



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

RELIABLE ANALYSIS – SHANGHAI, INC.¹
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Shanghai, People's Republic of China, 201319
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ELECTRICAL

Valid To: May 31, 2023

Certificate Number: 0386.05

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory, *as well as the satellite laboratory listed below*, to perform the following automotive electrical and electromagnetic compatibility tests:

Test:

Electrostatic Discharge (ESD)
(excluding Vehicle Test Method)

Test Methods²:

ISO 10605;
GMW 3097(2019,2012,2015);
SAE J1113-13;
TL 81000 (2018,2014,2016);
CS 00054;
B21 7110-E;
REQ-043878;
FMC 1278;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;
Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Honda 7794Z_S3V_0000;
Nissan 28401NDS02 [5];
MES PW 67602D;
Hyundai/Kia ES 96200-00 rev k;
B21 7112-OR;
BT-LAH-HV Modul-EMV-V4.6;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS-582;
GWTAD05-02;
VDR-NOTE-SPEC-31850329;
CEVT 8888621495-004

Test:

RF Conducted Emissions

Test Methods:

CISPR 25(2008, 2016);
GMW 3097(2019, 2012, 2015);
SAE J1113-41;
TL 81000 (2018, 2014, 2016);
CS 00054;
B21 7110-E;
REQ-043878;
FMC 1278;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;
Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Nissan 28401NDS02 [5];
MES PW 67602D;
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B21 7112-OR;
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SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
GWTAD05-02;
VDR-NOTE SPEC-31850329;
CEVT 8888621495-004;
Q/JLY J7110922C

RF Radiated Emissions

CISPR 25 (2008, 2016) (*ALSE and Strip-line only*);
GMW 3097 (2019, 2012, 2015);
SAE J1113-41;
TL 81000 (2018, 2014, 2016);
CS 00054;
B21 7110-E;
REQ-043878;
FMC 1278;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;
Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Nissan 28401NDS02 [5];
MES PW 67602D;
Hyundai/Kia ES 96200-00 rev k;
B21 7112-OR;
BT-LAH-HV Modul-EMV-V4.6;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;



Test:

RF Radiated Emissions(*cont'd*)

Bulk Current Injection (BCI)
Substitution Method

Bulk Current Injection (BCI)
Closed Loop Method

Absorber-lined Shielded Enclosure
(ALSE)
(*up to 6 GHz*)

Test Methods:

BAS 582;
GWT A D05-02;
VDR-NOTE-SPEC-31850329;
CEVT 8888621495-004

ISO 11452-4(2020,2011);
GMW 3097(2019,2012,2015);
SAE J1113-4;
TL 81000 (2018,2014,2016);
CS 00054;
B21 7110-E;
REQ-043878;
FMC 1278;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;
Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Nissan 28401NDS02 [5];
MES PW 67602D;
Hyundai/Kia ES 96200-00 rev k;
BT-LAH-HV Modul-EMV-V4.6;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
VDR-NOTE-SPEC-31850329;
GWT A D05-02;
CEVT 8888621495-004

ISO 11452-4 (2020, 2011);
SAE J1113-4;
Hyundai/Kia ES 96200-00 rev k;
Fiat 990110 01;
Fiat 990111 01;
B21 7110-E;
Renault 36-00-808;
Nissan 28401NDS02 [5]

ISO 11452-2 (2019, 2004);
GMW 3097 (2019, 2012, 2015);
SAE J1113-21;
TL 81000 (2018, 2014, 2016);
CS 00054;
B21 7110-E;
REQ-043878;
FMC 1278;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;



Test:

Absorber-lined Shielded Enclosure
(ALSE)
(up to 6 GHz) (cont'd)

Absorber-lined Shielded Enclosure
(ALSE) Radar Pulse Only

Stripline

Portable Transmitters

Test Methods:

Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Nissan 28401NDS02 [5];
MES PW 67602D;
Hyundai/Kia ES 96200-00 rev k;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
VDR-NOTE-SPEC-31850329;
GWT A D05-02;
CEVT 8888621495-004

ISO 11452-2 (2019, 2004);
GMW 3097 (2019, 2012, 2015);
REQ-043878;
SMTC 3 800 006;
Q/FC-CC06-001A;
MES PW 67602D;
Q/JLY J7110779D^①;
BAS 582;
GWT A D05-02;
CEVT 8888621495-004

ISO 11452-5 (2002);
TL 81000 (2018, 2014, 2016);
Hyundai/Kia ES 96200-00 rev k

ISO 11452-9 (2012);
GMW 3097 (2019, 2012, 2015);
TL 81000 (2018, 2014, 2016);
B21 7110-E;
REQ-043878;
Ford EMC CS 2009.1;
EMC-CS-2010 JLR V1.2;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
GWT A D05-02;
CEVT 8888621495-004;
MES PW 67602D



Test:

Conducted Transient Immunity

Test Methods:

ISO 7637-2 (2004, 2011);
ISO 7637-3 (2007, 2016);
SAE J1113-11;
SAE J1113-12;
GMW 3097 (2019, 2012, 2015);
TL 81000 (2018, 2014, 2016);
CS 00054;
B21 7110-E;
REQ-043878;
Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Honda 7794Z_S3V_0000;
Nissan 28401NDS02 [5];
MES PW 67602D;
Hyundai/Kia ES 96200-00 rev k;
B21 7112-OR;
BT-LAH-HV Modul-EMV-V4.6;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
VDR-NOTE-SPEC 31850329;
GWT A D05-02;
CEVT 8888621495-004

Conducted Transient Emissions

ISO 7637-2 (2004, 2011);
SAE J1113-42;
GMW 3097 (2019, 2012, 2015);
TL 81000 (2018, 2014, 2016);
CS 00054;
B21 7110-E;
REQ-043878;
FMC 1278;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;
Fiat 990110 01;
Fiat 990111 01;
MBN 10284-2;
BMW GS95002;
Renault 36-00-808;
Hyundai/Kia ES 96200-00 rev k;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
VDR-NOTE-SPEC-31850329;
GWT A D05-02;
CEVT 8888621495-004;
MES PW 67602D



Test:

Magnetic Field Immunity

Test Methods:

ISO 11452-8 (2015, 2007);
SAE J1113-22;
GMW 3097 (2019, 2012, 2015);
MIL-STD-461G;
TL 81000 (2018, 2014, 2016);
CS 00054;
B21 7110-E;
REQ-043878;
Ford EMC-CS-2009.1;
EMC-CS-2010JLR V1.2;
MES PW 67602D;
SMTC 3 800 006;
Q/FC-CC06-001A;
Q/JLY J7110779D^①;
BAS 582;
VDR-NOTE-SPEC-31850329;
GWT A D05-02;
CEVT 8888621495-004

Magnetic Field Emissions

GMW 3097 (2019, 2012, 2015);
TL 81000 (2018, 2014, 2016);
B21 7110-E;
REQ-043878;
SMTC 3 800 006;
BAS 582;
VDR-NOTE-SPEC-31850329;
GWT A D05-02;
Q/JLY J7110922C;
MES PW 67602D

HV-LV coupling test

B21 7112-OR;
BT-LAH-HV Modul-EMV-V4.6;
CISPR 25(2016);
GWT A D05-02;
MES PW 67602D;
Q/JLY J7110922C

Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

IEC 61000-3-2;
B21 7112-OR;
BT-LAH-HV Modul-EMV-V4.6;
GWT A D05-02;
Q/JLY J7110922C;
MES PW 67602D

Surge immunity test
(*power line only*)

IEC 61000-4-5;
B21 7112-OR;
BT-LAH-HV Modul-EMV-V4.6;
GWT A D05-02;
Q/JLY J7110922C;
MES PW 67602D



Test:

Electrical fast transient/burst immunity test
(excluding capacitive coupling clamp)

Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase

Limits–Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection

Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection

Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests

Electrical transient conduction along shielded high voltage supply lines only

Electromagnetic compatibility (EMC)-coupling or screening attenuation - absorbing clamp method

Electromagnetic compatibility (EMC) – Surface transfer impedance – Line injection method

Electromagnetic compatibility (EMC) - Part 4-8 Testing and measurement techniques - Power frequency magnetic field immunity test

Electromagnetic compatibility (EMC)- Part 4-13: Testing and measurement techniques-Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests, IDT

Test Methods:

IEC 61000-4-4;
B21 7112-OR; BT-LAH-HV Modul-EMV-V4.6;
GWT A D05-02;
Q/JLY J7110922C;
MES PW 67602D

IEC 61000-3-12;
B21 7112-OR; BT-LAH-HV Modul-EMV-V4.6;
GWT A D05-02;
Q/JLY J7110922C;
MES PW 67602D

IEC 61000-3-3;
B21 7112-OR; BT-LAH-HV Modul-EMV-V4.6;
Q/JLY J7110922C;
MES PW 67602D

IEC61000-3-11;
B21 7112-OR; BT-LAH-HV Modul-EMV-V4.6;
Q/JLY J7110922C;
MES PW 67602D

IEC61000-4-11;
B21 7112-OR

ISO 7637-4;
MES PW 67602D;
BT-LAH-HV Modul-EMV-V4.6;
CEVT 8888790454-002

IEC 62153-4-5

IEC 62153-4-6

IEC 61000-4-8;
Q/JLY J7110922C

IEC 61000-4-13

¹ This accreditation covers testing performed at the main laboratory listed above as well as the satellite laboratory listed below.

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<u>Test:</u>	<u>Test Method²:</u>
Road Vehicles — Environmental conditions and testing for electrical and electronic equipment —Part 2: Electrical loads	ISO 16750-2
Jump Start	GMW 3172 Section 8.2.1
Reverse Polarity	GMW 3172 Section 8.2.2
Over Voltage	GMW 3172 Section 8.2.3
State Change Waveform Characterization	GMW 3172 Section 8.2.4
Ground Path Inductance Sensitivity	GMW 3172 Section 8.2.5
Parasitic Current	GMW 3172 Section 9.2.1
Power Supply Interruptions	GMW 3172 Section 9.2.2
Battery Voltage Dropout	GMW 3172 Section 9.2.3
Sinusoidal Superimposed Voltage	GMW 3172 Section 9.2.4
Pulse Superimposed Voltage	GMW 3172 Section 9.2.5
Intermittent Short Circuit to Battery and to Ground for Input/Output	GMW 3172 Section 9.2.6
Continuous Short Circuit to Battery and to Ground for Input/Output	GMW 3172 Section 9.2.7
Multiple Power and Multiple Ground Short Circuits Including Pass Through	GMW 3172 Section 9.2.8

<u>Test:</u>	<u>Test Method²:</u>
Open Circuit – Single Line Interruption	GMW 3172 Section 9.2.9
Open Circuit – Multiple Line Interruption	GMW 3172 Section 9.2.10
Ground Offset	GMW 3172 Section 9.2.11
Power Offset	GMW 3172 Section 9.2.12
Discrete Digital Input Threshold Voltage	GMW 3172 Section 9.2.13
Over Load – All Circuits	GMW 3172 Section 9.2.14
Over Load – Fuse Protected Circuits	GMW 3172 Section 9.2.15
Insulation Resistance	GMW 3172 Section 9.2.16
Crank Pulse Capability and Durability	GMW 3172 Section 9.2.17
Switched Battery Line	GMW 3172 Section 9.2.18

² When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*.



Accredited Laboratory

A2LA has accredited

RELIABLE ANALYSIS - SHANGHAI, INC.

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 26th day of May 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0386.05
Valid to May 31, 2023

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.