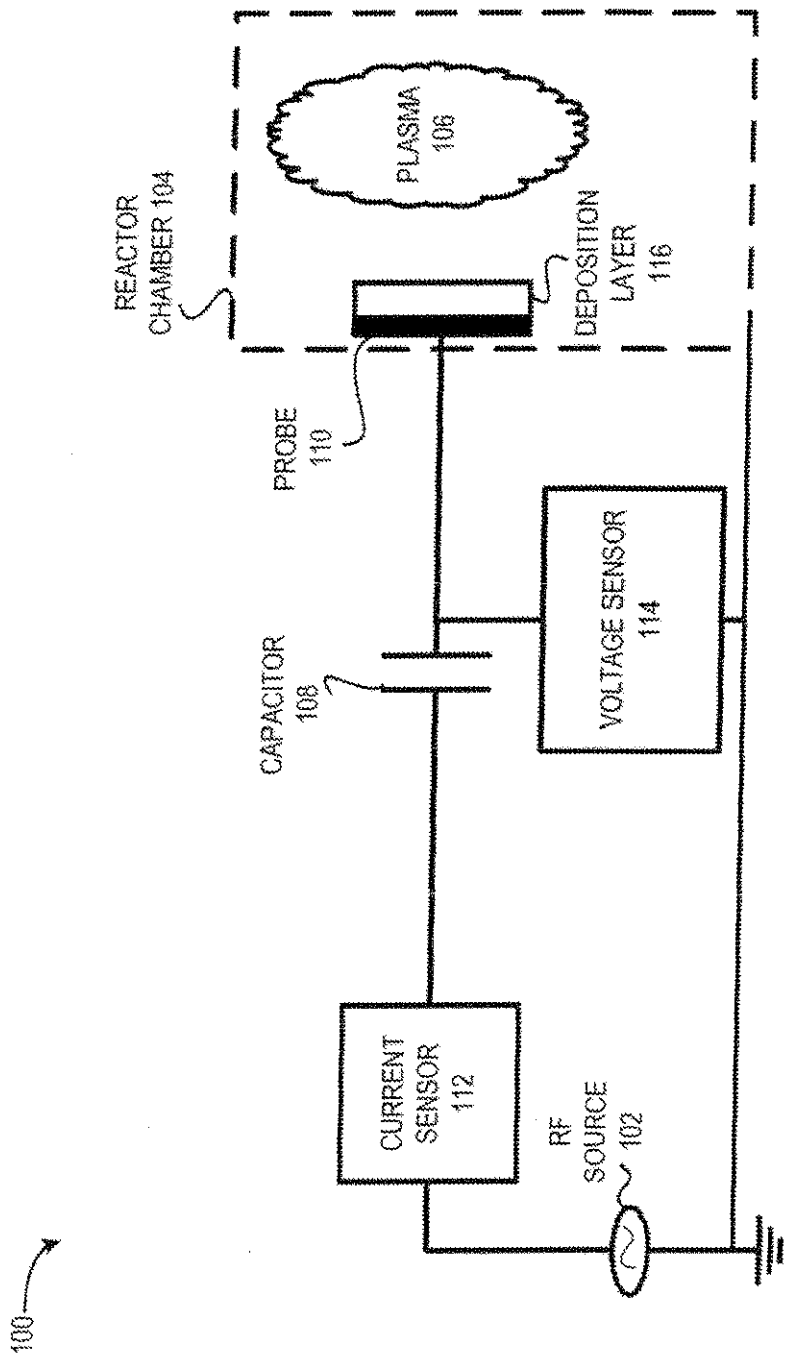

FIG. 1
(PRIOR ART)

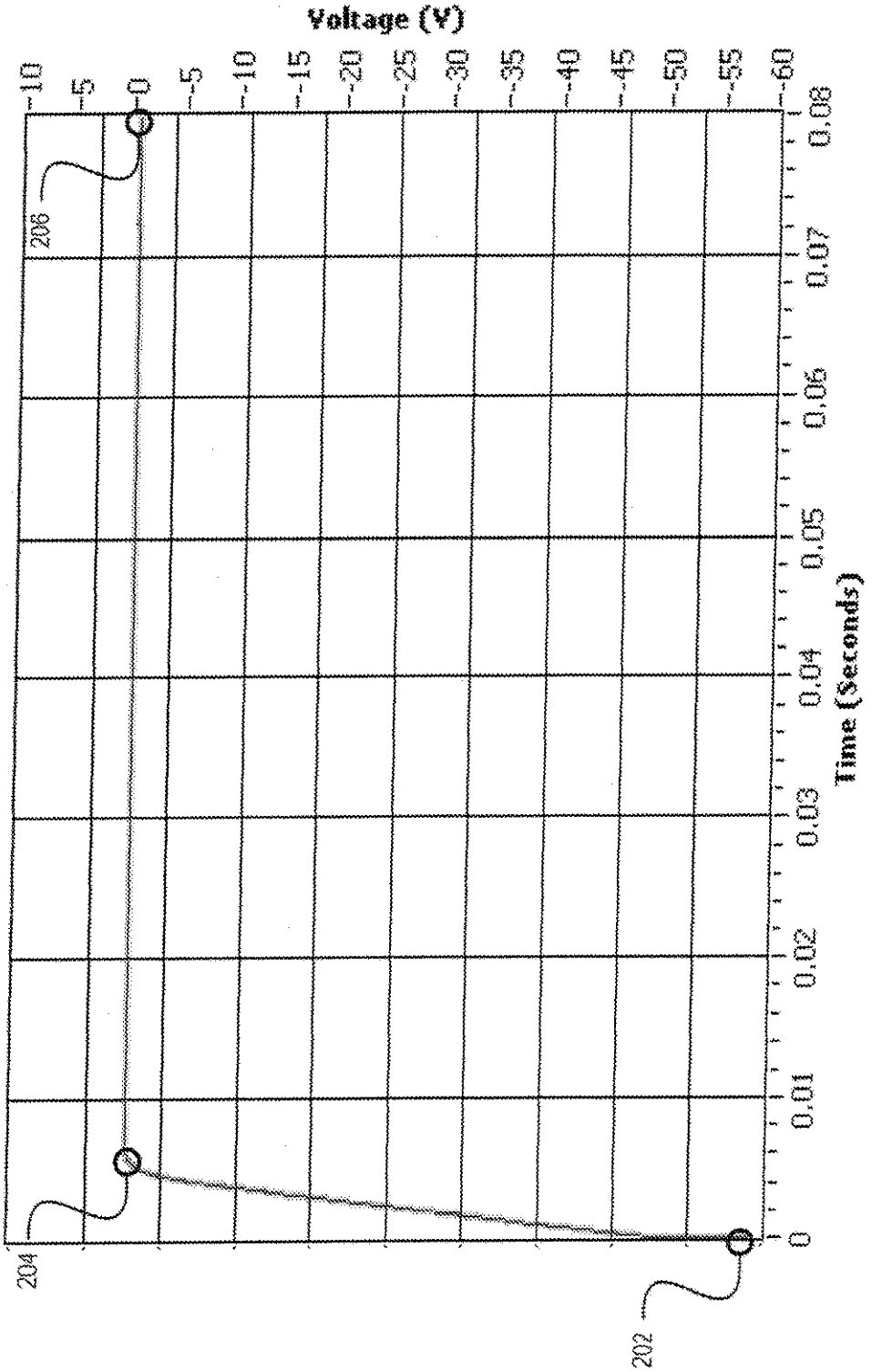

FIG. 2A
(PRIOR ART)

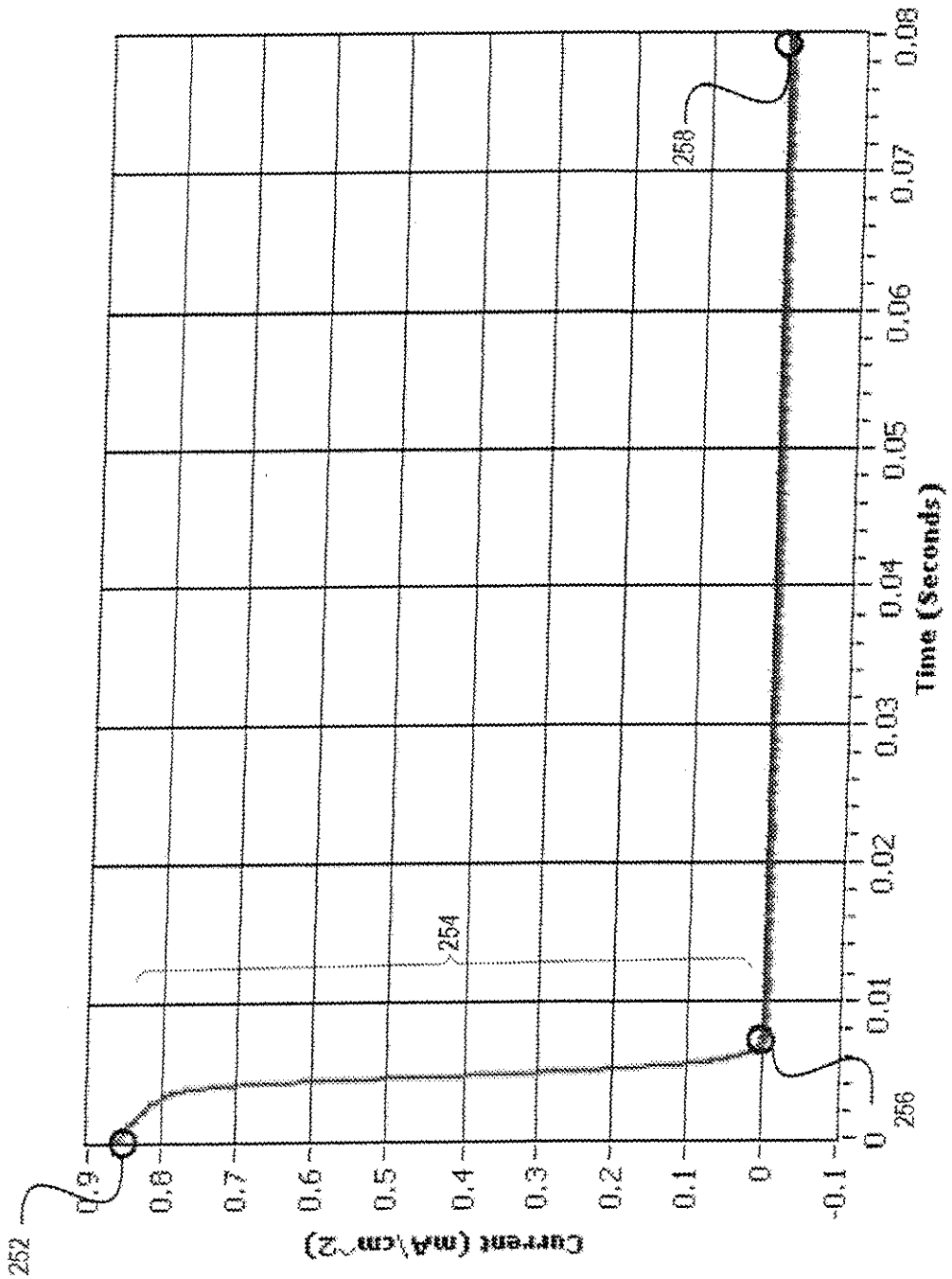

FIG. 2B
(PRIOR ART)

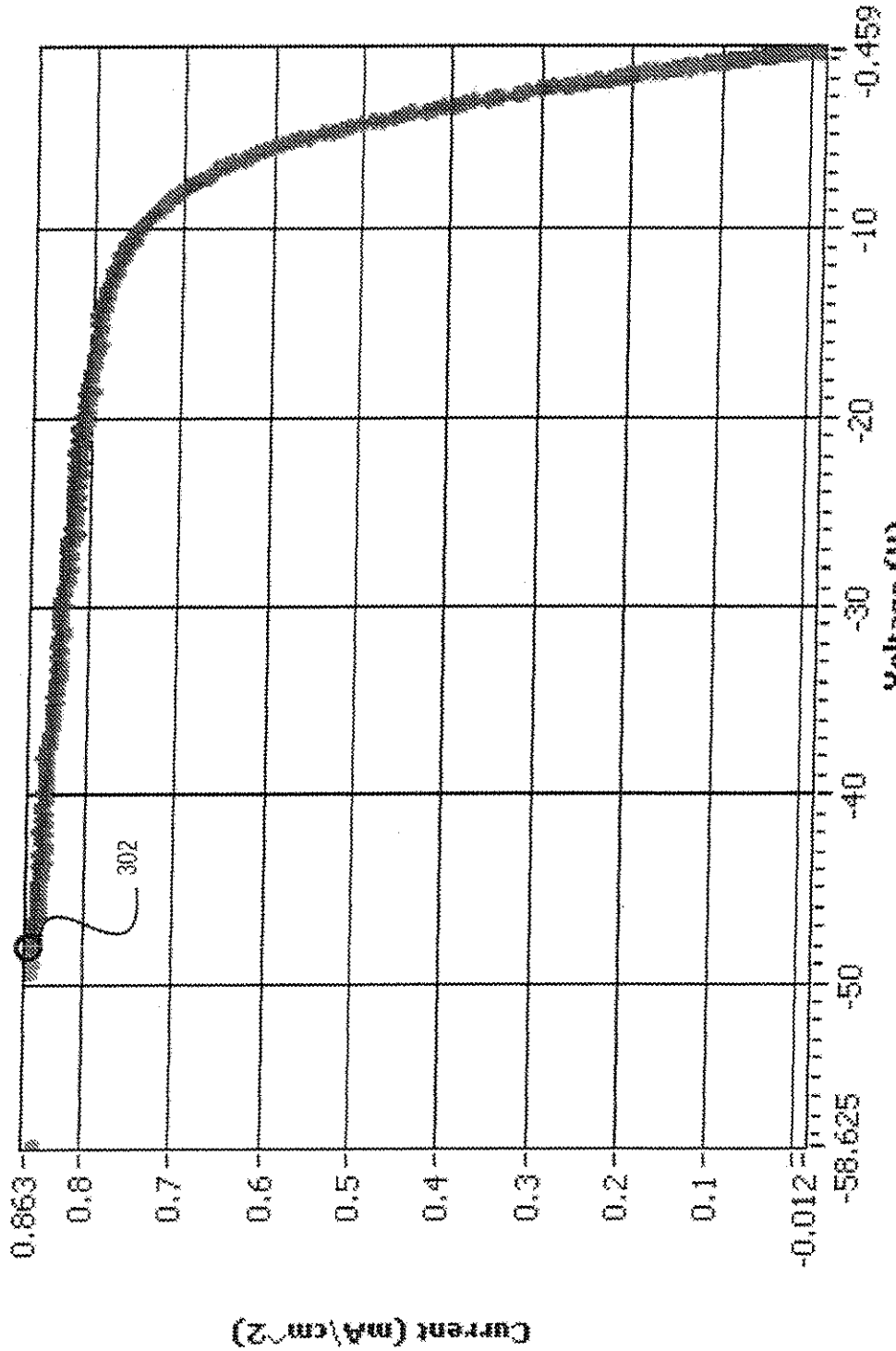

FIG. 3
(PRIOR ART)

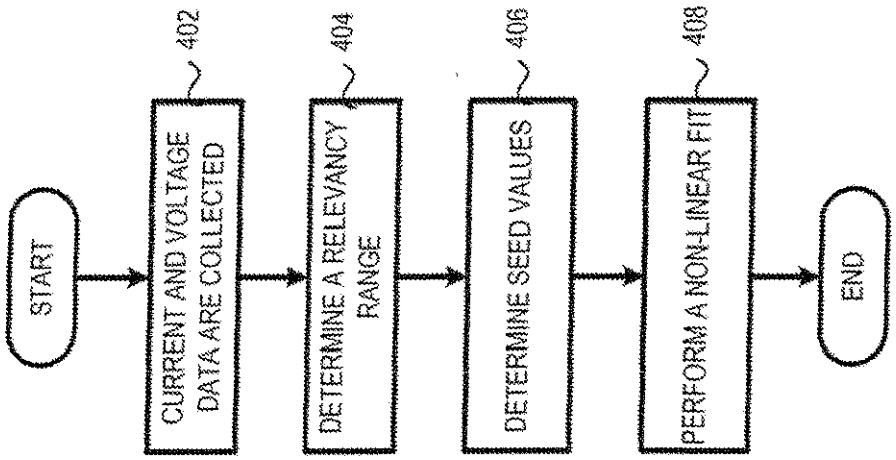
START
402
CURRENT AND VOLTAGE DATA ARE COLLECTED
404
DETERMINE A RELEVANCY RANGE
406
DETERMINE SEED VALUES
408
PERFORM A NON-LINEAR FIT
END

FIG. 4

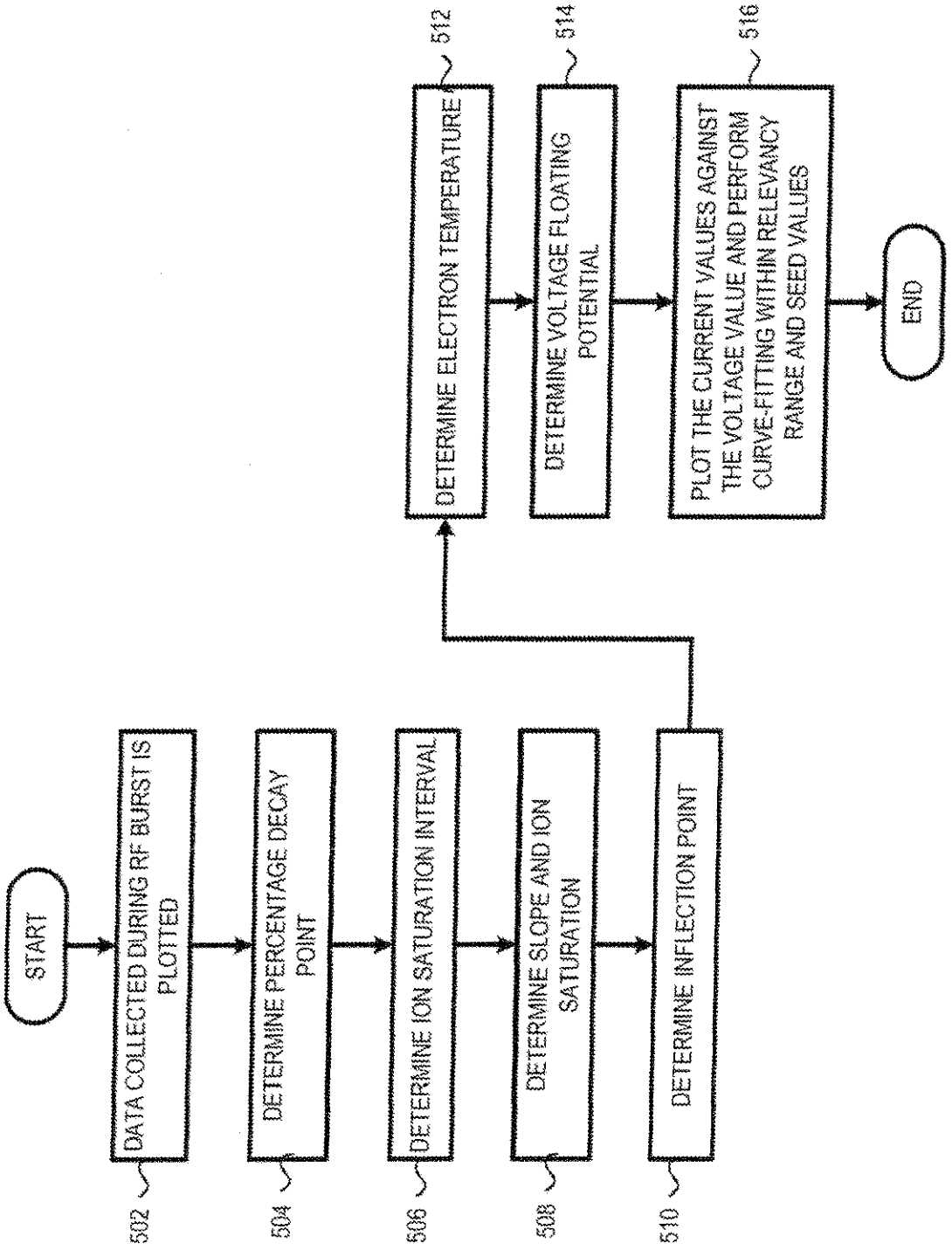
START
DATA COLLECTED DURING RF BURST IS PLOTTED
502
DETERMINE PERCENTAGE DECAY POINT
504
DETERMINE ION SATURATION INTERVAL
506
DETERMINE SLOPE AND ION SATURATION
508
DETERMINE INFLECTION POINT
510
DETERMINE ELECTRON TEMPERATURE
512
DETERMINE VOLTAGE FLOATING POTENTIAL
514
PLOT THE CURRENT VALUES AGAINST THE VOLTAGE VALUE AND PERFORM CURVE-FITTING WITHIN RELEVANCY RANGE AND SEED VALUES
516
END

FIG. 5

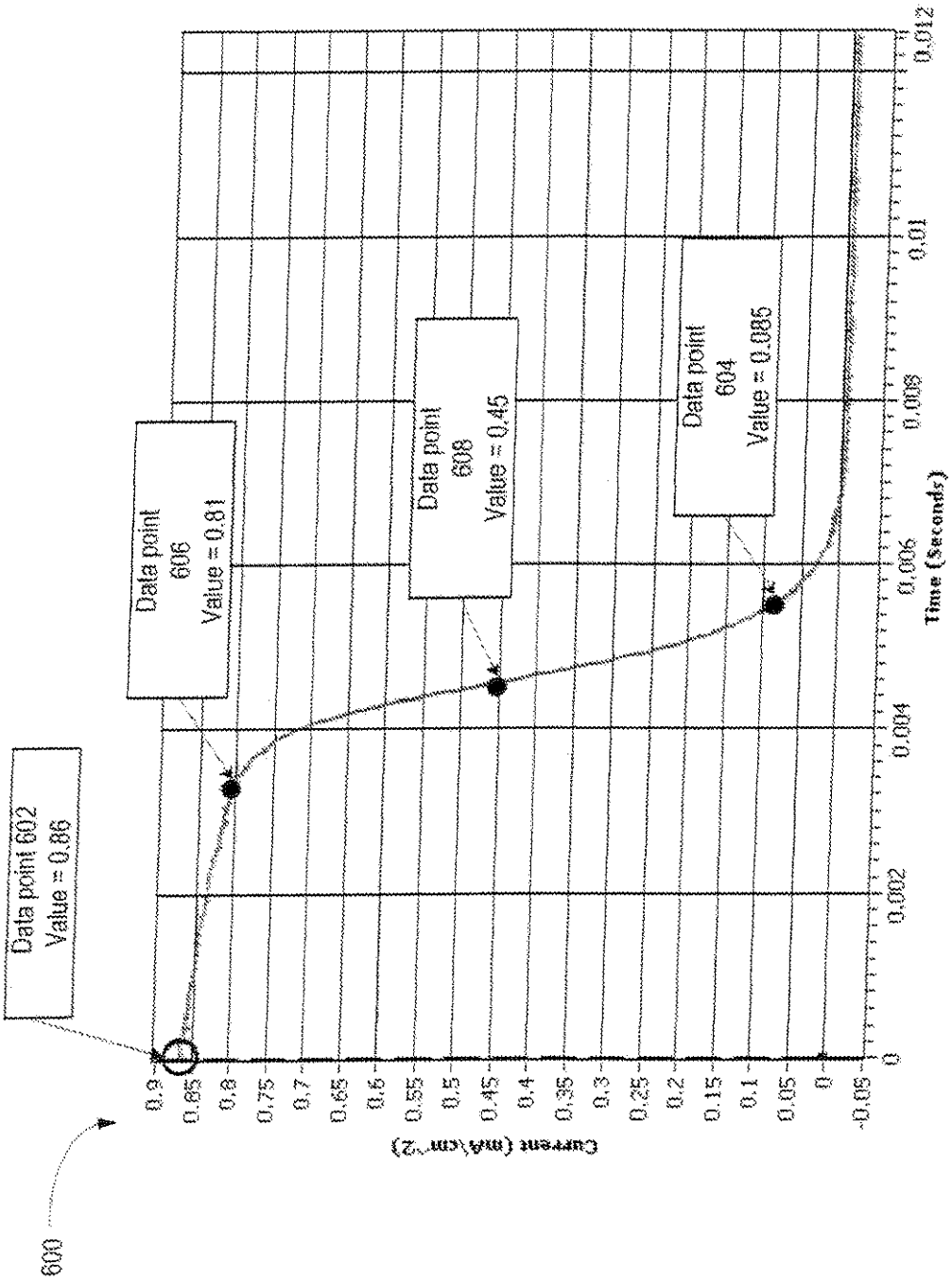
600
Data point 602
Value = 0.86
Data point
606
Value = 0.81
Data point
608
Value = 0.45
Data point
604
Value = 0.085
Current (mA\cm^2)
Time (Seconds)
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
0
0.002
0.004
0.006
0.008
0.01
0.012

FIG. 6A

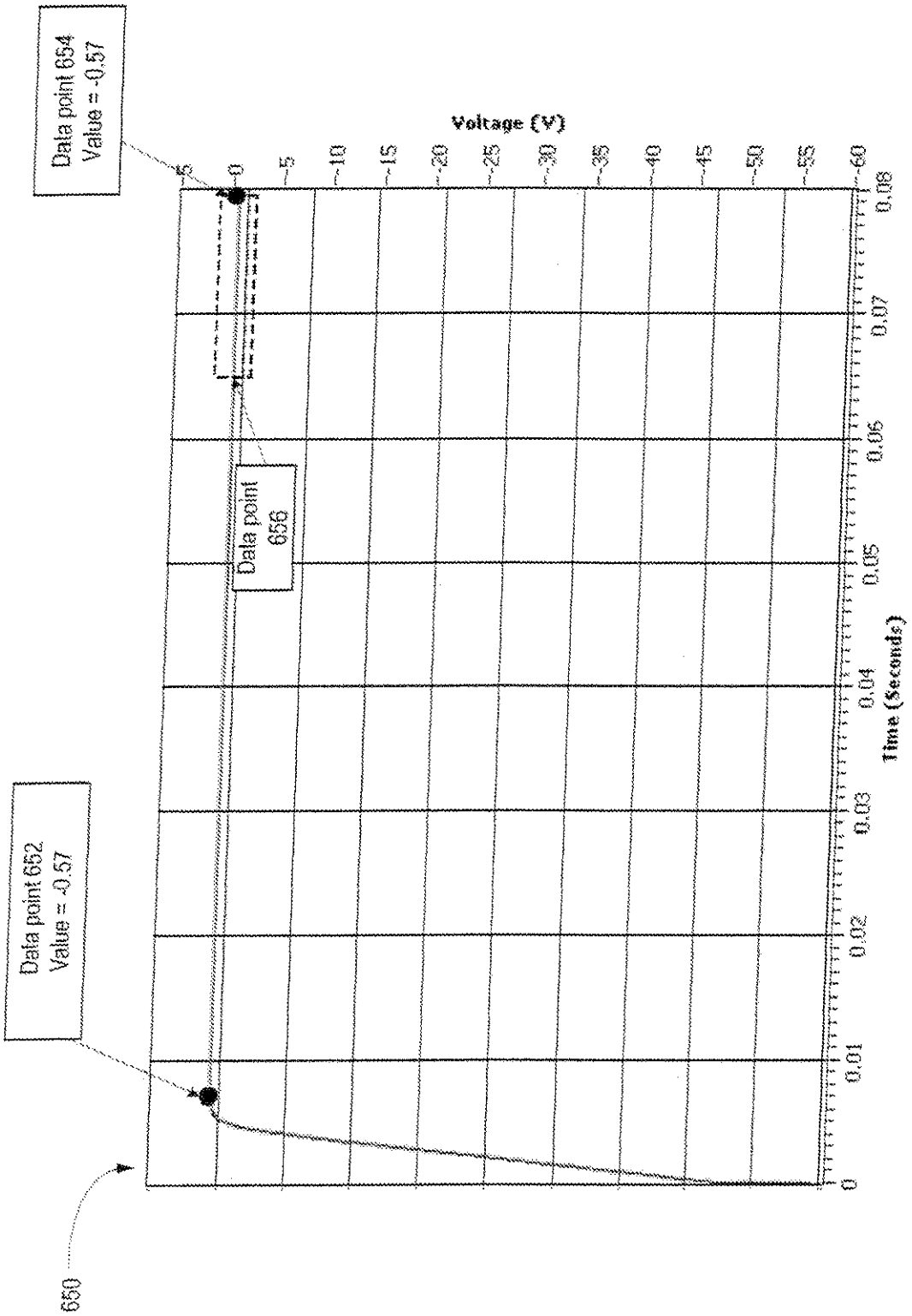
Data point 654
Value = -0.57
Data point
656
Data point 652
Value = -0.57
650
Voltage (V)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Time (Seconds)

FIG. 6B

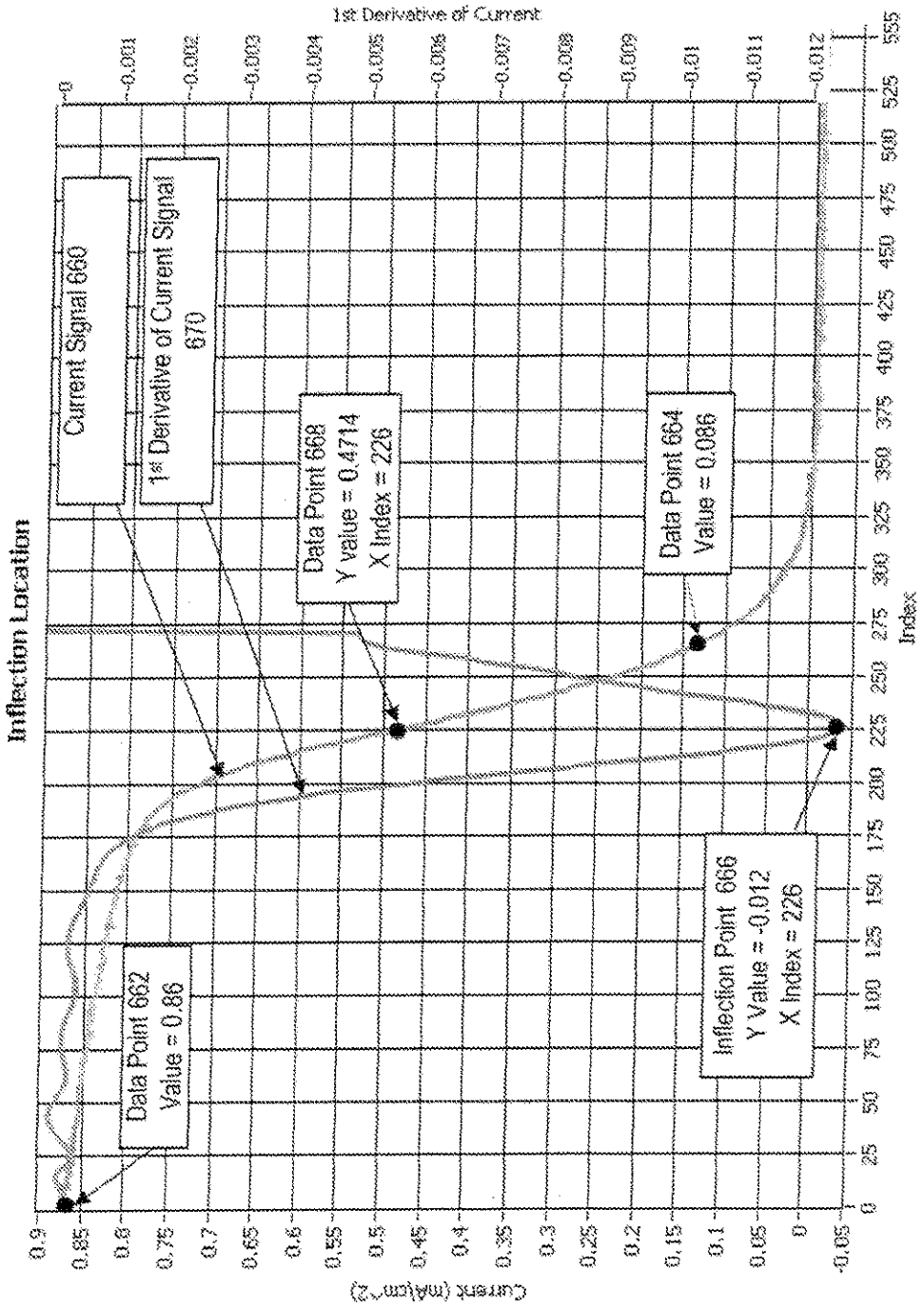
Inflection Location
1st Derivative of Current
Current Signal 660
1st Derivative of Current Signal 670
Data Point 662
Value = 0.86
Data Point 668
Y value = 0.4714
X Index = 226
Data Point 664
Value = 0.086
Inflection Point 666
Y Value = -0.012
X Index = 226
Current (mA/cm^2)
Index

FIG. 6C

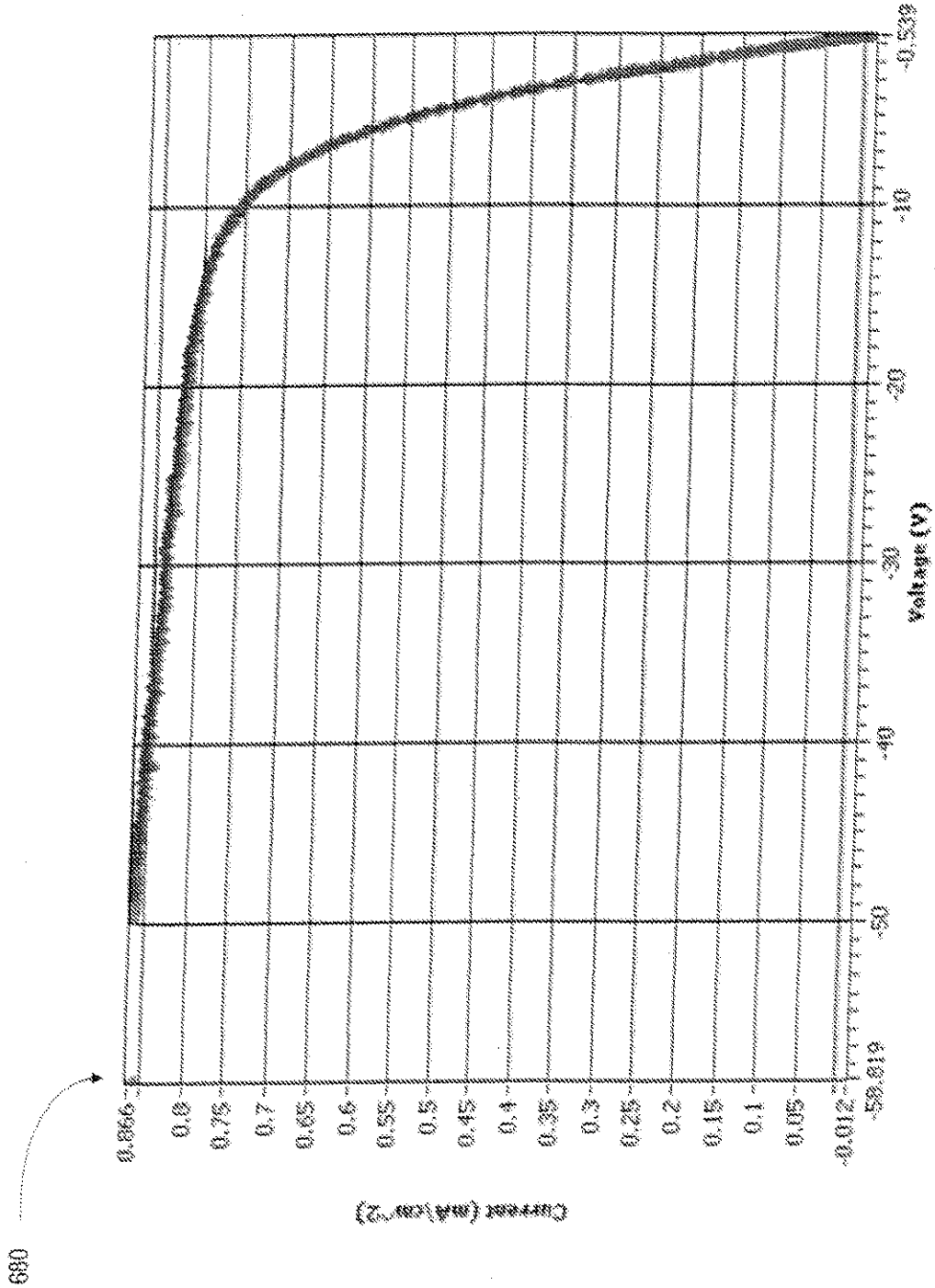
680
Current (mA/cm^2)
0.866
0.8
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
-0.012
-0.539
0
-10
-20
-30
-40
-50
-58.619
Voltage (V)

FIG. 6D