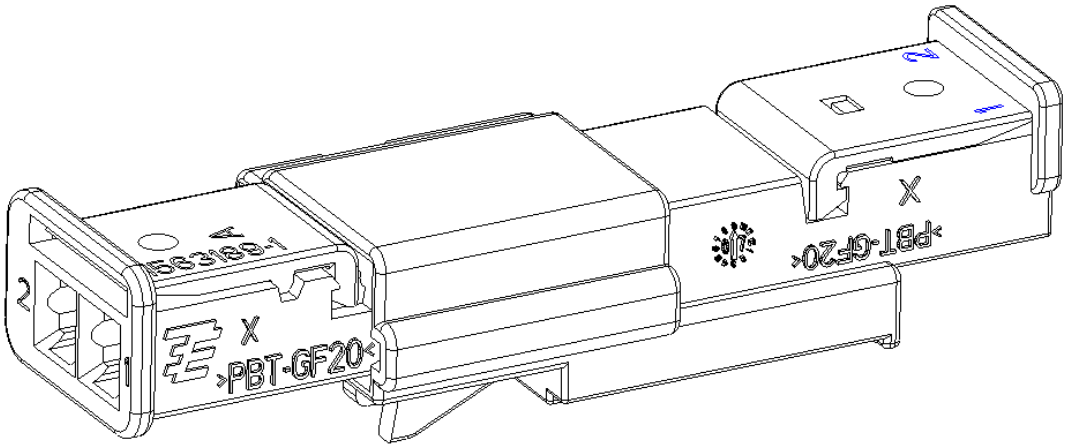
Class 1 | 2Pos MT2 Inline Connector



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5 ANHANG
Appendix

1 ANWENDUNGSBEREICH
Scope

1.1 Inhalt
Content

Diese Spezifikation beschreibt die Eigenschaften, Tests und Qualifikationsanforderungen für den 2 pol. Inline Connector (ungedichtete Ausführung).
Diese Micro Timer 2 Gehäuse wurden für den Einsatz im Automobilbereich kundenspezifisch entwickelt.
Es handelt sich um ein Micro Timer 2 Type A Buchsengehäuse zur Kontaktierung auf das Tab-Gehäuse mit 1.6x0,6mm Tabs. Das System wird in den Anforderungen als ein 1,5mm System gewertet.

Das Micro Timer 2 Type A Buchsengehäuse besitzt eine Verrastung mittels Rasthaken. Die zweite Kontaktsicherung erfolgt sowohl beim Buchsengehäuse wie auch beim Tab-Gehäuse durch eine angebundene einschwenkbare Klappe.

Der 2 pol. Inline Connector ist mit Micro Timer 2 Type A Kontakten sowie Tab 1.6x0.6 Kontakten zu bestücken. Die Leiterquerschnitte gehen von 0,5mm² bis 1.5mm².

This specification covers the performance, tests and quality requirements for the 2 pos. Inline Connector.
This 2 pos. Inline Connector was customer-specific developed for the usage in the Automotive Industry.
It is a Micro Timer 2 Type A receptacle housing to connect the tab-housing with 1.6x0.6 tabs.
This specification covers the performance, test and quality requirements for the 2 pos. Inline Connector (unsealed version).This terminal system will be evaluated with the requirements of a 1,5mm system.

This 2 pos. Micro Timer 2 receptacle housing has a locking latch.
The receptacle housing and pin housing have both a fastened and moveable second locking flap.

The 2 pos. Inline Connector is loaded with Micro Timer 2 type A and pin contacts 1.6x0.6.
The wire size range goes from 0.5mm² to 1.5mm².

1.2 Qualifikation
Qualification

Bei der Qualifikationsprüfung der genannten Produkte sind die nachfolgend genannten Richtlinien und Normen zu verwenden. Alle Prüfungen müssen nach den dazugehörigen Prüfplänen und Produktzeichnungen durchgeführt werden.

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

2 ANWENDBARE UNTERLAGEN
Applicable Documents

Die nachfolgend genannten Unterlagen, sofern im Einzelnen darauf verwiesen wird, sind Teil dieser Spezifikation. Im Falle des Widerspruches zwischen dieser Spezifikation und der Produktzeichnung oder des Widerspruches zwischen dieser Spezifikation und den aufgeführten Unterlagen hat diese Spezifikation Vorrang.

The following documents are part of this specification. In case of conflict between the requirements of this specification and the product drawing or of conflict between the requirements of this specification and the referenced documents, this specification takes precedence.

2.1 Tyco Unterlagen
Tyco Documents

A. Kundenzeichnungen:
Customer drawings

1563189	2 Pos, MT2, Rec.-Housing
1563190	2 Pos. 1.6x0.6 Tab Housing
2208214	2 Pos. 1.6x0.6 Tab Housing

Die Kundenzeichnungsnummern für die Kontakte sind den entsprechenden Gehäusezeichnungen zu entnehmen.
The drawing numbers for the contacts can be taken from the corresponding housing drawings.

B. Tyco Produkt-Spezifikationen:
Tyco Product Specifications

108-18055-0	Micro Timer 2/3
108-18331-0	1.6mm Flachstecker

C. Tyco Verarbeitungsspezifikationen:
Tyco Application Specifications

114-18081-0	Verarbeitungsspezifikation für Micro Timer 2/3
114-18082-0	Verarbeitungsspezifikation für 1.6mm Flachstecker
114-18901	Verarbeitungsspezifikation für 2 pol. MT2 inline connector

2.2 Allgemeine Unterlagen
Other documents

A.	GMW 3191 (Dez.2007)	Test- und Validierungsfestlegung für Steckverbinder *Connector test and validation specification*
B.	GME 14028	Designspezifikation für Elektrische Steckverbindungen *Design spezification for electrical connectors*
C.	GMW 3059	Regelung über die Zulässigkeit von gefährlichen Stoffen *Restricted and reportable substances for parts*
D.	GMW 3116	Entwicklungsrichtlinen zur Wiederverwertbarkeit *Recyclability design guide*

3 ANFORDERUNGEN
Requirements

3.1 Entwurf und Konstruktion
Design and Construction

Das Produkt muss seiner Ausführung und seinen physikalischen Abmessungen der Produktzeichnung entsprechen.
Product ll be of the design, construction and physical dimensions specified on the applicable production drawing

3.2 Leistungsmerkmale
Performance

A.	Nennspannung: *Nominal voltage:*	14V Gleichspannung *14V DC*
B.	Strombelastbarkeit: *Current capacity:*	Siehe Derating *See derating*
C.	Temperaturbereich: *Temperature range:*	Klasse 1 (-40 bis +85℃ Um gebungstemperatur) *Class 1 (-40 to +85℃ ambient temperature)*
D.	Vibrationsklasse: *Vibration class:*	Klasse 1 (An Karosserie oder Chassis) Class 1 (On body or chassis)
E.	Dichtigkeitsklasse: *Sealing class:*	Klasse 1 (Nicht abgedichtet) Class 1 (unsealed)

3.3 Leistungsmerkmale und Testbeschreibung
Performance and Test Description

Das Produkt erfüllt die in Abschnitt 3.4 aufgeführten elektrischen, mechanischen und klimatischen Anforderungen.
The product is designed to meet the electrical, mechanical and environmental performance requirements specified in chapter 3.4.

3.4 Qualifikations- und Requalifikationsprüfungen
Qualification- and Requalification Testing

Eigenschaften gemäß GMW3191, außer genehmigten Abweichungen
Performance according GMW3191, except approved deviations

Prüfablauf ***Test Sequence***	**Testberichte** ***Test Reports***	**Bemerkung** ***Remarks***
Steckverbinder – Elektr. Prüfungen (Tabelle 24) *Connector – Electrical Tests (Table 24)* *24 A Mech. Shock / Vibration* *24 B Thermal Ageing* *24 C Thermal Shock* *24 D Temperature Humidity Cycling* *24 E Heavy Duty Test*	 *08-A-0658;12-AUT-1989* *08-A-0451* *08-A-0451* *08-A-0451* *08-A-0451*	*OK*
Steckverbinder – Mech. Prüfungen (Tabelle 25) *Connector – Mechanical Tests (Table 25)* *25 A Term. to Conn. Body Engagement Force* *25 C Conn. to Conn. Engagement Force* *25 D Locked Conn. Disengagement Force* *25 E Unlocked Conn. Disengagement Force* *25 F Conn. Polarization Feature Effectiveness* *25 G Terminal Position Assurance*	 *08-A-0480* *08-A-0480;12-AUT-1825* *08-A-0480;12-AUT-1825* *08-A-0480;12-AUT-1825* *09-A-0128;12-AUT-1825* *08-A-0480*	*OK / except* *Deviations signed by John Sakowicz(GM) on 25 July 2008* - *Terminal to connector body engagement force, TPA in fully seated position (part 4.7)* *Requirement ≥ 40N* *actual value min. 5.5N, max. 9.5N* - *Connector polarization (coding) feature effectiveness* *Requirement ≥ 150N* *actual value min. 80N, max. 140N* $F_{TPA\ closed}$ *< 40 N* *Deviation approved by A. Greifenstein (Opel)*
Steckverbinder – Mech. Prüfungen (Tabelle 25) *Connector – Mechanical Tests (Table 25)* *25 B Terminal from Connector Extraction Force*	 *08-A-0456*	*OK* *Requirement:1,6 System rated as 1,5mm System*
Unged. Steckverbinder – Umwelttests (Tabelle 28) *Unsealed Conn. – Environmental Tests (Table 28)* *28 B Corrosion*	 *08-A-0402*	*OK*

Note 1: NA — Prüfung nicht anwendbar/nicht durchgeführt. OK — Prüfung wurde bestanden. NOK — Prüfung wurde nicht bestanden
Note 1: NA — Test not applicable/not processed. OK — Test passed. NOK — Test not passed.

4 QUALITÄTSICHERUNGSMASSNAHMEN
QUALITY ASSURANCE PROVISIONS

4.1 Requalifikationsprüfung
Requalification Testing

Falls signifikante, die vereinbarten Eigenschaften berührende Änderungen der Form, Ausstattung oder Funktion des Produktes oder dessen Herstellungsverfahrens vorgenommen wurden, wird die zuständige Entwicklungsabteilung einen Requalifikationstest koordinieren. Dieser besteht aus einem Teil oder den gesamten ursprünglichen Prüfgruppen, je nach Festlegung durch die Entwicklungs- und Qualitätsicherungsabteilung.

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

4.2 Abnahme
Acceptance

Die Abnahme basiert auf dem Nachweis, daß das Produkt den Anforderungen nach Abschnitt 3.4 genügt. Abweichungen, die auf Messgeräte, Messanordnungen oder Bedienungsmängel zurückzuführen sind, dürfen nicht zu einem Entzug der Qualifikation führen.
Tritt eine Abweichung am Produkt auf, müssen korrigierende Maßnahmen ergriffen werden und die Qualifikation ist erneut nachzuweisen. Vor dieser Requalifikation ist durch entsprechende Prüfungen der Erfolg der Korrekturmaßnahme zu bestätigen.

Acceptance is based on verification that the product meets the requirements of Para. 3.4. 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.

4.3 Prüfung und Konformität
Quality Conformance Inspection

Die Konformitätsprüfung erfolgt nach dem zugehörigen Qualitäts-Inspektionsplan, der die annehmbare Qualitätsgrenzlage nach dem Stichprobenumfang festlegt.
Maßliche und funktionelle Anforderungen müssen mit den Produktzeichnungen und dieser Spezifikation übereinstimmen.

The applicable Tyco 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.

5 Anhang
Appendix

Overview
***GMW3191* Draft rev. DEZ 2007**
(Details see GMW3191)

No.	Test	Acceptance Criteria
3.03	Conditioning	--
4.01	Visual Examination	There shall be no corrosion, discoloration, cracks etc., which could affect the functionality of the part. Swelling or physical distortion shall not exceed the tolerances specified on the part drawing.
4.02	Crack Corrosion This test is required only for unplated copper/zinc (copper ≦ 70 %) based terminals	Surface free of cracks
4.03	Crimp Integrity	All wire strands shall be uniformly deformed, honeycomb like structure, minimal cavities, all wire strands enveloped, wire strands evenly distributed on both sides, symmetrical with minimal burrs, a*cc. Tyco crimp spec. Visual Examination Cross section see 114-28022*
4.04	Terminal Wire Attachment Tensile Strength	Acc to table 5
4.05	Terminal-to-Terminal Engage Force	None, just record
4.06	Terminal Normal Force	Normal force min. 75% of initial value
4.07	Terminal to Connector-Engage Force	<1.0qmm 15N; =1.0qmm 20N; >1.0qmm 30N; with TPA or PLR min. factor2
4.08	Mechanical overstress test	Acc. to. table 6 and table 10
4.09	Terminal from Connector Extraction Force	Acc. to. table 7 – Terminal size 1.5mm
4.10	Terminal Push-out Force	Acc. to. table 8
4.11	Connector to Connector Engagement Force	Acc. to. table 4
4.12	Miscellaneous Connector Component(s)	
4.12.1	Terminal Position Assurance (TPA)	TPA prelocking force 20N; TPA closing force with correct mated terminal <30N; TPA closing force with incorrect mated terminal >60N
4.12.2	Lever and Slide “Open” Position Retention	1) 50 N force without separation or damage; 2) pre-lock position 150 N force; 3) without permanent damage
4.12.3	Mechanical Assist Integrity	1) withstand 100 N open and closed pos. without separation or damage; 2) withstand 60 N in the midpoint pos. without separation or damage.
4.12.4	Connector Mounting Feature Mechanical Strength	mounting direction min. 110 N; other directions min 50N
4.12.5	Connector Position Assurance (CPA)	close <22N, open min20N - max.40N; close unmated >50N for <=3pos, >80N for >3pos; removal from connector >60N for <=3pos, >80N for > 3pos

No.	Test	Acceptance Criteria
4.12.6	Removal Force Radial Sealing from Housing	min. 9N in unmating direction
4.13	Locked Connector Disengagement Force	acc. to table 9
4.14	Unlocked Connector Disengagement Force	disconnect connector <=100N ;disengage primary lock <=100N
4.15	Connector Polarization (Coding) Feature Effectiveness	Withstand min. result of 4.11 (3X); Withstand min.150N without electrical contact; no physical damage
4.16	Maximum Current Rating	Measured data must meet or exceed intended terminal design current capability and temp. rise.
4.17	Dry Circuit Resistance	"Initial" and "Post-Test" $R_{Total\ Connection}$ ≤the values listed in Table 10
4.18	Current Cycling	Measured temp. of mated terminal pair not exceed temp. limit terminal and cable size combination; $R_{Total\ Connection}$ <= values Table 10
4.19	Isolation Resistance	>100MOhm
4.20	Dielectric Strength	AC rms voltage of 1000 V at 50 Hz or 60 Hz or a DC voltage of 1600 V; no current leakage (dielectrical breakdown)
4.21	Thermal Aging	acc. to table 10, surface OK
4.22	Thermal Shock	acc. to table 10; no loss of electrical continuity (>7Ohm for >1µs); surface OK
4.23	Temperature/Humidity Cycling	acc. to table 10
4.24	Heavy duty test	Max temp rise on the terminal at end of each circle is 50℃; $R_{Total\ Connection}$ acc. table 10
4.25	Flammability	Burn rate less 100mm/min. (GMW3232); datasheet
4.26	Corrosion	R acc to table10; Terminal retention F acc to Table7
4.27	Mechanical Shock	none, see vibration *acc. to table 10* *no loss of electrical continuity (>7Ωfor >1µs)* *surface OK*
4.28	Vibration with Thermal Cycling	acc. to table 10 no loss of electrical continuity (>7Ω for >1µs) no fretting corrosion, surface OK
4.29	Water Submersion	no traces of water; leakage current <=5µA
4.30	Pressure/Vacuum Leak	positive pressure: no pressure loss, no bubbles; negative pressure: R-iso >100MOhm; no traces of water
4.31	High Pressure Spray	R-iso >100MOhm; no traces of water
4.32	Fluid Resistance	R-iso >100MOhm; no loss of mechanical function
4.33	Electrical Resistance of Short Circuit Devices / Shorting Bars	R <40mOhm
4.34	Terminal Bend Resistance	Withstand force from Table 21

GMW3191 Draft rev. DEZ 2007
(Details see GMW3191)

Fig 29: Terminal - Mechanical Test
Fig 29 preparation
Visual Examination
Crack Corrosion Seq. 22 A
4.02 Conditioning in Ammonia solution
4.02 Crack Corrosion
4.01 Visual Examination
4.03 Crimp Integrity Seq.22B
4.04 Terminal-Wire Attachment Tensile Strengt Seq.22C
4.05 Terminal-Terminal Engage Force Seq.22D
4.08 Mechanical overstress test Seq.22E
4.34 Terminal Bend Resistance Seq.22F
Fig. 29 Report

Fig 30: Terminal - Electrical Test
Preparation Fig 30
4.01 Visual Examination
3.03 Conditioning
Seq. 23 A
4.16 Maximum Current Rating
Seq. 23 B
4.17/33 Dry Circuit Resistance
4.18 Preparation
4.18 Current Cycling
4.17/33 Dry Circuit Resistance
Final Test Seq.23
4.01 Visual Examination
Fig. 30 Report

Fig 31: Connector - Electrical Test
Preparation Fig 31
4.01 Visual Examination
3.03 Conditioning
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
Seq. 24 A (31) [Vibration]
4.27 Preparation
4.27 Mechanical Shock
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
4.28 Prepearation
4.28 Vibration
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
4.01 Visual Examination
Seq. 24A (31) Report

Seq. 24 B (31) [Thermal Aging]
4.21 Preparation
4.21 Thermal Aging
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
4.01 Visual Examination
Seq. 24 D (31) [Thermal Shock]
4.22 Preparation
4.22 Thermal Shock
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
4.01 Visual Examination
Seq. 24 E (31) [Temp Humid. Cycl.]
4.23 Preparation
4.23 Temperature Humidity Cycling
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
4.01 Visual Examination
Seq. 24 C (31) [Heavy Duty]
4.24 Preparation
4.24 Heavy duty test
4.17 Dry Circuit Resistance
[optional] 4.33 Ohmic resistance of short circuit device
4.01 Visual Examination
Seq.24 B-E (31) Report

Fig 32: Connector System - Mechanical Test [Seq.25 A, C-M]
4.01 Visual Examination
4.07 Terminal to Connector-Engage Force Seq.25A
4.09 Terminal from Connector Extraction Force, done in Fig 33 Seq.25B
4.10 Terminal Push-out Seq.25N
4.11 Connector to Connector Engage Force Seq.25C
4.14 Unlocked Connector - Disengage Force Seq.25E
4.13 Locked Connector - Disengage Force Seq.25D
4.15 Connector Polarization (Coding) Feature Effec
4.12.1 mec. TPA test
4.12.2 Slide Retention pre lock pos
4.12.3 Mec. Assist Intergrity (Side Force Strength Lever and Slide)
4.12.4 Connector Mounting Feature (Clips and Fasteners)
4.12.5 CPA
4.12.6 Removal Force Radial Sealing from Housing
4.25 Flammability
4.01 Visual Examination
Fig.32 Report

Fig 33: Terminal from Connector Extraction Force (4.9) [Seq.25B]
4.01 Visual Examination
4.09.4-5 Terminal from Connector Extraction Force without Retainer Seq.25B
4.09.4-6 Terminal from Connector Extraction Force with Retainer Seq.25B
Preparation for Moisture cond.

4.09.4-7 Moisture cond. 6h for Terminal from Connector Extraction Force
4.09.4-7 Terminal from Connector Extraction Force (Moisture cond. 6h) Seq.25B
4.21 Preparation
4.21 Thermal Aging
4.09.4-8 Terminal from Connector Extraction Force Seq.25B
4.23 Preparation
4.23 Temperature Humidity Cycling
4.09.4-9 Terminal from Connector Extraction Force
4.01 Visual Examination
Fig 33 Report

Fig 34: Sealed Connector - Environmental Test [Seq.27]
Preparation 34
4.01 Visual Examination
3.03 Conditioning
4.19 Isolation Resistance
Seq. 27 A (34) [Fluid Resistance]
4.32 Fluid Resistance
4.32 Storage of Samples
4.19 Isolation Resistance
4.20 Dielectric Strength
4.09.4-5 Terminal from Connector Extraction
Seq. 27 B (34) [Corrosion]
4.26 Preparation
4.26 Corrosion
4.19 Isolation Resistance
4.20 Dielectric Strength
4.09.4-5 Terminal from Connector Extraction Force with retainer
Seq. 27 C (34) [Thermal Aging, leakage test]
4.30 Pressure/Vacuum Leak
4.30 Storage of Samples
4.21 Thermal Aging
4.30 Pressure/Vacuum Leak
4.30 Storage of Samples
4.29 Water Submersion
4.01 Visual Examination
4.31 High Pressure Spray
4.19 Isolation Resistance
4.20 Dielectric Strength
Seq. 27 D (34) [Thermal Shock, leakage test]
4.30 Pressure/Vacuum Leak (Classes 2 and 3)
4.30 Storage of Samples
4.22 Thermal Shock
4.30 Pressure/Vacuum Leak
4.30 Storage of Samples
4.29 Water Submersion
4.01 Visual Examination
4.31 High Pressure Spray
4.19 Isolation Resistance

4.20 Dielectric Strength
Seq. 27 E (34) Temp. Humid. Cycl., leakage test]
4.30 Pressure/Vacuum Leak
4.30 Storage of Samples
4.23 Temperature Humidity Cycling
4.30 Pressure/Vacuum Leak
4.30 Storage of Samples
4.29 Water Submersion
4.01 Visual Examination
4.31 High Pressure Spray
4.19 Isolation Resistance
4.20 Dielectric Strength
Final Test Fig 34
4.01 Visual Examination
Seq.27 (34) Report

Fig 35: Unsealed Connector - Environmental Test [Seq.28]
Preparation 35
4.01 Visual Examination
3.03 Conditioning
4.19 Isolation Resistance
Seq. 28 A (35) [Thermal Aging]
4.21 Preparation
4.21 Thermal Aging
4.19 Isolation Resistance
4.20 Dielectric Strength
Seq. 28 B (35) [Corrosion]
4.26 Preparation
4.26 Corrosion
4.19 Isolation Resistance
4.20 Dielectric Strength
4.17 Dry Circuit Resistance
Seq. 28 C (35) [Thermal Shock]
4.22 Preparation
4.22 Thermal Shock
4.19 Isolation Resistance
4.20 Dielectric Strength
Seq. 28 D (35) [Temp Humid. Cycl.]
4.23 Preparation
4.23 Temperature Humidity Cycling
4.19 Isolation Resistance
4.20 Dielectric Strength
Final Test Seq. 28
4.01 Visual Examination
Seq. 28 (35) Report