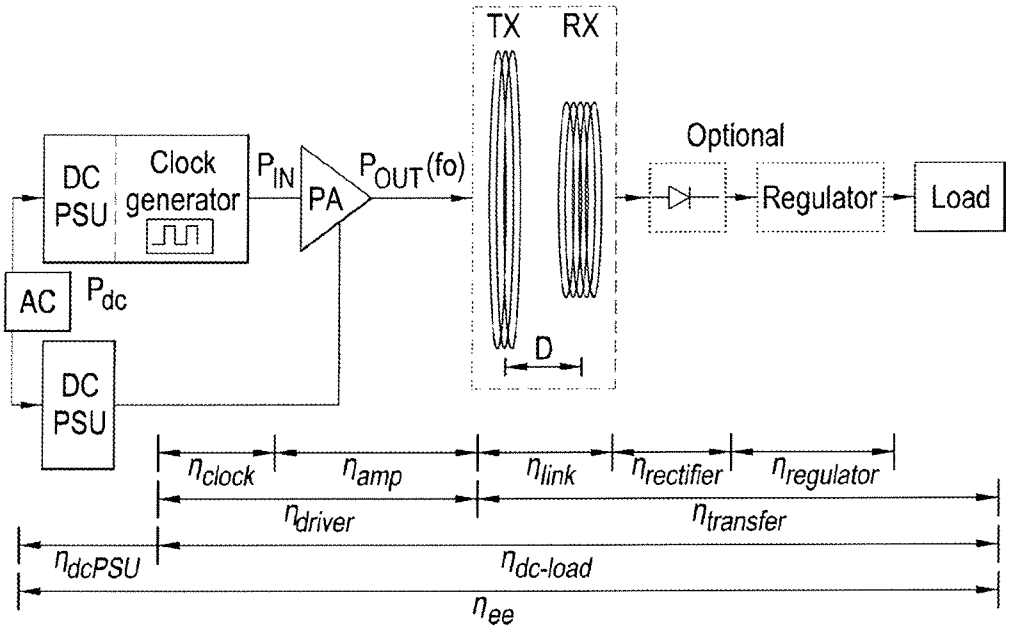

TX
RX
Optional
DC PSU
Clock generator
P_{IN}
PA
P_{OUT}(fo)
Regulator
Load
AC
P_{dc}
DC PSU
D
η_{clock}
η_{amp}
η_{link}
$\eta_{rectifier}$
$\eta_{regulator}$
η_{driver}
$\eta_{transfer}$
η_{dcPSU}
$\eta_{dc\text{-}load}$
η_{ee}

Fig. 1

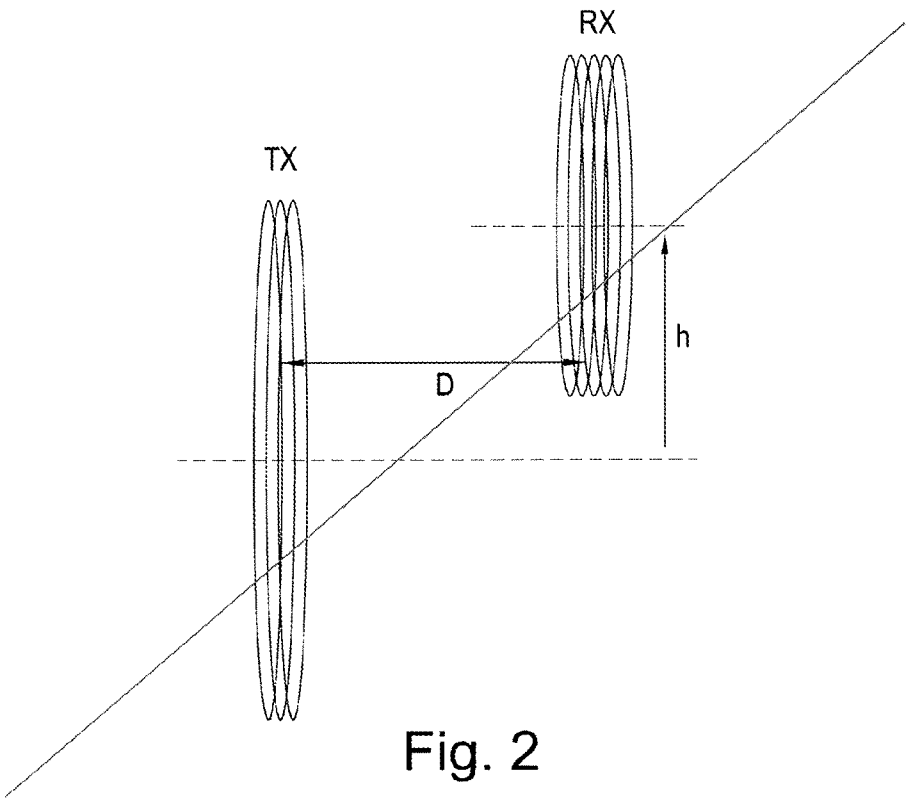

RX
TX
D
h

Fig. 2

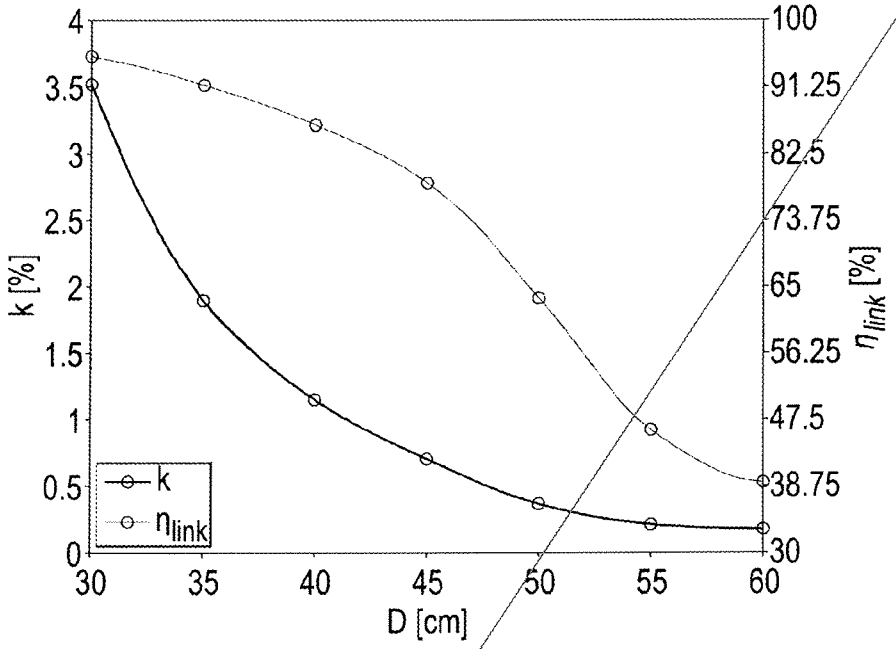

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
30
35
40
45
50
55
60
D [cm]

Fig. 4

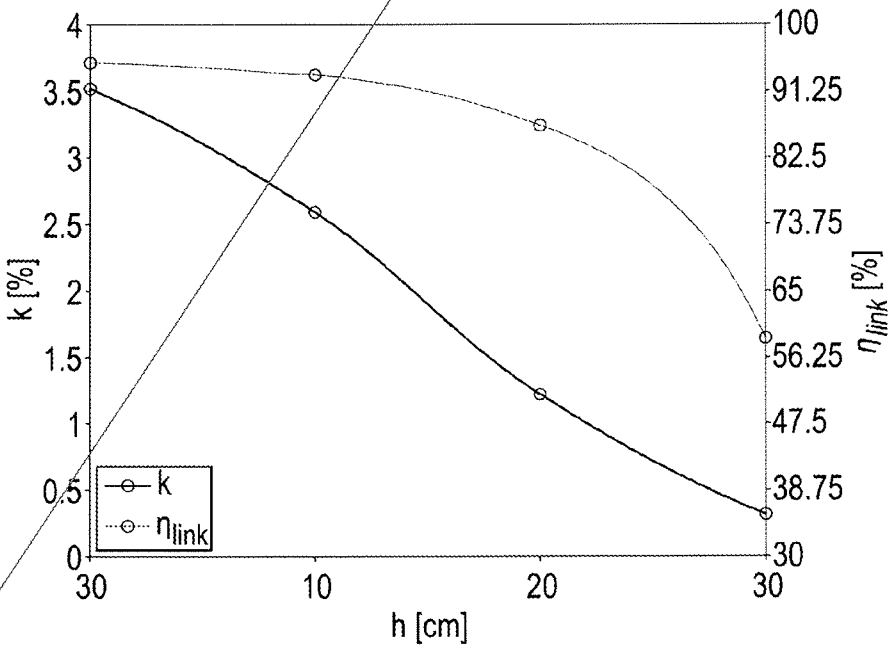

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
30
10
20
30
h [cm]

Fig. 5

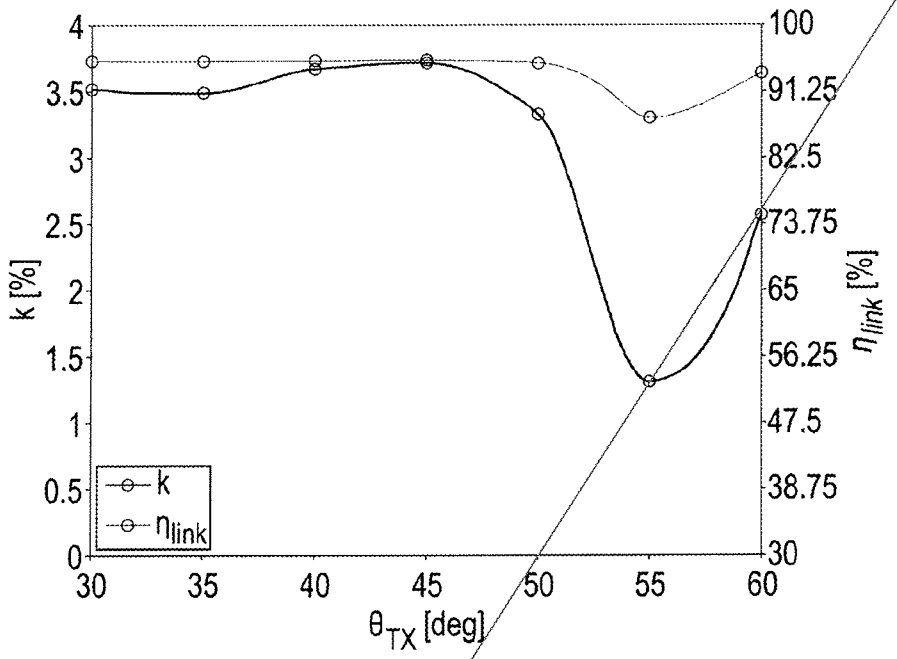

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
30
35
40
45
50
55
60
θ_{TX} [deg]

Fig. 6

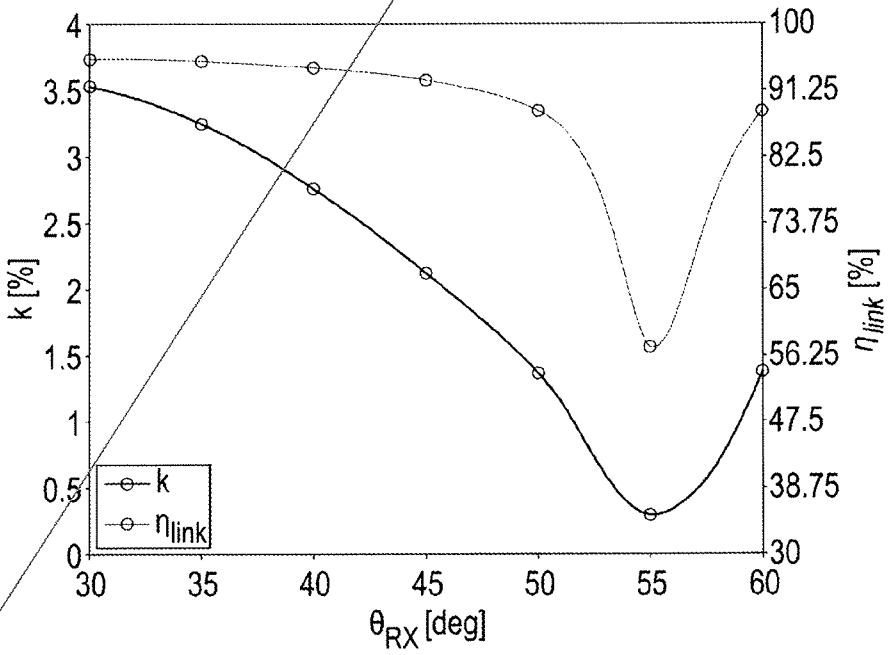

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
30
35
40
45
50
55
60
θ_{RX} [deg]

Fig. 7

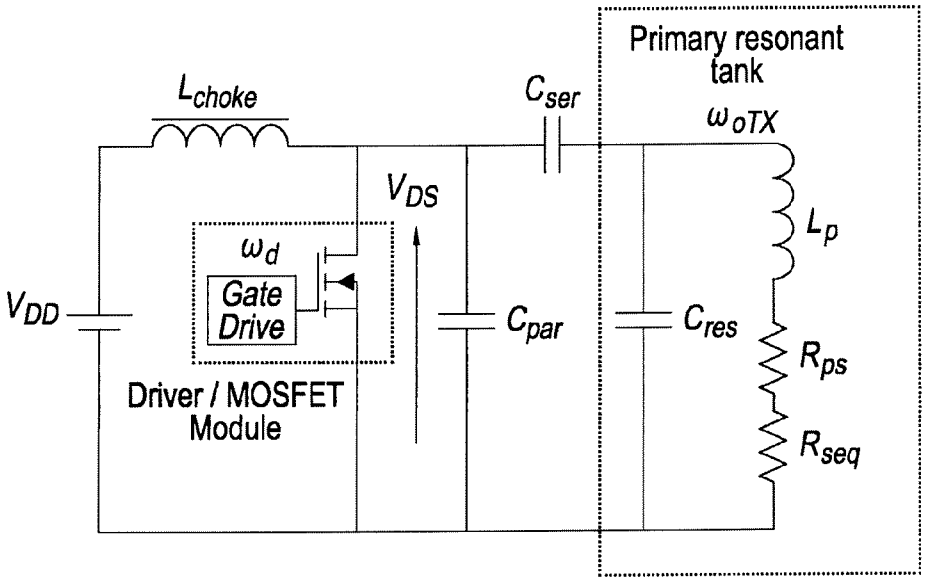

Primary resonant tank
L_{choke}
C_{ser}
ω_{oTX}
V_{DS}
L_p
ω_d
Gate Drive
V_{DD}
C_{par}
C_{res}
R_{ps}
R_{seq}
Driver / MOSFET Module

Fig. 8

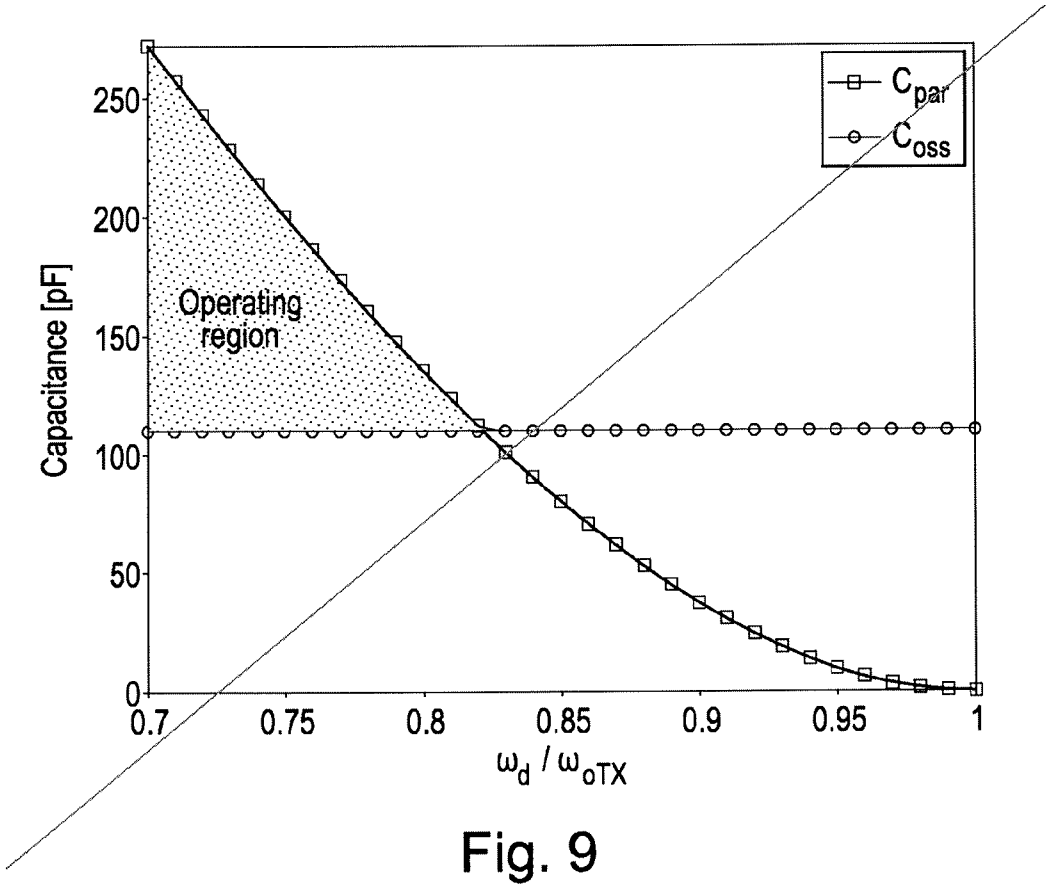

C_{par}
C_{oss}
Operating region
Capacitance [pF]
250
200
150
100
50
0
0.7
0.75
0.8
0.85
0.9
0.95
1
ω_d / ω_{oTX}

Fig. 9

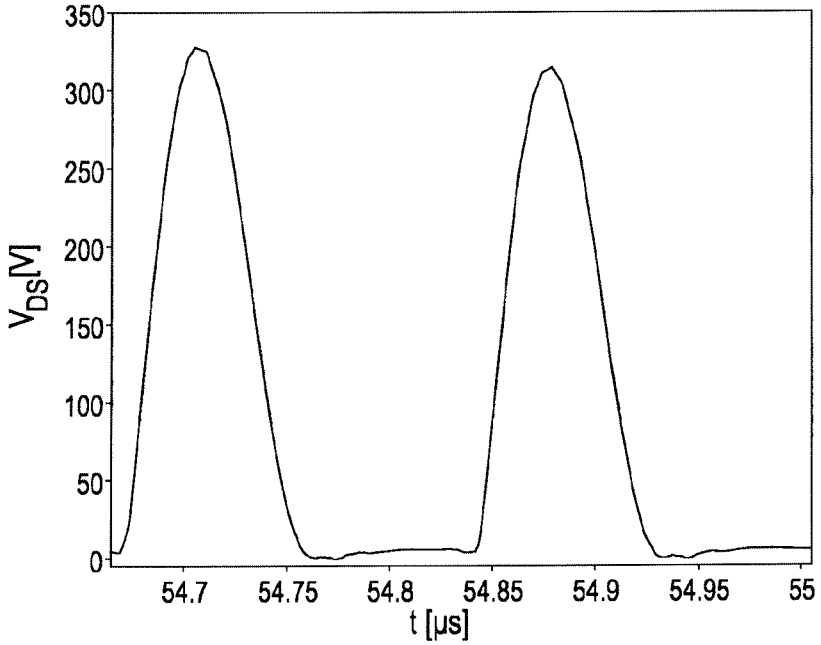

350
300
250
200
150
100
50
0
V_{DS}[V]
54.7
54.75
54.8
54.85
54.9
54.95
55
t [µs]

Fig. 10

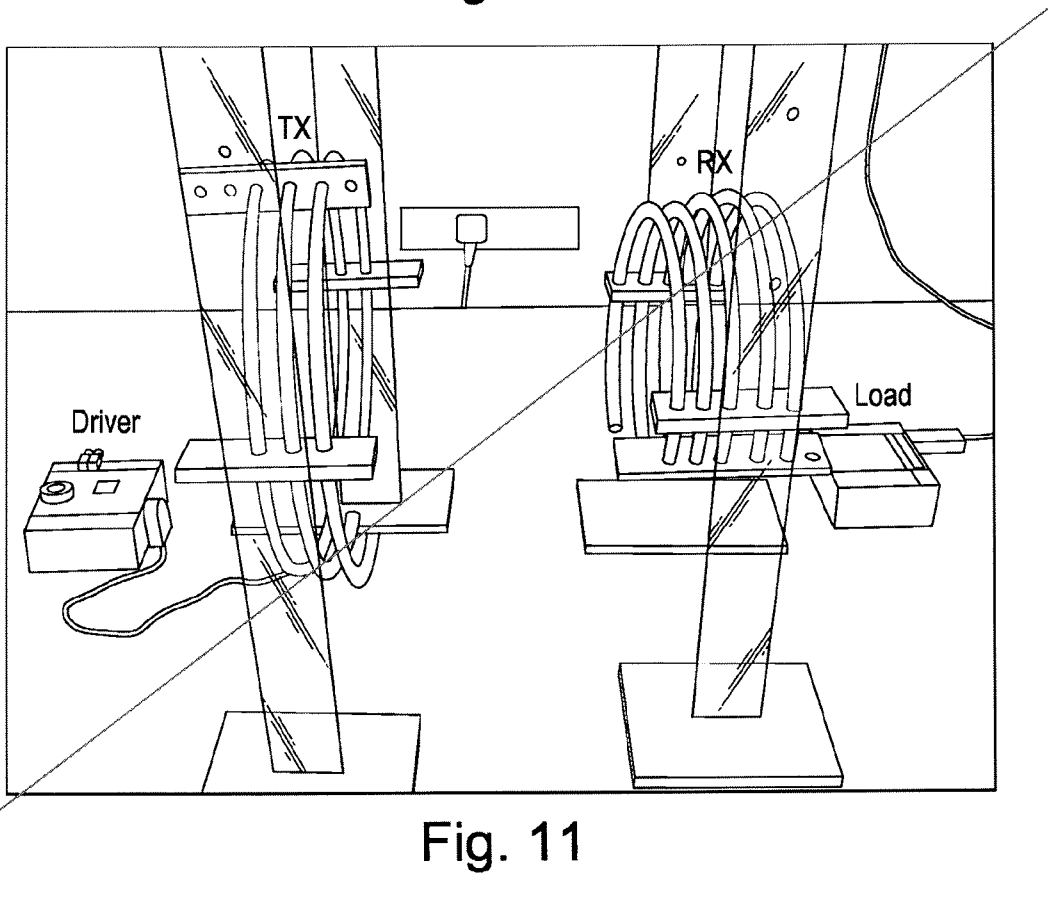

TX
RX
Driver
Load

Fig. 11

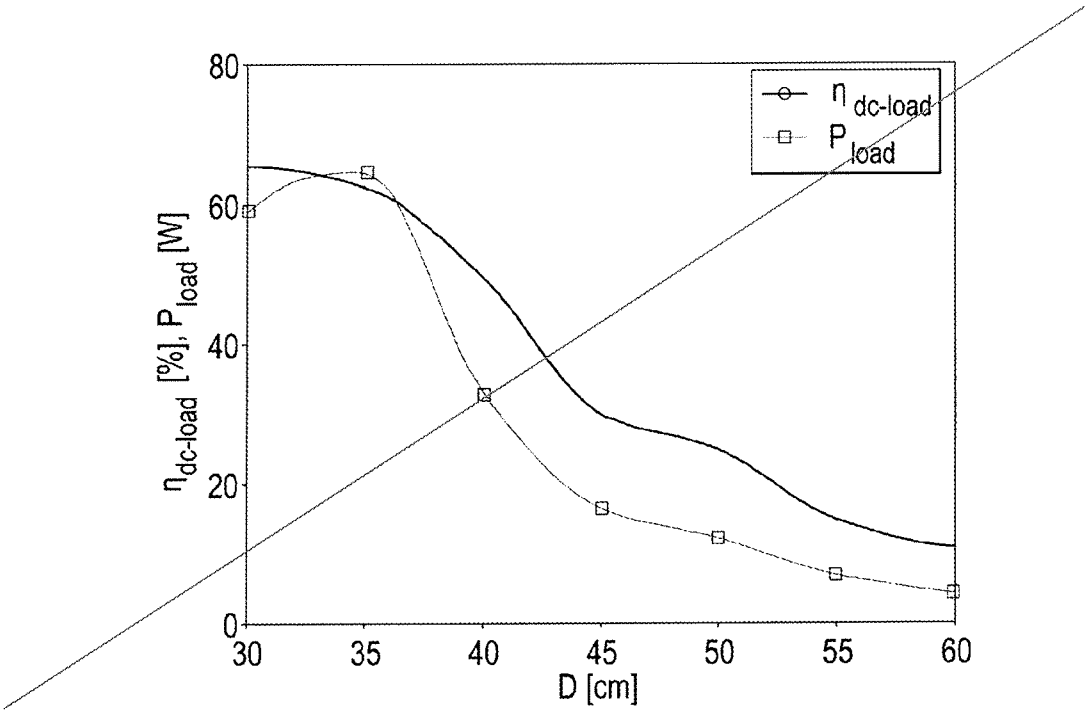

80
60
40
20
0
30
35
40
45
50
55
60
D [cm]
$\eta_{dc\text{-}load}$ [%], P_{load} [W]
$\eta_{dc\text{-}load}$
P_{load}

Fig. 14

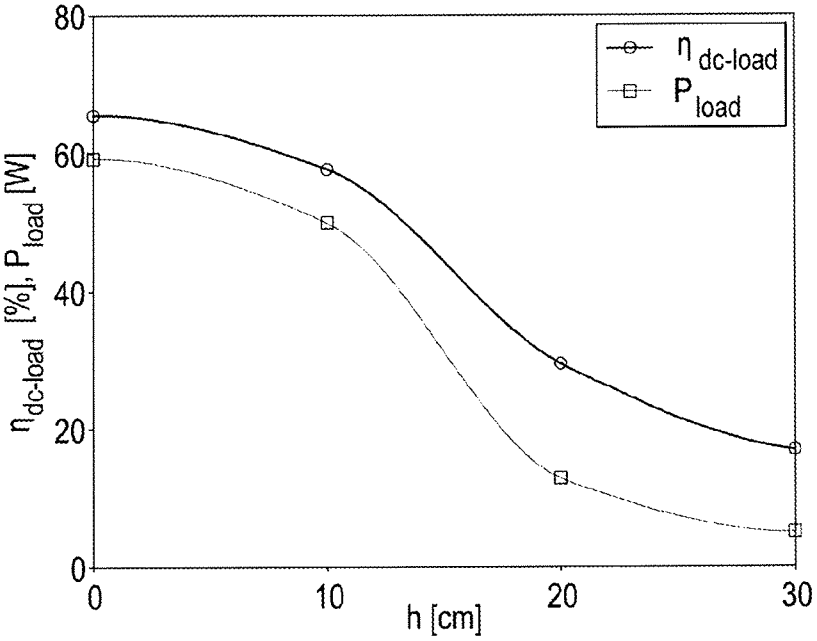

80
60
40
20
0
0
10
20
30
h [cm]
$\eta_{dc\text{-}load}$ [%], P_{load} [W]
$\eta_{dc\text{-}load}$
P_{load}

Fig. 15

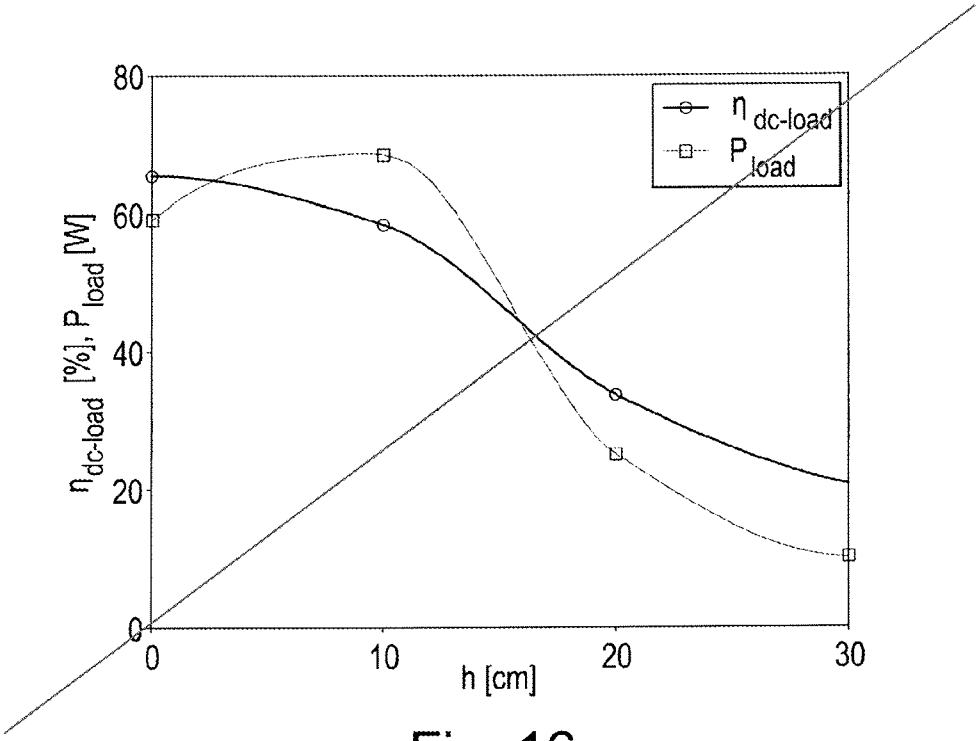

80
60
40
20
0
0
10
20
30
h [cm]
$\eta_{dc\text{-}load}$ [%], P_{load} [W]
$\eta_{dc\text{-}load}$
P_{load}

Fig. 16

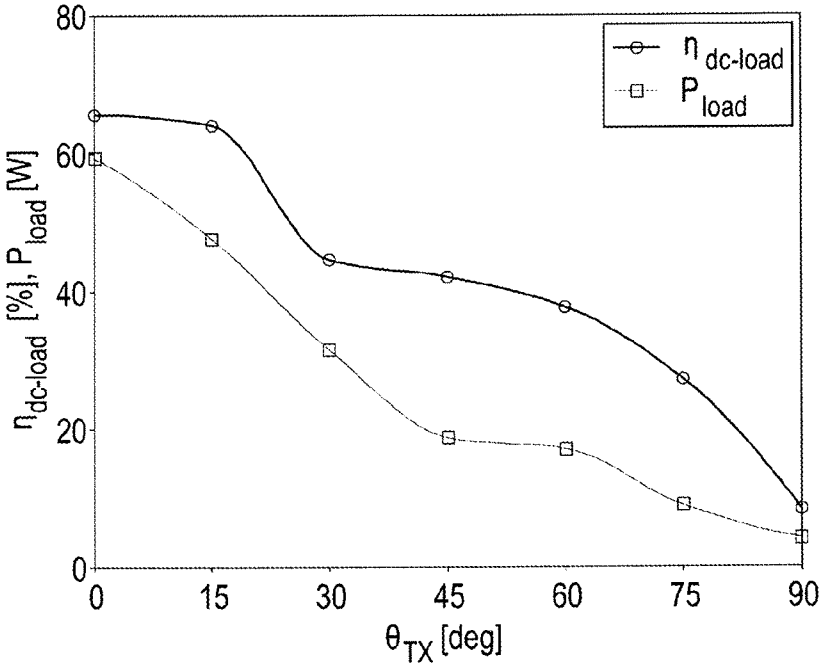

80
60
40
20
0
0
15
30
45
60
75
90
θ_{TX} [deg]
$\eta_{dc\text{-}load}$ [%], P_{load} [W]
$\eta_{dc\text{-}load}$
P_{load}

Fig. 17

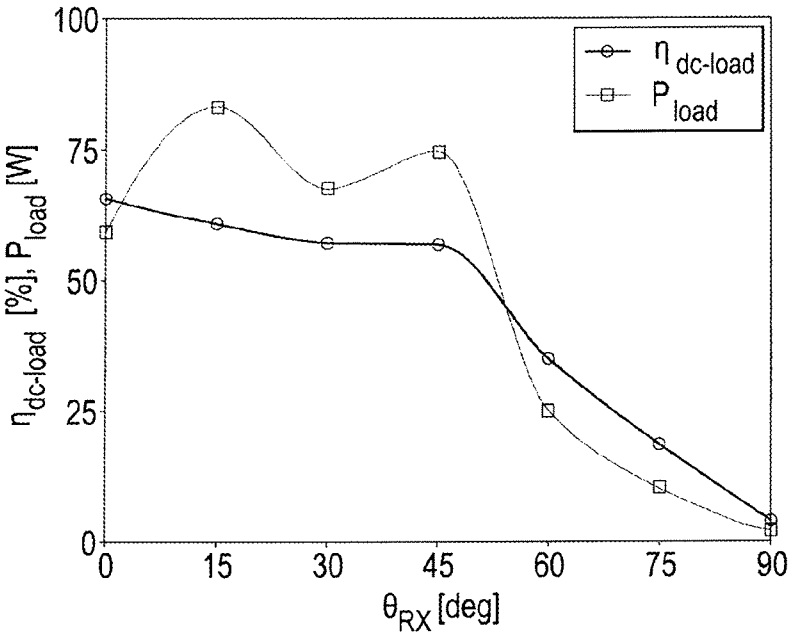

100
75
50
25
0
0
15
30
45
60
75
90
η dc-load
P load
η dc-load [%], P load [W]
θ RX [deg]

Fig. 20

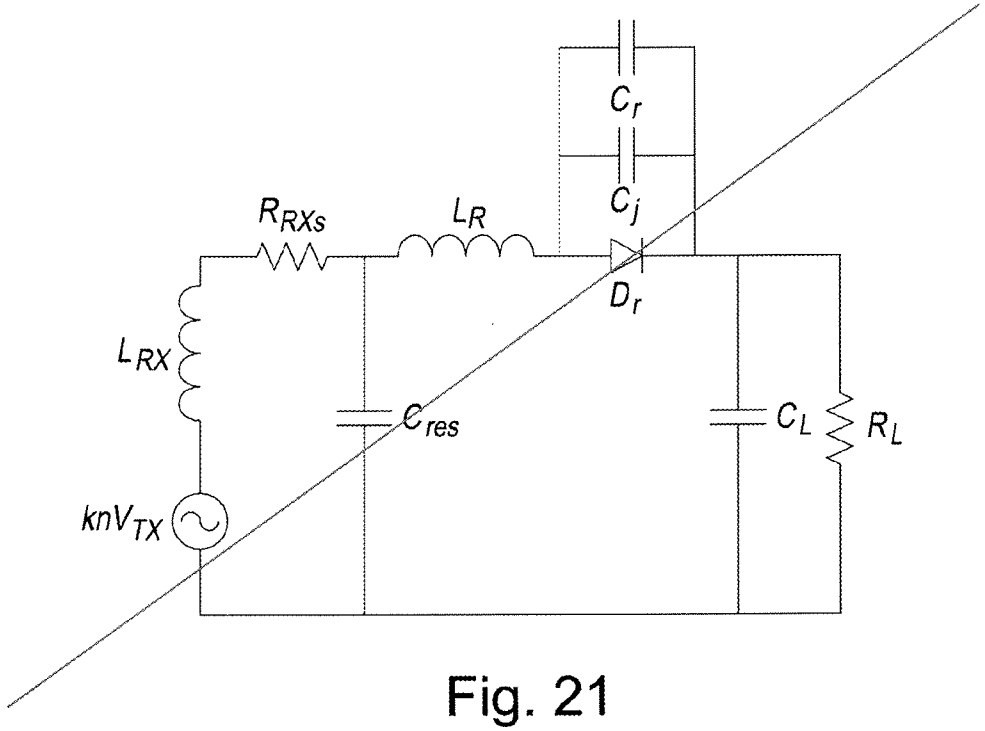

C r
C j
R RXs
L R
D r
L RX
C res
C L
R L
knV TX

Fig. 21

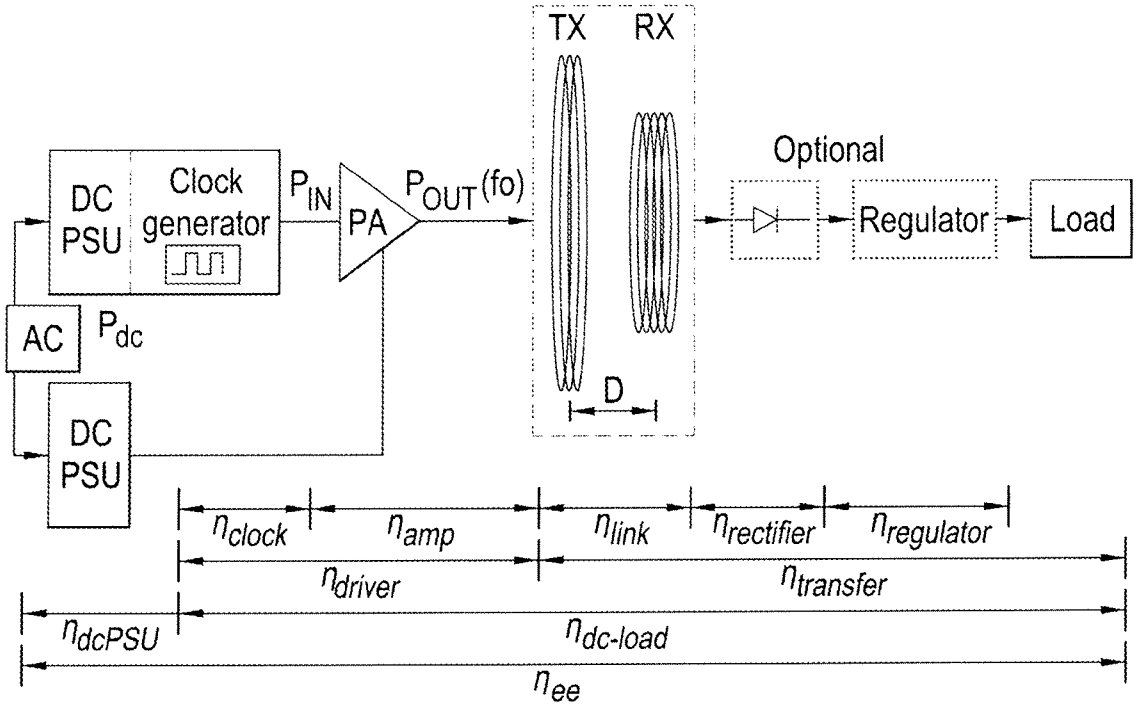

TX
RX
Optional
DC PSU
Clock generator
P_{IN}
PA
P_{OUT}(fo)
Regulator
Load
AC
P_{dc}
DC PSU
D
η_{clock}
η_{amp}
η_{link}
$\eta_{rectifier}$
$\eta_{regulator}$
η_{driver}
$\eta_{transfer}$
η_{dcPSU}
$\eta_{dc\text{-}load}$
η_{ee}

FIG. 1

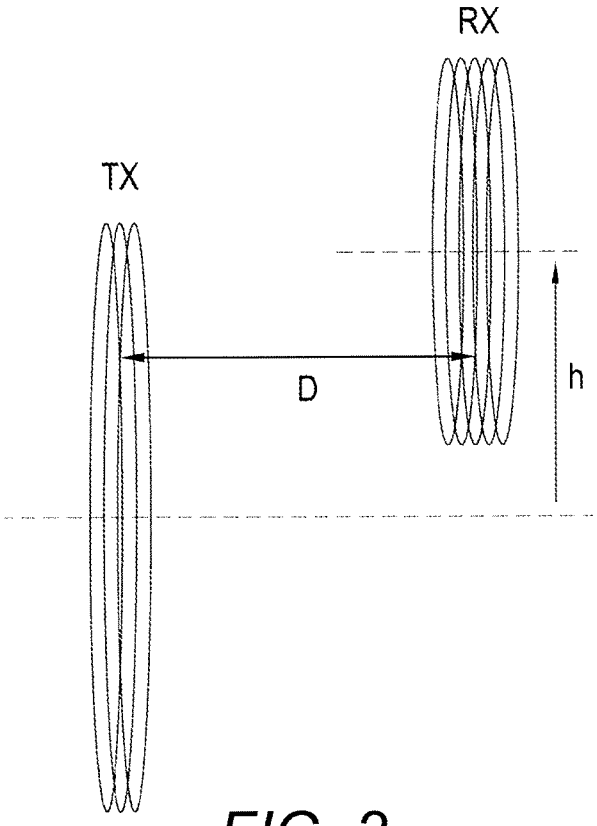

RX
TX
D
h

FIG. 2

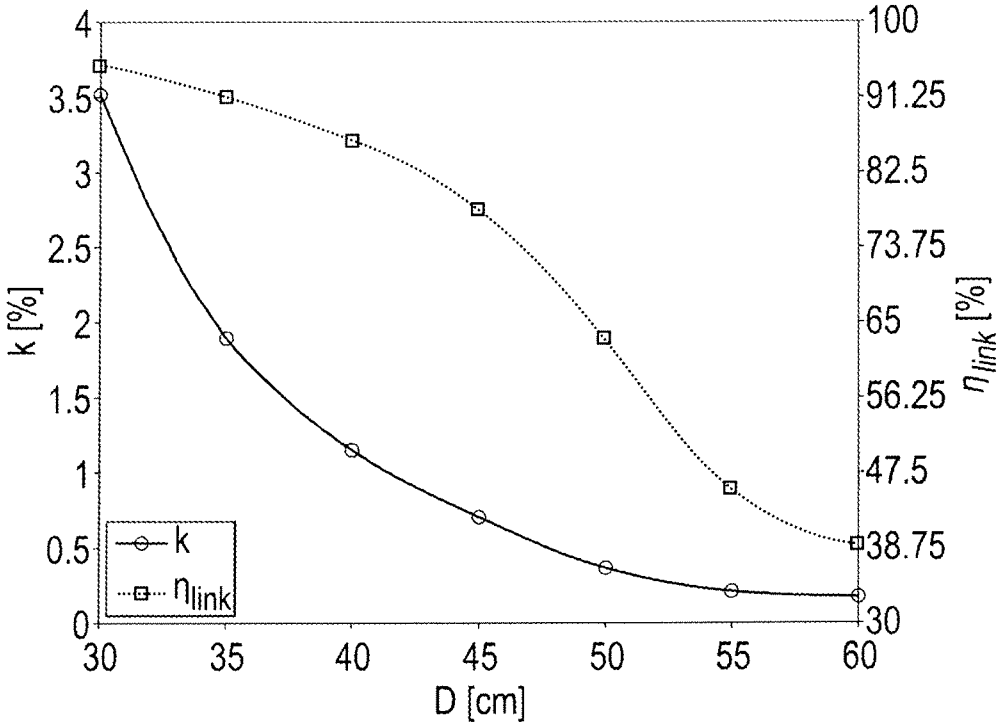

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
30
35
40
45
50
55
60
D [cm]

FIG. 4

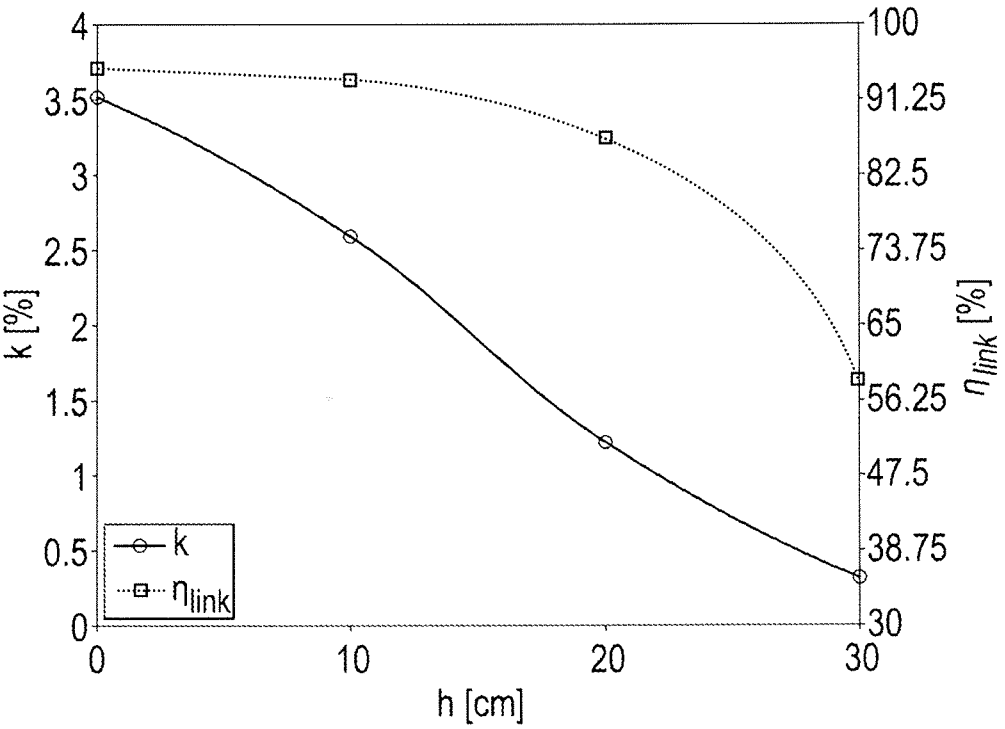

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
0
10
20
30
h [cm]

FIG. 5

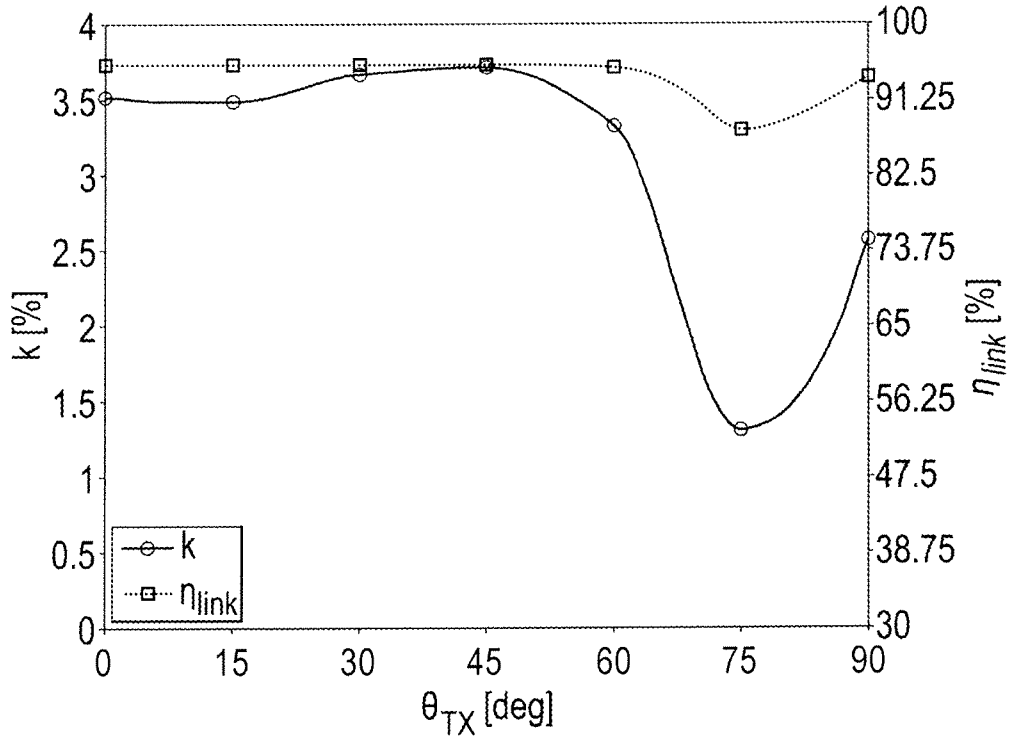

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
0
15
30
45
60
75
90
θ_{TX} [deg]

FIG. 6

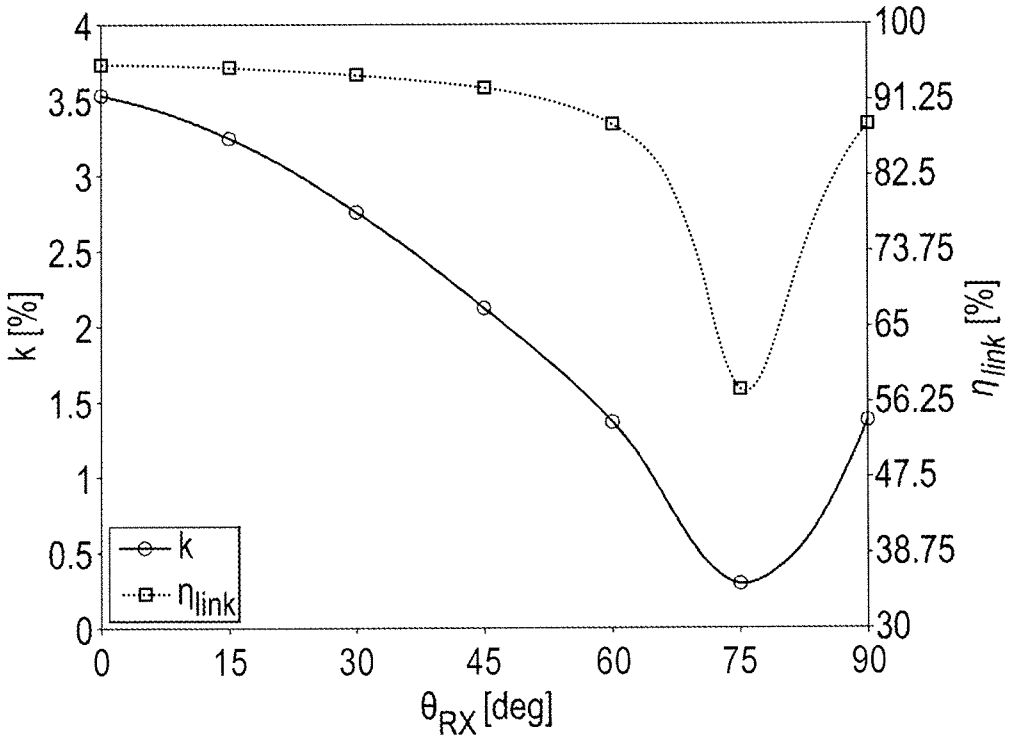

4
3.5
3
2.5
2
1.5
1
0.5
0
k [%]
100
91.25
82.5
73.75
65
56.25
47.5
38.75
30
η_{link} [%]
k
η_{link}
0
15
30
45
60
75
90
θ_{RX} [deg]

FIG. 7

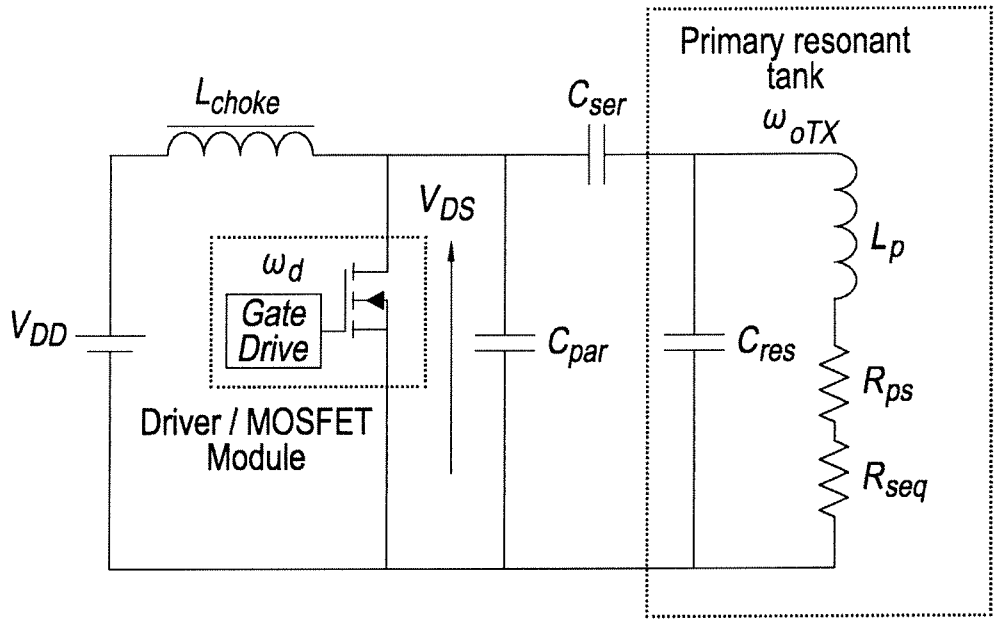

Primary resonant tank
L_{choke}
C_{ser}
ω_{oTX}
V_{DS}
L_p
ω_d
Gate Drive
V_{DD}
C_{par}
C_{res}
R_{ps}
R_{seq}
Driver / MOSFET Module

FIG. 8

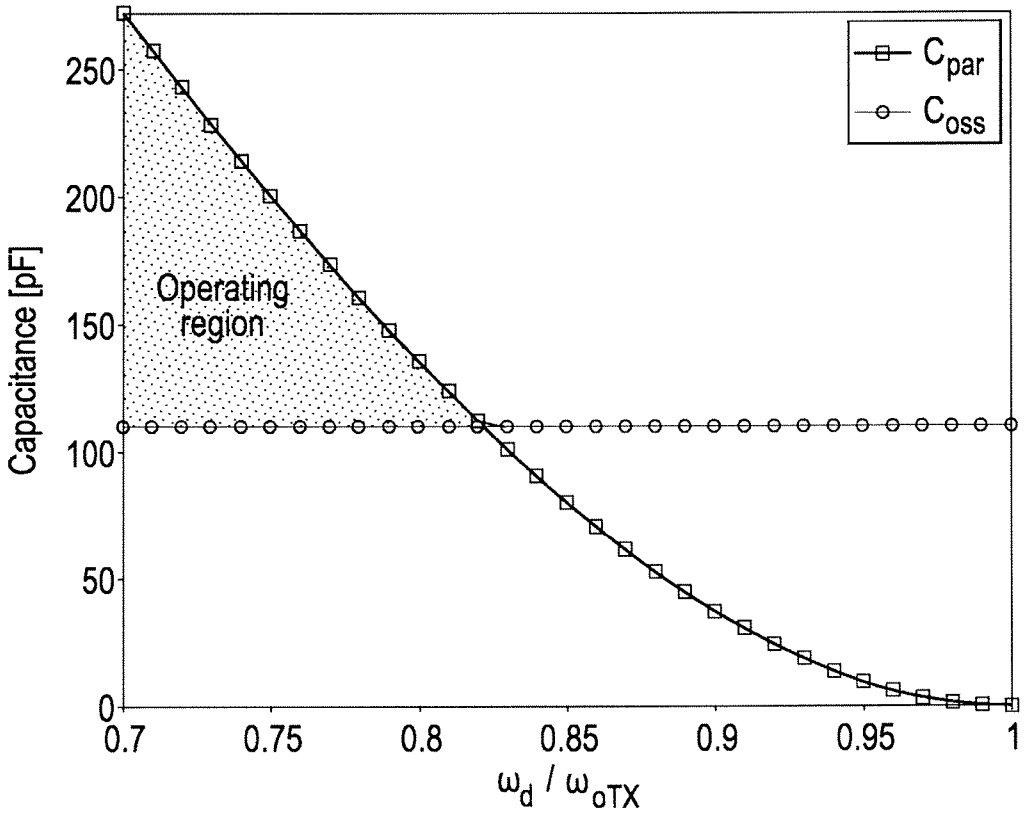

C_{par}
C_{oss}
Operating region
Capacitance [pF]
250
200
150
100
50
0
0.7
0.75
0.8
0.85
0.9
0.95
1
ω_d / ω_{oTX}

FIG. 9

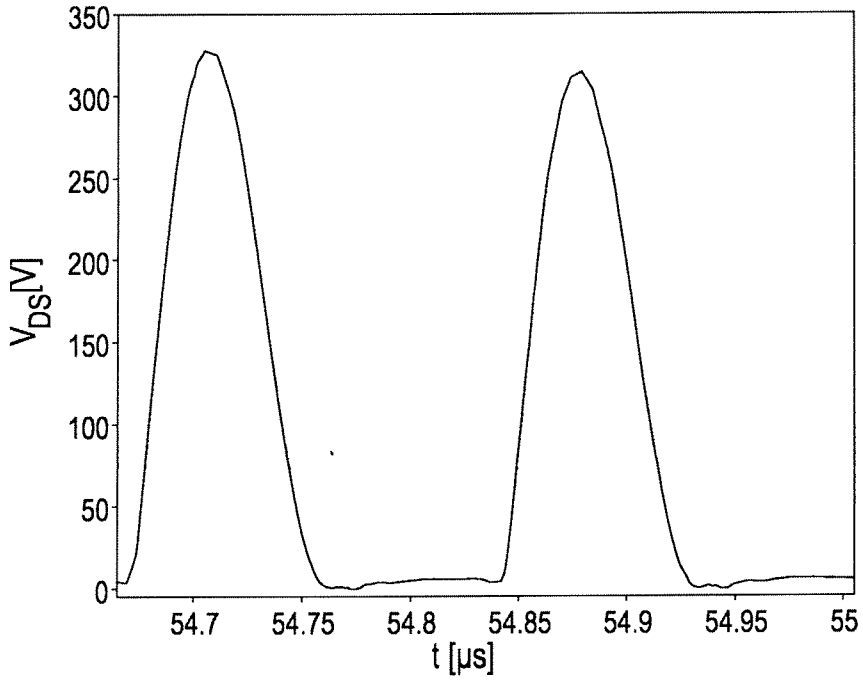

350
300
250
200
150
100
50
0
V_{DS}[V]
54.7
54.75
54.8
54.85
54.9
54.95
55
t [µs]

FIG. 10

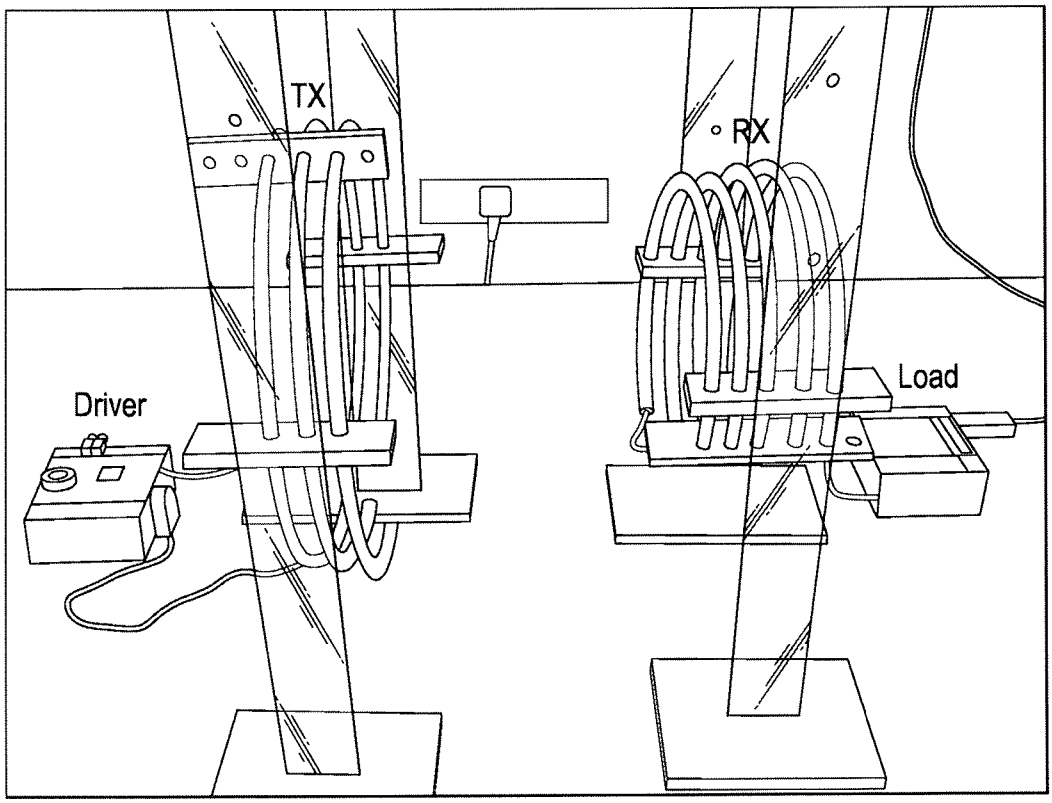

TX
RX
Driver
Load

FIG. 11

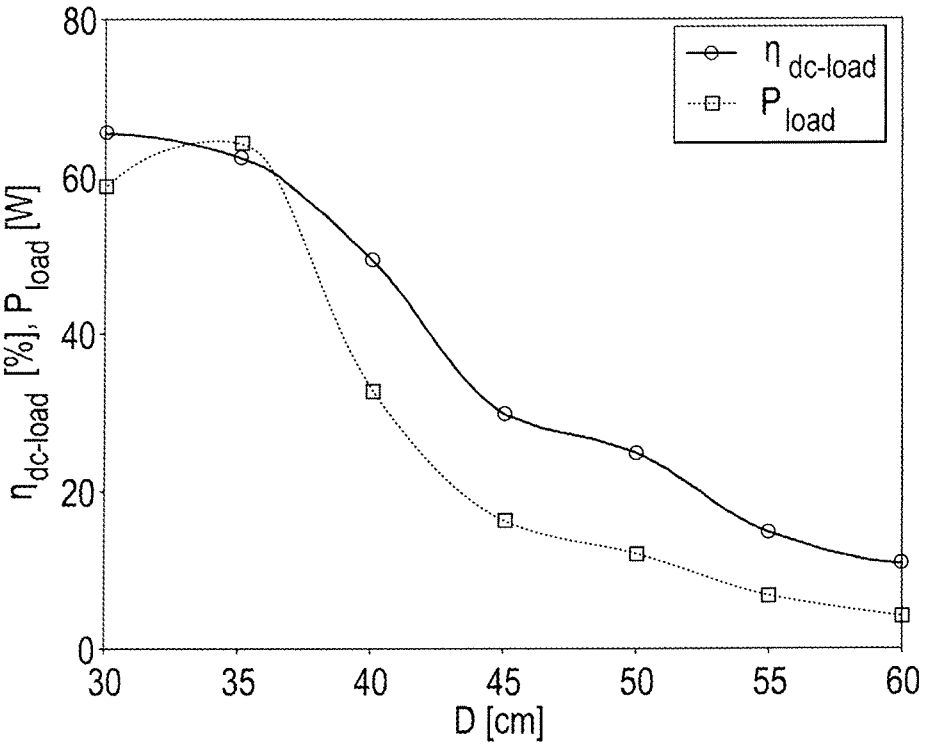

80
60
40
20
0
30
35
40
45
50
55
60
D [cm]
η dc-load [%], P load [W]
η dc-load
P load

FIG. 14

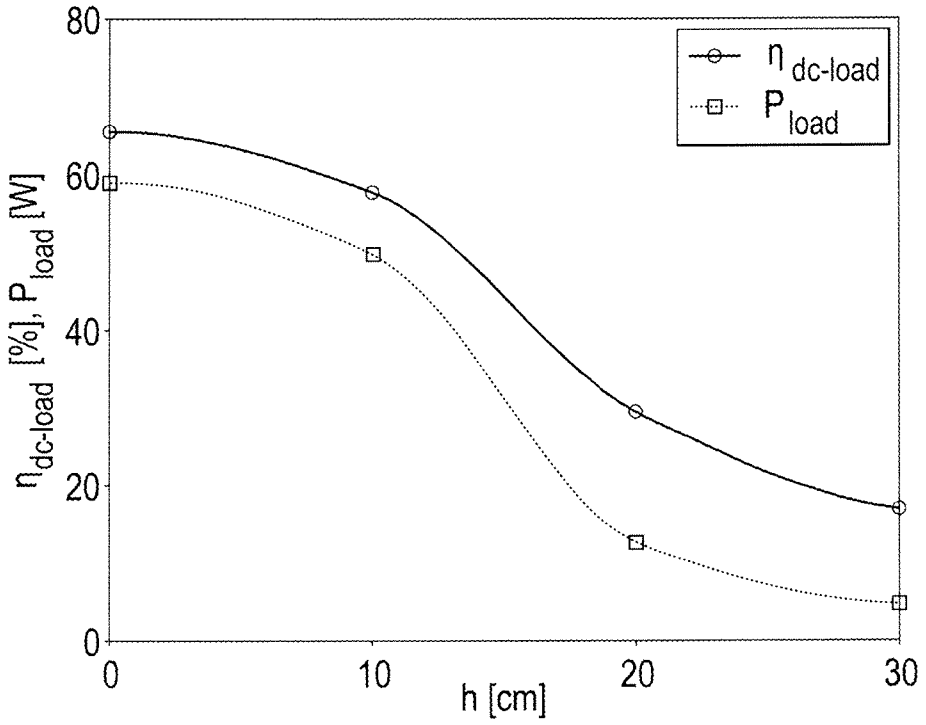

80
60
40
20
0
0
10
20
30
h [cm]
η dc-load [%], P load [W]
η dc-load
P load

FIG. 15

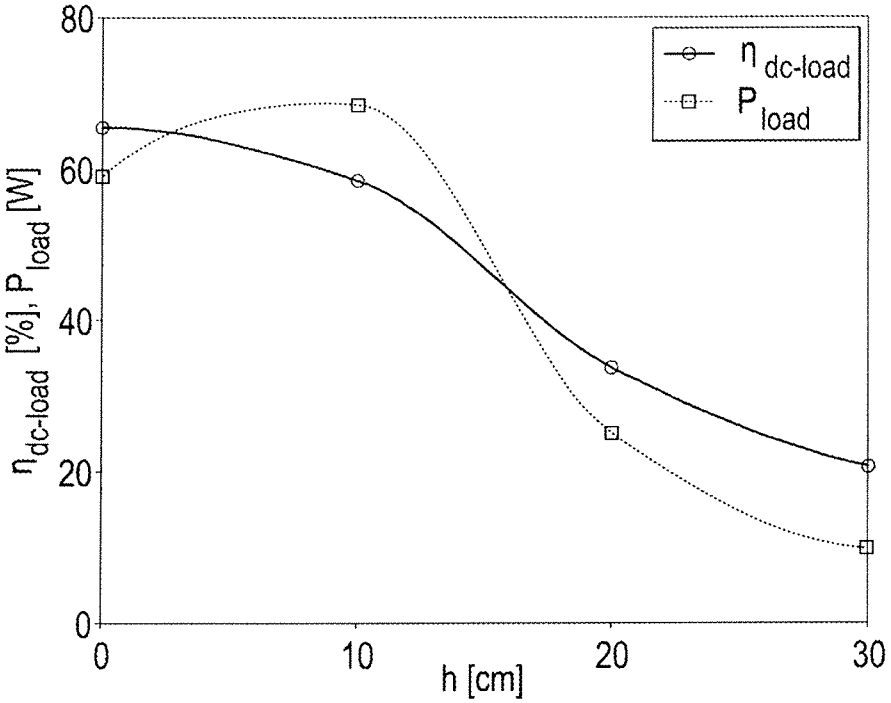

80
60
40
20
0
0
10
20
30
h [cm]
η dc-load
P load
η dc-load [%], P load [W]

FIG. 16

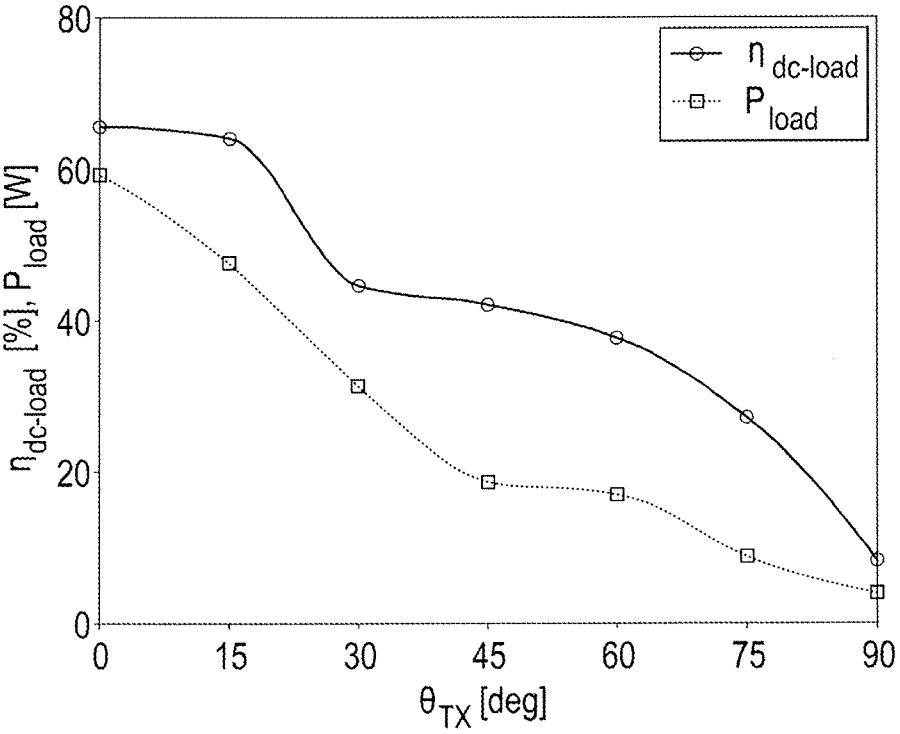

80
60
40
20
0
0
15
30
45
60
75
90
θ TX [deg]
η dc-load
P load
η dc-load [%], P load [W]

FIG. 17

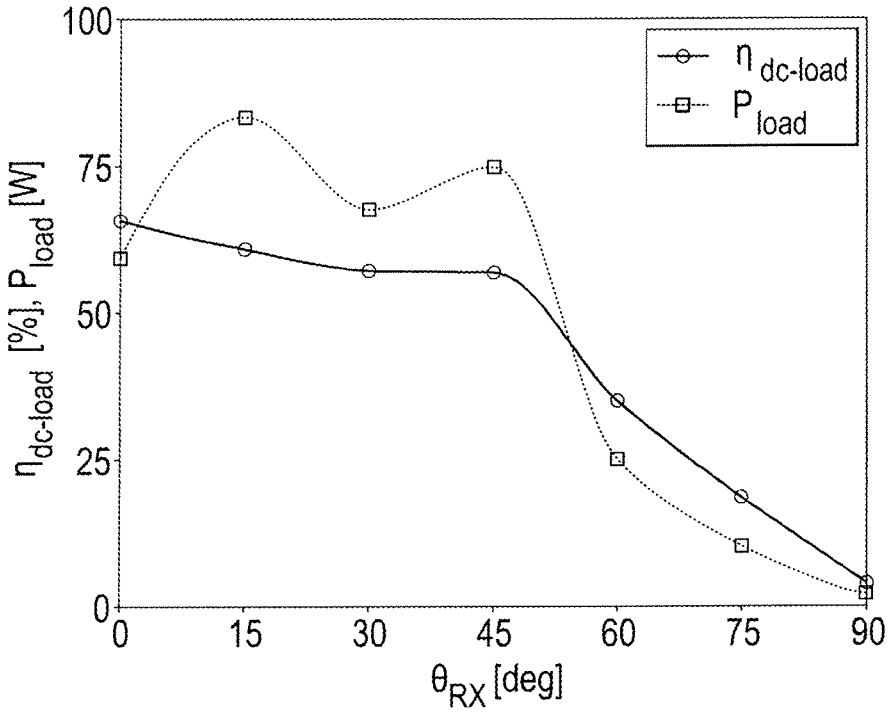

100
75
50
25
0
0
15
30
45
60
75
90
η dc-load
P load
η dc-load [%], P load [W]
θ RX [deg]

FIG. 20

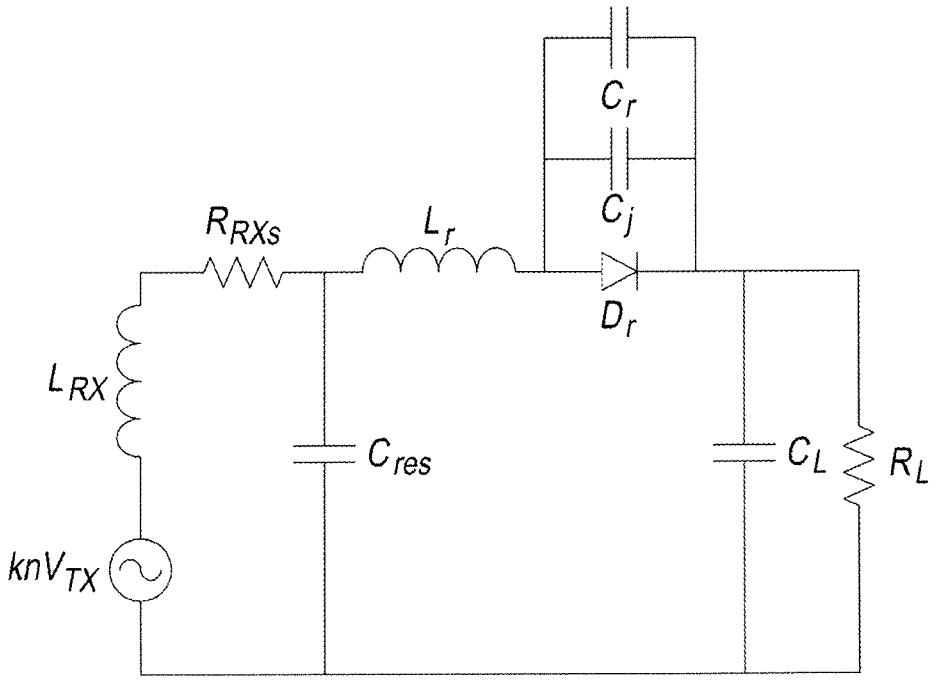

C r
C j
R RXs
L r
D r
L RX
C res
C L
R L
knV TX

FIG. 21