SAE Aerospace
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# AEROSPACE STANDARD

SAE AS4074/3 REV. A

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## Type E-1 Electrical Media Interface Characteristics

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" as of October 2004. It is recommended, therefore, that this document not be specified for new designs.

Each of these "NONCURRENT" documents is available from SAE.





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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 electrical 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

## TYPE E-1 ELECTRICAL MEDIA INTERFACE CHARACTERISTICS

| Parameter | Description | Units | Requirement |
|---|---|---|---|
| COMMON CHARACTERISTICS | | | |
| - | Encoding Method and Symbol Set | | Manchester II see Figure 1 |
| $R_d$ | Data Rate | Mbps | 50 ± 0.01% |
| $R_s$ | Signaling Rate | MBaud | 100 ± 0.01% |
| $T_o$ | Nominal Bit Time | ns | 20 |
| $T_m$ | Minimum Duration Between Transitions | ns | 10 |
| $T_{sr}$ | Maximum Station Response Time | ns | 500 |
| $S_{itg}$ | System Minimum Intertransmission Gap | ns | 280 |
| $S_v$ | Surge Voltage Level | V | ±1000 |
| $S_d$ | Surge Voltage Duration | ms | 10 |
| 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 |
| TRANSMITTER CHARACTERISTICS | | | |
| $T_{vo}$ | Transmitter Output Voltage Level (On) | V | ±(7.5 ± 20%) |
| $T_{vr}$ | Transmitter Peak Output Voltage Level (Off) | V | ±0.05 |
| $T_r$ | Transmitter Maximum Rise Time | ns | 4 ± 50% |
| $T_f$ | Transmitter Maximum Fall Time | ns | 4 ± 50% |
| $T_{ous}$ | Transmitter Combined Over/Under-Shoot | % | 5 |
| $T_{to}$ | Transmitter Nominal Bit Time | ns | 20 ± 10% |
| $T_{tm}$ | Transmitter Minimum Signaling Duration | ns | 10 ± 5% |
| $T_{iz}$ | Transmitter Drive Impedance | Ohms | 50 ± 20% |
| $T_{ds}$ | Data Streaming Timer | ms | 68 ± 1% |
| $T_{sk}$ | Transmitter Redundant Media Skew Time | ns | 150 |
| $P_t$ | Transmitter Preamble Length | Bit Times | 4 |

## TYPE E-1 ELECTRICAL MEDIA INTERFACE CHARACTERISTICS (CONTINUED)

| Parameter | Description | Units | Requirement |
|---|---|---|---|
| RECEIVER CHARACTERISTICS | | | |
| $R_{vo}$ | Receiver Maximum Input Voltage | V | ±12 |
| $R_{vm}$ | Receiver Minimum Input Voltage | V | ±0.1 |
| $R_{idr}$ | Receiver Intertransmission Dyn. Range | dB | 26 |
| $R_{ous}$ | Receiver Combined Over/Under-Shoot | % | 10 |
| $R_r$ | Receiver Maximum Rise Time | ns | 10 |
| $R_f$ | Receiver Maximum Fall Time | ns | 10 |
| $R_{to}$ | Receiver Nominal Bit Time | ns | 20 ± 10% |
| $R_{tm}$ | Receiver Maximum Signaling Rate | ns | 10 ± 10% |
| $R_{iz}$ | Receiver Input Impedance | Ohms | 50 ± 20% |
| $R_{cmr}$ | Receiver Common Mode Rejection Ratio | - | 0.5 |
| $R_{ber}$ | Receiver Maximum Bit Error Rate | - | 10exp[-12] |
| $R_{nv}$ | Receiver Noise Voltage Input | mV | 2.5 |
| $P_r$ | Receiver Minimum Valid Preamble Length | Bit Times | 4 |
| MEDIA CHARACTERISTICS | | | |
| $A_r$ | Attenuation of Reflected Signals | dB | 34 |
| $A_{min}$ | Minimum End-to-End Attenuation | dB | 10 |
| $A_{max}$ | Maximum End-to-End Attenuation | dB | 28 |
| W1 | Transmission Sys. Lower Bandpass Freq. | MHz | 0.5 |
| W2 | Transmission Sys. Upper Bandpass Freq. | MHz | 100 |
| $D_{gp}$ | Group Propagation Delay Difference | ns | 1 |
| $D_j$ | Jitter | ns | 1 |