

Laboratory **EMC Laboratory, Robert Bosch Engineering and Business Solutions Private Limited, CHIL-SEZ, Keeranatham Village, Coimbatore, Tamil Nadu**

Accreditation Standard **ISO/IEC 17025: 2017**

Certificate Number **TC-7259**

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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ELECTRONICS TESTING

I.	EMC TEST FACILITY			
1.	Electrical / Electronic Product	Radiated Emission (RE)	Antenna method, : CISPR25: 2002, Edition 2 CISPR25:2008-3, Edition 3, CISPR25:2016-10 Edition 4, Clause : 6.5 95/54/EC Directive, 1995, Annexure 7,8 2004/104/EC Directive 2004 Annexure 7,8 72/245/EEC Directive 2006 Annexure 7,8 2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 7,8 ECE-R10 Rev 4.0 2012 Annexes 7,8 ECE-R10 Rev:5.0 2014 Annexes 7,8 AIS-004(Part-3):2009 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3)/2009 Annexure 5 and 6 JLR-EMC-CS V1.0 Amendment 4 VW TL 81000 (2016-02)	9kHz to 6000MHz Upto 137 dBµV

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			Strip line method: CISPR25:2008-3, Edition 3 CISPR25:2016-10 Edition 4, Clause : 6.7 VW TL 81000 (2016-02)	100kHz to 400MHz Upto 137 dB μ V
		Conducted Emission- Power supply and Interconnect lines (CE)	Voltage Method: CISPR25:2002-08 Edition 2, CISPR25:2008-3, Edition 3 CISPR25:2016-10 Edition 4, Clause : 6.3	100kHz to 110MHz Upto 137 dB μ V
		Power lines	CISPR 32:2015 TEC/SD/DD/EMC- 221/05/OCT-16 Clause : 8.2 and 8.3	150 kHz to 30 MHz Upto 137 dB μ V
			Current probe Method: CISPR25:2002-08 Edition 2, CISPR25:2008-3 Edition 3 CISPR25:2016-10 Edition 4, Clause : 6.4 Renault 36-00-808/M, July 2012 Nissan 28401NDS02(6), January 2013	20 Hz to 245 MHz Upto 137 dB μ V

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		Conducted Emission-Transients on power supply line(CE)	ISO 7637-2:2004, Edition 2 ISO 7637-2:2011, Edition 3 Clause : 4.3 72/245/EEC Directive 2006 Annexure 10 2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 10 ECE-R10 Rev 4.0 2012 Annexes 10 ECE-R10 Rev 5.0 2014 Annexes 10 AIS-004(Part-3):2009 Annexure 8 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3): 2009	(±)12V to (±)600V
		Electrostatic Discharge Immunity (ESD)	ISO10605:2008 Edition 2 Contact and Air Discharge ISO_10605_AMD_1_2014-04 SAE J1113-13:2004 SAE J1113-13:2011 SAE J1113-13:2015 IEC 61000-4-2,2008 TEC/SD/DD/EMC-221/05/OCT-16 Clause 9.1	(±) 1kV to 30kV

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		RF Radiated Susceptibility –ALSE method	ISO 11452-2:2004, Edition 2 95/54/EC Directive 1995, Annexure 9 2004/104/EC Directive 2004 Annexure 9 72/245/EEC Directive 2006 Annexure 9 2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 9 ECE-R10 Rev 4.0 2012 Annexes 9 ECE-R10 Rev 5.0 2014 Annexes 9 AIS-004(Part-3):2009 Annexure 7 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3): 2009	80MHz to 200MHz 1V/m to 50V/m 200MHz to 6000MHz 1V/m to 200V/m
		RF Radiated Susceptibility – Harness excitation methods Bulk current Injection method (BCI)	ISO11452-4:2005, Edition 3 ISO11452-4:2011 Edition 4, 95/54/EC Directive 1995, Annexure 9 2004/104/EC Directive 2004 Annexure 9 72/245/EEC Directive 2006 Annexure 9	1MHz to 400MHz 10mA to 300mA

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			2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 9 ECE-R10 Rev 4.0 2012 Annexes 9 ECE-R10 Rev 5.0 2014 Annexes 9 AIS-004(Part-3):2009 Annexure 7 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3): 2009	
		RF Radiated Susceptibility –Strip line method	ISO11452-5:2002, Edition 2 95/54/EC Directive 1995, Annexure 9 2004/104/EC Directive 2004 Annexure 9 72/245/EEC Directive 2006 Annexure 9 2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 9 ECE-R10 Rev 4.0 2012 Annexes 9 ECE-R10 Rev 5.0 2014 Annexes 9 AIS-004(Part-3):2009 Annexure 7 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3)/2009	Frequency: 10 kHz to 400MHz 1 V/m to 360V/m

Prachi Kukreti
Convenor

N. Venkateswaran
Program Director

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		Electrical disturbance conduction and coupling Pulse 1	ISO 7637-2:2004, Edition 2 ISO 7637-2:2011, Edition 3, Clause : 5.6.1 SAE J1113-11 :2006 SAE J1113_11:2012, 2004/104/EC Directive 2004 Annexure 10 72/245/EEC Directive 2006 Annexure 10 2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 10 ECE-R10 Rev 4.0 2012 Annexes 10 ECE-R10 Rev 5.0 2014 Annexes 10 AIS-004(Part-3):2009 Annexure 8 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3): 2009	(-)20V to (-)600V, Supply voltage 32V,60A
		Electrical disturbance conduction and coupling Pulse 2 (a & b)	ISO 7637-2:2004, Edition 2 ISO 7637-2:2011, Edition 3, Clause : 5.6.2 SAE J1113-11 :2006 SAE J1113_11:2012, 2004/104/EC Directive 2004 Annexure 10 72/245/EEC Directive 2006 Annexure 10	(+)20V to (+)150V, pulse 2a (+)1V to (+)60V, pulse 2b Supply voltage 32V,60A

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			2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 10 ECE-R10 Rev 4.0 2012 Annexes 10 ECE-R10 Rev 5.0 2014 Annexes 10 AIS-004(Part-3):2009 Annexure 8 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3)/2009	
		Electrical disturbance conduction and coupling Pulse 3(a & b)	ISO 7637-2:2004, Edition 2 ISO 7637-2:2011, Edition 3, Clause : 5.6.3 SAE J1113-11 :2006 SAE J1113_11:2012, 2004/104/EC Directive 2004/Annexure 10 72/245/EEC Directive 2006 Annexure 10 2009/19/EC ECE-R10 Rev 3.0 2010 Annexes 10 ECE-R10 Rev 4.0 2012 Annexes 10 ECE-R10 Rev 5.0 2014 Annexes 10 AIS-004(Part-3):2009 Annexure 8 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3)/2009	(±) 25 to (±)800V Supply voltage 32V,60A

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		Electrical disturbance conduction and coupling Pulse 4	ISO 7637-2:2004, Edition 2, Clause : 5.6.4 SAE J1113-11 :2006, SAE J1113_11:2012, 2004/104/EC Directive 2004 Annexure 10 72/245/EEC Directive 2006 Annexure 10 2009/19/EC ECE-R10 Rev 4.0 2012 Annexes 10 ECE-R10 Rev 5.0 2014 Annexes 10 AIS-004(Part-3):2009 Annexure 8 Amendment No. 1, 10 April 2015 to AIS 004 (Part 3) 2009	Us: - 6V to – 16V Ua: - 2.5V to – 12V
		Electrical disturbance conduction and coupling Pulse 5(a & b)	ISO 7637-2:2004, Edition 2, Clause : 5.6.5 Load dump ISO 16750-2:2010 Edition 3 ISO 16750-2:2012 , Clause : 4.6.4 Edition 4 SAE J1113-11 :2006, SAE J1113_11:2012	(+)20 V to (+)200V, Supply voltage 32V,60A

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		Electrical disturbance conduction and coupling Capacitive coupling Fast pulses: Inductive coupling Slow pulses: Direct coupling capacitor Fast pulses and Slow pulses:	ISO 7637 -3:2005, ISO 7637 -3:2007 Edition 2, ISO 7637 -3:2016 , Edition 3, Clause : 4.5 SAE J1113-12 :2006 ISO 7637 -3:2005, ISO 7637 -3:2007 Edition 2, ISO 7637 -3:2016 , Edition 3, Clause : 4.7 SAE J1113-12 :2006 ISO 7637 -3:2005, ISO 7637 -3:2007 Edition 2, ISO 7637 -3:2016, Edition 3, Clause : 4.6 SAE J1113-12 :2006	(±)25V to (±)300V Supply voltage 32V,60A (±)3V to (±)150V Supply voltage 32V,60A Fast: (±)25V to (±)300V Slow: (±)20V to (±)150V Supply voltage 32V,60A
		Electrical disturbance conduction and coupling Super imposed alternating voltage	ISO 16750-2:2006, Edition 2 ISO 16750-2:2010, Edition 3 ISO 16750-2:2012, Edition 4 , Clause : 4.4	10Hz to 50KHz, 1Vpp to 10Vpp Supply voltage 32V,60A
		Electrical disturbance conduction and coupling - Discontinuities in supply voltage (momentary drop in supply voltage, Reset behavior at voltage drop, Starting profile)	ISO 16750-2:2006, Edition 2 ISO 16750-2:2010, Edition 3 ISO 16750-2:2012, Edition 4 Clause : 4.6,4.2,4.3,4.5,4.7,4.8,4.10, 4.9	Supply voltage 4V - 32V,60A

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		- DC supply voltage -Overtoltage -Slow increase and decrease of supply voltage -Reversed voltage -Ground reference and supply offset -Short-circuit protection - Open circuit		
		RF Radiated Susceptibility – Portable transmitters	ISO 11452-9:2012, Edition 1 Volkswagen: TL81000 2014-04 PSA B21 7110 D from 07/2012, chap.7.3.7 EQ/IR05	26 MHz to 6 GHz 20 W
		RF Radiated Susceptibility – Immunity to magnetic fields Radiating loop method	ISO 11452-8:2007, Edition 1 ISO 11452-8:2015, Edition 2	Upto150 kHz Test Level IV 1000 A/m
		Electrical Fast Transient (EFT)/ Burst Immunity Power lines	EN 61000-4-4,2012 TEC/SD/DD/EMC-221/05/OCT-16 Clause: 9.3	16 A for 1 ϕ Phase 32 A for 3 ϕ Phase Test level: \pm 0.5 kV to \pm 4 kV Rise time : 5 ns Pulse width: 50 ns Repetition Frequency: 5 kHz & 100 kHz

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		High Energy/Telecom Surge Immunity Power lines	IEC 61000-4-5,2014-05 TEC/SD/DD/EMC-221/05/ OCT-16 Clause: 9.4	16 A for 1 ϕ Phase 32 A for 3 ϕ Phase Open circuit Voltage: Test level: ± 0.5 kV to ± 6 kV Front time : 1.2 μ s Pulse width: 50 μ s Short circuit Current: Test level: ± 0.25 kA to ± 3 kA Front time : 8 μ s Pulse width: 20 μ s
		Immunity to conducted disturbances, induced by radio-frequency fields Power lines and signal lines	IEC 61000-4-6, 2013-10 TEC/SD/DD/EMC-221/ 05/ OCT-16 Clause: 9.5	150 kHz to 80 MHz 1 V _{rms} to 10 V _{rms}