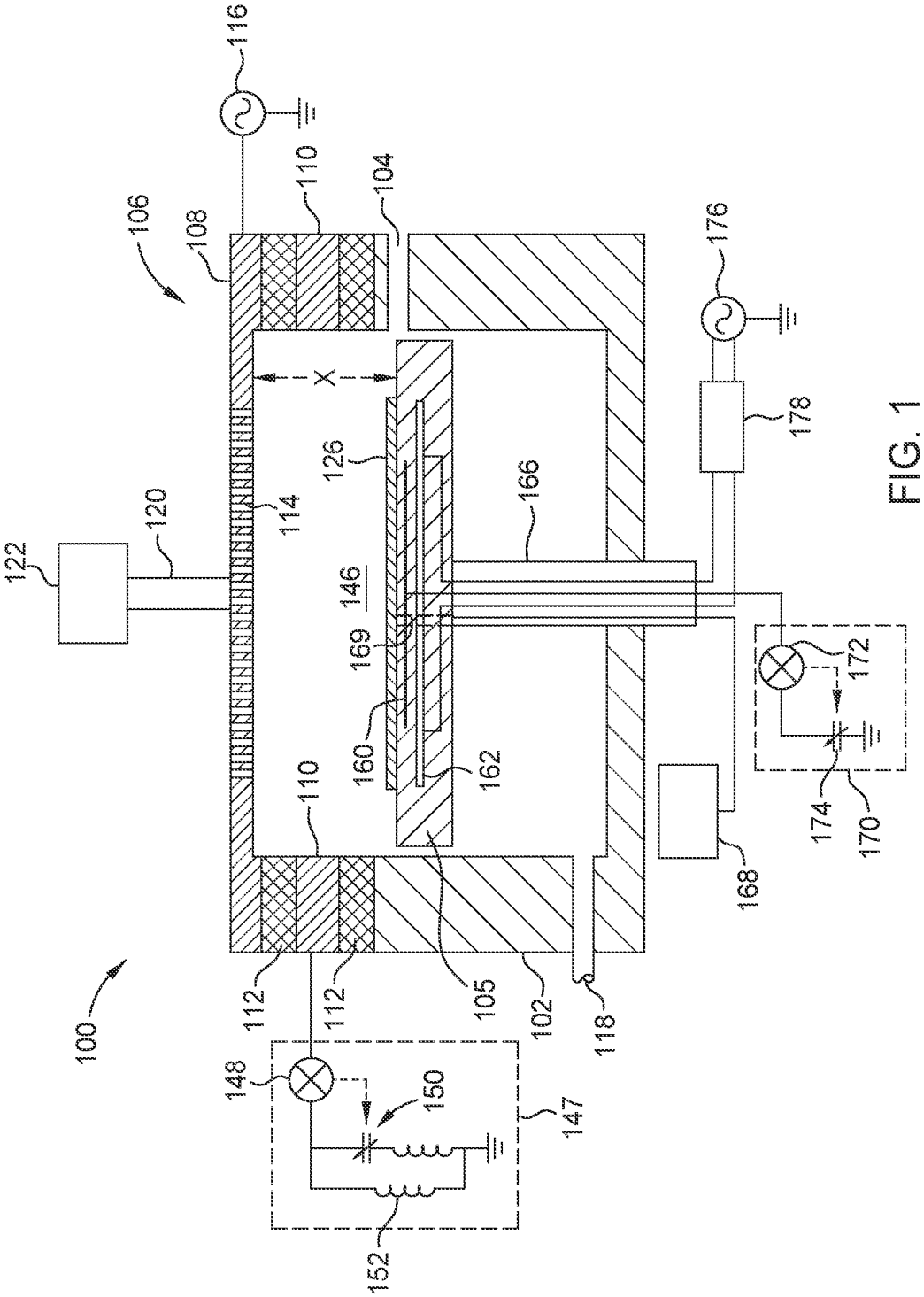
116
110
104
106
108
176
X
178
126
166
120
114
122
146
169
172
160
162
110
174
170
168
100
112
112
105
102
118
148
150
147
152

FIG. 1

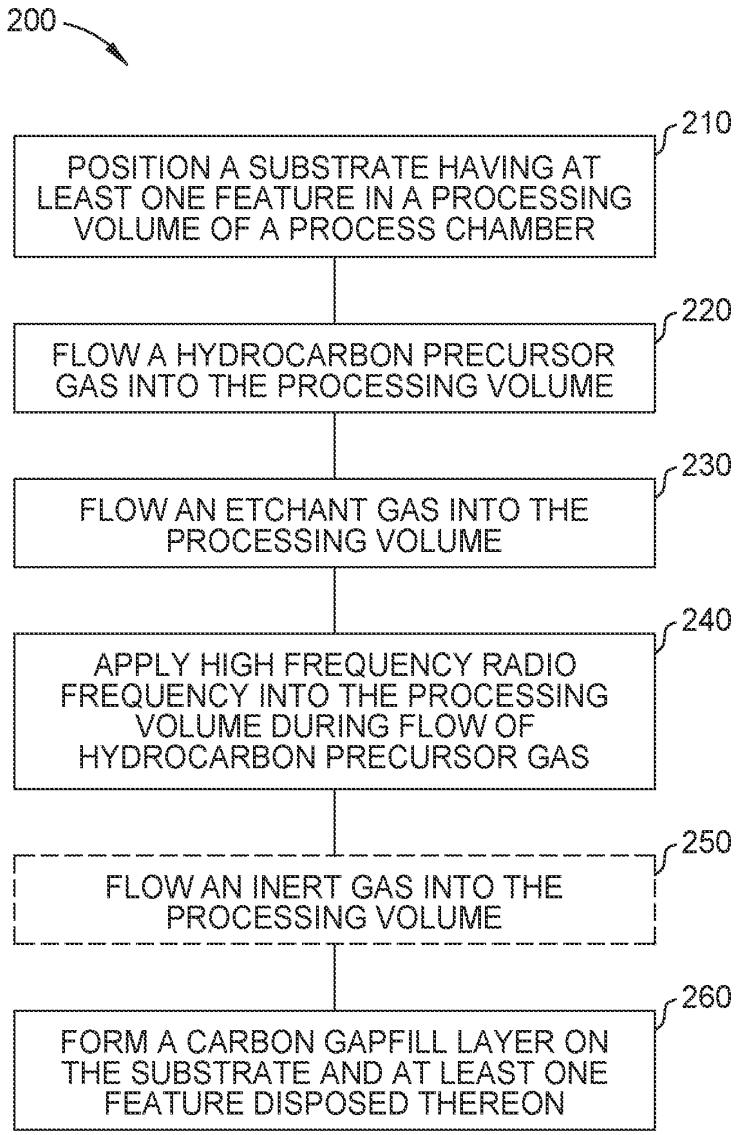
200
210
POSITION A SUBSTRATE HAVING AT LEAST ONE FEATURE IN A PROCESSING VOLUME OF A PROCESS CHAMBER
220
FLOW A HYDROCARBON PRECURSOR GAS INTO THE PROCESSING VOLUME
230
FLOW AN ETCHANT GAS INTO THE PROCESSING VOLUME
240
APPLY HIGH FREQUENCY RADIO FREQUENCY INTO THE PROCESSING VOLUME DURING FLOW OF HYDROCARBON PRECURSOR GAS
250
FLOW AN INERT GAS INTO THE PROCESSING VOLUME
260
FORM A CARBON GAPFILL LAYER ON THE SUBSTRATE AND AT LEAST ONE FEATURE DISPOSED THEREON

FIG. 2

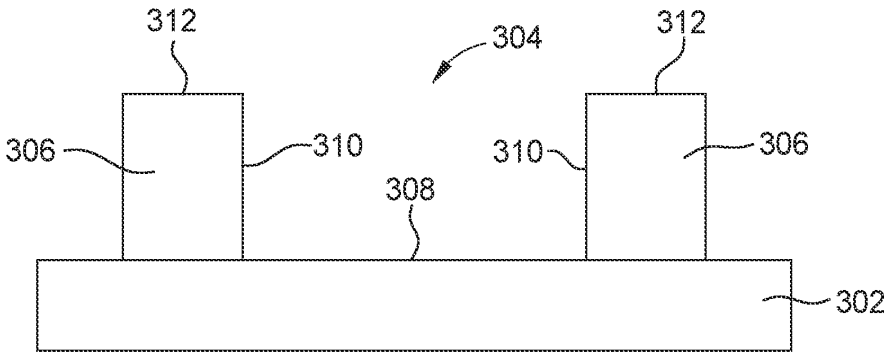

FIG. 3A

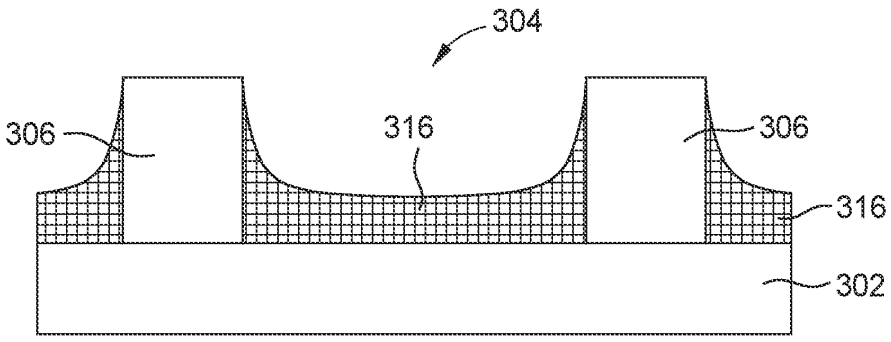

FIG. 3B

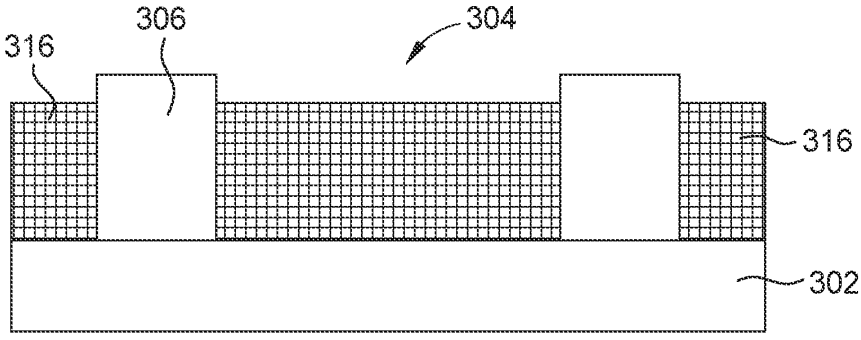

FIG. 3C

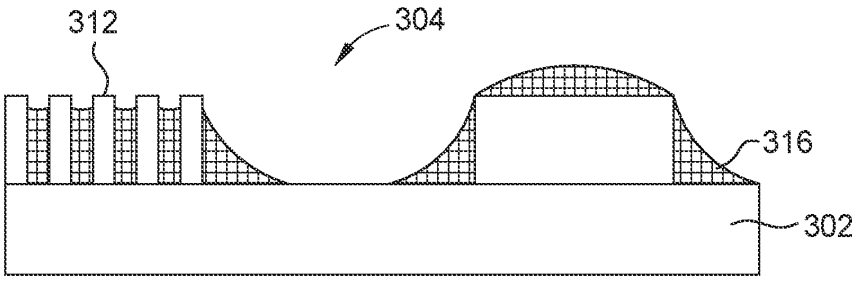

FIG. 4A

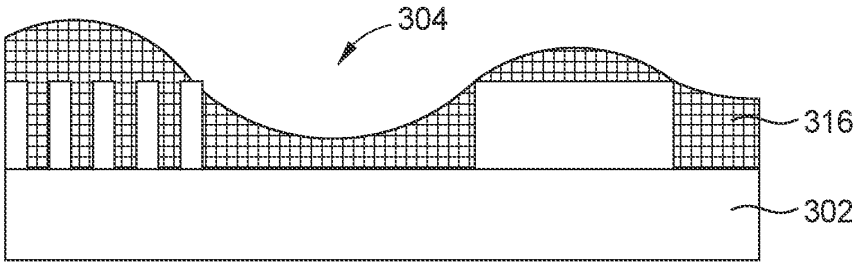

FIG. 4B

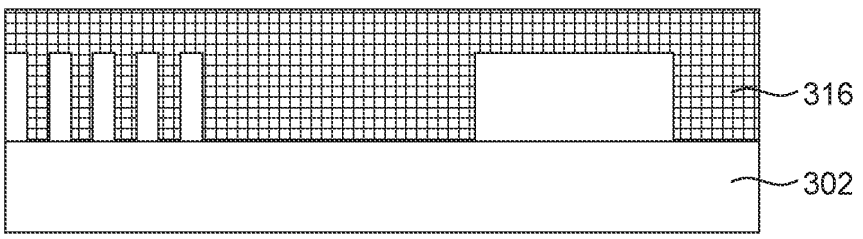

FIG. 4C

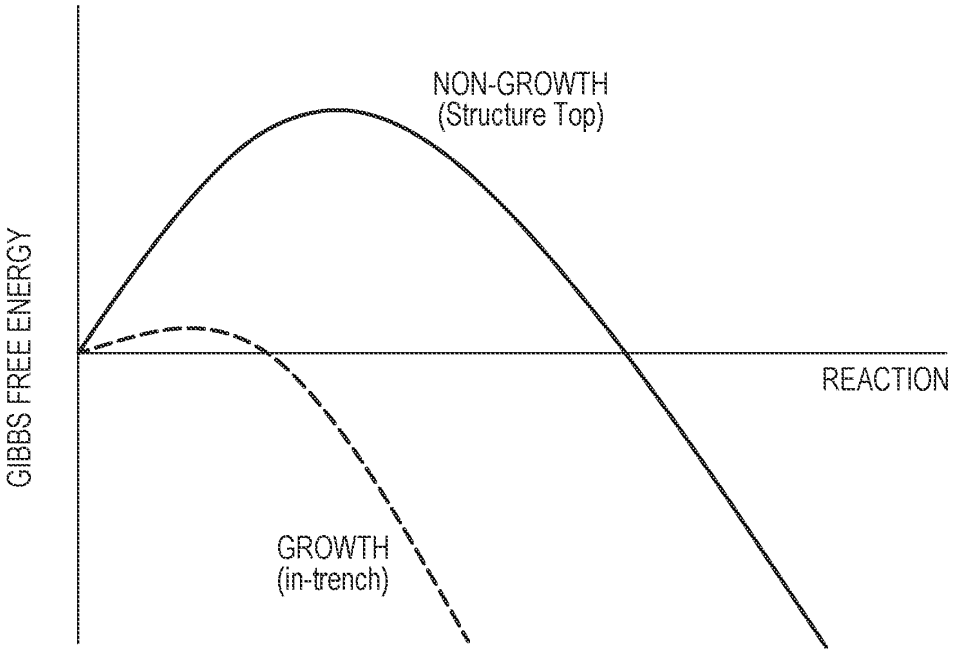
NON-GROWTH
(Structure Top)
GIBBS FREE ENERGY
REACTION
GROWTH
(in-trench)

FIG. 5

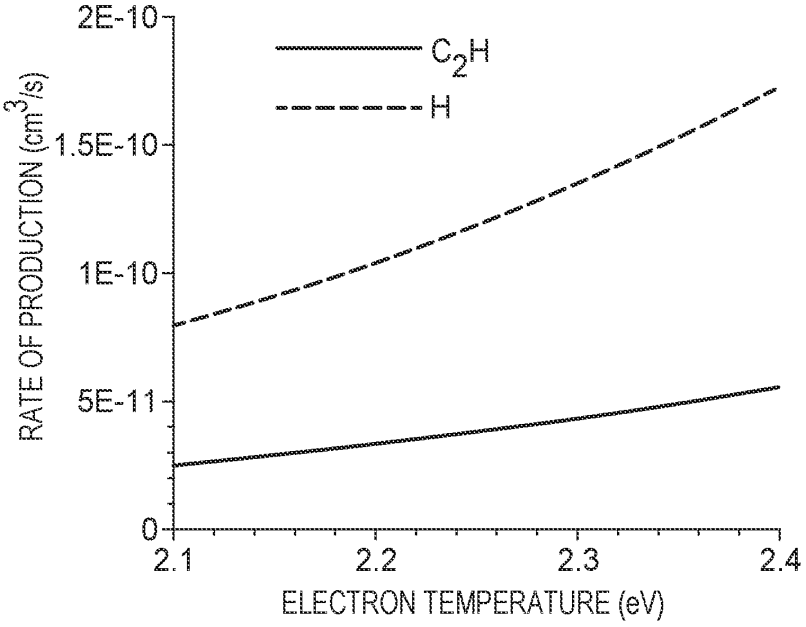
2E-10
1.5E-10
1E-10
5E-11
0
RATE OF PRODUCTION (cm3/s)
C2H
H
2.1
2.2
2.3
2.4
ELECTRON TEMPERATURE (eV)

FIG. 6

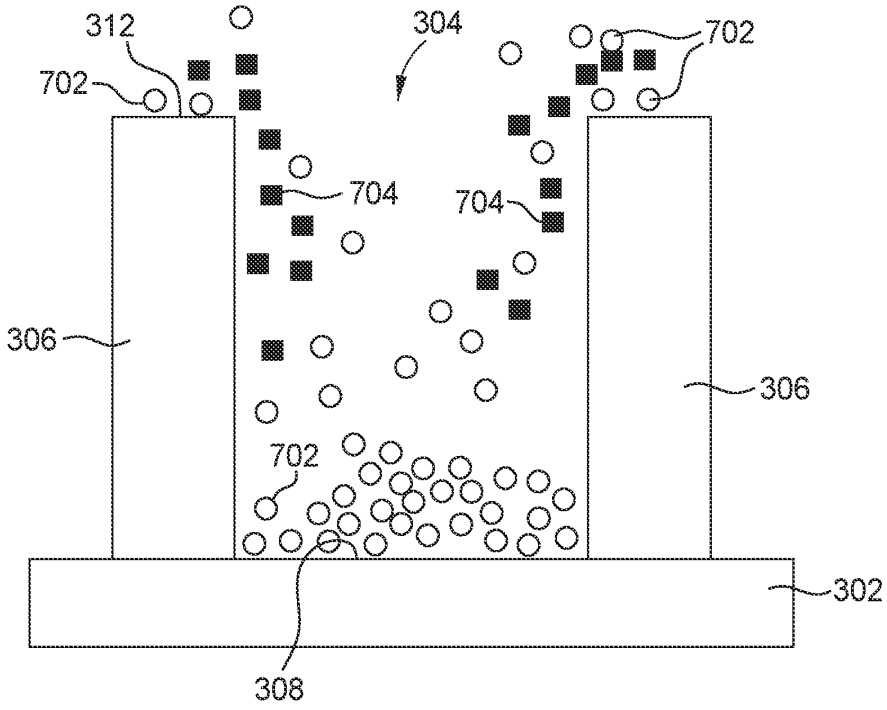

FIG. 7

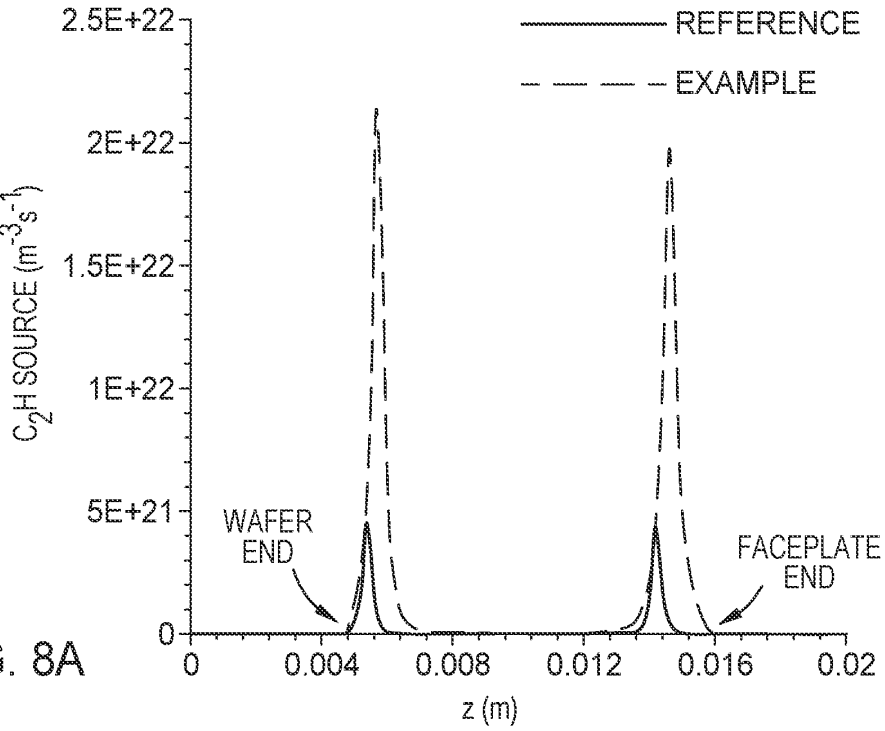
REFERENCE
EXAMPLE
2.5E+22
2E+22
1.5E+22
1E+22
5E+21
0
C_2H SOURCE ($m^{-3}s^{-1}$)
WAFER END
FACEPLATE END
0
0.004
0.008
0.012
0.016
0.02
z (m)

FIG. 8A

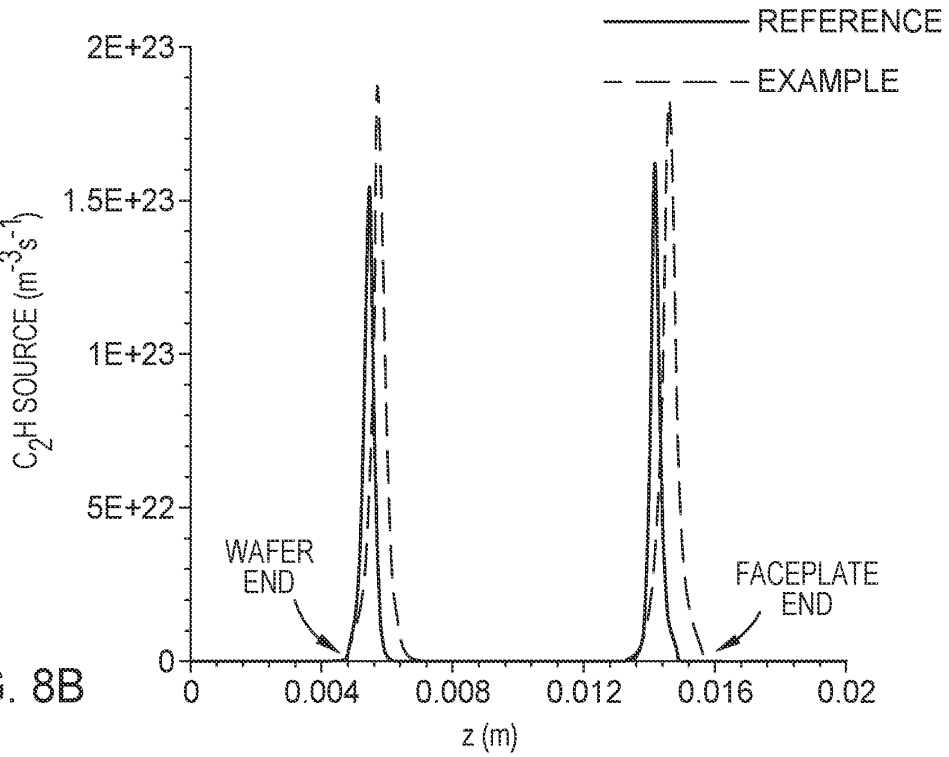
REFERENCE
EXAMPLE
2E+23
1.5E+23
1E+23
5E+22
0
C_2H SOURCE ($m^{-3}s^{-1}$)
WAFER END
FACEPLATE END
0
0.004
0.008
0.012
0.016
0.02
z (m)

FIG. 8B