

4580 01 - High-current contact

Overview acc. LV 215 Edition (VW 80332: 2021-02)

Test PCB: FR4 1,6 mm ±10 % (IPC 4101C/121) TG (DSC= =170 °C / 2 layers Cu 105 µm / 6 mm

Connection wire cross section for high load: 6 mm²

Version: 2

Lumberg 
passion for connections



Date: 13.06.2025

Test group		Requirement	Results Lumberg high current contact 4580 01				
TG 1	Dimensions	The measured values must be corresponded to the release drawing or product specification	Inspection reports available and ok			OK	
TG 2	Material and surface analysis, contacts	Confirmation that all materials are in conformance with applicable legal requirements and the drawings	Material certificates available and conform			OK	
TG 3	Material and surface analysis, contacts	not required, pure metal part	Not applicable for high current contact			OK	
TG 4	Contact engagement Length	Contact engagement length: > 1,00 mm					
		Contact overlap – Plug in direction top/bottom	Contact overlap with 3,6 mm above specification of >1,0 mm			OK	
		Contact overlap – Plug in direction horizontal	Contact overlap with 0,24 mm to 0,69 mm in mounting direction is below the specification of >1,0 mm. The usage of the contact in the mounting direction 'horizontal' in the final application is under the responsibility of the customer.			with limitations	
TG 5	Mechanical and thermal relaxation behaviour	The normal contact force must be documented. Graphical representation (simple logarithmic time representation) extrapolated to 3000 h. Intermediate values at 0h, 1h, 100h, 200 h, 500 h and 1000 h. The contact opening must be documented	The normal contact force is between 20 N and 41 N. After the thermal load, the contact force was measured between 14 N and 32 N.			OK	
TG 6	Interaction between contact and contact housing	This Test Group is not relevant for this application	Not applicable for high current contact			OK	
TG 7	Handling and functional reliability of the contact housings	This Test Group is not relevant for this application	Not applicable for high current contact			OK	
TG 8	Insertion and holding forces of the contact parts in the contact housing	This Test Group is not relevant for this application	Not applicable for high current contact			OK	
TG 9	Pin insertion angle/misuse-proofing (scoop-proofing)	CAD Documentation must be provided	The documentation shows that the function of the system is not lost if the specified installation tolerances are used.			OK	
TG 10	Contacts: Based on PG 10 - Misuse / Share force from PCBA SMD – Variante only	Misuse test Mechanical strength of the contact solder joint	Tensile Strength 326 N - 369 N			OK	
			Shear force in 4 directions				
			x / -x		y / -y		
			30 N to 38 N		96 N to 109 N		
TG 11	Contacts: Insertion and extraction forces; number of mating cycles	Insertion/extraction direction from ,horizontal /front side Insertion force: 18 N ±10 N Extraction force: 15 N ±10 N	First cycle		five cycle		ok
			Insertion force [N]	Extraction force [N]	Insertion force [N]	Extraction force [N]	
			13 N to 17 N	7 N to 10 N	42 N to 55 N	33 N to 40,3 N	
		Insertion/extraction direction from ,top side / bottom side Insertion force: 32 N ±15 N Extraction force: 32 N ±10 N	First cycle		five cycle		with limitations
			Insertion force [N]	Extraction force [N]	Insertion force [N]	Extraction force [N]	
			31 N to 42 N	31 N to 37 N	42 N to 55 N	33N to 40,3 N	
		Insertion/extraction direction from ,top side Insertion force change max. 25 % on each sample between 1st and 5th insertion	The surface analysis shows no impairment of the finish, the increase in force from the first to the fifth plug exceeds the permissible 25 % Based on the longer mounting path of the tab from 5.2 mm to 2.2 mm				
TG 12	Current heating derating - free in air	derating - free in air, one Contact on PCB Contact tab: CuZn37 tinned - 0,8 mm x 4,8 mm (corresponds to the cross section 4 mm²) PCB: double-sided - conductor thickness 105 µm / width 6 mm	Derating curve - short version: The testing resulted in a max current load of <56 A at Tu 20 °C at 80 %			OK	

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Connection wire cross section for high load: 6 mm²

Version: 2



Date: 13.06.2025

Test group		Requirement	Results Lumberg high current contact 4580 01				
TG 13	Derating wit housing	derating - free in air, three Contact on PCB Contact tab: CuZn37 tinned - 0,8 mm x 4,8 mm (corresponds to the cross section 4 mm²) PCB: double-sided - conductor thickness 105 µm / width 6 mm	Derating curve - short version: The testing resulted in a max current load of <51 A at Tu 20 °C at 80 % This contact has no plastic housing – it will be used in a customer specified application. Therefore the TG 13 was made with the test PCB and all 3 test circuits were loaded at the same time.			OK	
TG 14	Thermal time constant	Evaluating the temporary exceedance of the maximum current-carrying capacity (peaks)	The maximum values for the contact resistance would not be exceeded.			OK	
TG 15	Electrical stress test	Terminal gap documented before and after test	Gap measurement available			OK	
		Temperature change 1	Min.	Max.	Avg.		
		Contact resistance before test Rc init < 1,0 mΩ	0,46 mΩ	0,53 mΩ	0,5 mΩ		
		Humid heat, cyclic	Min.	Max.	Avg.		
		Contact resistance after test Rc final < 1,0 mΩ	0,47 mΩ	0,53 mΩ	0,5 mΩ		
		Temperature change 2	Min.	Max.	Avg.		
		Contact resistance after test Rc final < 1,0 mΩ	0,62 mΩ	0,7 mΩ	0,66 mΩ		
	Change in rated current <20 %	Requirement fulfilled					
TG 16	Fretting corrosion	The number of friction cycles until reaching the 300 mΩ	Test with 200.000 cycles			OK	
TG 17.1	Dynamic loading - Severity 1	Dynamic load, sinusoidal / DIN EN 60068-2-64	This test is NOT relevant for this applikation			OK	
		Dynamic load, broad-band random vibration / DIN EN 60068-2-64	Min.	Max.	Avg.		
			0,62 mΩ	0,69 mΩ	0,65 mΩ		
		Endurance mechanic shock test / DIN EN 60068-2-27	Min.	Max.	Avg.		
			0,5 mΩ	0,58 mΩ	0,58 mΩ		
	Resonance frequency of the contact system DIN EN 60068-2-6 / VDE 0468-2-6	The test has to be done in the customer application					
TG 17.2	Dynamic loading - Severity 2	Dynamic load, sinusoidal / DIN EN 60068-2-64	Not applicable for high current contact			OK	
		Dynamic load, broad-band random vibration / DIN EN 60068-2-64	Min.	Max.	Avg.		
			0,47 mΩ	0,53 mΩ	0,53		
		Endurance mechanic shock test / DIN EN 60068-2-27	Min.	Max.	Avg.		
			0,39 mΩ	0,43 mΩ	0,41		
	Resonance frequency of the contact system DIN EN 60068-2-6 / VDE 0468-2-6	The test has to be done in the customer application					
TG 18 A	Coastal climate stress	This Test Group is not relevant for this application					
TG 19	Environmental simulation	Contact resistance before test Rc init < 1,0 mΩ Group 1 : The DUTs are extracted Group 2 : The DUTs are inserted and extracted 1 time Group 3 : The DUTs are inserted and extracted 25 times	Min. (Group 1)	Max. (Group 1)	Avg. (Group 1)		
			0,49 mΩ	0,52 mΩ	0,54 mΩ		
			Min. (Group 2)	Max. (Group 2)	Avg. (Group 2)		
			0,43 mΩ	0,5 mΩ	0,55 mΩ		
			Min. (Group 3)	Max. (Group 3)	Avg. (Group 3)		
			0,52 mΩ	0,53 mΩ	0,54 mΩ		
		Contact resistance after test Rc final < 1,0 mΩ	Min. (Group 1)	Max. (Group 1)	Avg. (Group 1)		
			0,5 mΩ	0,54 mΩ	0,56 mΩ		
			Min. (Group 2)	Max. (Group 2)	Avg. (Group 2)		
			0,47 mΩ	0,52 mΩ	0,56 mΩ		
			Min. (Group 3)	Max. (Group 3)	Avg. (Group 3)		
			0,53 mΩ	0,7 mΩ	0,56 mΩ		
	No rubbing through in contact area	Contacts and contact area are ok					
TG 20A	Environmental load of the housing	This Test Group is not relevant for this application	Not applicable for high current contact			OK	
TG 21	Long-term temperature aging	This Test Group is not relevant for this application	Not applicable for high current contact			OK	
TG 22A	Chemical resistance	This Test Group is not relevant for this application	Not applicable for high current contact			OK	

File in the model manager under 4580A06

4580 03 - High-current contact

Overview acc. to LV 215 Edition (VW 80332: 2021-02)

Test PCB: FR4 1.6 mm ±10 % (IPC 4101C/121) TG (DSC= 170 °C / 2 layers Cu 105 µm / 6 mm)

Connection wire cross section for high load: 2x 6 mm²



28.05.2025

Version: 0

Test group			Results
TG 1	Dimensions		OK
TG 2	Material and surface analysis, contacts		OK
TG 3	Material and surface analysis, housing		OK*
TG 4	Contact engagement Length	Contact overlap – Plug in direction top/bottom	OK
		Contact engagement length: > 1,00 mm	
TG 5	Mechanical and thermal relaxation behaviour		OK
TG 6	Interaction between contact and contact housing		OK*
TG 7	Handling and functional reliability of the contact housings		OK*
TG 8	Insertion and holding forces of the contact parts in the contact housing		OK*
TG 9	Pin insertion angle/misuse-proofing (scoop- proofing)		OK
TG 10	Conductor pull-out strength		OK
TG 11	Contacts: Insertion and extraction forces; number of mating cycles	Insertion/extraction direction from horizontal/front side	OK
		Insertion/extraction direction from top side/bottom side	OK
		Insertion force change max. 25 % on each sample between 1st and 5th insertion	with limitations
		Remark: Depending on the surface roughness of the tab, mechanical abrasion of the tin layer down to the underlying base material may occur on individual contact fingers	Change in insertion force up to 35 %
TG 12	Current heating derating - free in air		OK
TG 13	Derating on 3 circuits in parallel to simulate housing condition		OK
TG 14	Thermal time constant		OK
TG 15	Electrical stress test		OK
TG 16	Fretting corrosion		OK
TG 17	Dynamic loading – Severity 2		OK
TG 18A	Coastal climate stress		OK*
TG 19	Environmental simulation		OK
TG 20A	Environmental load of the housing		OK*
TG 21	Long-term temperature aging		OK*
TG 22A	Chemical resistance		OK*

*= not relevant for the application