

## 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 below is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

$V_{CC}$ .....+7V

Input Voltages

Logic.....-0.3V to ( $V_{CC} + 0.5V$ )

Drivers.....-0.3V to ( $V_{CC} + 0.5V$ )

Receivers.....+/-15V

Output Voltages

Logic.....-0.3V to ( $V_{CC} + 0.5V$ )

Drivers.....+/-15V

Receivers.....-0.3V to ( $V_{CC} + 0.5V$ )

Storage Temperature.....-65°C to +150°C

Power Dissipation

8-pin NSOIC.....550mW  
(derate 6.60mW/°C above +70°C)

8-pin PDIP.....1000mW  
(derate 11.8mW/°C above +70°C)

## ELECTRICAL CHARACTERISTICS

$T_{MIN}$  to  $T_{MAX}$  and  $V_{CC} = +5.0V \pm 5\%$  unless otherwise noted.

| PARAMETERS                                                                         | MIN. | TYP. | MAX.     | UNITS   | CONDITIONS                                                                             |
|------------------------------------------------------------------------------------|------|------|----------|---------|----------------------------------------------------------------------------------------|
| <b>SP481E/SP485E DRIVER</b>                                                        |      |      |          |         |                                                                                        |
| <b>DC Characteristics</b>                                                          |      |      |          |         |                                                                                        |
| Differential Output Voltage                                                        | GND  |      | $V_{CC}$ | Volts   | Unloaded; $R = \infty$ ; see Figure 1                                                  |
| Differential Output Voltage                                                        | 2    |      | $V_{CC}$ | Volts   | With Load; $R = 50\Omega$ (RS-422); see Figure 1                                       |
| Differential Output Voltage                                                        | 1.5  |      | $V_{CC}$ | Volts   | With Load; $R = 27\Omega$ (RS-485); see Figure 1                                       |
| Change in Magnitude of Driver Differential Output Voltage for Complimentary states |      |      | 0.2      | Volts   | $R = 27\Omega$ or $R = 50\Omega$ ; see Figure 1                                        |
| Driver Common Mode Output Voltage                                                  |      |      | 3        | Volts   | $R = 27\Omega$ or $R = 50\Omega$ ; see Figure 1                                        |
| Input High Voltage                                                                 | 2.0  |      |          | Volts   | Applies to DE, DI, $\overline{RE}$                                                     |
| Input Low Voltage                                                                  |      |      | 0.8      | Volts   | Applies to DE, DI, $\overline{RE}$                                                     |
| Input Current                                                                      |      |      | +/-10    | $\mu A$ | Applies to DE, DI, $\overline{RE}$                                                     |
| Driver Short Circuit Current                                                       |      |      |          |         |                                                                                        |
| $V_{OUT} = \text{HIGH}$                                                            |      |      | +/-250   | mA      | $-7V \leq V_O \leq +12V$                                                               |
| $V_{OUT} = \text{LOW}$                                                             |      |      | +/-250   | mA      | $-7V \leq V_O \leq +12V$                                                               |
| <b>SP481E/SP485E DRIVER</b>                                                        |      |      |          |         |                                                                                        |
| <b>AC Characteristics</b>                                                          |      |      |          |         |                                                                                        |
| Max. Transmission Rate                                                             | 10   |      |          | Mbps    | $\overline{RE} = 5V$ , $DE = 5V$ ; $R_{DIFF} = 54\Omega$ , $C_{L1} = C_{L2} = 100pF$   |
| Driver Input to Output, $t_{PLH}$                                                  |      | 30   | 60       | ns      | See Figures 3 & 5, $R_{DIFF} = 54\Omega$ , $C_{L1} = C_{L2} = 100pF$                   |
| Driver Input to Output, $t_{PLH}$<br>(SP485EMN ONLY)                               |      | 30   | 80       | ns      |                                                                                        |
| Driver Input to Output, $t_{PHL}$                                                  |      | 30   | 60       | ns      | See Figures 3 & 5, $R_{DIFF} = 54\Omega$ , $C_{L1} = C_{L2} = 100pF$                   |
| Driver Input to Output, $t_{PHL}$<br>(SP485EMN ONLY)                               |      | 30   | 80       | ns      |                                                                                        |
| Driver Skew                                                                        |      | 5    | 10       | ns      | see Figures 3 and 5,<br>$t_{SKEW} =  t_{DPHL} - t_{DPLH} $                             |
| Driver Rise or Fall Time                                                           |      | 15   | 40       | ns      | From 10%-90%; $R_{DIFF} = 54\Omega$<br>$C_{L1} = C_{L2} = 100pF$ ; see Figures 3 and 6 |

# ELECTRICAL CHARACTERISTICS

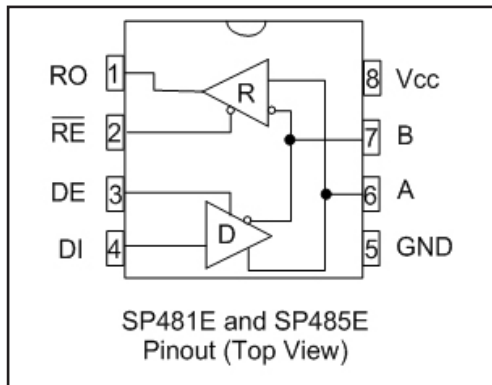
T<sub>MIN</sub> to T<sub>MAX</sub> and V<sub>CC</sub> = +5.0V +/-5% unless otherwise noted.

| PARAMETERS                                                      | MIN. | TYP. | MAX. | UNITS | CONDITIONS                                                                                               |
|-----------------------------------------------------------------|------|------|------|-------|----------------------------------------------------------------------------------------------------------|
| <b>SP481E/SP485E DRIVER (continued)</b>                         |      |      |      |       |                                                                                                          |
| <b>AC Characteristics</b>                                       |      |      |      |       |                                                                                                          |
| Driver Enable to Output High                                    |      | 40   | 70   | ns    | C <sub>L</sub> = 100pF, see Figures 4 and 6, S <sub>2</sub> closed                                       |
| Driver Enable to Output Low                                     |      | 40   | 70   | ns    | C <sub>L</sub> = 100pF, see Figures 4 and 6, S <sub>1</sub> closed                                       |
| Driver Disable Time from High                                   |      | 40   | 70   | ns    | C <sub>L</sub> = 100pF, see Figures 4 and 6, S <sub>2</sub> closed                                       |
| Driver Disable Time from Low                                    |      | 40   | 70   | ns    | C <sub>L</sub> = 100pF, see Figures 4 and 6, S <sub>1</sub> closed                                       |
| <b>SP481E/SP485E RECEIVER</b>                                   |      |      |      |       |                                                                                                          |
| <b>DC Characteristics</b>                                       |      |      |      |       |                                                                                                          |
| Differential Input Threshold                                    | -0.2 |      | +0.2 | Volts | -7V ≤ V <sub>CM</sub> ≤ +12V                                                                             |
| Differential Input Threshold (SP485EMN ONLY)                    | -0.4 |      | +0.4 | Volts | -7V ≤ V <sub>CM</sub> ≤ +12V                                                                             |
| Input Hysteresis                                                |      | 20   |      | mV    | V <sub>CM</sub> = 0V                                                                                     |
| Output Voltage High                                             | 3.5  |      |      | Volts | I <sub>O</sub> = -4mA, V <sub>ID</sub> = +200mV                                                          |
| Output Voltage Low                                              |      |      | 0.4  | Volts | I <sub>O</sub> = +4mA, V <sub>ID</sub> = +200mV                                                          |
| Three-State ( High Impedance) Output Current                    |      |      | +/-1 | μA    | 0.4V ≤ V <sub>O</sub> ≤ 2.4V; $\overline{RE}$ = 5V                                                       |
| Input Resistance                                                | 12   | 15   |      | kΩ    | -7V ≤ V <sub>CM</sub> ≤ +12V                                                                             |
| Input Current (A, B); V <sub>IN</sub> = 12V                     |      |      | +1.0 | mA    | DE = 0V, V <sub>CC</sub> = 0V or 5.25V, V <sub>IN</sub> = 12V                                            |
| Input Current (A, B); V <sub>IN</sub> = -7V                     |      |      | -0.8 | mA    | DE = 0V, V <sub>CC</sub> = 0V or 5.25V, V <sub>IN</sub> = -7V                                            |
| Short Circuit Current                                           | 7    |      | 95   | mA    | 0V ≤ V <sub>O</sub> ≤ V <sub>CC</sub>                                                                    |
| <b>SP481E/SP485E RECEIVER</b>                                   |      |      |      |       |                                                                                                          |
| <b>AC Characteristics</b>                                       |      |      |      |       |                                                                                                          |
| Max. Transmission Rate                                          | 10   |      |      | Mbps  | $\overline{RE}$ = 0V, DE = 0V                                                                            |
| Receiver Input to Output                                        | 20   | 45   | 100  | ns    | t <sub>PLH</sub> : See Figures 3 & 7, R <sub>DIFF</sub> = 54Ω, C <sub>L1</sub> = C <sub>L2</sub> = 100pF |
| Receiver Input to Output                                        | 20   | 45   | 100  | ns    | t <sub>PHL</sub> : See Figures 3 & 7, R <sub>DIFF</sub> = 54Ω, C <sub>L1</sub> = C <sub>L2</sub> = 100pF |
| Differential Receiver Skew  t <sub>PHL</sub> - t <sub>PLH</sub> |      | 13   |      | ns    | R <sub>DIFF</sub> = 54Ω, C <sub>L1</sub> = C <sub>L2</sub> = 100pF, see Figures 3 and 7                  |
| Receiver Enable to Output Low                                   |      | 45   | 70   | ns    | C <sub>RL</sub> = 15pF, Figures 2 & 8; S <sub>1</sub> Closed                                             |
| Receiver Enable to Output High                                  |      | 45   | 70   | ns    | C <sub>RL</sub> = 15pF, Figures 2 & 8; S <sub>2</sub> Closed                                             |
| Receiver Disable from LOW                                       |      | 45   | 70   | ns    | C <sub>RL</sub> = 15pF, Figures 2 & 8; S <sub>1</sub> Closed                                             |
| Receiver Disable from High                                      |      | 45   | 70   | ns    | C <sub>RL</sub> = 15pF, Figures 2 & 8; S <sub>2</sub> Closed                                             |

## ELECTRICAL CHARACTERISTICS

$T_{MIN}$  to  $T_{MAX}$  and  $V_{CC} = +5.0V \pm 5\%$  unless otherwise noted.

| PARAMETERS                                   | MIN.  | TYP. | MAX.  | UNITS       | CONDITIONS                                           |
|----------------------------------------------|-------|------|-------|-------------|------------------------------------------------------|
| <b>SP481E</b>                                |       |      |       |             |                                                      |
| <b>Shutdown Timing</b>                       |       |      |       |             |                                                      |
| Time to Shutdown                             | 50    | 200  | 600   | ns          | $\overline{RE} = 5V, DE = 0V$                        |
| Driver Enable from Shutdown to Output High   |       | 40   | 100   | ns          | $C_L = 100pF$ ; See Figures 4 and 6; $S_2$ Closed    |
| Driver Enable from Shutdown to Output Low    |       | 40   | 100   | ns          | $C_L = 100pF$ ; See Figures 4 and 6; $S_1$ Closed    |
| Receiver Enable from Shutdown to Output High |       | 300  | 1000  | ns          | $C_L = 15pF$ ; See Figures 2 and 8; $S_2$ Closed     |
| Receiver Enable from Shutdown to Output Low  |       | 300  | 1000  | ns          | $C_L = 15pF$ ; See Figures 2 and 8; $S_1$ Closed     |
| <b>POWER REQUIREMENTS</b>                    |       |      |       |             |                                                      |
| Supply Voltage $V_{CC}$                      | +4.75 |      | +5.25 | Volts       |                                                      |
| Supply Current                               |       |      |       |             |                                                      |
| <b>SP481E/SP485E</b>                         |       |      |       |             |                                                      |
| No Load                                      |       | 900  |       | $\mu A$     | $\overline{RE}, DI = 0V$ or $V_{CC}$ ; $DE = V_{CC}$ |
|                                              |       | 600  |       | $\mu A$     | $\overline{RE} = 0V, DI = 0V$ or $5V$ ; $DE = 0V$    |
| <b>SP481E</b>                                |       |      |       |             |                                                      |
| Shutdown Mode                                |       |      | 10    | $\mu A$     | $DE = 0V, \overline{RE} = V_{CC}$                    |
|                                              |       |      |       |             |                                                      |
| <b>ENVIRONMENTAL AND MECHANICAL</b>          |       |      |       |             |                                                      |
| Operating Temperature                        |       |      |       |             |                                                      |
| Commercial ( $_C_$ )                         | 0     |      | 70    | $^{\circ}C$ |                                                      |
| Industrial ( $_E_$ )                         | -40   |      | +85   | $^{\circ}C$ |                                                      |
| ( $_M_$ )                                    | -40   |      | +125  | $^{\circ}C$ |                                                      |
| Storage Temperature                          | -65   |      | +150  | $^{\circ}C$ |                                                      |
| Package                                      |       |      |       |             |                                                      |
| Plastic DIP ( $_P$ )                         |       |      |       |             |                                                      |
| NSOIC ( $_N$ )                               |       |      |       |             |                                                      |



Pin 1 - RO - Receiver Output

Pin 2 -  $\overline{RE}$  - Receiver Output Enable Active LOW

Pin 3 - DE - Driver Output Enable Active HIGH

Pin 4 DI - Driver Input

Pin 5 - GND - Ground Connection

Pin 6 - A - Driver Output / Receiver input  
Non-Inverting

Pin 7 - B - Driver Output / Receiver Input Inverting

Pin 8 - Vcc - Positive Supply  $4.75V \leq V_{CC} \leq 5.25V$

## TEST CIRCUITS

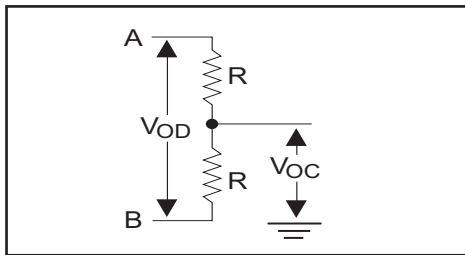


Figure 1. RS-485 Driver DC Test Load Circuit

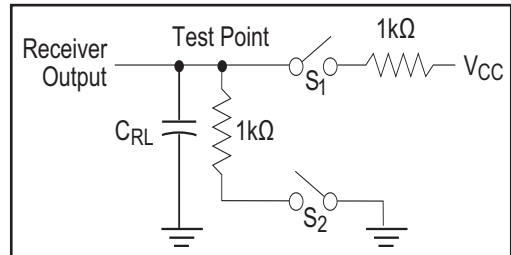


Figure 2. Receiver Timing Test Load Circuit

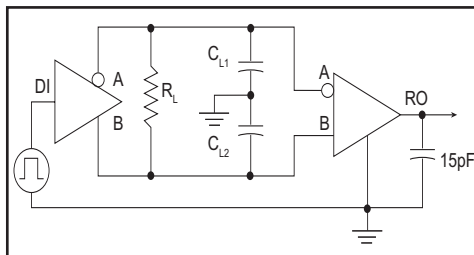


Figure 3. RS-485 Driver/Receiver Timing Test

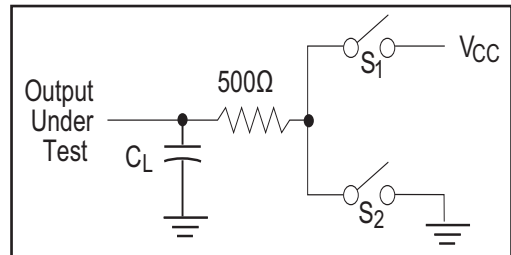


Figure 4. Driver Timing Test Load #2 Circuit

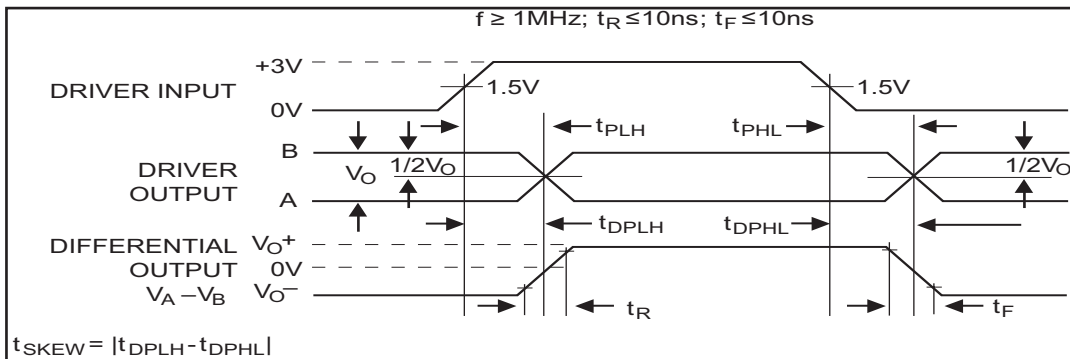


Figure 5. Driver Propagation Delays

## FUNCTION TRUTH TABLES

| INPUTS          |    |    | LINE<br>CONDITION | OUTPUTS |   |
|-----------------|----|----|-------------------|---------|---|
| $\overline{RE}$ | DE | DI |                   | A       | B |
| X               | 1  | 1  | No Fault          | 1       | 0 |
| X               | 1  | 0  | No Fault          | 0       | 1 |
| X               | 0  | X  | X                 | Z       | Z |
| X               | 1  | X  | Fault             | Z       | Z |

Table 1. Transmit Function Truth Table

| INPUTS          |    | A - B       | OUTPUTS |
|-----------------|----|-------------|---------|
| $\overline{RE}$ | DE |             |         |
| 0               | 0  | +0.2V       | 1       |
| 0               | 0  | -0.2V       | 0       |
| 0               | 0  | Inputs Open | 1       |
| 1               | 0  | X           | Z       |

Table 2. Receive Function Truth Table

## SWITCHING WAVEFORMS

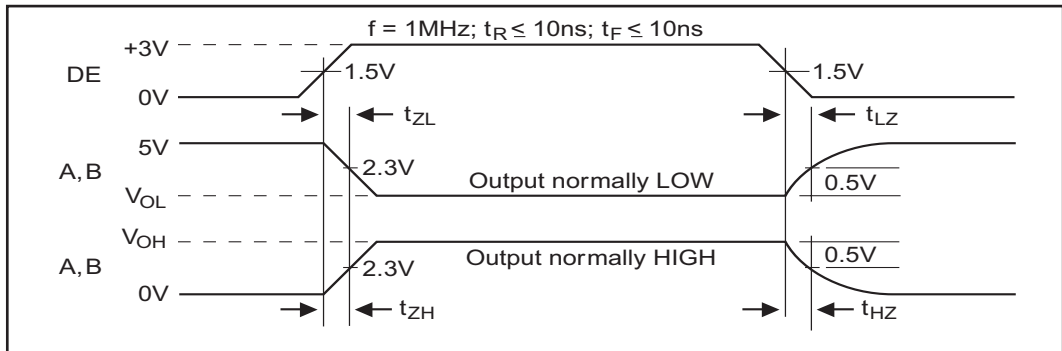


Figure 6. Driver Enable and Disable Times

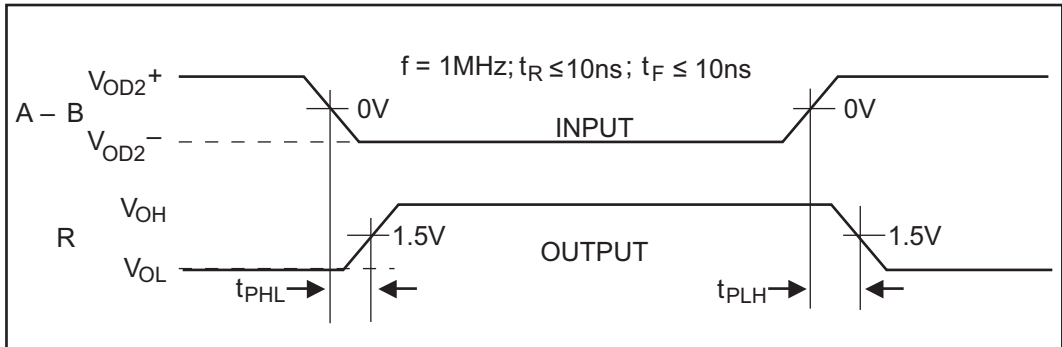


Figure 7. Receiver Propagation Delays

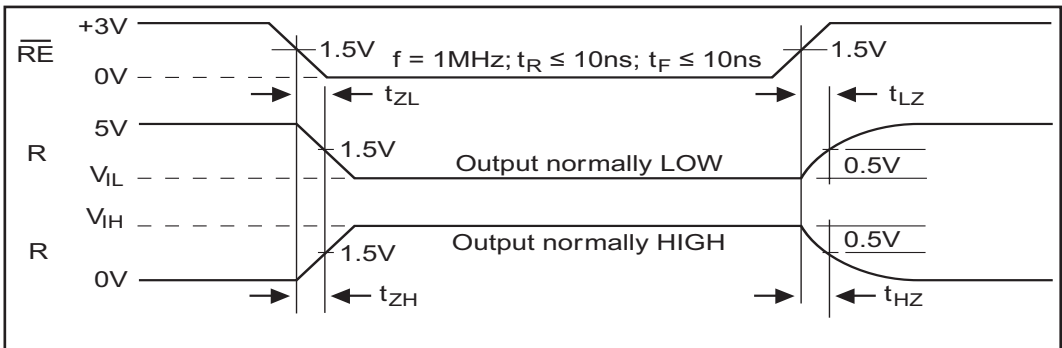


Figure 8. Receiver Enable and Disable Times

The **SP481E** and **SP485E** are half-duplex differential transceivers that meet the requirements of RS-485 and RS-422. Fabricated with an **Exar** proprietary BiCMOS process, this product requires a fraction of the power of older bipolar designs.

The RS-485 standard is ideal for multi-drop applications and for long-distance interfaces. RS-485 allows up to 32 drivers and 32 receivers to be connected to a data bus, making it an ideal choice for multi-drop applications. Since the cabling can be as long as 4,000 feet, RS-485 transceivers are equipped with a wide (-7V to +12V) common mode range to accommodate ground potential differences. Because RS-485 is a differential interface, data is virtually immune to noise in the transmission line.

### Drivers

The driver outputs of the **SP481E** and **SP485E** are differential outputs meeting the RS-485 and RS-422 standards. The typical voltage output swing with no load will be 0 Volts to +5 Volts. With worst case loading of 54Ω across the differential outputs, the drivers can maintain greater than 1.5V voltage levels. The drivers of the **SP481E** and **SP485E** have an enable control line which is active HIGH. A logic HIGH on DE (pin 3) will enable the differential driver outputs. A logic LOW on the DE(pin 3) will tri-state the driver outputs.

The transmitters of the **SP481E** and **SP485E** will operate up to at least 10Mbps.

### Receivers

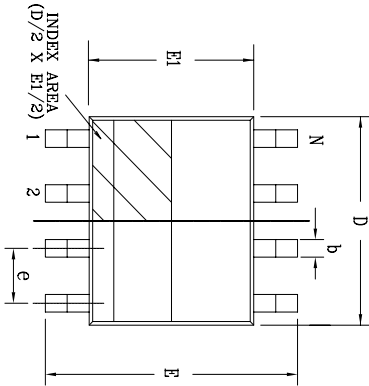
The **SP481E** and **SP485E** receivers have differential inputs with an input sensitivity as low as ±200mV. Input impedance of the receivers is typically 15kΩ (12kΩ minimum). A wide common mode range of -7V to +12V allows for large ground potential differences between systems. The receivers of the **SP481E** and **SP485E** have a tri-state enable control pin. A logic LOW on  $\overline{RE}$  (pin 2) will enable the receiver, a logic HIGH on  $\overline{RE}$  (pin 2) will disable the receiver.

The receiver for the **SP481E** and **SP485E** will operate up to at least 10Mbps. The receiver for each of the two devices is equipped with the fail-safe feature. Fail-safe guarantees that the receiver output will be in a HIGH state when the input is left unconnected.

### Shutdown Mode SP481E

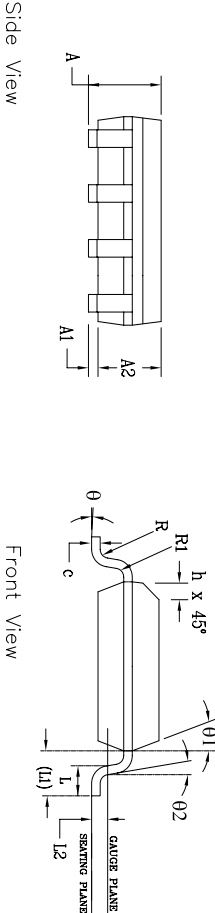
The **SP481E** is equipped with a Shutdown mode. TO enable the shutdown state, both driver and receiver must be disabled simultaneously. A logic LOW on DE (pin 3) and a Logic HIGH on  $\overline{RE}$  (pin 2) will put the **SP481E** into Shutdown mode. In Shutdown, supply current will drop to typically 1μA.

| REVISION HISTORY |                                      |          |       |  |
|------------------|--------------------------------------|----------|-------|--|
| REV.             | DESCRIPTION                          | DATE     | APP'D |  |
| A                | DRAWING ORIGINATOR                   | 08/16/05 | JL    |  |
| B                | DRAWING FORMAT MODIFICATION          | 07/19/06 | JL    |  |
| C                | CHANGE DRAWING LOGO AND COMPANY NAME | 11/16/07 | JL    |  |



Top View

| 8 Pin SOICN |          | JEDEC MS-012                       |      | Variation AA |                                        |       |     |
|-------------|----------|------------------------------------|------|--------------|----------------------------------------|-------|-----|
| SYMBOLS     |          | DIMENSIONS IN MM<br>(Control Unit) |      |              | DIMENSIONS IN INCH<br>(Reference Unit) |       |     |
|             |          | MIN                                | NOM  | MAX          | MIN                                    | NOM   | MAX |
| A           | 1.35     | —                                  | 1.75 | 0.053        | —                                      | 0.069 | —   |
| A1          | 0.10     | —                                  | 0.25 | 0.004        | —                                      | 0.010 | —   |
| A2          | 1.25     | —                                  | 1.65 | 0.049        | —                                      | 0.065 | —   |
| b           | 0.31     | —                                  | 0.51 | 0.012        | —                                      | 0.020 | —   |
| c           | 0.17     | —                                  | 0.25 | 0.007        | —                                      | 0.010 | —   |
| E           | 6.00 BSC |                                    |      |              | 0.236 BSC                              |       |     |
| E1          | 3.90 BSC |                                    |      |              | 0.154 BSC                              |       |     |
| e           | 1.27 BSC |                                    |      |              | 0.050 BSC                              |       |     |
| h           | 0.25     | —                                  | 0.50 | 0.010        | —                                      | 0.020 | —   |
| L           | 0.40     | —                                  | 1.27 | 0.016        | —                                      | 0.050 | —   |
| L1          | 1.04 REF |                                    |      |              | 0.041 REF                              |       |     |
| L2          | 0.25 BSC |                                    |      |              | 0.010 BSC                              |       |     |
| R           | 0.07     | —                                  | —    | 0.003        | —                                      | —     | —   |
| R1          | 0.07     | —                                  | —    | 0.003        | —                                      | —     | —   |
| θ           | 0°       | —                                  | 8°   | 0°           | —                                      | 8°    | —   |
| θ1          | 5°       | —                                  | 15°  | 5°           | —                                      | 15°   | —   |
| θ2          | 0°       | —                                  | —    | 0°           | —                                      | —     | —   |
| D           | 4.90 BSC |                                    |      |              | 0.193 BSC                              |       |     |
| N           | 8        |                                    |      |              | 8                                      |       |     |



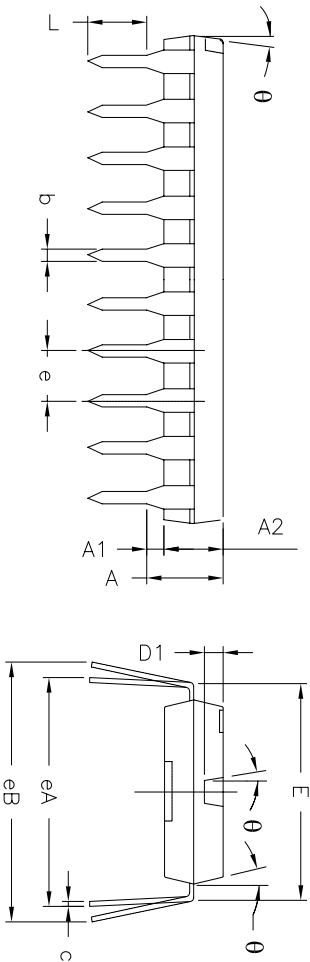
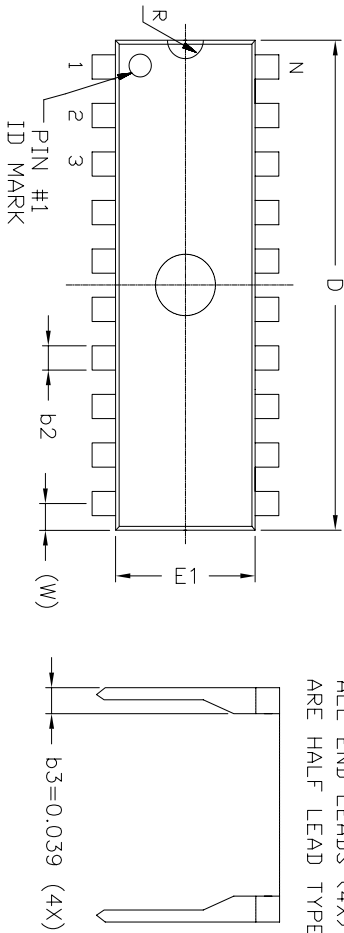
Side View

Front View

|                                                                                     |                |                             |             |
|-------------------------------------------------------------------------------------|----------------|-----------------------------|-------------|
|  |                | EXAR CORPORATION            |             |
| Packaging Approval:                                                                 |                | 8 PIN SOICN PACKAGE OUTLINE |             |
| By: JL                                                                              | Date: 11/16/07 | Drawing No: 8-PIN SOICN     | Revision: C |
|                                                                                     |                | Sheet: 1 OF 1               |             |

| REVISION HISTORY |                                      |          |       |  |
|------------------|--------------------------------------|----------|-------|--|
| REV.             | DESCRIPTION                          | DATE     | APP'D |  |
| A                | DRAWING ORIGINATOR                   | 04/26/06 | JL    |  |
| B                | CHANGE DRAWING LOGO AND COMPANY NAME | 11/28/07 | JL    |  |

REMARKS:  
FOR 8LD AND 16LD  
ALL END LEADS (4X)  
ARE HALF LEAD TYPES



| 8 Pin PDIP JEDEC MS-001 Variation BA |                                      |       |       |      |                                      |       |      |  |  |
|--------------------------------------|--------------------------------------|-------|-------|------|--------------------------------------|-------|------|--|--|
| SYMBOLS                              | DIMENSIONS IN INCH<br>(Control Unit) |       |       |      | DIMENSIONS IN MM<br>(Reference Unit) |       |      |  |  |
|                                      | MIN                                  | NOM   | MAX   |      | MIN                                  | NOM   | MAX  |  |  |
| A                                    | —                                    | —     | 0.210 | —    | —                                    | —     | 5.33 |  |  |
| A1                                   | 0.015                                | —     | —     | 0.38 | —                                    | —     | —    |  |  |
| A2                                   | 0.115                                | 0.130 | 0.195 | 2.92 | 3.30                                 | 4.95  |      |  |  |
| b                                    | 0.014                                | 0.018 | 0.022 | 0.36 | 0.46                                 | 0.56  |      |  |  |
| b2                                   | 0.045                                | 0.060 | 0.070 | 1.14 | 1.52                                 | 1.78  |      |  |  |
| c                                    | 0.008                                | 0.010 | 0.014 | 0.20 | 0.25                                 | 0.36  |      |  |  |
| D1                                   | 0.030                                | —     | 0.060 | 0.76 | —                                    | 1.52  |      |  |  |
| E                                    | 0.300                                | 0.310 | 0.325 | 7.62 | 7.87                                 | 8.26  |      |  |  |
| E1                                   | 0.240                                | 0.250 | 0.280 | 6.10 | 6.35                                 | 7.11  |      |  |  |
| e                                    | 0.100 BSC                            |       |       |      | 2.54 BSC                             |       |      |  |  |
| eA                                   | 0.300 BSC                            |       |       |      | 7.62 BSC                             |       |      |  |  |
| eB                                   | —                                    | —     | 0.430 | —    | —                                    | 10.92 |      |  |  |
| L                                    | 0.115                                | 0.130 | 0.150 | 2.92 | 3.30                                 | 3.81  |      |  |  |
| W                                    | 0.075 REF                            |       |       |      | 1.91 REF                             |       |      |  |  |
| R                                    | 0.030 BSC                            |       |       |      | 0.76 BSC                             |       |      |  |  |
| theta                                | 4°                                   | 7°    | 10°   | 4°   | 7°                                   | 10°   |      |  |  |
| D                                    | 0.355                                | 0.365 | 0.400 | 9.02 | 9.27                                 | 10.16 |      |  |  |
| N                                    | 8                                    |       |       |      | 8                                    |       |      |  |  |

|                                                                                     |                |                            |               |  |  |
|-------------------------------------------------------------------------------------|----------------|----------------------------|---------------|--|--|
|  |                | <b>EXAR CORPORATION</b>    |               |  |  |
|                                                                                     |                | 8 PIN PDIP PACKAGE OUTLINE |               |  |  |
| Packaging Approval:                                                                 |                | Drawing No:                | 8-PIN PDIP    |  |  |
| By: JL                                                                              | Date: 11/28/07 | Revision: B                | Sheet: 1 OF 1 |  |  |



| ORDERING INFORMATION |                      |               |
|----------------------|----------------------|---------------|
| Model                | Temperature Range    | Package Types |
| SP481ECN-L.....      | 0°C to +70°C.....    | 8-pin NSOIC   |
| SP481ECN-L/TR.....   | 0°C to +70°C.....    | 8-pin NSOIC   |
| SP481EEN-L.....      | -40°C to +85°C.....  | 8-pin NSOIC   |
| SP481EEN-L/TR.....   | -40°C to +85°C.....  | 8-pin NSOIC   |
| SP485ECN-L.....      | 0°C to +70°C.....    | 8-pin NSOIC   |
| SP485ECN-L/TR.....   | 0°C to +70°C.....    | 8-pin NSOIC   |
| SP485ECP-L.....      | 0°C to +70°C.....    | 8-pin PDIP    |
| SP485EEN-L.....      | -40°C to +85°C.....  | 8-pin NSOIC   |
| SP485EEN-L/TR.....   | -40°C to +85°C.....  | 8-pin NSOIC   |
| SP485EEP-L.....      | -40°C to +85°C.....  | 8-pin PDIP    |
| SP485EMN-L.....      | -40°C to +125°C..... | 8-pin NSOIC   |
| SP485EMN-L/TR.....   | -40°C to +125°C..... | 8-pin NSOIC   |

Note: /TR = Tape and Reel

## REVISION HISTORY

| DATE      | REVISION | DESCRIPTION                                                                                                                                                                    |
|-----------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| May 11/07 | --       | Legacy Sipex Datasheet                                                                                                                                                         |
| 12/18/08  | 1.0.0    | Convert to Exar Format. Update ordering information as a result of discontinued Lead type package options per PDN 081126-01. Remove "Top Mark" information from ordering page. |
| 11/19/09  | 1.0.1    | Correct table 1 error for driver output A and B outputs                                                                                                                        |
| 08/08/10  | 1.0.2    | Change SP485EMN-L and SP485EMN-L/TR temperature range error from +85C to +125C in ordering information section.                                                                |
| 05/27/11  | 1.0.3    | Remove driver minimum limits of propagation delay and Rise/Fall time. Remove SP481ECP-L and SP481EEP-L per PDN 110510-01                                                       |
| 05/24/13  | 1.0.4    | Correct type errors per PCN 13-0503-01 ECN: 1322-04 05/29/2013                                                                                                                 |

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