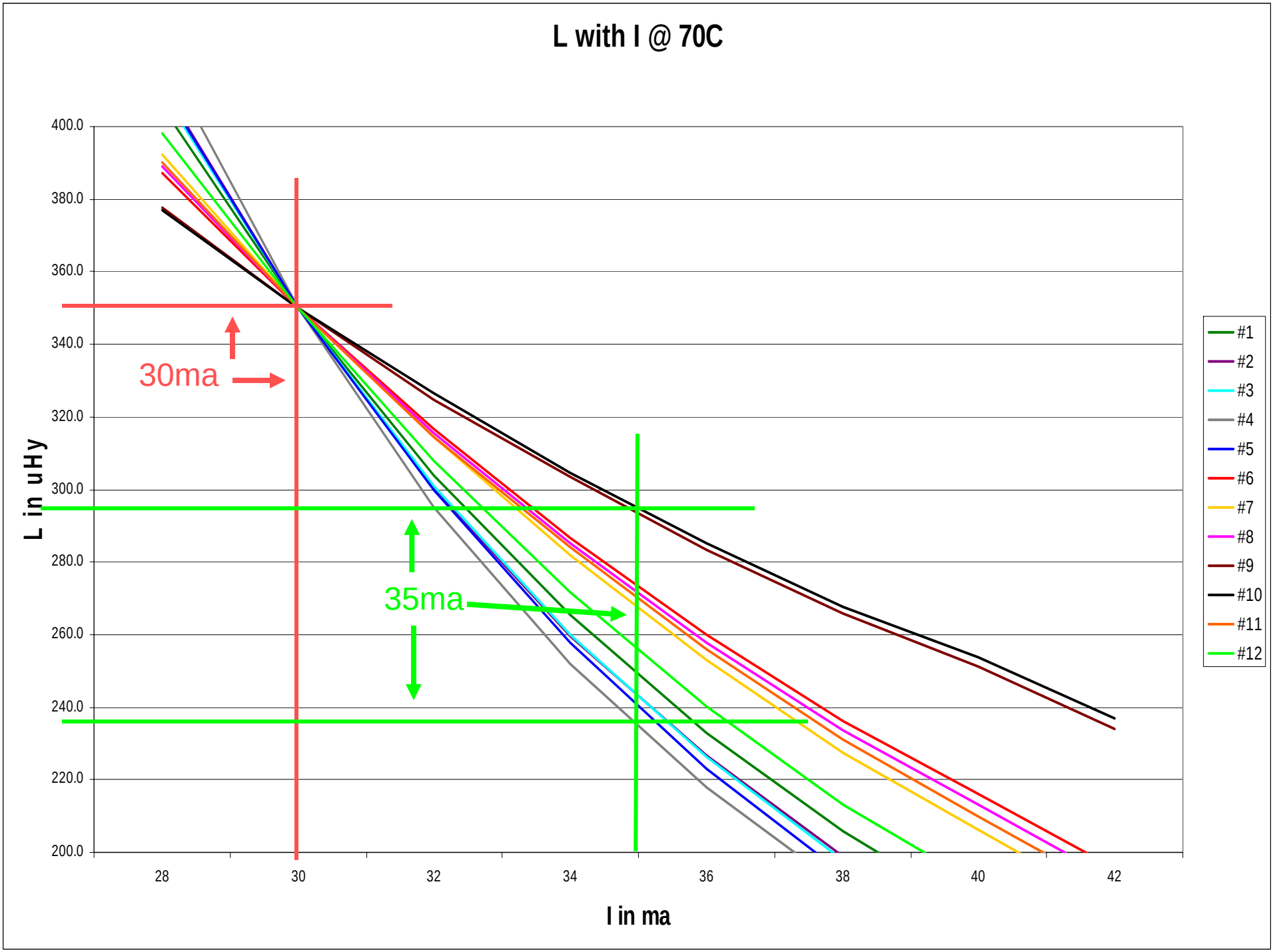
Lowering Inductance with DC Bias @ 70C

Steve Sedio
Foxconn
(760) 751-1645

The Effect of Current on Ungapped Toroids

- The curves correlate primarily with core size
  - In theory, double the length of gap, with the same area of core, requires 40% more turns to maintain inductance, but will support 40% more current.
- Secondarily with core material.
  - “DC bias” materials have some range of variation, between vendors, and lot to lot.
- The plots on the next page were with cores tuned for 350uHy at 30ma
  - At 35ma the inductance ranges from 238uHy to 295uHy


L with I @ 70C
400.0
380.0
360.0
340.0
320.0
300.0
280.0
260.0
240.0
220.0
200.0
L in uHy
28
30
32
34
36
38
40
42
I in ma
30ma
35ma
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12

Inductance with DC Bias

Oersteads = 0.4 * Pi * N * I^2 / Lg

Lg varies with core shape