# The United States of America



# The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

# **United States Patent**

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2)or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Juen Staret Head

Acting Director of the United States Patent and Trademark Office

# MAINTENANCE FEE NOTICE

If the application for this patent was filed on or after December 12, 1980, maintenance fees are due three years and six months, seven years and six months, and eleven years and six months after the date of this grant, or within a grace period of six months thereafter upon payment of a surcharge as provided by law. The amount, number and timing of the maintenance fees required may be changed by law or regulation. Unless payment of the applicable maintenance fee is received in the United States Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period.

# PATENT TERM NOTICE

If the application for this patent was filed on or after June 8, 1995, the term of this patent begins on the date on which this patent issues and ends twenty years from the filing date of the application or, if the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121, or 365(c), twenty years from the filing date of the earliest such application ("the twenty-year term"), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b), and any extension as provided by 35 U.S.C. 154(b) or 156 or any disclaimer under 35 U.S.C. *253*.

If this application was filed prior to June 8, 1995, the term of this patent begins on the date on which this patent issues and ends on the later of seventeen years from the date of the grant of this patent or the twenty-year term set forth above for patents resulting from applications filed on or after June 8, 1995, subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b) and any extension as provided by 35 U.S.C. 156 or any disclaimer under 35 U.S.C. 253.



# (12) United States Patent Lin et al.

(10) Patent No.:

US 8,369,066 B2

(45) **Date of Patent:** 

Feb. 5, 2013

# (54) LAMELLAR STACKED SOLID **ELECTROLYTIC CAPACITOR**

(75) Inventors: Ching-Feng Lin, Hsinchu County (TW); Yui-Hsin Fran, Hsinchu (TW); Chi-Hao Chiu, Hsinchu (TW); Ming-Tsung Chen, Changhua County (TW); Cheng-Wei Lai, Miaoli County (TW); Chun-Chia Huang, Tainan County

(73) Assignee: Apaq Technology Co., Ltd., Miaoli County (TW)

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 293 days.

(21) Appl. No.: 12/713,398

(22) Filed: Feb. 26, 2010

(65)**Prior Publication Data** 

US 2011/0007452 A1 Jan. 13, 2011

Foreign Application Priority Data

Jul. 10, 2009 (TW) ... 98123413 A

(51) **Int.** Cl. H01G 9/00

(2006.01)

(52) U.S. Cl. ....... 361/523; 361/525; 361/528; 361/529; 361/517; 361/519 (58) Field of Classification Search .. 361/516-519, 525, 528-530, 540-541, 535-536; 29/25.03, 25.05, 25.01 See application file for complete search history.

### (56)References Cited

### U.S. PATENT DOCUMENTS

7,289,314 B2 *	10/2007	Kobayashi et al 361/523
7,312,979 B2*	12/2007	Ishizuka et al 361/537
7.575.148 B2 *	8/2009	Kubouchi et al. 228/112.1

<sup>\*</sup> cited by examiner

Primary Examiner — Nguyen T Ha

(74) Attorney, Agent, or Firm — C. G. Mersereau; Nikolai & Mersereau, P.A.

### (57) ABSTRACT

A lamellar stacked solid electrolytic capacitor includes a plurality of capacitor units, a substrate unit and a package unit. Each capacitor unit is composed of a negative foil, an isolation paper with conductive polymer substance, a positive foil, an isolation paper with conductive polymer substance and a negative foil that are stacked onto each other in sequence, the positive foils of the capacitor units are electrically connected to each other, the negative foils of the capacitor units are electrically connected to each other, and the positive foils and the negative foils are insulated from each other. The substrate unit has a positive guiding substrate electrically connected to the positive foils of the capacitor units and a negative guiding substrate electrically connected to the negative foils of the capacitor units. The package unit covers the capacitor units and one part of the substrate unit.

## 12 Claims, 7 Drawing Sheets

