Step-up Application : High Voltage and Positive-Negative Voltage Output Solutions

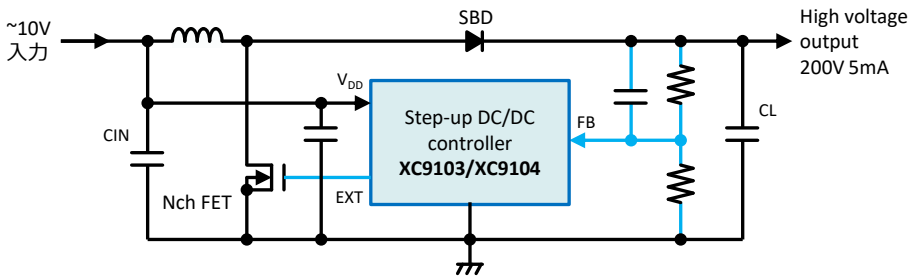
■ High Voltage / Positive-Negative Voltage for Biasing

● Technical trend and challenges

- Various bias power supplies, audio equipment, EMS devices, etc., require high voltages ranging from tens of volts to 300V / positive-negative voltages (up to several mA).
- Power management ICs and technical documentation supporting high voltage / positive-negative voltage outputs are scarce.
  Creating such circuits requires expertise in power supply circuitry and peripheral components.
- Using a generic step-up DC/DC converter circuit to generate high voltage and positive-negative voltage at low cost.

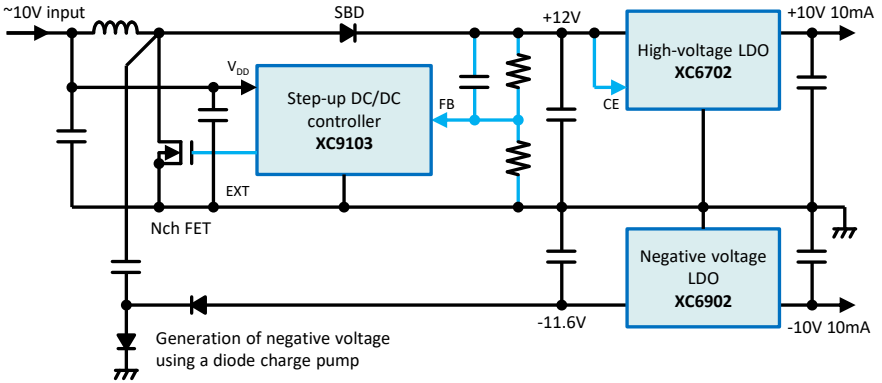
● TOREX Proposal : Generating High Voltage / Positive-Negative Voltage Using a Step-up DC/DC

➢ Example of High Voltage Generation (5V → 200V/5mA)



- Create high voltage cost-effectively using the step-up DC/DC controllers **XC9103** / **XC9104**
- Step-up to high voltage is achievable by selecting Nch FETs, SBDs, and peripheral components to match the required output voltage.
- **Output voltage** can be achieved **from tens of volts up to approximately 300V.**
- Where the input voltage is 10V or above, this can be accommodated by supplying a voltage within the operating range from the LDO to the V_{DD} pin of the **XC9103 / XC9104**.

➢ Example of Positive-Negative Voltage Generation using a Diode Charge Pump (5V → ±-15V/10mA)



- A step-up circuit was constructed using the step-up DC/DC controller **XC9103**
  A negative voltage was generated using a diode charge pump with a switching node.
- By utilizing the diode charge pump, it is possible to create a voltage boosted by n times the positive reference output voltage, as well as a negative voltage of -n times.
- A stable voltage is supplied by passing through an LDO.