



Fraunhofer

**TESTED[®]
DEVICE**

KUKA Roboter GmbH
KR3 R540 (prototype)
Report No. KU 1607-835

DUPLICATE

Statement of
Qualification

Electrostatic
Discharge Behavior

Statement of Qualification

Customer
 KUKA Roboter GmbH
 Zugspitzstrasse 140
 86165 Augsburg
 Germany

Component tested

Category: Automation Components
 Subcategory: Robotics
 Product name: KR3 R540 (prototype)
 (manufacturing date: 6/2016; serial number: 495007; payload: 3 kg; reach: 540 mm; color: white)

Measurement of the electrostatic field

Standards/Guidelines: SEMI E78
 The norms stated generally refer to the version valid at the time of the tests.

Test devices:

- Data capture:.....Influence-E-Fieldmeter, type EMF58
 Eltex-Elektrostatik-GmbH
- Insulating mounts:
 - type: 4x hexagonal insulators with $R > 10^{14} \Omega$
 - material: Polyester, glassfilled
 - thickness: 35 mm

Test environment parameters:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
- Airflow velocity:..... 0.45 m/s
- Airflow pattern:..... vertical laminar flow
- Temperature: $22 \text{ }^\circ\text{C} \pm 0.5 \text{ }^\circ\text{C}$
- Relative humidity: $45 \% \pm 5 \%$

Test procedure parameters:

- Speed: 50 %
- Attached payload: no tool mounted
- Motion sequence:..... representative pick & place movement

Test result / Classification

The robot KR3 R540 (prototype) fulfills the permissible limit value of 20 V/cm (2 kV/m) defined in SEMI E78-0309 for the Sensitivity Level 2018/18 nm.

Electrostatic Field		
Electrostatic Level		Test result
Year Node	[V/cm]	[V/cm]
2018 18 nm	20	7.6
Limit value:		fulfilled

This equates to a defined permissible limit value of 100V/cm (10kV/m) for Sensitivity Level 1 according to SEMI E78-0998 and causes minimal surface charges.

The measuring devices used for the qualification tests are calibrated at regular intervals; their results can be traced back to national and international standards. In cases where no national standards exist, the test procedure implemented complies with the technical regulations and norms applicable at the time of the test. The relevant documentation can be viewed on request at any time.

For further information about the test environment and parameters, please refer to the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

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Place, date of first document issued

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Place, current date

on behalf of 
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