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(54) **WIRELESS POWER TRANSMITTER AND RECEIVER FOR VEHICLE**

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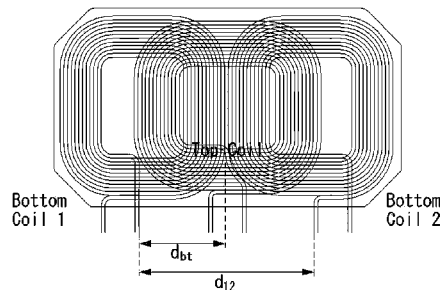
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(57) **ABSTRACT**

A wireless power transmitter configured to transfer power to a wireless power receiver including primary coils comprising first and second bottom coils placed adjacent to each other in a line and each consisting of a single layer of 11 turns and a top coil stacked on the first and second bottom coils and consisting of a single layer of 12 turns; a shielding; and a full-bridge inverter, wherein the first and second bottom coils and the top coil have a substantially rectangular frame structure with a through hole in the center, wherein the top coil lies on a plane surface in the middle between the first and second bottom coils, wherein a distance from the center of the first and second bottom coils to the center of the top coil is set to a range of 21 mm to 25 mm, wherein the first and second bottom coils have a height of 48 mm to 50 mm and a width of 43 mm to 45 mm, and the through hole in the first and second bottom coils has a height of 25 mm to 27 mm and a width of 21 mm to 23 mm, wherein the top coil has a height of 45 mm to 47 mm and a width of 48.5 mm to 50.5 mm, and the through hole in the top coil has a height of 20 mm to 22 mm and a width of 24.5 mm to 26.5 mm, wherein the first and second bottom coils and the top coil have a thickness of 0.9 mm to 1.3 mm, wherein an amount of power which is transferred is controlled based on an input voltage of the full-bridge inverter, wherein the input voltage has a range of 1 V to 18 V, wherein an operating frequency to control the amount of the power is within a range of 140 kHz to 150 kHz, wherein an assembly of the primary coils and the shielding has a self-inductance value of 11.3 μ H, wherein the full-bridge inverter drives a series capacitance, and wherein a value of the series capacitance is 139 nF.



Parameter	Symbol	Value
Top coil is placed alongside from a bottom coil with a displacement	d_{bt}	23 ± 2 mm
Bottom coils are placed alongside each other with a displacement	d_{12}	46 ± 4 mm
Self Inductance[$\text{@}1\text{V}, 100\text{kHz}$] of Primary Coil	L_p	$11.3 \pm 0.7 \mu\text{H}$
Distance from the top surface of primary coil to interface surface of base-station	d_z	5.5 ± 1.5 mm