ECL Data Inputs
$CLK$ , $\overline{CLK}$	Differential ECL Clock Input
MR	ECL Master Reset Input
$Q_0$ – $Q_5$	TTL Outputs
$V_{CCE}$	ECL $V_{CC}$
$V_{CCT}$	TTL $V_{CC}$
GND	TTL Ground
$V_{EE}$	ECL $V_{EE}$

### TRUTH TABLE

$D_n$	MR	TCLK/CLK	$Q_{n+1}$
L	L	Z	L
H	L	Z	H
X	H	X	L

Z = LOW to HIGH Transition

### Pinout: 28-Lead PLCC (Top View)



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**10H ECL DC CHARACTERISTICS** ( $V_{CCT} = +5.0V \pm 5\%$ ;  $V_{EE} = -5.20V \pm 5\%$ )

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
$I_{EE}$	Supply Current		63	75		63	75		61	75	mA	
$I_{IH}$	Input High Current			225			145			145	$\mu A$	
$I_{IL}$	Input Low Current	0.5			0.5			0.5			$\mu A$	
$V_{IH}$	Input High Voltage	-1170		-840	-1130		-810	-1060		-720	mV	
$V_{IL}$	Input Low Voltage	-1950		-1480	-1950		-1480	-1950		-1480	mV	
$V_{BB}$	Output Bias Voltage	-1400		-1280	-1370		-1270	-1330		-1210	mV	
$V_{Diff}$	Input Differential Voltage	150			150			150			mV	
$V_{max}$ CMRR	Input Common Mode Reject Range			0			0			0	mV	
$V_{min}$ CMRR	Input Common Mode Reject Range	-2800 -3000 -3300			-2800 -3000 -3300			-2800 -3000 -3300			mV	$V_{EE} = -4.94$ $V_{EE} = -5.20$ $V_{EE} = -5.46$

**100H ECL DC CHARACTERISTICS** ( $V_{CCT} = +5.0V \pm 5\%$ ;  $V_{EE} = -4.5V \pm 0.3V$ )

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
$I_{EE}$	Supply Current		65	75		65	75		70	85	mA	
$I_{IH}$	Input High Current			225			145			145	$\mu A$	
$I_{IL}$	Input Low Current	0.5			0.5			0.5			$\mu A$	
$V_{IH}$	Input High Voltage	-1165		-880	-1165		-880	-1165		-880	mV	
$V_{IL}$	Input Low Voltage	-1810		-1475	-1810		-1475	-1810		-1475	mV	
$V_{BB}$	Output Bias Voltage	-1400		-1280	-1400		-1280	-1400		-1200	mV	
$V_{Diff}$	Input Differential Voltage	150			150			150			mV	
$V_{max}$ CMRR	Input Common Mode Reject Range			0			0			0	mV	
$V_{min}$ CMRR	Input Common Mode Reject Range	-2000 -2200 -2400			-2000 -2200 -2400			-2000 -2200 -2400			mV	$V_{EE} = -4.20$ $V_{EE} = -4.50$ $V_{EE} = -4.80$

\* NOTE: DO NOT short the ECL inputs to the TTL  $V_{CC}$ .

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**TTL DC CHARACTERISTICS** ( $V_{CC} = +5.0V \pm 5\%$ ;  $V_{EE} = -5.2V \pm 5\%$  (10H);  $V_{EE} = -4.5V \pm 0.3V$  (100H))

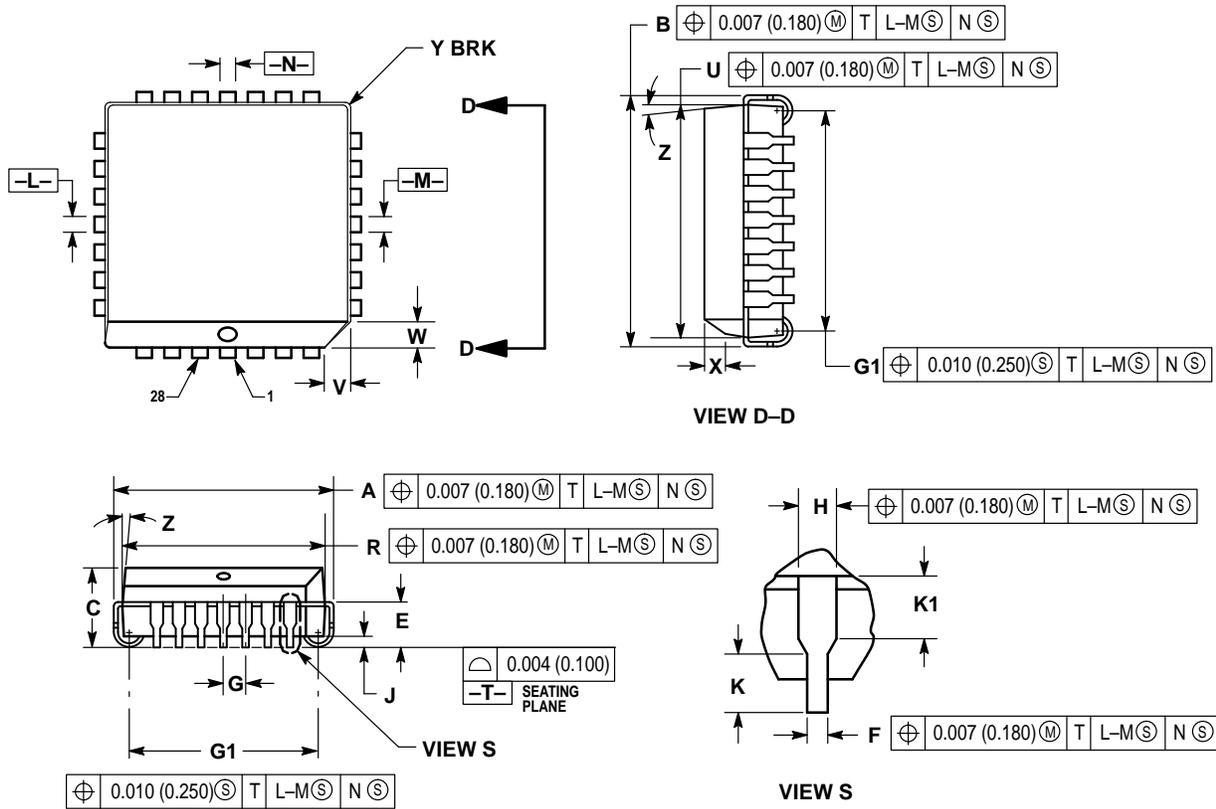
Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
I <sub>CCL</sub>	Supply Current		65	75		65	75		65	75	mA	Outputs Low
I <sub>CCH</sub>	Supply Current		65	75		65	75		65	75	mA	Outputs High
V <sub>OL</sub>	Output Low Voltage			0.5			0.5			0.5	mV	I <sub>OL</sub> = 24mA
V <sub>OH</sub>	Output High Voltage	2.5			2.5			2.5			mV	I <sub>OH</sub> = 24mA
I <sub>OS</sub>	Output Short Circuit Current	100		225	100		225	100		225	mA	V <sub>OUT</sub> = 0V

**AC TEST LIMITS** ( $V_{CC} = +5.0V \pm 5\%$ ;  $V_{EE} = -5.2V \pm 5\%$  (10H);  $V_{EE} = -4.5V \pm 0.3V$  (100H))

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
t <sub>PLH</sub>	Propagation Delay CLK to Q (Diff) CLK to Q (SE)	4.5 4.3	5.3 5.3	6.5 6.7	4.5 4.3	5.4 5.4	6.5 6.7	4.5 4.3	5.6 5.6	6.5 6.7	ns	Across P.S. and Temp C <sub>L</sub> = 50pF
t <sub>PHL</sub>	Propagation Delay CLK to Q (Diff) CLK to Q (SE)	4.0 3.8	5.0 5.0	6.0 6.2	4.0 3.8	5.1 5.1	6.0 6.2	4.0 3.8	5.5 5.5	6.0 6.2	ns	Across P.S. and Temp C <sub>L</sub> = 50pF
t <sub>PHL</sub>	Propagation Delay MR to Q	2.5	4.9	7.0	2.5	5.2	7.0	3.0	5.8	7.5	ns	Across P.S. and Temp C <sub>L</sub> = 50pF
t <sub>SKEW</sub>	Device Skew Part-to-Part (Diff) Within-Device		1.0 0.3	2.0 0.7		1.0 0.3	2.0 0.7		1.0 0.3	2.0 0.7	ns	C <sub>L</sub> = 50pF
t <sub>S</sub>	Setup Time	1.5			1.5			1.5			ns	
t <sub>H</sub>	Hold Time	1.5			1.5			1.5			ns	
t <sub>PW</sub>	Minimum Pulse Width CLK	1.0			1.0			1.0			ns	
t <sub>PW</sub>	Minimum Pulse Width MR	1.0			1.0			1.0			ns	
V <sub>PP</sub>	Minimum Input Swing	150			150			150			mV	Peak-to-Peak
t <sub>r</sub>	Rise Time	0.7	1.0	1.5	0.7	1.0	1.5	0.7	1.0	1.5	ns	1V to 2V
t <sub>f</sub>	Fall Time	0.5	0.7	1.2	0.5	0.7	1.2	0.5	0.7	1.2	ns	1V to 2V
t <sub>RR</sub>	Reset/Recovery Time	2.5			2.5			2.5			ns	

OUTLINE DIMENSIONS

FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 776-02  
ISSUE D



NOTES:

- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- 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.
- 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	0.485	0.495	12.32	12.57
B	0.485	0.495	12.32	12.57
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	0.450	0.456	11.43	11.58
U	0.450	0.456	11.43	11.58
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°	
G1	0.410	0.430	10.42	10.92
K1	0.040	—	1.02	—

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