Product Specification

108-20330

Rev.A1

Description **MCON to MCON 1.2 Interface**

DESIGN OBJECTIVES

The product described in this document has not been fully tested to insure conformance to the requirements outlined below. Therefore AMP Incorporated makes no representation or warranty, expressed or implied, that the product will comply with these requirements.

Further, AMP Incorporated may change these requirements based on the results of additional testing and evaluation.

Contact AMP Engineering for further details.

Il prodotto descritto in questa specifica non è stato ancora completamente provato per garantirne la conformità ai requisiti indicati nel documento. Perciò l'AMP non può al momento fornire assicurazione sulla conformità del prodotto a questi requisiti.

L'AMP si riserva inoltre la facoltà di modificare i requisiti della specifica sulla base dei risultati di addizionali prove e valutazioni.

Per ulteriori informazioni si prega di contattare l'Ufficio Tecnico.

MCON to MCON 1.2 Interface

Product Code: GPL: **Progr.: PRJ-12-1418**

rev letter	rev. record	DR	Date	CHK	Date
A1	Data update – Automotive fluid description	A.Briccarello	18/11/2014	A.Plazio	18/11/2014
A	Data update – Automotive fluid description	A.Briccarello	10/11/2014	A.Plazio	10/11/2014
3	Data update	A.Briccarello	14/03/2014	M.Gurlino	14/03/2014
2	Data update	A.Briccarello	29/01/2014	M.Gurlino	29/01/2014
1	Update contacts plating	A.Briccarello	12/11/2013	M.Gurlino	12/11/2013
0	Preliminary issue	M.Farinola	18/07/2013	A.Briccarello	18/07/2013

DR. DATE APVD DATE

1.0 SCOPE:

This specification covers the requirements for product performances, test methods and quality assurance provisions of:

Tyco Part Number	"Trade Mark" Description	Wire range (for contact only)	Wire seal	Cavity plug
2235686	Adapter TE MCON 1.2 to TE MCON 1.2			

This connector is suitable to be mated onto relevant counterpart (wire to wire or equipment) :

Wire-to-Wire Counterpart Part Number	Wire-to-Board Interface Part Number	Interface
1-1718643-1		

2.0 APPLICABLE DOCUMENTS:

The following documents form a part of this specification to the extent specified herein.
In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 TYCO SPECIFICATIONS:

Tyco Norm	Description
108-18969	Product Specification of connector 2 to 8 pos MCON-1.2 SWS
108-18782	Product Specification for MCON 1.2 Contact System
114-18464	Application Specification for MCON 1.2 mm Contact System
114-18679-3	Interface Specification
411-…	Instruction Sheet
501-…	Qualification Test Report

2.2 GENERAL & CUSTOMER SPECIFICATIONS (only for ref.):

Customer Standard (*Normativa Cliente*)	Descriptiopn (Descrizione)
IEC 60512	Connectors for electronic equipment - Tests and measurements Edition 11-2001
IEC 60512-5-1/-2	Current-carrying capacity tests Temperature rise/derating Edition 2002
ISO 8092-2	Road vehicles connectors for on-board electrical wiring harnesses Edition 12-2005
IEC 60068	Electrical engineering, basic environmental testing procedures Edition 02-1996
DIN 40050 part 9 (will become ISO 20653)	Road vehicles, degree of protection Edition 05-1993
BS EN 60529 (will become ISO 20653)	Degree of protection provided by enclosures (IP code) Edition 01-1992

IEC 60352-2	Solderless connections, part 2: Solderless crimped connections general requirements, test methods and practical guidance Edition 05-1990
ISO 16750	Road vehicles – environmental conditions and testing for electrical and electronic equipment Edition 08-2006 (-2 and -4)/08-2007 (-3)
LV 214	Connectors, general requirements

REQUIREMENTS:

3.0 DESIGN AND CONSTRUCTION:

Product shall comply with the design, construction and physical dimensions specified in the applicable product drawing.

3.1 CONNECTOR RATING:

Characteristic		Notes
Continuous Current	According to contact derating curve See contact spec. 108-18782	
Working temperature	**-40°C to +105°C**	
Vibration level	**See point 3.5.5 and annex 1**	
Operating Voltage	**16V DC**	at normal operation
Water Protection Degree	**IP10** (without counterparts) **IP9K** (with counterparts)	

3.2 MATERIALS:
(MATERIALI)

Components (*Componenti)*	Material (Materiale)	Surface finish, for contacts only (*Finitura superficiale solo per i contatti)*
MCON to MCON comoulded part	PBT GF20 UL 94 V0	
Electrical tab contact	CuSn0.15	Silver plated
Metal Bush	CuZn39Pb3	
O-Ring	FKM 80 LT	

3.3 QUALITY ASSURANCE PROVISION:
(MODALITA' APPROVVIGIONAMENTO CAMPIONI)

A. Sample preparation: *(Preparazione campioni)*

The test samples to be used for the tests shall be prepared by randomly selecting them from the current production, and the contact shall be crimped in accordance with the relevant Application Spec.

(I campioni da utilizzare durante le prove saranno scelti a caso dalla normale produzione; i contatti saranno aggraffati secondo la relativa specifica di applicazione)

No sample shall be reused, unless otherwise specified.

(nessun campione dovrà essere riutilizzato, se non diversamente specificato)

B. Test Conditions: *(Condizioni di prova)*

All the tests shall be performed under the combination of the following test conditions, unless otherwise specified.

(Tutti i test devono essere condotti rispettando la combinazione delle seguenti condizioni di prova se non diversamente specificato)

Room temperature: 23 ± 5°C *(Temperatura ambiente: 23±5°C)*
Relative Humidity: 45 - 70% *(Umidità relativa: 45 - 70%)*
Atmospheric Pressure: 860÷1060 mbar *(Pressione Atmosferica : 860÷ 1060 mbar)*

3.5 TEST REQUIREMENTS AND PROCEDURES SUMMARY:

OPTICAL INSPECTIONS			
Par.	Test Items	Requirements	Test method
3.5.1	Visual and dimensional examination. Critical dimensions to be selected on basis of measuring report	Meets requirements of product drawing	Acc. to IEC 60512-1-1

MECHANICAL INSPECTIONS			
Par.	Test Items	Requirements	Test method
3.5.2	Tab pull-out force out of the header	Tab 1.2 x 0.6 mm: Min. **100N** No physical damage allowed.	Testing speed: 25mm/min Acc. to IEC 60512-8-2 Measured in mating direction (from the connector side) of the housing
3.5.3	Drop test	No physical damage allowed	Samples without wire cable. Drop the sample from 1.0 m in free position for 50 times. Impact surface must be a steel plate of 3 mm thickness, backed by hardwood of between 10 mm and 19 mm thickness (According to DIN IEC 60068-2-31 par. 5.3)

3.5.4	Vibration	No physical damage of housings and contacts, no derogation of function; the connection may not open during the test. Only micro interruption allowed. R >7Ω for max. 1µs “Insulation resistance“ must be mesured after testing	Samples must be fully loaded with max section wires. They must be mated with relevant counterpart and they must be positioning onto vibration plate in accordance with picture shown in the annex 1 Supply each way of connector assembly at 100mA. Apply sinusoidal vibration in accordance with vibration diagram shown in the annex 1. Test time: 24h per axis. For each axis, the environmental temperature must be cycle according to diagram shown in the annex1. This test shall be followed by the random vibration test according to diagram in the annex1. Test time: 24h per axis. Also for this test, the environmental temperature must be cycle according to diagram in the annex 1
3.5.5	Counterpart Mating/ unmating force	Mating force ≤ **75N** Unmating force ≤ **100N**	**Mating** Mate the part with counterpart with uniform ratio of 50 mm/min until fully engagement. **Unmating** Apply a load parallel to insertion direction with uniform ratio of 50 mm/min. Unlock before to apply a load.
3.5.6	Counterpart pull-out force with locking device system locked	Pull-out force ≥ **80 N**	Apply a load to wire cables parallel to insertion direction with uniform ratio of 50 mm/min.

ELECTRICAL INSPECTIONS			
Par.	Test Items	Requirements	Test method
3.5.7	Current-temperature derating	For test acc. to IEC 60512-5-1 contact temperature rise limit is 40K after 1h test duration.	Samples must be loaded with contact crimped to 0.5 and 1 mm^2 wire section, length 500mm. Supply the system by d.c. current of 6A for wire sec. of 0.5mm^2 and 11A for wire sec. of 1mm^2. Acc. to IEC 60512-5-1 (test 5a: temperature rise) Then theterminate the deratin curve of the system conn.+interconnection+conn. Acc. to IEC 60512-5-2 [test 5b: current-carrying capacity (derating)]
3.5.8	Contact resistance of all interconnection system conn. + intercom. + conn.	At new **R_{init} < 10mΩ** After tests **$R_{aft.\ test}$ < 20mΩ**	Acc. to IEC 60512-2-1, test 2a
3.5.9	Insulation resistance	**R > 10 MΩ**	Acc. to IEC 60512-3-1, Test 3a Method: C Test Voltage: 500V= Testing time: 60s

ENVIRONMENTAL INSPECTIONS			
Par.	Test Items	Requirements	Test method
3.5.10	Rapid change of temperature	No physical damage Contact resistance according to point 3.5.8	Acc. to IEC 60068-2-14, Test Na Ta = -40°C Tb = +105°C ta = 0.25 h tb = 0.25h 144 cycles
3.5.11	Thermal aging	No physical damage	Temperature 120°C Duration 120h According to DIN EN 60068-2-2.
3.5.12	Water jet resistance	IP X9K	All three sides of the test specimen are to be subjected to the steam jet. The jet is to be directed especially to the sealing elements. Pressure: 80 bar Temperature: 80°C Duration: 30sec for each angle 0°/ 30°/ 60° /90° Distance between nozzle and specimen: 10 – 15 cm Acc. to ISO 40050 T9 und EN 60529
3.5.13	Resistance against operation substances	No physical damage Contact resistance according to point 3.5.8	Use two samples for each fluid. Dip different samples for 5 min in each fluids: • Motor oil • Hypoid-transmission fluid (SAE 80/90) • Radiator antifreeze fluid • Engine preservative • Spirit, undiluted • Lubrication grease • Brake fluid • Cold cleaner undiluited Than drip off samples and store them for 48h at 50°C
3.5.14	Flammability test	Test severity: UL 94 V0	Acc. to FMVSS 302 See material data sheet On interface plastic material only

4. PRODUCT QUALIFICATION TEST SEQUENCE

Items	Description	Test group										
		A	B	C	D	E	F	G	H	I	L	M
		Test sequence										
3.5.1	Visual and dimensional examination. Critical dimensions to be selected on basis of measuring report.	1,3	1,3	1,5	1,4	1,3	1,5	1,6	1,6	1,5	1,3	1,3
3.5.2	Tab pull-out force out of the header	2										
3.5.3	Drop test		2									
3.5.4	Vibration			3								
3.5.5	Counterpart Mating/ unmating force				2							
3.5.6	Counterpart pull-out force with locking device system locked				3							
3.5.7	Current-temperature derating											2
3.5.8	Contact resistance of all interconnection system conn. + intercom. + conn			2,4			2,4	2,5	2,5	2,4		
3.5.9	Insulation resistance					2						
3.5.10	Rapid change of temperature						3	3				
3.5.11	Thermal aging								3			
3.5.12	Water jet resistance							4	4			
3.5.13	Resistance against operation substances									3		
3.5.14	Flammability test										2	

Annex1

Oscillation, sinusoidal /

Severity:	s = 0,35mm,	f = 100 – 200Hz
	a = 24g,	f = 200 – 220Hz
	a = 16g	f = 230 – 350Hz
	a = 10g,	f = 400Hz

Duration: **24 h per spatial axis**

Random vibration

Severity:	20Hz,	0,15g²/Hz
	95Hz	0,2g²/Hz
	110Hz	0,0001g²/Hz
	380Hz	0,0001g²/Hz
	410Hz	0,2g²/Hz
	800Hz	0,1g²/Hz
	1600Hz	0,05g²/Hz

g_{eff} = 11,2 m/s²

Duration: **24 h per spatial axis**

Temperature Profile:

0 min	+20°C
60 min	-40°C
150 min	-40°C
300 min	+105°C
420 min	+105°C
480 min	+20°C

Fixing condition