

Title (en)

Reverse pulse plating method

Title (de)

Methode zum Elektroplattieren mit Umkehrpulsstrom

Title (fr)

Méthode pour placage électrolytique utilisant du courant pulsé inversé

Publication

**EP 1475463 B2 20170301 (EN)**

Application

**EP 03258024 A 20031218**

Priority

US 43597602 P 20021220

Abstract (en)

[origin: EP1475463A2] A composition and method for electroplating a metal on a substrate. The composition has a chloride to brightener concentration ratio of from 20:1 to 125:1. The method of electroplating, which employs the composition, employs pulse patterns that improve physical properties of metal surfaces.

IPC 8 full level

**C25D 3/02** (2006.01); **C25D 3/38** (2006.01); **C25D 5/18** (2006.01); **C25D 7/00** (2006.01)

CPC (source: EP KR US)

**C25D 3/02** (2013.01 - EP KR US); **C25D 3/38** (2013.01 - EP US); **C25D 5/18** (2013.01 - EP US)

Citation (opposition)

Opponent :

- US 6071398 A 20000606 - MARTIN JAMES L [US], et al
- US 2001015321 A1 20010823 - REID JONATHAN D [US], et al
- US 4666567 A 19870519 - LOCH DAVID M [US]
- EP 0785297 B1 20000105 - ATOTECH DEUTSCHLAND GMBH [DE]
- US 5433840 A 19950718 - DAHMS WOLFGANG [DE], et al
- EP 1054080 A2 20001122 - SHIPLEY CO LLC [US]
- EP 1069212 A1 20010117 - APPLIED MATERIALS INC [US]
- EP 1132500 A2 20010912 - APPLIED MATERIALS INC [US]
- US 6210555 B1 20010403 - TAYLOR E JENNINGS [US], et al
- US 5486280 A 19960123 - BULLOCK IV JONATHAN S [US], et al
- US 6099711 A 20000808 - DAHMS WOLFGANG [DE], et al
- WO 0129878 A2 20010426 - FARADAY TECHNOLOGY INC [US]
- PUIPPE J.C. ET AL.: "Theory and Practice of Pulse Plating", 1986, THE AMERICAN ELECTROPLATERS AND SURFACE FINISHERS SOCIETY, ORLANDO, pages: 1-17 - 221
- VAN DER MEULEN P.A. ET AL.: "A Study of Whisker Formation in the Electrodeposition of Copper", JOURNAL OF THE ELECTROCHEMICAL SOCIETY, vol. 109, no. 7, July 1958 (1958-07-01), pages 300 - 391-395
- SCHLESINGER M. ET AL.: "Modern Electroplating", vol. 4, 2000, JOHN WILEY & SONS, NEW YORK, pages: 81-84 - 99-100
- <http://groups.molbiosci.northwestern.edu/holmgren/Glossary/Definitions/Def-P/parts per million.html>.
- "The International System of Units (SI)", BUREAU INTERNATIONAL DES POIDS ET MESURES, vol. 8, 2006, pages 133 - 135

Cited by

DE102004045451A1; DE102004045451B4; US9902044B2; US9862041B2; US9878382B2; US10137514B2; US10583506B2; US9445510B2; US9526183B2; US9687962B2; US10596681B2

Designated contracting state (EPC)

DE FR GB

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**EP 1475463 A2 20041110; EP 1475463 A3 20060412; EP 1475463 B1 20110330; EP 1475463 B2 20170301**; CN 1540040 A 20041027; CN 1540040 B 20120404; DE 60336539 D1 20110512; JP 2004204351 A 20040722; JP 4342294 B2 20091014; KR 101085005 B1 20111121; KR 20040055684 A 20040626; TW 200424330 A 20041116; TW I296014 B 20080421; US 2005016858 A1 20050127; US 2006081475 A1 20060420

DOCDB simple family (application)

**EP 03258024 A 20031218**; CN 200310124974 A 20031219; DE 60336539 T 20031218; JP 2003423400 A 20031219; KR 20030093625 A 20031219; TW 92136071 A 20031219; US 29004005 A 20051130; US 74190803 A 20031219