

Moderate

Assistant Engineer (Electrical), Class 2025

Building Department

Wide Bandgap (WBG) semiconductors like Gallium Nitride (GaN) are becoming popular in power electronics primarily because they offer _____

A

Lower cost than silicon

B

Higher efficiency and smaller size for power converters

Correct

C

Easier manufacturing processes

D

Better performance at very low temperatures

Correct Answer: B**Full Detailed Explanation**

Concept & Reasoning: Wide bandgap gives high critical electric field and supports high-voltage operation with thinner active regions; GaN also offers fast switching and low charge/capacitance in suitable devices. Higher switching frequency can shrink inductors, transformers and capacitors, raising power density. Cost/manufacturing are not universally lower/easier than silicon. How to Solve It in the Exam: GaN/SiC efficiency + high frequency + power density. Important Exam Point: High-frequency capability only helps if layout, magnetics, EMI and thermal design are also engineered correctly. Related Revision Path: This question sits in the revision path Power Electronics → Semiconductor Devices → Wide-Bandgap Devices.

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