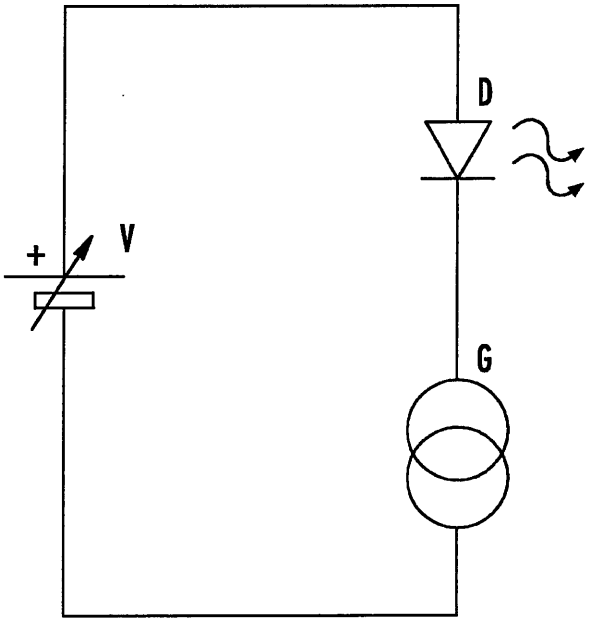

FIG. 1

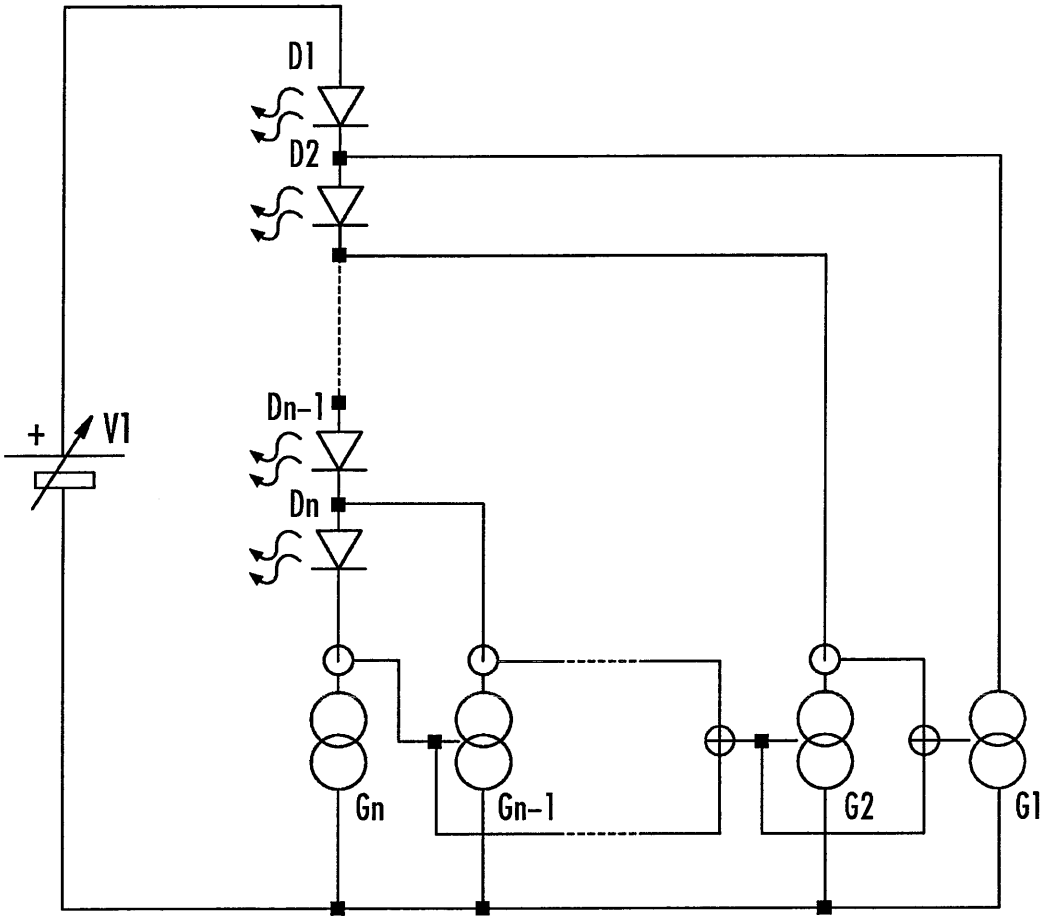

FIG. 2

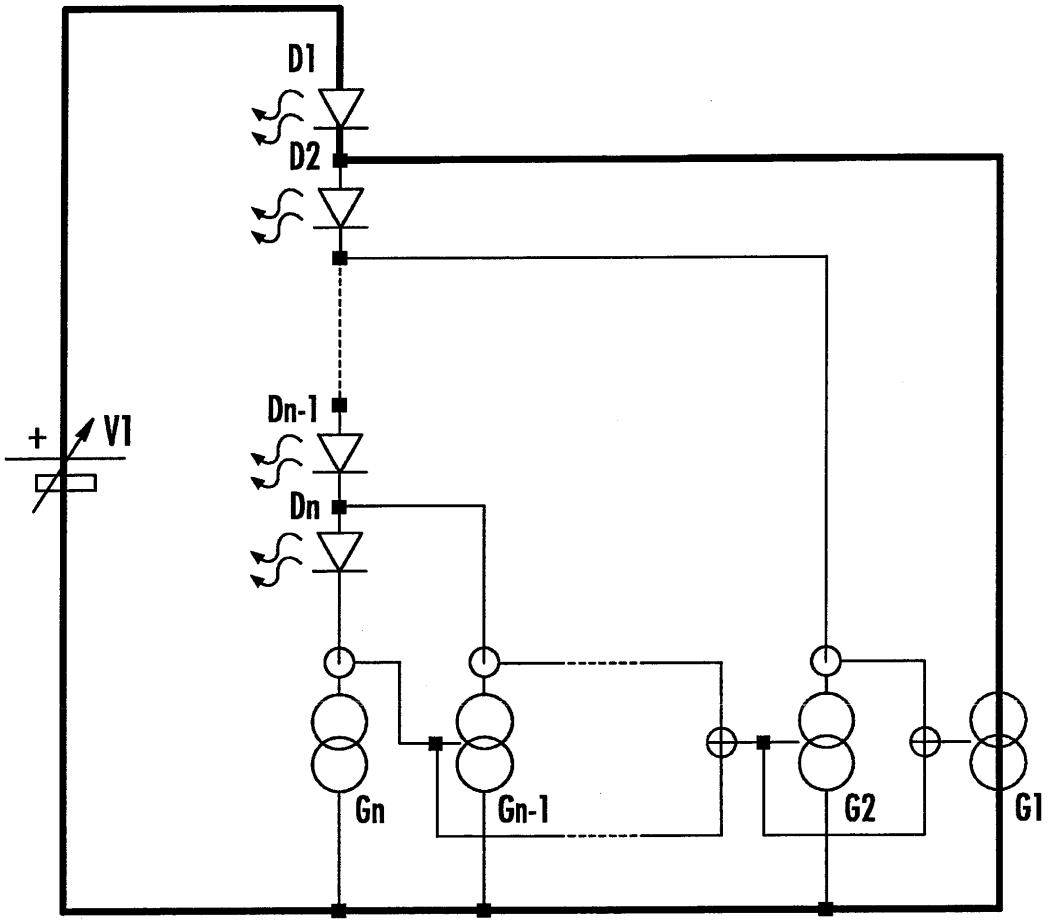

FIG. 3A

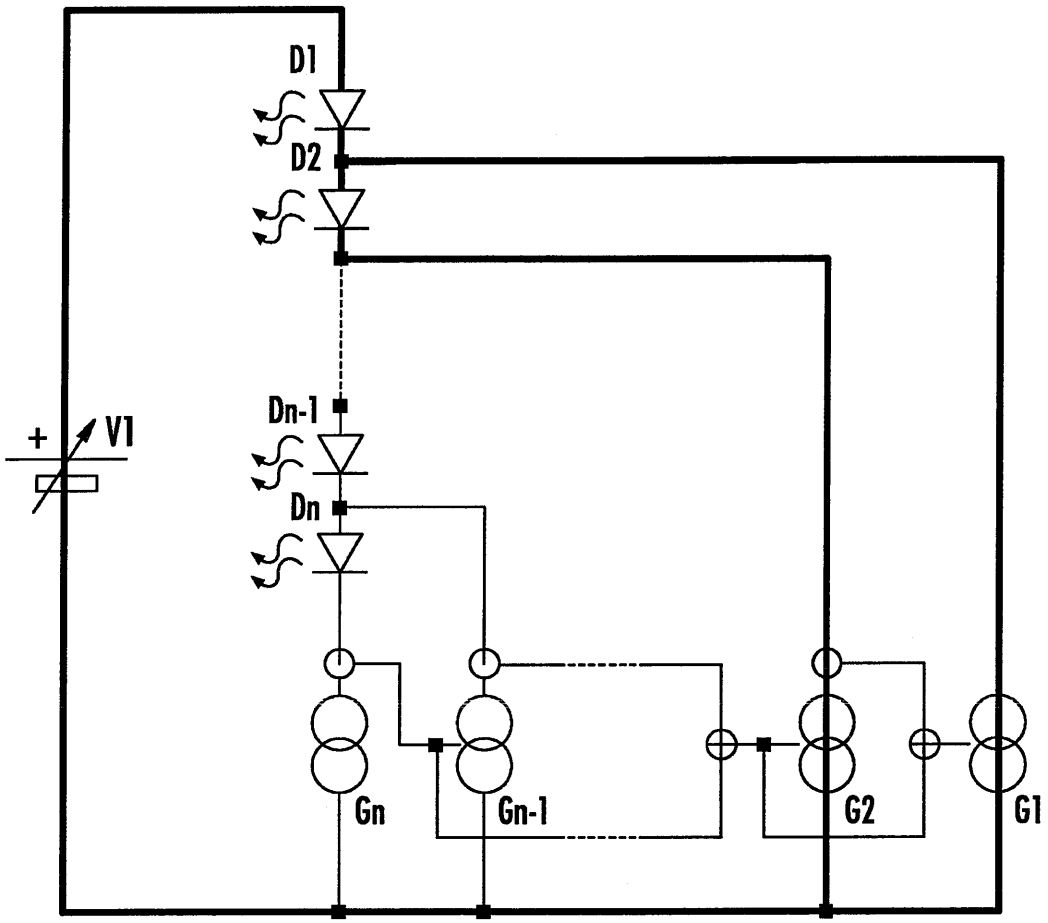

FIG. 3B

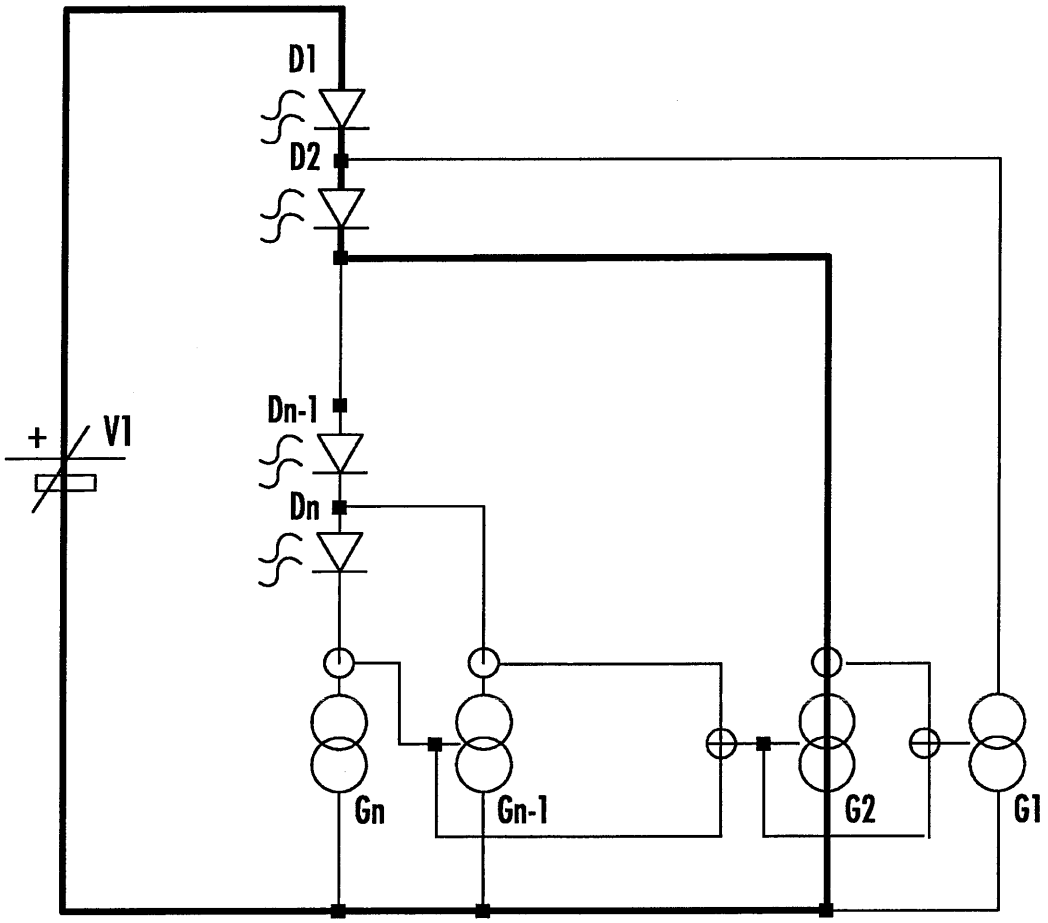

FIG. 3C

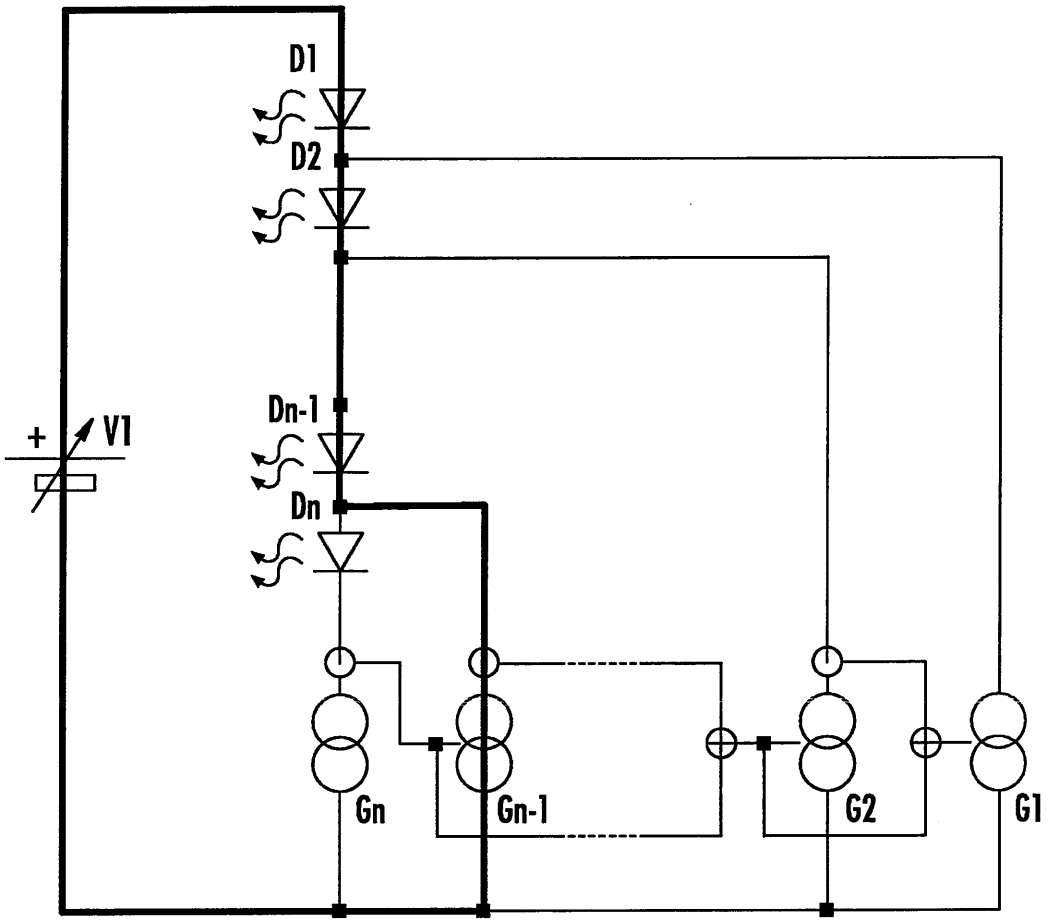

FIG. 3D

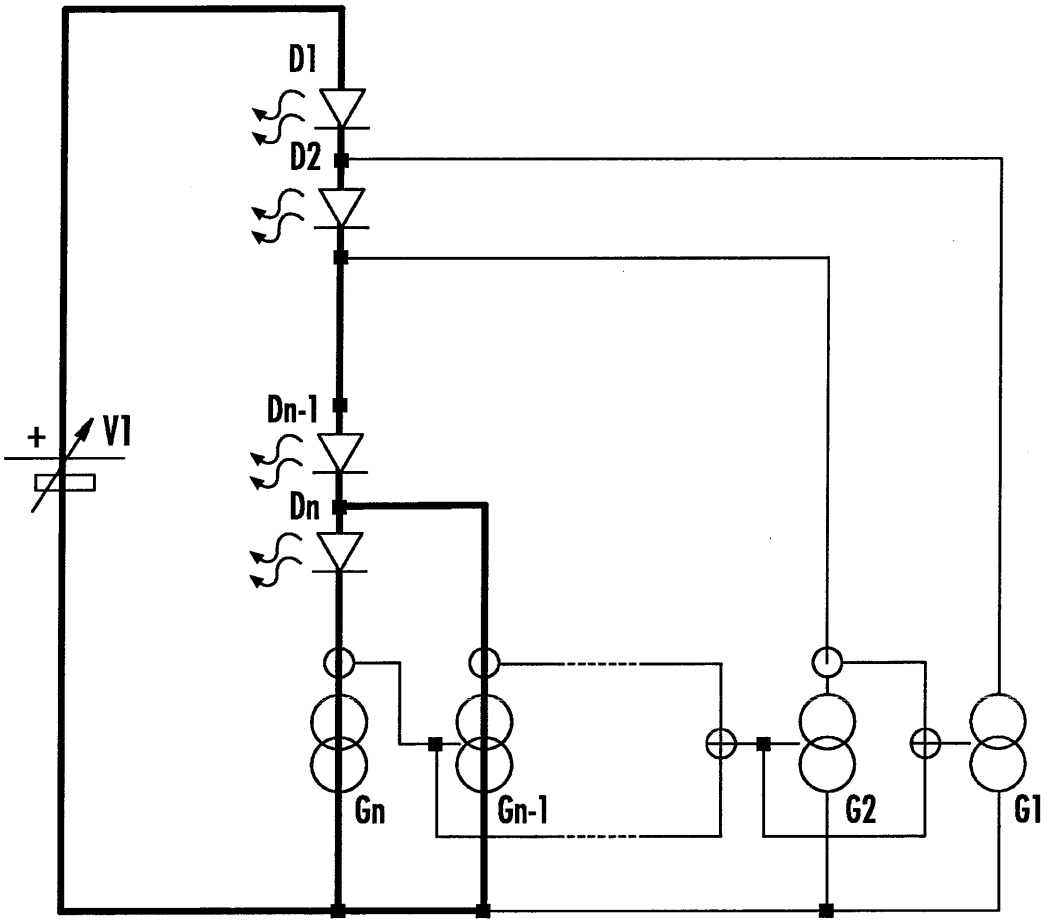

FIG. 3E

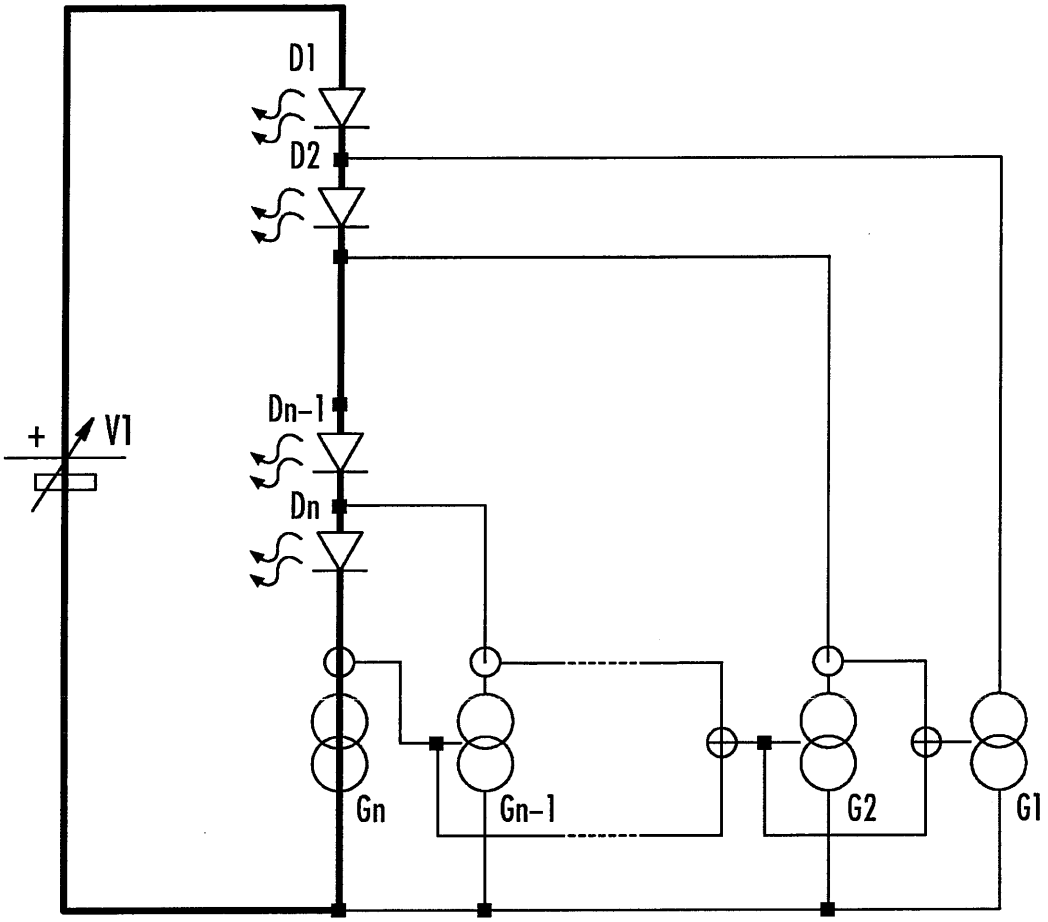

FIG. 3F

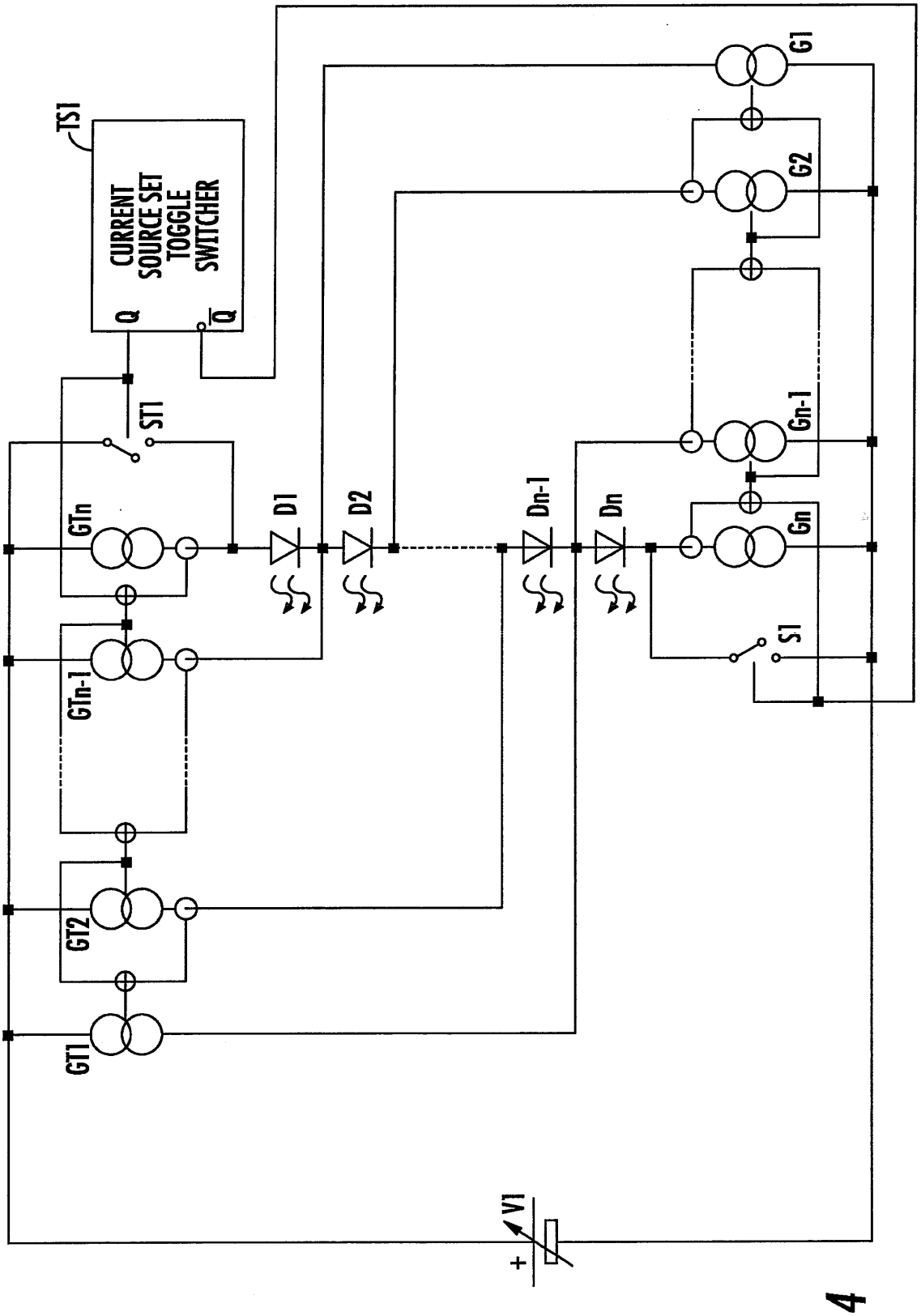
TS1
CURRENT SOURCE SET TOGGLE SWITCHER
Q
Q
ST1
GTn
GTn-1
GT2
GT1
D1
D2
Dn-1
Dn
G1
G2
Gn-1
Gn
S1
V1
+

FIG. 4

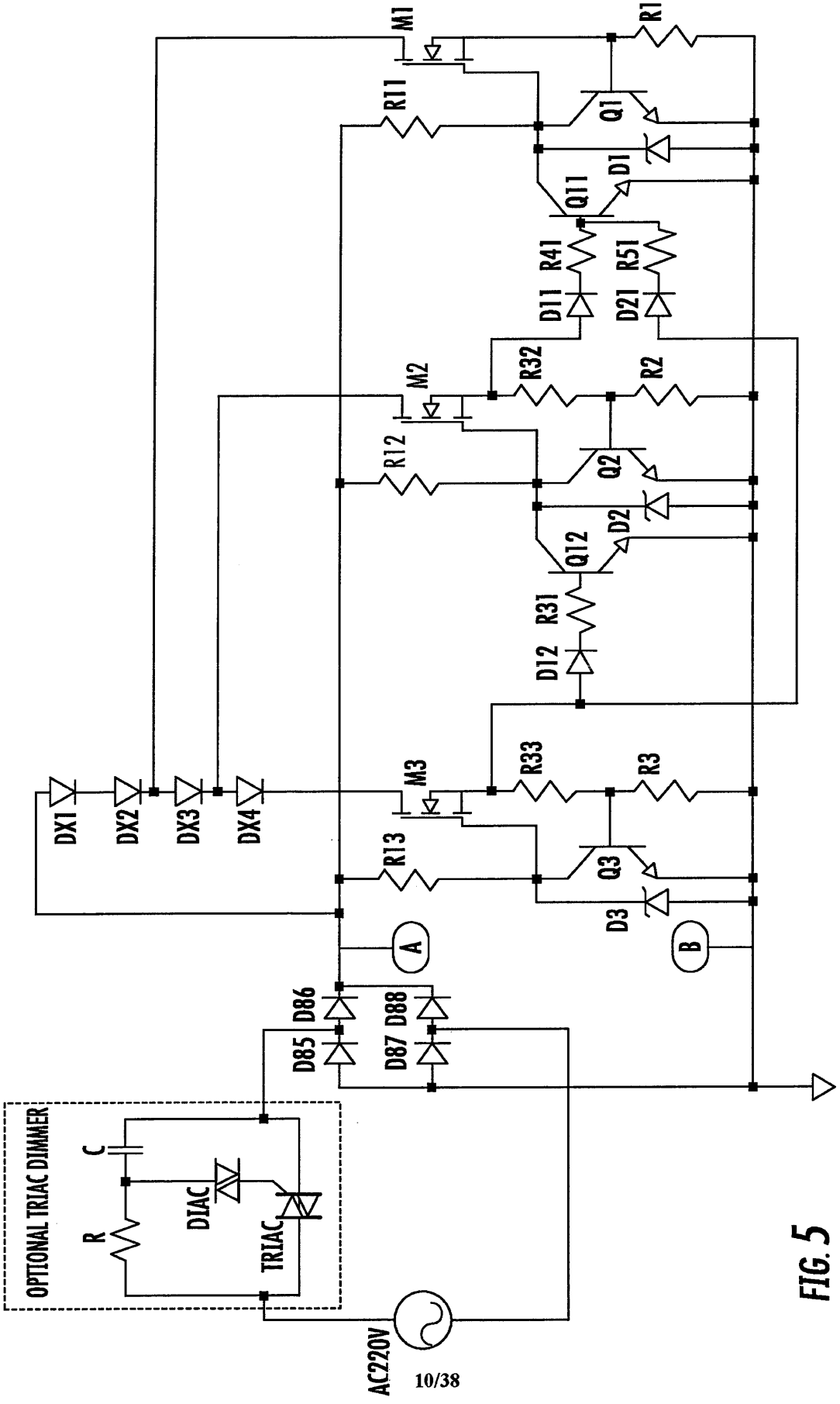
M1
R1
R11
Q1
D1
Q11
R41
R51
D11
D21
M2
R32
R2
R12
Q2
D2
Q12
R31
D12
M3
R33
R3
R13
Q3
D3
DX1
DX2
DX3
DX4
A
B
D86
D85
D88
D87
OPTIONAL TRIAC DIMMER
C
R
DIAC
TRIAC
AC220V

FIG. 5

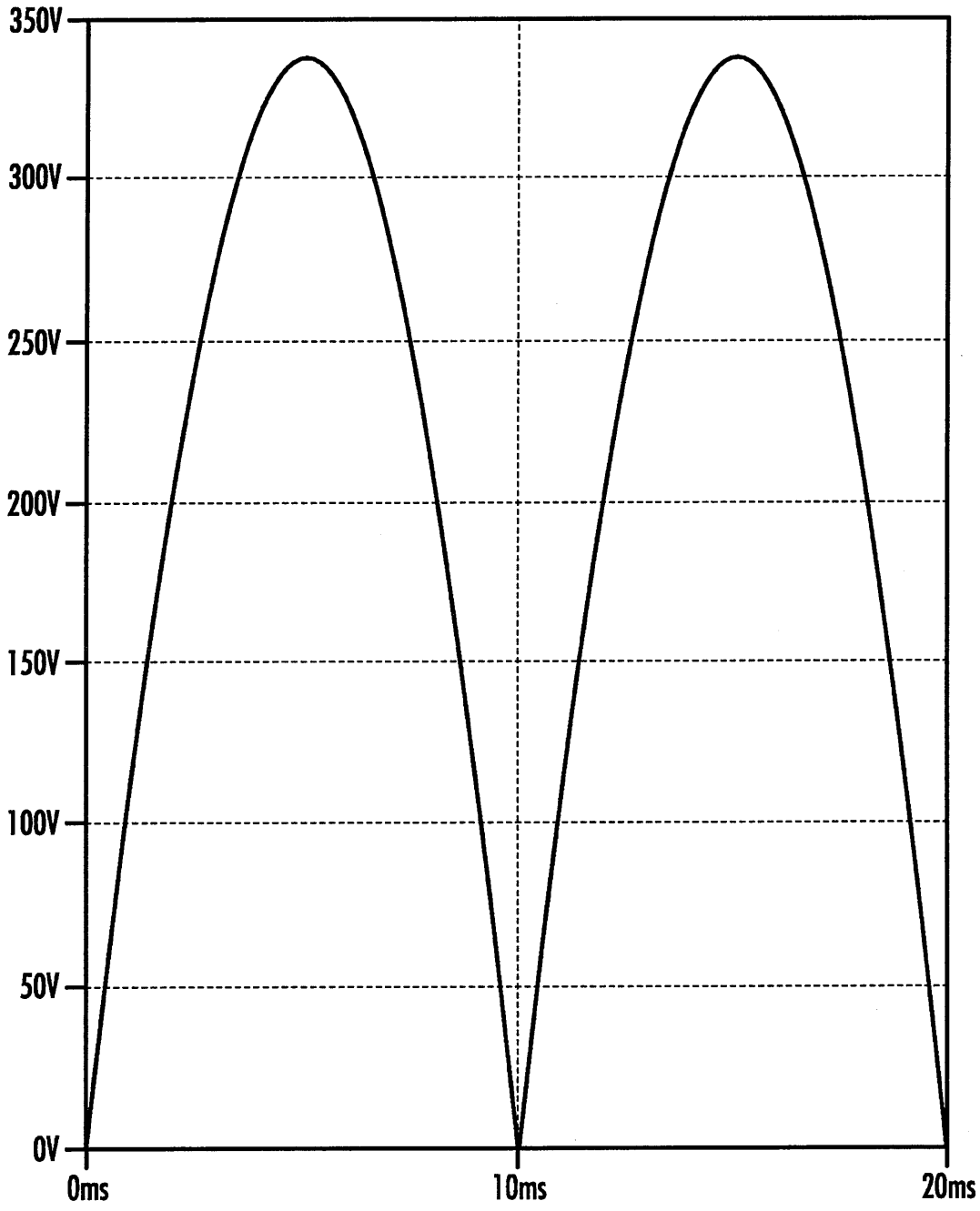

FIG. 6

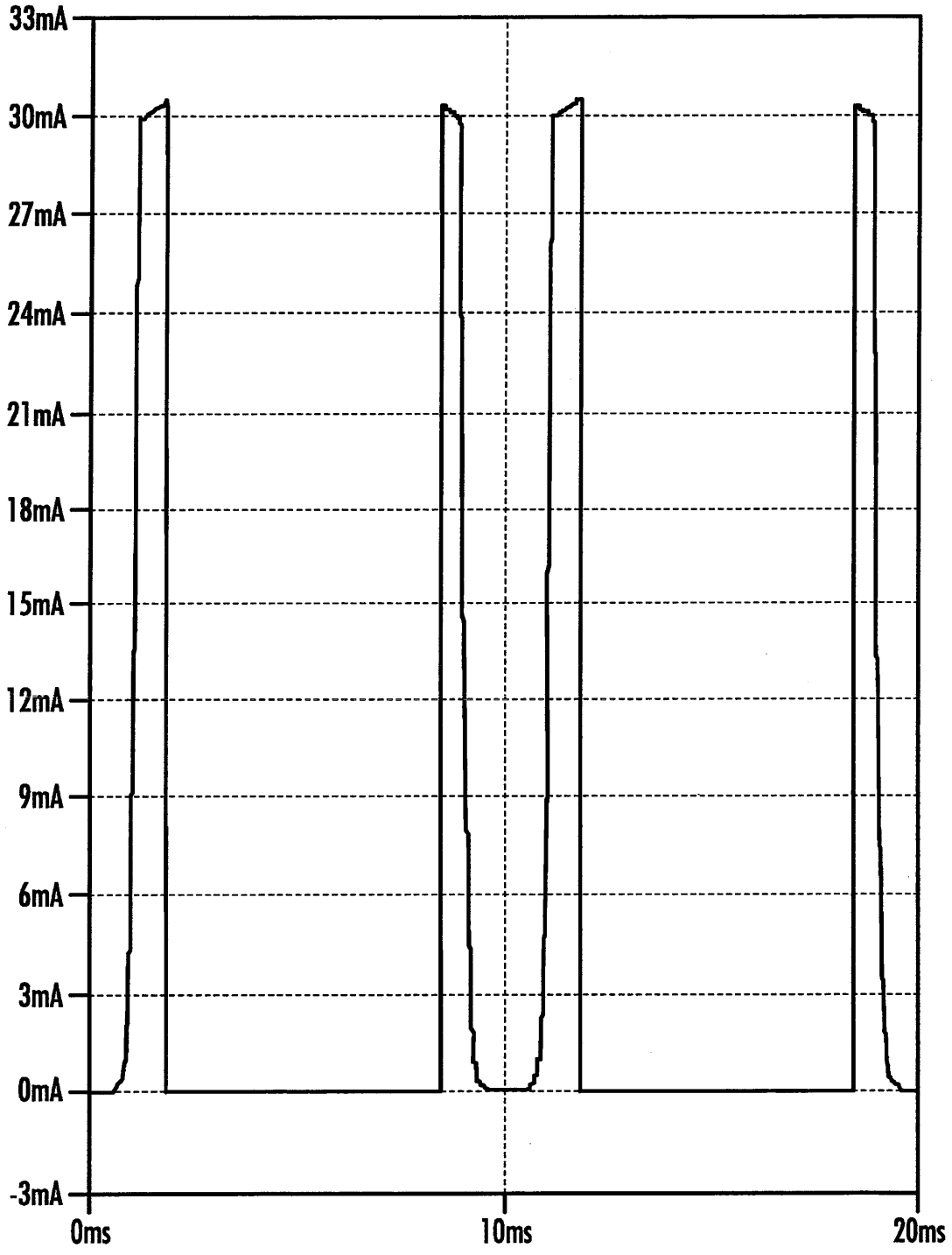
33mA
30mA
27mA
24mA
21mA
18mA
15mA
12mA
9mA
6mA
3mA
0mA
-3mA
0ms
10ms
20ms

FIG. 7

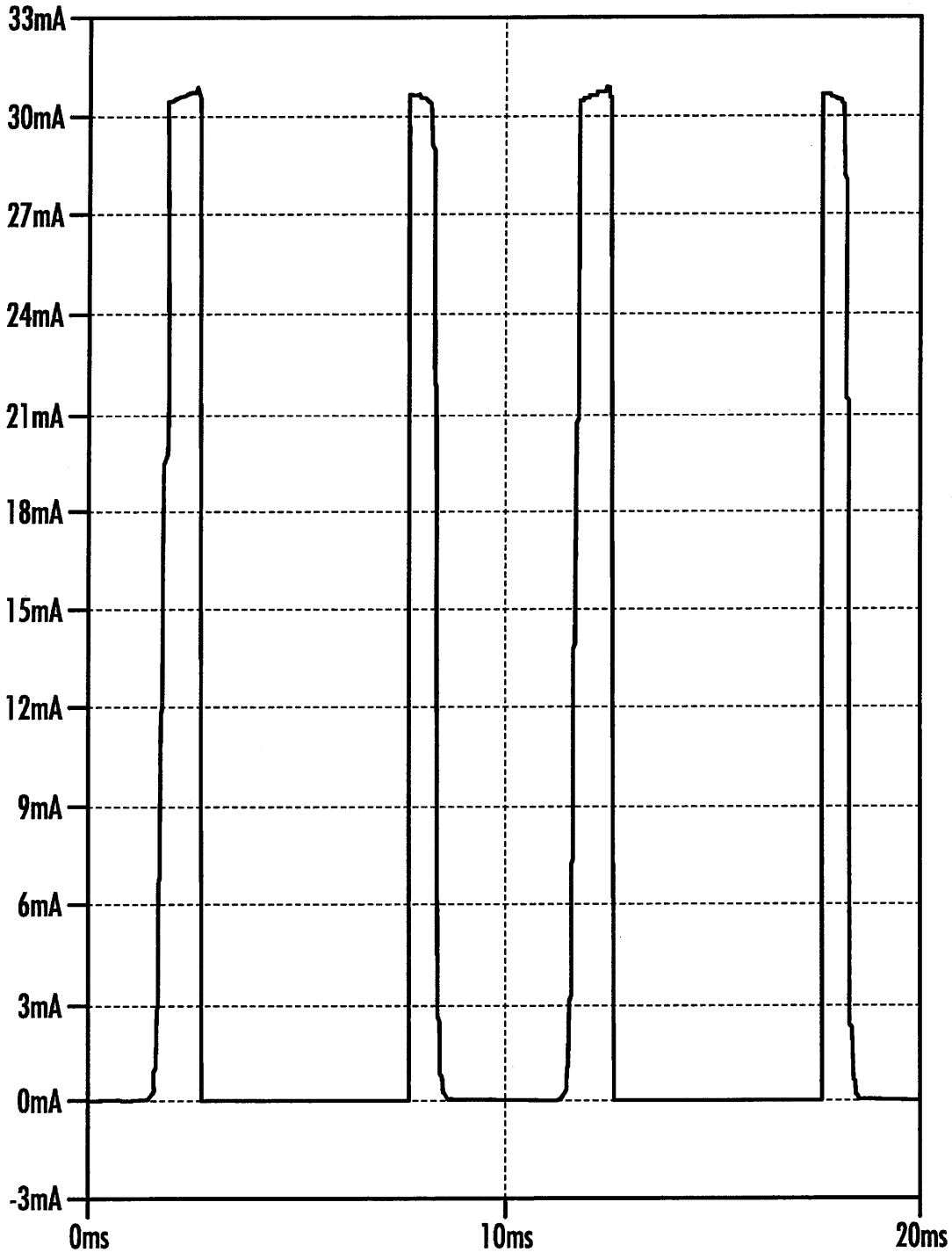
33mA
30mA
27mA
24mA
21mA
18mA
15mA
12mA
9mA
6mA
3mA
0mA
-3mA
0ms
10ms
20ms

FIG. 8

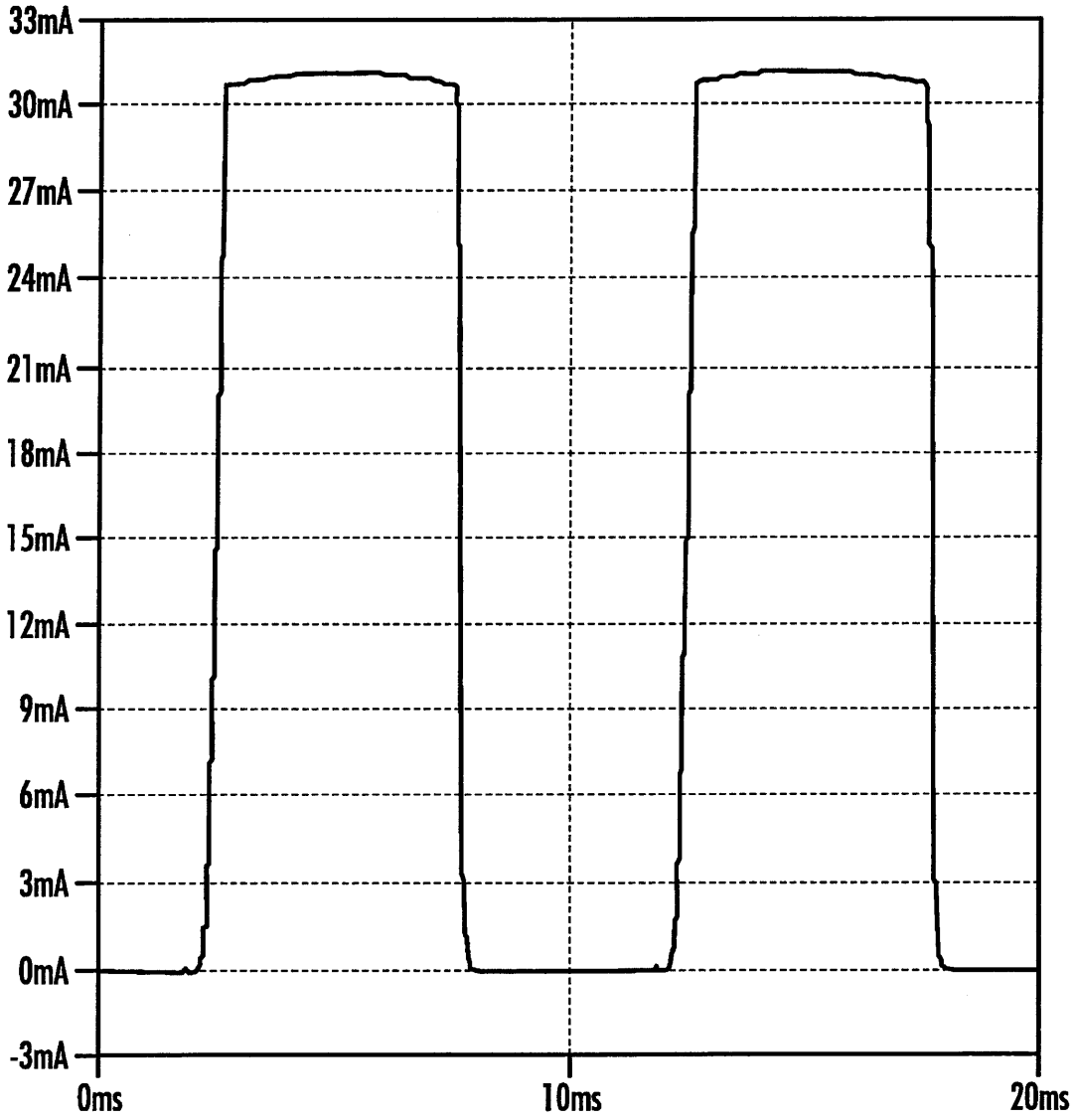
33mA
30mA
27mA
24mA
21mA
18mA
15mA
12mA
9mA
6mA
3mA
0mA
-3mA
0ms
10ms
20ms

FIG. 9

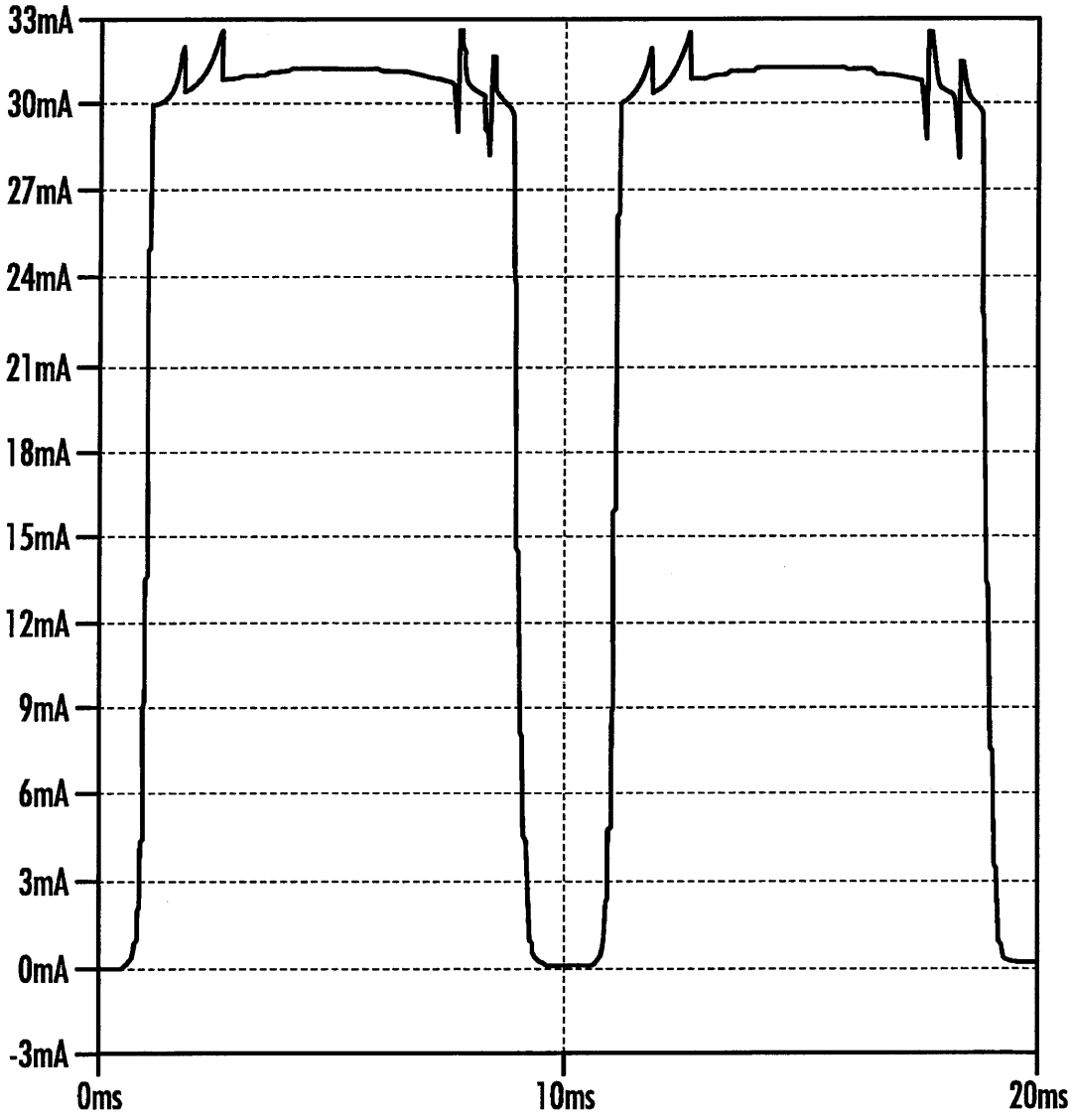
33mA
30mA
27mA
24mA
21mA
18mA
15mA
12mA
9mA
6mA
3mA
0mA
-3mA
0ms
10ms
20ms

FIG. 10

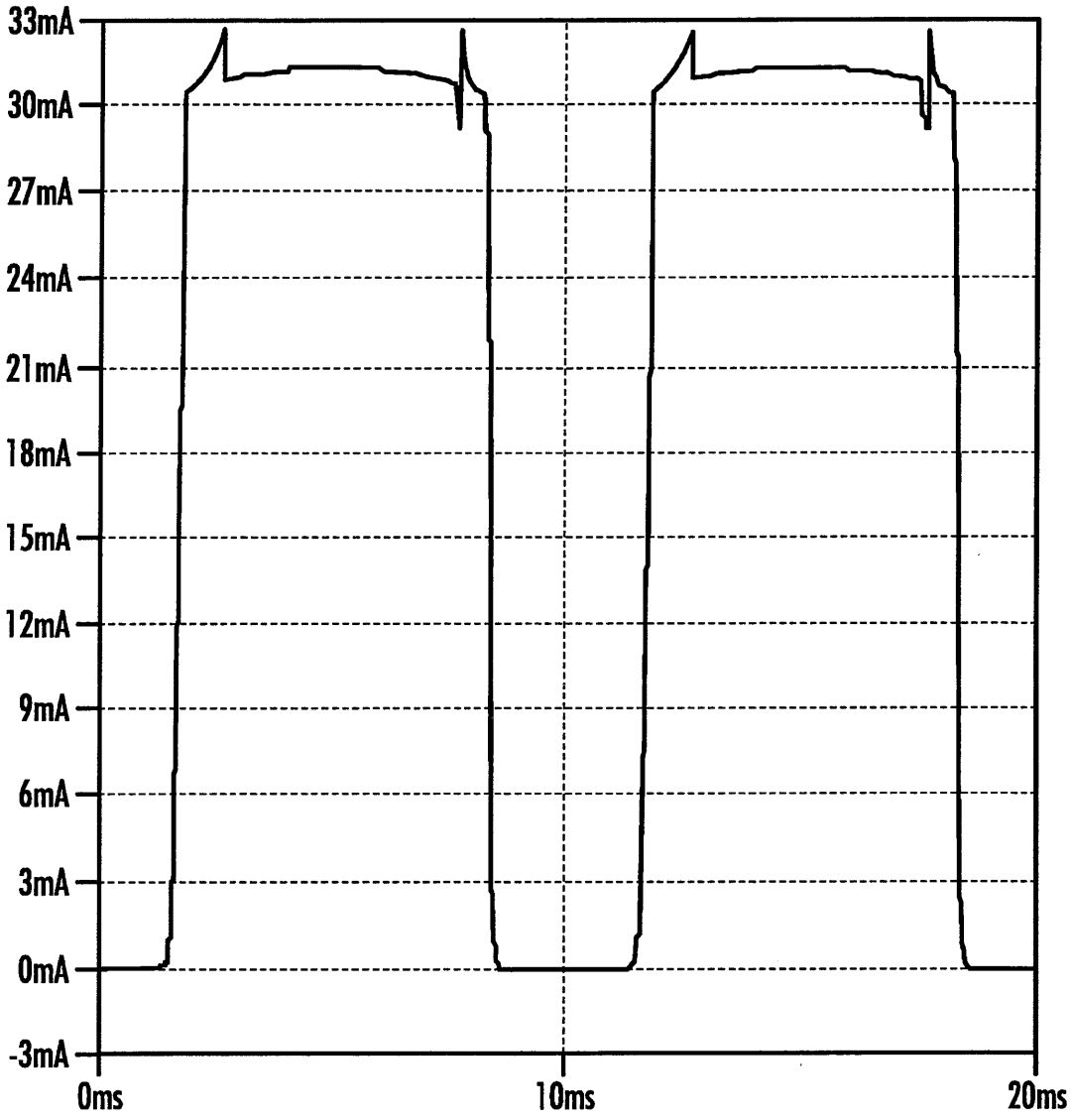
33mA
30mA
27mA
24mA
21mA
18mA
15mA
12mA
9mA
6mA
3mA
0mA
-3mA
0ms
10ms
20ms

FIG. 11

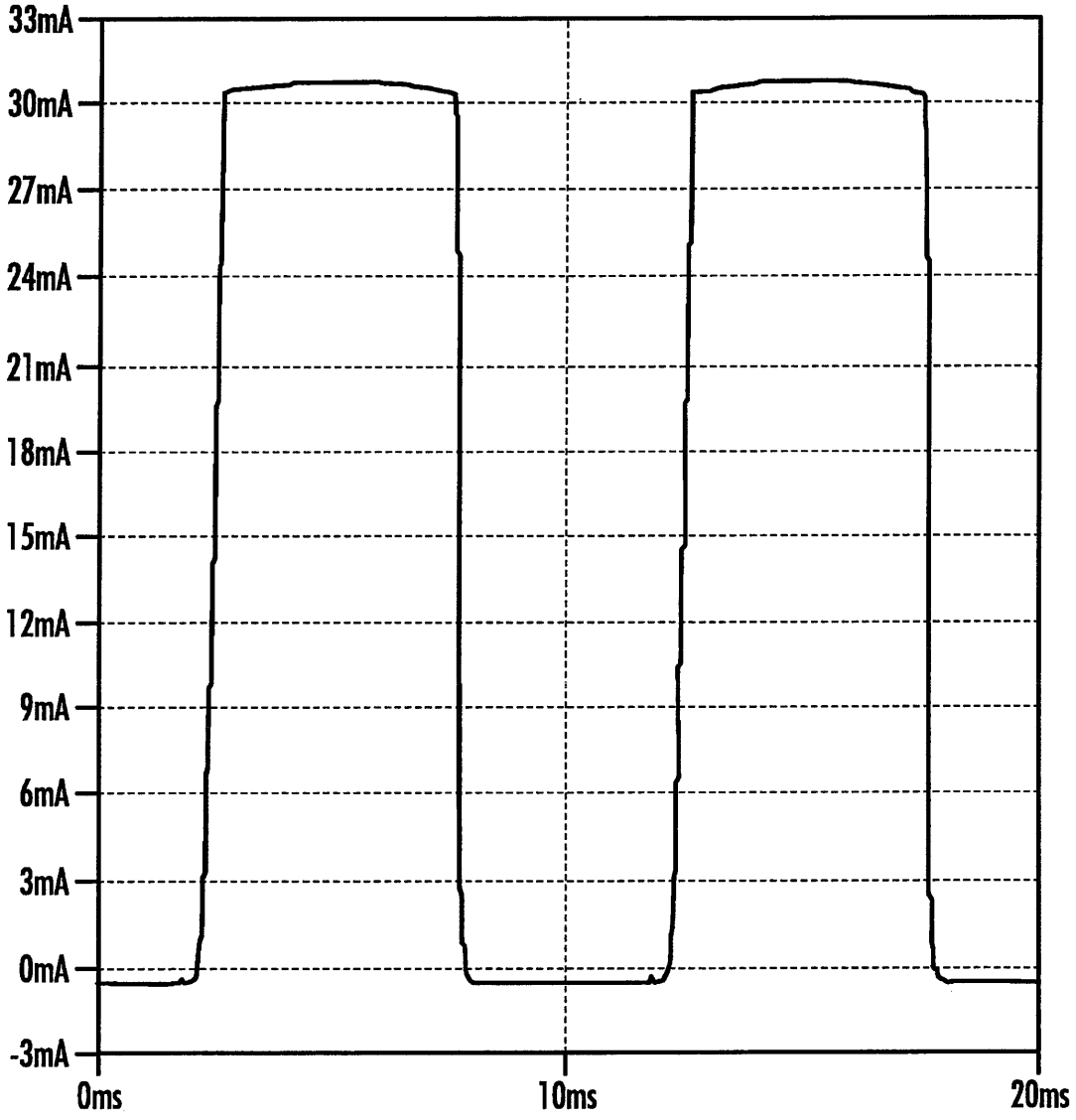
33mA
30mA
27mA
24mA
21mA
18mA
15mA
12mA
9mA
6mA
3mA
0mA
-3mA
0ms
10ms
20ms

FIG. 12

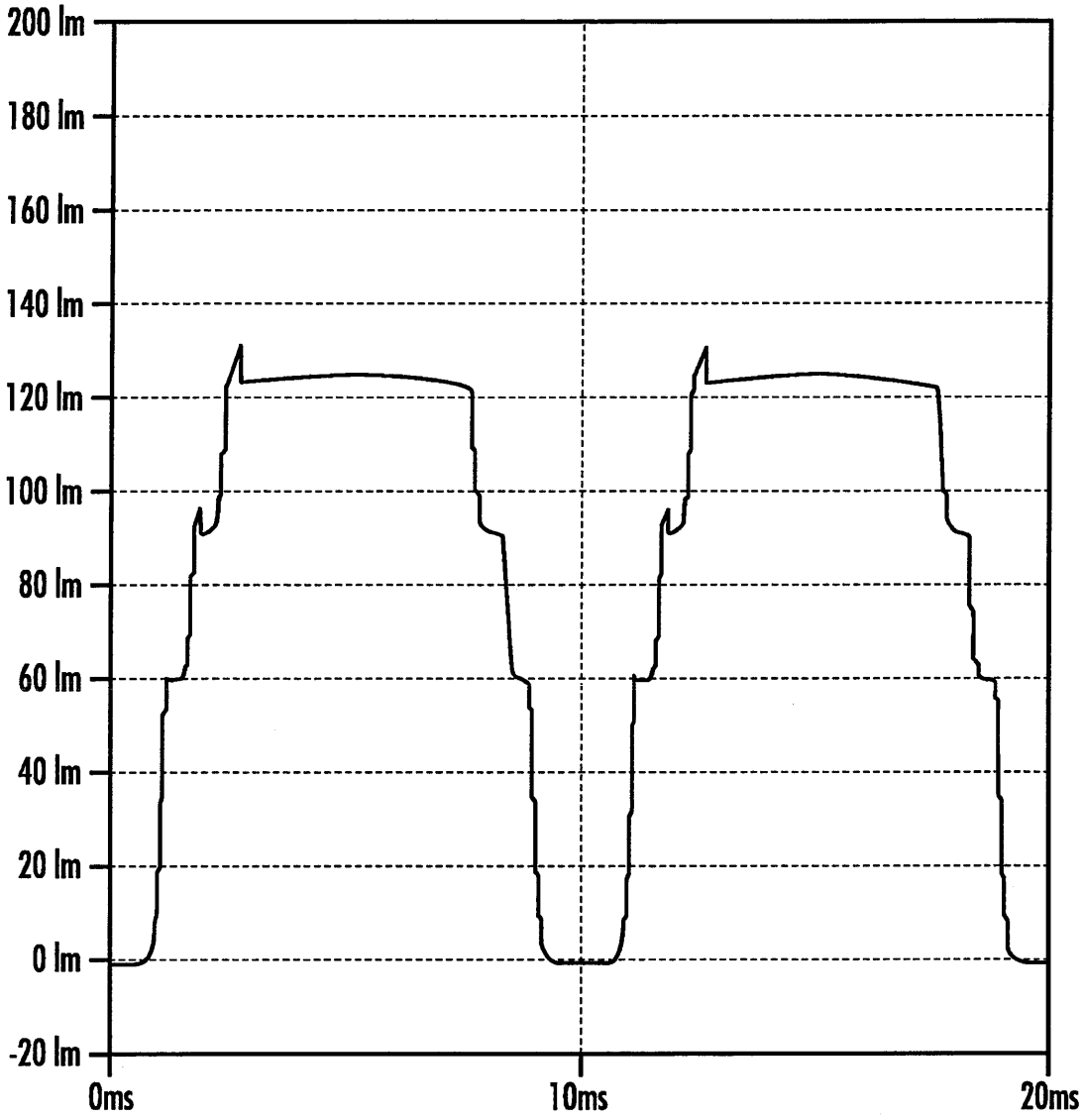
200 lm
180 lm
160 lm
140 lm
120 lm
100 lm
80 lm
60 lm
40 lm
20 lm
0 lm
-20 lm
0ms
10ms
20ms

FIG. 13

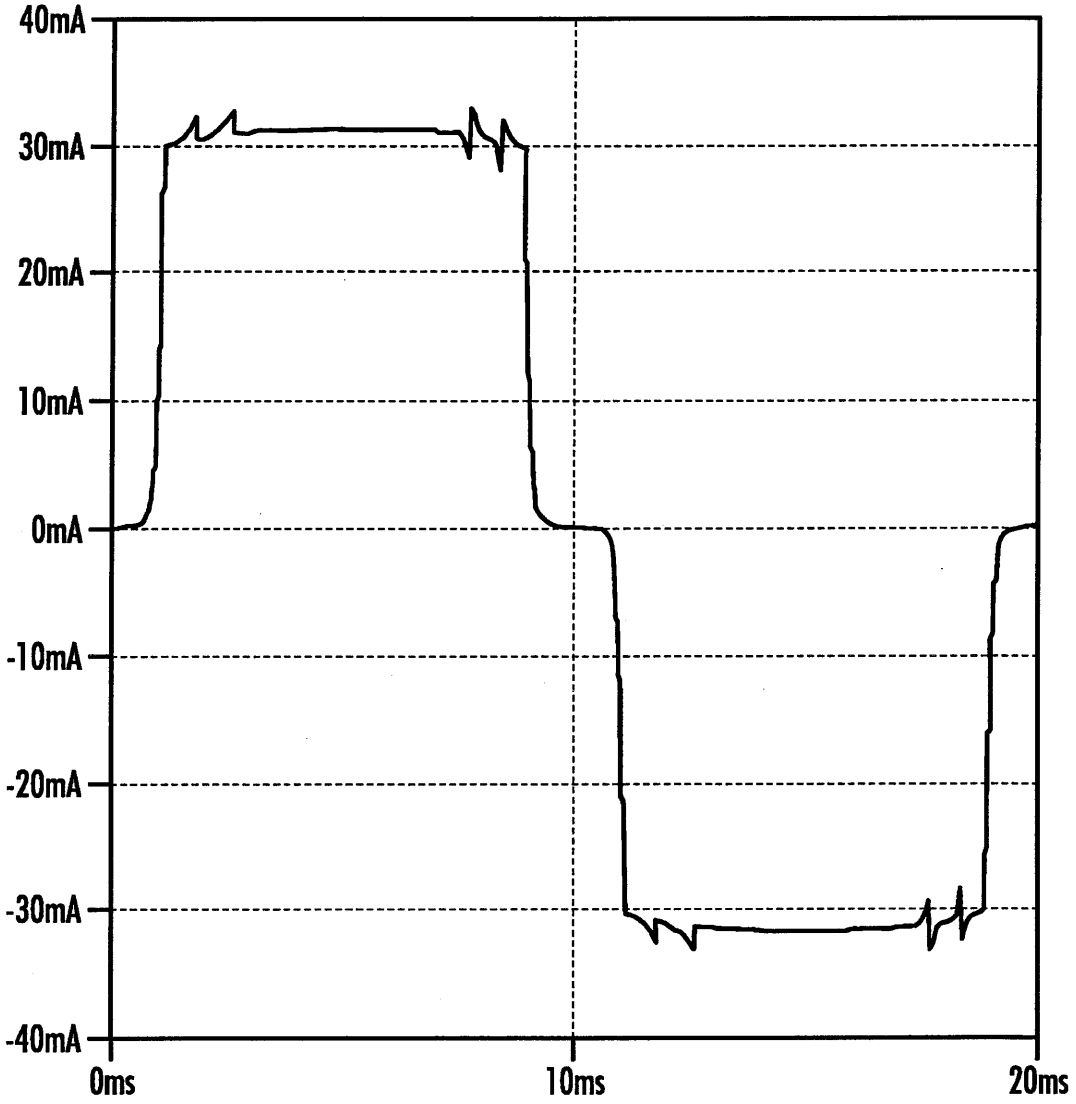

FIG. 14

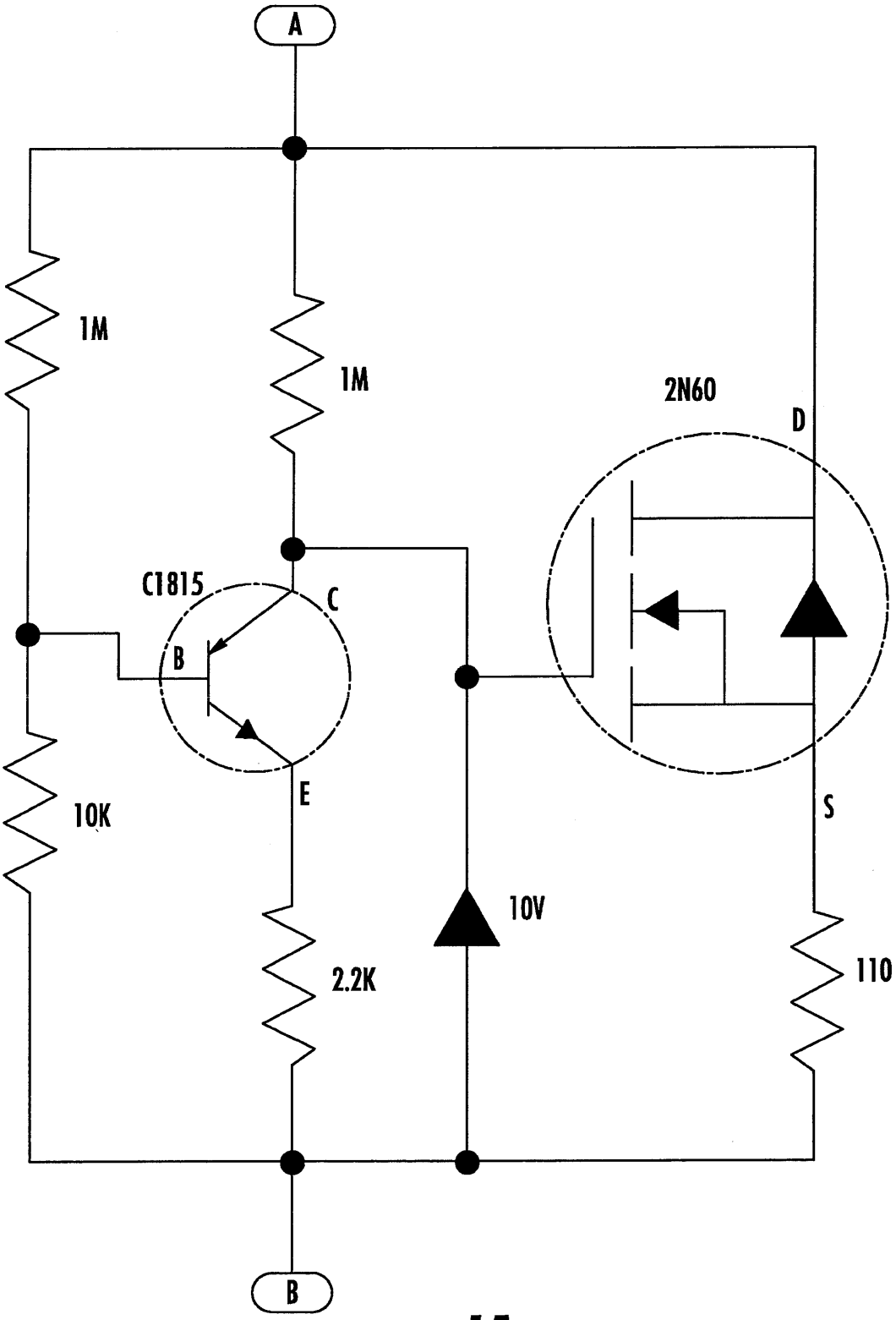

FIG. 15

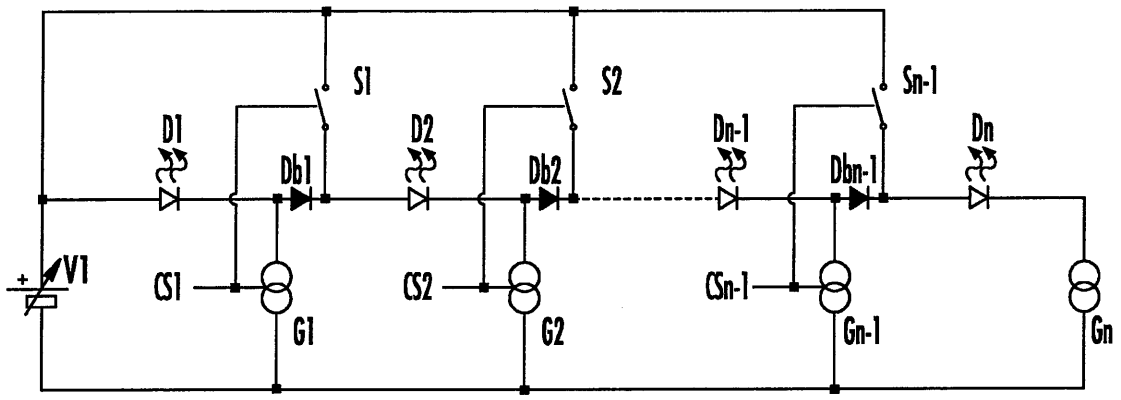
S1
S2
Sn-1
D1
D2
Dn-1
Dn
Db1
Db2
Dbn-1
V1
CS1
CS2
CSn-1
G1
G2
Gn-1
Gn

FIG. 16

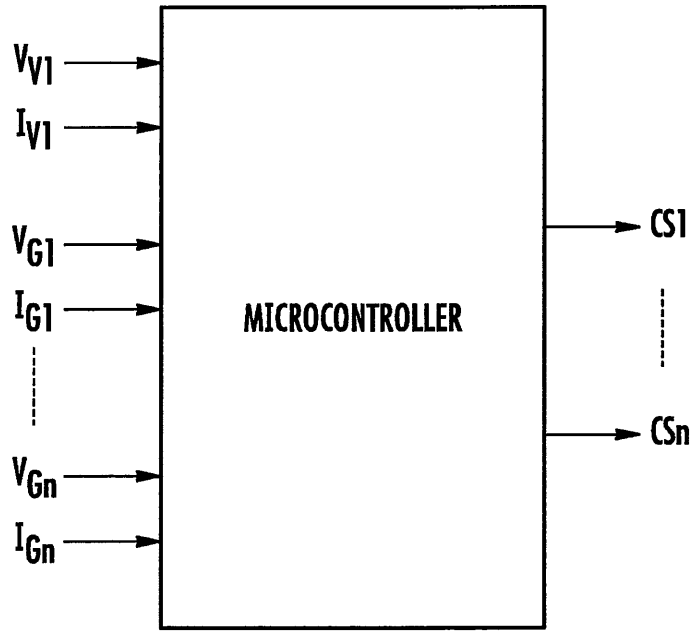
V_{V1}
I_{V1}
V_{G1}
I_{G1}
V_{Gn}
I_{Gn}
MICROCONTROLLER
CS1
CSn

FIG. 17

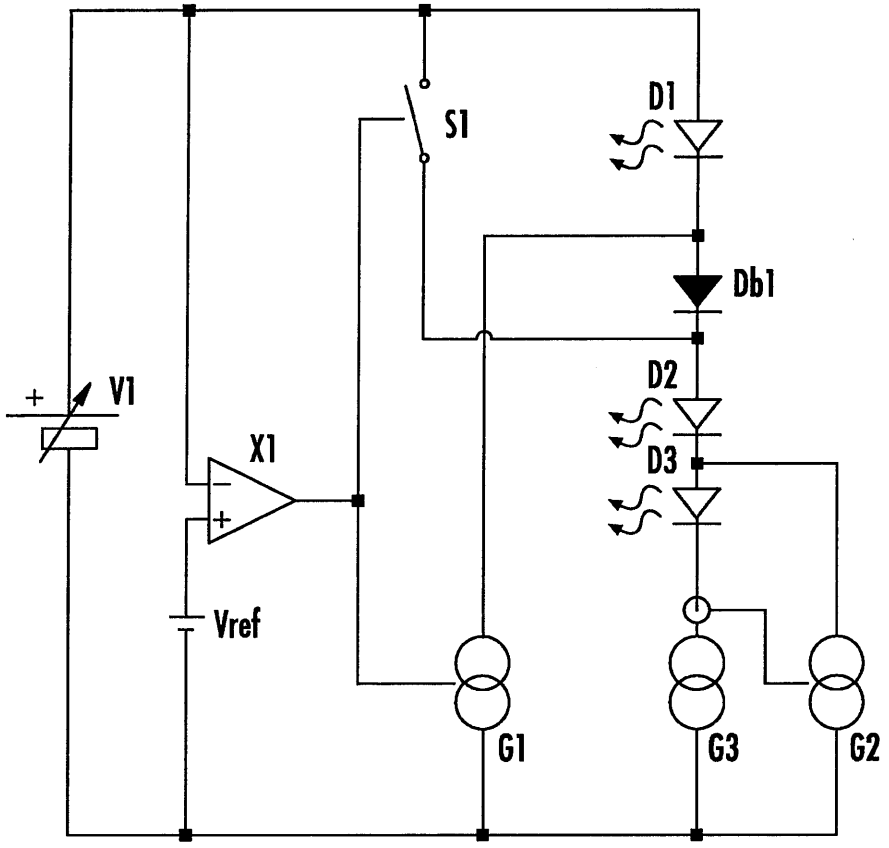

FIG. 18

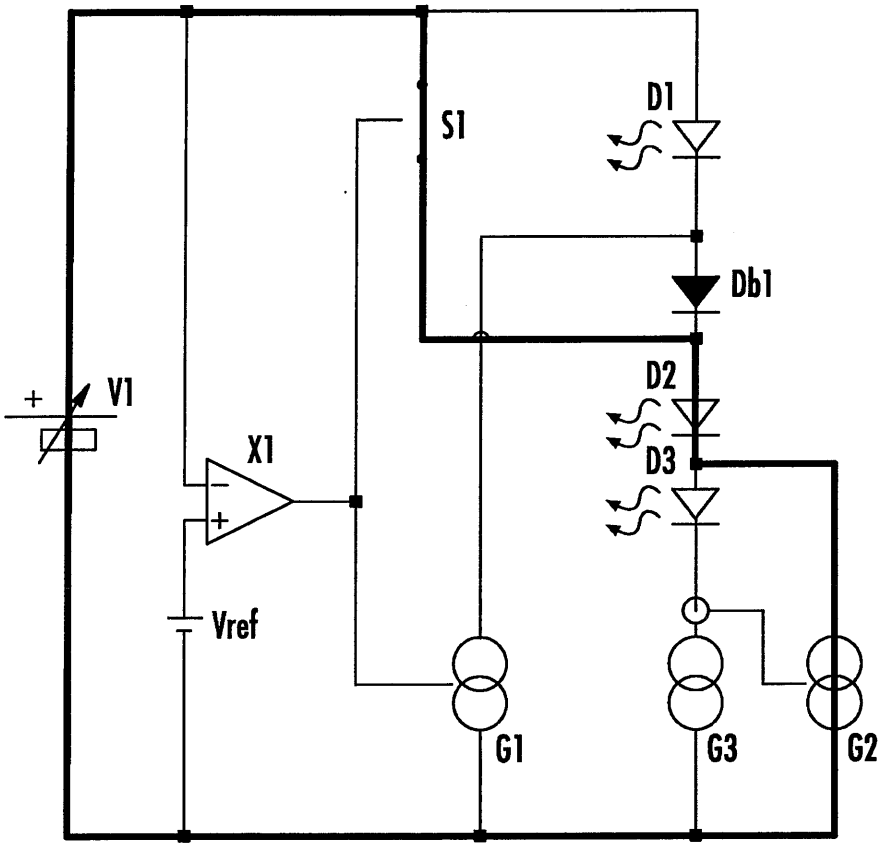

FIG. 19A

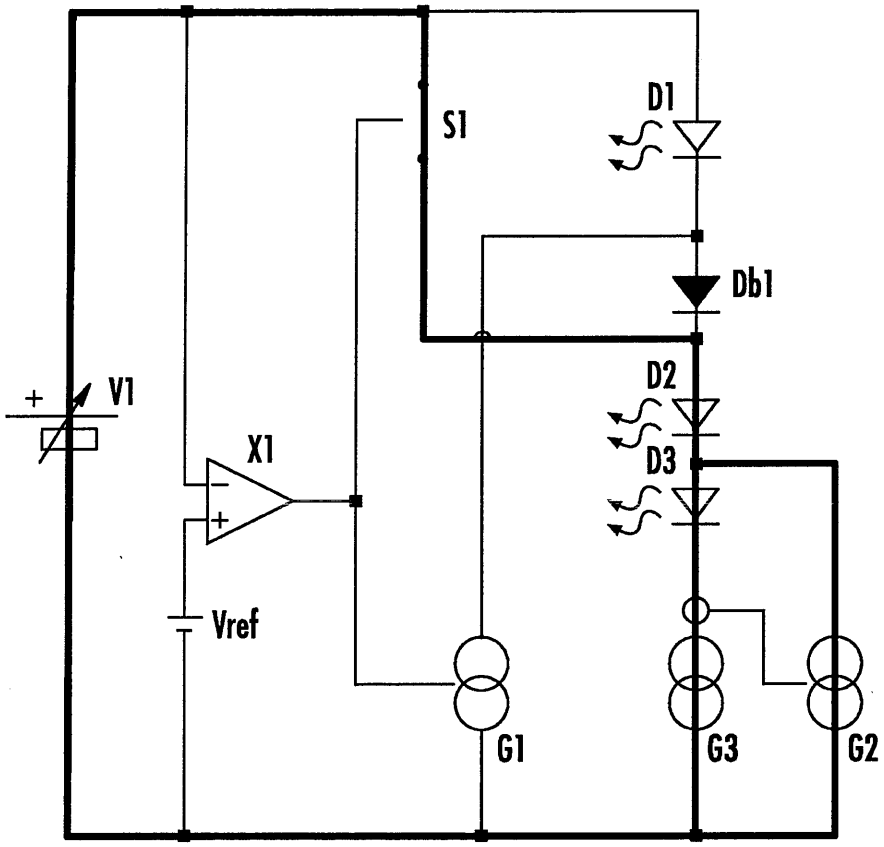

FIG. 19B

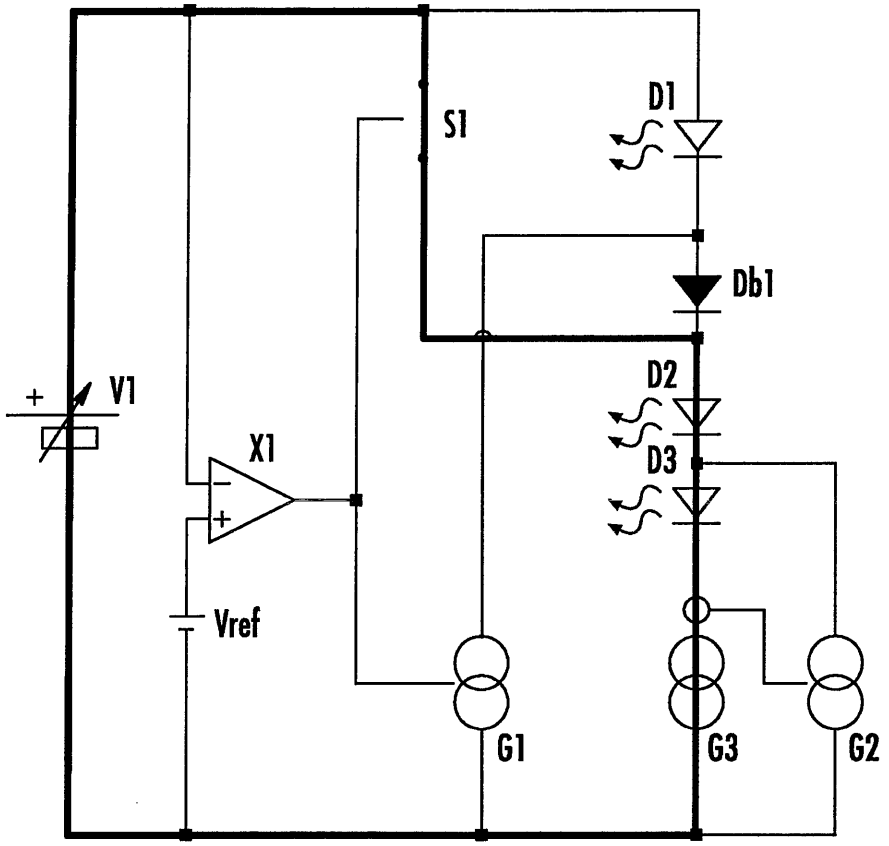

FIG. 19C

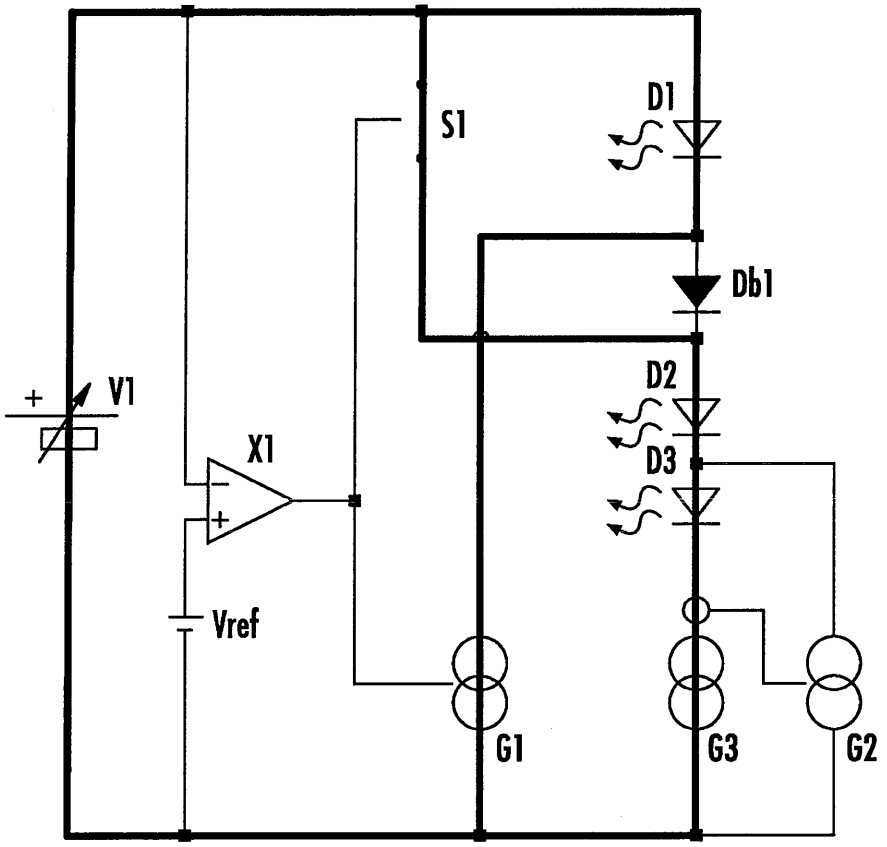

FIG. 19D

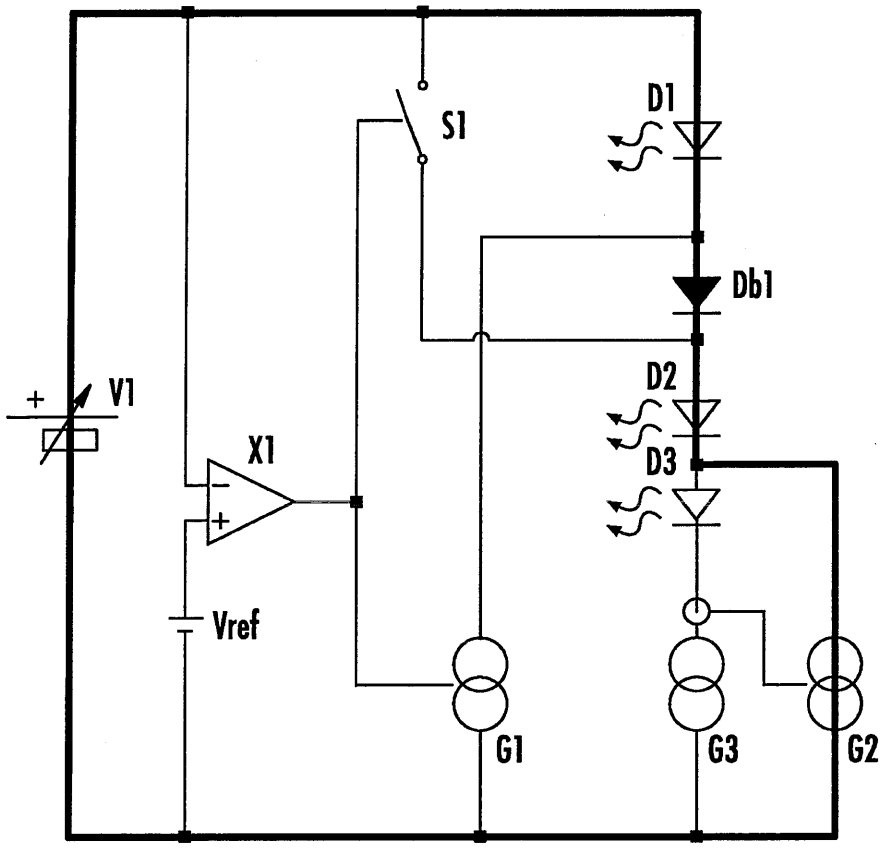

FIG. 19E

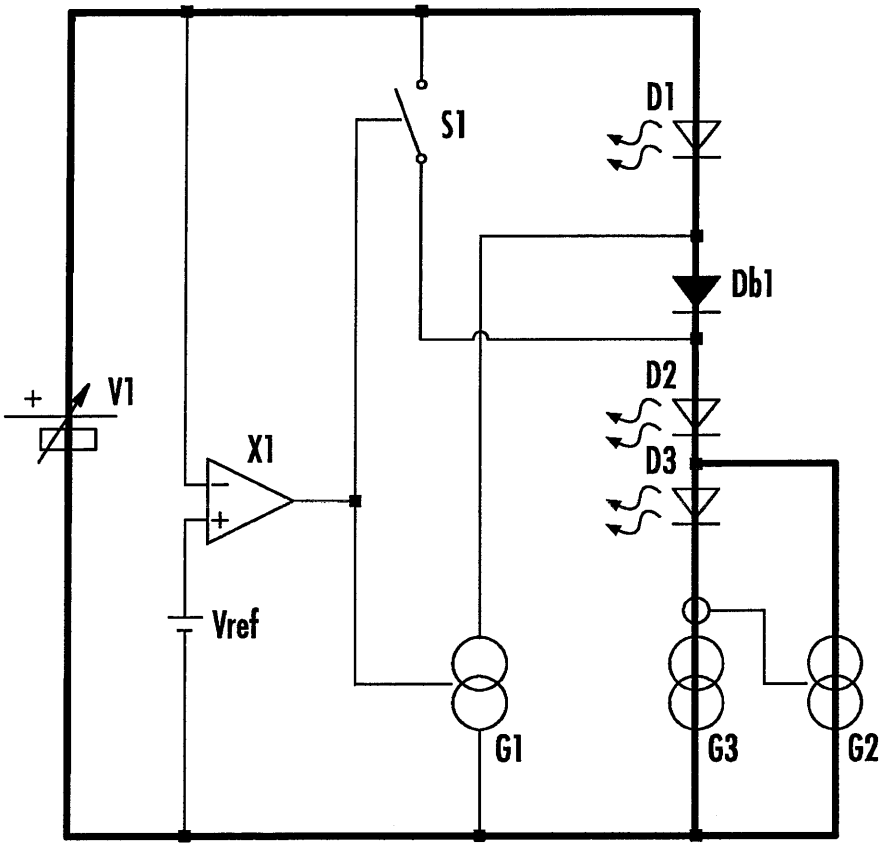

FIG. 19F

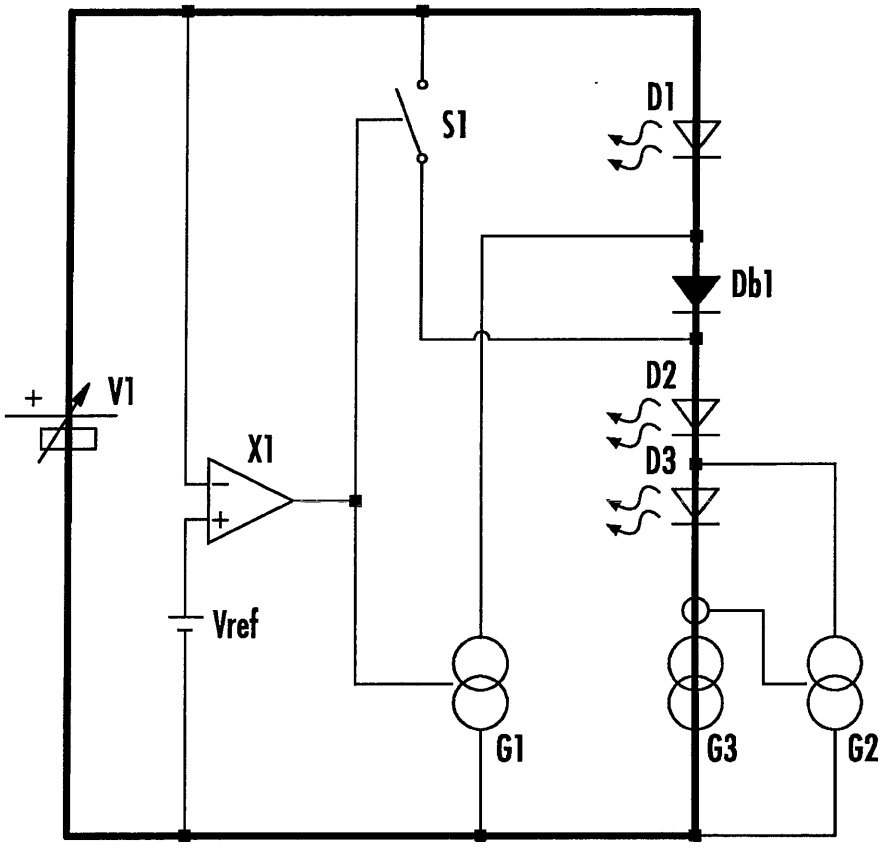

FIG. 19G

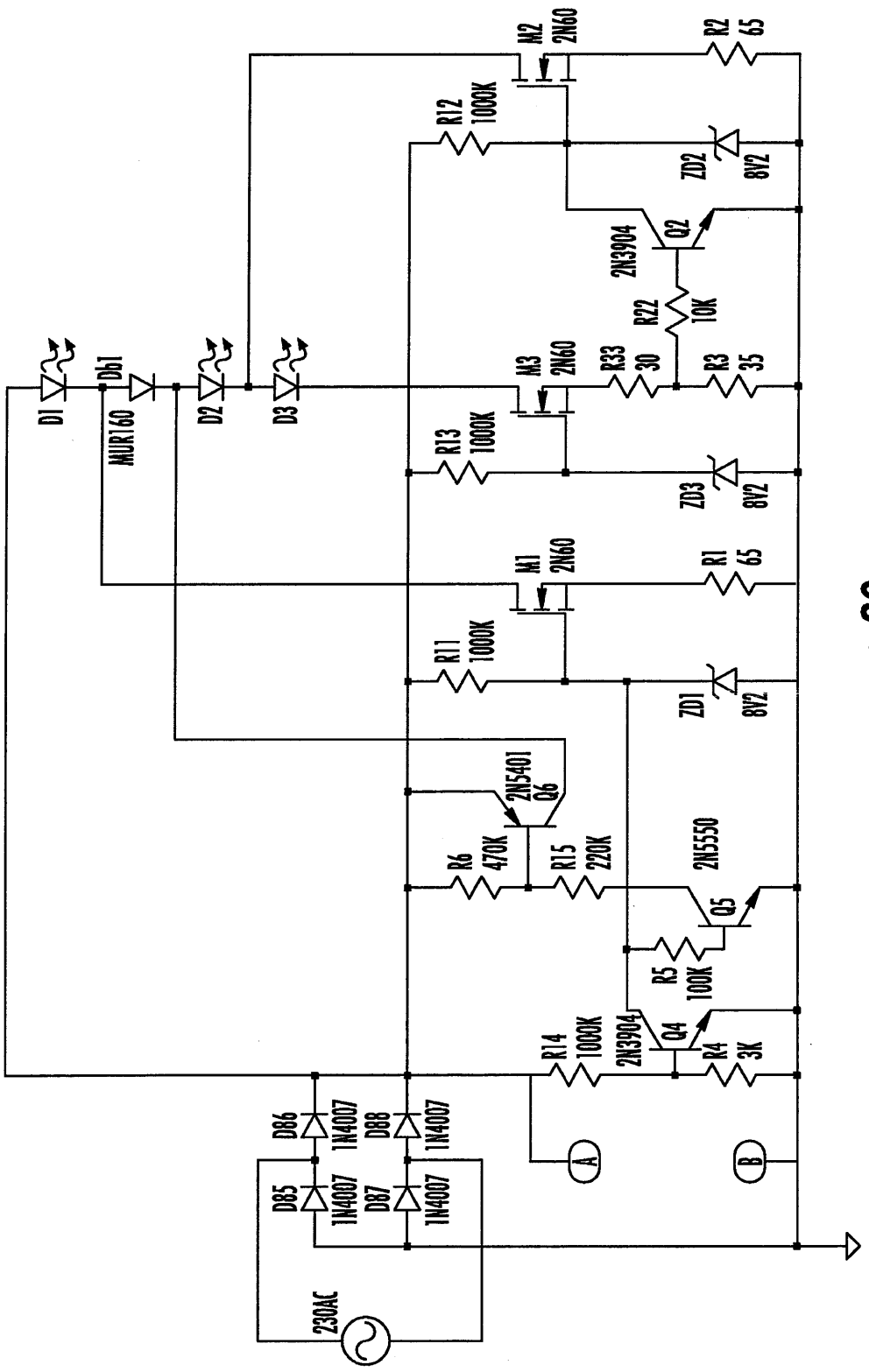
M2 2N60
R2 65
R12 1000K
ZD2 8V2
2N3904 Q2
R22 10K
M3 2N60
R33 30
R3 35
R13 1000K
ZD3 8V2
M1 2N60
R1 65
R11 1000K
ZD1 8V2
D1
Db1
MUR160
D2
D3
2N5401 Q6
R6 470K
R15 220K
2N5550 Q5
R5 100K
R14 1000K
2N3904 Q4
R4 3K
D86 1N4007
D88 1N4007
D85 1N4007
D87 1N4007
230AC
A
B

FIG. 20

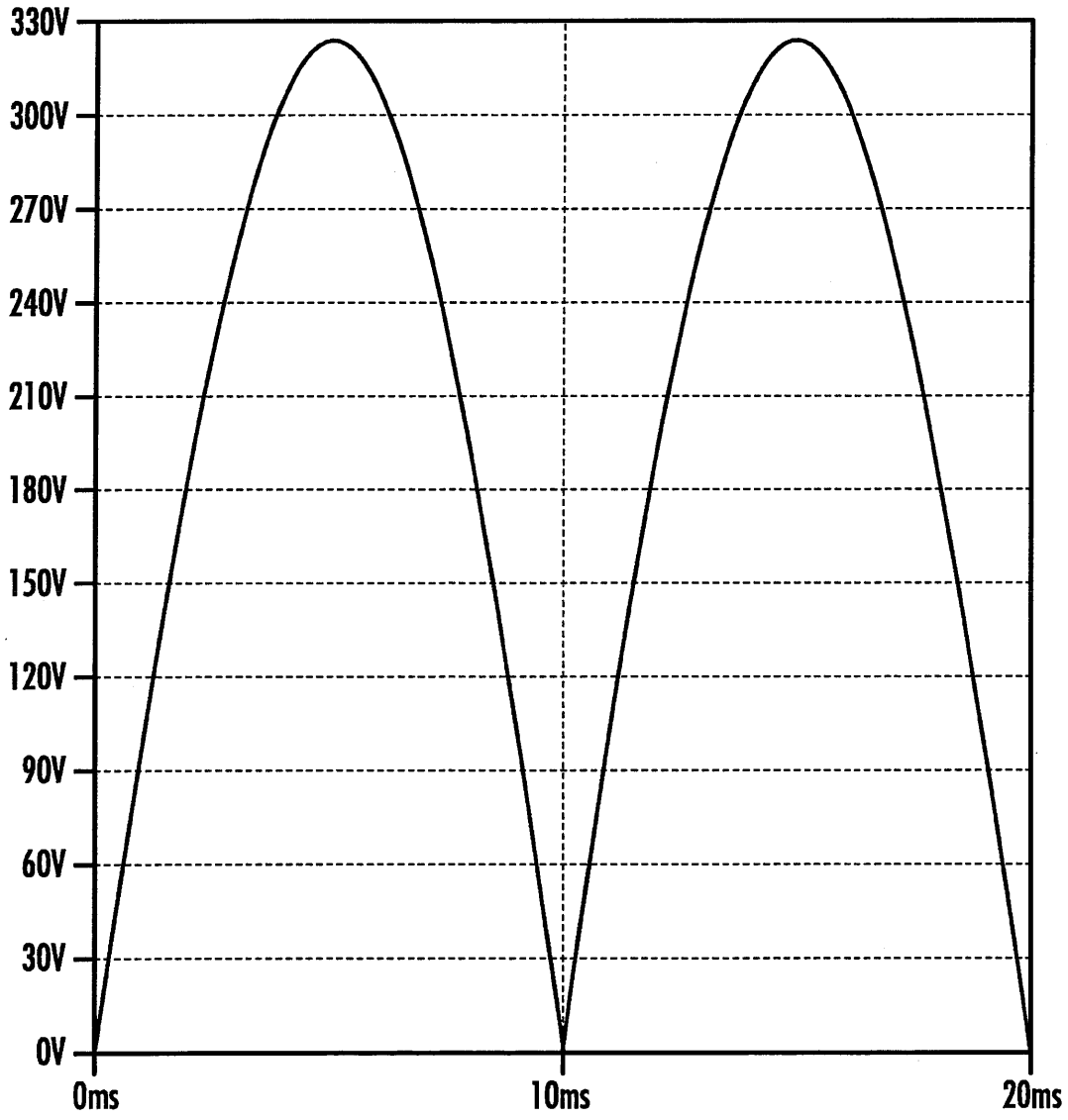
330V
300V
270V
240V
210V
180V
150V
120V
90V
60V
30V
0V
0ms
10ms
20ms

FIG. 21

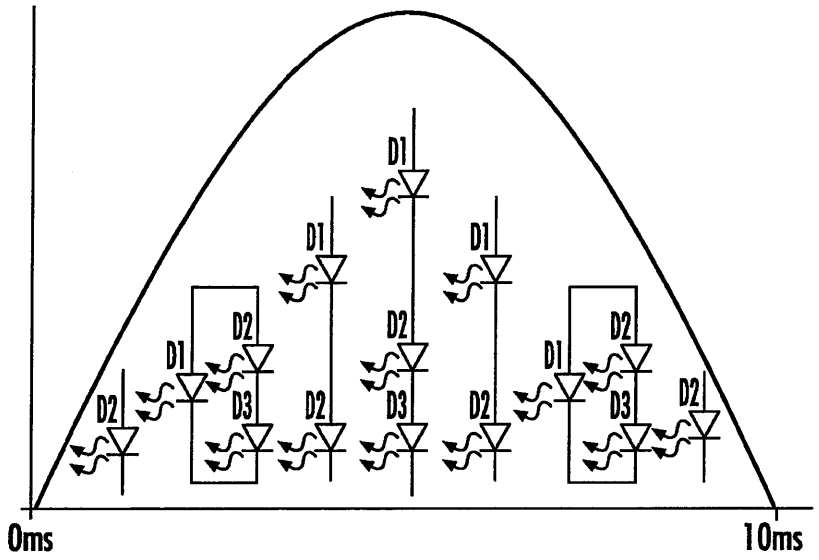
D1
D2
D3
0ms
10ms

FIG. 22

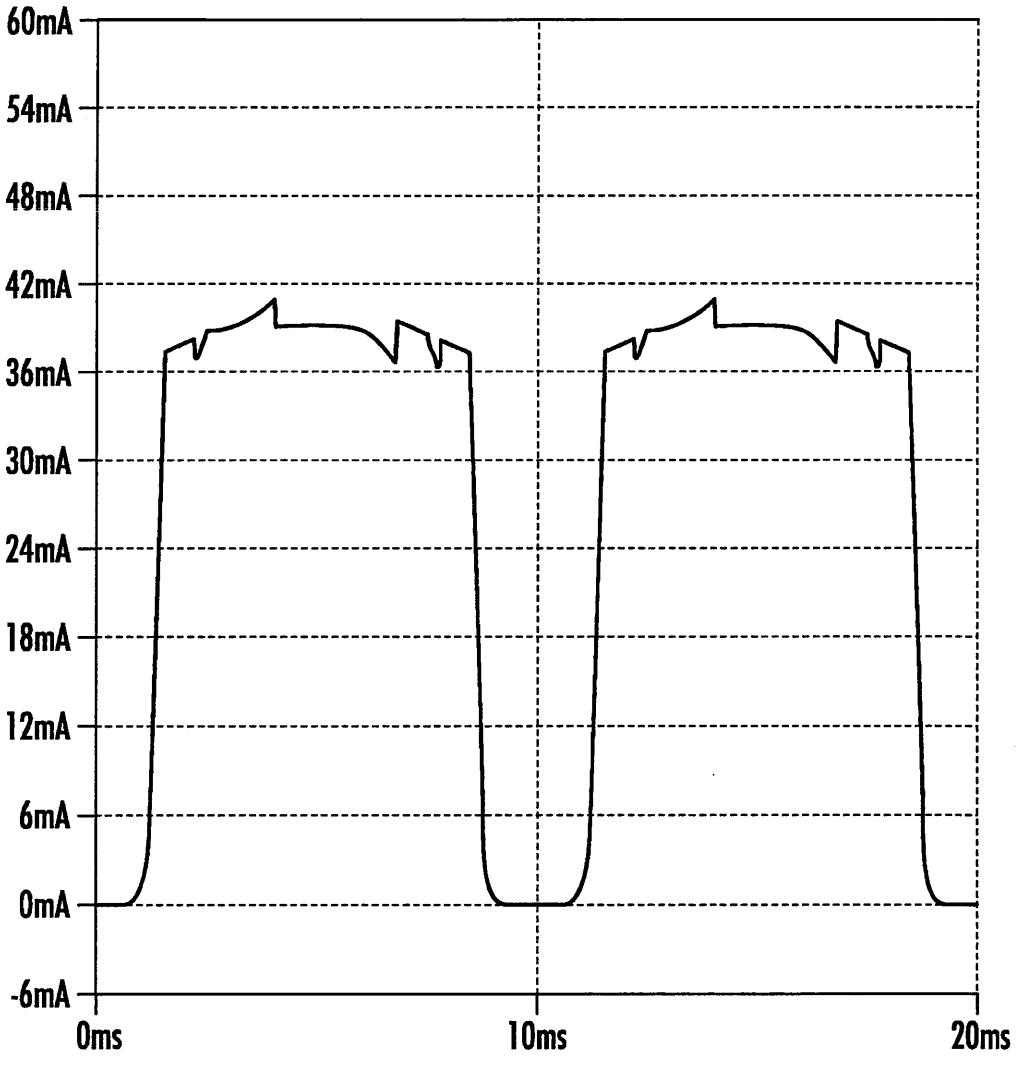
60mA
54mA
48mA
42mA
36mA
30mA
24mA
18mA
12mA
6mA
0mA
-6mA
0ms
10ms
20ms

FIG. 23

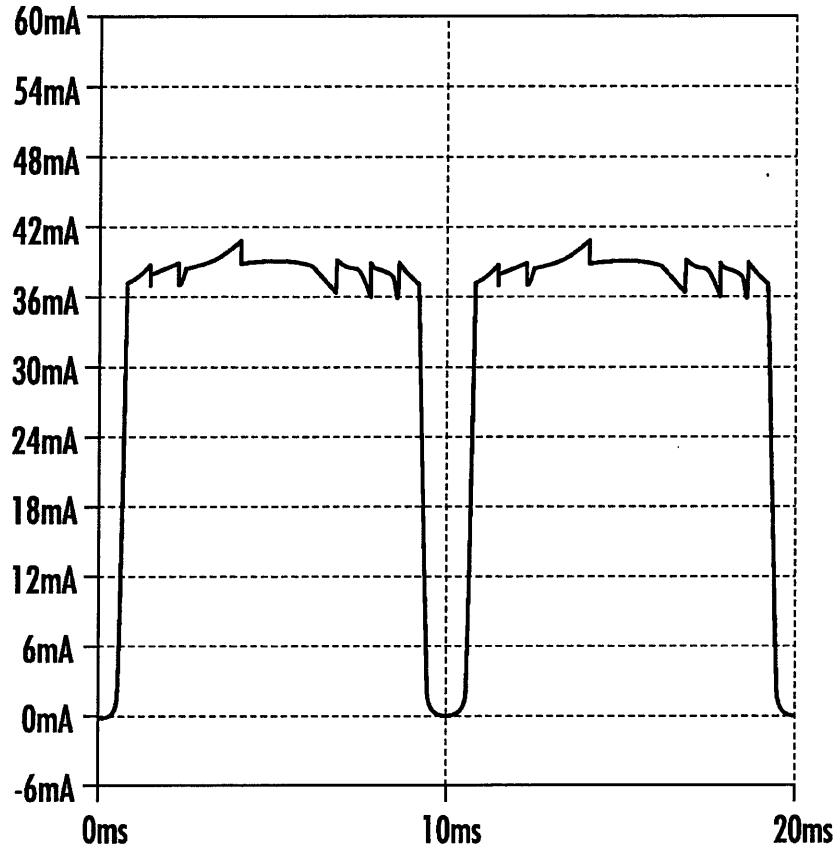
60mA
54mA
48mA
42mA
36mA
30mA
24mA
18mA
12mA
6mA
0mA
-6mA
0ms
10ms
20ms

FIG. 24

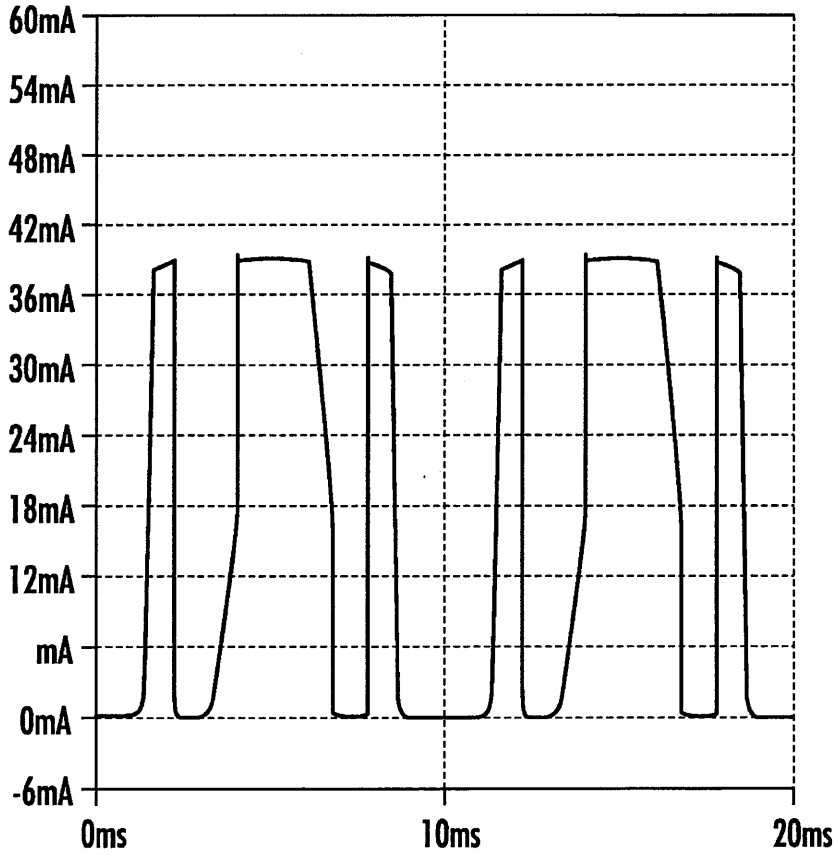
60mA
54mA
48mA
42mA
36mA
30mA
24mA
18mA
12mA
mA
0mA
-6mA
0ms
10ms
20ms

FIG. 25

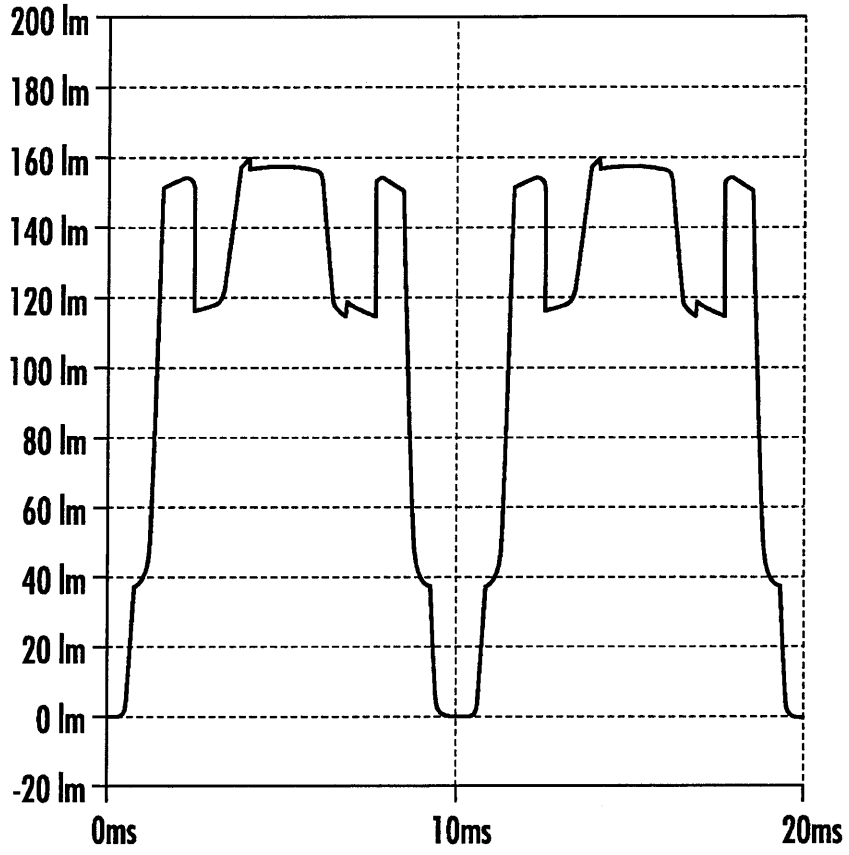
200 lm
180 lm
160 lm
140 lm
120 lm
100 lm
80 lm
60 lm
40 lm
20 lm
0 lm
-20 lm
0ms
10ms
20ms

FIG. 26

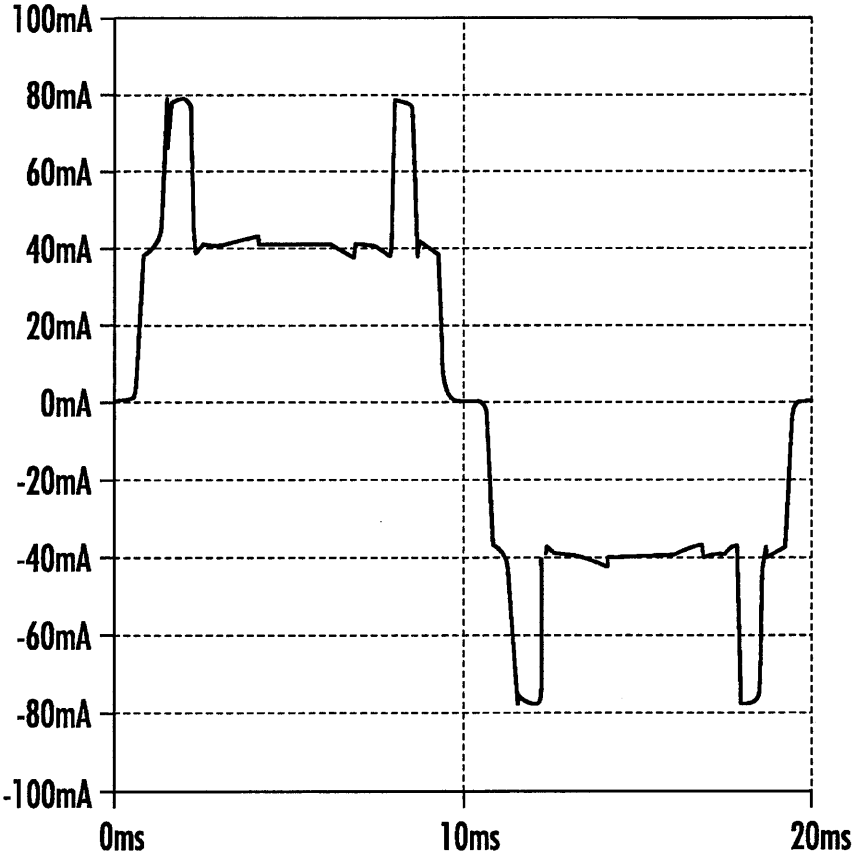
100mA
80mA
60mA
40mA
20mA
0mA
-20mA
-40mA
-60mA
-80mA
-100mA
0ms
10ms
20ms

FIG. 27

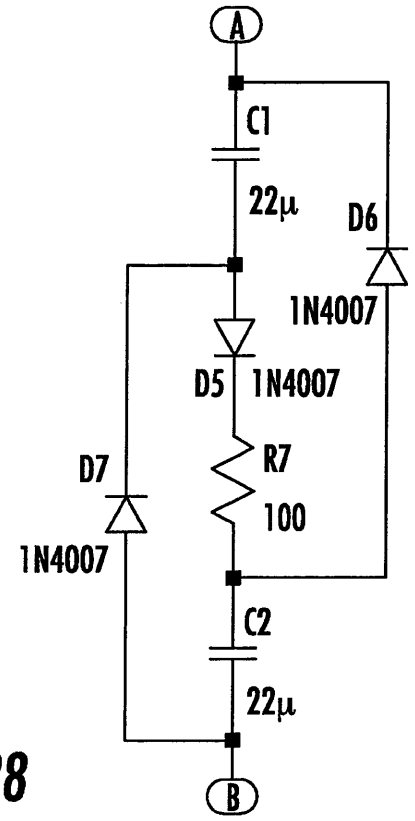
A
C1
22µ
D6
1N4007
D5
1N4007
R7
100
D7
1N4007
C2
22µ
B

FIG. 28

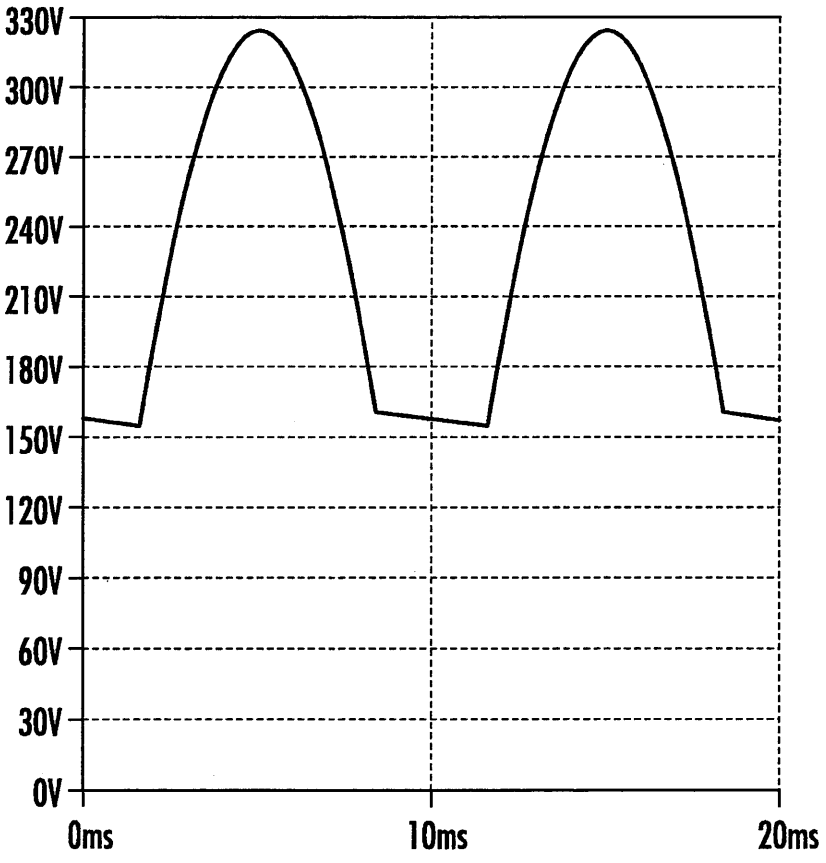
330V
300V
270V
240V
210V
180V
150V
120V
90V
60V
30V
0V
0ms
10ms
20ms

FIG. 29

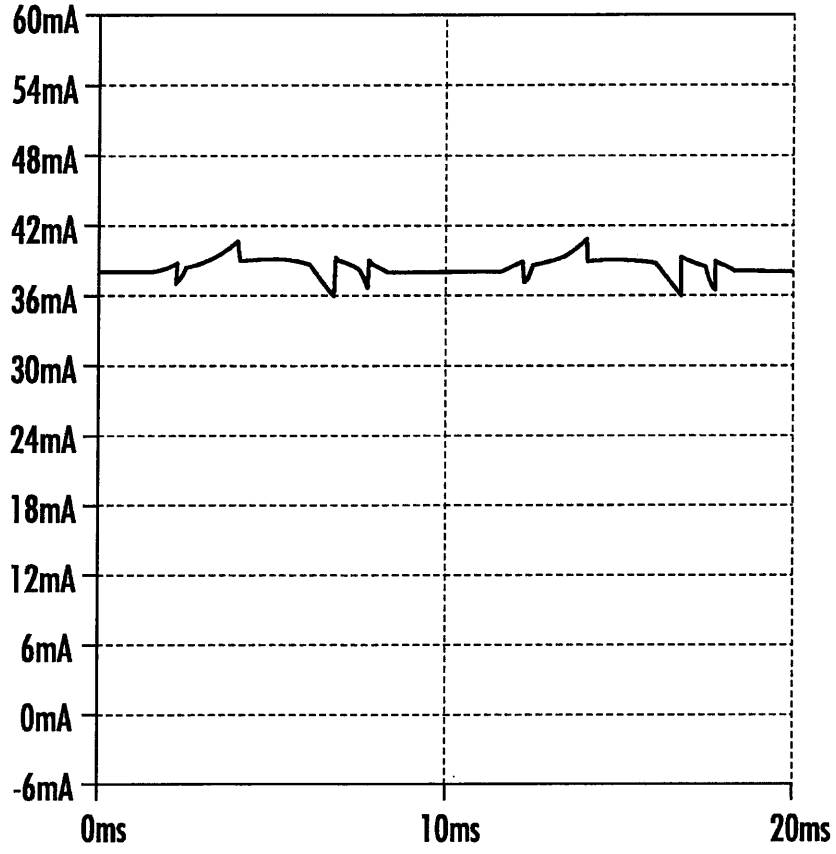
60mA
54mA
48mA
42mA
36mA
30mA
24mA
18mA
12mA
6mA
0mA
-6mA
0ms
10ms
20ms

FIG. 30

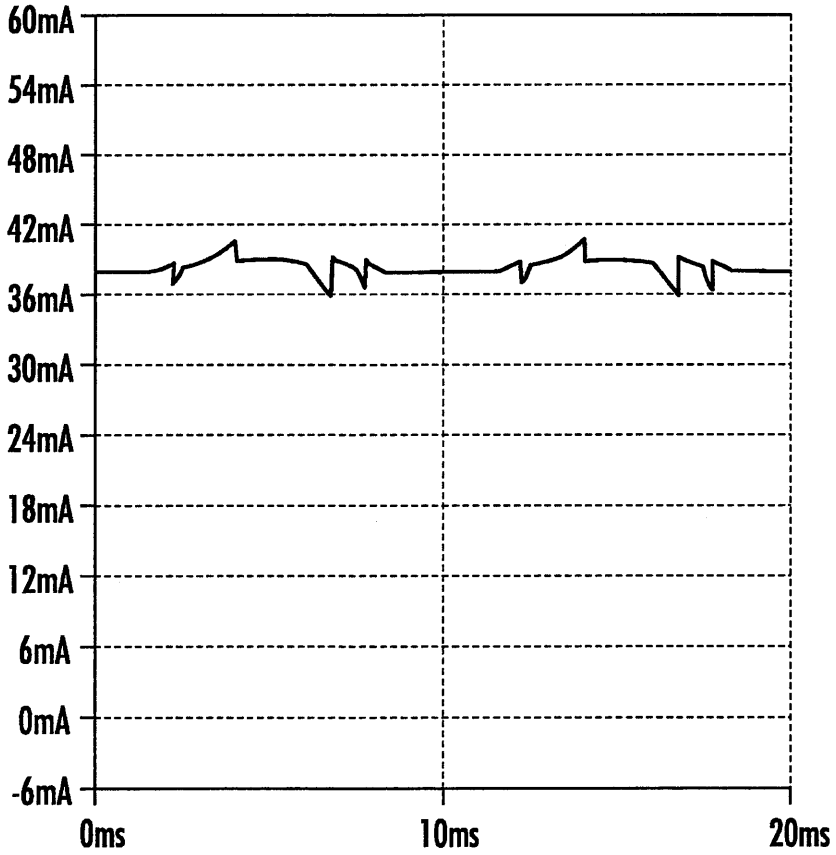
60mA
54mA
48mA
42mA
36mA
30mA
24mA
18mA
12mA
6mA
0mA
-6mA
0ms
10ms
20ms

FIG. 31

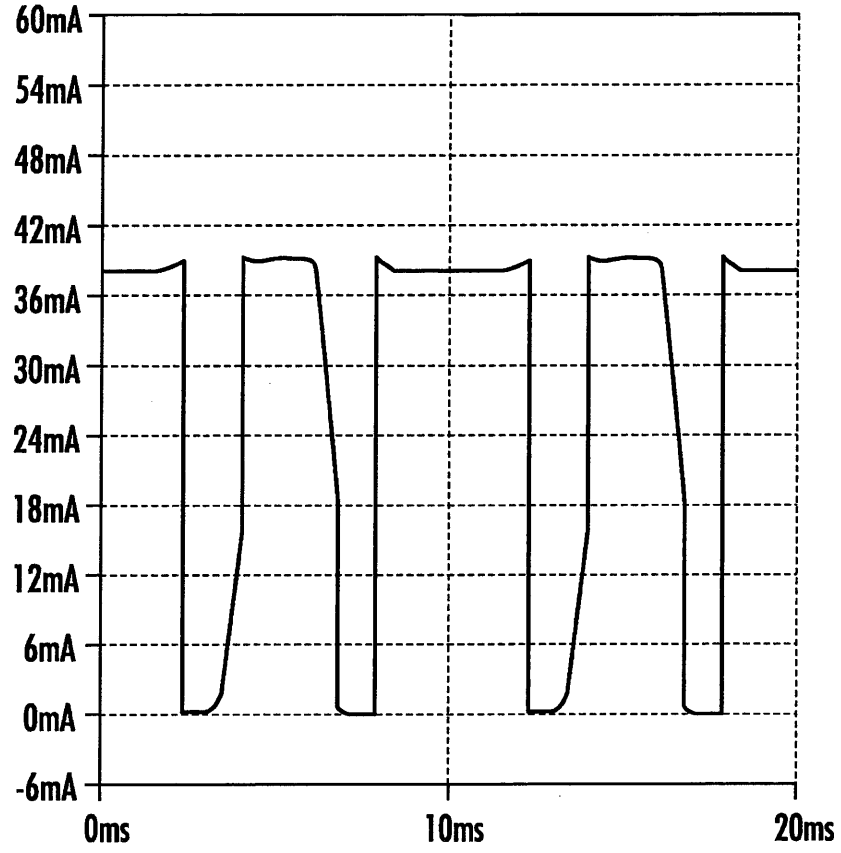
60mA
54mA
48mA
42mA
36mA
30mA
24mA
18mA
12mA
6mA
0mA
-6mA
0ms
10ms
20ms

FIG. 32

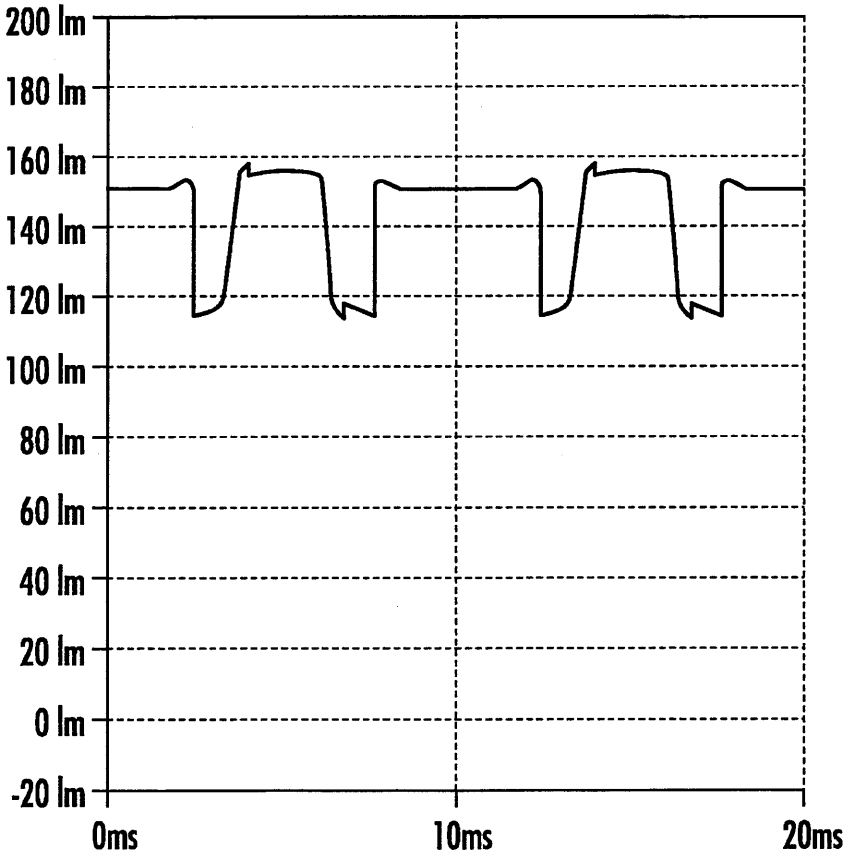
200 lm
180 lm
160 lm
140 lm
120 lm
100 lm
80 lm
60 lm
40 lm
20 lm
0 lm
-20 lm
0ms
10ms
20ms

FIG. 33

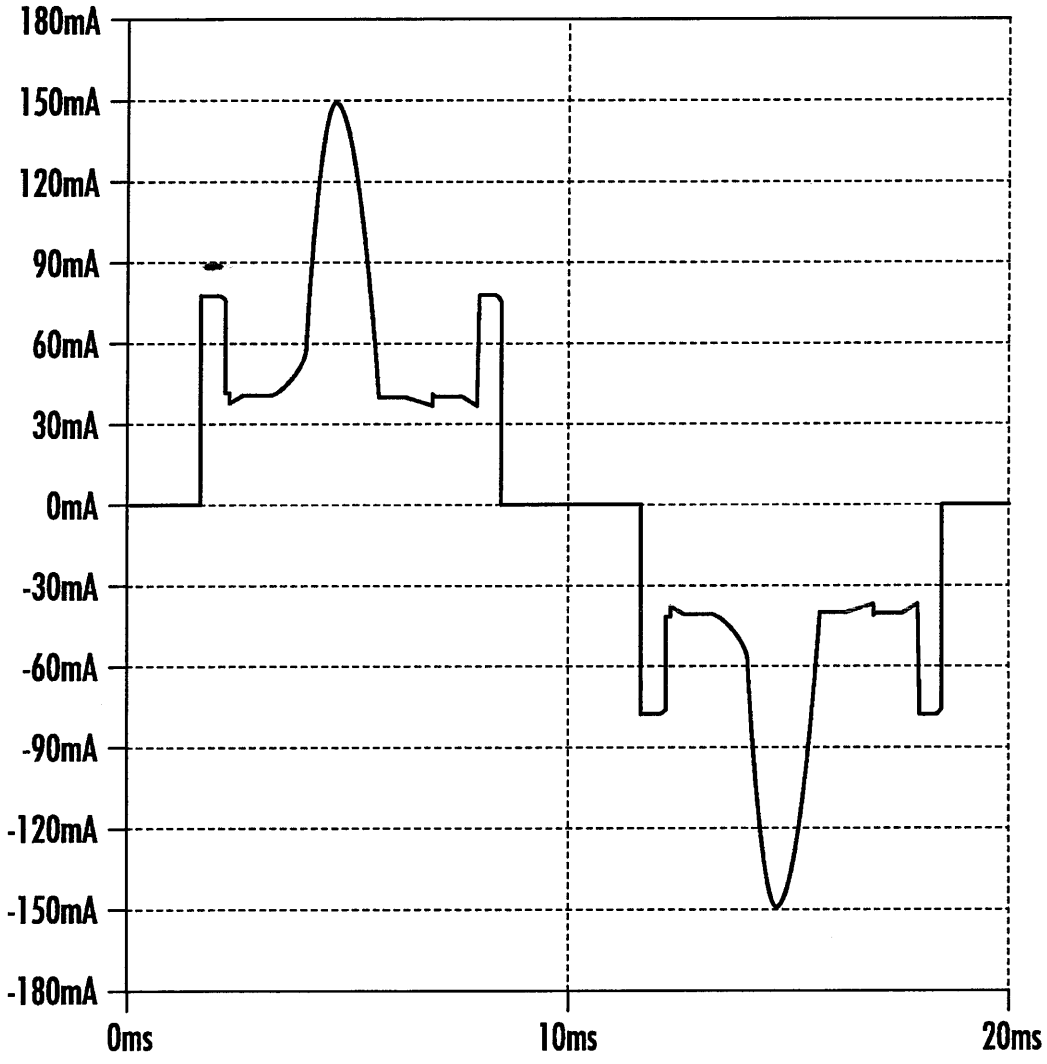
180mA
150mA
120mA
90mA
60mA
30mA
0mA
-30mA
-60mA
-90mA
-120mA
-150mA
-180mA
0ms
10ms
20ms

FIG. 34