

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.7
H03F 1/07

(11)
(43)

2003-0063473
2003 07 28

(21) 10-2003-7008663
(22) 2003 06 26
2003 06 26

(86) PCT/US2001/44591
(86) 2001 11 29

(87)
(87)

WO 2002/54581
2002 07 11

(30) 09/752,625 2000 12 29 (US)

(71) 27709 7001

(72) 27514 103

(74)

:

(54) E

E

on-peaked average power level) (envelope) RF (n

가 가 AM 가 가 가

가 (backing-off) (clipping)

P_{SAT} ((dBm) - PeakToAvgRatio(dB)) (EVM) (ACPR) (head

room) 가 (Doherty)

가 1 (2) 가 가

2 (4, 6) 가 가

가 가 (8)

arter-wave transformer)(10) (8) 35.36 Ohms 1/4 (qu
50 Ohms 2 1/4 (12) 50 25 (

4) (14) (6) (16) 1 (4) $2 * R_{OPT} = 100$ Ohms

(4) (6)가 (4) $2 * R_{OPT}$ 3dB (4, 6)가 (4)

(local load impedances)($R_{OPT} = 50$ Ohms)

2 (4)가 3dB 가 (4, 6) 6dB 3dB

가 C 1 B , C 가

가

- 1
- 2

3

4 1

5 2

6 3

7 4

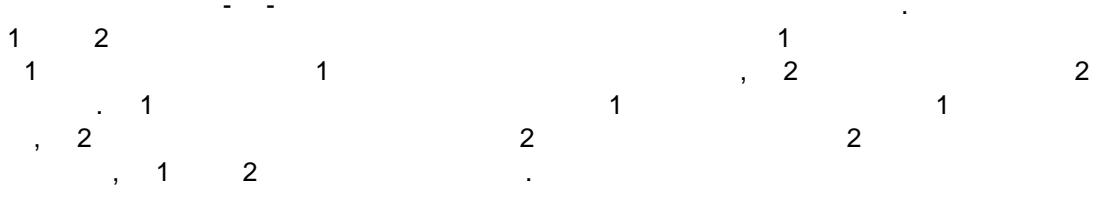
8 E

9

0552-US1-BMOT , E 가 , 가 P10550-US1-BMOT, P10551-US1-BMOT, P1

E

E



가

. E (envelope restoration)

E

, TIMER

(Transmitter using Input Modulation for Envelope Restoration)

TIMER

2

E

FET

(phase-only constant envelope information)

2

가

가

가 , 2 E (201) (210)

(212)

(214 216)

'ON' 가 MwT MwT-5 FET(, htt

p://www.mwtinc.com/cat/fets/htm/new-html/MwT-T_1.htm)

가

(214, 216) (217) (212)

(214 216) (214a 216a) 1 (224)

(226) (214 216) (214a 216a) (224 226)

1 (217) 2

E (212) (217) (212)

(210) E (232) (236) (240) (242) (238) (Vdd)(234)

(246)(50 Ohms) (244)

(217) (234) (Vdd) (217)

(224 226) (214a 216a) (246)

가

(214) (220) (214) (214a)

(220) (216) (216b)

2 (216)

(214) (214) (224) (214a)

(216) (226) (216a)

가 RF (201)

(212) (46) (214 216) (216)

(216)

2 (216) 가 , ' '

(216) (210) RF

(214) 가 RF

(214 216) (215) (216)

(214)

(210) 가 (212) RF 2 RF

(212) 가 , (212)

E (conduction angle) C 3 (C

73.5 ° (conduction angle)) 100 % 85% E C RF

80% 65% TIMER 가

(back-off)

, 3dB - - 80% , 50%
 (roll-off)가 가 ,
 E
 E 2 TIMER 1 4
 가 2 가
 5 E 5 6
 (506) (504) (500) (504)
 (504 506) E (500) (540, 542)
 544) (540 542) (504 506)
 (550 552) (540 542) (504 506)
 DSP(500) (544) (504 506) RF
 (544) DSP(500) (554)
 ating upconverter)(560) (562) (544) (quadrature-modul
 가
 14) (562) E (504) . 50-ohm 1/4- (5
 (570) (562) (506) (504)
 (570) (506) (574) 1/4 50 ohm (512)
 (580) (576)
 5 가 , 가 가 RF
 (DSP) 3 가 (out-of-band) (DAC)
 6 1/4
 RF (resulting outputs) DSP(600)
 5 1/4 (514) 2 90° (646)
 (600) (646) (664) (656) (668) (668) (6
 56) (606) (604) (616) (604) (668) (660)
 (662)
 RF 2 (604 606)
 , 1/4 (606) (615) , 2
 DSP(600)가
 가 1/4 가
 (504) (506)가 (504)가 가
 6dB -

가

, 1/4

가 , 가, 2 가
- (trade-off)가 E
- 6dB 70%

(predistortion options)

가

7

AM/PM
가

(long-term degradation requirements)

(702)

(774)

(VSWR)

706)

VSWR

(700)

(704

가 C B RF 2 가 E I/Q
RF 가

가, E

가,

B

C

DC

, E

FET

가

가

3dB

3dB

E

TIMER

A.

8 (801) (810) (815) (812) (816) ()
810) (816) 2SK2922 LDMOS RF FET 가
Hitachi

(<http://www.hitachi.co.jp/Scid/English/Products/transise.htm>)

(815)

(816a)
가

(818)

RF (816)

(819)

(815)

(818)

RF

(819)

DC

RF

가

(816) (816a) 1 (812) (815a 815b) (817) (815) (82
4) (826) (816) (816a) (820) (815a) (820)
(816) (817) 2 (824 826) 1 (816a)
(812) (816) (816)가 RF (824 826) (816a)
(816) (846) (816) (816) (816)
(816) (810) RF (810) 가
(812) (810) 가 (812) RF 가 (812)
RF 가 (812)

B.

가 9 (901) (910) (914) (912) (910) (916, 918, 9
20 922) (가 , Motorola, Inc. 가
가)가 Hitachi, Inc 2SK2922 LDMOS RF FET (http://www.hitach
i.co.jp/Scid/English/Products/transis.htm).
가
(914) 1 (924) (926) (926)
(924) (914) (914a 914b) (928) (914b) (916a, 918a, 920a,
922a) (916, 918, 920, 922) (928) (914)
(928) / (914)
(916, 918, 920 922)
(914) (924) (916, 918, 920 922) (916, 918, 920a 922a) (914)
(914) (926)
(912) (917) 2
(914) (926) (914)
(926) 가
(916, 918, 920 922) (914) (924)
가 , 1 (quantized approximation)
(926) 가 (924)
(924) (926) 1 2
, 2 (901) (912)

C. 1/4

가
 r 1/4 .4 1.48 FR4 PCB 1GHz
 0.33 80

D. DC

E , DC 가 , 가 DC
 가 AM/PM , DC , DC AM/PM , DC

가

(57)

1.

2.

3.

4.

1 ; ,
 E
 1 가
 1 2
 1 E 1 2 , 1 2
 1 2

5.

1 ,

E

6.

2 ,

7.

2 ,

8.

5 ,

9.

6 ,

10.

5 ,

1

11.

10 ,

2

12.

1 ,

VSWR

VSWR

13.

;

; ,

E

14.

12

RF

15.

14

16.

13

17.

13

E

18.

13

2

19.

13

20.

13

2

; ,

2

21.

13

13 22. ,

VSWR ,

VSWR .

23. - -

1 2 ;

1 ;

1 1 2 2 ;

1 1 ;

1 1 1 ;

2 2 2 ; ,

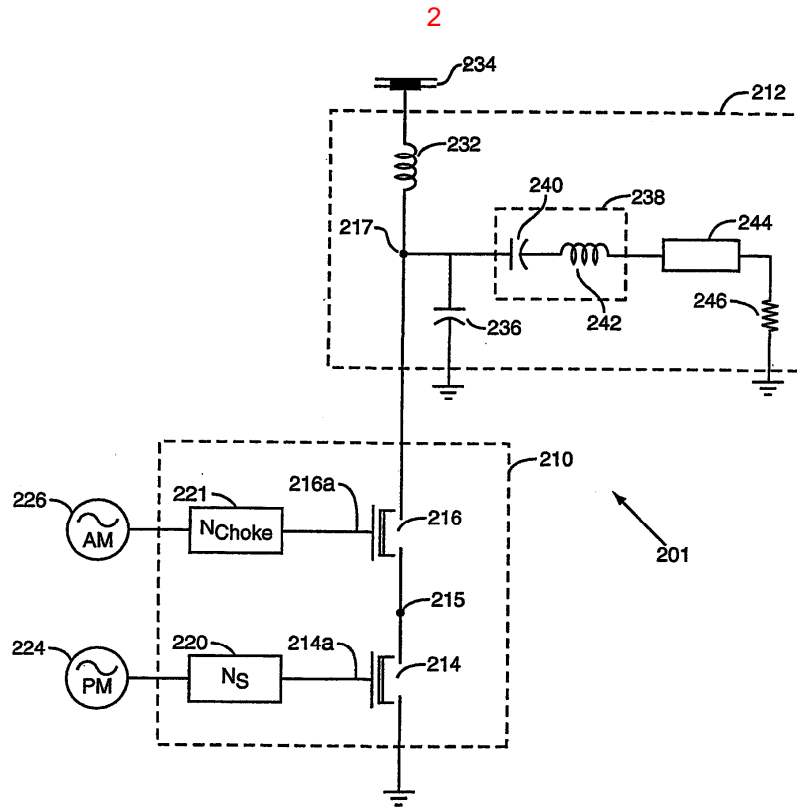
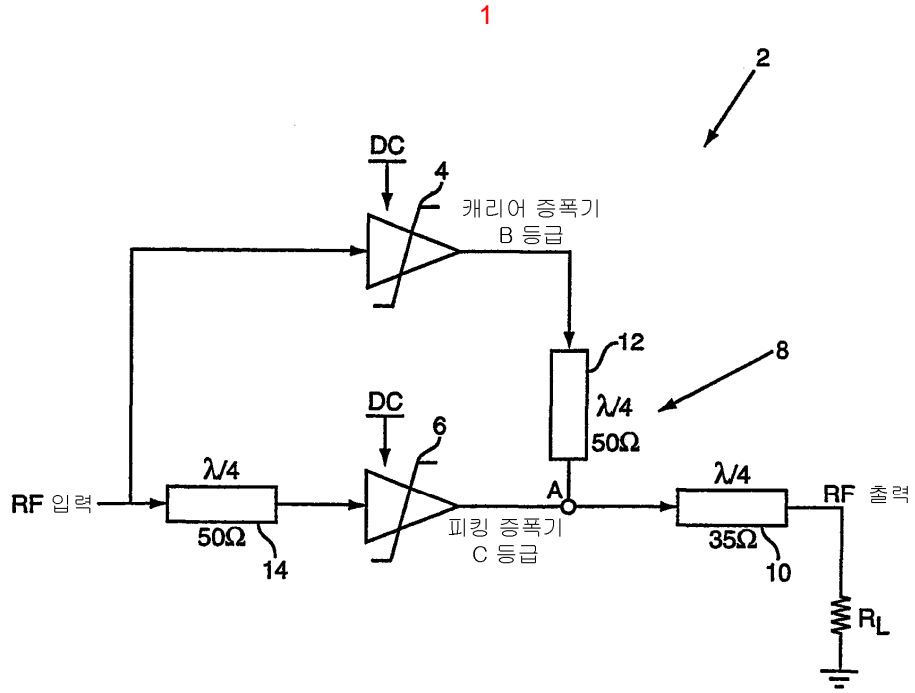
1 2 - - .

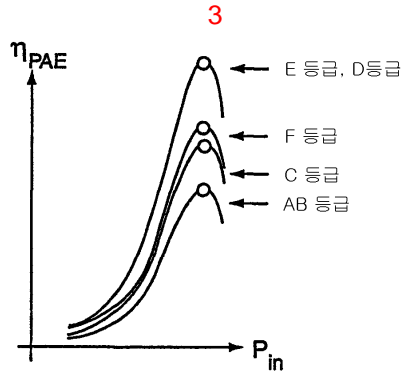
23 24. ,

VSWR ; ,

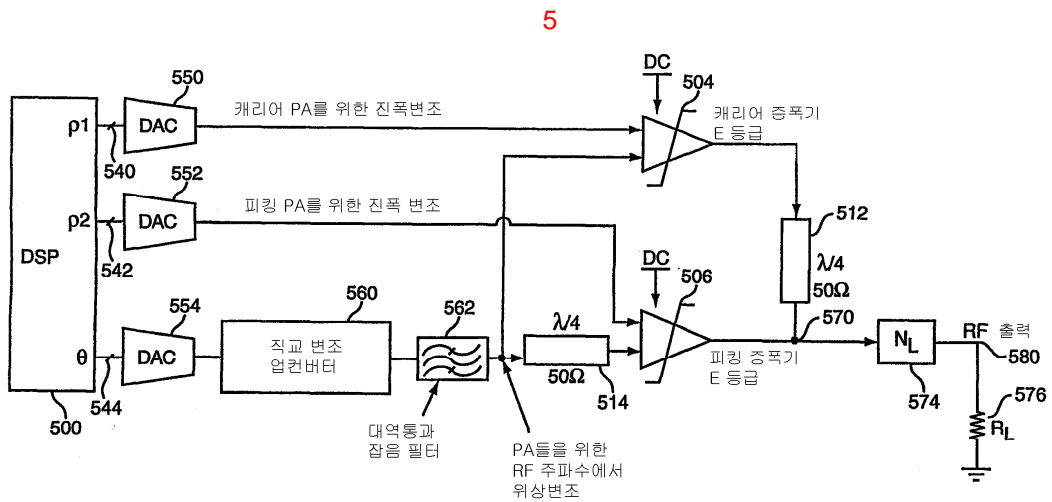
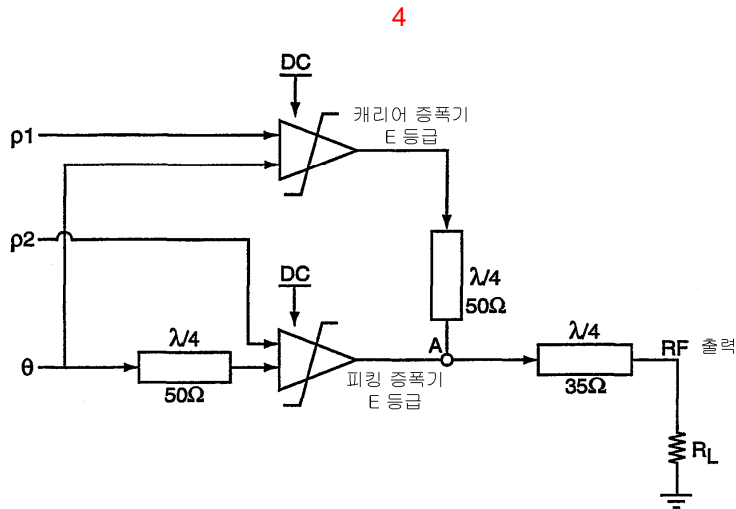
VSWR

- -

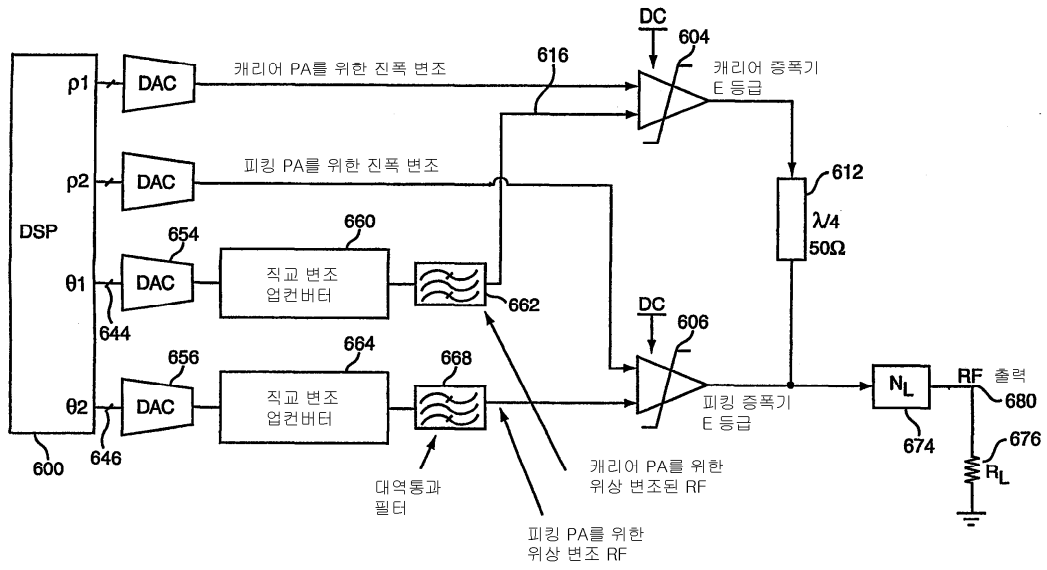




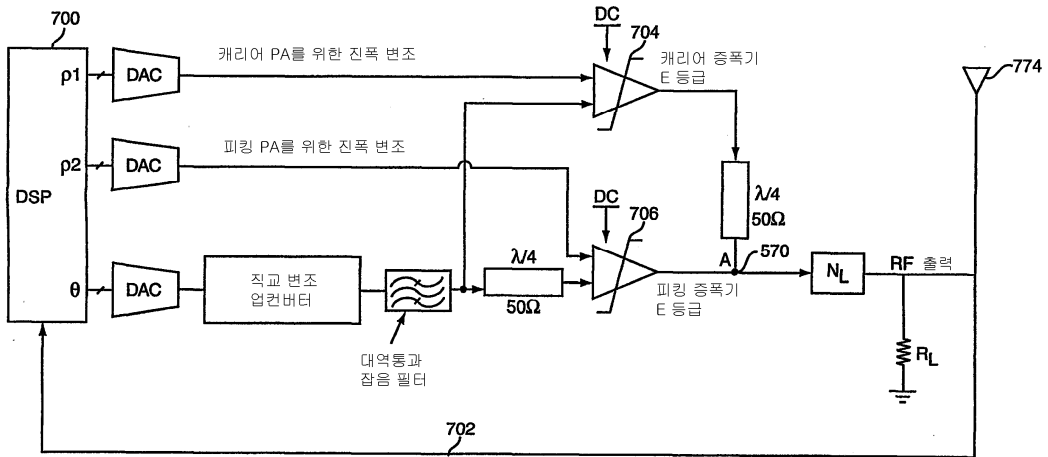
토포로지에 따른 PA의 이론적인 피크 효율



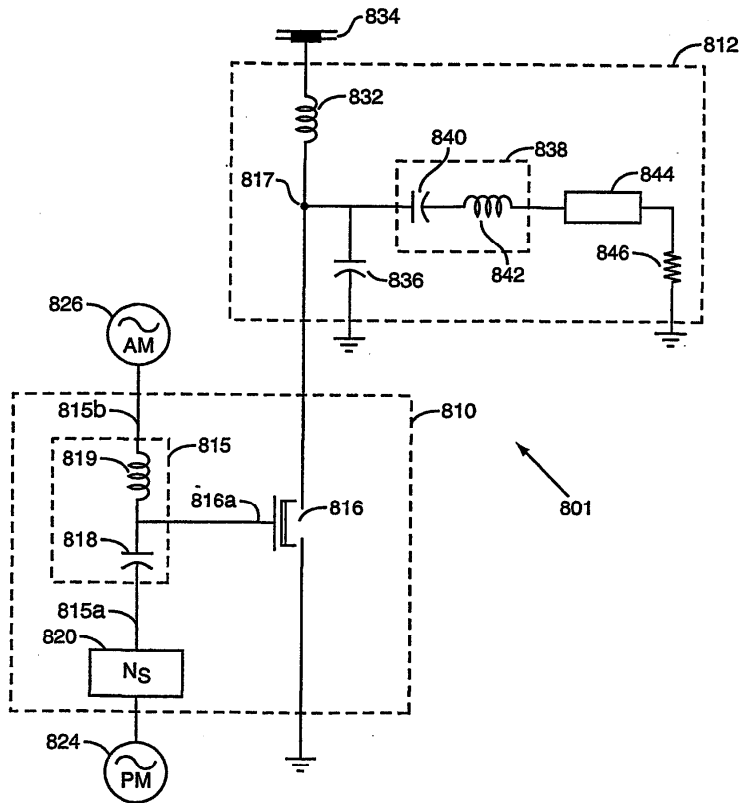
6



7



8



9

