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Nice Arcs High Voltage DCDC converter module YH11068 - close look at and test with sparks *Soft Switching Part 1 High Voltage MOSFET Switch Tutorial*

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Mosfets Zero Voltage Switching Full

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» Zero voltage diode » JeeLabs

AN2626 Application note - STMicroelectronics

A Review of Zero-Voltage Switching and Importance | DigiKey

□ Designed and developed for “soft switching” or “zero voltage switching” topologies such as: o Half bridge (LLC) o Phase-shifted full bridge o Can be also be used for “hard switching” topologies where the body diode MOSFET operates only in the first quadrant (never turns on) □ Power factor correction (PFC) □ Two-switch forward converter □ Flyback converter □ Forward converter charge forces the voltage across MOSFET A to zero (MOS-FET B ZVS occurs during the cycles second half), enabling zero voltage switching to take place. Here the MOSFETs output capacitances form a resonant circuit with the resonant inductance. The charge is displaced in a time equal to one-fourth the resonant period. As a result, the left leg transi-

The MOSFET is the most common choice of controlled switch in the zero-voltage-switching full-bridge converter. The MOSFET is capable of very fast commutations and its intrinsic body diode saves an additional external component that would otherwise be necessary to clamp the switch voltage to the in-

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#### High-Voltage MOSFET Behavior in Soft-Switching Converters ...

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#### AN9506: A 50W, 500kHz, Full-Bridge, Phase-Shift, ZVS ...

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#### Quadrilateral Current Mode (QCM) Paralleling of Power ...

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#### Zero Voltage Switching - Texas Instruments

Quasi-resonant switching is a good technique for improving voltage-converter efficiency, but things can be further improved by implementing full soft switching. During soft switching the voltage falls to zero (rather than just a minimum) before the MOSFET is turned on or off, eliminating any overlap between voltage and current and minimizing losses. (The technique can also be used to switch the MOSFET when current, rather than voltage, reaches zero. This is known as Zero Current Switching ... The basic idea of zero voltage switching is simple. Prior to turn on, the MOSFET  $V_{DS}$  is at a high voltage, which is also the voltage to which  $C_{OSS}$  is charged. To achieve ZVS, the  $C_{OSS}$  is tricked into discharging its energy before the gate signal is applied. Even a partial discharge is beneficial though ideally, all of the energy stored in  $C_{OSS}$

September 2007 Rev 1 1/13. AN2626 Application note. MOSFET body diode recovery mechanism in a phase-shifted ZVS full bridge DC/DC converter. Introduction. The ZVS exploits the parasitic circuit elements to guarantee zero voltage across the switching device before turn on, eliminating hence any power losses due to the simultaneous overlap of switch current and voltage at each transition [1]. Infineon's 40V and 60V MOSFET product families feature not only the industry's lowest  $R_{DS(on)}$  but also a perfect switching behavior for fast switching applications. 15% lower  $R_{DS(on)}$  and 31% lower figure of merit ( $R_{DS(on)} \times Q_g$ ) compared to alternative devices has been realized by advanced thin wafer technology.

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