

# EXHIBIT 30

# EXHIBIT 10

Maxell v. ZTE  
5: 16-cv-00179-RWS  
ZTE Exhibit  
**DX-0260**

Version 1.10 26-Jul-2011

MIPI Alliance Specification for RFFE



## **MIPI® Alliance Specification for RF Front-End Control Interface**

**Version 1.10 – 26 July 2011**

MIPI Board Approved 2-Nov-2011

Further technical changes to this document are expected as work continues in the RF Front-End Control Working Group

Version 1.10 26-Jul-2011

MIPI Alliance Specification for RFFE

**NOTICE OF DISCLAIMER**

The material contained herein is not a license, either expressly or impliedly, to any IPR owned or controlled by any of the authors or developers of this material or MIPI®. The material contained herein is provided on an "AS IS" basis and to the maximum extent permitted by applicable law, this material is provided AS IS AND WITH ALL FAULTS, and the authors and developers of this material and MIPI hereby disclaim all other warranties and conditions, either express, implied or statutory, including, but not limited to, any (if any) implied warranties, duties or conditions of merchantability, of fitness for a particular purpose, of accuracy or completeness of responses, of results, of workmanlike effort, of lack of viruses, and of lack of negligence.

All materials contained herein are protected by copyright laws, and may not be reproduced, republished, distributed, transmitted, displayed, broadcast or otherwise exploited in any manner without the express prior written permission of MIPI Alliance. MIPI, MIPI Alliance and the dotted rainbow arch and all related trademarks, tradenames, and other intellectual property are the exclusive property of MIPI Alliance and cannot be used without its express prior written permission.

ALSO, THERE IS NO WARRANTY OF CONDITION OF TITLE, QUIET ENJOYMENT, QUIET POSSESSION, CORRESPONDENCE TO DESCRIPTION OR NON-INFRINGEMENT WITH REGARD TO THIS MATERIAL OR THE CONTENTS OF THIS DOCUMENT. IN NO EVENT WILL ANY AUTHOR OR DEVELOPER OF THIS MATERIAL OR THE CONTENTS OF THIS DOCUMENT OR MIPI BE LIABLE TO ANY OTHER PARTY FOR THE COST OF PROCURING SUBSTITUTE GOODS OR SERVICES, LOST PROFITS, LOSS OF USE, LOSS OF DATA, OR ANY INCIDENTAL, CONSEQUENTIAL, DIRECT, INDIRECT, OR SPECIAL DAMAGES WHETHER UNDER CONTRACT, TORT, WARRANTY, OR OTHERWISE, ARISING IN ANY WAY OUT OF THIS OR ANY OTHER AGREEMENT, SPECIFICATION OR DOCUMENT RELATING TO THIS MATERIAL, WHETHER OR NOT SUCH PARTY HAD ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Without limiting the generality of this Disclaimer stated above, the user of the contents of this Document is further notified that MIPI: (a) does not evaluate, test or verify the accuracy, soundness or credibility of the contents of this Document; (b) does not monitor or enforce compliance with the contents of this Document; and (c) does not certify, test, or in any manner investigate products or services or any claims of compliance with the contents of this Document. The use or implementation of the contents of this Document may involve or require the use of intellectual property rights ("IPR") including (but not limited to) patents, patent applications, or copyrights owned by one or more parties, whether or not Members of MIPI. MIPI does not make any search or investigation for IPR, nor does MIPI require or request the disclosure of any IPR or claims of IPR as respects the contents of this Document or otherwise.

Questions pertaining to this document, or the terms or conditions of its provision, should be addressed to:

MIPI Alliance, Inc.  
c/o IEEE-ISTO  
445 Hoes Lane  
Piscataway, NJ 08854  
Attn: Board Secretary

## 4 Architecture and Operations Overview

85 This section is intended to convey an overview of the architecture and operational details of the RFFE interface.

### 4.1 Overview

86 RFFE is a two-wire, serial interface intended to be used to connect Radio Frequency ICs (RFIC) of a mobile terminal to their related Front-End Modules (FEM). The RFFE interface enables systems to efficiently control various FEMs in next generation mobile terminals with increased complexity of performance supporting multi-mode, multi-band and multiple antennas, all with a minimum number of wires and pins using a single RFFE bus. It is designed to support existing 3GPP standards such as LTE, EGPRS, UMTS, HSPA, etc. and also other, non-3GPP air interfaces. The RFFE interface is based on *MIPI Alliance Specification for System Power Management Interface (SPMI)* [MIPI03]. The RFFE interface is intended to be efficient, flexible, and extensible, accommodating many variations in the overlying system design, while providing interoperability at the interface level between compliant RFICs and FEMs. The ability to design one common control interface which may be reused for all of these modules helps reduce front-end complexity, and hence speed up the time-to-market for these terminals.

87 Within the mobile terminal, the RFIC is the Master and the FEMs are the Slaves on the RFFE bus. Command Sequences on the bus may only be initiated by the Master. A Slave shall not initiate Command Sequences on the bus. This specification defines the operating states, the Command Sequence set, the physical interface, and the protocol for data communication between RFFE devices on an RFFE bus to insure the compatibility of control and data transfers. The RFFE Command Sequence set includes Slave addressing, control of the Slave operating state, register read from and register write to Slaves, as well as Command Sequences supporting the use of Device Descriptor Block [MIPI05].

88 The key pillars of the RFFE design include the following considerations:

- 89 • Minimize the wiring effort in the front-end of a mobile terminal
- 90 • Minimize pin count
- 91 • Ease and optimize control flow
- 92 • Ensure minimal EMI contributions due to RFFE bus
- 93 • Minimize complexity for the Slave
- 94 • Add flexibility and scalability, allowing use of multiple receivers and transmitters simultaneously

95 The basic configuration of the RFFE interface and its bus structure are shown in Figure 1. As RFFE is based on the SPMI interface it shall have two signals, one serial bidirectional data signal (SDATA) and one clock signal (SCLK) controlled by the Master. Any additional signals present on an RFFE device shall not change the behavior of the RFFE interface protocol or prevent the operation of the RFFE bus described in this specification.

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.