WHAT IS IR DROP?

Current I

METAL WIRE

TSV

C4 BUMP (PIN)

Voltage V

CIRCUIT

Voltage V – IR
KEY CONTRIBUTIONS

1. A 3D memory package with few pins & TSVs
KEY CONTRIBUTIONS

② Spice analysis to show voltage maps

High IR Drop
Low IR Drop
KEY CONTRIBUTIONS

③ Memory controller: what, when, where
KEY CONTRIBUTIONS

4 Handle starvation

High IR Drop
Low IR Drop
Place pages in favored regions
NOW PLAYING

A PAPER ABOUT

COST &

VOLTAGE

NOISE

UTAH, SAMSUNG, ARM

WHERE ARE THE

#$@$ PERFORMANCE

NUMBERS?

TUESDAY 9:30am,

SESSION 3A ?!

I’LL BE THERE!

INTRIGUED TOM CONTE