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Superseding AS4074/2

**Type F-2 Fiber Optic Media Interface Characteristics**

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**1. SCOPE:**

This slash sheet specifies the operational parameters and characteristics of a particular implementation of the SAE Linear, Token Passing Bus (LTPB) Interface Unit.

This slash sheet defines the following:

- a. The physical media interface: This slash sheet specifies the characteristics of the optical interface to the physical bus media.
- b. The minimum and maximum timing requirements for operation of this implementation of the LTPB.
- c. The data coding used to encode and decode the data for transmission.
- d. The default values to be loaded into the timers of the LTPB interface at power-up prior to intervention by the host processor.

**2. REFERENCES:**

There are no referenced publications specified herein.

PREPARED UNDER THE JURISDICTION OF  
SAE COMMITTEE AS-2, INTERCONNECT NETWORKS

# SAE AS4074/2 Revision A

## TYPE F-2 FIBER OPTIC MEDIA INTERFACE CHARACTERISTICS

| Parameter                          | Description                                | Units     | Requirement                   |
|------------------------------------|--------------------------------------------|-----------|-------------------------------|
| <b>COMMON CHARACTERISTICS</b>      |                                            |           |                               |
| -                                  | Encoding Method and Symbol Set             |           | Manchester II<br>see Figure 1 |
| R <sub>d</sub>                     | Data Rate                                  | Mbps      | 50 ± 0.01%                    |
| R <sub>s</sub>                     | Signaling Rate                             | MBaud     | 100 ± 0.01%                   |
| T <sub>o</sub>                     | Nominal Bit Time                           | ns        | 20                            |
| T <sub>m</sub>                     | Minimum Duration Between Transitions       | ns        | 10                            |
| T <sub>sr</sub>                    | Maximum Station Response Time              | ns        | 500                           |
| S <sub>itg</sub>                   | System Minimum Intertransmission Gap       | ns        | 280                           |
| W1                                 | Optical Wavelength Lower                   | nm        | 800                           |
| W2                                 | Optical Wavelength Upper                   | nm        | 880                           |
| BW                                 | Spectral Bandwidth                         | nm        | 60                            |
| TPT                                | Token Passing Timer Initializ. Value       | us        | 10.20                         |
| BAT                                | Bus Activity Timer Initializ. Value        | us        | 15*(PSA+1)                    |
| RAT                                | Ring Admit. Timer Initializ. Value         | ms        | 100                           |
| THT                                | Token Holding Timer Initializ. Value       | us        | 50                            |
| TRT1                               | Token Rot. Timer 1 Initializ. Value        | us        | 400                           |
| TRT2                               | Token Rot. Timer 2 Initializ. Value        | us        | 300                           |
| TRT3                               | Token Rot. Timer 3 Initializ. Value        | us        | 200                           |
| <b>TRANSMITTER CHARACTERISTICS</b> |                                            |           |                               |
| T <sub>po</sub>                    | Transmitter Optical Power (Signal High)    | dBm       | -3.0 ± 1.5                    |
| T <sub>pr</sub>                    | Transmitter Residual Power (Signal Low)    | dBm       | -16                           |
| T <sub>pl</sub>                    | Transmitter Leakage Power (Tx Off)         | dBm       | -40                           |
| T <sub>r</sub>                     | Transmitter Maximum Rise Time              | ns        | 4                             |
| T <sub>f</sub>                     | Transmitter Maximum Fall Time              | ns        | 6                             |
| T <sub>pwd</sub>                   | Transmitter Maximum Pulse Width Distortion | ns        | 2.4                           |
| T <sub>ous</sub>                   | Transmitter Combined Over/Under-Shoot      | %         | 5                             |
| T <sub>to</sub>                    | Transmitter Nominal Bit Time               | ns        | 20 ± 10%                      |
| T <sub>tm</sub>                    | Transmitter Minimum Signaling Duration     | ns        | 10 ± 5%                       |
| T <sub>ds</sub>                    | Data Streaming Timer                       | ms        | 68 ± 1%                       |
| T <sub>sk</sub>                    | Transmitter Redundant Media Skew Time      | ns        | 150                           |
| P <sub>t</sub>                     | Transmitter Preamble Length                | Bit Times | 16                            |

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TYPE F-2 FIBER OPTIC MEDIA INTERFACE CHARACTERISTICS (CONTINUED)

| Parameter                | Description                             | Units     | Requirement   |
|--------------------------|-----------------------------------------|-----------|---------------|
| RECEIVER CHARACTERISTICS |                                         |           |               |
| $R_{po}$                 | Receiver Maximum Optical Power Input    | dBm       | 0             |
| $R_{or}$                 | Receiver Operating Range                | dB        | 21            |
| $R_{idr}$                | Receiver Intertransmission Dyn. Range   | dB        | 15            |
| $R_{pm}$                 | Receiver Minimum Optical Power Input    | dBm       | -32.5         |
| $R_{ous}$                | Receiver Combined Over/Under-Shoot      | %         | 25            |
| $R_r$                    | Receiver Maximum Rise Time              | ns        | 5             |
| $R_f$                    | Receiver Maximum Fall Time              | ns        | 7             |
| $R_{pwt}$                | Receiver Maximum Pulse Width Distortion | ms        | 2.4           |
| $R_{to}$                 | Receiver Nominal Bit Time               | ns        | $20 \pm 10\%$ |
| $R_{tm}$                 | Receiver Maximum Signaling Rate         | ns        | $10 \pm 10\%$ |
| $R_{ber}$                | Receiver Maximum Bit Error Rate         | -         | $10\exp[-10]$ |
| $P_r$                    | Receiver Minimum Valid Preamble Length  | Bit Times | 12            |
| MEDIA CHARACTERISTICS    |                                         |           |               |
| $D_{core}$               | Fiber Core Diameter                     | um        | 200           |
| $D_{clad}$               | Fiber Cladding Diameter                 | um        | 240           |
| NA                       | Fiber Minimum Numerical Aperture        | -         | 0.2           |
| $D_{cm}$                 | Maximum Total Dispersion                | ns        | 3             |
| $A_{min}$                | Minimum Optical Attenuation             | dB        | 11.5          |
| $A_{max}$                | Maximum Optical Attenuation             | dB        | 28.5          |