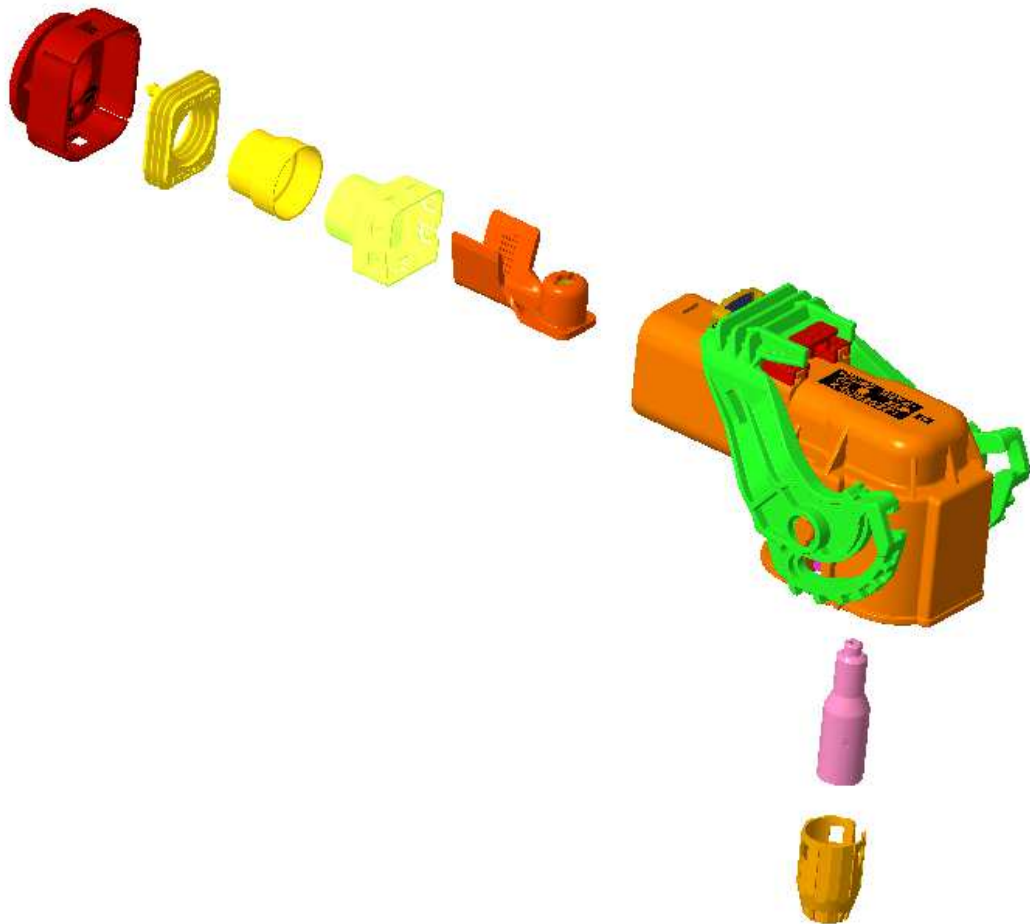



PRODUCT SPECIFICATION

P2P 1POS 90DEG Conn 产品规范



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1. SCOPE 适用范围

1.1 Content 内容

This specification covers the performance, test and quality requirements for Plug 2324136 and Header 2324108 (hereinafter referred to as 2324136 and 2324108).

This specification applies to the product 2324136-1 and 2324108-1, but not limited to it.

本规范适用于 Plug 2324136 和 Header 2324108(以下简称 2324136 和 2324108) 的性能, 测试和质量要求。

本规范适用但不仅限于以下零件号: 2324136-1 和 2324108-1

1.2 Qualification

When tests are performed, the following specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

本测试规范依照下面的规范及标准执行。所有的检验应依照合适的检验计划及产品图纸执行。

2. APPLICABLE DOCUMENTS 适用文件

2.1 Usable document 使用文件

In the event of conflict between the requirements of this specification and the drawing, the drawing shall take precedent.

In the event of conflict between the requirement of this specification and the referenced documents, this specification shall take precedent.

在本规范的要求与图纸发生冲突时, 以产品图纸为准。在本规范的要求与参考文件发生冲突时, 以本规范为准。

2.2 TE specifications 泰科电子规范

Table 1: General Requirement

Requirement	Description
TEC-109-1	General requirements for Test Specifications
108-94255	Product Specification HV 8MM 180 DEG turned contact
108-18782	Product Specification MCON-1.2 Contact System
114-94125	Application Specification for 8mm Round turned contact System
114-18464	Application Specifications MCON-1.2 Contact System
114-94130	Application Specification HVP800 180DEG
108-94451	Product Specification HV 8MM 180 DEG stamped contact
114-94325	Application Specification for 8mm Round stamped contact System

2.3 Other specifications 其他规范

Table 2: References

Requirement	Description
LV214-1	Test specification for motor vehicle connectors
LV215-1	Electrical/Electronic Requirements of HV Connectors
108-94255	Product Specification HV 8MM 180 DEG turned CONTACT
108-18782	Product Specification MCON-1.2 Contact System
DIN EN 60664-1	Isolation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests
DIN 40050-9	IP, Degrees of protection (IP-Code) - Protection of electrical equipment against foreign objects, water and access
ISO 20653	Road vehicles - Degrees of protection (IP-Code) - Protection of electrical equipment against foreign objects, water and access
ISO 6469-3	Electric road vehicles – Safety specifications. Part 3: Protection of person against electric hazards
SAE J1742	Connections for High Voltage On-Board Road Vehicle, Electrical Wiring Harnesses Test Methods and General Performance Requirements

3. REQUIREMENT 要求

3.1 Design and Construction 设计和结构

Products must meet the design, construction and physical dimensions specified in the applicable product drawings.

产品必须满足产品图纸上的设计，结构和尺寸要求。

3.2 Customer drawings 图纸

Table 3: Customer drawings

Part Number	Description
P2P 1Pos. Connector	
2324136	P2P 1Pos.Plug 90DEG Assy Kit, Overview, not for sale
2324138	P2P 1Pos.Plug 90DEG Assy
2324108	P2P 1Pos.Header Assy
Single component used at P2P 1Pos Connector	
2141211	Deep drawn socket, 90deg, Assy
2141157	Shield crimp ferrule
2141158	Shielding sleeve, 90Deg
2141156	Single wire seal
2303018	Protection cover
2141212	Deep drawn socket, 90deg, Assy
2303272	Finger protection cap

3.3 Test parameters and tolerances 测试参数与公差

Table 4: Test parameters and tolerances

Requirement 要求	Tolerance 公差
Ambient temperature 环境温度	23°C ± 5°C
Relative humidity 相对湿度	45% to 75%
Atmospheric pressure 大气压力	96kPa ± 10kPa

3.4 Ratings 等级

Table 5: Product Rating

Description	Range
Max working voltage at 5500m above sea level	$\leq 650\text{VDC}$
Voltage class acc. ISO 6469-3	B
Class 1 equipment acc. ISO 6469-3	1
Dielectric withstand voltage acc. ISO 6469-3	2700V
Insulation resistance acc. ISO 6469-3, SAE J 1742	$> 200\text{M}\Omega$
Isolation Group I acc. DIN EN 60664-1	$600 \leq \text{CTI}$
Pollution degree acc. DIN EN 60664-1	2
Clearance distance at 5500m above sea level acc. DIN EN 60664-1	$> 2.89\text{mm}$
Creepage Distance acc. DIN EN 60664-1	$> 4.25\text{mm}$
Ambient temperature	-40°C to 125°C
Degrees of protection (IP-Code) against access acc. ISO 20653, unmated situation	IPXXB
Degree of protection (IP-Code) against foreign objects and water acc. ISO 20653, mated situation	IP6K9K, IP6K7
Color of plastic housing	Orange similar RAL 2003

3.5 General Performance and Test description 通用性能和试验描述

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in table 6 and table 7. All testes must be performed at the test condition of the TE test specification 109-1 unless otherwise specified.

产品应能满足表格 6 和表格 7 中的电气，机械和环境等性能要求。所有试验均需按照 TE 规范 109-1 中的测试条件进行，除非另有说明。

3.6 Tests requirement and method summary 测试要求及方法

Not shown test-details see LV 214 and LV215-2

Table 6: Test Requirement and procedures summary

Para.	Test Item	Requirements	Procedure
PG0 RECEIVING INSPECTION			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E0.2.1	Terminal Contact resistance	8mm Contact: $\leq 0.36 \text{ m}\Omega$ (50mm ²); $\leq 0.39 \text{ m}\Omega$ (35mm ²); $\leq 0.40 \text{ m}\Omega$ (25mm ²) HVIL-contact: $\leq 15 \text{ m}\Omega$	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance $\leq 10 \text{ m}\Omega$	DIN EN 60512-2-1 TE-Spec. 109-18212
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance $> 200 \text{ M}\Omega$	DIN EN 60512-3-1 SAE J 1742
E0.4	Dielectric strength	Measurement voltage: 2700VAC Time: 60s Leakage current $\leq 10 \text{ mA}$	DIN EN 60512-3-1 SAE J 1742 ISO 6469-3
PG6 INTERACTION BETWEEN CONTACT AND HOUSING			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
B6.1	Drop test	Drop test from 1m height; No damages or impairments of function, Or the damage is visually evident.	DIN EN 60068-2-38
PG7 HANDING AND FUNCTIONAL RELIABILITY OF THE HOUSING			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1

E7.1	Error-proof design of housings	Test load: 150N, 10s No damage of involved matched connectors at above named test load	DIN EN 60512-13-5.
E7.2	Retention force of the housing latch/lock	Retention force of the housing latch /lock: >250N	DIN IEC 60512-8
E7.4	Insertion force or actuation force for insertion and removal aids	Insertion and actuation force: $\leq 75\text{N}$	LV214
PG8 Insertion and retention force of the contact parts in the housing			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E8.1	Contact insertion forces	Plug contact with cable insertion forces $\leq 75\text{N}$	DIN IEC 60512-8
E8.2	Contact removal force from the housing	Header: 1. Contact > 500N 2. Shielding > 100N Plug: Contact with shielding and cable > 180N	DIN IEC 60512-8
PG11 Insertion and removal forces, mating cycle frequency			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E0.2.1	Terminal Contact resistance	8mm Contact: $\leq 0.36\text{ m}\Omega$ (50mm ²); $\leq 0.39\text{m}\Omega$ (35mm ²); $\leq 0.40\text{m}\Omega$ (25mm ²) HVIL-contact: $\leq 15\text{m}\Omega$	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance $\leq 10\text{m}\Omega$	DIN EN 60512-2-1 TE-Spec. 109-18212
E0.2	Mating cycle frequency	50 Cycles	LV214

E0.2.1	Terminal Contact resistance	8mm Contact: $\leq 0.72 \text{ m}\Omega$ (50mm ²); $\leq 0.78 \text{ m}\Omega$ (35mm ²); $\leq 0.80 \text{ m}\Omega$ (25mm ²) HVIL-contact: $\leq 15 \text{ m}\Omega$	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance $\leq 10 \text{ m}\Omega$	DIN EN 60512-2-1 TE-Spec. 109-18212
PG13 Derating with housing			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E13.2	Derating with housing	Dependent on the application and cable type, different values are possible	See Appendix 5.1
PG17-2 DYNAMIC LOAD			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E0.2.1	Terminal Contact resistance	8mm Contact: $\leq 0.36 \text{ m}\Omega$ (50mm ²); $\leq 0.39 \text{ m}\Omega$ (35mm ²); $\leq 0.40 \text{ m}\Omega$ (25mm ²) HVIL-contact: $\leq 15 \text{ m}\Omega$	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance $\leq 10 \text{ m}\Omega$	DIN EN 60512-2-1 TE-Spec. 109-18212
E17.4	Dynamic Load; broad-band random	Severity 2: "Body" sealed; Details see appendix 5.2 Cable fixed after 100mm	LV214 DIN EN 60068-2-64
E0.2.1	Terminal Contact resistance	8mm Contact: $\leq 0.72 \text{ m}\Omega$ (50mm ²); $\leq 0.78 \text{ m}\Omega$ (35mm ²); $\leq 0.80 \text{ m}\Omega$ (25mm ²) HVIL-contact: $\leq 15 \text{ m}\Omega$	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance $\leq 10 \text{ m}\Omega$	DIN EN 60512-2-1 TE-Spec. 109-18212

E17.7	Endurance shock test	30g; T=6ms; N=6000	LV214 DIN EN 60068-2-27
E0.2.1	Terminal Contact resistance	8mm Contact: ≤0.72mΩ (50mm ²); ≤0.78mΩ (35mm ²); ≤0.80mΩ (25mm ²) HVIL-contact: ≤15mΩ	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance ≤ 10mΩ	DIN EN 60512-2-1 TE-Spec. 109-18212
PG18C DICING SALT LOAD			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E0.2.1	Terminal Contact resistance	8mm Contact: ≤0.36 mΩ (50mm ²); ≤0.39mΩ (35mm ²); ≤0.40mΩ (25mm ²) HVIL-contact: ≤15mΩ	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance ≤ 10mΩ	DIN EN 60512-2-1 TE-Spec. 109-18212
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance >200MΩ	DIN EN 60512-3-1 SAE J 1742
B18.3	Salt spray, cyclic	Resistance after Salt spray test, not sealed	LV215-2 DIN EN 60068-2-52 (SG3)
E0.2.1	Terminal Contact resistance	8mm Contact: ≤0.72 mΩ (50mm ²); ≤0.78mΩ (35mm ²); ≤0.80mΩ (25mm ²) HVIL-contact: ≤15mΩ	DIN EN 60512-2-1
E0.2.2	Shielding Contact resistance	Total Shielding resistance ≤ 10mΩ	DIN EN 60512-2-1 TE-Spec. 109-18212
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance >200MΩ	DIN EN 60512-3-1 SAE J 1742

PG20 CLIMATIC LOAD OF HOUSING			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance >200MΩ	DIN EN 60512-3-1 SAE J 1742
B20.1	Aging in dry heat	Period: 120h Temperature 125° C	DIN EN 60068-2-2
B20.2	Humid heat, constant	Damp heat 10 days / 40°C / 95% rel. humidity	DIN EN 60068-2-30
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance >200MΩ	DIN EN 60512-3-1 SAE J 1742
B20.3	Low-temperature aging	Period: 48h Temperature -40°C	DIN EN 60068-2-1
B20.4	Removal and insertion	Removal and insertion at -20 °C	DIN EN 60068-2-2
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
PG21 Long-term temperature aging			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
E0.2.1	Terminal Contact resistance	8mm Contact: ≤0.36 mΩ (50mm ²); ≤0.39mΩ (35mm ²); ≤0.40mΩ (25mm ²) HVIL-contact: ≤15mΩ	DIN EN 60512-2-1

E0.2.2	Shielding Contact resistance	Total Shielding resistance $\leq 10\text{m}\Omega$	DIN EN 60512-2-1 TE-Spec. 109-18212
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance $>200\text{M}\Omega$	DIN EN 60512-3-1 SAE J 1742
E0.4	Dielectric strength	Measurement voltage: 2700VAC Time: 60s Leakage current $\leq 10\text{mA}$	DIN EN 60512-3-1 SAE J 1742 ISO 6469-3
B21.1	Long time aging in dry heat	Period: 1000hc Temperature 125°C	DIN EN 60068-2-2
E8.2	Contact pull-out force	Header Contact $> 500\text{N}$ Plug Contact with shielding and cable $> 180\text{N}$	LV214
PG23 Water leak tightness			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
B19.3	Aging in dry heat	Duration: 120H Temperature: 125°C	DIN EN 60068-2-2
B19.1	Thermal shock	Duration: 144 Cycles Temperature: -40°C for 15min and 125°C for 15min	DIN EN 60068-2-14
B23.1	Immersion with pressure difference	Immerse the sample into the 5% NaCl salt water, adjust the vacuum pressure as below: a) Normal pressure b) -10kPa , holding time 5 mins. c) -50kPa , holding time 5 mins. d) Normal pressure Change in pressure: $10\text{kPa}/\text{min}$. No leakage	DIN EN 60512-14-5 & DIN EN 60068-2-13

B23.2	Line movement during immersion with pressure difference- Vacuum	Waggle the cable times during immersion with pressure difference No leakage	DIN EN 60512-14-5 & DIN EN 60068-2-13						
B23.3	Thermal shock test	5% NaCl solution 30min.in120°C air 15 min in 0°C water 5cycles. No leakage	LV214						
B23.4	High pressure spray (IPX9K) test	Test duration per side: 15s Distance to nozzle: 10 - 15 cm Pressure: 80 bar Temperature: 80°C 3 times No leakage	No leakage						
E0.3	Insulation resistance	Measurement voltage: 1000VDC Time: 60s Insulation resistance >200MΩ	DIN EN 60512-3-1 SAE J 1742						
PG50 EMC- ELECTROMAGNETIC COMPATIBILITY									
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1						
EMC	EMC- Electromagnetic compatibility	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Delta- Transfer impedance</th> </tr> </thead> <tbody> <tr> <td>2MHz</td> <td><10mΩ</td> </tr> <tr> <td>30MHz</td> <td><60mΩ</td> </tr> </tbody> </table>	Frequency	Delta- Transfer impedance	2MHz	<10mΩ	30MHz	<60mΩ	VG 95214-11 LV215-1 LV215-2
Frequency	Delta- Transfer impedance								
2MHz	<10mΩ								
30MHz	<60mΩ								
PG51 Protection, unmated IPXXB and mated IPXXD									
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1						
E51.1	Protection, unmated IPXXB	Press the access probe against every opening on the housing using a force of 10N, check whether any metal contact with test finger.	LV215-2						
E51.1	Protection, mated IPXXD	Press the access probe against every commissure on the housing using a force of 10N, check whether it can be inserted	LV215-2						

3.7 Additional Tests requirement and method summary 附加测试要求及方法

A1 IPX7/IPX9K after climate			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
B19.3	Low temperature aging	Duration: 48H Temperature: -40° C	DIN EN 60068-2-2
B20.1	Aging in dry heat	125 °C chamber for 120h	DIN EN 60068-2-2.
A1.1	Water tightness test (IPX7)	1meter depth water tank for 30 minutes No leakage water	According to ISO 20653
A1.2	Degree of protection test/pressure washer test (IPX9K)	Water spray pressure: 8000 kPa; Water spray temperature: 80 °C; Water flow rate: (14~16) L/minute; Angle: 0°, 30°, 60°, 90°; Rotate speed: 5 revolutions per minute; Every angle keep time: 30 second. No leakage	According to ISO 20653.
A2 Shielding crimp validation			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
A2.1	Shielding crimp	Shield crimping resistance $\leq 3 \text{ m}\Omega$	TE-Spec.109-18212
A2.2	Shielding crimp	Pull out force shield crimp: >150 N	TE-Spec.109-18212
A3 Retention torque			
E0.1	Visual inspection	No defects of fabrication, no changes before and after several testing procedures, mechanical basic function	DIN EN 60512-1-1
A3.1	Retention torque	Header Pin M6: >12Nm	No damage for Pin thread
A3.2	Retention torque	Header Pin M8: >20Nm	No damage for Pin thread

4. QUALITY 质量

4.1 Qualification test 鉴定

Samples must be in accordance with drawings and be taken in a random way in the production in progress.

样件必须与产品图纸一致，并且是生产过程中随机选取的。

4.2 Requalification test 重新鉴定

If changes significantly affecting form, fit, or function are made to the product or to the manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by product engineering.

如果产品或者制造过程中有显著影响外观，装配和功能的设变，质保需要协调按照原先工程部定义的测试顺序，重新验证全部或者部分测试项目。

4.3 Acceptance 验收

Acceptance is based on verification that the product meets the requirements of section **Error! Reference source not found.** Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

归咎于测试设备，样件安装或者操作员的失误的失效不应判定产品不合格。当产品失效发生时，需要有纠正措施以及重新提交样件进行验证。在重新验证前，需确认已有纠正措施。

4.4 Quality conformance inspection 质量合格检验

The applicable TE Connectivity quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification

TE Connectivity 的质量检验计划将指定适用的质量标准。尺寸和功能要求，应按照适用的产品图纸和本规范。

5. APPENDIX 附录

5.1 Housing influence on derating 载流能力曲线

80% Characteristic curve of measured value, cable length according to DIN EN 60512-5-2

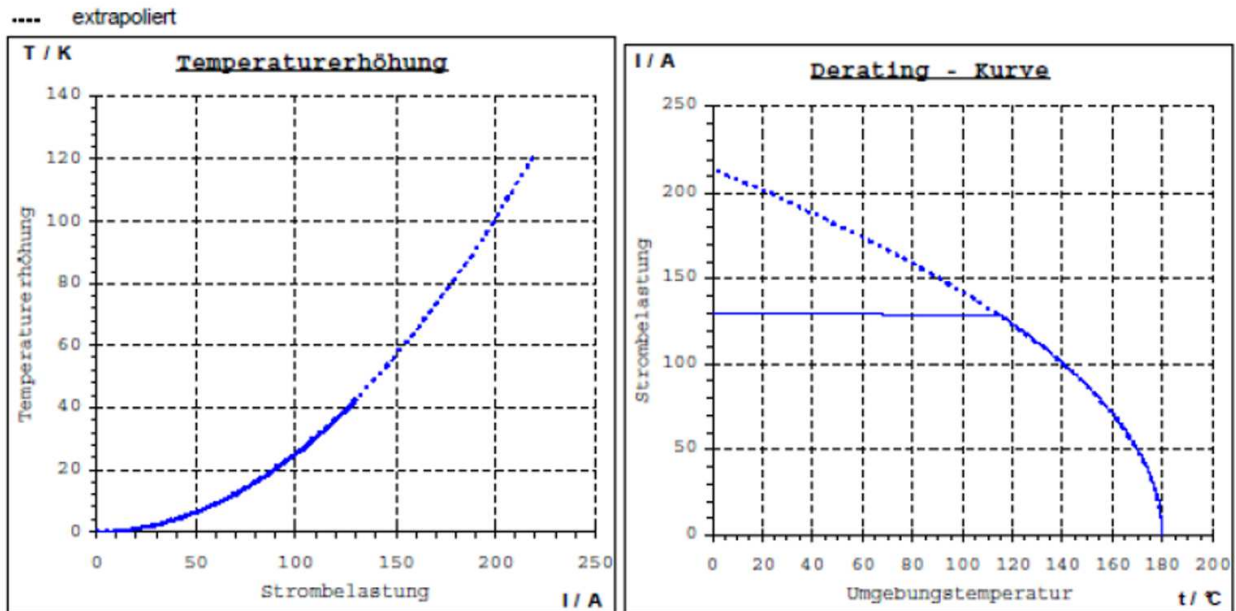


Figure1:Derating and temperature rise-1pos 25mm² Coroplast-Part-No.9-2611

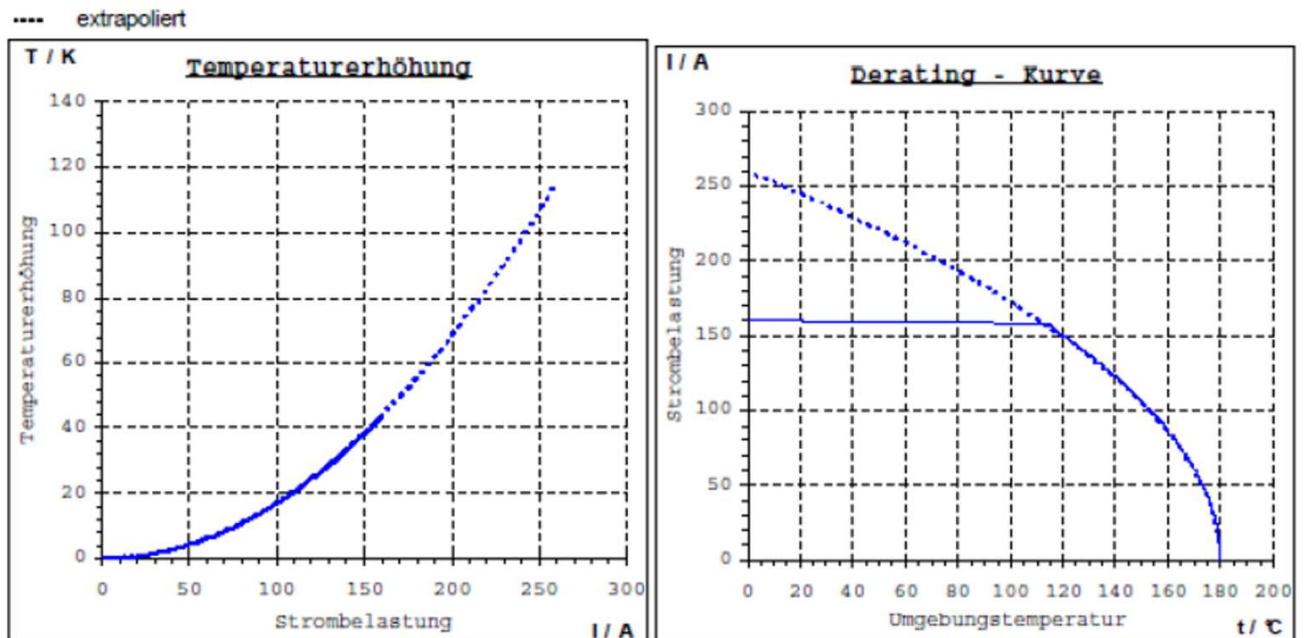


Figure2:Derating and temperature rise-1pos 35mm² Coroplast-Part-No.9-2611

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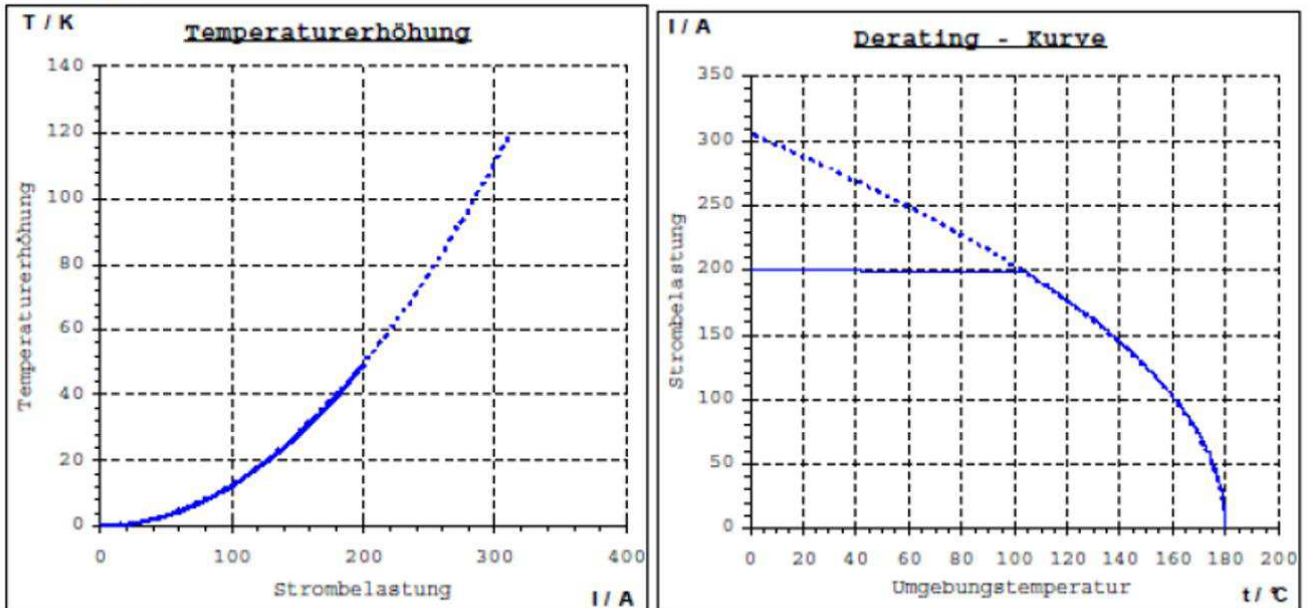
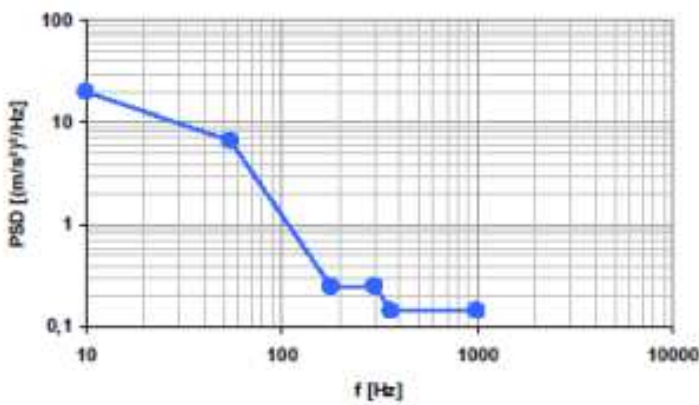
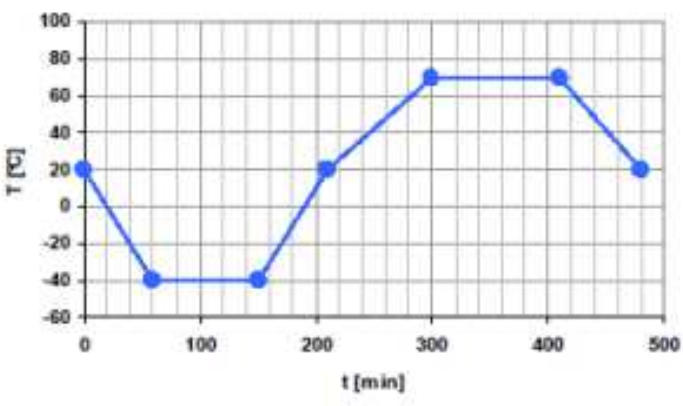


Figure3:Derating and temperature rise-1pos 50mm² Coroplast-Part-No.9-2611

5.2 Dynamic load 动态负载

Dynamic load acc. ISO16750 and LV214-1

Table 8: Vibration severity: Passenger car, sprung masses

ISO16750-3 Test IV – Passenger car, sprung masses (vehicle body) <i>ISO16750-3 Test IV - Karosserieanbau</i>		
Duration: 3 x 8h <i>Dauer: 3 x 8h</i>		
No Sinusoidal load <i>Keine Sinusbelastung</i>		
Shock: <i>Schockbelastung:</i>	A= 30g	No. of shocks: 6000 <i>Schockzahl: 6000</i>
Random: <i>Rauschbelastung:</i>	a_{eff} f [Hz]	27,8 (m/s²)_{RMS} PSD [(m/s²)²/Hz]
	10 55 180 300 360 1000	20 6,5 0,25 0,25 0,14 0,14
Temperature: <i>Temperatur:</i>	[min]	[°C]
	0 60 150 210 300 410 480	20 -40 -40 20 70 70 20

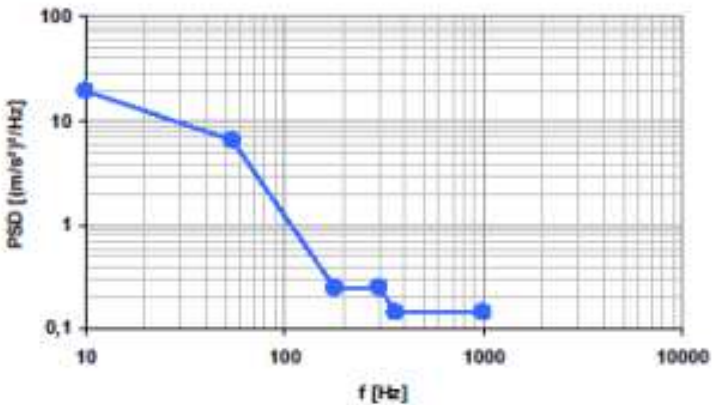
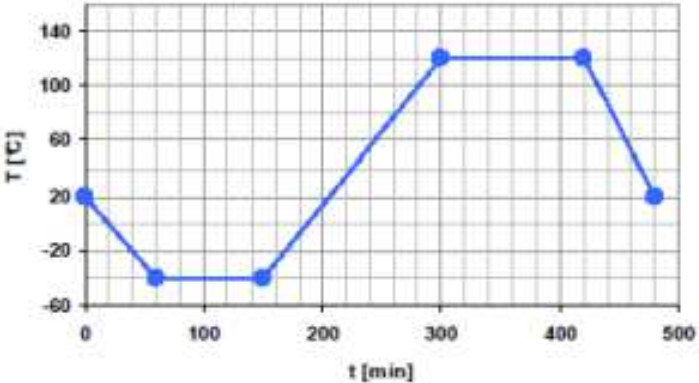
LV214-1 Severity 2: "Body" sealed <i>LV214-1 Schärfegrad 2: „Karosserie“ gedichtet</i>		
Duration: 3 x 20h <i>Dauer: 3 x 20h</i>		
No Sinusoidal load <i>Keine Sinusbelastung</i>		
Shock: <i>Schockbelastung:</i>	A= 30g	No. of shocks: 6000 <i>Schockzahl: 6000</i>
Random: <i>Rauschbelastung:</i>	a_{eff} f [Hz] 10 55 180 300 360 1000	27,8 (m/s²)_{RMS} PSD [(m/s²)²/Hz] 20 6,5 0,25 0,25 0,14 0,14
		
Temperature: <i>Temperatur:</i>	[min] 0 60 150 210 300 410 480	[°C] 20 -40 -40 20 120 120 20
		

Figure 4 Typical Compliant Pin Press into PCB