Dual Bootstrapped, 12 V MOSFET Driver with Output Disable

ADP3418

FEATURES

All-in-one synchronous buck driver
Bootstrapped high-side drive
1 PWM signal generates both drives
Anticross-conduction protection circuitry

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Publication Order Number:
ADP3418/D

SPECIFICATIONS[1]

V_{CC} = 12 V, BST = 4 V to 26 V, T_A = 0°C to 85°C, unless otherwise noted.

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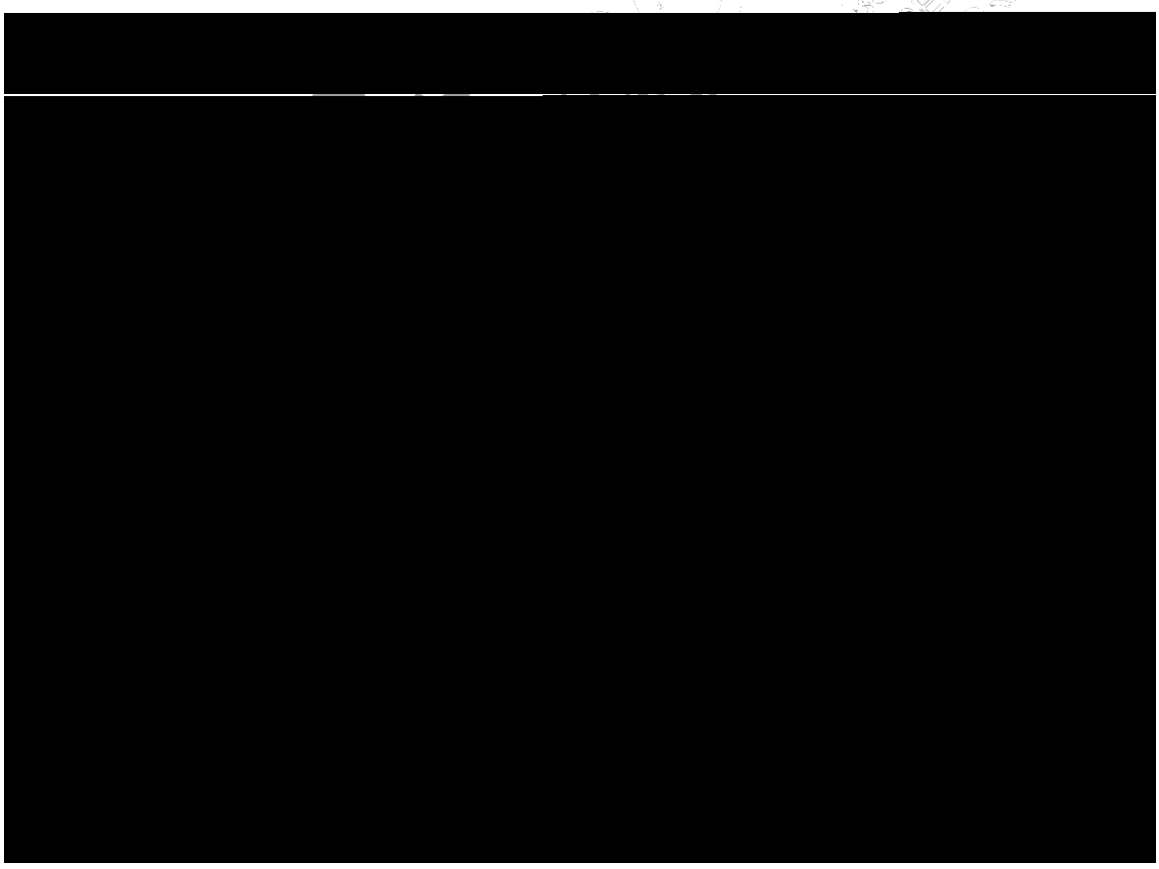
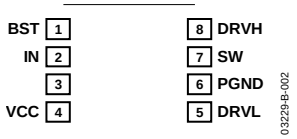
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
SUPPLY						
Supply Voltage Range	V_{CC}		4.15		13.2	V
Supply Current	I_{SYS}	BST = 12 V, IN = 0 V		3	6	mA
$\overline{OD}$ INPUT						
Input Voltage High			2.6			V
Input Voltage Low					0.8	V



PIN CONFIGURATION AND FUNCTION DESCRIPTIONS



TYPICAL PERFORMANCE CHARACTERISTICS

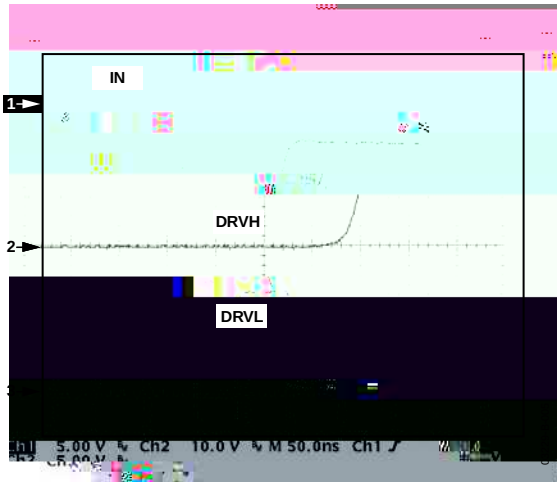


Figure 5. DRVH Rise and DRVL Fall Times

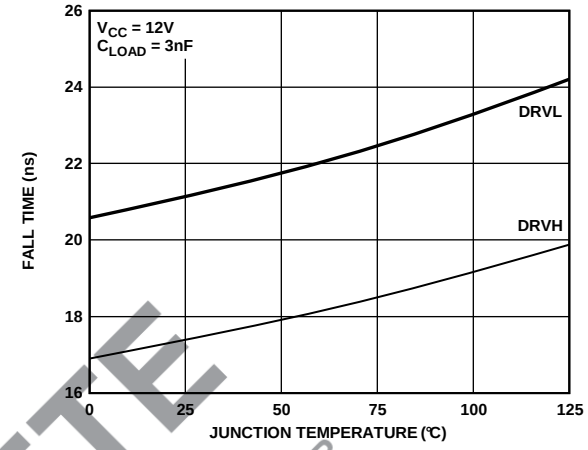
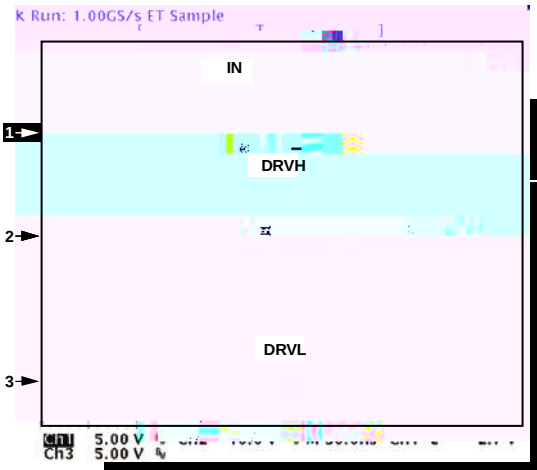


Figure 8. DRVH and DRVL Fall Times vs. Junction Temperature



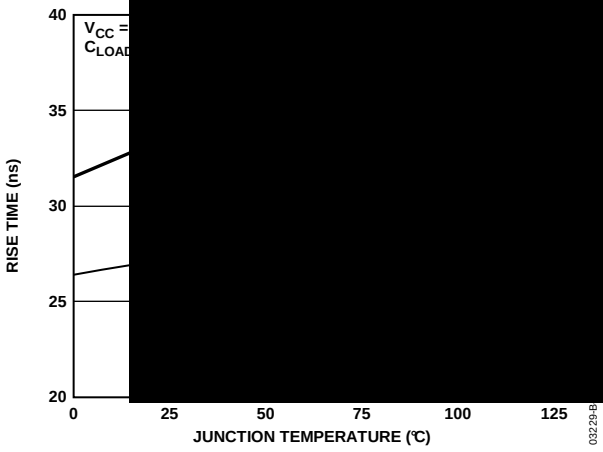


Figure 7. DRVH and DRVL Rise Times vs. Junction Temperature

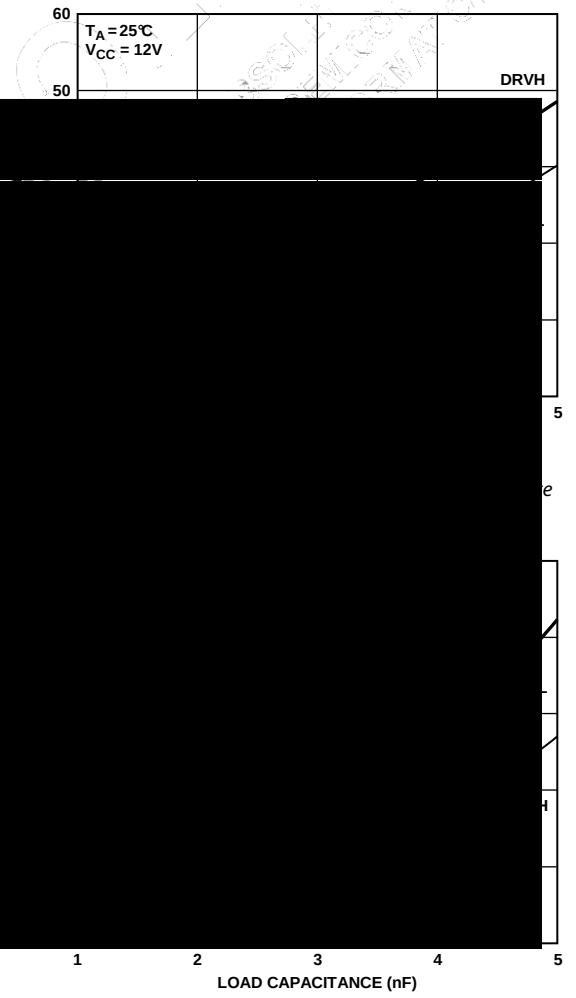


Figure 10. DRVH and DRVL Fall Times vs. Load Capacitance

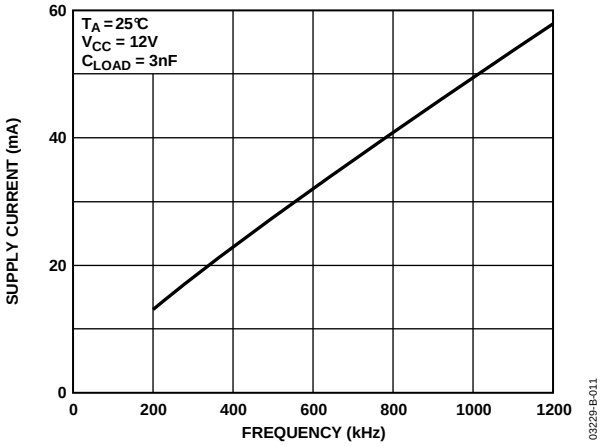
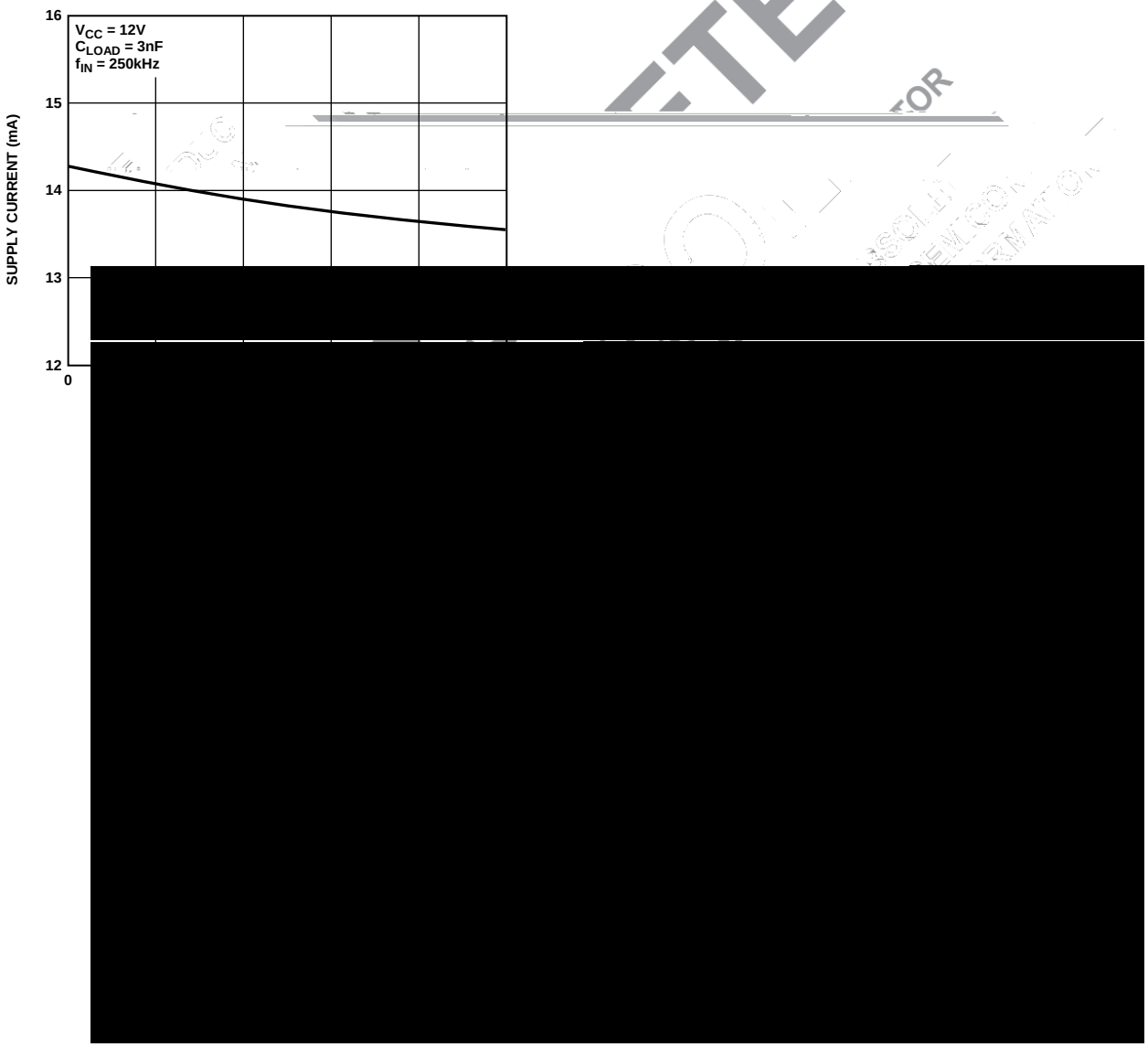
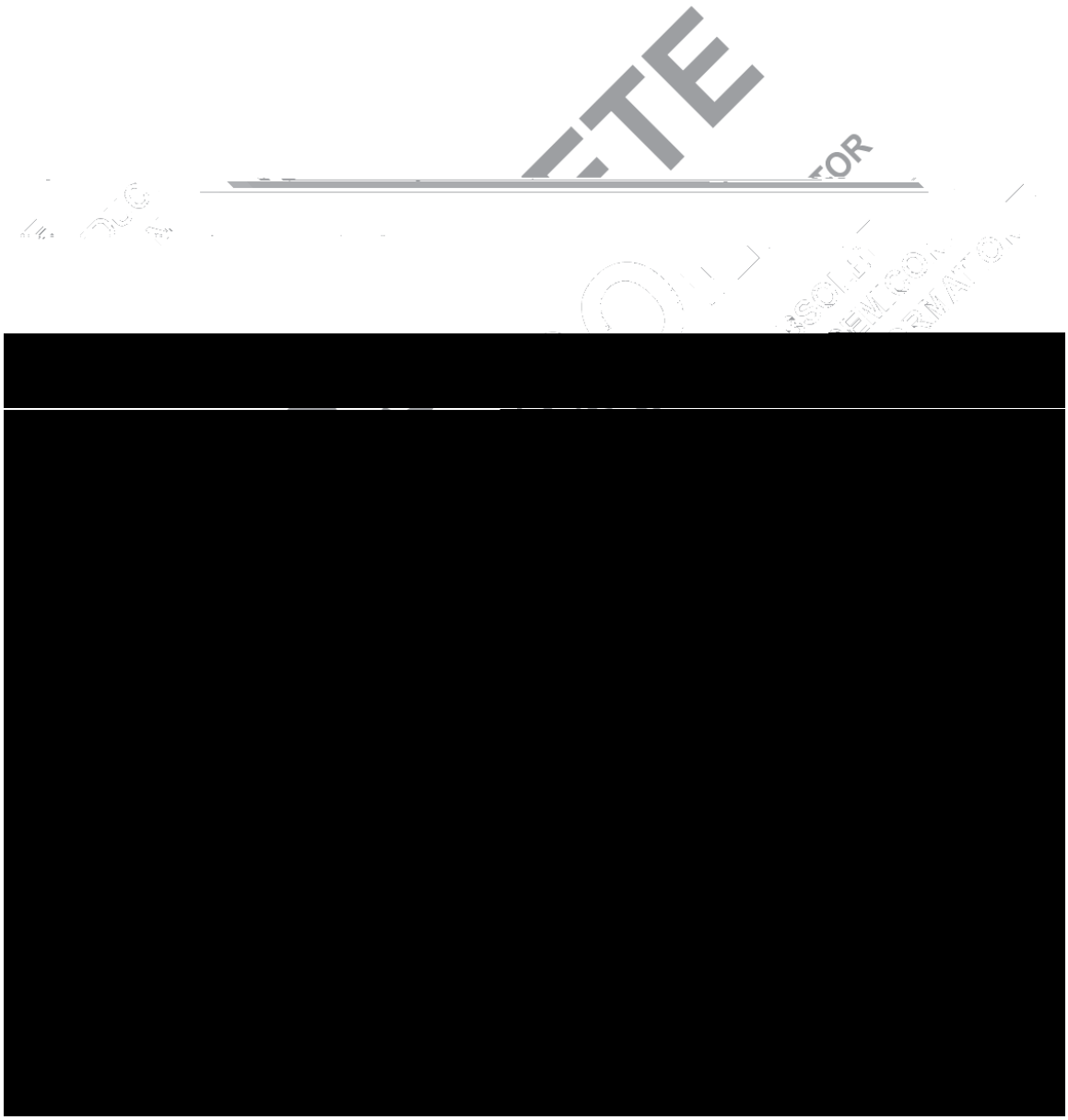


Figure 11. Supply Current vs. Frequency



THEORY OF OPERATION

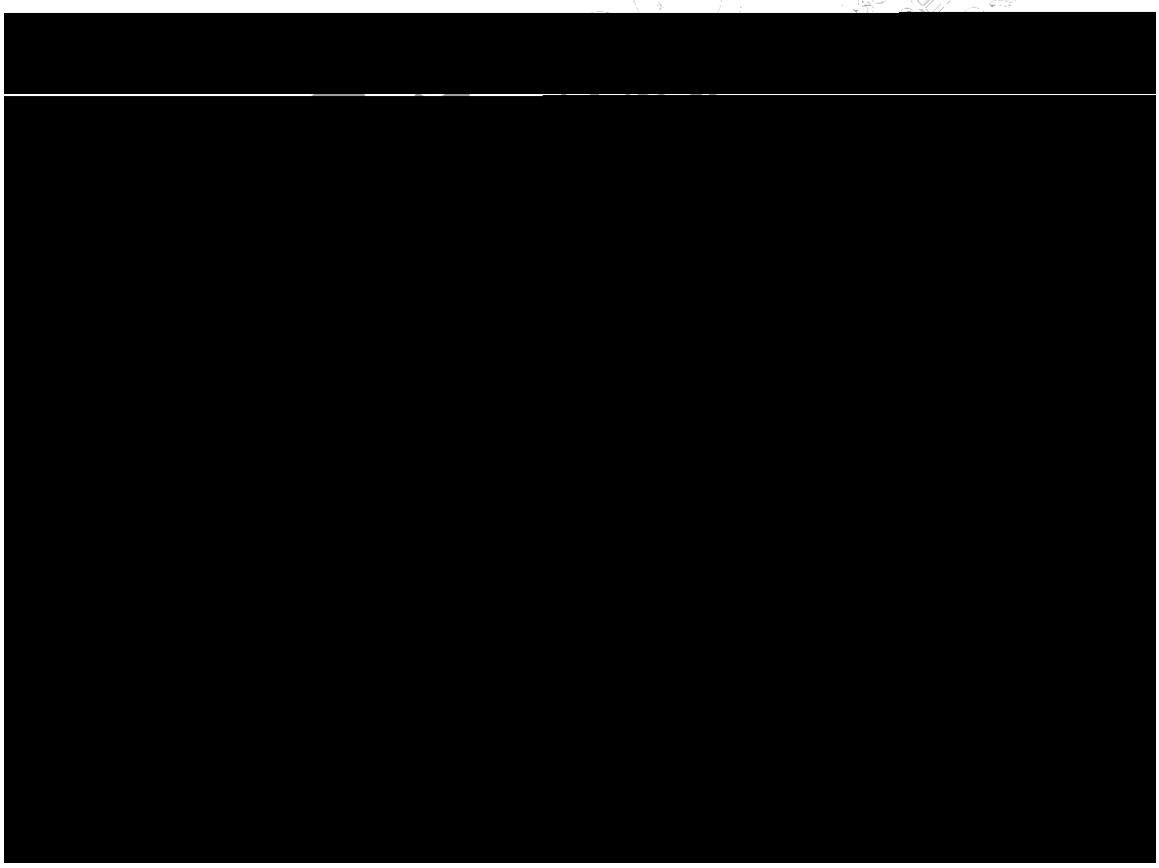
The ADP3418 is a dual MOSFET driver optimized for driving two N-channel MOSFETs in a synchronous buck converter



APPLICATION INFORMATION

SUPPLY CAPACITOR SELECTION

For the supply input (V_{CC}) of the ADP3418, a local bypass capacitor is recommended to reduce the noise and to supply some of the peak currents drawn, such as a 4.7 μF,



The MOSFET vendor should provide a maximum voltage slew rate at the drain current rating such that this can be designed around. Once this specification is had, the next step is to determine the maximum current expected to be seen in the MOSFET. This can be done by

$$_{AX} = _{DC}(p\blacksquare r\ p\ \ s\blacksquare)+(\ _{CC}-\ \ )\times\frac{D\ _{AX}}{_{AX}\times} \quad (5)$$

where:

$D\ _{AX}$ is determined for the VR controller being used with the driver. Note that this current is divided roughly equally between MOSFETs if more than one is used (assume a worst-case mismatch of 30% for design margin).

is the output inductor value.

When producing the design, there is no exact method for calculating the dV/dt due to the parasitic effects in the external MOSFETs as well as the PCB. However, it can be measured to determine if it is safe. If it appears the dV/dt is too fast, an optional gate resistor can be added between DRVH and the high-side MOSFETs. This resistor slows down the dV/dt, but it also increases the switching losses in the high-side MOSFETs. The ADP
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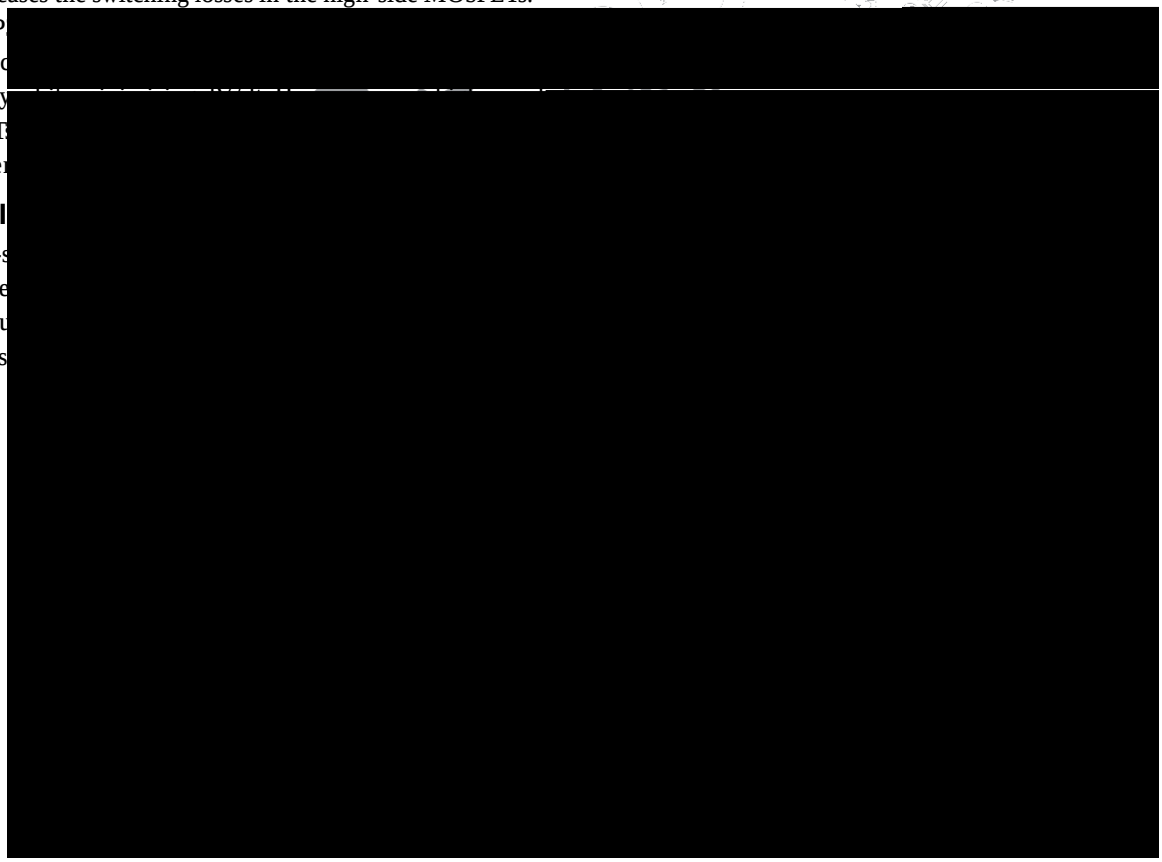

OUTLINE DIMENSIONS