

Title (en)  
VERTICAL SWITCHING FORMATIONS FOR ESD PROTECTION

Title (de)  
VERTIKALE SCHALTFORMATIONEN FÜR ESD-SCHUTZ

Title (fr)  
FORMATIONS DE COMMUTATION VERTICALES POUR PROTECTION CONTRE LES DÉCHARGES ÉLECTROSTATIQUES

Publication  
**EP 2758992 A4 20150812 (EN)**

Application  
**EP 12834081 A 20120921**

Priority  
• US 201161537490 P 20110921  
• US 2012056663 W 20120921

Abstract (en)  
[origin: WO2013044096A2] Embodiments disclosed herein generally relate to structures, methods and devices employing a voltage switchable dielectric material to achieve vertical and/or dual switching protection against ESD and other overvoltage events.

IPC 8 full level  
**H05K 1/02** (2006.01); **H01L 23/60** (2006.01); **H01L 27/02** (2006.01); **H01L 23/525** (2006.01); **H05K 1/16** (2006.01)

CPC (source: EP)  
**H01C 1/14** (2013.01); **H01C 7/1013** (2013.01); **H01L 23/60** (2013.01); **H01L 27/0288** (2013.01); **H02H 9/041** (2013.01); **H05K 1/0257** (2013.01); **H01G 7/06** (2013.01); **H01L 23/5252** (2013.01); **H01L 2924/0002** (2013.01); **H02H 9/044** (2013.01); **H05K 1/0259** (2013.01); **H05K 1/16** (2013.01); **H05K 2201/0738** (2013.01)

C-Set (source: EP)  
**H01L 2924/0002 + H01L 2924/00**

Citation (search report)  
• [XII] US 2006152334 A1 20060713 - MAERCKLEIN NATHANIEL [US], et al  
• [XII] EP 1990834 A2 20081112 - TEXAS INSTRUMENTS FRANCE [FR]  
• [XII] US 2006061925 A1 20060323 - SHRIER KAREN P [US]  
• [XII] US 2011211289 A1 20110901 - KOSOWSKY LEX [US], et al  
• See references of WO 2013044096A2

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)  
**WO 2013044096 A2 20130328; WO 2013044096 A3 20130704**; CN 103999217 A 20140820; CN 103999217 B 20170606;  
EP 2758992 A2 20140730; EP 2758992 A4 20150812; JP 2014535157 A 20141225; JP 2017152711 A 20170831; JP 2020080419 A 20200528;  
JP 6860718 B2 20210421; KR 101923760 B1 20181129; KR 20140110838 A 20140917; TW 201330710 A 20130716; TW I473542 B 20150211

DOCDB simple family (application)  
**US 2012056663 W 20120921**; CN 201280056095 A 20120921; EP 12834081 A 20120921; JP 2014532024 A 20120921;  
JP 2017062476 A 20170328; JP 2020020870 A 20200210; KR 20147010416 A 20120921; TW 101134632 A 20120921