Advance Information

This document contains information on a product under development. The parametric information contains target parametersis are subject to change.

Bt297

27 MHz VideoNet™ 10KH ECL to TTL 11-Bit Translator

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Distinguishing Features

- 10KH ECL Compatible Inputs
- Registered or Transparent Operation
- TTL-Compatible Outputs
- Separate TTL and ECL Supply Pins
- TTL-Compatible Control Inputs
- 68-pin PLCC Package
- Typical Power Dissipation: 550 mW

Applications

- CCIR601
- SMPTE RP125
- EBU 3246-E

Related Devices

- Bt296

Product Description

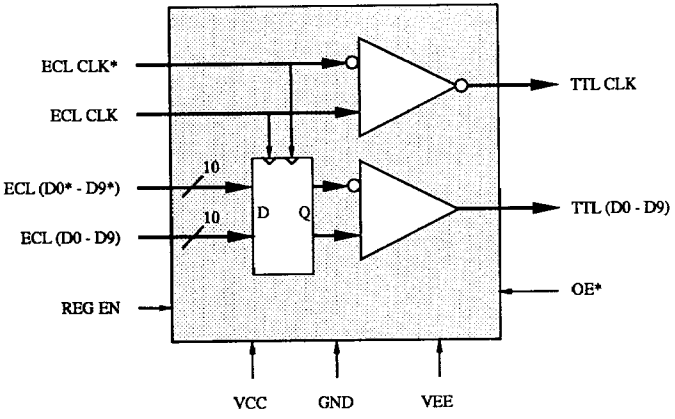
The Bt297 ECL/TTL Translator converts 11 bits of differential 10KH ECL data to 11 bits of TTL data.

The Bt297 incorporates all translators in one package to eliminate delay skew that results when using multiple devices.

The REG EN input controls whether the input data is registered or the data register is bypassed (transparent operation).

The TTL clock and data outputs may be three-stated asynchronously to the clock by the OE* pin.

Functional Block Diagram



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Pin Descriptions

Pin Name	Description
TTL (D0–D9)	TTL data outputs (TTL compatible).
TTL CLK	TTL clock output (TTL compatible).
ECL (D0–D9) ECL (D0*–D9*)	Differential ECL data inputs (ECL compatible). ECL data is latched by the ECL CLK signals, converted to TTL levels, and output onto the TTL data pins. Single-ended ECL operation may be used by connecting the ECL (D0*–D9*) pins to VBB (–2 V). If a pair of ECL inputs are left floating or are in the same logical state, the corresponding TTL output will be a logical zero.
ECL CLK, ECL CLK*	Differential ECL clock inputs (ECL compatible). Single-ended ECL operation may be used by connecting the ECL CLK pin to VBB (–2 V). If REG EN is a logical one, the ECL CLK is inverted and output onto the TTL CLK output pin. If REG EN is a logical zero, the ECL CLK is not inverted before being output onto the TTL CLK output pin.
REG EN	Register enable control input (TTL compatible). A logical one enables the D0–D9 input data to be registered by the data input register. A logical zero bypasses the data input register, enabling transparent operation.
OE*	Output enable control (TTL compatible). A logical one three-states the TTL (D0–D9) and TTL CLK outputs asynchronously to the clock.
VCC	TTL power supply. All VCC pins must be connected together as close to the device as possible.
GND	Ground. All GND pins must be connected together as close to the device as possible.
VEE	ECL power supply. All VEE pins must be connected together as close to the device as possible.

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Device Ground	GND	0	0	0	Volts
TTL Power Supply	VCC	+4.75	+5.0	+5.25	Volts
ECL Power Supply	VEE	–4.9	–5.2	–5.5	Volts
Ambient Operating Temperature	TA	0		+70	°C

Note: Thermal equilibrium is established by applying power for at least 2 minutes while maintaining a transverse air flow of 400 linear feet per minute over the device either mounted in the test socket or on the printed circuit board.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units
VEE (measured to GND)				–8.0	Volts
VCC (measured to GND)				+7.0	Volts
Voltage on Any ECL Pin		–1.8 V		GND	Volts
Voltage on Any TTL Pin		GND–0.5		VCC + 0.5	Volts
Ambient Operating Temperature	TA	–55		+125	°C
Storage Temperature	TS	–65		+150	°C
Junction Temperature	TJ			+150	°C
Vapor Phase Soldering (1 minute)	TVSOL			220	°C

Note: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ECL DC Characteristics

Parameter	Symbol	TA (°C.)	Min	Typ	Max	Units
Input High Voltage*	VIH	0 +25 +70	-1170 -1130 -1070		-840 -810 -735	mV mV mV
Input Low Voltage*	VIL	0 + 25 + 70	-1950 -1950 -1950		-1480 -1480 -1450	mV mV mV
Input Current (Vin = VIHmax or VIL min)	IIN	0 +25 +70			10 10 10	µA µA µA
Common Mode Voltage Range Differential Input Voltage			 tbd		-310	mV mV
Input Impedance Input Capacitance			- 2450 185	tbd tbd		Ohms pF
ECL VEE Supply Current	IEE	0 +25 +70		5 5 5	7 7 7	mA mA mA

Test conditions (unless otherwise specified): "Recommended Operating Conditions." Typical values are based on nominal temperature, i.e., room, and nominal voltage, i.e., 5 V.

*Relative to GND.

The specified limits shown can be met only after thermal equilibrium has been established. Thermal equilibrium is established by applying power for at least 2 minutes while maintaining a transverse air flow of 400 linear feet per minute over the device, either mounted in the test socket or on the printed circuit board.

TTL DC Characteristics

Parameter	Symbol	Min	Typ	Max	Units
Input High Voltage*	VIH	2.0		TTL VCC +0.5	Volts
Input Low Voltage*	VIL	TTL GND −0.5		0.8	Volts
Input High Current (Vin = 2.4 V)	IIH			70	µA
Input Low Current (Vin = 0.4 V)	IIL			−0.7	mA
Output High Voltage* (IOH = −2.0 mA)	VOH	2.5			Volts
Output Low Voltage* (IOL = 20 mA)	VOL			0.5	Volts
Three-State Output Current	IOZ				
Vout = VOHmin				10	µA
Vout = VOLmax				−10	µA
Output Capacitance			tbd		pF
Input Capacitance			tbd		pF
TTL VCC Supply Current	ICC		100	130	mA

Test conditions (unless otherwise specified): "Recommended Operating Conditions." Typical values are based on nominal temperature, i.e., room, and nominal voltage, i.e., 5 V.

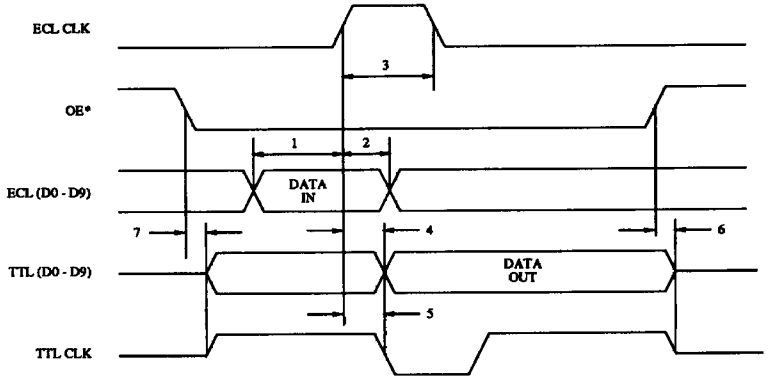
*Relative to GND.

AC Characteristics—Registered Operation

Parameter	Symbol	Min	Typ	Max	Units
ECL D0–D9 Setup Time	1	3			ns
ECL D0–D9 Hold Time	2	3			ns
ECL CLK High Time	3	10			ns
Clock Rate		tbd		27	MHz
TTL D0–D9 Output Delay	4	tbd		10	ns
TTL CLK Output Delay	5	tbd		10	ns
Output Disable Time	6	tbd		15	ns
Output Enable Time	7	tbd		15	ns

Test conditions (unless otherwise specified): "Recommended Operating Conditions." ECL input values are –0.89 to –1.69 V, with input rise/fall times ≤ 4 ns, measured between the 20% and 80% points. Timing reference points at 50% for inputs and outputs. Typical values are based on nominal temperature, i.e., room, and nominal voltage, i.e., 5 V.

Timing Waveforms—Registered Operation



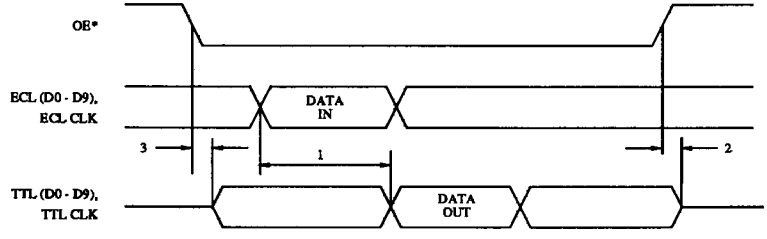
Registered Input/Output Timing.

AC Characteristics—Transparent Operation

Parameter	Symbol	Min	Typ	Max	Units
Output Delay	1	tbd		10	ns
Output Disable Time	2	tbd		15	ns
Output Enable Time	3	tbd		15	ns

Test conditions (unless otherwise specified): "Recommended Operating Conditions." ECL input values are –0.89 to –1.69 V, with input rise/fall times ≤ 4 ns, measured between the 20% and 80% points. Timing reference points at 50% for inputs and outputs. Typical values are based on nominal temperature, i.e., room, and nominal voltage, i.e., 5 V.

Timing Waveforms—Transparent Operation



Transparent Input/Output Timing.

Ordering Information

Model Number	Package	Ambient Temperature Range
Bt297KPJ	68-pin Plastic J-lead	0° to +70° C