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(54) Title: RESIST MATERIALS FOR 157-NM LITHOGRAPHY

(57) Abstract: A radiation sensitive resin composition including a photo-acid generator and an aliphatic polymer having one or more electron withdrawing groups adjacent to or attached to a carbon atom bearing a protected hydroxyl group, wherein the protecting group is labile in the presence of in situ generated acid is described. The radiation sensitive resin composition can be used as a resist suitable for image transfer by plasma etching and enable one to obtain an etching image having high precision with high reproducibility with a high degree of resolution and selectivity.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/05907

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G03F7/039 G03F7/004

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 00 17712 A (E.I. DU PONT DE NEMOURS AND COMPANY) 30 March 2000 (2000-03-30) page 25, line 25 - line 30 page 17 ---	1-33
P,X	EP 1 035 441 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 13 September 2000 (2000-09-13) page 8; example 5 ---	1-33
E	WO 01 37047 A (E.I. DU PONT DE NEMOURS AND COMPANY) 25 May 2001 (2001-05-25) claim 11 ---	1-33
X	EP 0 875 789 A (WAKO PURE CHEMICAL INDUSTRIES, LTD.) 4 November 1998 (1998-11-04) page 3, line 5 - line 29 --- -/--	1,6,8,9, 11,12, 27,28,32

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 09 050126 A (FUJITSU, LTD.) 18 February 1997 (1997-02-18)  page 25  ---	1,6,8,9, 11,12, 27,28,32
A	DE 42 07 261 A (HOECHST AG) 9 September 1993 (1993-09-09) claims  ---	1-33
A	EP 0 880 075 A (JSR CORPORATION) 25 November 1998 (1998-11-25) page 10, line 25 - line 41 page 11; example 1  -----	1-33

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/05907

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0017712	A	30-03-2000	AU 6056099 A EP 1131677 A1 WO 0017712 A1	10-04-2000 12-09-2001 30-03-2000
EP 1035441	A	13-09-2000	EP 1035441 A1 JP 2000321774 A	13-09-2000 24-11-2000
WO 0137047	A	25-05-2001	WO 0137047 A2	25-05-2001
EP 0875789	A	04-11-1998	EP 0875789 A1 JP 11015164 A	04-11-1998 22-01-1999
JP 9050126	A	18-02-1997	NONE	
DE 4207261	A	09-09-1993	DE 4207261 A1	09-09-1993
EP 0880075	A	25-11-1998	JP 10319593 A EP 0880075 A1 US 5958648 A	04-12-1998 25-11-1998 28-09-1999