

# White Paper

## The Merits of a Standby UPS with a Modified Sine Wave Output

### Author

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# The Merits of a Standby UPS with a Modified Sinewave Output



Of the 3 major UPS architectures (e.g. Standby, Ferroresonant On-Line, and Double-Conversion On-Line), the Standby UPS features the following advantages:

	Features	Benefits
1.	Extremely high power efficiency, typically above 97%.	Lowest operating cost in terms of electric use – only 1/10 of double-conversion on-line UPS.
2.	Air exhaust fan is normally off since very little heat is generated.	Quiet operation. Does not add to air conditioning loads.
3.	The inverter circuit is normally off.	Very quiet operation and the highest MTBF (mean-time-between failure) due to the lowest voltage, current and temperature of its internal parts.
4.	Cooler internal operating temperature.	Battery lifetime is approximately twice that of an on-line type UPS.
5.	Output waveform is normally a sinewave. The inverter waveform is a modified square-wave, generated only during power outages.	The pulse-width-modified and optimized peak-voltage modified square waveform is actually more beneficial for switchmode power supplies.
6.	Simplest and most economical UPS design.	Simple design with the lowest parts count. Means lowest purchase price and maintenance costs. Repair procedures are quick and easy.
7.	The switchover time of some high-quality Standby UPS is less than 1ms.	The ride-through of a typical switchmode power supply is 10 to 20 ms. A fast 1 ms switchover time guarantees glitch-free transfers.



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## About the Author

### **Nam Paik ~ Director of Engineering, TSi Power Corporation**

*Mr. Paik has over 15 years experience in the power electronics industry. He was with Northern Telecom (now Nortel Networks) for 4 years prior to joining TSi Power in 1988. Nam has focused on UPS, Line Conditioner and dc to ac inverter products and most recently has developed a number of customized power protection and conversion systems for several U.S. government agencies and international applications.*

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