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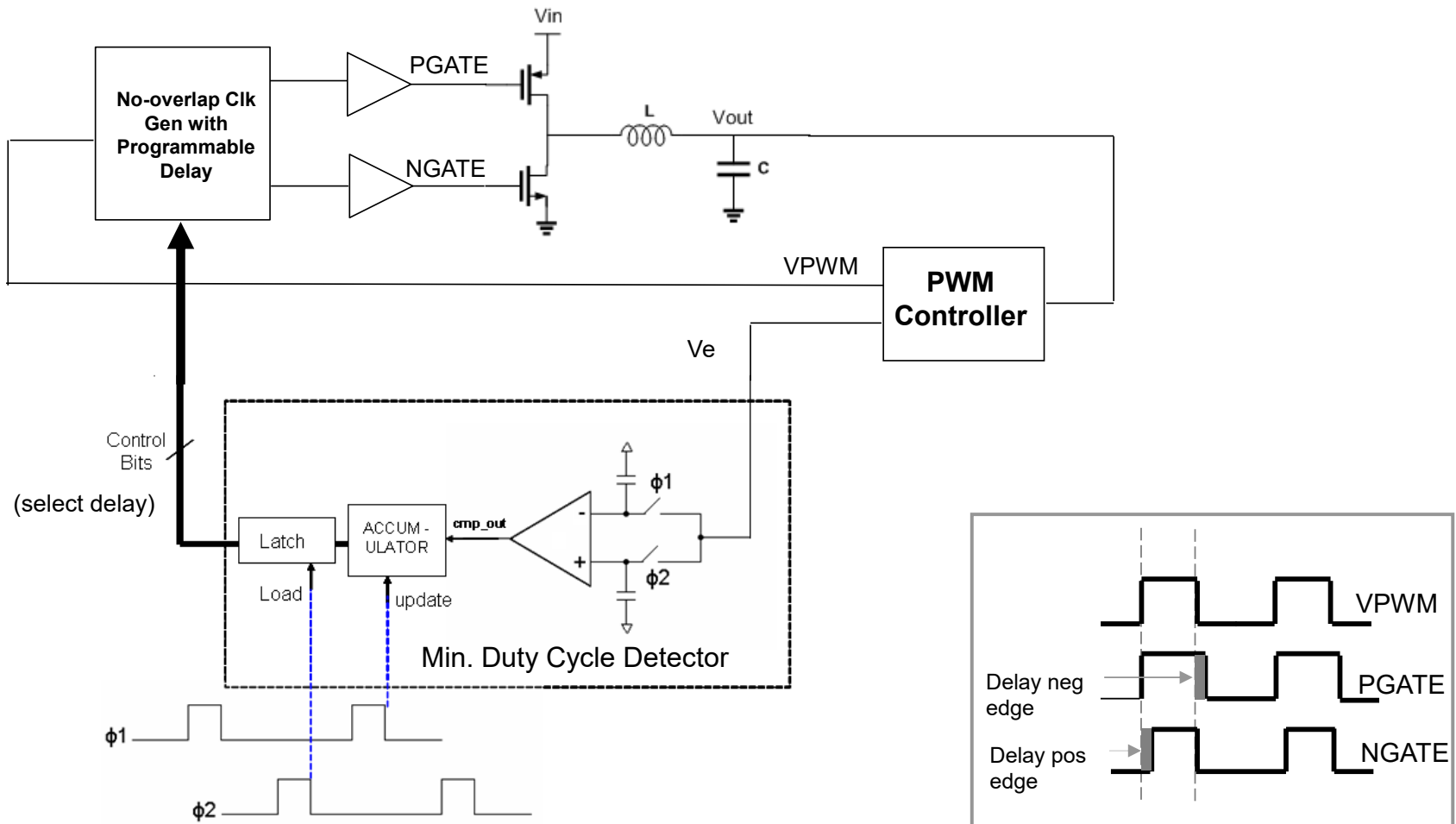
# ***Lecture-44***

## ***EE5325 Power Management Integrated Circuits***

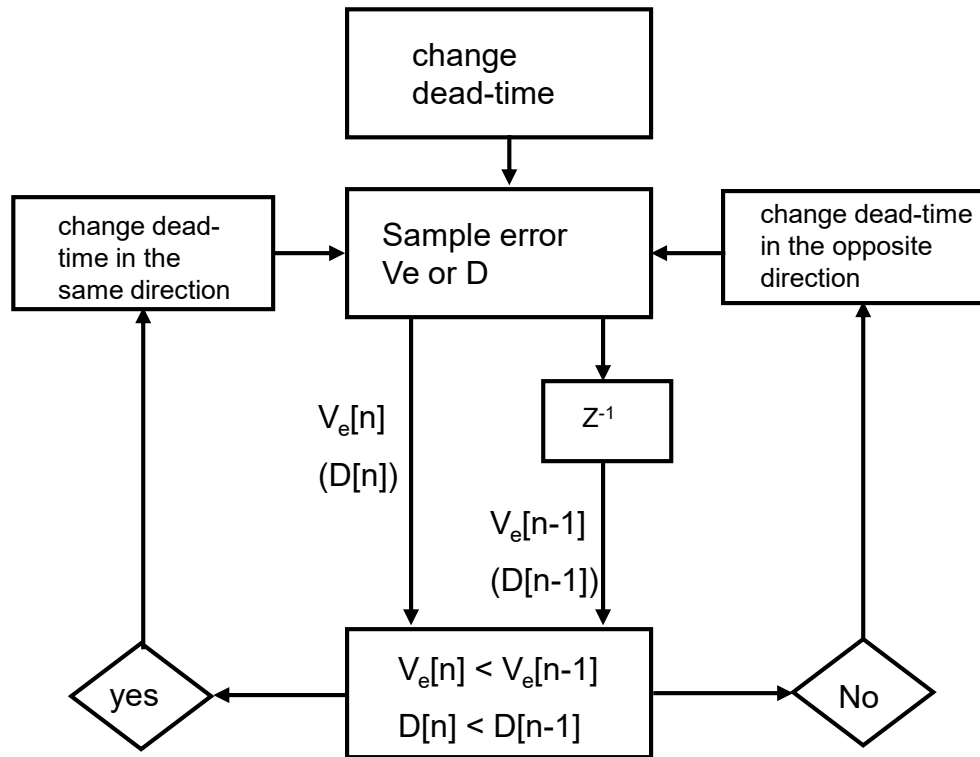
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# Adaptive Dead Time Control



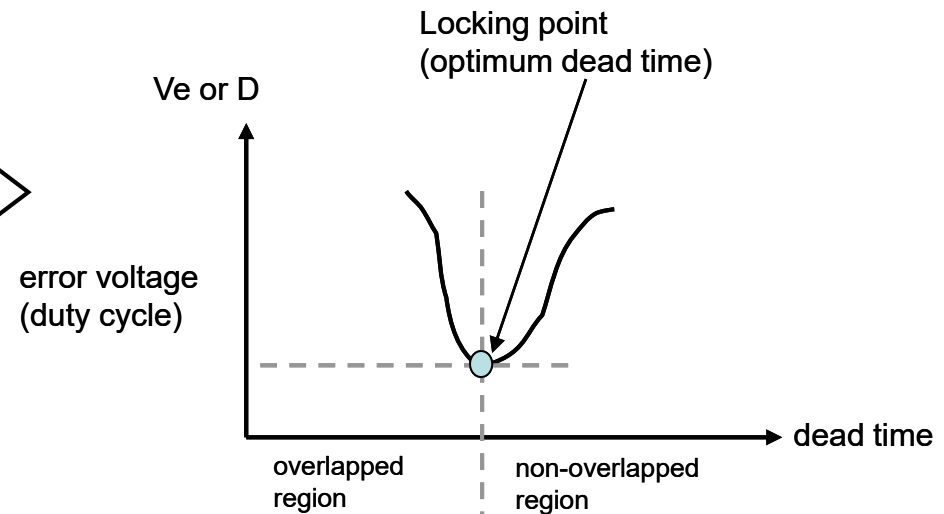
# Adaptive dead time algorithm



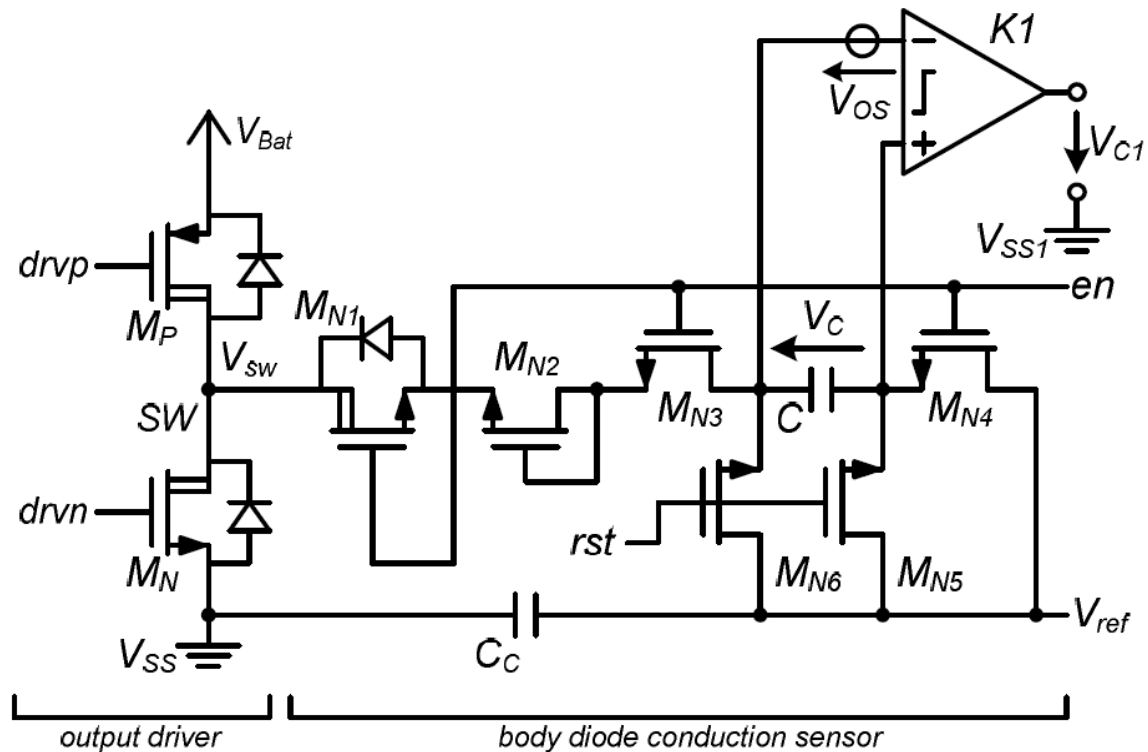
$V_e[n]$  or  $D[n] \rightarrow$  sample after changing the dead-time

$V_e[n-1]$  or  $D[n-1] \rightarrow$  sample before changing the dead-time

If overlapped region needs to be avoided then initial dead-time could be set to max and brought to optimum point through adaptive control.



# Adaptive Dead Time Control



G. Maderbacher, T. Jackum, W. Pribyl and C. Sandner, "A sensor concept for minimizing body diode conduction losses in DC/DC converters," *2010 Proceedings of ESSCIRC*, Seville, 2010, pp. 442-445.

# References

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- G. Maderbacher, T. Jackum, W. Pribyl and C. Sandner, "A sensor concept for minimizing body diode conduction losses in DC/DC converters," *2010 Proceedings of ESSCIRC*, Seville, 2010, pp. 442-445.
- G. Maderbacher, T. Jackum, W. Pribyl, M. Wassermann, A. Petschar and C. Sandner, "Automatic dead time optimization in a high frequency DC-DC buck converter in 65 nm CMOS," *2011 Proceedings of the ESSCIRC (ESSCIRC)*, Helsinki, 2011, pp. 487-490.
- V. Yousefzadeh and D. Maksimovic', "Sensorless optimization of dead times in dc-dc converters with synchronous rectifiers," *IEEE Trans. Power Electron.*, vol. 21, no. 4, pp. 994-1002, Jul. 2006.