ZT202E/ZT232E
Low Power 5V 250Kbps RS232 Transceivers
Datasheet

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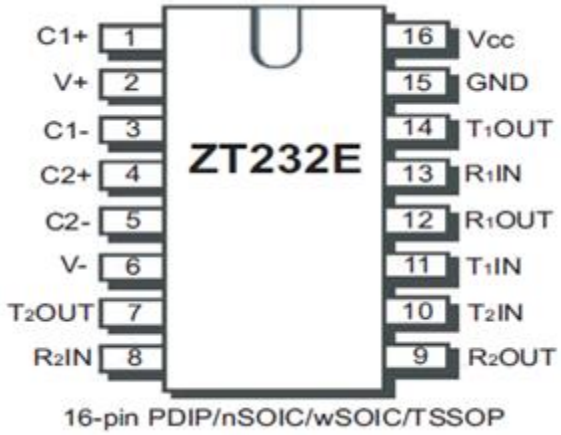
Features

- Meets EIA/TIA-232F and CCITT V.28/V.24 specifications for V_{CC} at +5V ±10%
- Low Quiescent Current – 3mA typ., 5mA max.
- Guaranteed Standard Data Rate 250Kbps
- Proprietary Switch-Capacitor Regulated Voltage Converters (patent pending)
- Use Small 0.1µF Capacitors
- Latch-up Free
- ESD Protection for RS-232 I/O's
  ±15KV Human Body Model (HBM)
- Drop-in Replacements for MAX202E, MAX232E, SP202E, SP232E, ST202E, ST232E, HIN202E, HIN232E, ADM202E, ADM232L
- High Data Rate at 1000Kbps Available on ZT232F Series



16-pin PDIP/nSOIC/wSOIC/TSSOP

General Description

The ZT232E series devices are +5V powered EIA/TIA-232 and CCITT V.28/V.24 communication interfaces with low power requirements. These transceivers consist of two line drivers, two line receivers and the proprietary switch-capacitor regulated voltage converters. These devices operate from a single +5V power supply at the guaranteed data rate of 250K bits/sec with enhanced electrostatic discharge (ESD) protection in all RS232 I/O pins exceeding ±15KV HBM.

Applications

- Single Power Supply Applications
- Industrial and Embedded PCs
- Set Top Boxes
- Terminal Adapters
- POS terminals
- Peripherals Interface
- Routers and HUBs

Product Selection Guide and Cross Reference

Part Number	# of RS232 Tx	# of RS232 Rx	# of Rx active in SD	# of 0.1 µF caps	ShutDown	Wake Up	TTL Tri-State	Data Rate (Kbps)	ESD HBM on RS232 I/O	Pin-to-Pin Cross Reference
ZT202E	2	2	0	4	No	No	No	250	±15KV	Analog Devices, Intersil, Maxim, EXAR, STmicro, TI
ZT232E	2	2	0	4	No	No	No	250	±15KV	

Absolute Maximum Ratings

These are stress ratings only and functional operation of the device at these ratings or any other above those indicated in the operation sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

Power Supply, (V_{CC})..... –0.3V to +6.0V
V+ ..... –0.3V to +7.0V
V– .....+0.3V to –7.0V
|V+| + |V-| ..... +13.0V
I_{CC} (DC V_{CC} or GND current)..... ±100mA

Input Voltages
TxIN ..... –0.3V to +6.0V
RxIN..... ±25V

Output Voltages
TxOUT ..... ±12V
RxOUT..... –0.3V to (V_{CC} +0.3V)

Short-Circuit Duration
TxOUT ..... Continuous

Operating Temperature..... –40°C to +85°C
Storage Temperature..... –65°C to +150°C

Power Dissipation Per Package

16-pin PDIP (derate 11.20mW/°C above +70°C) 896mW
16-pin nSOIC (derate 10.00mW/°C above +70°C) …. 720mW
16-pin wSOIC (derate 10.10mW/°C above +70°C) …. 787mW
16-pin TSSOP (derate 6.80mW/°C above +70°C) 556mW

Storage Considerations

Storage in a low humidity environment is preferred. Large high density plastic packages are moisture sensitive and should be stored in Dry Vapor Barrier Bags. Prior to usage, the parts should remain bagged and stored below 40°C and 60%RH. If the parts are removed from the bag, they should be used within 168 hours or stored in an environment at or below 20%RH. If the above conditions cannot be followed, the parts should be baked for 12 hours at 125°C in order to remove moisture prior to soldering. ASIX ships product in Dry Vapor Barrier Bags with a humidity indicator card and desiccant pack. The humidity indicator should be below 30%RH. The MSL of this product is 3.

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1 Electrical Characteristics

Unless otherwise stated, V_{CC} = +5.0V, T_A = T_{min} to T_{max}, C1 to C4 = 0.1µF, typical values apply at V_{CC} = +5.0V and T_A = 25°C.

Parameter	Condition	Min	Typ	Max	Units
TTL Logic Input TTL Logic Output RS-232 Input RS-232 Output Charge Pump Pin Power Pin	T1IN, T2IN R1OUT, R2OUT R1IN, R2IN T1OUT, T2OUT C1P, C1N, C2P, C2N V_{CC}, V_{GND}, V_{DD}, V_{SS}	See specifications below			
Charge Pump Caps Temp 0°C to +70°C Temp –40°C to +85°C V_{CC} Voltage Range	C1P, C1N, C2P, C2N Commercial Grade Industrial Grade V_{CC} = +5.0V Supply	0.1 0 –40 4.5	0.1 +25 +25 5	1.0 +70 +85 5.5	µF °C °C V
Supply Current Quiescent	TTL Inputs = V_{CC} /GND, RS-232 Input = float, T_A = 25°C V_{CC} = +5.0V ±10%, No load on transmitter outputs (for ZT232E) (for ZT202E)		 3 4	 5 8	 mA mA
Supply Current Transmitters Loaded	TTL Inputs = V_{CC} /GND, RS-232 Inputs = float, T_A = 25°C V_{CC} = +5.0V, All transmitter outputs loaded with R_L = 3KΩ		15		mA
TTL LOGIC Input Input Threshold Low Input Threshold High Input Hysteresis Input Leakage Current	V_{CC} = +5.0V Supply T1IN, T2IN T1IN, T2IN T1IN, T2IN TxIN = GND	 2.4 	 0.5 15	 0.8 200	 V V V µA
TTL LOGIC Output Output Voltage Low Output Voltage High	 I_{OUT} = 3.2mA I_{OUT} = –1.0mA	 3.5	 	 0.4 	 V V
Receiver Input Input Voltage Range Input Threshold Low Input Threshold High Input Hysteresis Input Resistance	 T_A = T_{min} – T_{max} T_A = 25°C, V_{CC} = 5.0V V_{CC} = +5.0V Supply T_A = 25°C V_{IN} = ±25V, T_A = 25°C	 –25 0.8 0.2 3	 1.2 1.7 0.5 	 25 2.4 1.0 7	 V V V V KΩ
Transmitter Output Output Voltage Swing Output Resistance Output Short-Circuit Current	 R_L = 3~7KΩ, All Outputs are loaded (for ZT232E) R_L = 3~7KΩ, All Outputs are loaded, V_{CC} = 5.25V (for ZT202E) V_{CC} = V_{DD} = V_{SS} = GND, V_{OUT} = ±2V V_{OUT} = GND	 ±5 ±5 300 	 ±6 ±9 ±20	 ±60	 V V Ω mA

Parameter	Condition	Min	Typ	Max	Units
Timing Characteristics Maximum Data Rate One Transmitter (1Tx/1Rx) Switching	R_L = 3~7KΩ, C_L = 50~2500pF, T_A = 25°C	250			Kbps
Transition-Region Slew Rate	R_L = 3~7KΩ, C_L = 50p~2500pF, One Transmitter Switching, T_A = 25°C, Measured from +3V to –3V or –3V to +3V, V_{CC} =4.5V	6		30	V/µs
Transmitter Propagation t_{PLH} Transmitter Propagation t_{PHL} Transmitter Skew	All transmitters loaded with R_L = 3KΩ, C_L = 1000pF All transmitters loaded with R_L = 3KΩ, C_L = 1000pF $t_{PHL} – t_{PLH}$		2.0 2.0 100		µs µs ns
Receiver Propagation t_{PLH} Receiver Propagation t_{PHL} Receiver Skew	C_L = 150pF C_L = 150pF $t_{PHL} – t_{PLH}$		0.15 0.15 50		µs µs ns
ESD Tolerance RS-232 I/Os ESD HBM TTL/CMOS I/Os ESD HBM			 ±15 ±2		 KV KV

2 Circuit Description

Proprietary Switch-Capacitor Regulated Voltage Converter

Different from other suppliers, ASIX uses a patent pending switch-capacitor voltage-controlled source and sink current generators design to provide powerful bipolar voltages to maintain compliant EIA/RS232 levels regardless of power supply fluctuations. The design consists of an internal regulated oscillator, a two phase clock cycling, regulated complementary MOS switches, fast switching diode and switch capacitors.

The switch capacitor bi-directional current generators operate with ASIX's proprietary smartly regulated complementary MOS switches and fast switching diode from its proprietary high voltage process technology. The efficiency of these bidirectional current generators is well over 70%. The switching frequency is generated by an internal oscillator and regulated by the current loads. The switch capacitor pump design delivers higher negative bucked voltage than the positive boosted voltage to achieve a balanced voltage controlled source and sink current generators resulting a balanced bipolar voltage supplies to the chip.

With its unique proprietary design technique, ASIX's interface product series provide a better power efficient, stable and compliant EIA/RS232 levels with superior low power consumption.

ESD Immunity

Electro-Static Discharge (ESD) is an important factor when implementing a serial port into a system. In some applications, it is crucial that the ESD protection for the system must meet a certain tolerance level. Since RS232 transceiver devices are exposed to the outside world, there are many environmental factors that can affect the serial port and even subject it to transients that could potentially damage the transceiver itself.

The RS232 transceiver is usually routed from the serial port connector to the transceiver IC through the metal trace on the printed circuit board. This trace will have some small amount of resistance that will add some protection in terms of limiting transient current to the IC. However for added voltage protection, transient voltage suppressors (TVS) or transzorbs, which are back-to-back diode arrays clamp, are usually necessary to protect the serial port circuity.

To further reduce cost within their system, more engineers are requiring higher ESD tolerances from the transceiver ICs themselves without having to add costly TVS circuitry. ASIX's RS232 transceivers include built-in transient voltage suppression where external ESD circuitry is not necessary to meet the MIL-STD-883, Method 3015, Human Body Model and the EN61000-4-2 Air/Contact Discharge tests.

The Human Body Model has been the generally accepted ESD testing method for semiconductors. This test is intended to simulate the human body's potential to store electrostatic energy and discharge it to an integrated circuit upon close proximity or contact. This method will test the IC's capability to withstand an ESD transient during normal handling such as in manufacturing areas where the ICs tend to be handled frequently.

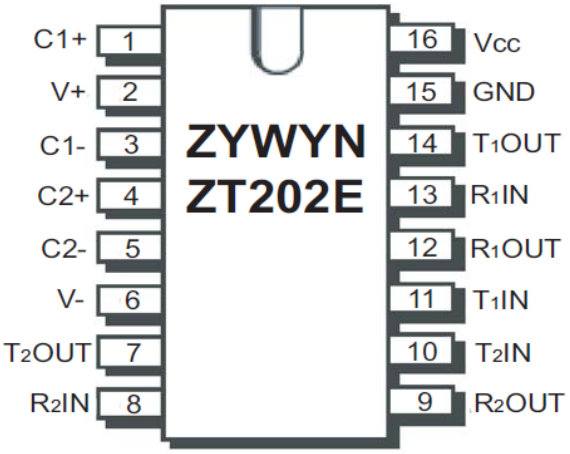
EN61000-4-2 is used for testing ESD on equipment and systems. For system manufacturers, they must guarantee a certain amount of ESD protection since the system itself is exposed to the outside environment and human presence. EN61000-4-2 specifies that the system is required to withstand an amount of static electricity when ESD is applied to exposed metal points and surfaces of the equipment that are accessible to personnel during normal usage. The transceiver IC receives most of the ESD current when the ESD source is applied to the connector pins.

There are two methods within EN61000-4-2, the Air Discharge method and the Contact Discharge method. With the Air Discharge Method, an ESD voltage is applied to the equipment under test through air, which simulates an electrically charged person ready to connect a cable onto the rear of the system and the high energy potential on the person discharges through an arcing path to the rear panel of the system before he or she even touches the system. The Contact Discharge Method applies the ESD current directly to the EUT. This method was devised to reduce the unpredictability of the ESD arc. The discharge current rise time is constant since the energy is directly transferred without the air-gap arc inconsistencies.

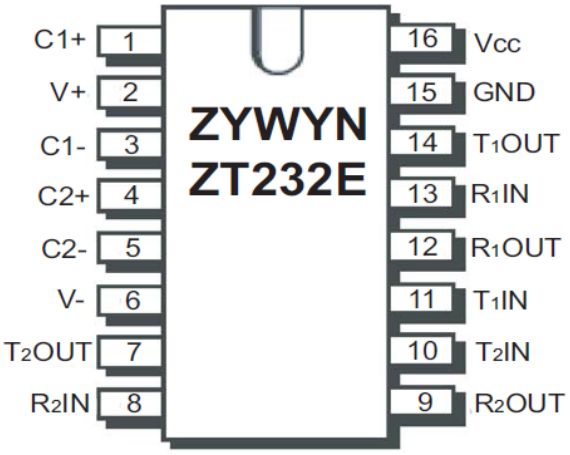
Specification	RS-232D	RS-423A	RS-422	RS-485	RS-562
Mode of Operation	Single-Ended	Single-Ended	Differential	Differential	Single-Ended
No. of Drivers and Receivers Allowed on One Line	1 Driver 1 Receiver	1 Driver 10 Receivers	1 Driver 10 Receivers	32 Drivers 32 Receivers	1 Driver 1 Receiver
Maximum Cable Length	50 feet	4,000 feet	4,000 feet	4,000 feet	C ≤ 2,500 pF@ <20Kbps; C ≤ 1,000 pF@ >20Kbps
Maximum Data Rate	20 Kbps	100 Kbps	10 Mbps	10 Mbps	64 Kbps
Driver Output Maximum Voltage	± 25V	± 6V	-0.25V to +6V	-7V to +12V	-3.7V to +13.2V
Driver Output Signal Level Loaded Unloaded	 ±5V ±15V	 ±3.6V ±6V	 ±2V ±5V	 ±1.5V ±5V	 ±3.7V ±13.2V
Driver Load Impedance	3~7KΩ	450 Ω	100 Ω	54 Ω	3~7KΩ
Maximum Driver Output Current (High Impedance State) Power On Power Off	 V_{MAX}/300	 100µA	 ±100µA	 ±100µA ±100µA	
Slew Rate	30V/µs max.	Controls Provided			30V/µs max.
Receiver Input Voltage Range	±15V	±12V	-7V to +7V	-7V to +12V	±15V
Receiver Input Sensitivity	±3V	±200mV	±200mV	±200mV	±3V
Receiver Input Resistivity	3~7KΩ	4KΩ min.	4KΩ min.	12KΩ min.	3~7KΩ

Table 2. EIA Standard Parameter Summary

3 Pin Configuration

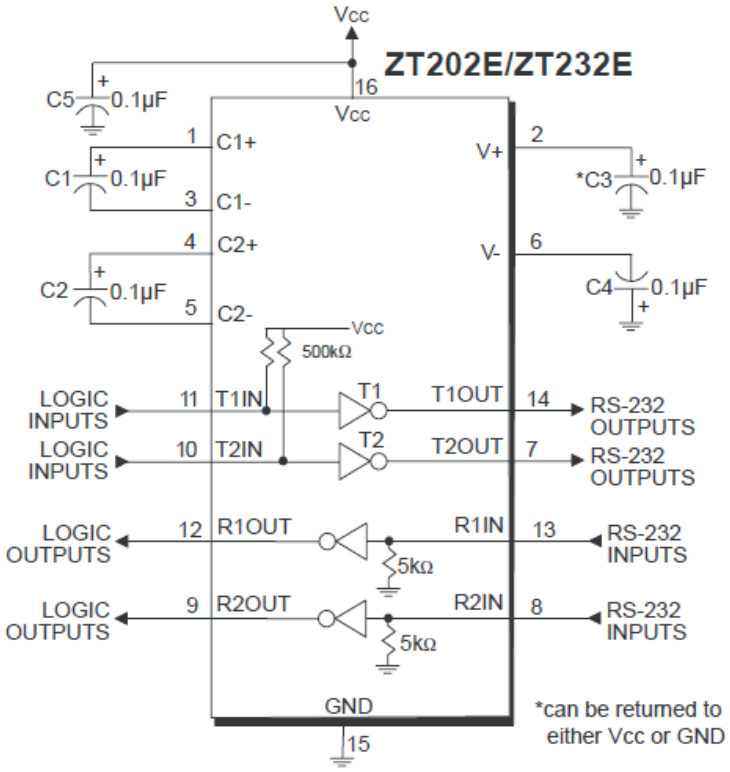


16-pin PDIP/nSOIC/wSOIC/TSSOP

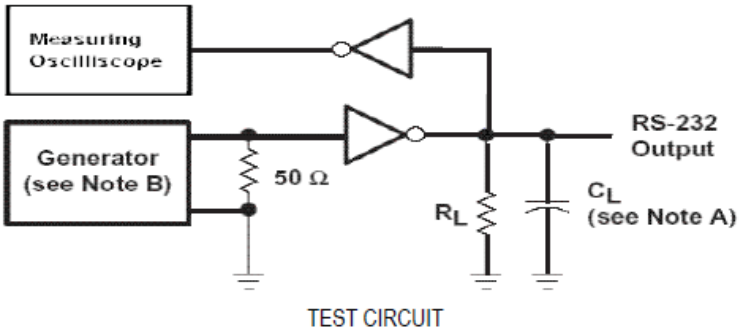


16-pin PDIP/nSOIC/wSOIC/TSSOP

4 Typical Application Circuits



5 Typical Test Circuits



TEST CIRCUIT

Maximum Data Rate Test Circuit

Notes:

A. R_L = 3KΩ , C_L = 1000pF, T_A = 25°C, One Driver Switching.

B. The pulse generator had the following characteristics: PRR = 250 Kbps, Zo = 50Ω, 50% duty cycle, T_r & T_f <= 10ns.

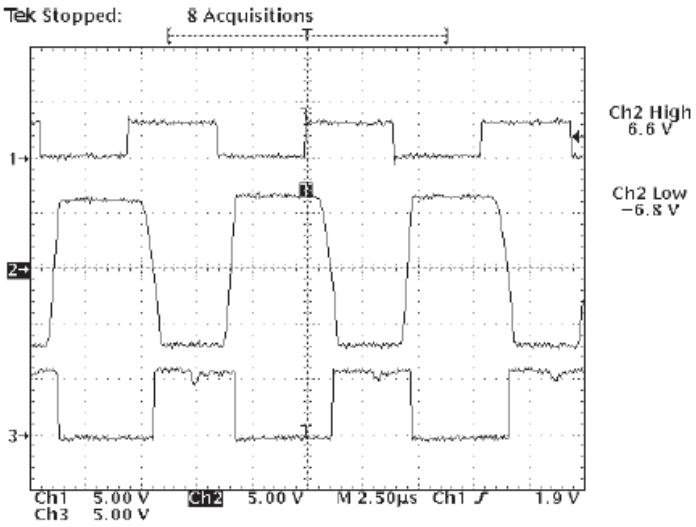


Figure 1. ZT232E TxIN to TxOut (no load) at 250Kbps waveform

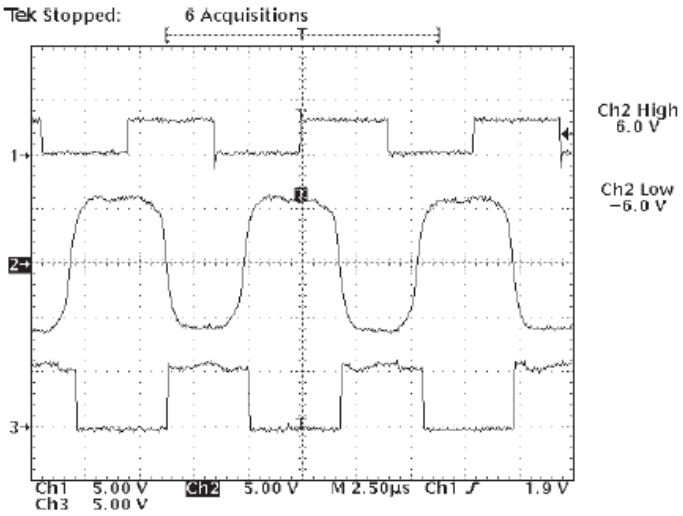


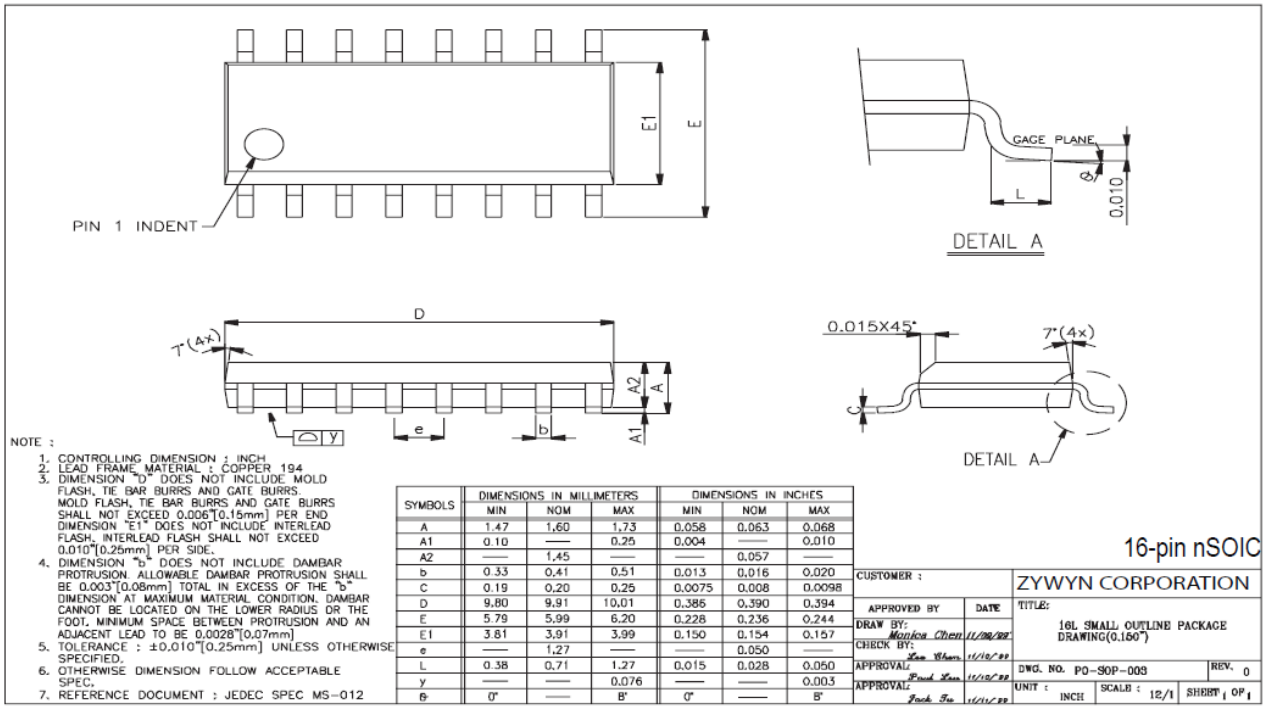
Figure 2. ZT232E TxIN to TxOut to RxOut (loopback to Rx with 1000pF load) at 250Kbps waveform

Test Circuit RS232 Signal Characteristics

Figure 1 shows the normal RS232 transceiver function with a TTL/CMOS signal applied to the input on channel 1 and the resultant RS232 output shown on channel 2. This figure shows a typical RS232 line driver output without loading. In other words, this is the open circuit RS232 output voltage. The charge pump voltage converter efficiently converts the necessary voltage for the driver's output transistors so that the RS232 output is close to the ideal rail voltage of 6.6V.

Figure 2 shows the RS232 transceiver function using the TTL/CMOS input on channel 1 while showing the RS232 output on channel 2. This figure shows the RS232 signal while the output is loaded with 3K ohms and 1000pF. The resistive load is the receiver's input impedance as the driver's output is looped back to the receiver's input. The resultant output on channel 3 is the receiver's TTL/CMOS output. While loaded with a typical RS232 load, the driver's output level only drops 0.2V from its open circuit voltage while running that 250Kbps. The RS-232 output on channel 2 also shows good signal integrity while at the high data rates, which allows the receiver to process the signal with minimum skew and delay. ASIX's low-drop driver circuitry working with its efficient voltage regulator allows superior line driving capability with the bonus of ±15KV ESD immunity.

6 Package Information

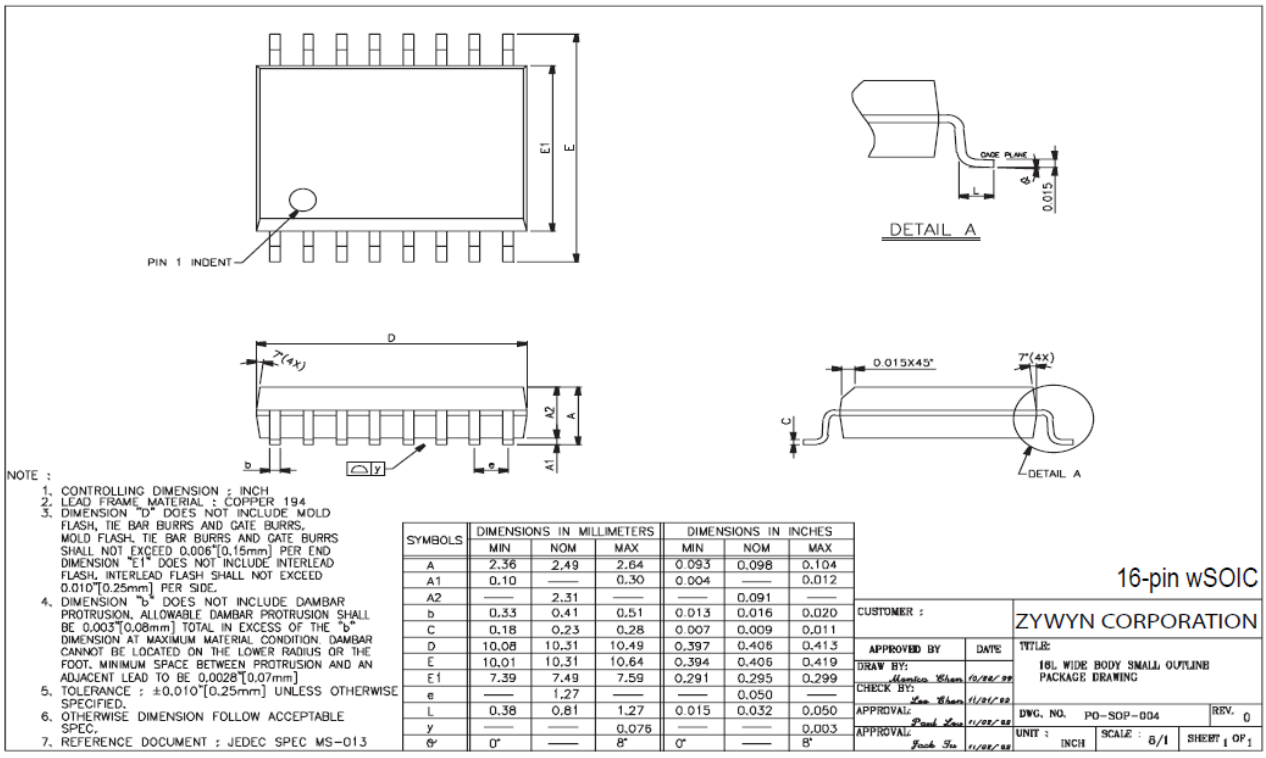


NOTE :
1. CONTROLLING DIMENSION : INCH
2. LEAD FRAME MATERIAL : COPPER 194
3. DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, TIE BAR BURRS AND GATE BURRS. MOLD FLASH, TIE BAR BURRS AND GATE BURRS SHALL NOT EXCEED 0.006"[0.15mm] PER END DIMENSION "E1" DOES NOT INCLUDE INTERLEAD FLASH, INTERLEAD FLASH SHALL NOT EXCEED 0.010"[0.25mm] PER SIDE.
4. DIMENSION "b" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.003"[0.08mm] TOTAL IN EXCESS OF THE "b" DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSION AND AN ADJACENT LEAD TO BE 0.0028"[0.07mm]
5. TOLERANCE : ±0.010"[0.25mm] UNLESS OTHERWISE SPECIFIED.
6. OTHERWISE DIMENSION FOLLOW ACCEPTABLE SPEC.
7. REFERENCE DOCUMENT : JEDEC SPEC MS-012

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	—	0.25	0.004	—	0.010
A2	—	1.45	—	—	0.057	—
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	9.80	9.91	10.01	0.386	0.390	0.394
E	5.79	5.99	6.20	0.228	0.236	0.244
E1	3.81	3.91	3.99	0.150	0.154	0.157
e	—	1.27	—	—	0.050	—
L	0.38	0.71	1.27	0.015	0.028	0.050
y	—	—	0.076	—	—	0.003
θ	0°	—	8°	0°	—	8°

16-pin nSOIC

CUSTOMER :		ZYWYN CORPORATION	
APPROVED BY	DATE	TITLE: 16L SMALL OUTLINE PACKAGE DRAWING(0.150")	
DRAW BY: Monica Chen	11/08/99		
CHECK BY: Lee Chen	11/10/99		
APPROVAL: Frank Lee	11/10/99	DWG. NO. PO-SOP-003	REV. 0
APPROVAL: Jack Su	11/11/99	UNIT : INCH / SCALE : 12/1 / SHEET 1 OF 1	



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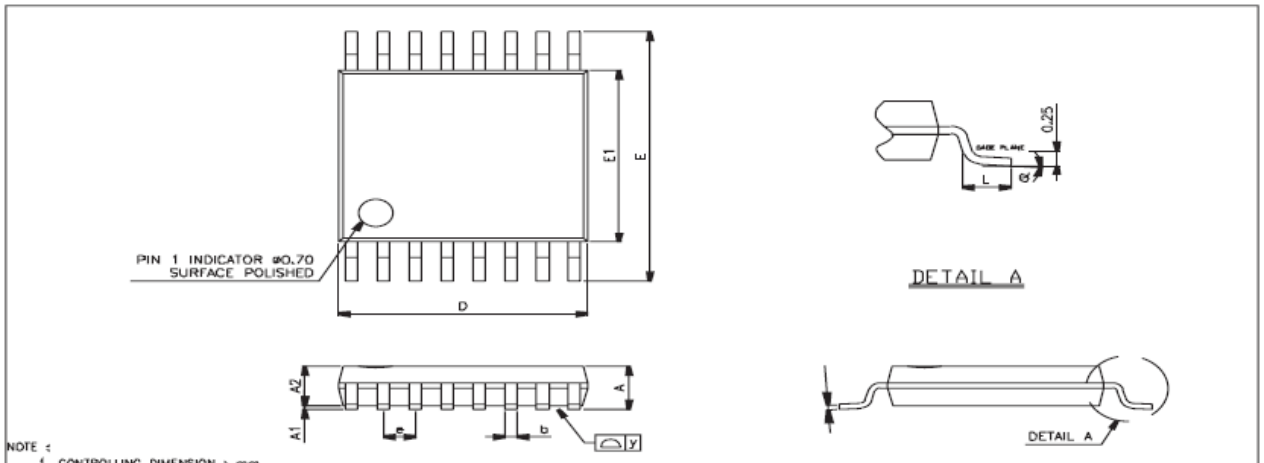
5. TOLERANCE : ±0.010"[0.25mm] UNLESS OTHERWISE SPECIFIED.
6. OTHERWISE DIMENSION FOLLOW ACCEPTABLE SPEC.
7. REFERENCE DOCUMENT : JEDEC SPEC MS-013

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.36	2.49	2.64	0.093	0.098	0.104
A1	0.10	—	0.30	0.004	—	0.012
A2	—	2.31	—	—	0.091	—
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.18	0.23	0.28	0.007	0.009	0.011
D	10.08	10.31	10.49	0.397	0.406	0.413
E	10.01	10.31	10.64	0.394	0.406	0.419
E1	7.39	7.49	7.59	0.291	0.295	0.299
e	—	1.27	—	—	0.050	—
L	0.38	0.81	1.27	0.015	0.032	0.050
y	—	—	0.076	—	—	0.003
θ	0°	—	8°	0°	—	8°

16-pin wSOIC

CUSTOMER :		ZYWYN CORPORATION	
APPROVED BY	DATE	TITLE: 16L WIDE BODY SMALL OUTLINE PACKAGE DRAWING	
DRAW BY: Monica Chen	10/28/99		
CHECK BY: Lee Chen	11/01/99		
APPROVAL: Frank Lee	11/02/99	DWG. NO. PO-SOP-004	REV. 0
APPROVAL: Jack Su	11/02/99	UNIT : INCH / SCALE : 8/1 / SHEET 1 OF 1	



NOTE :
1. CONTROLLING DIMENSION : mm.
2. LEAD FRAME MATERIAL : OLIN C7025/EFTEC 64T
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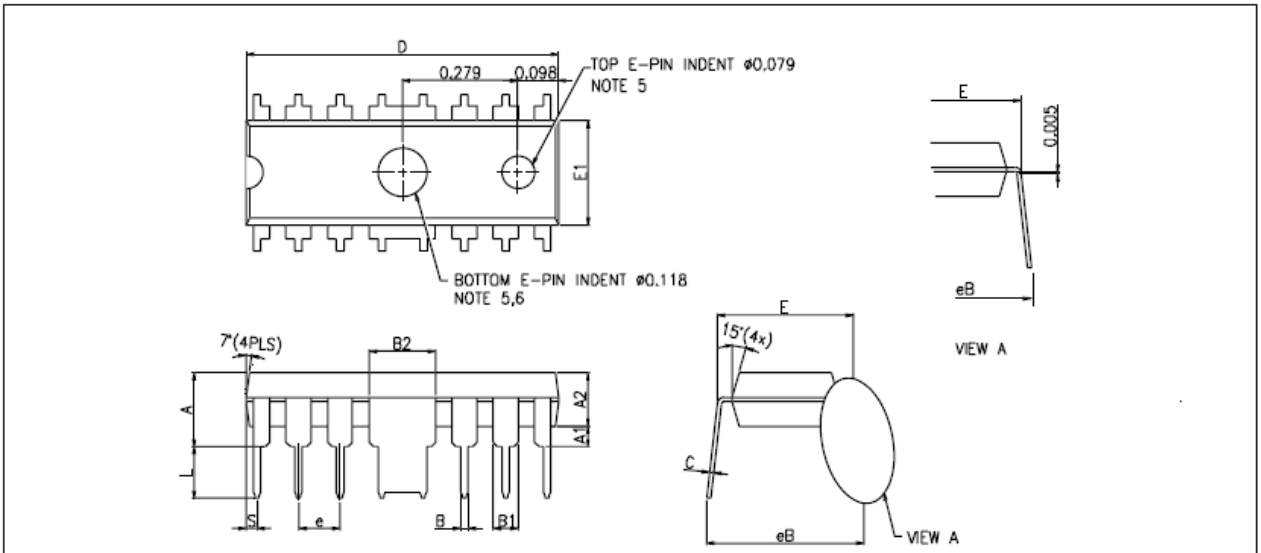
5. TOLERANCE : ±0.010"[0.25mm] UNLESS OTHERWISE SPECIFIED.
6. OTHERWISE DIMENSION FOLLOW ACCEPTABLE SPEC.
7. REFERENCE DOCUMENT : JEDEC SPEC MO-153

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.05	1.10	1.20	0.041	0.043	0.047
A1	0.05	0.10	0.15	0.002	0.004	0.006
A2	——	1.00	1.05	——	0.039	0.041
b	0.20	0.25	0.28	0.008	0.010	0.011
C	——	0.127	——	——	0.005	——
D	4.90	5.075	5.10	0.193	0.1998	0.200
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.170	0.173	0.177
e	——	0.65	——	——	0.026	——
L	0.50	0.60	0.70	0.020	0.024	0.028
y	——	——	0.076	——	——	0.003
θ	0°	4°	8°	0°	4°	8°

16-pin TSSOP

CUSTOMER :		ZYWYN CORPORATION
APPROVED BY	DATE	TITLE: 16L TSSOP PACKAGE OUTLINE DRAWING
DRAW BY: Marcus Chen	04/05/00	
CHECK BY: Jack Chen	04/05/00	
APPROVAL: Paul Lee	04/05/00	DWG. NO. PO-TSSOP-002 REV. 1
APPROVAL: Jack Fu	04/05/00	UNIT : mm SCALE : 15/1 SHEET 1 OF 1



NOTES :
1. CONTROLLING DIMENSION : INCH
2. LEAD FRAME MATERIAL : OLIN 151 3/4 HARD
3. PACKAGE DIMENSION EXCLUDE MOLDING FLASH
4. THE MAX. ALLOEABLE MOLDING FLASH IS 0.010"
5. THE DEPTH OF E-PIN INDENT : 0.010"~0.015".
6. BOTTOM E-PIN INDENT ARE MARKED AS BELOW :

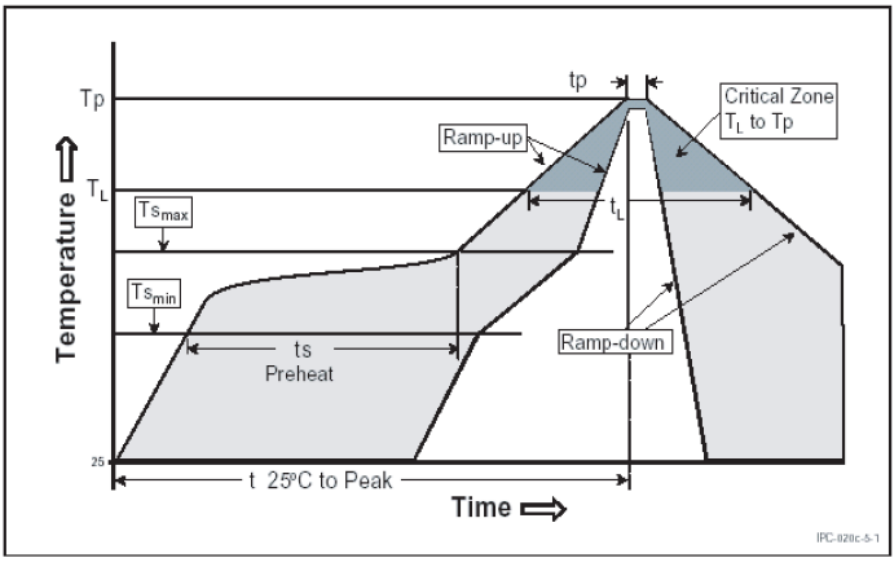
XY
X : A ~ M
Y : 0 ~ 9

SYMBOLS	MIN	NOM	MAX	DIMENSIONS IN INCHES MIN	NOM	MAX
A	—	—		—	—	0.180
A1	0.38	0.51	0.64	0.015	0.020	0.025
A2	3.05	3.30		0.120	0.130	0.140
B	0.41	0.46		0.016	0.018	0.020
B1	1.40	1.52		0.055	0.060	0.065
C	0.20	0.25		0.008	0.010	0.012
D	18.90	19.15		0.744	0.754	0.760
E	7.62	—		0.300	—	0.325
E1	6.35	6.50		0.250	0.256	0.260
e	—	2.54	—	—	0.100	—
L	2.79	3.05	3.30	0.110	0.120	0.130
eB	7.62	—		0.300	—	0.380
S	0.56	0.69	0.76	0.022	0.027	0.030
B2	3.94	4.06	4.19	0.155	0.160	0.165

16-pin PDIP

CUSTOMER :		ZYWYN CORPORATION
APPROVED BY	DATE	TITLE : 16L PLASTIC DIP 8ATWING PACKAGE OUTLINE DRAWING
DRAW BY: Vick Chen	07/27/99	
CHECK BY: Thomas Kao	7/8/99	
APPROVAL: Paul Lee	7/8/99	DWG. NO. PO-DIP-004 REV. 0
APPROVAL: Jack Fu	7/8/99	UNIT : INCH SCALE : 6/1 SHEET 1 OF 1

7 Green Package SMD IR Reflow Profile Information

IR Reflow Profile Conditions		
Profile Feature	**JESD Sn-Pb Eutectic Assembly**	**JESD Pb-free Assembly**
Average Ramp-Up Rate (T_{Smax} to T_P)	3°C/seconds max.	3°C/seconds max.
Pre-heat - Temperature Min (T_{Smin}) - Temperature Max (T_{Smax}) - Time (T_{Smin} to t_{Smax})	 100°C 150°C 60~120 seconds	 150°C 200°C 60~180 seconds
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 seconds	 217°C 60~150 seconds
Peak/Classification Temperature (T_P)	235°C+5/-0°C	255°C+5/-0°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 seconds	20~40 seconds
Ramp-Down Rate	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

ASIX Green Packages are Pb-free and RoHS compliance.

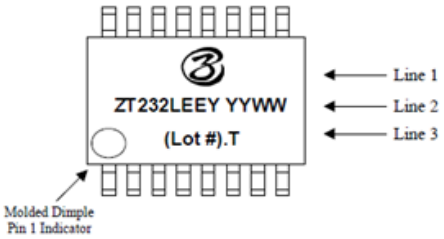
8 Ordering Information

Part Number	Drivers	Receivers	Temperature Range	Package Type	Green Package
ZT202LEEN	2	2	-40°C to +85°C	16-pin nSOIC	
ZT202LEEP	2	2	-40°C to +85°C	16-pin PDIP	
ZT202LEET	2	2	-40°C to +85°C	16-pin wSOIC	
ZT202LEEY	2	2	-40°C to +85°C	16-pin TSSOP	
ZT232LEEN	2	2	-40°C to +85°C	16-pin nSOIC	
ZT232LEEP	2	2	-40°C to +85°C	16-pin PDIP	
ZT232LEET	2	2	-40°C to +85°C	16-pin wSOIC	
ZT232LEEY	2	2	-40°C to +85°C	16-pin TSSOP	

Please contact the factory for pricing and availability on Tape-on-Reel options.

9 Part Marking Information

TOPSIDE MARK INSTRUCTIONS:



Line 1: Zywyn (logo)
Line 2: Zywyn Part Number "ZT232LEEY", Space " ", Date Code (Prod Year & Week)
Line 3: Lot #, dot and Country ".T"
Note: Pin # 1 "○ " Indicator Required if no mold dimple

BOTTOMSIDE MARK INSTRUCTIONS:

No backside marking

Revision History

Revision	Date	Comment
V0.4	2010/06/01	Initial release to customers
V2.00	2015/05/25	1. Changed to ASIX Electronics Corp. logo, strings and contact information. 2. Added ASIX copyright legal header information. 3. Modified the Revision History table format. 4. Removed ZT310E/ZT312E information.
V2.10	2017/09/05	1. Updated the Marking Information in Section 9.

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