

Abstract: The transportation sector is witnessing a rapid shift towards the use of electric vehicles as a sustainable alternative to conventional combustion vehicles.[34] B. Johns, T. Antonacci and K. Siddabattula, 2012, 'Designing a Qi-compliant receiver coil for wireless power systems, Texas Instruments Incorporated, part 1,[14] S. Li and C. Mi, 2015 "Wireless Power Transfer for Electric Vehicle Applications," Journal of Emerging and Selected Topics in Power Electronics, vol. 3, no. 1, pp. 4–17. [15] J. Villa, J. Sallan, J. Osorio, A. Llombart, 2012 High-misalignment tolerant compensation topology For ICPT Systems, IEEE Trans. Indust. Electr. 59, 945–951. [16] K. Kalwar, S. Mekhilef, M. Seyedmahmoudian, B. Horan, 2016 Coil design for high misalignment tolerant inductive power transfer system for EV charging, Energies vol 9 pp. 937. [17] C. Panchal, S. Stegen, J. Lu 2018 'Review of static and dynamic wireless electric vehicle charging system' Griffith School of Engineering, Griffith University, Nathan Campus, Brisbane 4111, Australia [18] D. Leskarac, C. Panchal, S. Stegen, J. Lu, 2015 PEV Charging Technologies and V2G on Distributed Systems and Utility Interfaces, in J. Lu, J. Hossain (Eds.), Vehicle-to-Grid: Linking Electric Vehicles to the Smart Grid, The Institution of Engineering and Technology (IET), London, United Kingdom, pp. 157–209. [19] C. Panchal, J. Lu, S. Stegen, 2017 Static in-wheel wireless charging systems for electric vehicles, Int. J. Sci. Technol. Res. 6 280–284. [20] D. Vilathgamuwa, J. Sampath, 2015 Wireless Power Transfer (WPT) for Electric Vehicles (EVs)--Present and Future Trends, in: S.F. Rajakaruna, , Springer International Publishing AG, 2015, pp. 33–60. [21] W. Zhang and C. Mi, 2016 Compensation Topologies of High-Power Wireless Power Transfer Systems, IEEE Transactions on Vehicular Technology, vol. 65, no. 6, pp. 4768–4778. [22] C. Wang, G. Covic and O. Stielau, 2004 "Power Transfer Capability and Bifurcation Phenomena of Loosely Coupled Inductive Power Transfer Systems," IEEE Transactions on Industrial Electronics, vol.[6] A. Kurs, A. Karalis, R. Moffatt, J. Joannopoulos, P. Fisher and M. Soljacic, 2007 "Wireless Power Transfer via Strongly Coupled Magnetic Resonances," Science, vol. 317, no. 5834, pp. 83–86, [7] B. Regensburger, S. Sinha, A. Kumar, J. Vance, Z. Popovic, and K. K. Afridi, 2018 "Kilowatt-Scale Large Air-Gap Multi-Modular Capacitive Wireless Power Transfer System for Electric Vehicle Charging," in IEEE Applied Power Electronics Conference and Exposition (APEC), San Antonio, USA.30, no. 11, pp. 6017–6029, 201 [10] J. Moon, H. Hwang, B. Jo, C. Kwon, T. Kim and S. Kim, 2017 "Design and Implementation of a high-efficiency 6.78MHz resonant wireless power transfer system with a 5W fully integrated power receiver," IET Power Electronics, vol. 10, no. 5, pp. 577–578. [11] V. Esteve, J. Jordan, E. Sanchis-Kilders, E. Dede, E. Maset, J. Ejea and A. Ferreres, 2015 "Comparative Study of a Single Inverter Bridge for Dual-Frequency Induction Heating Using Si and SiC MOSFETs," IEEE Transactions on Industrial Electronics, vol.[25] J. Miller, P. Schrafel, B. Long and A. Daga, 2016, The WPT dilemma – High k or high Q, in IEEE PELS Workshop on Emerging Technologies: Wireless Power Transfer (WoW), Knoxville, USA, [26] R. Bosshard, J. Muehlethaler, J. Kolar and I. Stevanovic, 2013 Optimized Magnetic Design for Inductive Power Transfer Coils, in Twenty-Eighth Annual IEEE Applied Power Electronics Conference and Exposition (APEC), Long Beach, USA.[28] R. Bosshard, J. Muehlethaler, J. Kolar and I. Stevanovic, 2013, Optimized Magnetic Design for Inductive Power Transfer Coils, in Twenty-Eighth Annual IEEE Applied Power Electronics Conference and Exposition (APEC), Long Beach, USA [29] W. Chen, C. Liu, C. Lee, Z. Shan, 2016, Cost-effectiveness comparison of coupler designs of wireless power transfer for

electric vehicle dynamic charging, *Energies* 9, 906.[8] M. Kline, I. Izyumin, B. Boser and S. Sanders, 2011 "Capacitive Power Transfer for Contactless Charging," in Twenty-Sixth Annual IEEE Applied Power Electronics Conference and Exposition (APEC), Forth Worth, USA. [9] J. Dai and D. Ludois, 2015 "A Survey of Wireless Power Transfer and a Critical Comparison of Inductive and Capacitive Coupling for Small Gap Application," *IEEE Transactions on Power Electronics*, vol.[27] R. Laouamer, M. Brunello, J. Ferieux, O. Normand and N. Buchheit, 1997, A Multi-Resonant Converter for Non-Contact Charging with Electromagnetic Coupling, in 23rd International Conference on Industrial Electronics, Control and Instrumentation (IECON), New Orleans, USA. This pioneering invention opened up new horizons for wireless charging.40, pp. 91–100. Transp. 1.