

Quad MECL to TTL Translator

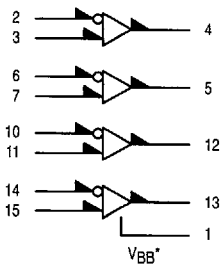
The MC10125 is a quad translator for interfacing data and control signals between the MECL section and saturated logic sections of digital systems. The MC10125 incorporates differential inputs and Schottky TTL "totem pole" outputs. Differential inputs allow for use as an inverting/non-inverting translator or as a differential line receiver. The V_{BB} reference voltage is available on pin 1 for use in single-ended input biasing. The outputs of the MC10125 go to a low logic level whenever the inputs are left floating.

Power supply requirements are ground, +5.0 Volts and -5.2 Volts. Propagation delay of the MC10125 is typically 4.5 ns. The MC10125 has fanout of 10 TTL loads. The dc levels are MECL 10,000 in and Schottky TTL, or TTL out. This device has an input common mode noise rejection of ± 1.0 Volt.

An advantage of this device is that MECL level information can be received, via balanced twisted pair lines, in the TTL equipment. This isolates the MECL logic from the noisy TTL environment. This device is useful in computers, instrumentation, peripheral controllers, test equipment and digital communications systems.

$P_D = 380$ mW typ/pkg (No Load)
 $t_{pd} = 4.5$ ns typ (50% to + 1.5 Vdc out)
 $t_r, t_f = 2.5$ ns typ (1.0 V to 2.0 V)

LOGIC DIAGRAM



Gnd = PIN 16
 V_{CC} (+5.0Vdc) = PIN 9
 V_{EE} (-5.2Vdc) = PIN 8

* V_{BB} to be used to supply bias to the MC10125 only and bypassed (when used) with 0.01 μ F to 0.1 μ F capacitor to ground (0 V). V_{BB} can source < 1.0 mA.
 When the input pin with the bubble goes positive, the output goes negative.

MC10125



L SUFFIX
CERAMIC PACKAGE
CASE 620-10

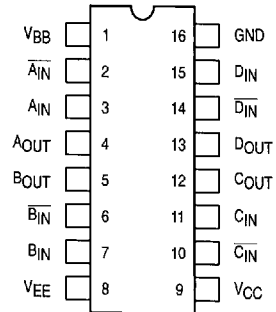


P SUFFIX
PLASTIC PACKAGE
CASE 648-08



FN SUFFIX
PLCC
CASE 775-02

DIP PIN ASSIGNMENT



Pin assignment is for Dual-In-Line Package.
 For PLCC pin assignment, see the Pin Conversion
 Tables on page 6-11.

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ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Pin Under Test	Test Limits						Unit	
			-30°C		+25°C			+85°C		
			Min	Max	Min	Typ	Max	Min		Max
Negative Power Supply Drain Current	I_E	8		-44			-40		-44	mAdc
Positive Power Supply Drain Current	I_{CCH}	9		52			52		52	mAdc
	I_{CCL}	9		39			39		39	mAdc
Input Current	I_{inH}^1	2		180			115		115	μ Adc
Input Leakage Current	I_{CBO}	2		1.5			1.0		1.0	μ Adc
High Output Voltage	V_{OH}	4	2.5		2.5			2.5		Vdc
Low Output Voltage	V_{OL}	4		0.5			0.5		0.5	Vdc
High Threshold Voltage	V_{OHA}	4	2.5		2.5			2.5		Vdc
Low Threshold Voltage	V_{OLA}	4		0.5			0.5		0.5	Vdc
Indeterminate Input Protection Tests	V_{OLS1}	4		0.5			0.5		0.5	Vdc
	V_{OLS2}	4		0.5			0.5		0.5	Vdc
Short Circuit Current	I_{OS}	4	40	100	40		100	40	100	mAdc
Reference Voltage	V_{BB}	1	-1.420	-1.280	-1.350		-1.230	-1.295	-1.150	Vdc
Common Mode Rejection Tests	V_{OH}	4	2.5		2.5			2.5		Vdc
		4	2.5		2.5			2.5		Vdc
	V_{OL}	4		0.5			0.5		0.5	Vdc
		4		0.5			0.5		0.5	Vdc
Switching Times (50 Ω Load)										ns
Propagation Delay (50% to +1.5Vdc)	t_{6+5-}	5	1.0	6.0	1.0	4.5	6.0	1.0	6.0	
	t_{6-5+}	5	1.0	6.0	1.0	4.5	6.0	1.0	6.0	
	t_{2+4-}	4	1.0	6.0	1.0	4.5	6.0	1.0	6.0	
	t_{2-4+}	4	1.0	6.0	1.0	4.5	6.0	1.0	6.0	
Rise Time (+1.0V to 2.0V)	t_{4+}	4		3.3			3.3		3.3	
Fall Time (+1.0V to 2.0V)	t_{4-}	4		3.3			3.3		3.3	

1. Individually test each output, apply V_{IHmax} to pin under test.

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ELECTRICAL CHARACTERISTICS (continued)

② Test Temperature			TEST VOLTAGE VALUES (Volts)						Gnd	Output Condition
			V _{IHmax}	V _{ILmin}	V _{IHAmin}	V _{ILAmax}	V _{IHH}	V _{ILH}		
-30°C			-0.890	-1.890	-1.205	-1.500	+0.110	-0.890		
+25°C			-0.810	-1.850	-1.105	-1.475	+0.190	-0.850		
+85°C			-0.700	-1.825	-1.035	-1.440	+0.300	-0.825		
Characteristic	Symbol	Pin Under Test	TEST VOLTAGE APPLIED TO PINS LISTED BELOW						Gnd	Output Condition
			V _{IHmax}	V _{ILmin}	V _{IHAmin}	V _{ILAmax}	V _{IHH}	V _{ILH}		
Negative Power Supply Drain Current	I _E	8							16	
Positive Power Supply Drain Current	I _{CCCH}	9	2,6,10,14						16	
	I _{CCCL}	9		2,6,10,14					16	
Input Current	I _{inH} ¹	2	2,6,10,14						16	
Input Leakage Current	I _{CBO}	2							16	
High Output Voltage	V _{OH}	4		2,6,10,14					16	-2.0mA
Low Output Voltage	V _{OL}	4	2,6,10,14						16	20mA
High Threshold Voltage	V _{OHA}	4		6,10,14		2			16	-2.0mA
Low Threshold Voltage	V _{OLA}	4	6,10,14		2				16	20mA
Indeterminate Input Protection Tests	V _{OLS1}	4							16	20mA
	V _{OLS2}	4							16	20mA
Short Circuit Current	I _{OS}	4		2,6,10,14					4, 16	
Reference Voltage	V _{BB}	1		2,6,10,14						
Common Mode Rejection Tests	V _{OH}	4					3	2	16	-2.0mA
		4							16	-2.0mA
	V _{OL}	4					2	3	16	20mA
		4							16	20mA
Switching Times (50Ω Load)			Pulse In	Pulse Out	C _L (pF)					
Propagation Delay (50% to +1.5Vdc)	t ₆₊₅₋	5	6	5	25				16	
	t ₆₋₅₊	5	6	5	25				16	
	t ₂₊₄₋	4	2	4	25				16	
	t ₂₋₄₊	4	2	4	25				16	
Rise Time (+1.0V to 2.0V)	t ₄₊	4	2	4	25				16	
Fall Time (+1.0V to 2.0V)	t ₄₋	4	2	4	25				16	

1. Individually test each output, apply V_{IHmax} to pin under test.

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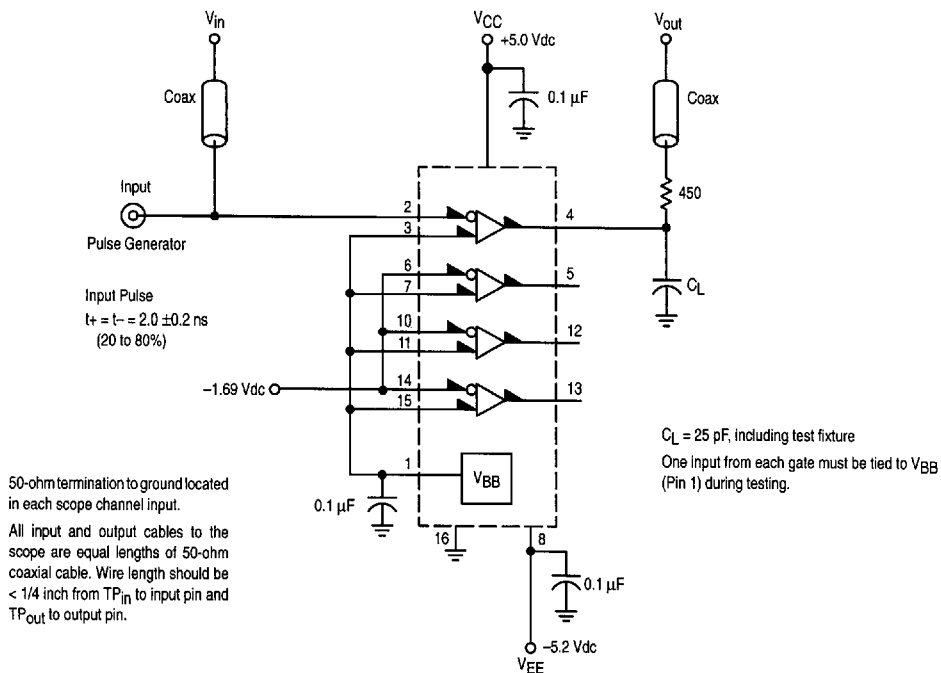
ELECTRICAL CHARACTERISTICS (continued)

© Test Temperature			TEST VOLTAGE VALUES (Volts)					Gnd	Output Condition
			V _{IHH}	V _{ILH}	V _{BB}	V _{CC}	V _{VEE}		
-30°C			-1.890	-2.890	From Pin 1	+5.0	-5.2		
+25°C			-1.810	-2.850		+5.0	-5.2		
+85°C			-1.700	-2.825		+5.0	-5.2		
Characteristic	Symbol	Pin Under Test	TEST VOLTAGE APPLIED TO PINS LISTED BELOW					Gnd	Output Condition
			V _{IHH}	V _{ILH}	V _{BB}	V _{CC}	V _{VEE}		
Negative Power Supply Drain Current	I _E	8			3,7,11,15	9	8	16	
Positive Power Supply Drain Current	I _{CCH}	9			3,7,11,15	9	8	16	
	I _{CCL}	9			3,7,11,15	9	8	16	
Input Current	I _{inH} ¹	2			3,7,11,15	9	8	16	
Input Leakage Current	I _{CBO}	2			3,7,11,15	9	2,6,8,10,14	16	
High Output Voltage	V _{OH}	4			3,7,11,15	9	8	16	-2.0mA
Low Output Voltage	V _{OL}	4			3,7,11,15	9	8	16	20mA
High Threshold Voltage	V _{OHA}	4			3,7,11,15	9	8	16	-2.0mA
Low Threshold Voltage	V _{OLA}	4			3,7,11,15	9	8	16	20mA
Indeterminate Input Protection Tests	V _{OLS1}	4				9	2,3,6,7,8,10,11,14,15	16	20mA
	V _{OLS2}	4				9	8	16	20mA
Short Circuit Current	I _{OS}	4			3,7,11,15	9	8	4, 16	
Reference Voltage	V _{BB}	1			3,7,11,15				
Common Mode Rejection Tests	V _{OH}	4				9	8	16	-2.0mA
		4	3	2		9	8	16	-2.0mA
	V _{OL}	4				9	8	16	20mA
		4	2	3		9	8	16	20mA
Switching Times (50Ω Load)									
Propagation Delay (50% to +1.5Vdc)	t ₆₋₅₋	5			3,7,11,15	9	8	16	
	t ₆₋₅₊	5			3,7,11,15	9	8	16	
	t ₂₊₄₋	4			3,7,11,15	9	8	16	
	t ₂₋₄₊	4			3,7,11,15	9	8	16	
Rise Time (+1.0V to 2.0V)	t ₄₊	4			3,7,11,15	9	8	16	
Fall Time (+1.0V to 2.0V)	t ₄₋	4			3,7,11,15	9	8	16	

1. Individually test each output, apply V_{IHmax} to pin under test.

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.

SWITCHING TIME TEST CIRCUIT



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