



# 电子质量

ELECTRONICS QUALITY

03  
2022  
月刊 总第420期  
**中国电子行业  
质量学术期刊**  
THE QUALITY ACADEMIC JOURNAL  
IN CHINA ELECTRONIC INDUSTRY

电子质量

二零二二年三月

总第四百二十期



**长河机箱各办事处  
全面升级为全国机箱壳体连锁!**

选型便捷·订货放心·正宗直销·合作可靠

**长河机箱—中国机箱领导者**

<http://www.enclosures.com.cn>

总部：0574-63028237 北京店：010-62650366 上海店：021-53081250 深圳店：0755-83013735 西安店：029-85215485 武汉店：027-87161136 济南店：0531-67757071  
杭州店：0571-56789255 沈阳店：024-24130241 成都店：028-83230122 南京店：025-84537071 青岛店：13626408513 大连店：0411-84997783 郑州店：0371-58576383

ISSN 1003-0107



03>

中国电子质量管理协会 工业和信息化部电子第五研究所(中国赛宝实验室) 主办

国际标准连续出版物号：ISSN1003-0107

国内统一连续出版物号：CN44-1038/TN

邮发代号：46-39

# 电子质量

## DIANZI ZHILIANG

(月刊)公开发行

1980 年创刊

2022 年第 03 期(总第 420 期)

## 目 次

### 测试测量技术 //

#### 理论与研究

01 一种新型的雷达吸波结构快速设计方法 宋琳

06 GMSK 信号维特比解调算法研究及其在信道衰落性能分析  
朱岩

#### 通用测试

13 漏电开关带载动作特性试验线路优化设计 张业真 郑美海  
17 浅析开关电源中的变压器过载温升的判定 王珏斌 冯建军 黄燕飞  
21 某型光电探测器响应输出异常现象分析及处理 刘沛文

#### 专业测试

26 高集成度微波组件加电前检测方法的研究  
曹雪姣 陈恒佳 赵勇 吴光明 何子均  
30 基于压力传感器的超低功耗波导管监测系统设计  
吴青伟 赵波 李泽军 胡达洋

#### 可靠性分析

34 电泳摆杆环氧涂层对电泳质量的影响 程琳琳 张莹  
37 再流焊高温对导电胶粘接工艺可靠性影响研究 王腾 朱仁贤 周长健  
43 关于汽车零部件疲劳试验和裂纹识别问题的分析  
周弘 刘树文 刘飞 周浩 肖艳  
47 免洗助焊剂“清洗”的意义 张呈波 秦旺洋 范从国

### 绿色质量观察 //

#### 产品设计与开发

51 一种鳄鱼夹及其试验线夹改进装置研究 李芬  
55 基于无人机的基站综合一体化代维能力提升研究 黎彦玲 程晓海  
59 基于 Go Web 的二手图书交易平台的设计与实现 王明松 秦永佩  
62 智能化负载均衡打造安全高质 IP 网络方案设计 李俊辉  
67 基于 CRUISE 的纯电动商用车动力参数匹配及仿真分析 施佳能 韦尚军 丘云燕 姜浩楠

#### 测评与应用

73 汽车芯片的特点及其应用分析 张送

76 飞行控制组件半实物仿真系统的研究与应用 任庭苇 张育  
79 关于 3D 机芯按摩椅运动部件机械危险的研究 秦绍航

83 办公自动化中的计算机技术应用研究 王谦

#### 绿色质量与管理

88 薄壁工件加工方法探析 韩清震  
93 新一代信息技术背景下物联网专业建设的思考 王颖峰 胡慧敏  
96 基于 OBE 理念的《高电压技术》课程改革与探索 刘亚琳 王喜燕 周郑  
101 基于新工科理念的通信工程专业实践教学体系构建与探索 李爽 秦锋 刘毅科

#### 行业视点

105 TUV 南德与佛山机器人协会签署战略合作协议  
105 SGS 为上海辰竹安全继电器颁发功能安全证书  
105 意法半导体推出其第三代 MEMS 传感器

### 认证与实验室 //

#### 多国认证

108 IEC62368-1:2018 保护导体测试要求浅析 姚尧 李晶晶  
114 浅谈 IEC 62368-1:2018 中压敏电阻的附加要求与合理运用 方欢  
120 军用软件鉴定定型标准化工作方法 张勤 武志功

#### 实验室特写

124 基于陶瓷材料动态断裂韧性的测试方法研究 刘树文 周弘 肖艳 刘飞 周浩  
129 大功率 S 波段波导滤波器的设计与仿真 李闯 王捷 范迎山  
133 基于高斯滤波运动预测模型改进 RSSI 测距算法研究 迟耀丹 赵慧强 陈伟利 赵阳  
136 实验室小型急停按钮升级改造研究 李蓉 任引弟 李芳芳

#### 电磁兼容

140 一种 30/20 GHz 圆极化相控阵天线的设计 丁宇昕  
145 ECMS 在混合动力船舶电力系统中的应用 秦锋 刘毅科 李爽  
150 雷达监测系统在矿区开采作业中的应用 丛培华

#### Q 博士案例

154 ( )是指计量必需的法制保障方面的特性。  
154 质量检验最重要、最基本的功能是( )。  
154 测量误差分量按其特性可分为( )。

# Electronic Quality

Founded 1980

NO.03(Serial No.420),2022  
(Monthly)

## CONTENTS

### Test & Measurement Technology

#### Theory & Research

- 01 – A Novel and Fast Method to Design Radar Absorbing Structure Song Lin  
06 – Research on Viterbi Demodulation Algorithm of GMSK Signal and its Performance Analysis under Channel Fading Zhu Yan

#### General Test

- 13 – Optimization Design of Load Action Characteristics Test Circuit of Leakeage Switch Zhang Ye-zhen Zheng Mei-hai  
17 – Analysis on the Judgment of Temperature Rise of Transformer Overload in Switching Power Supply Wang Jue-bin Feng Jian-jun Huang Yan-fei  
21 – Analysis and Processing of Abnormal Response Output of a Photoelectric Detector Liu Pei-wen

#### Professional Test

- 26 – Research on the Detection Method of High Integration Microwave Assembly before Power on Cao Xue-jiao Chen Heng-jia Zhao Yong Wu Guang-ming He Zi-jun  
30 – Design of Ultra Low Power Wave Guide Tube Monitoring System Based on Pressure Sensor Wu Qing-wei Zhao Bo Li Ze-jun Hu Da-yang

#### Reliability Analysis

- 34 – Effect of Epoxy Coating on Electrophoretic Quality of Pendulum Bar Ching Lin-lin Zhang Ying  
37 – Study on the Effect of Reflow Welding High Temperature on the Reliability of Conductive Adhesive Bonding Process Wang Teng Zhu Ren-xian Zhou Chang-jian  
43 – Analysis on Fatigue Test and Crack Identification of Auto Parts Zhou Hong Liu Shu-wen Liu Fei Zhou Hao Xiao Yan  
47 – The Cleaning Meaning of No Clean Flux Zhang Cheng-bo Qin Wang-yang Fan Cong-guo

### Observation of Green Quality

- #### Product Design and Development
- 51 – Research on Crocodile Clamp and Its Improved Device Li Fen  
55 – Research on the Improvement of Comprehensive and Integrated Generation and Dimension Capacity Based on UAV Li Yan-ling Cheng Xiao-hai  
59 – Design and Implementation of Book's Trading Platform Based on Go Web Wang Min-song Qin Yong-pei  
62 – Intelligent Load Balancing to Build a Safe and High-Quality IP Network Li Jun-hui  
67 – Dynamic Parameter Matching and Simulation Analysis of Pure Electric Commercial Vehicle Based on CRUISE Shi Jia-neng Wei Shang-jun Qiu Yun-yan Jiang Hao-nan

#### Assessment and Application

- 73 – Characteristics and Application Analysis of Automotive Chip Zhang Song  
76 – Research and Application of Hardware in the Loop Simulation System for Flight Control Components Ren Ting-wei Zhang Yu

- 79 – The Research of Mechanical Hazards of Moving Parts of 3D Motion Message Chair Qin Shao-hang

- 83 – Research on the Application of Computer Technology in Office Automation Wang Qian

#### Green Quality & Management

- 88 – Analysis on the Processing Method of Thin-Walled Workpieces Han Qing-zhen  
93 – Thoughts on the Professional Construction of Internet of Things under the Background of New Generation Information Technology Wang Ying-feng Hu Hui-min  
96 – Reform and Exploration of "High Voltage Technology" Course Based on OBE Concept Liu Ya-lin Wang Xi-yan Zhou Zheng  
101 – Construction and Exploration of Practical Teaching System of Communication Engineering Specialty Based on New Engineering Concept Li Shuang Qin Feng Liu Yi-ke

#### Industry Perspective

- 105 – TUV SUD signed a strategic cooperation agreement with Foshan Robotics Industry Innovation Association  
105 – SGS issues a functional safety certificate for Shanghai Chenzhu safety relay  
105 – STMicroelectronics launches its third-generation MEMS sensor

### Certification & Labs

#### Multi-country Certification

- 108 – Analysis of Test Requirements for Protective Conductor According to IEC62368-1:2018 Yao Yao Li Jing-jing  
114 – Brief Introduction to Additional Requirements and Rational Application for Metal Oxide Varistor in IEC 62368-1:2018 Fang Huan  
120 – Standardized Working Method of Military Software Identification and Finalization Zhang Qin Wu Zhi-gong

#### Featured Lab

- 124 – Research on Testing Method Based on Dynamic Fracture Toughness of Ceramic Materials Liu Shu-wen Zhou Hong Xiao Yan Liu Fei Zhou Hao  
129 – Design and Simulation of an S-Band High-Power Waveguide Filter Li Chuang Wang Jie Fan Ying-shan  
133 – Research on Improved RSSI Positioning and Ranging Algorithm Based on Gaussian Filtering Motion Prediction Model Chi Yao-dan Zhao Hui-qiang Chen Wei-li Zhao Yang  
136 – Research on Upgrading and Improvement of Small Emergency Stop Button in Laboratory Li Rong Ren Yin-di Li Fang-fang

#### EMC

- 140 – Design of a 30/20 GHz Band Circularly Polarized Phased Array Antenna Ding Yu-xin  
145 – Application of ECMS in Hybrid Ship Power System Qin Feng Liu Yi-ke Li Shuang  
150 – The Application of Radar Monitoring System in Mining Operations Cong Pei-hua

#### Cases from Quality Doctor

- 154 – ( ) refers to the characteristics in aspect of legal guarantee necessary for measurement.  
154 – The most important and basic function of quality inspection is ( ).  
154 – Measurement error component can be divided into ( ) according to the characteristics.