
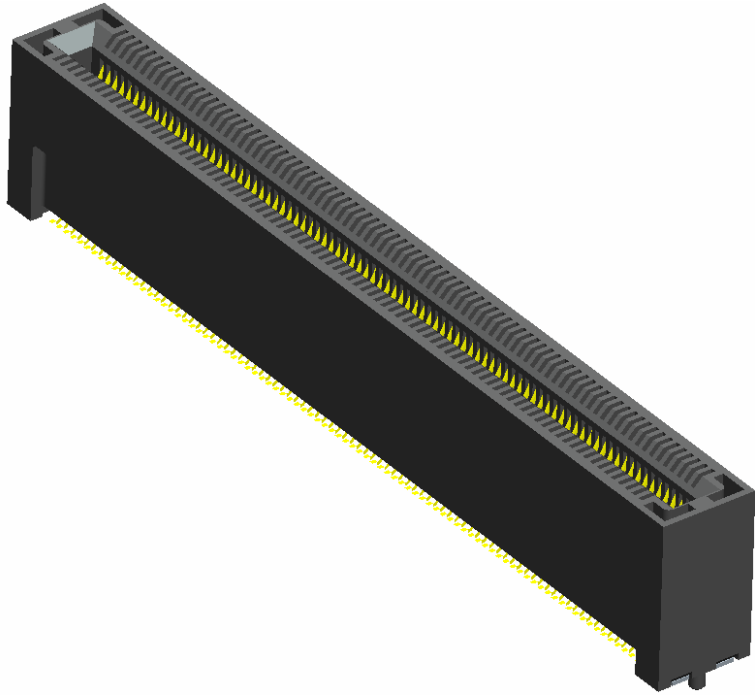



NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 1 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

MICRO TCA



NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 2 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

1.0 General

This document covers the performance, minimum quality requirement and application of MICRO TCA connectors of solder surface mounting style for AMC modules.

2.0 Applicable documents

The following document of the issue in effect on the date of the latest revision of this specification shall form a part of this specification to the extent specified herein.

2.1 Specification

FCI engineering drawing P/N 10058835.

2.2 Material

Parts	Material	Finish / Grade
Housing	High temperature resin	UL 94-V0
Terminal	Hi performance copper alloy	Under plate: 50μ Nickel Contact: gold plated Solder tail: 100u"min matte Tin
Hold down	Copper alloy	Plate: matte Tin 100μ" cover 50μ" Nickel

The product meets the RoHS requirements for banned substances.

2.3 Recommended foot print & module configuration


See customer drawing 10058835 for detail.

3.0 Mechanical requirements

3.1 visual inspection

There should be no defect that would impair normal operation.

3.2 Durability (IEC 60512, test 9a)

NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 3 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

200 mating cycles with one AMC connector with 10 mm per sec. max., rest 5 sec.(unmated).
The cycle rate per hour shall be 500 ± 50.
Note: "*" only half of specified durability is performed at each interval (100 cycles each time)

3.3 Contact force (EIA 364-04)

The contact normal force shall not be less than 40 grams when tested in accordance with FCI test specification BUS-03-404.

3.4 Engaging and separating forces (IEC 60512, test 13a)

Mating sides	Force
Maximum engaging force	100N
Maximum separating force	65N

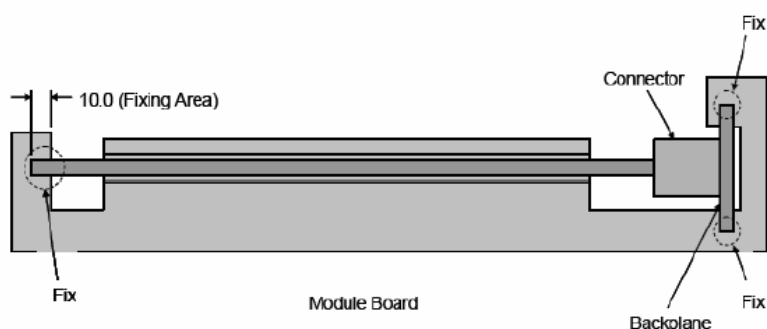
3.5 Vibration (IEC 60512, test 6d)

10 Hz to 500 Hz with an amplitude of 0.35 mm or an acceleration of 10 G eight sweepings in each direction, duration 3x8 h/axis in there axes. Duration of disturbance = 1µs max.
The specimen shall be installed in a fixture according to Fig.1.

3.6 Shock (IEC 60512, test 6c)

Shock acceleration 300 m/s², duration of impact 11 ms, three shocks in two directions/axis, in three axes(18 shocks in total). Duration of disturbance = 1µs max.
The specimen shall be installed in a fixture according to Fig.1.

Fig.1 Shock/vibration test setup



3.7 Minute disturbance

Disturb module PCB slightly from connector, and then reseal, measure arrangement as Fig.2


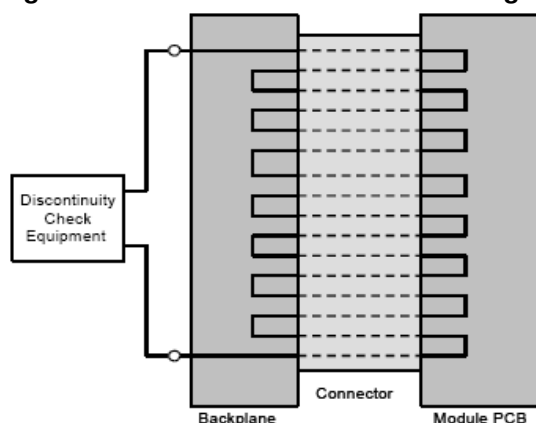
NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 4 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

Fig.2 Contact disturbance measure arrangement



4.0 Electrical requirements

4.1 Voltage proof (IEC 60512, test 4a)

There shall be no breakdown or flashover under minimum insulation voltage 80 VAC, leakage limit 0.5mA.

4.2 Current carrying capacity (IEC 60512, test 5b)

Connectors perform at 70°C ambient condition plus additional 30°C temperature rise by current 1A, which is 100°C..

4.3 Contact resistance (IEC 60512, test 2a)

Under Max. voltage = 20 mV in open circuit, and max. current = 100 mA

Initial line resistance = 25 mΩ max.

*change after test = 10 mΩ max.

Measure position as Fig.3.


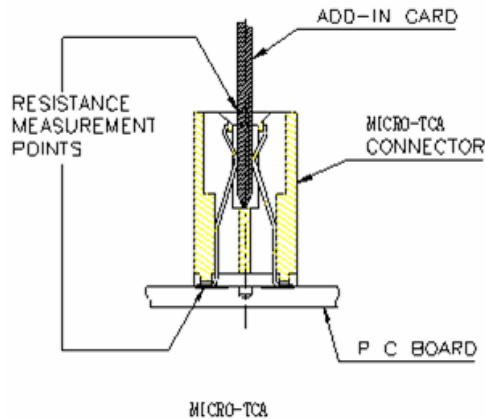
NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 5 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

Fig.3 Contact resistance measure position



4.4 Insulation resistance (IEC 60512, test 3a)

Test voltage 500 V DC
Initial value = 100 MΩ min.
After moisture = 10 MΩ min.

5.0 High-speed requirements

5.1 Differential impedance (IEC 60512 test 23d method B)


Measured step rise time 30 ps max. throughout interconnection
Environment impedance = 100Ω differential
Adjacent lines terminated at both ends.
Requirement : Average impedance 100Ω±5Ω
Peak values 100Ω±10Ω

5.2 Cross talk (IEC 60512 test 25a)

Measured step rise time 30 ps max. throughout interconnection
Environment impedance = 100Ω differential
Adjacent lines terminated at both ends.
Requirement : near end and far end cross talk between adjacent pairs < 2% (far end)
between one quiet pair and two surrounding driven pairs < 2% (far end)
between facing lines on component side 1 and component side 2 < 1% (far end)

5.3 Attenuation (IEC 60512 test 25b)

Environment impedance = 100Ω differential

NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 6 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

Adjacent lines terminated at both ends
Frequency range 0 to 20 GHz.
Requirement : < 1 dB at 8 GHz
 < 2 dB at 12 GHz
 < 4 dB at 14.5 GHz

5.4 Return loss (IEC 60512 test 25e)

Environment impedance = 100Ω differential
Adjacent lines terminated at both ends
Frequency range 0 to 20 GHz.
Requirement : > 20 dB at 5 GHz
 > 13 dB at 8 GHz
 > 8 dB at 14.5 GHz

6.0 Environmental requirements

6.1 High temperature life (EIA 364-14)

Ambiant temperature 105°C, duration 42 days.

6.2 Mixed flowing gas (EIA 364-65A Class IIIA)

20 days for gold flash plating, 10 days unmated (connector only) followed by 10 days mated.
NO₂: 200 ppb(±50)
Cl₂ : 20 ppb(± 5)
H₂S: 100 ppb(±20)
SO₂: 200 ppb(±50)

6.3 Dust exposure (EIA 364-91)


Unmated connectors
Begin dust concentration of 300 g/cm³ of chamber volume, flow rate = 300 m/s and exposure time of 1 hr.

6.4 Thermal shock (EIA 364-35C)

5 cycles of alternating high and low temperature with no discontinuity for mated connectors.
30 min. dwell at each extreme, with a max. transfer time of 5 sec. between extremes -65°C to 105°C.

6.5 Temperature cycling (EIA 364-31B Method III)

Mated connectors.

NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 7 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
		CLASSIFICATION UNRESTRICTED	

Thermal cycling between 5°C and 85°C with 80% to 98% relative humidity 50 cycles, duration 500 hrs.

6.6 Damp heat steady state (EIA 364-31)

No electrical load, polarizing voltage 60 Vdc.
Ambient temperature 40°C, 93% relative humidity, 10days.


7.0 Test schedule

This section defines six groups of connector test requirements referenced from GR-1217-CORE. These are applicable to all connectors mounted on Micro TCA system.

- Group A – Mixed flowing gas
- Group B – Mechanical endurance and dust
- Group C – Thermal shock and moisture
- Group D – High temperature
- Group E – Electrical load Temperature Rise
- Group F – Signal integrity validation

7.1 Specimen measure arrangements

- Set 1 – Contact resistance measure arrangement
- Set 2 – Insulation resistance and voltage-proofing measure arrangement
- Set 3 – Current carrying capacity measure arrangement
- Set 4 – Contact disturbance measure arrangement
- Set 5 – Signal integrity measure arrangement


NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 8 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

7.2 Test schedule

Test group	Refer item	A		B			C			D		E	F
		Set1	Set2	Set1	Set2	Set4	Set1	Set2	Set4	Set1	Set2	Set3	Set5
Sets arrangement		4	3	4	3	3	4	3	3	4	3	3	3
Number of specimen		4	3	4	3	3	4	3	3	4	3	3	3
General inspection	3.1	1,15	1,10	1,15	1,12	1,7	1,13	1,11	1,6	1,7	1,6,10	1,3	
Durability	3.2	4*,12*	5*,8*	4*,12*	5*8*	2*,6*	4	5	2				1
Contact force	3.3	2,14		2,14			2,12			2,6			
Engaging and separating forces	3.4		2,9		2,9			2,8			2,7		
Vibration	3.5			8	6	4							
Shock	3.6			10	7	5							
Minute disturbance	3.7	10											
Voltage proof	4.1		4		4,11			4,10			4,9		
Current carrying capacity	4.2											2	
Contact Resistance	4.3	3,5,7,9,11,13		3,5,7,9,11,13			3,5,7,9,11			3,5			
Insulation Resistance	4.4		3		3,10			3,9			3,8		
Differential impedance	5.1												3
Cross talk	5.2												4
Attenuation	5.3												5
Return loss	5.4												6
Temperature life	6.1	6	6							4	5		
Mixed flowing gas	6.2	8	7										
Dust exposure	6.3			6		3	6		3				
Thermal shock	6.4						8	6	4				
Temperature cycling	6.5						10	7	5				
Damp heat, steady state	6.6												2

Note:

1. “*” refer to item 3.2

NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 9 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

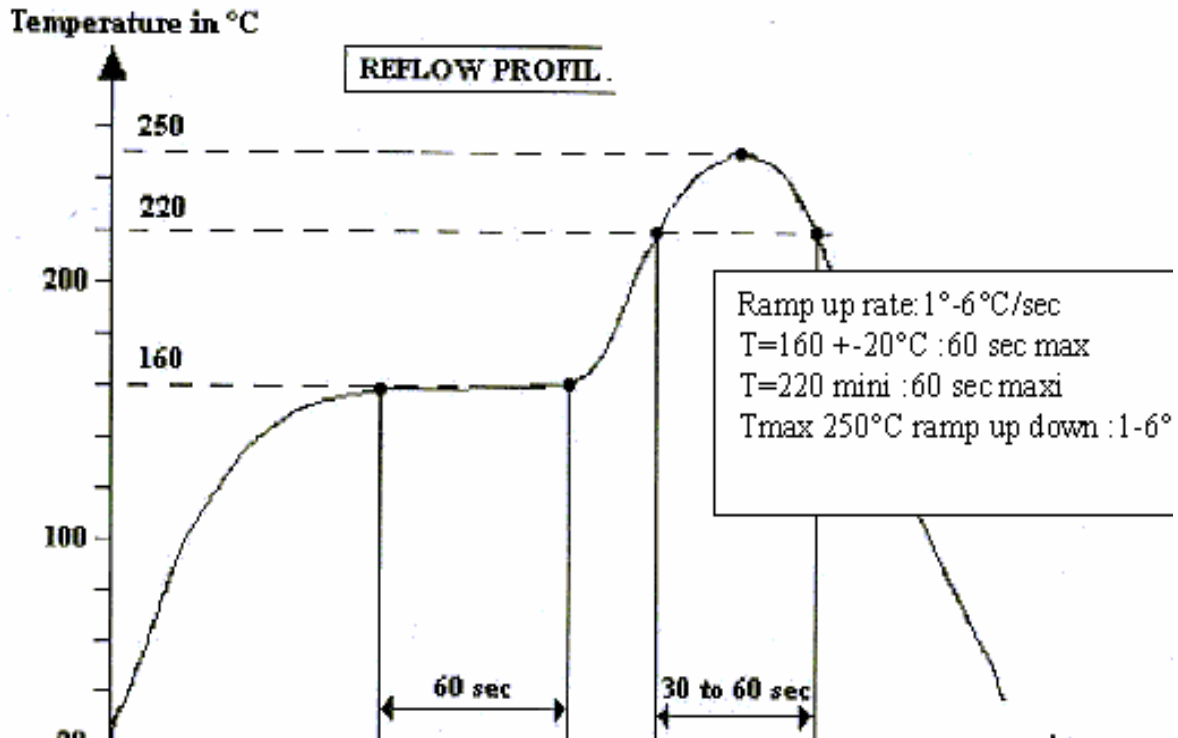
8.0 Packaging


Packing per FCI spec. GS-14-1047, the traceability of all parts must be guaranteed by date code on each product.

9.0 Manufacturing environment

9.1 Customer environment

SMT environment



NUMBER GS-12-362	TYPE PRODUCT SPECIFICATION		
TITLE MICRO TCA CONNECTOR		PAGE 10 of 10	REVISION J
		AUTHORIZED BY ERIC WU	DATE 12/15/05
CLASSIFICATION UNRESTRICTED			

REVISION RECORD

REV	PAGE	DESCRIPTION	ECR #	DATE
A	ALL	RELEASED	T05-0285	12/15/2005
B	4	Item 3.5 change acceleration to 10G	T06-0028	02/13/2006
	6	Item 6.1 change duration to 42 days		
	7	Item 6.4 change cycles to 100, temperature extremes -65°C to 105°C		
C	3	Item 3.1 add cycle rate per hour 500 ± 50	T06-0034	02/23/2006
	6	Item 6.2 add days of exposure		
		Item 6.3 unmated connector		
	7	Item 6.4 change cycles to 5		
		Item 6.5 change title to Temperature cycling, temperature extremes 5 °C to 85°C		
	8	Item 7 change test group A~D sequence		
D	ALL	Change according to MicroTCA.0 Draft0.9	T06-0110	06/02/2006
E	8	Add set2 to test groupD based on DraftRC1.0	T06-0121	06/20/2006
F	8	Update test schedule	T06-0124	06/26/2006
G	4	Contact resistance was 90 milliohms Max initial		
		With 15 milliohms maximum changed.	DG06-0562	12/26/2006
H	3	Remove the added weight for vibration test	DG07-0134	4/07/2006
J	ALL	Change document from Confidential to Unrestricted	DG07-0204	5/18/2007