



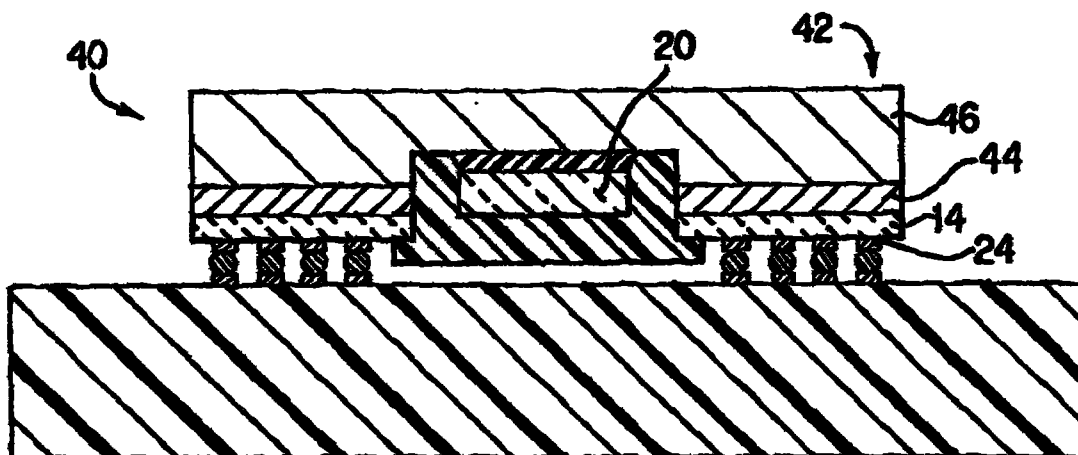
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(21) International Application Number: PCT/US96/11461 ✓ (22) International Filing Date: 9 July 1996 (09.07.96) ✓ (30) Priority Data: 502,662 14 July 1995 (14.07.95) ✓ US (71) Applicant: OLIN CORPORATION [US/US]; 350 Knotter Drive, P.O. Box 586, Cheshire, CT 06410-0586 (US). (72) Inventors: ROBINSON, Peter, W.; 21 Arrowhead Lane, Branford, CT 06405 (US). MAHULIKAR, Deepak; 20 Martlesham Heath, Madison, CT 06443 (US). HOFFMAN, Paul, R.; 5542 American Avenue, Modesto, CA 95336 (US). (74) Agents: ROSENBLATT, Gregory, S. et al.; Wiggin & Dana, One Century Tower, New Haven, CT 06508-1832 (US).	(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>	

(54) Title: METAL BALL GRID ELECTRONIC PACKAGE



(57) Abstract

The bending of a ball grid array electronic package (40) having a metallic base (12) is reduced minimizing stresses applied to the innermost row of solder balls (36) when the package base (12) is cyclically heated and cooled. Reducing the stresses applied to the solder balls (36) increases the number of thermal cycles before solder ball (36) fracture causes device (20) failure. Among the means disclosed to reduce the bending moment are a bimetallic (44, 46) composite base, an intergral stiffener (72), a centrally disposed cover (52) bonded to an external structure (30) and a package base (12) with a stress accommodating depressed portion (64).