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Implementation of Non-Isolated High Voltage Gain Input-Parallel Output-Series Dc/Dc Converter with Switched Capacitor

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Abstract: This paper proposed about non-isolated input-paralleloutput-series dc/dc converter with switched capacitor. A non-isolated dc-dc converter can it'soperate its own input and output between the dc line path systems. It can be for design it on integrated circuit system which can consist of low cost it may be use in process of negative ground application system. Switched capacitor operatedat high-electrical voltage current on the input sidethenno protection of loadwith less noise filtering system. The high voltage gain interface system but the low voltages limited by duty cycle. Theextremely, large duty cycle is inevitable at switched capacitor formed by the two-capacitor and three diodes are proposed. Which increases to switch current and deteriorates conductionand switching losses problem solved by the proposed converterthe primary side of the capacitor was connected to input-parallel to carry the current ripple at the input side. The secondary sides of the capacitor wereconnected to the output-series to get the current and reduces ripple at the output side. There switched capacitor extending the voltage gain and balancing problem of diodes can been reasonable leakage inductances can be recycled we are comparing switched capacitor based on dc-dc converter. The modified converter has two stage switched capacitor in series. Then the combination is used for increases voltage gain of converter side of switched capacitor.

Keywords: DC/DC converter, High voltage gain, Switched capacitor, MATLAB/Simulink.

1. INTRODUCTION

Switched-capacitor (SC) converter are required in many industry for commercial products and it's have the advantages of small size, light weight, and high density due to the absence of magnetic components which can be high voltage gain are in derived in [1] and [2].Which can be useful in suitable in electronics like mp3player, cameras with the increasing demandsfor power converters.The dc-dc power converter was can use the switches and capacitor can converter the one of the voltage defiantly to another voltage. The switched capacitor dc-dc converter no inductor are used. The switched capacitor converter may be with energy efficiency can be varied still up to frequently used. The switched capacitor can integrated and develop the common integrated inductors are not useful for a power electronics applications. Then its non-overlapping can be signals are used to control the switches [3]. The switched capacitor dc-dc converter can also be exhibit there on advantages so that not all switches are closed simultaneously filters implemented with these elements are turned "switched capacitors filters" and depend only on ratio of between capacitors[4].these may be used to provide the voltage of much more the suitable with in integrated circuits help of flash and the programmable type of memory which can specified resistors[5].the switched capacitor are used in led-display light's, discrete-capacitor and integrated circuits are not in economical to construct in switched capacitor in order to say that high voltage conversion ratio M it can be obtained by the use of the two ratios of boost converter conversion and by varying frequency switches with coupled inductor in the integratedcircuit the low-extremely stand power circuit, and low-ultra power as wireless sensor nodes system dc-dc converter for output full regulation method, the SC occupied in space can be regulated for the

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inductor-based system cycle the control circuit efficiency and implies for the transient system[6]and[9]. The duty cycle may be stored by generating in capacitor-internal a power supply of +10v in single –polarity of 5v input amount of the part in the power can available in Zhao and Lee [10] introduced a family of high-efficient and high step-up dc-dc converters byOnly adding one addition diode and a small capacitor.TheSC can be variable connecting process of the arbitrary it voltage source current source, resistive load and the other circuit. Low-frequency output-impedance can subset the maxim converter power by efficiency minimal objects the load regulation can been open-loop voltage regulation with switched [11].the voltage regulation have mostly developed for revised the valve of a 1-v supply source off the voltage can be required in the microprocessors[12] a tuition on the circuits of dynamic are fast still found in process[13].the switched-capacitor can be varied in the cascade method of converter for getting their own voltage ratio.

Non-isolatedAlthough the non-dissipative snubber circuits and active-clamp circuits can be employed, the cost is increased due to the extra power switch and high side driver [14] in single transistor driven can obtained between voltage and current overstress. Thehigh –efficiency and high voltage gain were introduced by the wai and duan.This can have only one part of switching losses[15]. The boost converter is also having higher coefficient coupling system for phenomenon for circuit current supply can be varied in process of topology. The high efficiency mostly effective at solution of the environmental pollution may be varied in formation of voltage regulation problem.Then voltage circuit isproduced at the voltage-lifts technique. The conversion of the efficiency will be improved by archived performance charged conversion forward employing capacitors cells. A 20V input 480 W voltage doubler prototypes is also designed and built to confirm the operation, simulation and experiment results are provided.Thusmaking reliable and low cost.

2. OPERATION OF SWITCHED CAPACITOR

The proposed converter about the process in switched capacitor can explain in the method of topology of interleaved boost converter with non-isolated system for switched-capacitor and coupled-inductor can be shown in fig1.the input is given by dc-input terminal than module can operate in process of the varied in input-parallel output-series 1) the switched capacitor can multiple voltage gain in the interleaved boost converter system.2) high output voltage ripple due to in between the series-connectedsystem capacitors.3)high switch voltage stress present in the switched-capacitor. And high voltage gain due to the series connected

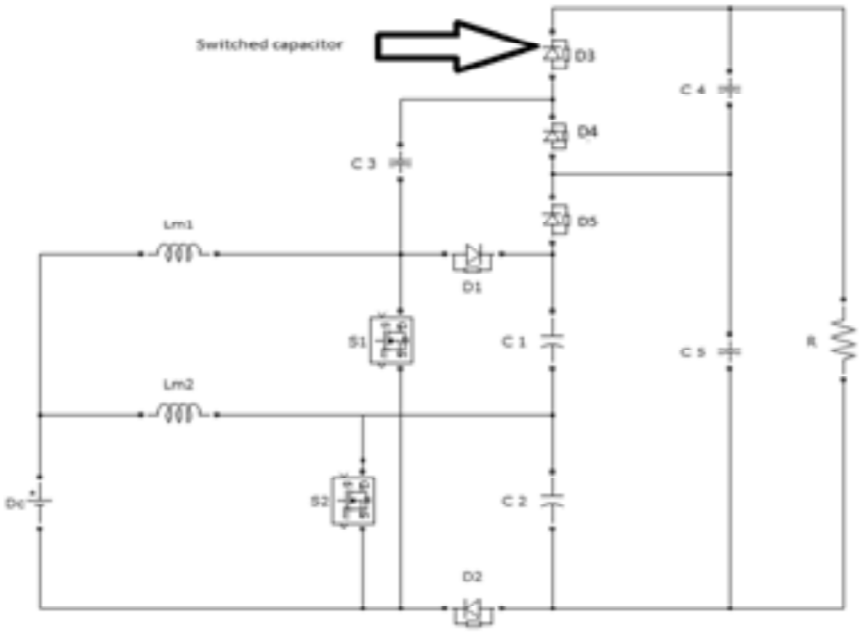


Figure 1: A high voltage gain input-parallel output series dc/dc converter with switched capacitor

capacitor side present. Then switched capacitor can about non-isolated converter can parameters could be voltage-clamped techniques can be manipulated so that process in the working period can between voltage level of source system many different in power diodes can presented.

Lm1, Lm2-magnetizing inductances

S1, s2-main switches

C1, C2, C3,-clamp capacitors

D1, D2-clamp diodes

D3, D4, D5-regenerative diode and capacitor

C4, C5-output capacitors

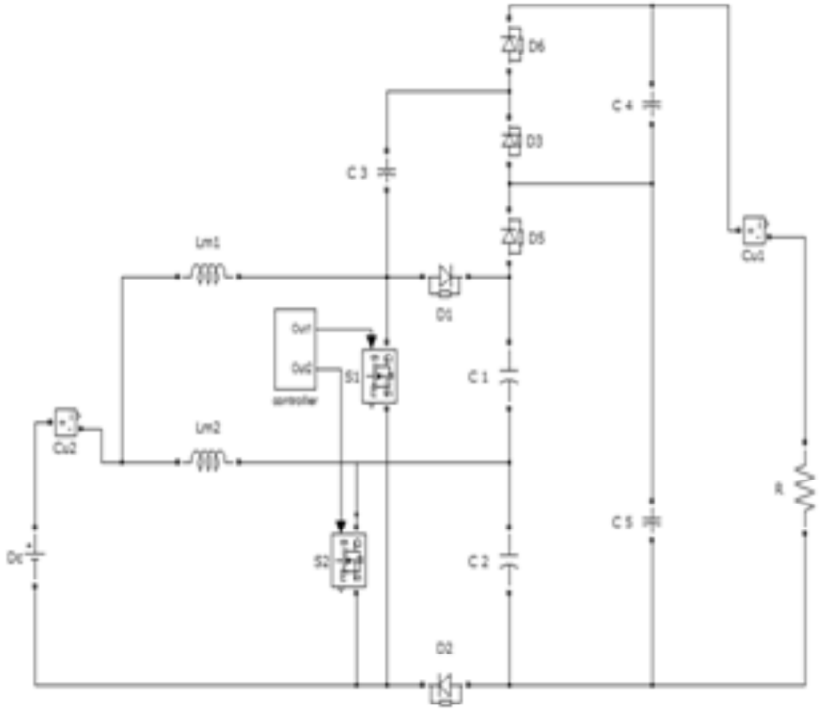


Figure 2: Proposed converter circuit for switched capacitor

Sc technique is a combination of series capacitor which improve the output voltage by controlling the capacitor link system to reduce the voltage ripple of the capacitor and achive high effecieny fig 2.The dc input is given to leakage inductance lm1, lm2 is connect to leakage inductance lm2.then both lm1 and lm2 to diode but switch s2 is connected the lm2 and the s1 is connected to capacitor and the capacitor c1 is connected in between d3, and d4 as per the process. We d1 is connected to the R-load in d4, and d3 were connected of the c4 and c5 of the switched capacitors in the switched capacitor c1, and d3, d4, d5 and c2 also connected in switched capacitor. This cycle can converter of switched with 180 degree process. Then can be operated for when switches s1-on, s2-on;then s1-on and s2-off, then s1-off and s2-on, then s1-off and s2-off;with one side to another side of energy with switched capacitor;

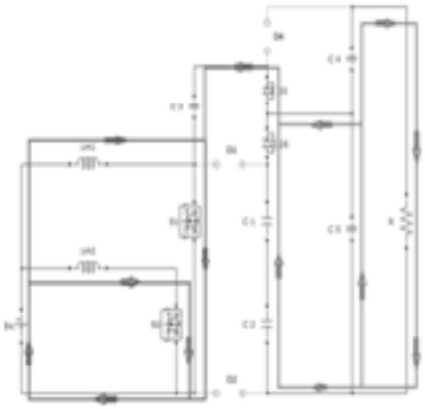
3. MODE OF OPERATION

FIRST STAGE: At both two switches are S1-on and S2-on stage then inductors are LM1 and LM2 are charging energy the output capacitor c4, c3 are deriving to the load. Then load connect to diodes were turn off at D1, D2, D3 power switch can operated in process of zero current switching system. With load diode can carrying the current stress in reverse recovery problem.

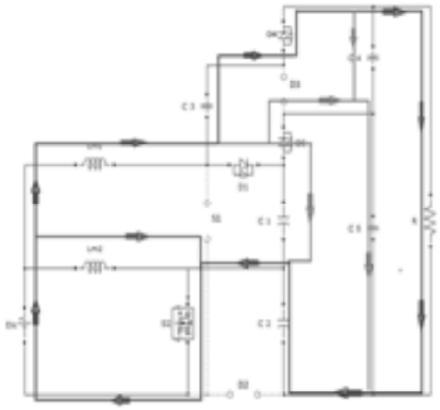
SECOND STAGE: the switch S1 is in off position and S2 is in on position the Lm2 is charge the energy Lm1 is charge that to load then C4 and C5 are charge at the C3 is discharge with diodes of the system then the load can capacitors of the inductors by process of the diodes

THIRD STAGE: the switches are both s1 and s2 is on-position then first mode C4, C5 capacitor are discharge and c3 is all ways charge then D1, D2, D3 didoes are interleaved between their own position then in leakage magnetic Lm2, Lm1, are can be varied system

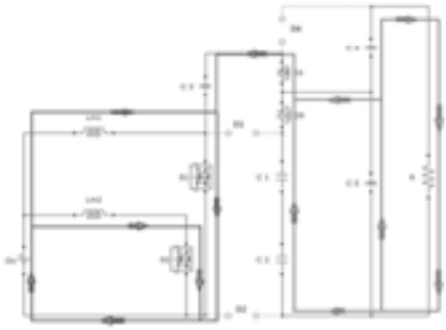
FOURTH STAGE: thus S1 will be on state and S2 will be off-stage at that time inductor Lm1, is charging the energy from source Lm2 is discharge the energy through load then C1, C4, C3 capacitors are discharge at that diode D5 is forward dais.



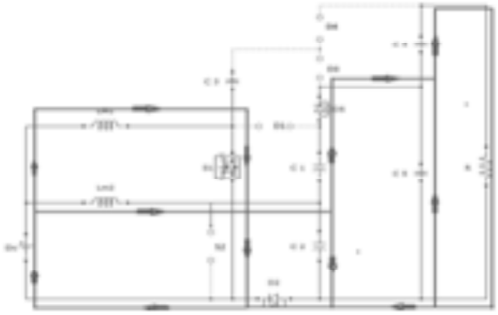
FIRST STAGE:



SECOND STAGE:



THRID STAGE:



FOURTH STAGE:

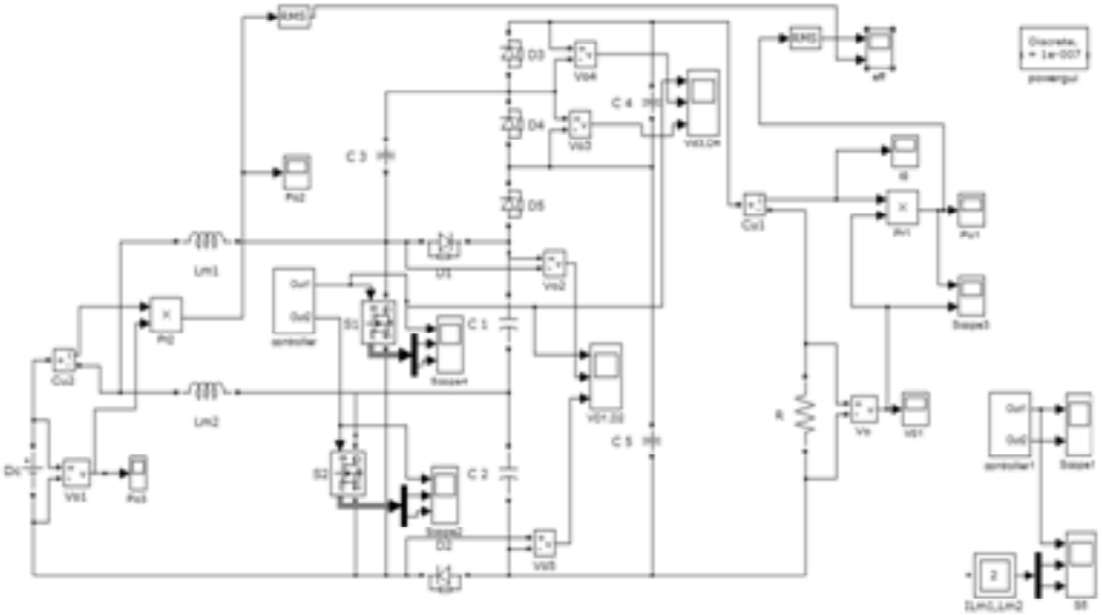
4. ANALYSIS OF PROPOSED CONVERTER

1) Slow switching limit:-the impedance with the resistance of the required for switches, capacitors are not in used. Acharger multiper vector bepresentedfor switched-capacitors with suppling for phase capacitors the switched-capacitor dc-dc converter were using of Kirchhoff's law-current flow through charge multiplier vector system. The input terminal were using of non-zero supplied for phase of one side only, wherethe switched capacitor dc/dc converter can be connected input terminal may be short-circulated then output terminal may be connected to the independent of dc-voltage source system

2) capacitor non-linear:-The series output of converter losses can be obtained then capacitors be related with voltage swing time period of capacitor system the demonstrates control of energy lost in between capacitors then equal the transistor and diodes were focused in between voltage stress of total energy may be field magnetic in inductor at the current ripple process can be formed then period of with switching inductance stages of the discharged method of the voltage output stages for steady-state analysis.

3) fast-switching limit:-The converter that can be flow in current between capacitors the duty cycle of switching determine by the combination may be linear to charge capacitors system a positive multiplier steady-state of fast-switching limit can be simple varied to charge flows to the switches of the circuit capacitors system switched capacitors may switch conducts positive current may be blocks in the positive terminals of voltage while it off system switched capacitor can be charge in input and output of flow of the output voltage drop the actual power can circuit loss of power in due to the output impedance of system the co-efficiency of each switch can be charge in multiplier possess of the parameters in the output impedance may be design for the switched capacitors dc/dc converter.

5. PROPOSED SIMULINK MODEL



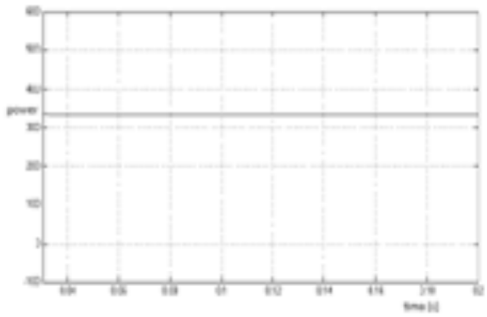


Figure 3: (a) input power

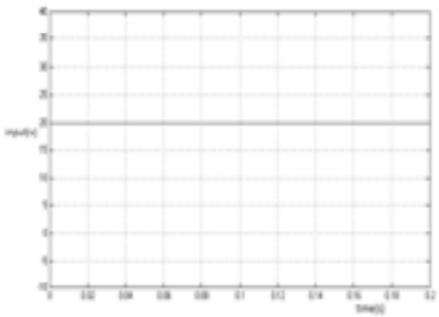
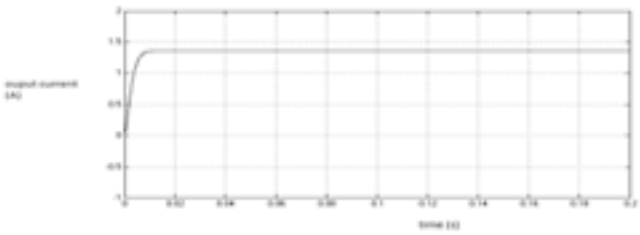
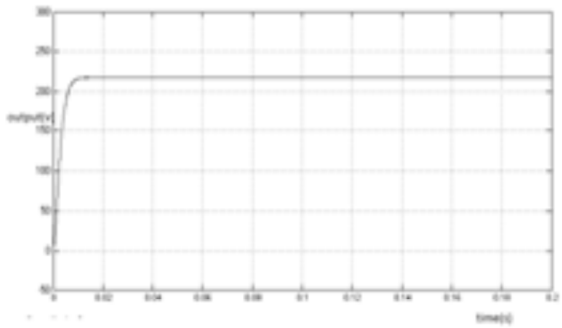


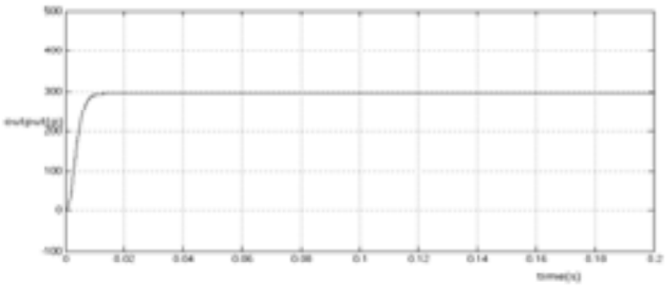
Fig 3: (b) input voltage



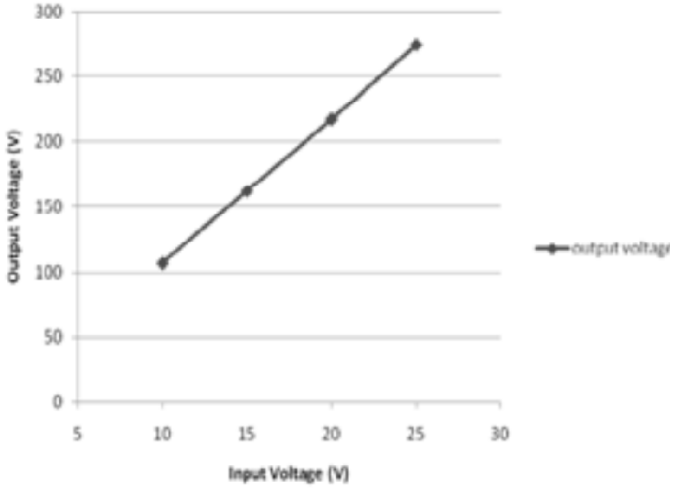
Input current



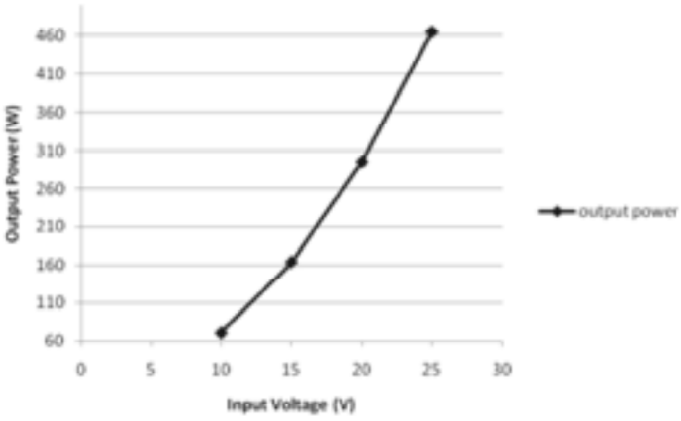
(b) output voltage



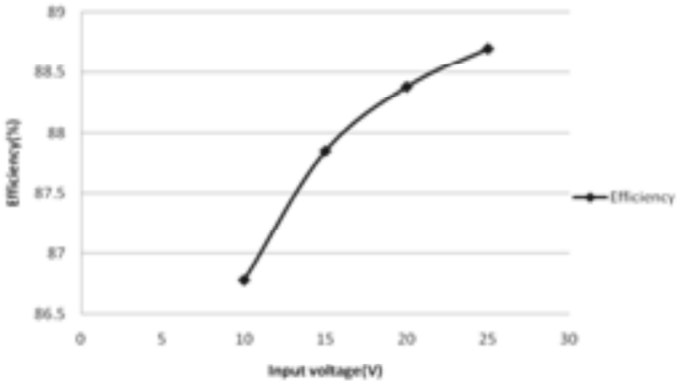
(c) output power



Input voltage Vs output voltage



Input voltage Vs output power



Input voltage Vs Eficiency

7. DESIGN CONSIDERTIONS

(1) Switched capacitor: the sc means dc-dc converter no inductors are used in capitor voltage supply process it may be attracted could be switches and suppling process of period can be prestend electrioncs applicationcs sysem the methid can be disucess in voltage efficiently period system it can display system.

(2) Active switches and diodes: The aswitches-rating is process of tramission of it can effect to the system of leakage-inductances system may be persented in process diodes it wili be the voltage sources method the capacitor charged by the series source it can been obtained maximum of 100% efficienty by using the soft-charing linit the switched capacitor may loss upto 21% decreases in the current-source load how ever the higher efficeny can been ripple in voltage efficiency may be

achieved in cuurent-source system to ensure output significant minimum value micro-processor may been voltage source load result in the conduction

(3) Resistive load:-The switched-capacitor can be converter in resistive load output of capacitor the capacitor is large size in output switching frequency of the output converter with a high voltage gain can beeen presented in the charge of interlaved phases with additional of loss in current for the process of the capacitor load but instead it equal in each phase impulsive charges to squre they evalute performance of the magnitude of each pulses.

Table 1
parameters of proposed converter

Components	*Parameters*
Input voltage vin	10-25
Output voltage vo	274
Maximum output power	465.86
Switching frequceny	40KHZ
Magnetizing inductors	120e-6
Power switches s1, s2	IRFP150N
Diodes d1, d3, and d5	SSK20-015K
Diodes d2, d4	DSSK28-015K
Capacitor c1, c2, c3	0e-6
Capacitor c4, and c5	0e-6(or)470uf/220v
Resistance	160Ω

8. CONCLUSION

A unified method for developing switched capacitor with a high voltage gain input parallel output series conversion non-isolated high voltage and increases effeicency was proposed.The topologies of the dc-dc gain have been deducted, a detailed analysis and discussion of paractical aspects of every one of the new converters being left for other papers.the new switched capacitors converters present a similars complexity with available quadratic converter, similar voltage stress on the capacitors and didoes, for some values of the duty cycle, some of the quadratic converters have edge, for other values, the new siwtched capacitors have a dc-dc voltage stress.

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