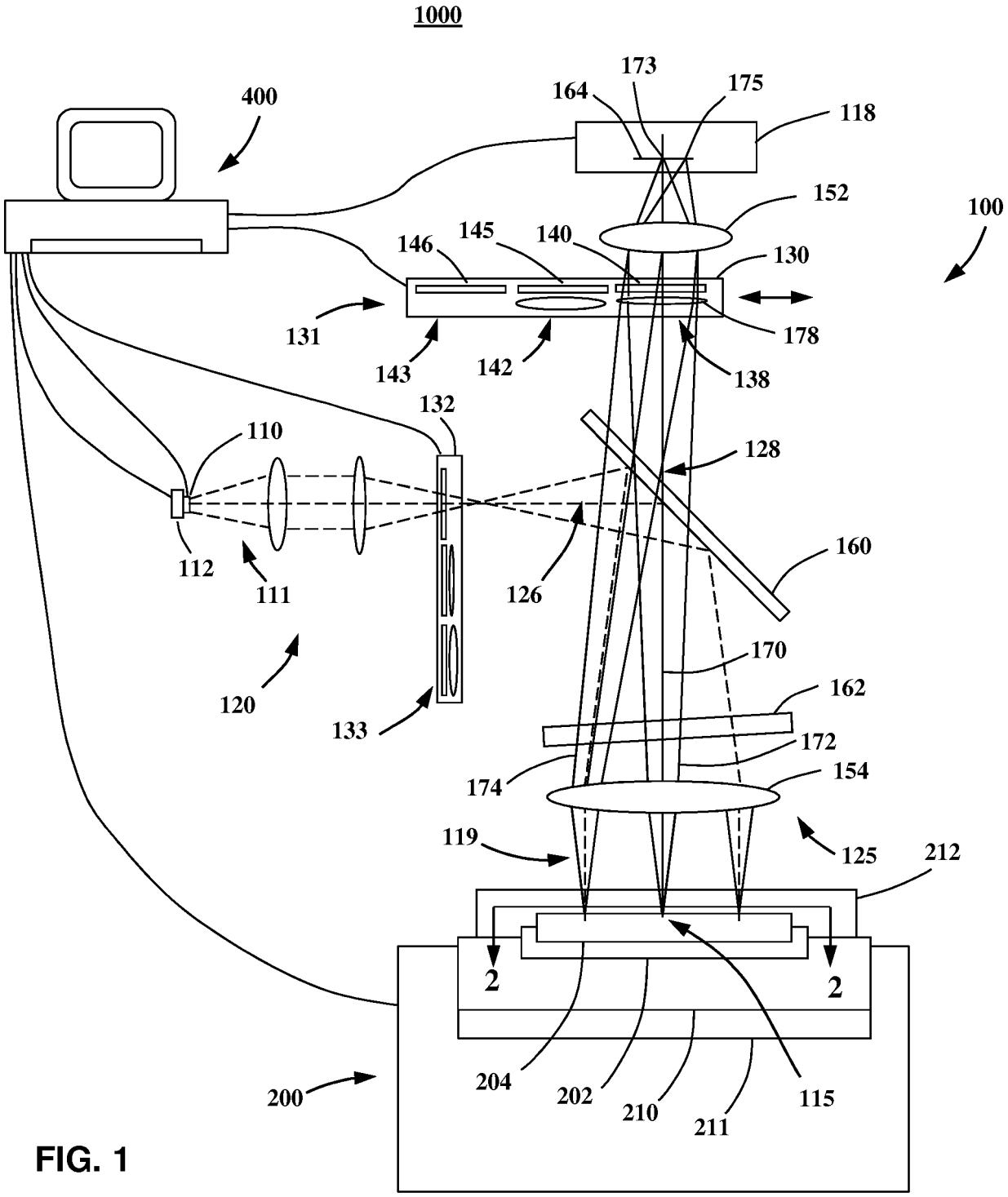
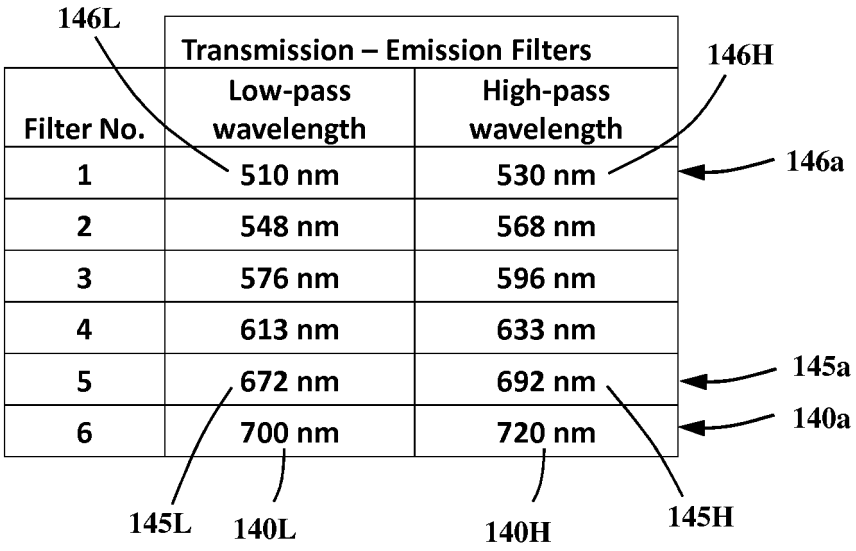

1000
400
173
164
175
118
152
100
146
145
140
130
131
178
143
142
138
132
110
128
112
111
126
160
120
170
133
162
172
174
154
119
125
212
2
2
204
202
210
211
115
200

FIG. 1



	Transmission – Emission Filters	
Filter No.	Low-pass wavelength	High-pass wavelength
1	510 nm	530 nm
2	548 nm	568 nm
3	576 nm	596 nm
4	613 nm	633 nm
5	672 nm	692 nm
6	700 nm	720 nm

FIG. 2

	Transmission – Excitation Filters	
Filter No.	Low-pass wavelength	High-pass wavelength
1	460 nm	480 nm
2	510 nm	530 nm
3	540 nm	560 nm
4	570 nm	590 nm
5	630 nm	650 nm
6	652 nm	672 nm

FIG. 3

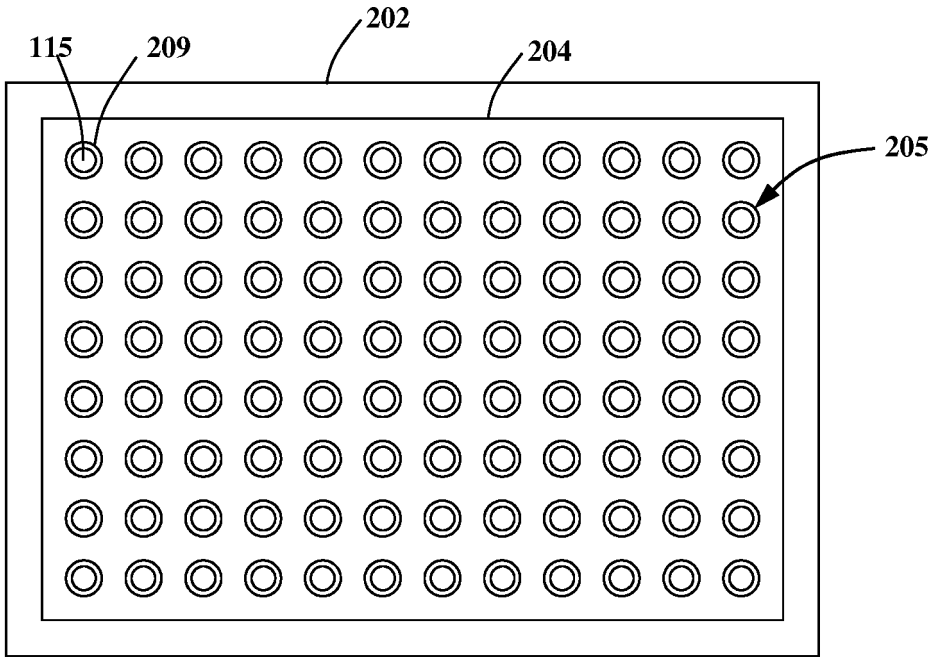


FIG. 4

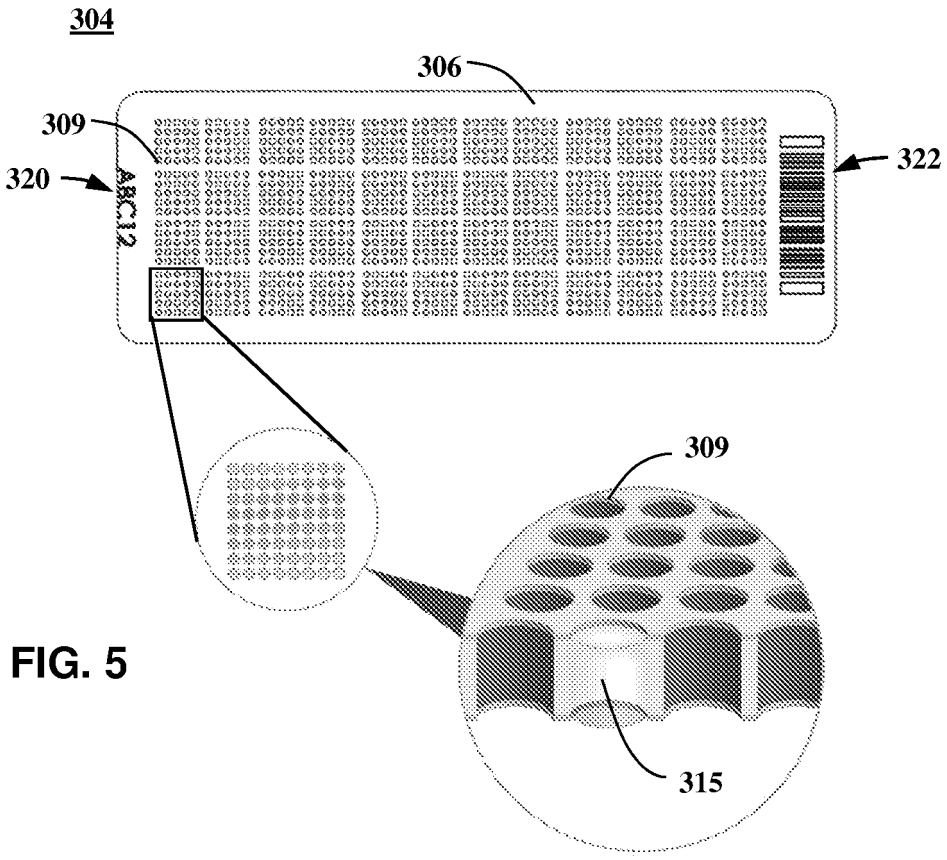


FIG. 5

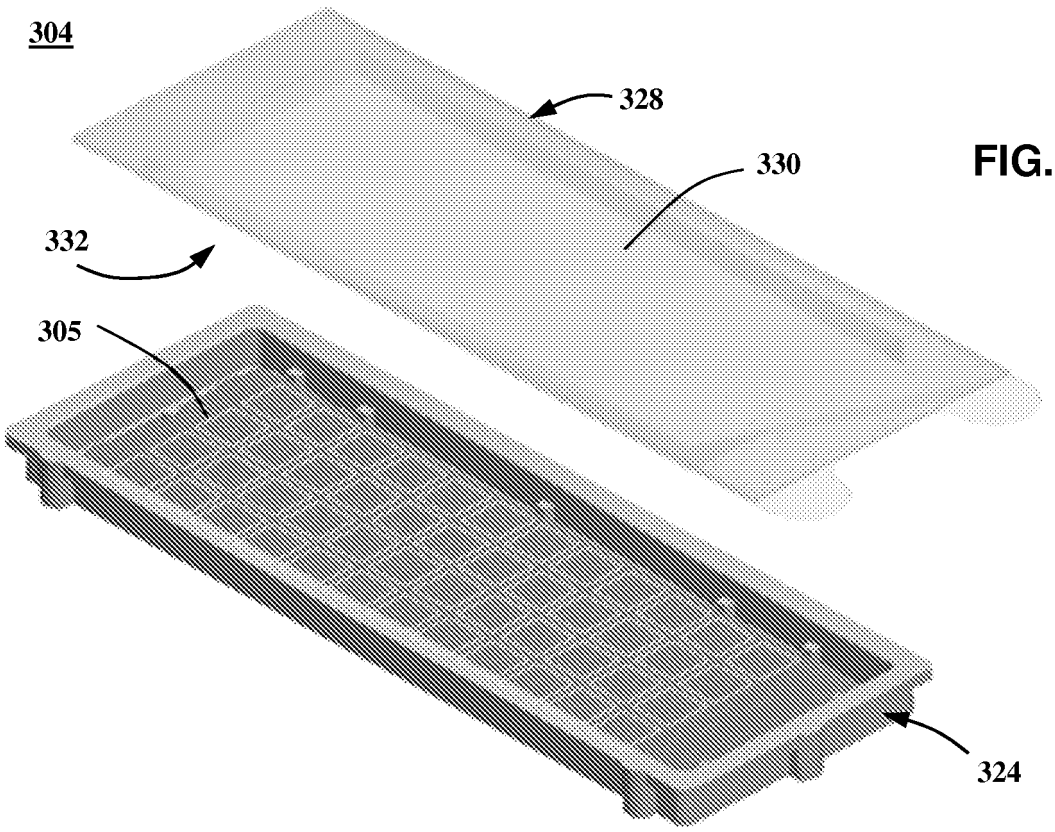


FIG. 6

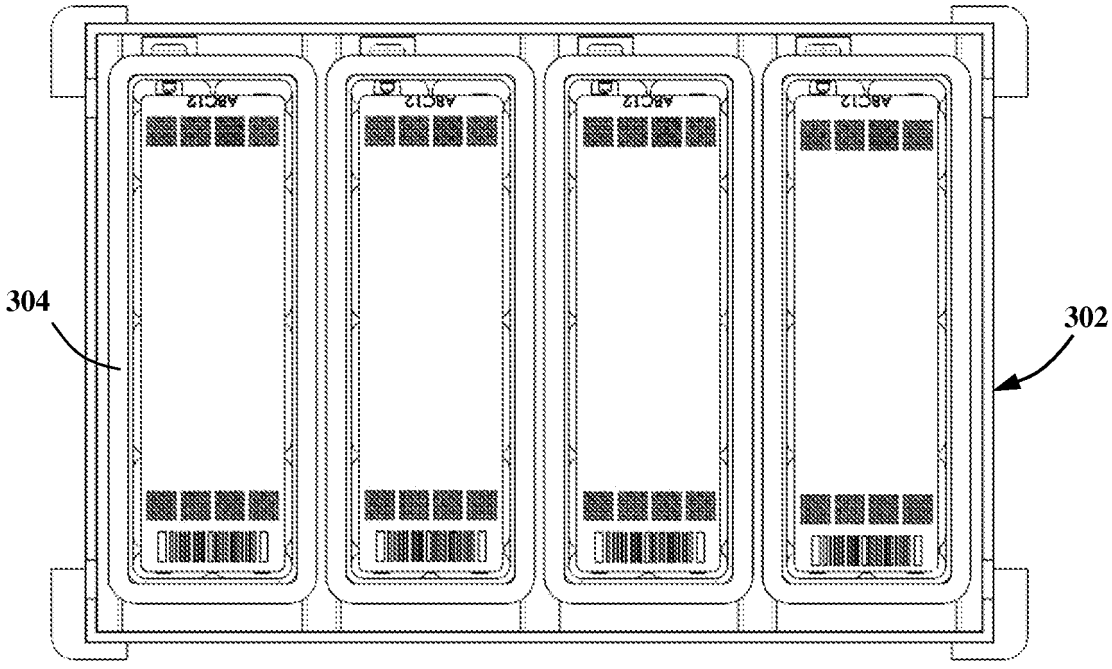


FIG. 7

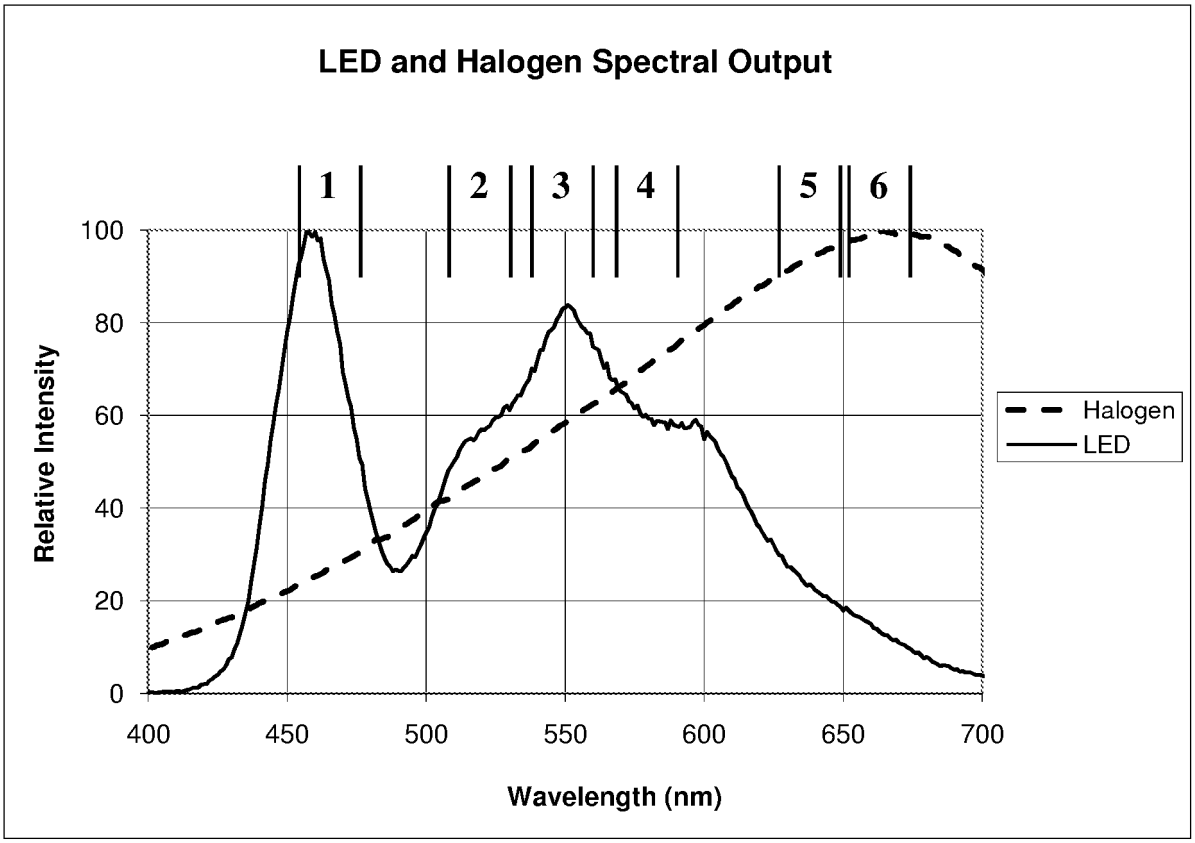

LED and Halogen Spectral Output
1
2
3
4
5
6
100
80
60
40
20
0
Relative Intensity
400
450
500
550
600
650
700
Wavelength (nm)
Halogen
LED

FIG. 8

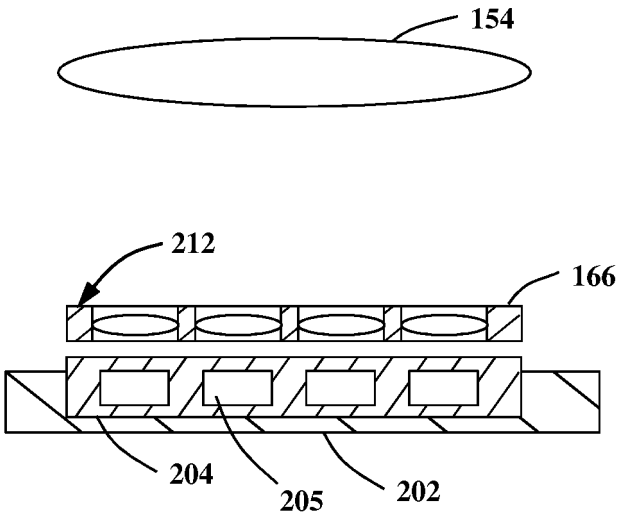


FIG. 9

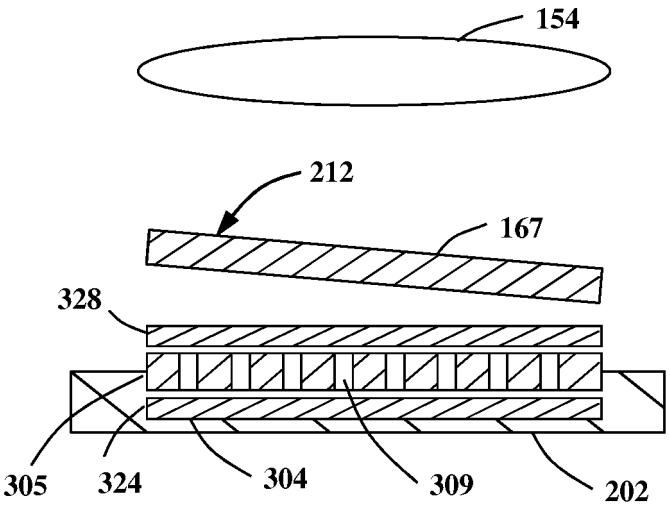


FIG. 10

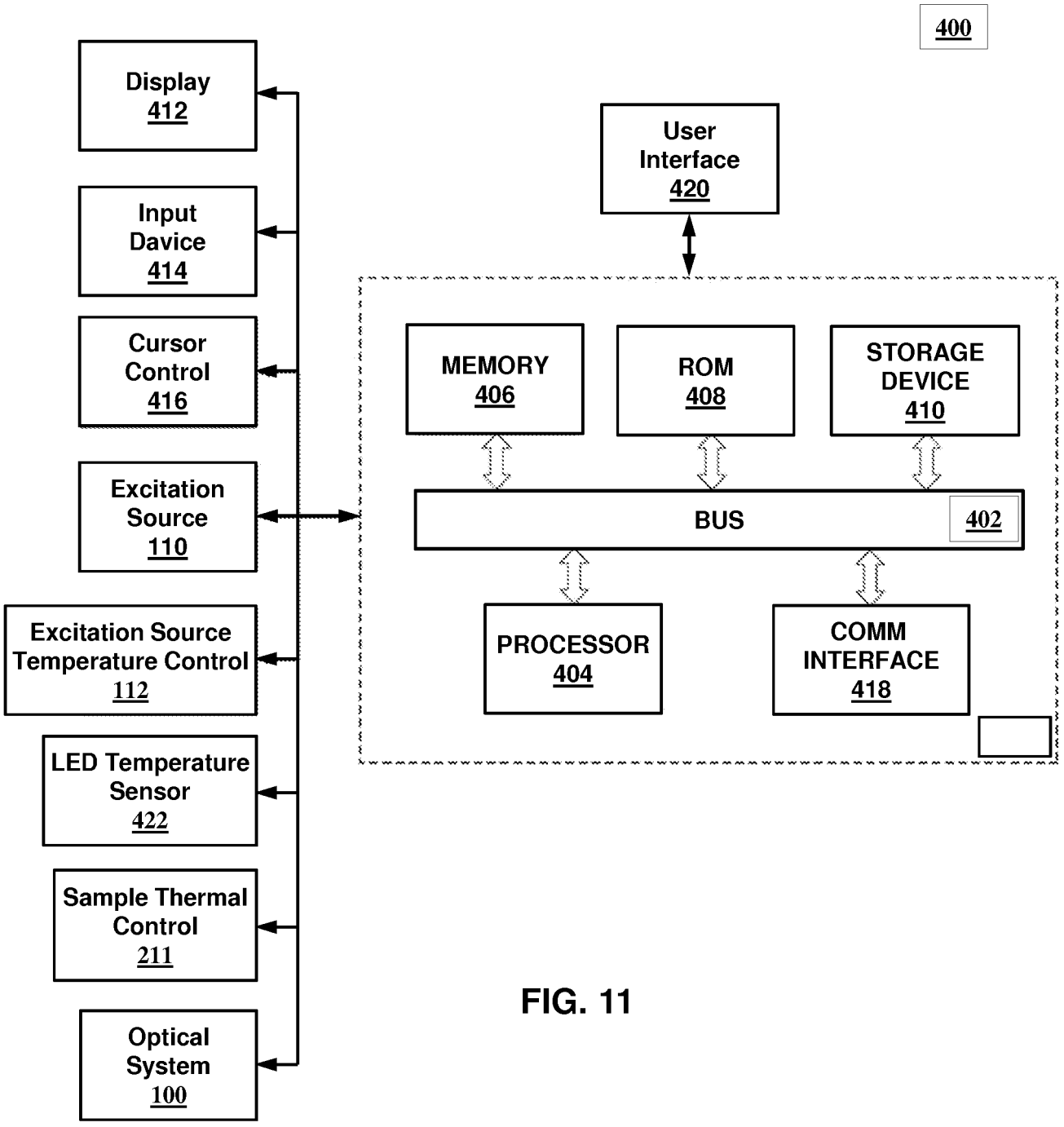

400
Display
412
Input
Davice
414
Cursor
Control
416
Excitation
Source
110
Excitation Source
Temperature Control
112
LED Temperature
Sensor
422
Sample Thermal
Control
211
Optical
System
100
User
Interface
420
MEMORY
406
ROM
408
STORAGE
DEVICE
410
BUS
402
PROCESSOR
404
COMM
INTERFACE
418

FIG. 11

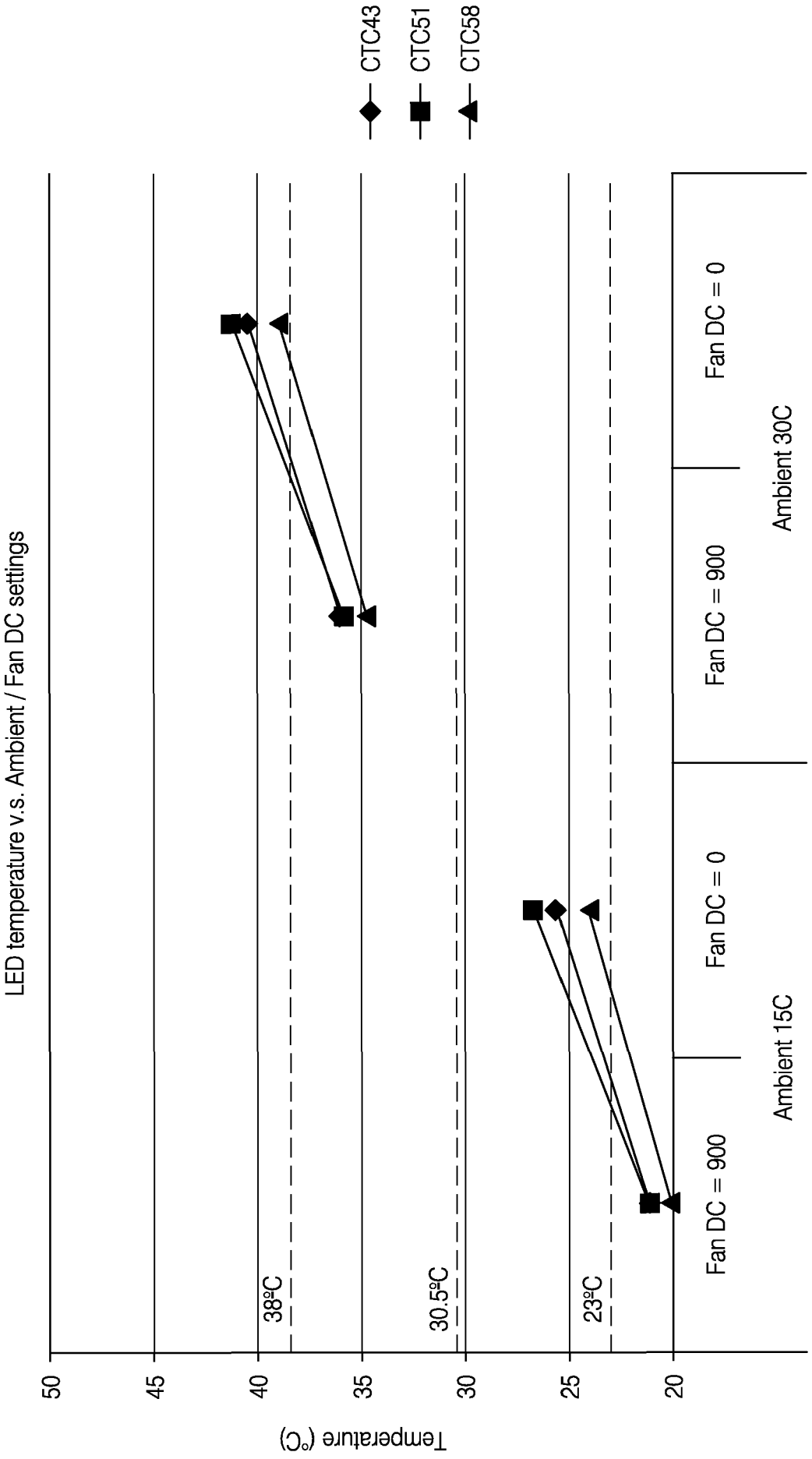

CTC43
CTC51
CTC58
LED temperature v.s. Ambient / Fan DC settings
Temperature (°C)
50
45
40
35
30
25
20
38ºC
30.5ºC
23ºC
Fan DC = 900
Fan DC = 0
Fan DC = 900
Fan DC = 0
Ambient 15C
Ambient 30C

FIG. 12

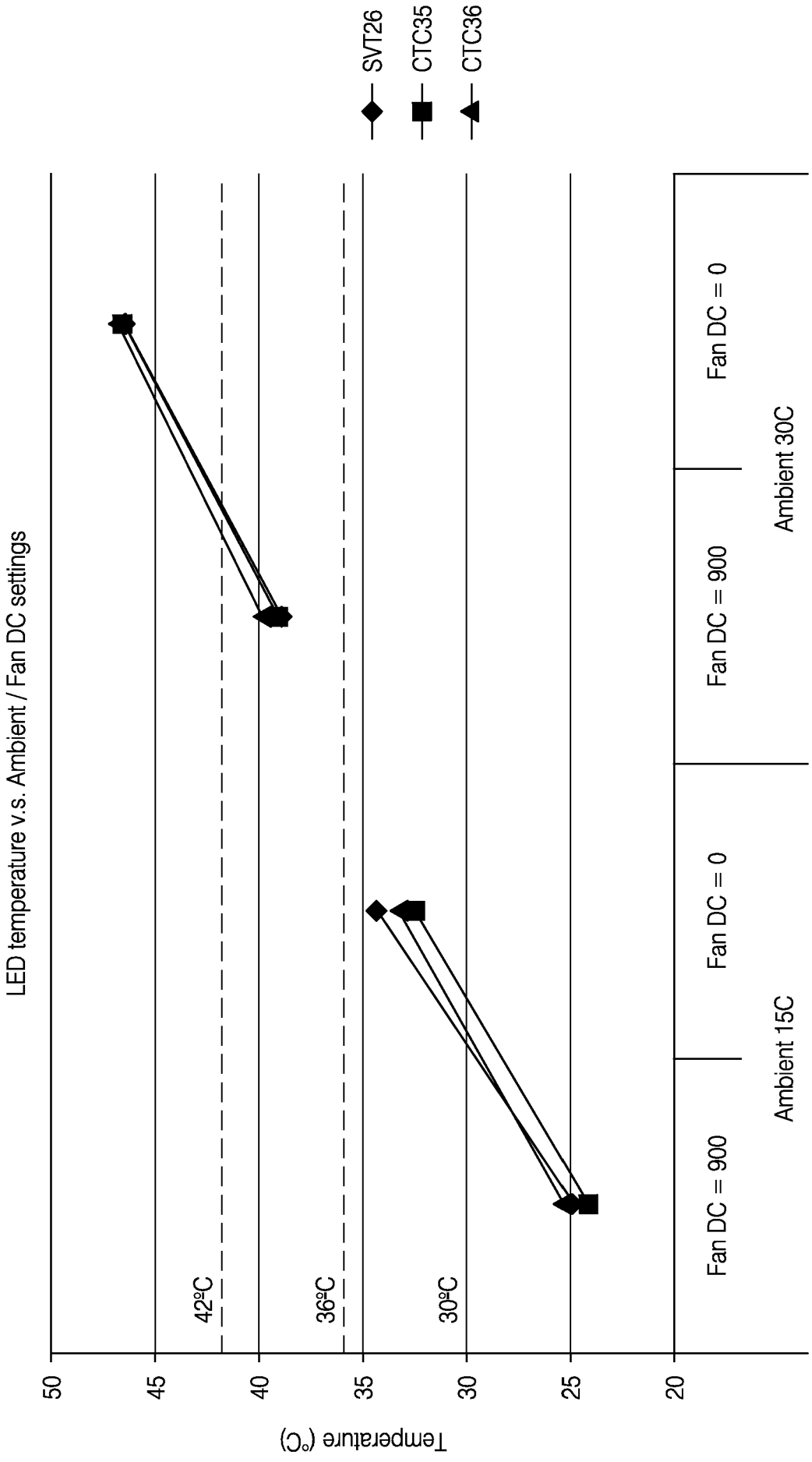

SVT26
CTC35
CTC36
LED temperature v.s. Ambient / Fan DC settings
Temperature (°C)
50
45
40
35
30
25
20
42ºC
36ºC
30ºC
Fan DC = 900
Fan DC = 0
Ambient 15C
Fan DC = 900
Fan DC = 0
Ambient 30C

FIG. 13

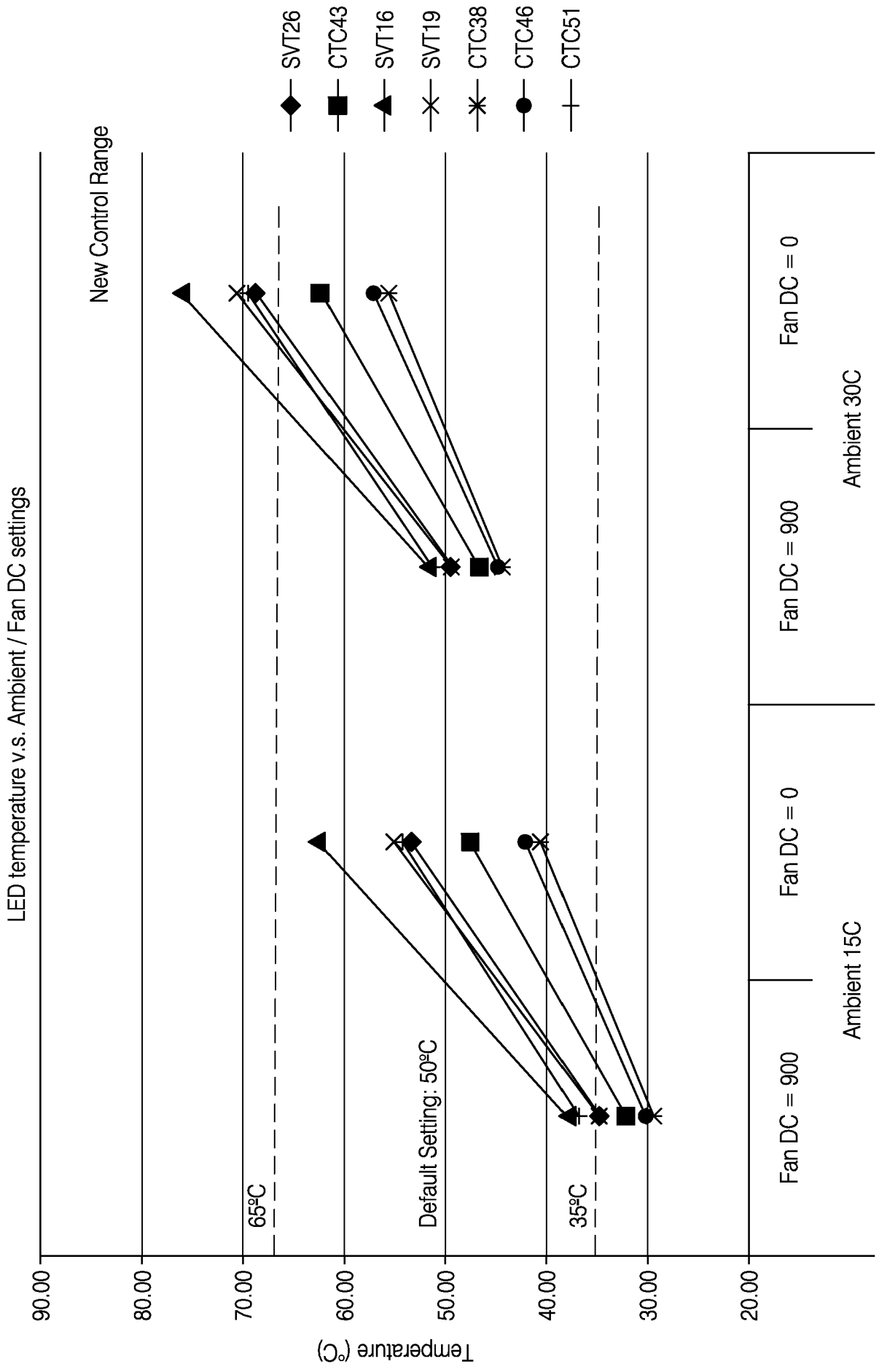

LED temperature v.s. Ambient / Fan DC settings
New Control Range
SVT26
CTC43
SVT16
SVT19
CTC38
CTC46
CTC51
65ºC
Default Setting: 50ºC
35ºC
Temperature (ºC)
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
Fan DC = 900
Fan DC = 0
Fan DC = 900
Fan DC = 0
Ambient 15C
Ambient 30C

FIG. 14

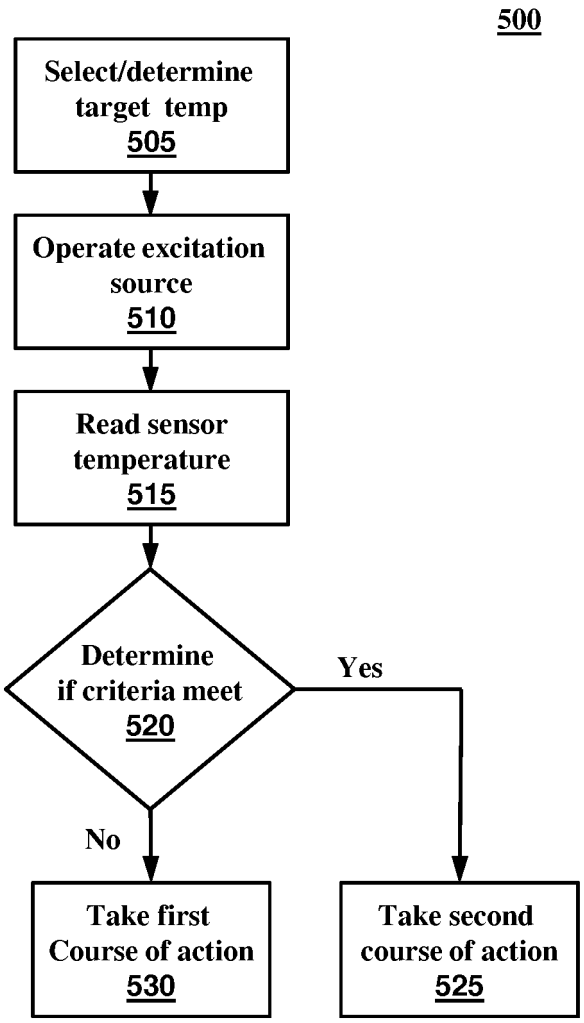

500
Select/determine target temp 505
Operate excitation source 510
Read sensor temperature 515
Determine if criteria meet 520
Yes
No
Take first Course of action 530
Take second course of action 525

FIG. 15

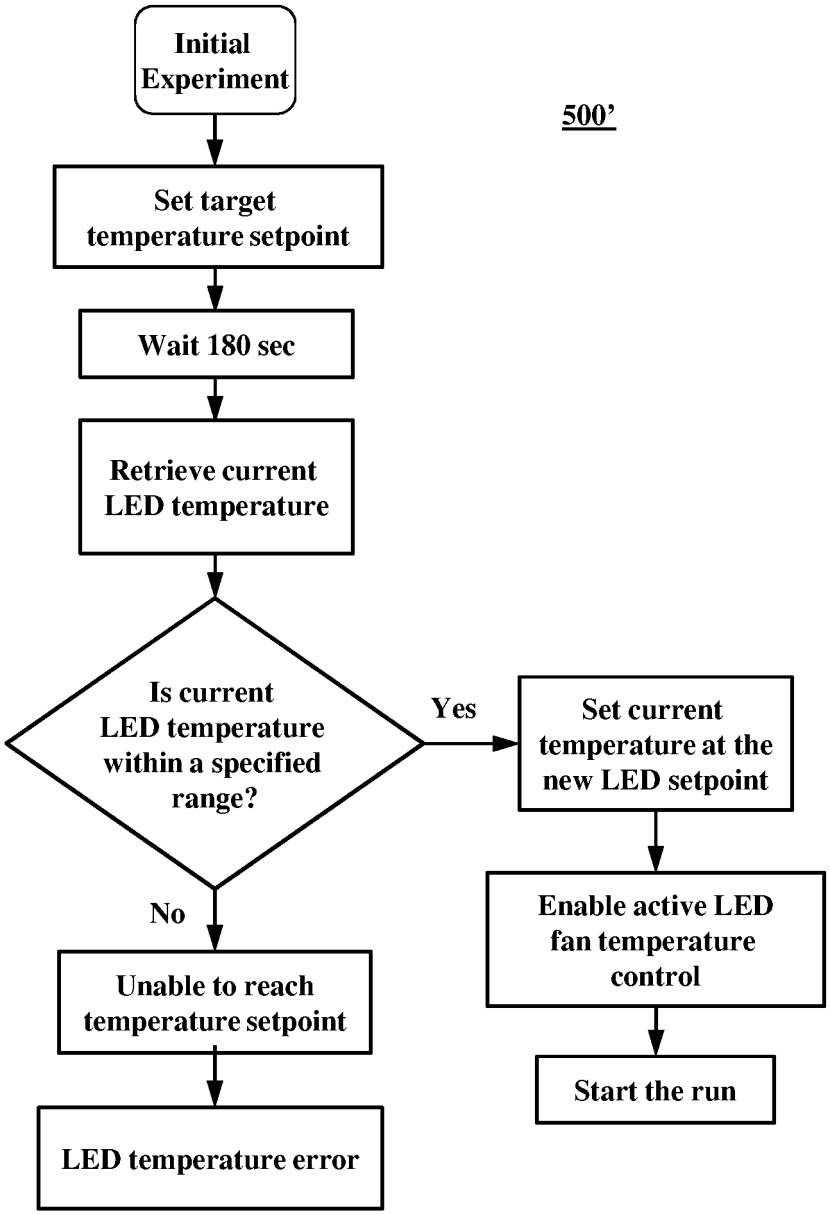

Initial Experiment
500'
Set target temperature setpoint
Wait 180 sec
Retrieve current LED temperature
Is current LED temperature within a specified range?
Yes
Set current temperature at the new LED setpoint
Enable active LED fan temperature control
Start the run
No
Unable to reach temperature setpoint
LED temperature error

FIG. 16