

Title (en)  
ELECTROMAGNETICALLY REFLECTIVE PLATE WITH A METAMATERIAL STRUCTURE AND MINIATURE ANTENNA DEVICE INCLUDING SUCH A PLATE

Title (de)  
ELEKTROMAGNETISCH REFLEKTIERENDE PLATTE MIT METAMATERIALSTRUKTUR UND MINIATURANTENNENVORRICHTUNG MIT SOLCH EINER PLATTE

Title (fr)  
PLAQUE DE REFLEXION ELECTROMAGNETIQUE A STRUCTURE DE METAMATERIAU ET DISPOSITIF MINIATURE D'ANTENNE COMPORTANT UNE TELLE PLAQUE

Publication  
**EP 3417507 B1 20211117 (FR)**

Application  
**EP 17708866 A 20170216**

Priority  

- FR 1651278 A 20160217
- FR 1651373 A 20160219
- FR 2017050349 W 20170216

Abstract (en)  
[origin: WO2017140987A1] This electromagnetically reflective plate (10) for a miniature antenna device includes: etched conductive elements (20, 22, 24, 26) on a first dielectric substrate layer (30); an apertured ground plane (32) placed between the first substrate layer (30) and a second dielectric substrate layer (38); a set of metal through-vias (42) formed in the thickness of the two substrate layers (30, 38), each having an upper end making contact with one of the conductive elements (20, 22, 24, 26), a lower end reaching a lower face (44) of the second substrate layer (38), and passing through the ground plane (32) without electrical contact in one of its apertures (40). Each conductive element (20, 22, 24, 26) makes contact with a plurality of vias (42) and each via of each conductive element is connectable to another via of a neighbouring conductive element using a corresponding electrical connection (46) making contact with the lower end of this via. At least some of the electrical connections (46) comprise one or more meanders.

IPC 8 full level  
**H01P 1/20** (2006.01); **H01Q 15/00** (2006.01)

CPC (source: EP US)  
**H01P 1/2005** (2013.01 - EP US); **H01Q 15/0066** (2013.01 - EP US); **H01Q 15/008** (2013.01 - EP US); **H01Q 15/14** (2013.01 - US); **H01Q 15/006** (2013.01 - EP US)

Citation (examination)  

- US 9755320 B2 20170905 - TSENG BIN-CHYI [TW], et al
- US 2003142036 A1 20030731 - WILHELM MICHAEL JOHN [US], et al

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**FR 3047846 A1 20170818; FR 3047846 B1 20180302**; EP 3417507 A1 20181226; EP 3417507 B1 20211117; FR 3047845 A1 20170818; US 10826188 B2 20201103; US 2019044244 A1 20190207; WO 2017140987 A1 20170824

DOCDB simple family (application)  
**FR 1651373 A 20160219**; EP 17708866 A 20170216; FR 1651278 A 20160217; FR 2017050349 W 20170216; US 201716074571 A 20170216