


NUMBER <b>GS-12-251</b>	TYPE <b>PRODUCT SPEC</b>		
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CLASSIFICATION <b>UNRESTRICTED</b>			

## 1.0 GENERAL

THIS SPECIFICATION COVERS .039 INCHES VERTICAL AND ANGLED DDR II SOCKETS WITH BLANKED / FORMED CONTACT DESIGNED FOR PRINTED WIRING BOARD TO DUAL IN-LINE MEMORY MODULE INTERCONNECTION. IN ALL APPLICATIONS THE MATED SYSTEM PLATING SHOULD BE TIN TO TIN OR GOLD TO GOLD. THE SPECIFICATION IS COMPOSED OF THE FOLLOWING SECTION.

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## 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 SPECIFICATIONS


FCI ENGINEERING DRAWING 10005639/ 10023061

### 2.2 OTHER STANDARD AND SPECIFICATION

- \* UL-94 TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS.
- \* EIA 364 ELECTRICAL CONNECTOR/SOCKET TEST PROCEDURES INCLUDE ENVIRONMENTAL CLASSIFICATION.
- \* EIA-364-1000.01 ENVIRONMENTAL TEST METHODOLOGY FOR ASSESSING THE PERFORMANCE OF ELECTRICAL CONNECTORS AND SOCKETS USED IN BUSINESS OFFICE APPLICATIONS.
- \* INTEL "MATERIAL TECHNICAL TARGET SPECIFICATION DDR 2 MEMORY CONNECTOR" VER 1.0.

### 2.3 FCI SPECIFICATION

BUS-19-002	SOLDERABILITY TEST.
GES-12-066	DDR PRODUCT SPECIFICATION.

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### 3.0 REQUIREMENTS

RECOMMENDED WORK RATING & TEMPERATURE RANGE:

ITEM	RATING
VOLTAGE	30 V (AC/DC)
CURRENT	0.75 A (AC/DC)
STORAGE TEMPERATURE	-40 °C ~ 65 °C
OPERATING TEMPERATURE	-55 °C ~ 85 °C

#### 3.1 DESIGN AND CONSTRUCTION

CONNECTORS SHALL BE OF THE DESIGN CONSTRUCTION AND PHYSICAL DIMENSIONS SPECIFIED ON THE APPLICABLE PRODUCT DRAWING.

#### 3.2 MATERIAL

THE MATERIAL FOR EACH PART SHALL BE AS SPECIFIED HEREIN OR EQUIVALENT. THE SUBSTITUTE MATERIAL SHALL MEET THE PERFORMANCE REQUIREMENT OF THIS SPECIFICATION.

3.2.1 CONTACTS THE CONTACT SHALL BE COPPER ALLOY , POST PLATED.

3.2.2 HOUSINGS ALL HOUSING MATERIAL SHALL BE RATED FLAME RETARDANT 94V-0 IN ACCORDANCE WITH UL-94. THE HOUSING SHALL BE GLASS FILLED, NYLON, OR OTHER HIGH PERFORMANCE RESIN.

3.2.3 EJECTORS THE MATERIAL OF EJECTOR SHALL BE NYLON, OR OTHER HIGH PERFORMANCE RESIN.

#### 3.3 FINISH


THE FINISH FOR APPLICABLE COMPONENTS SHALL BE SPECIFIED HEREIN OR EQUIVALENT REFERENCE BUS-02-057.

3.3.1 CONTACT COATING: GOLD PLATING OVER 50 MICROINCHES MIN. NICKEL UNDERPLATED.

3.3.2 SOLDER TAIL COATING: 100~120 MICROINCHES TIN/LEAD OR PURE MATTE TIN PLATING OVER 50 MICROINCHES MIN. NICKEL UNDERPLATE.

3.3.3 CONNECTOR P/N WITH "LF" SUFFIX MEANS LEAD FREE PLATING AND ROHS COMPATIBLE.

#### 3.4 MECHANICAL CHARACTERISTICS

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- 3.4.1 WORKMANSHIP DDR 2 CONNECTORS SHALL BE UNIFORM IN QUALITY AND SHALL BE FREE FROM BURRS , SCRATCH , CRACKS , VOIDS , CHIPS , BLISTERS PINHOLES , AND OTHER DEFECTS THAT WILL ADVERSELY AFFECT THE PERFORMANCE.
- 3.4.2 CONTACT RETENTION THE INDIVIDUAL CONTACT RETENTION SHALL NOT BE LESS THAN 0.67 LBS (300 gf) WHILE APPLYING A DOWNWARD AXIAL LOAD TO THE SUPPORT MEMBER OF THE CONTACT. (PER EIA 364-29 ; NO MOVMENT > 0.38 mm )
- 3.4.3 FORKLOCK RETENTION FORCE: THE FORKLOCK RETENTION FORCE SHALL BE 3 LBS MIN ALL FORKLOCK. ( PER 364-29 ; NO MOVEMENT > 0.38 mm )
- 3.4.4 DURABILITY AFTER 25 MATING CYCLES WITH MAXIMUM THICKNESS-GAGE AT A RATE OF 5 INCHES / MINUTE. THERE SHALL BE NO DAMAGE TO THE HOUSING OR CONTACTS. THE CONNECTOR SHALL MEET ALL ELECTRICAL AND MECHANICAL CHARACTERISTICS.
- 3.4.5 INSERTION FORCE (CONNECTOR WITH 3 FORKLOCKS TO PCB) INSERT CONNECTOR TO PCB WITH MAX FORKLOCK HOLE (D2.45 +0/-0.05 mm) AND NOMINAL FORKLOCK HOLE (D2.45 +0.05/-0). PER EIA 364-05, THE INSERTION FORCE NO MORE THAN 23 LBS.
- 3.4.6 SOLDERABILITY PER EIA 364-52, CLASS 1, CATEGORY 3. THERE SHALL HAVE A SOLDER COVERAGE OF 95% MINIMUM.
- 3.4.7 MATING/UNMATING FORCE THE TOTAL FORCE TO MATE A CONNECTOR AND DDR 2 MODULE SHOULD NOT EXCEED 35 LBS . THE UNMATING FORCE NO LESS THAN 14 gf PER PIN PAIR. TEST PER EIA 364-13, WITH SPEED OF 0.2 INCH / MINUTE.
- 3.4.8 RESEATING MANUAL PLUG/ UNPLUG THE CONNECTOR WITH MODULE BOARD. PERFORM 3 SUCH CYCLES.

### 3.5 ELECTRICAL CHARACTERISTICS


- 3.5.1 CURRENT RATING THE MAXIMUM TEMPERTURE RISE PER CONDUCTOR SHOULD NO MORE THAN 30 DEGREE C WITH CURRENT OF 0.5 AMPERE / PIN. (PER EIA 364-70).
- 3.5.2 LOW LEVEL CONTACT RESISTANCE THE LOW LEVEL CONTACT RESISTANCE SHALL NOT EXCEED THE VALUE SPECIFIED AS BELOW .

MAXIMUM RESISTANCE (MILLI-OHMS)

<u>INITIAL</u>	<u>AFTER TEST</u>
30	DELTA R <= 20

TEST PER EIA 364-23 (TERMINATION OF CONNECTOR TO BASE BOARD AND ADD-IN CARD SHALL BE INCLUDED IN MEASUREMENTS).

- 3.5.3 DIELECTRIC WITHSTANDING VOLTAGE PER EIA 364-20, THERE SHALL NO SHORT CIRCUIT OR INSULATION BREAK DOWN WITH 500 V.

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- 3.5.4 INSULATION RESISTANCE PER EIA 364-21, THE INSULATION RESISTANCE SHALL BE 1 MEG-OHM MIN WITH VOLTAGE OF 500V.
- 3.5.4 INDUCTANCE PER INTEL "MTTS DDR 2 MEMORY CONNECTOR" VER 0.8 , SECTION 6.4 AND APPENDIX A. MEASURE AT 266, 333, 400 MHZ. THE SIGNAL LOOP INDUCTANCE L11 SHALL BE 2.5 TO 3.5 NH. MUTUAL INDUCTANCE BETWEEN ADJACENT SIGNALS L12 SHALL BE 0.9 NH MAX.
- 3.5.5 CAPACITANCE PER INTEL "MTTS DDR2 MEMORY CONNECTOR" REV 0.8 , SECTION 6.4 AND APPENDIX A. MEASURE AT 266 , 333, 400 MHZ. THE C11 (SIGNAL TO GROUND) CAPACITANCE SHOULD BE 0.3 TO 0.6 PF, THE C12 (COUPLING CAPACITANCE BETWEEN ADJACENT SIGNALS) SHOULD BE 0.3 PF MAX.

### 3.6 ENVIRONMENTAL CONDITIONS

- 3.6.1 PHYSICAL SHOCK THERE SHALL BE NO EVIDENCE OF PHYSICAL DAMAGE PER EIA 364-27. WITH TEST CONDITION :

- (A) 50G , DURATION 11 MS OF TRAPEZOIDAL WAVE .
- (B) MODULE WEIGHT 35g +/- 5 g WITH CENTER OF GRAVITY 20~25 mm FROM THE MODULE MATING EDGE.
- (C) NUMBER OF SHOCKS : 3 SHOCKS IN EACH OF 6 DIRECTIONS.
- (D) TEST BOARD AS PER INTEL 240P DDR2 MTTs FIGURE 6.5.1 DEFINED.


- 3.6.2 RANDOM VIBRATION THERE SHALL BE NO EVIDENCE OF PHYSICAL DAMAGE PER EIA 364-28 WITH TEST CONDITION:

- (A) FREQUENCY RANGE: 5 HZ ~ 500 HZ .
- (B) DURATION: 10 MINUTES PER AXIS FOR ALL 3 AXIS ON ALL SAMPLES.
- (C) INPUT ACCELERATION: 5 ~20 HZ (SLOPE): (0.01 g2/HZ)@5 HZ, (0.02g2/ HZ)@20 HZ. 20~500 HZ (FLAT): (0.02g2/HZ)@20HZ INPUT ACCELERATION IS 3.13 g RMS , RANDOM CONTROL LIMIT TOLERANCE : +/- 3 dB.
- (D) MODULE WEIGHT 35g +/- 5 g WITH CENTER OF GRAVITY 20~25 mm FROM THE MODULE MATING EDGE.

- 3.6.3 HIGH TEMPERATURE LIFE TEST PER EIA 364-17, METHOD A. 240 HOURS AT TEMPERATURE 105 DEGREE C.

- 3.6.4 THERMAL SHOCK: PER EIA 364-32 , TEST CONDITION 1. CYCLE THE CONNECTOR -55 TO +85 DEGREE C . DWELL TIME OF 30 MINUTES AT EXTREME TEMPERATURE. TRANSFER TIME 5 MINUTES MAX. NO DAMAGE AFTER 10 CYCLES.

- 3.6.5 CYCLIC TEMPERATURE AND HUMIDITY: PER EIA 364-1000-01 , TEST GROUP 2. CYCLE THE CONNECTOR BETWEEN 25 °C ± 3°C AT 80% RH AND 65 °C ± 3°C AT 50% RH. RAMP TIMES


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SHOULD BE 0.5 HOUR AND DWELL TIMES SHOULD BE 1 HOUR. DWELL TIMES START WHEN THE TEMPERATURE AND HUMIDITY HAVE STABILIZED WITHIN THE SPECIFIED LEVELS. PERFORM 24 SUCH CYCLES. (PROCEDURE PER EIA 364-31)

- 3.6.6 MIXED FLOWING GAS: PER EIA 364-65, CLASS IIA. EXPOSURE FOR 5 DAYS TO SIMULATE A 3-YEAR FIELD LIFE FOR GOLD FLASH CONTACT PLATING. 7 DAYS (OR ABOVE) TO SIMULATE A 5-YEAR FIELD LIFE FOR 15u" OR ABOVE CONTACT GOLD PLATING.
- 3.6.7 THERMAL DISTURBANCE: CYCLE THE CONNECTOR BETWEEN 15 °C ± 3°C AND 85 °C ± 3°C , AS MEASURED ON THE PART. RAMPS SHOULD BE A MINIMUM OF 2 °C PER MINUTE, AND DWELL TIMES SHOULD INSURE THAT THE CONTACTS REACH THE TEMPERATURE EXTREMES( A MINIMUM OF 5 MINUTES) . HUMIDITY IS NOT CONTROLLED. PER EIA 364-1000.01 TEST GROUP 4 . PERFORM 10 SUCH CYCLES.

#### 4.0 PRODUCT QUALIFICATION PROVISIONS

- 4.1 EQUIPMENT CALIBRATION ALL TEST EQUIPMENT AND INSPECTION FACILITIES USED IN THE PERFORMANCE OF ANY TEST SHALL BE MAINTAINED A CALIBRATION SYSTEM IN ACCORDANCE WITH MIL-C-45662.
- 4.2 INSPECTION CONDITIONS UNLESS OTHERWISE SPECIFIED HEREIN, ALL INSPECTIONS SHALL BE PERFORMED UNDER THE FOLLOWING AMBIENT CONDITION.
- (a) TEMPERATURE : 25 +/- 5 DEGREE C.
  - (b) RELATIVE HUMIDITY : 30 TO 80%
  - (c) BAROMETRIC PRESSURE : LOCAL AMBIENT
- 4.3 SAMPLE QUANITY AND DESCRIPTION:  
SAMPLES SHALL BE SELECTED AT RANDOM FROM CURRENT PRODUCTION. THE SAMPLE SIZE SHALL BE ACCORDING TO TEST SEQUENCE NEEDED.

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4.4 QUALIFICATION TEST SEQUENCE:

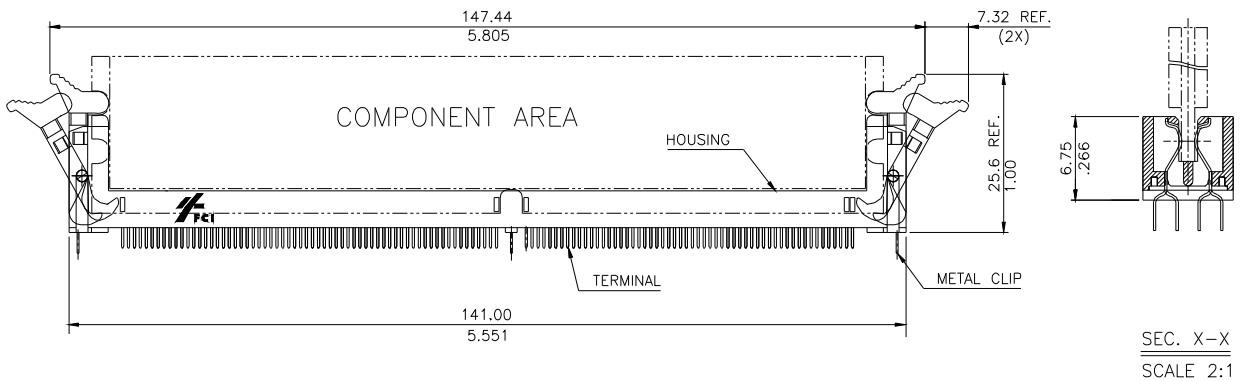
Test Items	Refer to	TEST SEQUENCE						
		GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6	GROUP 7
Insertion Force (Connector with 3 forklock to PCB)	3.4.5					1		
Mating/ Unmating Force	3.4.7					2		
Contact Retention	3.4.2					3		
Forklock Retention Force	3.4.3					4		
Physical Shock	3.6.1			6				
Random Vibration	3.6.2			4				
Inductance	3.5.4							1
Capacitance	3.5.5							2
Solderability	3.4.6					5		
Durability	3.4.4	2	2	2	2		3	
L L C R	3.5.2	1,4,6	1,4,7,9	1,3,5,7	1,4,6,8,10		2,5	
Insulation Resistance	3.5.4		6					
Dielectric Withstanding Voltage	3.5.3						1,4	
Current Rating	3.5.1							3
High Temperture Life	3.6.3	3			3			
Cycling Temperature & Humidity	3.6.5		5					
Thermal Disturbance	3.6.7				7			
Thermal Shock	3.6.4		3					
Mixed Flowing Gas	3.6.6				5			
Reseating	3.4.8	5	8		9			
Sample Quantity		5	5	5	5	5	5	5

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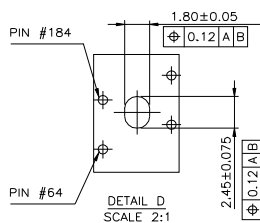
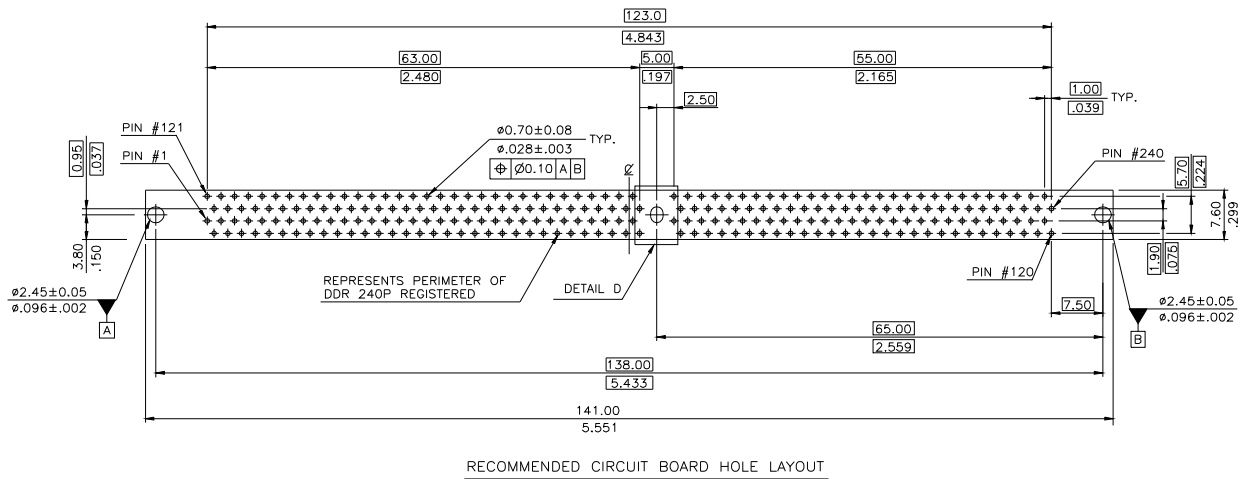
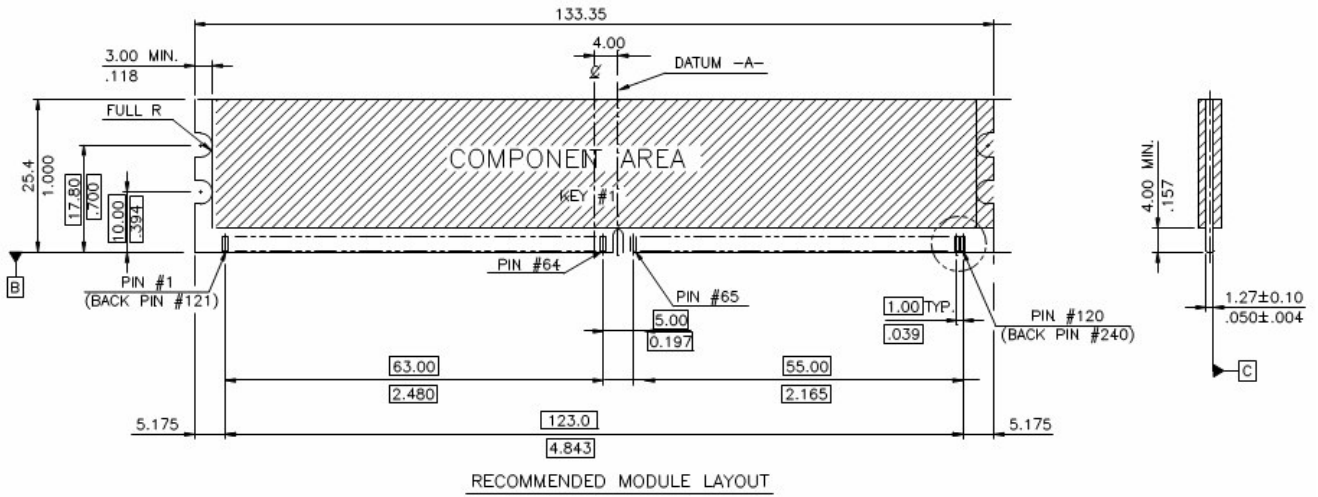
## 5.0 PACKAGING AND SHIPPING

- 5.1 PACKING THE PACKING AND PACKAGING SHALL BE IN ACCORDANCE WITH INDUSTRY STANDARD PRACTICE IN A MANNER TO INSURE CARRIER ACCEPTANCE AND SAFE DELIVERY TO DESTINATION PER FCI PACKAGING SPECIFICATION .
- 5.2 PACKAGING MARKING EACH SHIPPING CONTAINER SHALL BE CLEARLY MARKED WITH THE NAME OF THE CONTENTS, THE AMOUNT OF CONTAINED, THE FCI PART NUMBER, AND THE NAME OF THE RECEIVING PART , AS LISTED IN THE PROCUREMENT.


## 6.0 THE PROFILE OF DDR 2 CONNECTOR:



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REVISION RECORD

REV	PAGE	DESCRIPTION	EC #	DATE
A	All		T04-0041	1/29/04
B	2 1	Change solder tail plating to pure matte Tin Item 2-1 FCI drawing no 10023056 change to 10023061	T04-0226	5/27/04
C	5 2	Item 3.6.6 describe 5 days and 7 days MFG for different field life Add item 3.3.3 for lead free version & RoHS compatible.	T05-0068	3/30/05
D	3	Change forklock retention force	DG06-0186	5/15/06
E	2	Add work rating, operating temperature and storage temperature	DG09-0363	11/19/09