

# F100125 Hex ECL-to-TTL Translator

F100K ECL Product

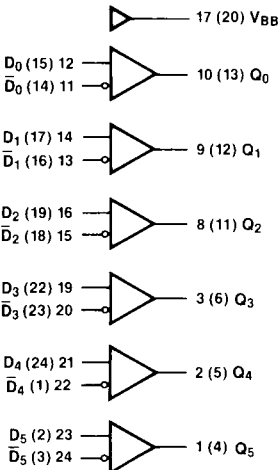
### Description

The F100125 is a hex translator for converting F100K logic levels to TTL logic levels. Differential inputs allow each circuit to be used as an inverting, non-inverting or differential receiver. An internal reference voltage generator provides  $V_{BB}$  for single-ended operation or for use in Schmitt trigger applications. All inputs have 50 k $\Omega$  pull-down resistors; therefore, the outputs will go LOW when the inputs are left unconnected.

When used in the differential mode, the inputs have a common mode rejection of +1 V, making this device tolerant of ground offsets and transients between the signal source and the translator. The  $V_{EE}$  and  $V_{TTL}$  power may be applied in either order.

Pin Names	Description	TTL Unit Load (U.L.)	
		HIGH	LOW
$D_0$ - $D_5$	Data Inputs	—	—
$\bar{D}_0$ - $\bar{D}_5$	Inverting Data Inputs	—	—
$Q_0$ - $Q_5$	Data Outputs	50	12.5

### Logic Symbol



$V_{TTL}$  = Pins 4 (7), 5 (8)

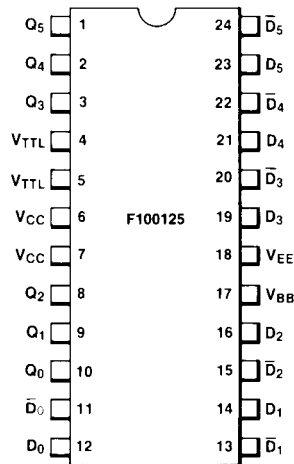
$V_{CC}$  = Pins 6 (9), 7 (10)

$V_{EE}$  = Pin 18 (21)

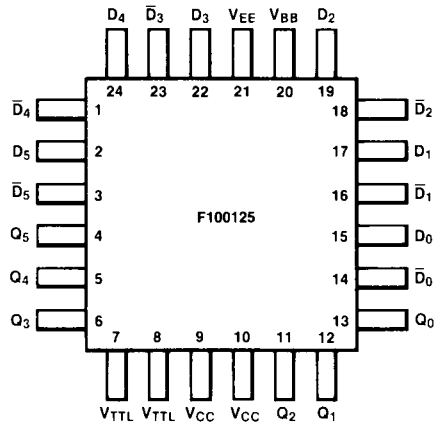
( ) = Flatpak

### Connection Diagrams

#### 24-Pin DIP (Top View)



#### 24-Pin Flatpak (Top View)



### Ordering Information

Package	Outline	Order Code
Ceramic DIP	6Y	DC
Flatpak	4V	FC

Truth Table

Inputs		Outputs
D <sub>n</sub>	$\overline{D}_n$	Q <sub>n</sub>
L	H	L
H	L	H
L	L	U
H	H	U
Open	Open	L
V <sub>EE</sub>	V <sub>EE</sub>	L
L	V <sub>BB</sub>	L
H	V <sub>BB</sub>	H
V <sub>BB</sub>	L	H
V <sub>BB</sub>	H	L

H = HIGH Voltage Level  
 L = LOW Voltage Level  
 U = Undefined

**Absolute Maximum Ratings<sup>1</sup>** Above which the useful life may be impaired

V<sub>TTL</sub> Pin Potential to Ground Pin +6.0 V to -0.5 V

**DC Characteristics:** V<sub>EE</sub> = -4.2 V to -4.8 V unless otherwise specified, V<sub>CC</sub> = GND, V<sub>TTL</sub> = +4.5 to +5.5 V, T<sub>C</sub> = 0°C to +85°C

Symbol	Characteristic	Min	Typ	Max	Unit	Condition
V <sub>OH</sub>	Output HIGH Voltage	2.5			V	I <sub>OH</sub> = -2.0 mA
V <sub>OL</sub>	Output LOW Voltage			0.5	V	I <sub>OL</sub> = 20 mA
V <sub>IH</sub>	Single-ended Input HIGH Voltage	-1165		-880	mV	V <sub>EE</sub> = -4.5 V
		-1150		-880	mV	V <sub>EE</sub> = -4.2 V to -4.8 V
V <sub>IL</sub>	Single-ended Input LOW Voltage	-1810		-1475	mV	V <sub>EE</sub> = -4.5 V
		-1810		-1490	mV	V <sub>EE</sub> = -4.2 V to -4.8 V
V <sub>BB</sub>	Output Reference Voltage	-1380	-1320	-1260	mV	V <sub>EE</sub> = -4.5 V
		-1396	-1320	-1244	mV	V <sub>EE</sub> = -4.2 V to -4.8 V

**Notes**

1. See Family Characteristics for other absolute maximum ratings
2. One input tied to V<sub>BB</sub>

# F100125

3

**DC Characteristics** (Cont'd):  $V_{EE} = -4.2\text{ V to }-4.8\text{ V}$  unless otherwise specified,  $V_{CC} = \text{GND}$ ,  
 $V_{TTL} = +4.5\text{ to }+5.5\text{ V}$ ,  $T_C = 0^\circ\text{C to }+85^\circ\text{C}$

Symbol	Characteristic	Min	Typ	Max	Unit	Condition
$V_{DIFF}$	Input Voltage Differential	150			mV	Required for Full Output Swing
$V_{CM}$	Common Mode Voltage			1.0	V	Permissible $\pm V_{CM}$ with Respect to $V_{BB}$
$I_{IH}$	Input HIGH Current			350	$\mu\text{A}$	$V_{IN} = V_{IH(max)}$ , $D_0-D_5 = V_{BB}$ , $\overline{D_0}-\overline{D_5} = V_{IL(min)}$
$I_{IL}$	Input LOW Current	0.5			$\mu\text{A}$	$V_{IN} = V_{IL(min)}$ , $D_0-D_5 = V_{BB}$
$I_{OS}$	Output Short-circuit Current	-100		-40	mA	$V_{OUT} = \text{GND}^*$
$I_{EE}$	$V_{EE}$ Power Supply Current	-85	-60	-40	mA	$D_0-D_5 = V_{BB}$
$I_{TTL}$	$V_{TTL}$ Power Supply Current		75	115	mA	$D_0-D_5 = V_{BB}$

**Ceramic Dual In-line Package AC Characteristics:**  $V_{EE} = -4.2\text{ V to }-4.8\text{ V}$ ,  $V_{CC} = \text{GND}$ ,  $V_{TTL} = +4.5\text{ V to }+5.5\text{ V}$

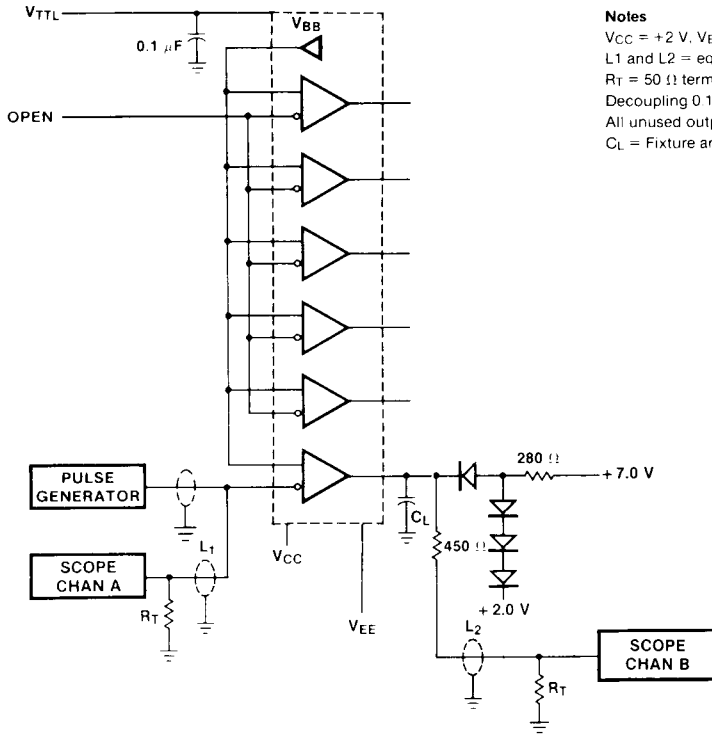
Symbol	Characteristic	$T_C = 0^\circ\text{C}$		$T_C = +25^\circ\text{C}$		$T_C = +85^\circ\text{C}$		Unit	Condition
		Min	Max	Min	Max	Min	Max		
$t_{PLH}$ $t_{PHL}$	Propagation Delay Data to Output	0.80	3.50	0.90	3.70	1.00	4.00	ns	Figures 1 and 2
$t_{TLH}$ $t_{THL}$	Transition Time 1 V to 2 V, 2 V to 1 V	0.50	2.60	0.50	2.60	0.50	2.60	ns	

**Flatpak AC Characteristics:**  $V_{EE} = -4.2\text{ V to }-4.8\text{ V}$ ,  $V_{CC} = \text{GND}$ ,  $V_{TTL} = +4.5\text{ V to }+5.5\text{ V}$

Symbol	Characteristic	$T_C = 0^\circ\text{C}$		$T_C = +25^\circ\text{C}$		$T_C = +85^\circ\text{C}$		Unit	Condition
		Min	Max	Min	Max	Min	Max		
$t_{PLH}$ $t_{PHL}$	Propagation Delay Data to Output	0.80	3.30	0.90	3.50	1.00	3.80	ns	Figures 1 and 2
$t_{TLH}$ $t_{THL}$	Transition Time 1 V to 2 V, 2 V to 1 V	0.50	2.50	0.50	2.50	0.50	2.50	ns	

\* Test one output at a time.

Fig. 1 AC Test Circuit



**Notes**

- VCC = +2 V, VEE = -2.5 V, VTTL = +7 V
- L1 and L2 = equal length 50 Ω impedance lines
- RT = 50 Ω terminator internal to scope
- Decoupling 0.1 μF from GND to VCC. VEE and VTTL
- All unused outputs are loaded with 50 Ω to GND
- CL = Fixture and stray capacitance ≲ 3 pF

Fig. 2 Propagation Delay and Transition Times

