3-BIT SCANNABLE REGISTERED BUS TRANSCEIVER

SY10E337
SY100E337

FEATURES

- **1500ps max. clock to bus (data transmit)**
- **1000ps max. clock to Q (data receive)**
- **Extended 100E V_{EE} range of –4.2V to –5.5V**
- **25Ω cutoff bus outputs**
- **50Ω receiver outputs**
- **Scannable implementation of E336**
- **Synchronous and asynchronous bus enables**
- **Non-inverting data path**
- **Bus outputs feature internal edge slow-down capacitors**
- **Additional package ground pins**
- **Fully compatible with industry standard 10KH, 100K ECL levels**
- **Internal 75KΩ input pulldown resistors**
- **Fully compatible with Motorola MC10E/100E337**
- **Available in 28-pin PLCC package**

PIN NAMES

Pin	Function
A_0–A_2	Data Inputs A
B_0–B_2	Data Inputs B
S-IN	Serial (Scan) Data Input
TEN, REN	LOAD/$\overline{\text{HOLD}}$ Controls
SCAN	Scan Control
$\overline{\text{ABUSDIS}}$	Asynchronous Bus Disable
SBUSEN	Synchronous Bus Enable
$\overline{\text{SYNCEN}}$	Synchronous Enable Control
CLK	Clock
BUS_0–BUS_2	25Ω Cutoff BUS Outputs
Q_0–Q_2	Receive Data Outputs (Q_2 serves as SCAN_OUT in scan mode)
V_{CCO}	V_{CC} to Output

DESCRIPTION

The SY10/100E337 are 3-bit registered bus transceivers with scan designed for use in new, high- performance ECL systems. The bus outputs (BUS_0–BUS_2) are designed to drive a 25Ω bus; the receive outputs (Q_0–Q_2) are designed for 50Ω. The bus outputs feature a normal logic HIGH level (V_{OH}) and a cutoff LOW level of –2.0V and the output emitter-follower is "off", presenting a high impedance to the bus. The bus outputs also feature edge slow-down capacitors.

Both drive and receive sides feature the same logic, including a loopback path to hold data. The LOAD/$\overline{\text{HOLD}}$ function is controlled by Transmit Enable (TEN) and Receive Enable (REN) on the transmit and receive sides, respectively, with a HIGH selecting LOAD. The implementation of the E337 Receive Enable differs from that of the E336.

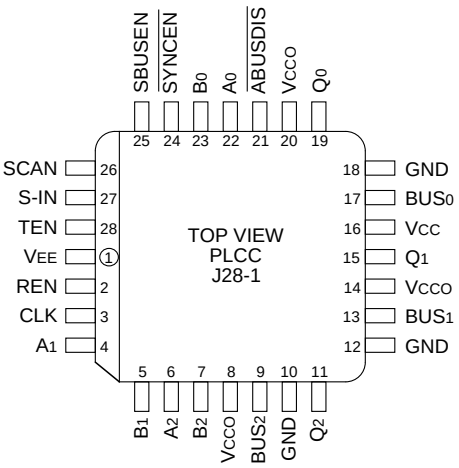
A synchronous bus enable (SBUSEN) is provided for normal, non-scan operation. The asynchronous bus disable ($\overline{\text{ABUSDIS}}$) disables the bus for scan mode.

The $\overline{\text{SYNCEN}}$ input allows either synchronous or asynchronous re-enabling after disabling with $\overline{\text{ABUSDIS}}$. An alternative use is asynchronous-only operation with $\overline{\text{ABUSDIS}}$, in which case $\overline{\text{SYNCEN}}$ is tied LOW. $\overline{\text{SYNCEN}}$ is implemented as an overriding SET control to the enable flip-flop.

Scan mode is selected by a logic HIGH at the SCAN input. Scan input data is shifted in through S-IN, and output data appears at the Q_2 output.

All registers are clocked on the rising edge of CLK. Additional lead-frame grounding is provided through the ground pins (GND) which should be connected to 0V. The GND pins are not electrically connected to the chip.

PACKAGE/ORDERING INFORMATION



28-Pin PLCC (J28-1)

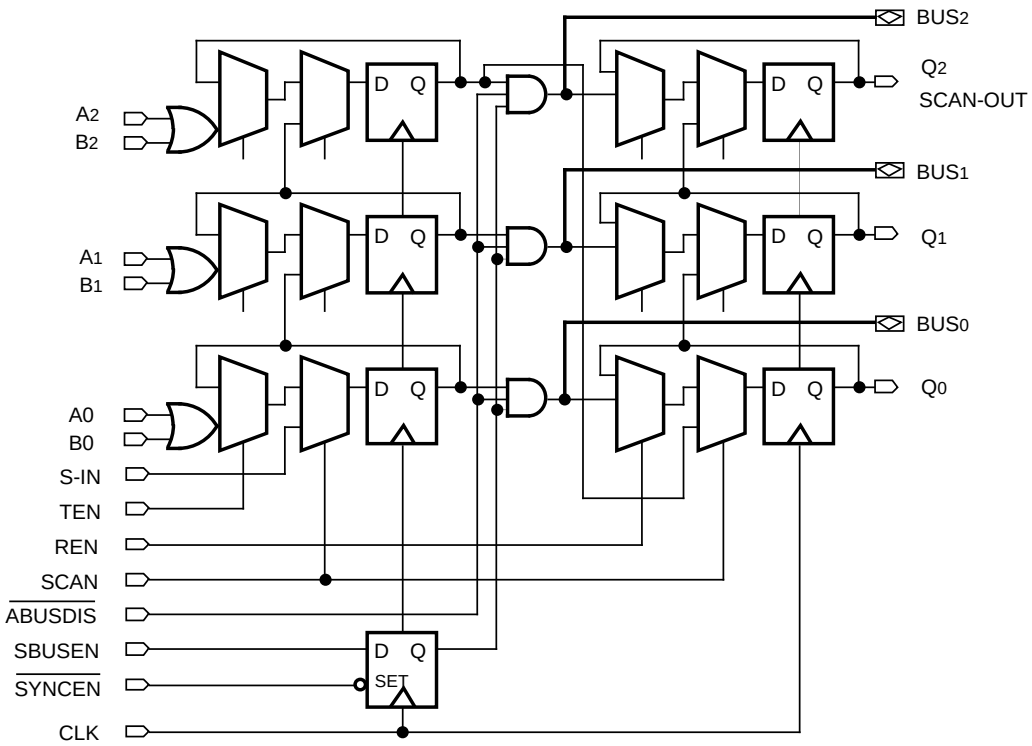
Ordering Information[1]

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10E337JC	J28-1	Commercial	SY10E337JC	Sn-Pb
SY10E337JCTR[2]	J28-1	Commercial	SY10E337JC	Sn-Pb
SY100E337JC	J28-1	Commercial	SY100E337JC	Sn-Pb
SY100E337JCTR[2]	J28-1	Commercial	SY100E337JC	Sn-Pb
SY10E337JZ[3]	J28-1	Commercial	SY10E337JZ with Pb-Free bar-line indicator	Matte-Sn
SY10E337JZTR[2, 3]	J28-1	Commercial	SY10E337JZ with Pb-Free bar-line indicator	Matte-Sn
SY100E337JZ[3]	J28-1	Commercial	SY100E337JZ with Pb-Free bar-line indicator	Matte-Sn
SY100E337JZTR[2, 3]	J28-1	Commercial	SY100E337JZ with Pb-Free bar-line indicator	Matte-Sn

Notes:

1. Contact factory for die availability. Dice are guaranteed at $T_A = 25°C$, DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

BLOCK DIAGRAM



DC ELECTRICAL CHARACTERISTICS

V_{EE} = V_{EE} (Min.) to V_{EE} (Max.); V_{CC} = V_{CCO} = GND

Symbol	Parameter	T_A = 0°C			T_A = +25°C			T_A = +85°C			Unit	Condition
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
V_{CUT}	Cut-off Output Voltage	–2.10	—	–2.03	–2.10	—	–2.03	–2.10	—	–2.03	V	1
I_{IH}	Input HIGH Current All Other Inputs	—	—	150	—	—	150	—	—	150	µA	—
I_{EE}	Power Supply Current										mA	—
	10E	—	145	174	—	145	174	—	145	174		
	100E	—	145	174	—	125	174	—	167	200		

Note:

1. Applies to BUS outputs only. Measured with V_{TT} = –2.10V.

AC ELECTRICAL CHARACTERISTICS

V_{EE} = V_{EE} (Min.) to V_{EE} (Max.); V_{CC} = V_{CCO} = GND

Symbol	Parameter	T_A = 0°C			T_A = +25°C			T_A = +85°C			Unit	Condition
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
t_{PD}	Propagation Delay to Output										ps	—
	CLK to Q	450	—	1000	450	—	1000	450	—	1000		
	CLK to BUS	800	—	1800	800	—	1800	800	—	1800		
	$\overline{\text{ABUSDIS}}$	500	—	1500	500	—	1500	500	—	1500		
	$\overline{\text{SYNCEN}}$	800	—	1800	800	—	1800	800	—	1800		
t_S	Set-up Time										ps	—
	BUS	350	—	—	350	—	—	350	—	—		
	SBUSEN	100	—	—	100	—	—	100	—	—		
	Data, S-IN	400	—	—	400	—	—	400	—	—		
	TEN, REN, SCAN	550	—	—	550	—	—	550	—	—		
t_H	Hold Time										ps	—
	BUS	350	—	—	350	—	—	350	—	—		
	SBUSEN	500	—	—	500	—	—	500	—	—		
	Data, S-IN	350	—	—	350	—	—	350	—	—		
	TEN, REN, SCAN	200	—	—	200	—	—	200	—	—		
t_{PW}	Minimum Pulse Width	400	—	—	400	—	—	400	—	—	ps	—
t_r t_f	Rise/Fall Time 20% to 80% (Q_n)	300	—	800	300	—	800	300	—	800	ps	—
	20% to 80% (BUS_n Rise)	500	—	1000	500	—	1000	500	—	1000		
	20% to 80% (BUS_n Fall)	300	—	800	300	—	800	300	—	800		

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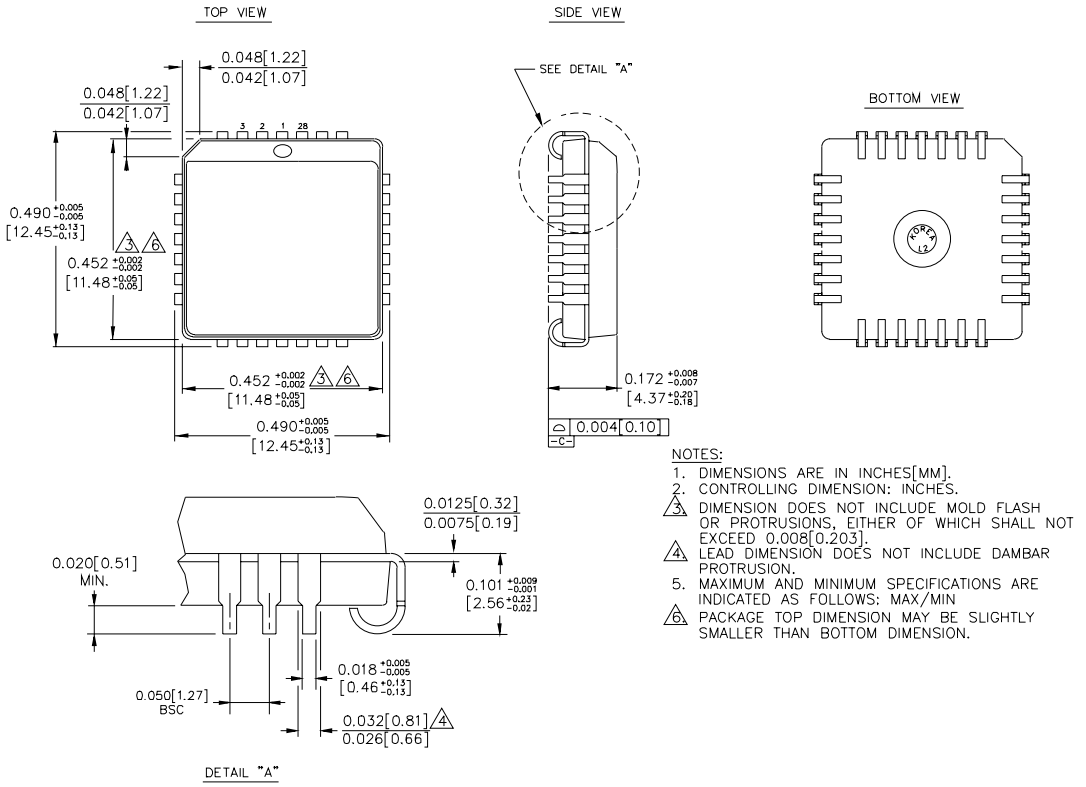

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