

MeitY Launches 30 kW Wide Band Gap (WBG)–Based Integrated Drive System to Boost Electric Vehicle Adoption

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An indigenously developed **30 kW Wide Band Gap (WBG)-based Integrated Drive System (IDS) for electric vehicle applications** was launched in Chennai today. The technology has been developed by Centre for Development of Advanced Computing (C-DAC), Thiruvananthapuram in collaboration with Indian Institute of Technology Madras and Lucas TVS under the National Mission on Power Electronics Technology (NaMPET). It was launched by Shri S. Krishnan, Secretary, Ministry of Electronics and Information Technology (MeitY) at IIT Madras.



The launch marks a significant step in contributing to MeitY's mission of strengthening indigenous capabilities in advanced power electronics. The 30-kW power class is **particularly relevant for** India's fast-growing **electric passenger vehicle segment**, including compact cars and fleet mobility platforms. Currently, a substantial portion of high-performance EV powertrain systems and critical semiconductor-based drive components are imported. Indigenous development of such integrated systems will **reduce import dependency, lower system costs through localization, and support scalable manufacturing** aligned with national initiatives such as Production-Linked Incentive (PLI) schemes.

The technology has been successfully designed, fabricated, and validated in collaboration with Lucas TVS and is now ready for commercialization and large-scale deployment. Successful adoption of this integrated drive technology can significantly strengthen India's EV supply chain, create opportunities for MSMEs in power electronics manufacturing, thermal systems, and control hardware, and **enhance India's global competitiveness in semiconductor-based electric mobility solutions**. Through NaMPET, MeitY continues to catalyse innovation-driven partnerships to build globally competitive and self-reliant power electronics technologies for next-generation mobility and energy systems.

Addressing the gathering, Shri S. Krishnan said that Prime Minister Narendra Modi's vision of "Make in India, Make for the World" is being realized through indigenous development of advanced power electronics technologies. He emphasized that India's transition from a technology-importing nation to a technology-developing and exporting nation is being strengthened by collaborative innovation among R&D institutions, academia, and industry. He mentioned that the development of the 30 kW Integrated Drive System represents a major milestone in India's journey towards Aatmanirbhar Bharat in electric mobility and strategic electronics. He also highlighted that the newly launched 30 kW Integrated Drive System integrates the electric motor and inverter into a single compact, high power-density unit, replacing the conventional separated motor-drive configuration. He added that such design-led innovation in India will help create strong domestic intellectual property, accelerate the start-up ecosystem, and strengthen high-value manufacturing in the EV sector.



Shri E. Magesh, Director General, C-DAC; Shri Manoj Kumar Jain, Group Coordinator (R&D in IT & CC& BT), MeitY; Shri Ramanathan N S, CTO, Lucas TVS Chennai; Shri Renji V Chako, Senior Director, C-DAC, Thiruvanthpuram; Dr Om Krishan Singh, Scientist 'E', MeitY; Prof Kamlesh Hatua, IIT Madras, and representatives from industry were present on the occasion.

Development of WBG based Integrated Drive System for Electric Vehicles [evIDS]

Design and development of a 30 kW Silicon Carbide (SiC) based integrated drive system targeted for four-wheeler electric propulsion. This compact and lightweight motor-inverter configuration provides programmable torque-speed characteristics along with high overload capability. The drive system achieves high power density and enhanced efficiency, reducing battery energy demand and extending the vehicle's driving range



FEATURES

- ❖ High starting torque and wide operating speed
- ❖ Configurable torque-speed characteristics
- ❖ High torque capability in high speed region
- ❖ Higher overload capability compared to a conventional 3 ϕ IPMSM machine
- ❖ Wider speed range (3-4 times the base speed)
- ❖ High efficiency over wide speed and torque range
- ❖ Intermittent overload capability
- ❖ Improved Electromagnetic Interference and Electromagnetic Compatibility behavior
- ❖ Low acoustic noise and low torque ripple

SYSTEM SPECIFICATIONS

Continuous Power	: 30kW
DC bus voltage	: 320V
Motor Technology	: IPMSM
Continuous RMS current	: 200A
Continuous Torque	: 110Nm
Base Speed	: 3000rpm
Operating Speed Range	: 12000rpm
Type of Sensor	: Absolute Encoder
Switching Frequency	: 10-50kHz
Type of Cooling	: Liquid
Switching Device	: SiC MOSFET Power Module
Modes of Operation	: Four Quadrant variable speed drive
Protection	: DC bus under/over voltage, Short-circuit/over current, Input under/over voltage, Over temperature
Ambient temperature	: 55°C
Digital Controller	: DSP based digital controller



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