

# WCDMA FOR UMTS

Radio Access For Third Generation  
Mobile Communications



10110100 11101010 01011001 11010001  
0110100 11101010 01011001 11010001 11011001  
10110100 11101010 01011001 11010001 11011001  
10110100 11101010 01011001 11010001 11011001

15.10.02  
Contacts  
\$7,840.00

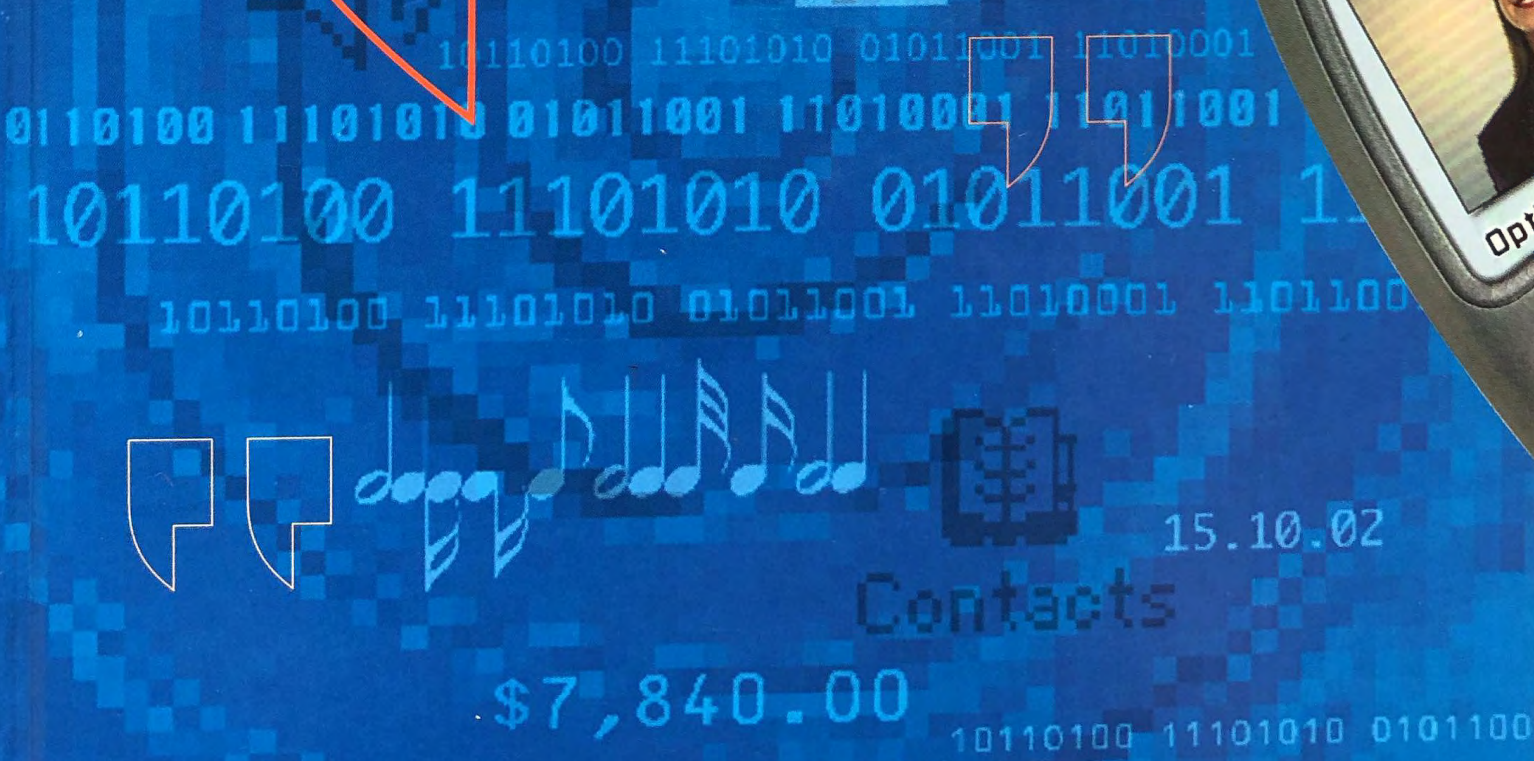
Edited by H

MICROSOFT - EXHIBIT 1028  
MICROSOFT CORP. ET AL. v.  
UNILOC 2017 LLC  
IPR2019-00973

(Duplicate first page for exhibit labeling, per 37 C.F.R. § 42.63(d)(2)(ii).)

# WCDMA FOR UMTS

Radio Access For Third Generation  
Mobile Communications



Edited by Harri Holma  
Antti Töckelä

# FOR UMTS

Radio Access For Third Generation  
Mobile Communications

Edited by  
**Harri Holma and Antti Toskala**  
*Both of Nokia, Finland*

JOHN WILEY & SONS, LTD  
Chichester · New York · Weinheim · Brisbane · Singapore · Toronto

Neither the author(s) nor John Wiley & Sons Ltd accept any responsibility or liability for damage occasioned to any person or property through using the material, instructions contained herein, or acting or refraining from acting as a result of such use. The author(s) expressly disclaim all implied warranties, including merchantability of fitness for any particular purpose. There will be no duty on the author(s) or Publisher to correct any errors or omissions in the software.

Designations used by companies to distinguish their products are often claimed as trademarks. In instances where John Wiley & Sons is aware of a claim, the product names appear in all capital letters. Readers, however, should contact the appropriate companies for more information regarding trademarks and registration.

### ***Other Wiley Editorial Offices***

John Wiley & Sons, Inc., 605 Third Avenue,  
New York, NY 10158-0012, USA

WILEY-VCH Verlag GmbH  
Pappelallee 3, D-69469 Weinheim, Germany

Jacaranda Wiley Ltd, 33 Park Road, Milton,  
Queensland 4064, Australia

John Wiley & Sons (Asia) Pte Ltd, 2 Clementi Loop #02-01,  
Jin Xing Distripark, Singapore 129809

John Wiley & Sons (Canada) Ltd, 22 Worcester Road  
Rexdale, Ontario, M9W 1L1, Canada

### ***British Library Cataloguing in Publication Data***

A catalogue record for this book is available from the British Library

ISBN 0 471 72051 8

Produced from PostScript files supplied by the authors.

Printed and bound in Great Britain by Antony Rowe Ltd, Chippenham, Wiltshire

This book is printed on acid-free paper responsibly manufactured from sustainable

1.4 Differences between WCDMA and Second Generation Air Interfaces ....  
1.5 Core Networks .....  
References .....

**2 - UMTS Services and Applications .....**

*Jouni Salonen*

2.1 Introduction .....  
2.2 UMTS Bearer Service .....  
2.3 UMTS QoS Classes.....  
    2.3.1 *Conversational Class* .....  
    2.3.2 *Streaming Class* .....  
    2.3.3 *Interactive Class* .....  
    2.3.4 *Background Class*.....  
2.4 Concluding Remarks .....  
References .....

**3 - Introduction to WCDMA .....**

*Peter Muszynski and Harri Holma*

3.1 Introduction .....  
3.2 Summary of Main Parameters in WCDMA .....  
3.3 Spreading and Despreading.....  
3.4 Multipath Radio Channels and Rake Reception .....  
3.5 Power Control .....  
3.6 Softer and Soft Handovers .....  
References .....

# 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.