



ST1394-01SC6

IPAD™
(Integrated Passive and
Active Devices)

IEEE1394 ONE PORT CABLE TERMINATION NETWORK WITH ESD PROTECTION DIODES

MAIN APPLICATIONS

IEEE1394 line termination on:

- Desktops
- Notebooks
- Digital Camcorders
- External storage drive
- Set Top Box

FEATURES

- LINE TERMINATION FOR 2 TWISTED PAIRS TPA AND TPB
- THE DEVICE COMPLIES WITH IEEE1394 REQUIREMENT FOR DIFFERENTIAL AND COMMON MODE IMPEDANCE ON TPA AND TPB LINE
- MONOLITHIC DEVICE WITH COMPLETE TERMINATION FOR ONE IEEE1394 CONNECTION

DESCRIPTION

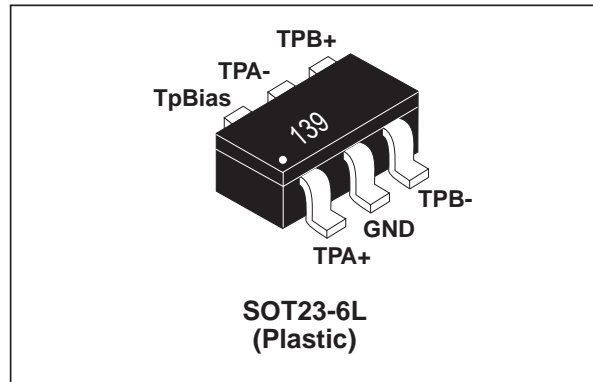
The ST1394-01SC6 is an integrated termination network that optimizes board layout of the PHY layer in IEEE1394 one port cable application.

This monolithic device is tested, according to ESD requirement described in IEC61000-4-2 standard level 2. ST1394-01SC6 device ruggedness limits overvoltage at the 1394 transceiver inputs and outputs below acceptable limits.

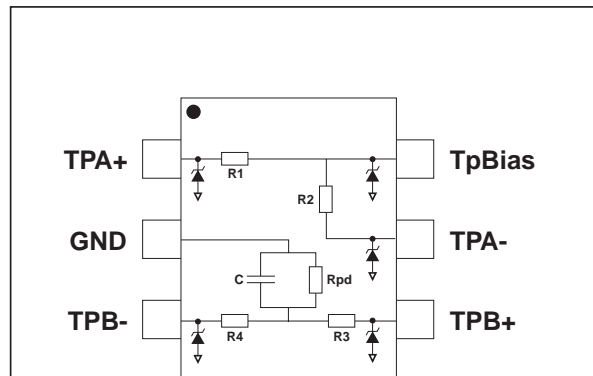
The ST1394-01SC6 implements IEEE1394 recommendation for line termination of TPA and TPB differential lines. Excellent matching of the termination resistor will minimize common mode noise that is needed to improve communication speed.

BENEFITS

- Resistor matching between TPA / TPB lines.
- Resistor matching between TPA+ / TPA-
- Single chip device versus 11 discretes
- No need for additional overvoltage protection device
- High level of integration



FUNCTIONAL DIAGRAM



| Lines | TPA+ | TPA- | TPB+ | TPB- | Rpd | GND | Zener Capacitance |
|-----------|--|------|------|------|-----|-------|-------------------|
| Names | R1 | R2 | R3 | R4 | R5 | C | Cz |
| Value | 55Ω | 55Ω | 55Ω | 55Ω | 5kΩ | 250pF | 5pF |
| Tolerance | Typ. | Typ. | Typ. | Typ. | 20% | 20% | Max. |
| Matching | Matching between 55Ω Resistor at ± 1% max. | | | | | | |

ST1394-01SC6

ABSOLUTE RATINGS (T_{amb} = 25°C)

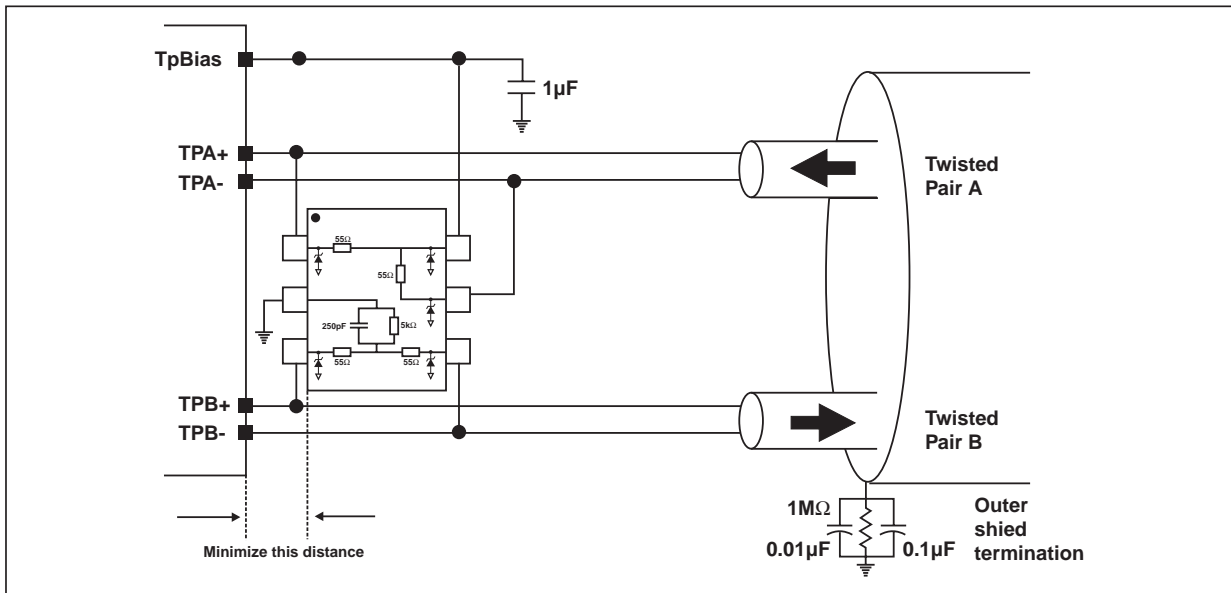
| Symbol | Parameter and test conditions | Value | Unit |
|------------------|--|-------------|------|
| T _{stg} | Storage temperature range | -55 to +150 | °C |
| T _j | Maximum junction temperature | +150 | °C |
| TL | Lead solder temperature (10 second duration) | 260 | °C |

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C)

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|---------------------|--|------|------|------|------|
| R1, R2, R3, R4 | Bus termination resistors (note 1) | | 55 | | Ω |
| C _Z | Zener capacitance | | | 5 | pF |
| R _{pd} | Pull down resistor | | 5 | | kΩ |
| C | Capacitor in parallel with R _{pd} | | 250 | | pF |
| (R1+R2), (R3+R4) | Bus termination impedance | 102 | 110 | 118 | Ω |

Note 1: matching between 55Ω resistors is better than ± 1%.

FUNCTIONAL DIAGRAM



APPLICATION INFORMATION

The functional diagram here above presents a IEEE1394-a cable and shows how to connect the ST1394-01SC6 in order to correctly terminate and filter the TPA and TPB lines.

TECHNICAL INFORMATION

FREQUENCY BEHAVIOR OF DATA AND STROBE SIGNALS

Fig. A1: Measurement conditions.

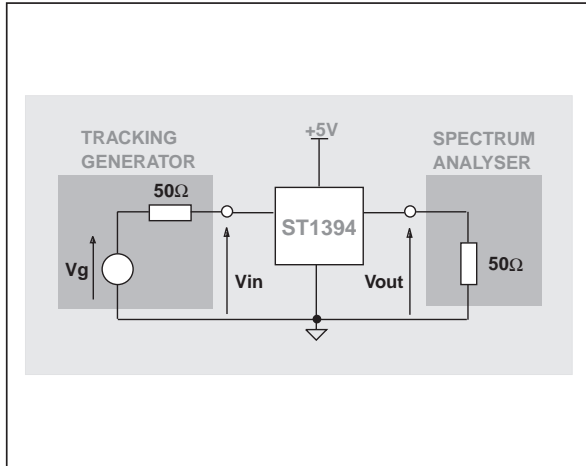


Fig. A2: Test Board.

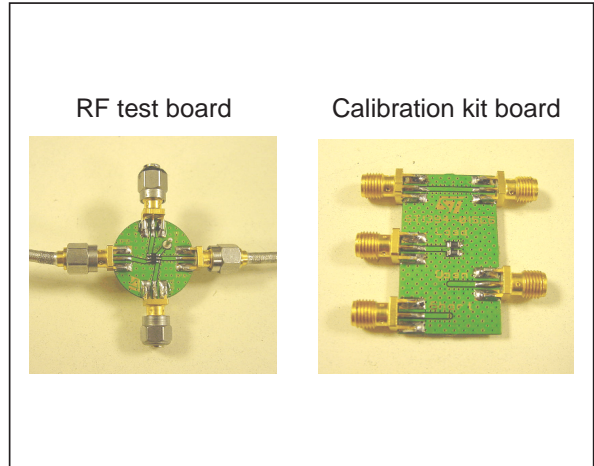


Fig. A3: TPA line: comparison between Aplac model and device.

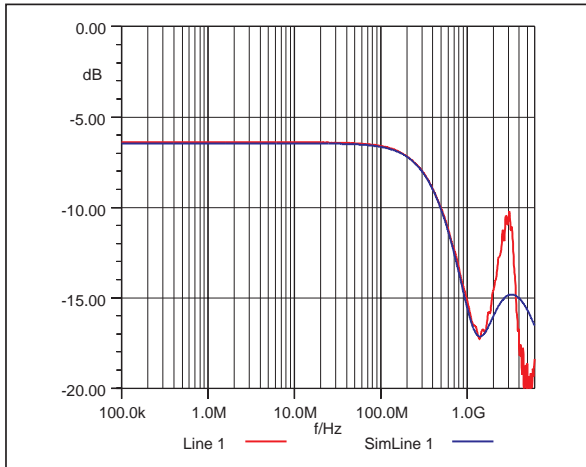
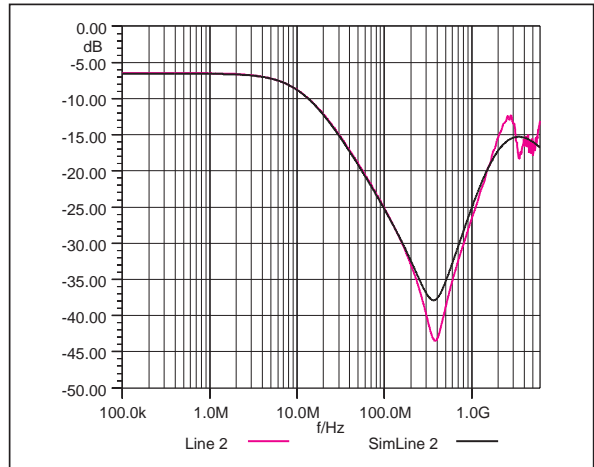


Fig. A4: TPB line: comparison between Aplac model and device.



Note: For a convenience reason, frequency response have been carried out on both TPA and TPB lines as if TPA+ and TPA- or TPB+ and TPB- were respectively Inputs and Outputs lines

Fig. A5: Crosstalk between TPA and TPB lines.

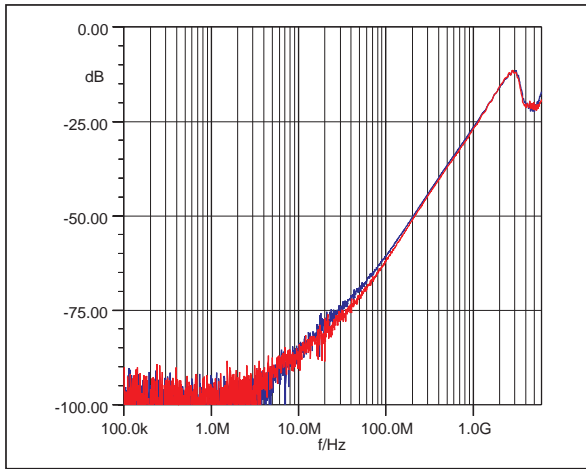
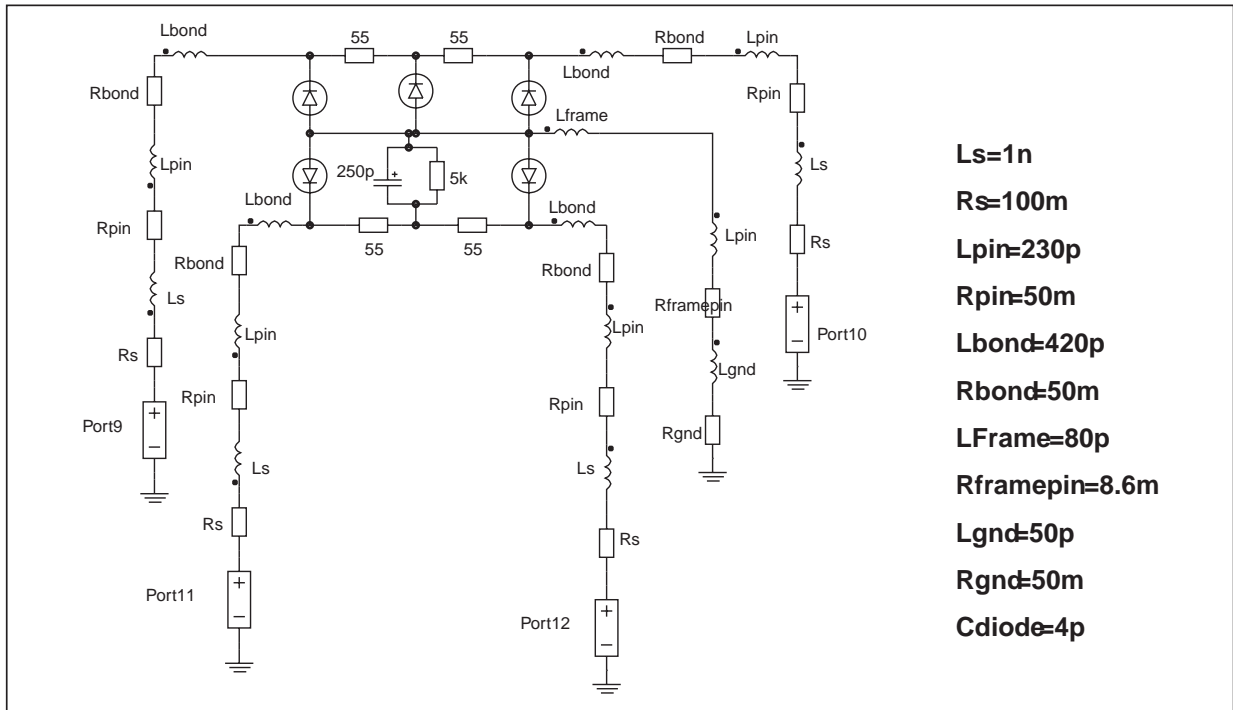
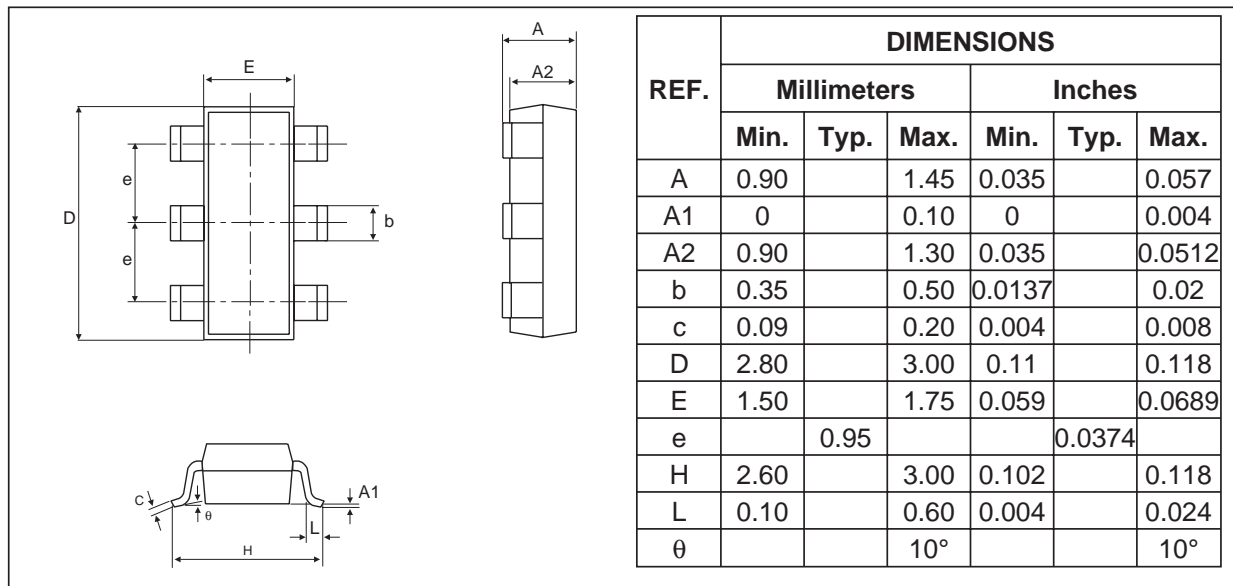


Fig. A6: ST1394 APLAC model.

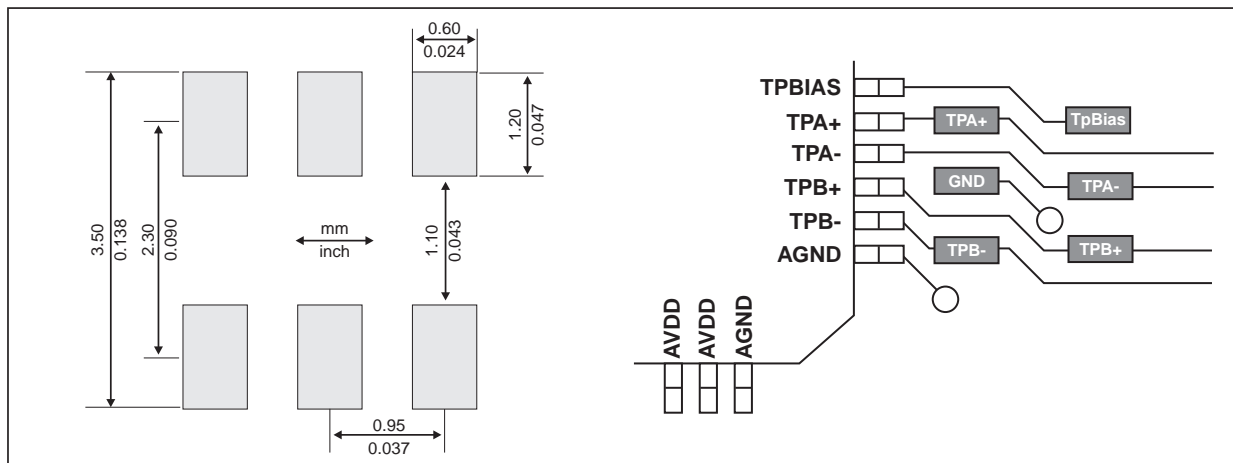


ST1394-01SC6

PACKAGE MECHANICAL DATA SOT23-6L (Plastic)



FOOTPRINT DIMENSIONS



| Order code | Marking | Package | Weight | Delivery mode | Base qty |
|--------------|---------|----------|---------|---------------|----------|
| ST1394-01SC6 | 139 | SOT23-6L | 16.7 mg | Tape & reel | 3000 |

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