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AES standard for audio connectors - XL Connectors to Improve Electromagnetic Compatibility

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Abstract

This standard specifies a variant of the standard XLR connector that provides improved shell-to-shell connection to aid the rejection of RF interference. While maintaining compatibility with existing XLR connectors, a circumferential connection between the connector shells is added.

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Foreword

This foreword is not part of the AES68-2014 *AES standard for audio connectors - XL Connectors to Improve Electromagnetic Compatibility*

Improved continuity between the shells of mated XLR connectors can be a useful part of improved shielding and rejection of radio frequency interference. The existing dimensional standard for the XLR connector does not address this issue, which led members of the AES standards working group to develop this standard. It specifies a way to provide a circumferential connection between the shells of mated XLR type connectors.

This document was developed under project AES-X123. The members of the writing group that developed this document in draft included: W. Bachman, J. Brown, J. Dow, M. Natter, B. Olson, R. Rayburn, J. Schmidt, W. Whitlock, J. Woodgate.

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2014-04-29

Note on normative language

In AES standards documents, sentences containing the word “shall” are requirements for compliance with the document. Sentences containing the verb “should” are strong suggestions (recommendations). Sentences giving permission use the verb “may”. Sentences expressing a possibility use the verb “can”.

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0 Introduction

Current standard XLR type connectors are suffering from the problem of not having a specified shielding capability - especially considering RF disturbances. Although most cable connectors are being housed in a metal shell, the primary function of the shell is for mechanical robustness and durability. There is no systematic use of this feature with regard to EMC. Relevant application standards, like IEC 60268-12 and AES14, define Pin 1 as the designated shield, or screen, contact. These standards do not identify the possibility of using the metal shells for shielding purposes, leaving their electrical status undefined.

Some connector types offer at least the possibility of a termination to this shell by means of an additional solder tag which is connected to the shell by means of a screw or by spring force. Such a single-point connection between the cable shield and the connector shell represents a disruption of the ideally continuous shielding tube and will be effective only at low frequencies - from DC to a few megahertz depending on the reactive component of the impedance being formed by that shield termination. To provide immunity at the gigahertz frequencies of cellular telephones, for example, a more satisfactory shell-to-shell connection at radio frequencies is required.

Due to standardized design dimensions, the continuation of the shield across the shells of cable connectors can be rather easily accomplished by means of appropriate circumferential spring contacts. In contrast mating with chassis connectors is not so easy. Although some chassis connectors are available with a supplementary "ground" contact - meaning a contact to the shell - again there is the limitation of efficiency to the low frequency range. Furthermore the variety of designs - including housings made of plastics serving simply as a contact carrier - complicates a general solution for an RF-capable shield termination.

1 Scope

This document specifies an improved shell-to-shell connection with regard to EMC by means of a circumferential contact established by the female XLR type connector.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61076-2-103 (2004) *Connectors for electronic equipment – Part 2-103: Circular connectors – Detail specification for a range of multipole connectors (type 'XLR')*, International Electrotechnical Commission, Geneva, Switzerland.