TATA ADVANCED SYSTEMS

TATA

EMC Test Report For

<John Doe >

ULR - TC52281A000000XXXF

Test Report No.: TASL/17025/EMC/TRP/MIL or DO/XXXX/YYY

Certificate No.: TC-5228

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For any Complaints / Suggestions please email to:

qmlabs@tataadvancedsystems.com

Submitted by

Tata Advanced Systems Limited
42 - 43 Electronics City
Hosur Road, Bengaluru - 560 100.
Tel: 080 - 6785 9900 Fax: 080 - 6785 9903

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Amendment History

Revision No.	Date of Amend.	Amendment made	Reasons	Approved by
1.0	01/03/2021	Laboratory name and logo, Tata power sed is replaced with Tata advanced systems limited	Due to organization name change from TPSED to TASL	QM
2.0	05/04/2021	Reference no updated for use of NABL Accredited CAB combined ILAC MRA Mark ,included Test Report prepared by & EMC 32 software version is updated to 10.6	To update Ref no provided by NABL for use of NABL Accredited CAB combined ILAC MRA Mark & Internal review of test report format	QM

EMC CENTRE ACCREDIATION DETAILS

The accreditation details in the below table

Accreditation Bodies	Certificate Number
National Accreditation Board for Testing and Calibration Laboratories (NABL) ,as per ISO/IEC 17025 :2017 Agreement for use of NABL Accredited CAB combined ILAC MRA Mark	TC-5228 Ref No: NABL/ILAC/0876
Telecommunication Engineering Centre (TEC) Department of Telecommunications Government of India	TEC/MRA/CAB/IND-D/15 CAB Identification : IND015

Table of Contents

LIST OF FIGURES

LIST OF GRAPHS

1. General Information

Name of the Applicant	Mr/Ms. <.....>
Contact Name	<.....>
Contact No	<.....>
Email id	<.....>
EUT Manufacturer Name and Address	M/s. <.....>

EUT Name	<.....>
Model No	<.....>
Serial No	<.....>
Supply Voltage & Current Ratings	<.....>
Test Location	M/s.<.....>
Tests conducted	<....,.....,....,.....,.....,.....,.....,.....,.....,...,>
Test Standard	<.....,.....,.....,.....,.....,>
Status of EUT on receipt	EUT was received in Good Condition
EUT Received on	DD/MM/YYYY
Dates of Test	DD/MM/YYYY to DD/MM/YYYY
Test Report Issued on	DD/MM/YYYY
Test witnessed by	Mr. <.....>(Ms.<.....>)
Test Result	Pass/Fail
Statement of conformity	Declaration of conformity of the results is based as per the standard limits-
Test Report Prepared By	Mr/Ms<.....>

Test Engineer and Reviewer Details		
Tested by	**Reviewed by**	**Authorized by**
<.....>	**<.....>**	**<.....>**
Test Engineer	**Lab in Charge**	**Technical Manager**

Note: This report is digitally signed by the approving authority through a secured workflow

Text Style: Arial, Text Size: 10, Picture size(H): 3.65inch or 9.3cm

2. Test Summary

I. ELECTRONICS TESTING

1. EMC TESTING

Emission Tests			
Sl. No	**Name of the Tests**	**Limits**	**Results**
1.	CE01/CE101-Conducted Emissions, Power Leads, 30Hz to 10kHz	CE101-1/2/3/4 ,Submarine applications ,Navy ASW aircraft and Army aircraft	Emissions are within the Limit / Emissions are exceeding the limit or Pass / Fail Refer Annex 1
2.	CE03/CE102-Conducted Emissions, Power Leads, 10kHz to 10MHz	CE102 -1 for all application	Emissions are within the Limit / Emissions are exceeding the limit or Pass / Fail Refer Annex 2
3.	CE06/CE106- Conducted emissions, antenna terminal ,10kHz to 40GHz	34 dBµV	Emissions are within the Limit / Emissions are exceeding the limit or Pass / Fail Refer Annex 3
4.	RE01/RE101-Radiated Emissions, Magnetic field, 30Hz to 100kHz	RE101-1/2, all Army/Navy Applications	Emissions are within the Limit / Emissions are exceeding the limit or Pass / Fail Refer Annex 4

Emission Tests			
Sl. No	**Name of the Tests**	**Limits**	**Results**
5.	RE02/RE102- Radiated Emissions, Electric field, 10kHz to 18GHz	RE102-1/2/3/4, Surface ship/sub marine /aircraft and space system/ground army /ground air force applications	Emissions are within the Limit / Emissions are exceeding the limit or Pass / Fail Refer Annex 5

Susceptibility Tests			
Sl. No	**Name of the Test**	**Limits**	**Results**
1.	CS01/CS02/CS101- Conducted Susceptibility, Power Leads, 30Hz to 150kHz	CS101 -1,voltage limit for all application or CS101-2, power limit for all application or Curve#1,Curve #2	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 6
2.	CS03/CS103,CS04/CS104, CS05/CS105 /-Conducted susceptibility, antenna port, intermodulation ,15kHz to 10GHz rejection of undesired signal/ cross modulation 30Hz to 20GHz	-14 dBm- 80dB	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 7
3.	CS06/CS106-Conducted Susceptibility, transients, power leads	Vpeak = 400 volt peak tr = 1.5 µsec, ± 0.5 µsec tf = 3.5 µsec, ± 0.5 µsec td = 5.0 µsec, ± 22% Vsag ≤ 120 volt peak (maximum)	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail

Susceptibility Tests			
Sl. No	**Name of the Test**	**Limits**	**Results**
		tsag ≤ 20 µsec	Refer Annex 8
4.	CS114-Conducted Susceptibility, Bulk Cable injection, 10kHz to 200MHz	CS114 -1 ,Curve #3	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 9
5.	CS115-Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation	CS115-1, Imax = 5Amps	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 10
6.	CS116 - Conducted Susceptibility, Damped sinusoidal Transients, Cable and power Leads, 10kHz to 100MHz	CS116-2, Imax = 10Amps	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 11
7.	CS118 -Personnel borne electrostatic discharge.	±8KV- Contact Discharge ±15KV-Air Discharge	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 12

Susceptibility Tests			
Sl. No	**Name of the Test**	**Limits**	**Results**
8.	RS01/RS101 - Radiated Susceptibility, Magnetic field, 2MHz to 18GHz	RS101-1/2 all Navy/ all Army applications.	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 13
9.	RS03/RS103- Radiated Susceptibility, Electrtic field, 2MHz to 18GHz	10/50/200V/m	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail or Compliance / Incompliance Refer Annex 14
10.	LDC102- Normal steady state limits for voltage	28VDC NLSS-22VDC NHSS-29VDC	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail Refer Annex 15
11.	LDC104-Toatal ripple	DC Voltage distortion: Voltage ripple 1.5Volts peak to average Ripple frequency & Amplitude- 1.2kHz to 16.8KHz – 0.8Vrms to 0.06Vrms	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail Refer Annex 16
12.	LDC301-Abnormal steady state limits for voltage	Voltage NLSS-20.0VDC Voltage NHSS-31.5VDC	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail Refer Annex 17

Susceptibility Tests			
Sl. No	**Name of the Test**	**Limits**	**Results**
13.	LDC401-Emergency steady state voltage	Voltage ELSS-18.0VDC Voltage EHSS-29.0VDC	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail Refer Annex 18
14.	LDC601-Power Failure	28VDC - 7 Sec Duration of power failure : 100ms,500ms,3 s,7s	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail Refer Annex 19
15.	LDC602-Phase reversal	28VDC- 30 min	EUT Performance found satisfactory / EUT Performance found not satisfactory or Pass / Fail Refer Annex 20

2.1 MEASUREMENT UNCERTAINTY

The following measurement uncertainties are applicable to the relevant tests that are mentioned below:

Test		Uncertainty (±)
Conducted Emission		
Radiated Emission	Below 1GHz	
	Above 1GHz	

2.2 OPINIONS& INTERPRETATIONS

2.3 DEVIATION FROM STANDARD

3. Equipment under Test Description

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Figure 1: Block diagram for EUT

Figure 2: Photograph of EUT

Figure 3: EUT Name and Serial No.

Figure 4: EUT Configuration

Figure 5: Photograph of EUT Cable

4. Performance Monitoring Parameters

Detailed explanation of performance monitoring parameters with tolerance given by the customer and photographs

During susceptibility test the following parameters are monitored.

Sl.No.	Monitored Parameters	Observed Conditions
1.		
2.		
3.		
4.		
5.		
6.		

Figure 6: EUT Performance Monitoring

Annexure 1: CE01/CE101- Conducted Emissions, Power Leads

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : EMC32 Ver_8.54

Temperature : .....ºC

Humidity :

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Receiver Settings

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30Hz- 1kHz	Peak	10 Hz	0.15s	ESU40
1kHz- 10kHz	Peak	100 Hz	0.015s	ESU40

Figure 7: CE01 / CE101 Limit

Graph 1: CE01 / CE101 – Ambient Graph

Graph 2: CE01 / CE101 - Positive or Phase

Graph 3: CE01 / CE101 - Négative or Phase

Figure 8: CE01 / CE101 Test Setup Photograph

Test Result	Pass/Fail or Emission are within Limit /exceeding limit or as per JRF Decision Rule

Annexure 2: CE03/CE102- Conducted Emissions, Power Leads

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_8.54
Temperature : .....ºC

Humidity :

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Receiver Settings

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
10kHz- 150kHz	Peak	1 kHz	0.015s	ESU40
150kHz- 10MHz	Peak	10 kHz	0.015s	ESU40

Figure 9: CE03 / CE102 Limit

Graph 4: CE03 / CE102– Ambient Graph

Graph 5: CE03 / CE102- Positive or Phase

Graph 6: CE03 / CE102 - Négative or Neutral

Figure 10: CE03 / CE102 Test Setup Photograph

Test Result	Pass/Fail or Emission are within Limit /exceeding limit or as per JRF Decision Rule

Annexure 3: CE06/CE106- Conducted Emissions, Antenna Terminal

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_8.54
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Receiver Settings

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
10kHz- 150kHz	Peak	1 kHz	0.015s	ESU40
150kHz- 30MHz	Peak	10 kHz	0.015s	ESU40
30MHz- 1GHz	Peak	100 kHz	0.015s	ESU40
Above 1GHz	Peak	1 MHz	0.015s	ESU40

Figure 11: CE06 / CE106 Limit

Graph 7: CE06 / CE106– <1MHz- 40GHz>

Figure 122: CE06 /CE106 Test Setup Photograph

Test Result	Pass/Fail or Emission are within Limit /exceeding limit or as per JRF Decision Rule

Annexure 4: RE01/RE101- Radiated Emissions, Magnetic field

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_8.54
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>

3	<.....>	<.....>	<.....>	<.....>	<.....>

Receiver Settings

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30Hz- 1kHz	Peak	1 kHz	0.015s	ESU40
1kHz- 10kHz	Peak	10 kHz	0.015s	ESU40
10kHz- 100kHz	Peak	1 kHz	0.015s	ESU40

Figure 13: RE01 / RE101 Limit

Graph 8: RE01 / RE101 – Ambient Graph

Graph 9: <RE01 /RE101>

EUT Left, Right, Top, Bottom, Display, keybord, Ventilation,etc….)

*EUT Right Rear Bottom	*EUT Front Bottom

*EUT Left top middle	*EUT Left Bottom

Figure 14: <RE01/RE101> Test Setup Photograph

Test Result	**Pass/Fail or Emission are within Limit /exceeding limit or as per JRF Decision Rule**

Annexure 5: RE02/RE102 - Radiated Emissions, Electric field

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_8.54
Temperature : .....°C

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>

3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>

Receiver Settings

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
10kHz- 150kHz	Peak	1 kHz	0.015s	ESU40
150kHz-30MHz	Peak	10 kHz	0.015s	ESU40
30MHz-1GHz	Peak	100 kHz	0.015s	ESU40
1GHz to 18GHz	Peak	1 MHz	0.015s	ESU40

Figure 15: RE02 / RE102 Limit

Graph 10: RE02 / RE102– Ambient Graph

Graph 11: RE02 / RE102– Vertical Polarization

Graph 12: RE02 / RE102 – Horizontal Polarization

10kHz to 30MHz	30MHz to 200MHz

200MHz to 1GHz	1GHz to 18GHz

Figure 16: RE02 / RE102 Test Setup Photograph

Test Result	Pass/Fail or Emission are within Limit /exceeding limit or as per JRF Decision Rule

Annexure 6: CS01/CS02/CS101 - Conducted Susceptibility, Power Leads

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_10.6
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due

1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>
7	<.....>	<.....>	<.....>	<.....>	<.....>
8	<.....>	<.....>	<.....>	<.....>	<.....>

Scan Settings

Subrange	Step Size	Dwell	Modulation
30Hz- 150kHz	5%	3 Sec	CW

The test carried out in the following cables

Cable No.	Cable Description

Figure 17: CS01 / CS101 Limit

Graph 13: CS01/CS101 – Sensor Level (dBµV)

Figure 188: CS 01/ CS101 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 7: CS03/CS103, CS04/CS104,CS05/CS105 - Conducted Susceptibility, Antenna port-Intermodulation/ rejection of un desired signal/ Cross modulation

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_10.6.
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>
7	<.....>	<.....>	<.....>	<.....>	<.....>
8	<.....>	<.....>	<.....>	<.....>	<.....>

Graph 14: CS03/CS103, CS04/CS104, CS05/CS105 –<10khz to 20GHz>

Figure 199: CS03/CS103, CS04/CS104, and CS05/CS105 –Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 8: CS06/CS106 - Conducted Susceptibility, Transients, Power Leads

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_10.6
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>
7	<.....>	<.....>	<.....>	<.....>	<.....>
8	<.....>	<.....>	<.....>	<.....>	<.....>

The test carried out in the following cables

Cable No.	Cable Description

Figure 20: CS06 / CS106 Limit

Figure 21: CS 06/ CS106 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 9: CS114 - Conducted Susceptibility, Bulk Cable injection

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_10.6

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>
7	<.....>	<.....>	<.....>	<.....>	<.....>
8	<.....>	<.....>	<.....>	<.....>	<.....>

Scan Settings

Subrange	Step Size	Dwell	Modulation	Test Curve#
10kHz- 1MHz	5%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>
1MHz to 30 MHz	1%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>
30 MHz to 200 MHz	0.5%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>

The test carried out in the following cables

Cable No.	Cable Description

Figure 22: CS114 Limit Curve#X

Graph 15: CS114 – Immunity Level (dBµA)

Graph 16: CS114 – Forward power (dBm)

Figure 23: CS 114 Test Setup Photograph

Test Result	**Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule**

Annexure 10: CS115 - Conducted Susceptibility, Bulk Cable injection, Impulse Excitation

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : EMC32 Ver_10.6

Temperature : .....°C

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>

The test carried out in the following cables

Cable No.	Cable Description

Figure 24: CS115 Limit

Figure 25: CS115 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 11: CS116, Conducted Susceptibility, Damped sinusoidal Transients.

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_10.6
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>
7	<.....>	<.....>	<.....>	<.....>	<.....>

The test carried out in the following cables

Cable No.	Cable Description

Figure 26: CS116 Limit

Figure 27: CS116 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 12: CS118, Personal borne Electrostatic Discharge

Common Information:

Reference Standard : <.....>

Basic Standard : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Temperature : .....ºC

Humidity : .....%

Atmospheric Pressure : Start_....kPa

End_....kPa

Test Equipment :

Sl. No.	Equipment	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

Discharge points of Contact:

Sl.No.	Test Points
1	<.....>
2	<.....>
3….N	<.....>

Discharge points of Air:

Sl.No.	Test Points
1	<.....>
2	<.....>
3….N	<.....>

Test Details:	Contact Discharge
Discharge Network : 150pF, 330Ω	Discharge Type: Contact (Direct)
Level : 8KV	Polarity : Positive & Negative
Number of Discharge per test points: ≥10 pulses	
Observation :	

Test Details:	Contact Discharge
Discharge Network : 150pF, 330Ω	Discharge Type: Contact (Indirect)
Level : 8KV	Polarity : Positive & Negative
Number of Discharge per test points: ≥10 pulses	Indirect discharge planes: VCP & HCP
Observation :	

Test Details:	Air Discharge
Discharge Network : 150pF, 330Ω	Discharge Type: Air
Level : 2kV,4kV,8kV and 15kV	Polarity : Positive & Negative
Observation :	

Figure 28: Photographs of ESD Test Setup

Test Result	Pass/Fail or EUT performance found satisfactory / Not

	Satisfactory or as per JRF Decision Rule

Annexure 13: RS01/RS101,Radiated Susceptibility,Magnetic Field

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : EMC32 Ver_10.6

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>

Scan Settings

Subrange	Step Size	Dwell	Modulation
30Hz- 100kHz	5%	3 Sec	CW

Figure 29: RS01 / RS101 Limit

Graph 17: RS01 / RS101 – Immunity level Magnetic Field Level (dBpT)

*EUT Right	*EUT Front
*EUT middle	*EUT Left

Figure 30: <RS01/RS101> Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not

	Satisfactory or as per JRF Decision Rule

Annexure 14: RS03/RS103,Radiated Susceptibility, Electric Field

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>
Test Standard : <.....>
Test Date : <dd/mm/yyyy>
Test mode : <.....>
Software used : EMC32 Ver_10.6
Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>
4	<.....>	<.....>	<.....>	<.....>	<.....>
5	<.....>	<.....>	<.....>	<.....>	<.....>
6	<.....>	<.....>	<.....>	<.....>	<.....>

Subrange	Step Size	Dwell	Modulation	Field Level(V/m)
10kHz- 1MHz	5%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>
1MHz to 30 MHz	1%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>
30 MHz to 1 GHz	0.5%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>
1 GHz to 8 GHz	0.1%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>

8 GHz to 40 GHz	0.05%	3 Sec	PM,1 kHz 50% duty cycle.	<.....>

Graph 18: RS03 / RS103 – Field Level (dBµV /V/m)

Graph 19: RS03 / RS103 – Antenna Forward Power (dBm)

10kHz to 80MHz	80MHz to 200MHz
200MHz to 1GHz	1GHz to 6GHz

Figure 31: RS03 / RS103 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 15: LDC102, Normal steady state limits for voltage

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Method : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : .....

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

LDC 102-1 MIL-STD-704 normal limits for steady state voltage

Normal limit	704A	704B	704C	704D	704E	704F
Voltage NLSS	<.....>	<.....>	<.....>	<.....>	<.....>	<.....>
Voltage NHSS	<.....>	<.....>	<.....>	<.....>	<.....>	<.....>

Test condition	Voltage	Frequency	Time duration	Observation

Figure 32: LDC102 -1

Figure 33: LDC102 Test Setup Photograph 1

Figure 34: LDC102 Test Setup Photograph 2

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 16: LDC 104,Total Ripple

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Method : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : .....

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

LDC104-1 MIL-STD-704 limits for ripple DC voltage distortion

Limit	704A	704B	704C	704D	704E	704F
Voltage Ripple	2Volts peak to Mean	1.5Volts peak to Average	1.5Volts peak to Average	1.5Volts peak to Average	1.5Volts peak to Average	1.5Volts peak to Average

Test condition	Ripple Frequency Components	Amplitude of Ripple Component (Vrms) MIL STD-704A/B/C/D/E/F
A	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
B	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	
	.....Hz	

Test condition	Ripple Frequency Components	Amplitude of Ripple	Time duration	Observation

Graph 20: LDC104 -1

Figure 35: LDC104 Test Setup Photograph 1

Figure 36: LDC104 Test Setup Photograph 2

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 17: LDC 301, Abnormal Steady state Limits for voltage

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Method : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : .....

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

LDC301-1 MIL-STD-704 abnormal limits for steady state voltage

Abnormal limit	704A	704B	704C	704D	704E	704F
Voltage NLSS	<.....>	<.....>	<.....>	<.....>	<.....>	<.....>
Voltage NHSS	<.....>	<.....>	<.....>	<.....>	<.....>	<.....>

Test condition	Voltage	Time duration	Observation

Graph 21: LDC301 -1

Figure 37: LDC301 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 18: LDC 401, Emergency Steady state Limits for voltage

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Method : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : .....

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

LDC401-1 MIL-STD-704 emergency limits for steady state voltage

Abnormal limit	704A	704B	704C	704D	704E	704F
Voltage ELSS	<.....>	<.....>	<.....>	<.....>	<.....>	<.....>
Voltage EHSS	<.....>	<.....>	<.....>	<.....>	<.....>	<.....>

Test condition	Voltage	Time duration	Observation

Graph 22: LDC401 -1

Figure 38: LDC401 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

Annexure 19: LDC 601, Power Failure

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Method : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : .....

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

LDC601-1 MIL-STD-704 power failure limits

Limit	704A	704B	704C	704D	704E	704F

Power failure	7 Sec	7 Sec	7 Sec	7 Sec	7 Sec	7 Sec

Test condition	Voltage	Time duration	Observation

Graph 23: LDC601 -1

Figure 39: LDC601 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not

Annexure 20: LDC 602, Phase reversal

Common Information:

Ref EMC Test Plan / QT / ATP : <.....>

Test Standard : <.....>

Test Method : <.....>

Test Date : <dd/mm/yyyy>

Test mode : <.....>

Software used : .....

Temperature : .....ºC

Humidity : .....%

Test Equipment Used :

Sl. No.	Description	Make	Model No.	Serial No.	Cal Due
1	<.....>	<.....>	<.....>	<.....>	<.....>
2	<.....>	<.....>	<.....>	<.....>	<.....>
3	<.....>	<.....>	<.....>	<.....>	<.....>

Specifications:

LDC602-1 MIL-STD-704 power failure limits

Limit	704F
Phase reversal	Phase reversal does not cause damage

Test condition	Voltage	Time duration	Observation

Graph 24: LDC602 -1

Figure 40: LDC602 Test Setup Photograph

Test Result	Pass/Fail or EUT performance found satisfactory / Not Satisfactory or as per JRF Decision Rule

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