

(19)  
(12)

(KR)  
(A)

(51) 。 Int. Cl. 7  
G01N 29/24

(11)  
(43)

2003-0040592  
2003 05 23

(21) 10-2001-0070930  
(22) 2001 11 15

(71) ( )  
1276-10

( )  
997-10

(72) 1 1844 5 508-305

104-302

4 1561-5

1 가 10-10

(74)

:

(54)

, 가 가 / (matching) 가  
/

3

1a 1b

2

3

4

5a 5b PZT

6a 6b

\*

1: 2a, 2b: 1, 2

3a, 3b: 4:

5: 6a, 6b: ,

7: 8: 가

9: 10:

11: 가 12:

13: 14: (Drop-Down)

15: 16:

17: 가 18:

19: 20:

21: 22:

23: 24:

25: 26:

( ),

(pulse),

가  
(beam)

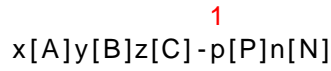
(Doppler shift, (B ) )

apping, (carotid artery) 2 (Color Flow M  
 . CFM) 가 , ,  
 . CFM (coronary thrombus) 가  
 B , CFM  
 (echo) B  
 가 가  
 가 (Pb(Zr,Ti)O<sub>3</sub>, PZT)  
 가 PZT 가 PZT  
 가 PZT 가 PZT  
 PZT 가 (Pb(Zn<sub>1/3</sub>Nb  
<sub>2/3</sub>)O<sub>3</sub>-PbTiO<sub>3</sub>, PZN-PT) - (Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>-PbTiO<sub>3</sub> 가가  
 3, PMN-PT) PZT 가  
 가 (k<sub>33</sub>)가 20%,  
 PZT 가  
 가 (d<sub>33</sub>)가 2  
 가  
 PZN-PT PMN-PT (flux method),  
 (Bridgman method) 2 가 (J. K  
 uwata, K. Uchino, S. Nomura, Jpn. *J. Appl. Phys.* Vol. 21. No. 9, 1982, p.1298) 91PZT-9PT  
 (T. Kobayashi, s. Shimanuki, s. Saitoh, Y. Yam  
 ashita, Jpn. *J. Appl. Phys.* , Vol. 36, No. 9B, 1997, p.6035) , (f  
 lux inclusion) (S. Saitoh, T. Takeuchi, T. Kobaya  
 shi, K. Harada, S. Shimanuki, Y. Yamashita, IEEE Transactions on ultrasonics, Ferroelectrics, and Frequency  
 control, Vol. 46, No. 2, 1999, p.414) 91PZT-9PT  
 (S. Shimanuki, S. Saito, Y. Yamashita, Jpn. *J.*  
*Appl. Phys.* Vol. 37, No. 6A, 1998, p.3382) ,  
 가 1a (PbO)  
 (Vertical Bridgman method, 1a) (9) 가 (8)  
 91PZN-9PT (10) (K. Harada, S. Shimanuki, T. Kobay  
 ashi, S. Saitoh, Y. Yamashita, *J. Intelligent Material Systems and Structures*, Vol. 10, No. 6, 1999, p.493)  
 (Solution Bridgman method) 91PZN-9PT  
 (B<sub>2</sub>O<sub>3</sub>) 가 , ,  
 (crack) (opaque) (stripped)  
 (H. Luo, G. Xu, H. Xu, P, Wang, Z, Yin, Jpn. *J. Appl. Phys.* Vol. 39, 2000, p5581) ,  
 가 1b (12) 가 (11)  
 (Modified Bridgman method) PMN-PT 40mm  
 가 가 (seed)  
 가  
 5,402,791 PMN-PT 6,020,675  
 (seed) (Abnormal Grain Growth)  
 6,238,481 PMN-PT  
 (PbO) (B<sub>2</sub>O<sub>3</sub>) 가  
 PMN-PT 가

가

가 / 가

, 1 :



[A] [Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>] [Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>]

[B] [PbTiO<sub>3</sub>]

[C] [LiTaO<sub>3</sub>] [LiNbO<sub>3</sub>]

[P] , , , ,

[N] , , , , , , ,

x 0.65 0.98 ,

y 0.01 0.34 ,

z 0.01 0.1 ,

p n 0.01 5 .

3 1 가 ( )

1), (2a) (3a, 3b), (2a, 2b) (4), 1 2 (Flexible Printed Circuit Board)(6b) (6a)

1 (2a) 가 (6b) 2 (2b) .

( 2 ) 1 ( 1 )



00 $\mu$ m 가 20 / 2,000 $\mu$ m 가 (array)  
 PZT (stray capacitance)  
 (1) (001) / (k<sub>33</sub>')가 80 95% (001) / [001]  
 1,200 4,000 m/s ( : 1,400 2,  
 000 Hz.m) , (k<sub>33</sub>')가 80 95%

1-4 :

1 , , 0.5'  
 가 920 6 150 ,  
 가 (17) (26) 120 (25) 20 (1500 , 100psi) 20 (15)

[ 1 ]

	x[A] 0.65<x<0.98 x: mol x+y+z=1	y[B] 0.01<y<0.34 y: mol	z[C] 0.01<z<0.1 z: mol	p[P] 0.01<p<5 p: w/w%= P/(A+B+C)	n[N] 0.01<n<5 n: w/w%= N/(A+B+C)	
	[A]: [Pb(Mg <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> ] [Pb(Zn <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> ]	[B] PbTiO <sub>3</sub>	[C] LiTaO <sub>3</sub>	[P]: Pt Ag Au Pd Rh	[N]: NiO Co Fe <sub>2</sub> O <sub>3</sub> ScO SrO RuO <sub>2</sub> CuO CdO	x[A]y[B]z[C]-p[P]n[N]
1	[Pb(Mg <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> ] 0.65	0.33	0.02	Pt 1 %	NiO 1 %	MPN
2	[Pb(Mg <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> ] 0.66	0.33	0.02	Ag 1 %	NiO 1 %	MAN
3	[Pb(Zn <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> ] 0.89	0.09	0.02	Pt 1 %	NiO 1 %	ZPN
4	[Pb(Zn <sub>1/3</sub> Nb <sub>2/3</sub> )O <sub>3</sub> ] 0.89	0.09	0.02	Ag 1 %	NiO 1 %	ZAN

MPN : 0.65[Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>] 0.33[PbTiO<sub>3</sub>]0.02[LiTaO<sub>3</sub>] - 1[Pt]1[NiO]  
 MAN : 0.80[Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>] 0.18[PbTiO<sub>3</sub>]0.02[LiTaO<sub>3</sub>] - 1[Ag]1[NiO]  
 ZPN : 0.89[Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>]0.09[PbTiO<sub>3</sub>]0.02[LiTaO<sub>3</sub>] - 1[Pt]1[NiO]  
 ZAN : 0.89[Pb(Zn<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>]0.09[PbTiO<sub>3</sub>]0.02[LiTaO<sub>3</sub>] - 1[Ag]1[NiO]

1:  
 1 4 (Laue) [001]  
 (001) ( ) Cr(200 )/Ni(2,000 )/Au(1,000 ) 3 ( ) 1.2×1  
 0<sup>-7</sup> mmHg , Cr - , Ni Au 가 가  
 . 130 150 10 3kV/cm 가 가  
 70 90 가  
 , , 2000-69311 (k<sub>33</sub> )  
 가 80 95% 가 1,000 10,000, 1,200m/s 4,000m/s,  
 /  
 (2a) (6a) / (2a, 2b) , (6b) / ,  
 (3a, 3b) (3a, 3b) (pitch) 0.315mm ( : 50μm)  
 (5) 1 2 (2a, 2b) 가 (3a, 3b) (1) : 10 pF/m, : 2m  
 (6b) 가 4 가  
 / (pulse echo method)  
 가 2.5MHz , , 5a 5b  
 PZT , , 6a  
 6b , PMN-PT 5 6 , ,  
 2 .

[ 2 ]

	PMN-PT ( ) 1)	PZT ( )
(dB)	3.59	0
	3.03	2.76
-6dB (%)	101.9	72.0

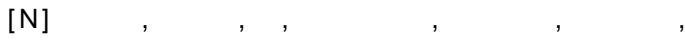
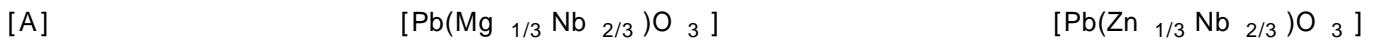
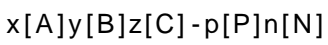
2 , PMN-PT 가 PZT 가 ,  
 가 .

, 가 / 가  
 . 가 ,

(57)

1.

(2a, 2b) (1) / ,  
 1 가 : ,  
 1



x 0.65 0.98 ,

y 0.01 0.34 ,

z 0.01 0.1 ,

p n 0.01 5 .

2.

1 ,  
 (1) / (001) , .

3.

1 ,  
 (1)가 20 500,000 $\mu$ m 가 , .

4.

1 ,  
 / 가 (array) , .

5.

4 ,

(1) / (001) , .

6.

4 ,

(1)가 20 2,000 $\mu\text{m}$  가 , .

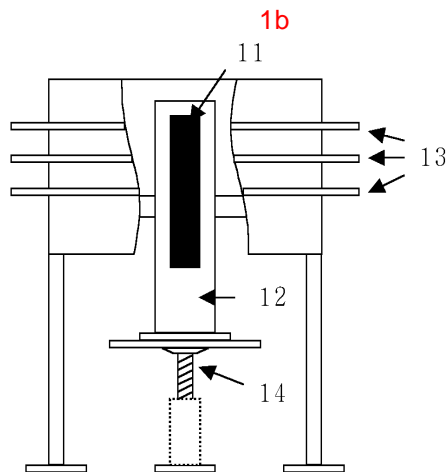
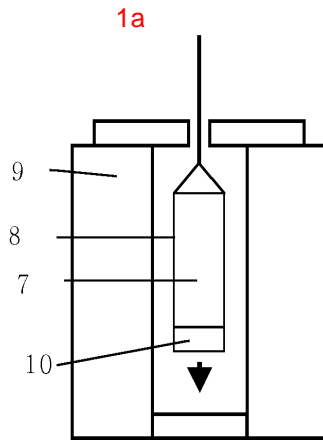
7.

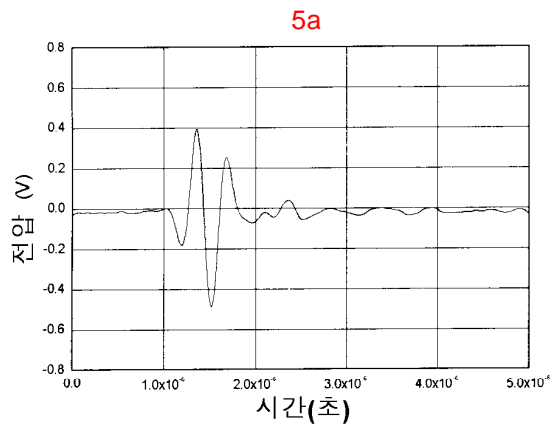
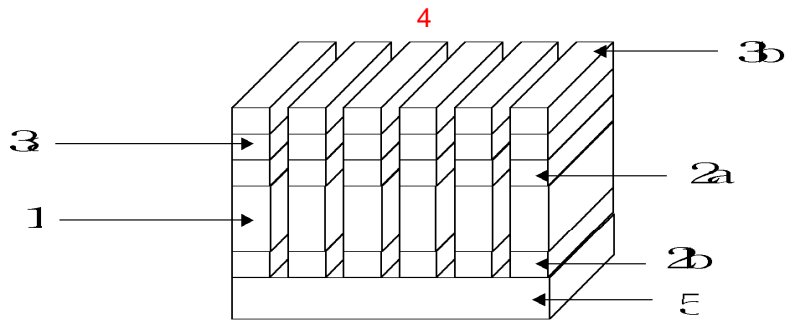
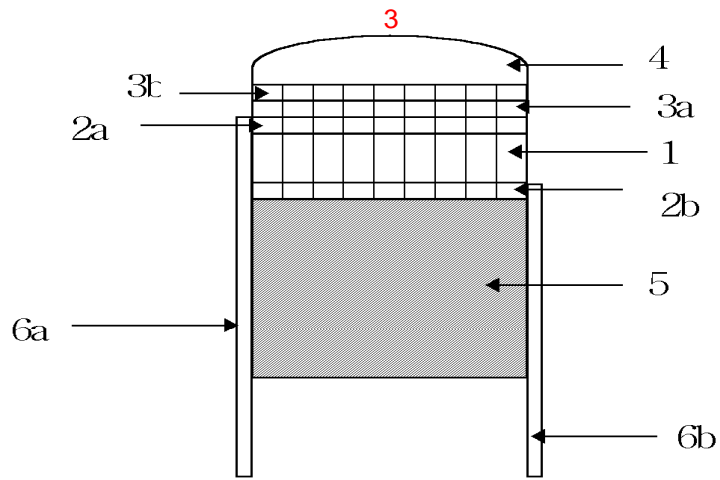
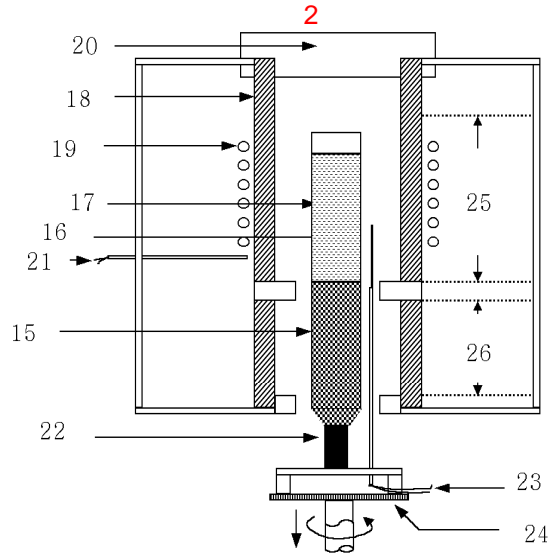
1 6 , .

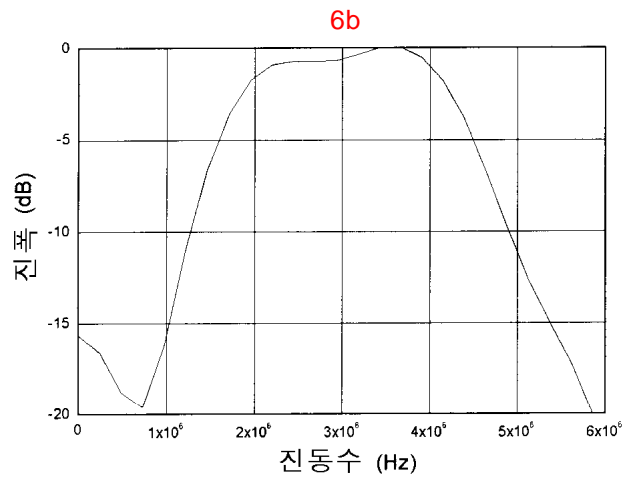
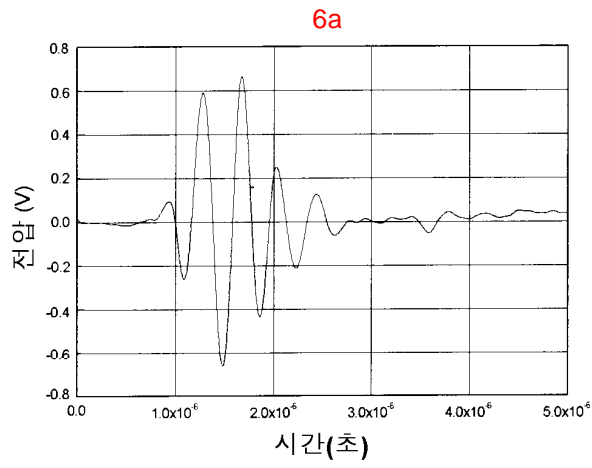
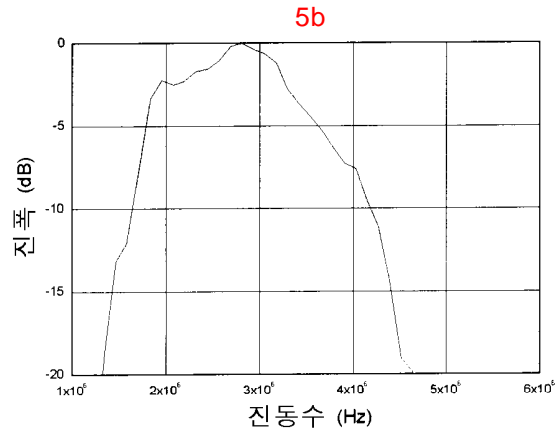
8.

7 ,

/ .







专利名称(译)	超声探头采用新型压电单晶		
公开(公告)号	<a href="#">KR1020030040592A</a>	公开(公告)日	2003-05-23
申请号	KR1020010070930	申请日	2001-11-15
[标]申请(专利权)人(译)	伊布勒光子学公司		
申请(专利权)人(译)	光子有限公司ahyibeul 주식회사휴먼스캔		
当前申请(专利权)人(译)	光子有限公司ahyibeul 주식회사휴먼스캔		
[标]发明人	LEE SANG GOO 이상구 RHIM SUNGMIN 임성민 JUNG HO 정호 KIM SEA HOON 김세훈		
发明人	이상구 임성민 정호 김세훈		
IPC分类号	H01L41/047 G01H11/06 A61B8/14 G01N9/18 H04R17/00 G01N29/24 H01L41/18 H01L41/22		
CPC分类号	H01L41/18 Y10T29/42		
代理人(译)	张居正, KU SEONG		
其他公开文献	KR100480876B1		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

目的：通过使用新的压电单晶材料制造超声波探头，提供超声波探头以实现相对于超声波发射/接收电路的优异灵敏度和匹配特性。组成：超声波探头包括一个由新的压电单晶材料制成的压电器件（1）和一个具有一对电极（2a, 2b）的超声波发射/接收装置，它们形成在超声波发射/接收表面中。新压电器件（1）及其相对表面。声学匹配层（3a, 3b）形成在连接到超声波发射/接收表面的电极（2a）上。接地电极板（6a）和柔性印刷电路板（6b）分别连接到初级和次级电极。接地电极板（6a）与主电极接合，柔性印刷电路板（6b）通过粘合剂与第二电极接合。

