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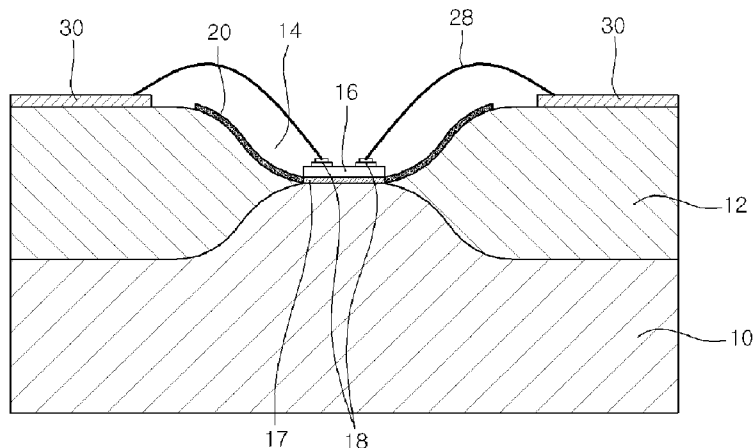
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[Fig. 1]



(57) Abstract: A metal-based photonic device package module that is capable of greatly improving heat releasing efficiency and implementing a thin package is provided. The metal-based photonic device package module includes a metal substrate (10) that is formed to a shape of a plate, a metal oxide layer (12) that is formed on the metal substrate (10) to have a mounting cavity (14), a photonic device (16) that is mounted in the mounting cavity (14) of the metal oxide layer (12), and a reflecting plane (20) that is formed at an inner surface of the mounting cavity 14 of the metal oxide layer 12.

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP2003218398 A (CITIZEN ELECTRONICS; KAWAGUCHIKO SEIMITSU KK) 31 July 2003 (31.07.2003) <i>Abstract, Figs. 1-10</i>	1-5, 7, 8
A	<i>Abstract, Figs. 1-10</i> --	6, 9-34
A	US2005280019 A1 (KONNO KUNIAKI) 22 December 2005 (22.12.2005) <i>whole document</i> --	1-34
A	JP2007158086 A (REIMEI GIKEN KOGYO KK) 21 June 2007 (21.06.2007) <i>Abstract, Figs. 1-3</i> ----	1-34
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP A 2003218398		JP A 2003218398	2003-07-31
US A 2005280019		CN A 1722481	2006-01-18
		JP A 2006012868	2006-01-12
		US A1 2005280019	2005-12-22
JP A 2007158086		JP A 2007158086	2007-06-21