



MCM and MCGA625 status

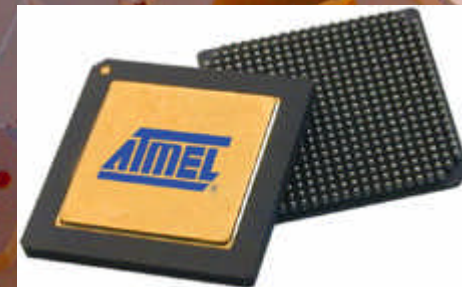
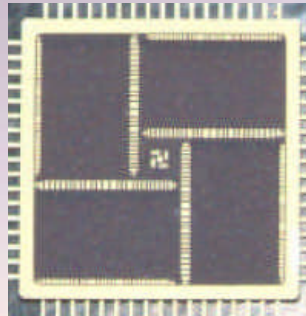
AEROSPACE Product Line

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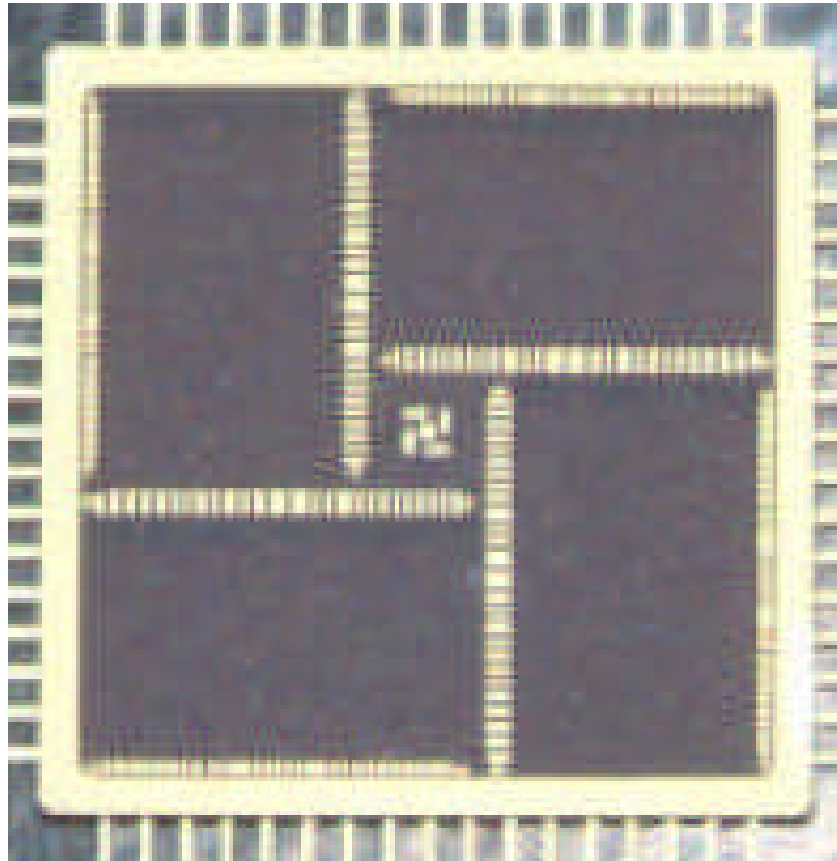




- **MCM**
 - **Rationales**
 - **MCM SRAM status**
 - **MCM industrial capability**
 - **MCM spin off products**
- **MCGA625 contract status**
- **Packaging roadmap**



MCM





Rationales for going MCM

- **DSM technologies are more and more expensive making the ROI in space more questionable**
- **MCM allows:**
 - **Either to mix various technologies and/or functionalities**
 - **To bridge the time gap between the availability of the next technology products**
 - **To test the market for the next generation of products**

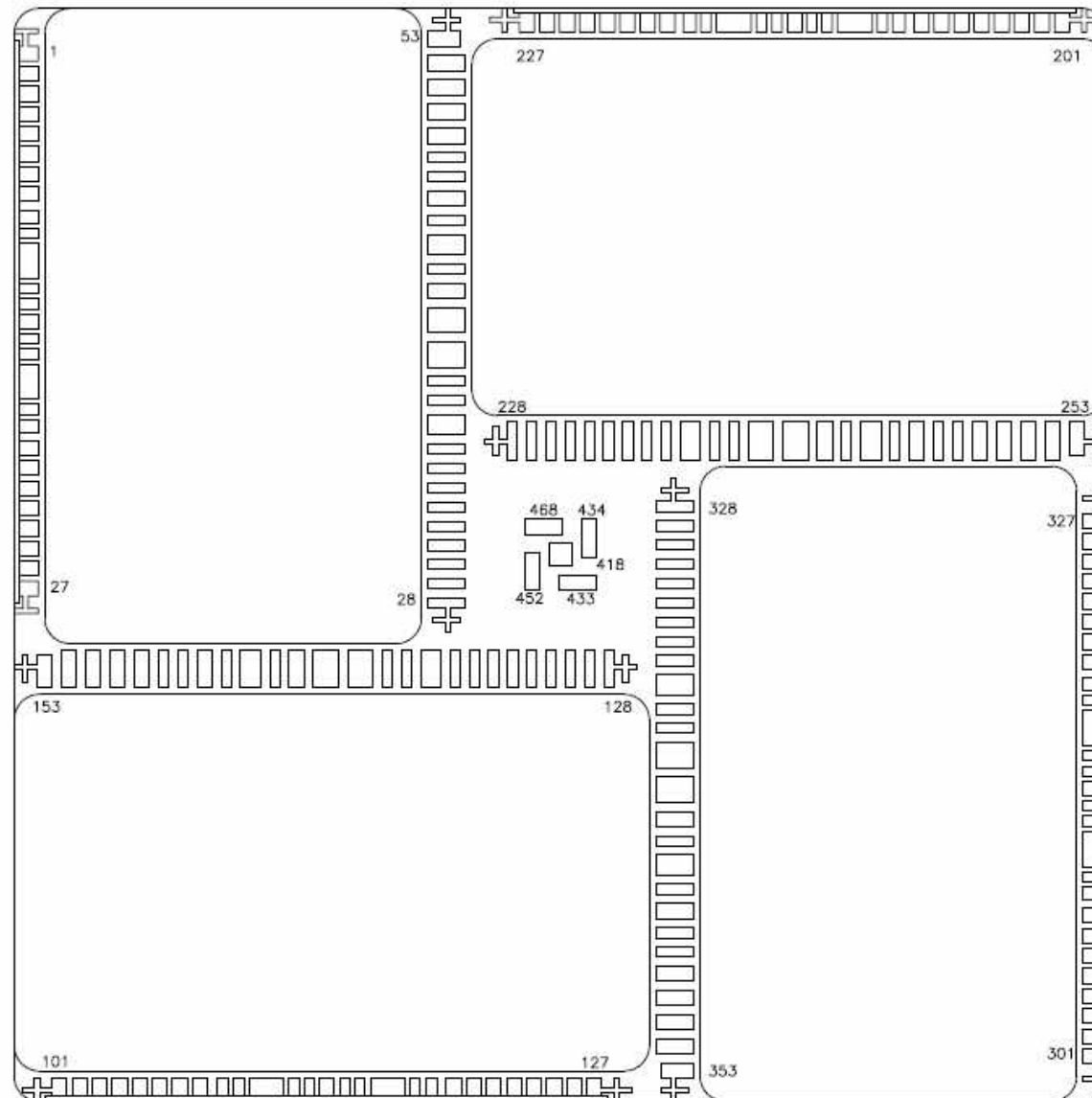


AT68166F/FT MCM SRAM description

- MQFPF_T68 package, 4 of 512Kx8 SRAM AT60142F/FT
- 1 sided cavity Kyocera package
- Same die bonding as all other products (Cyanat Ester) in one pass
- Same wire bonding (32µm Al wire) in one pass
- Same sealing process: 1 Kovar lid with Au.Sn. (80/20) pre-form
- Samples delivered
- FM with Atmel qualification July 06

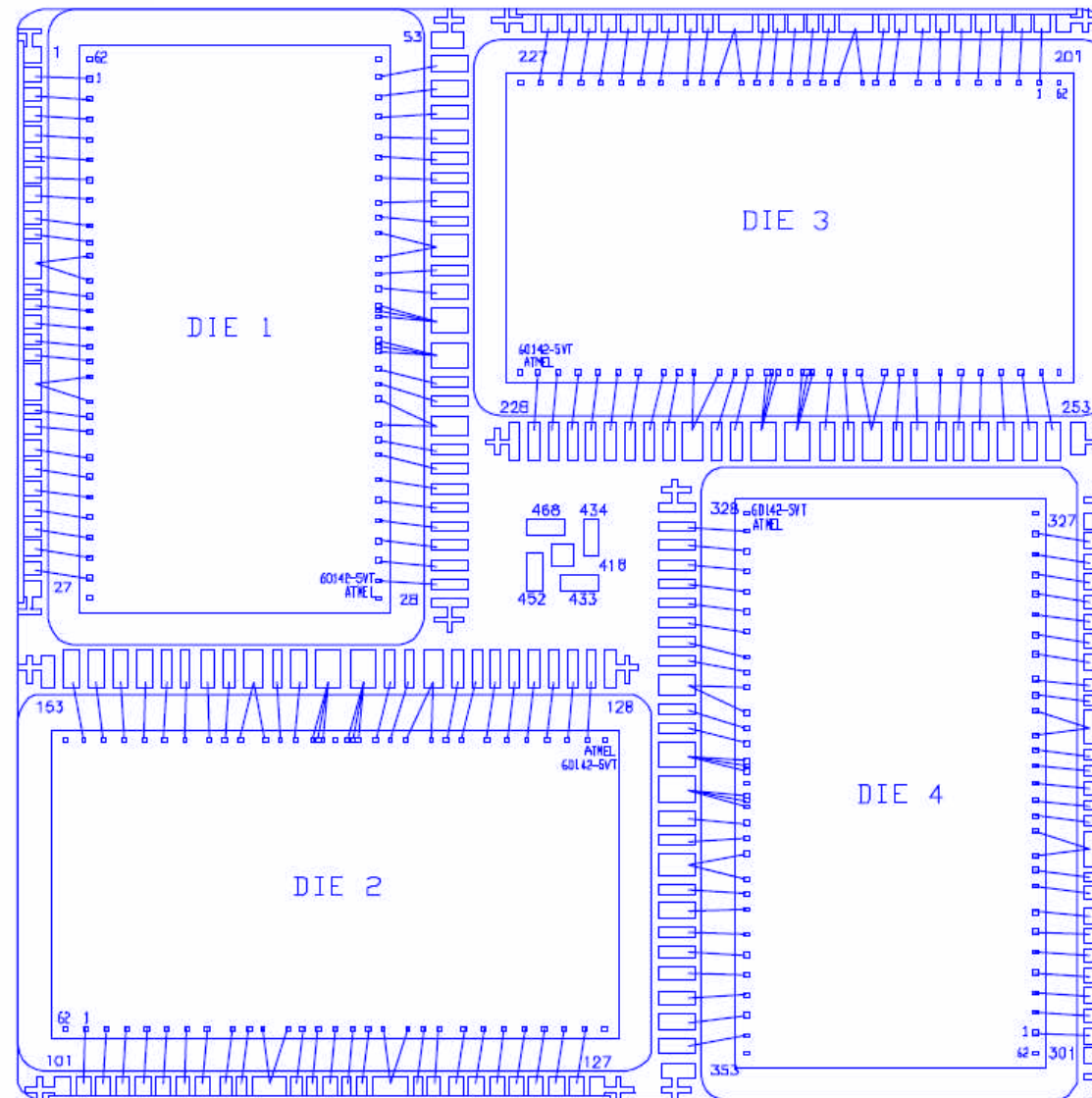


MCM SRAM: cavity layout



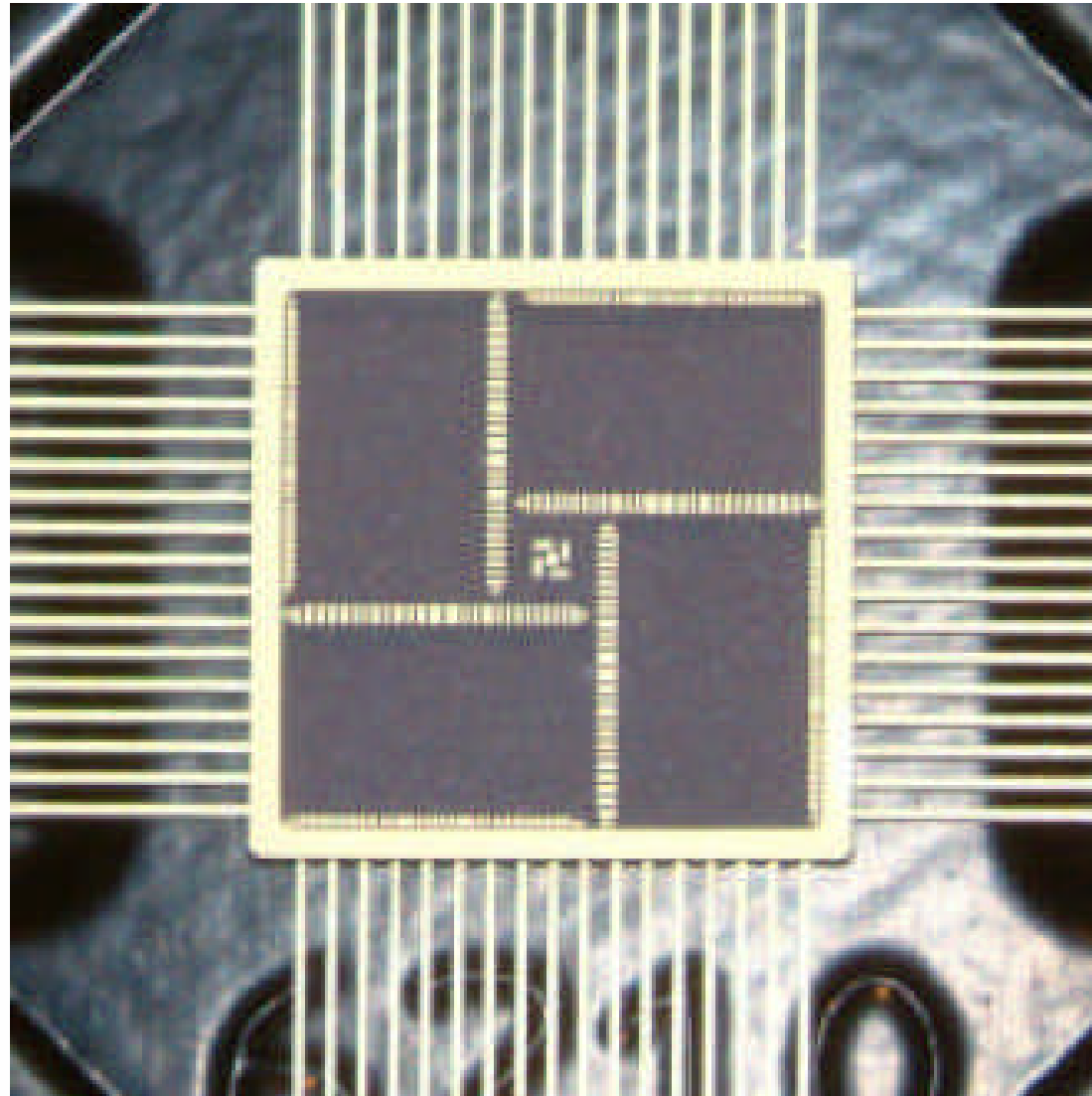


MCM SRAM: bonding diagram



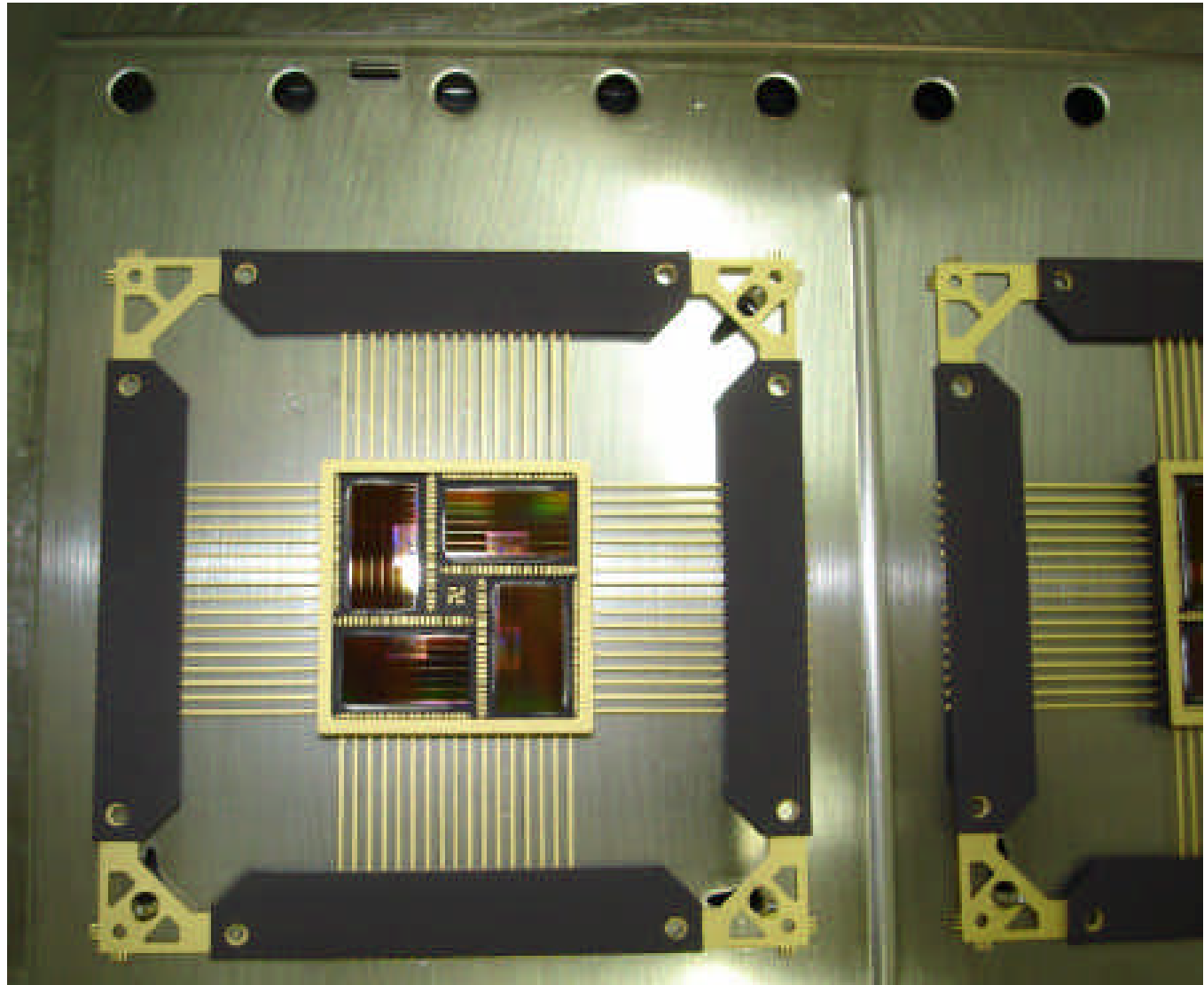


MCM SRAM: raw material



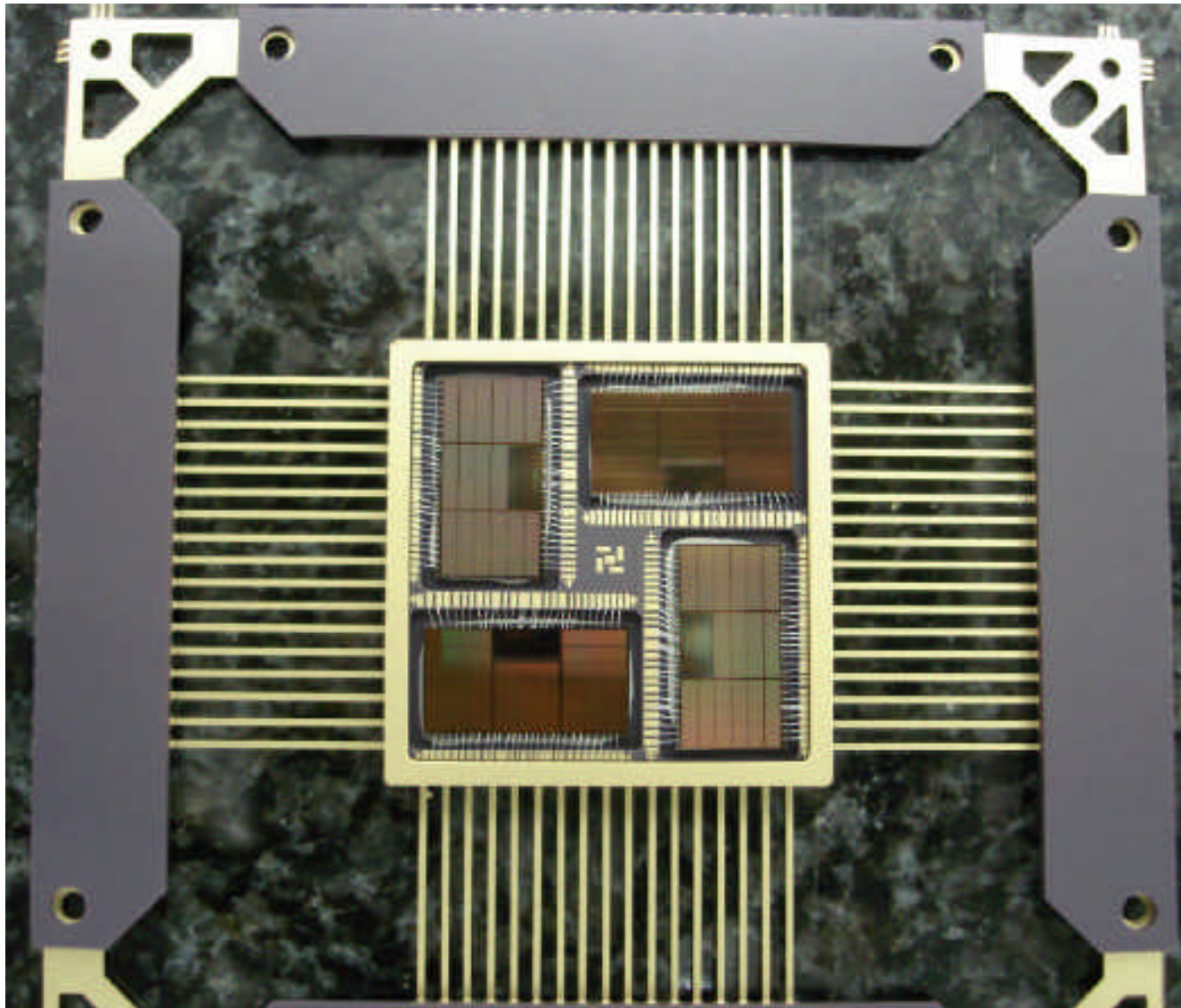


MCM with die bonded



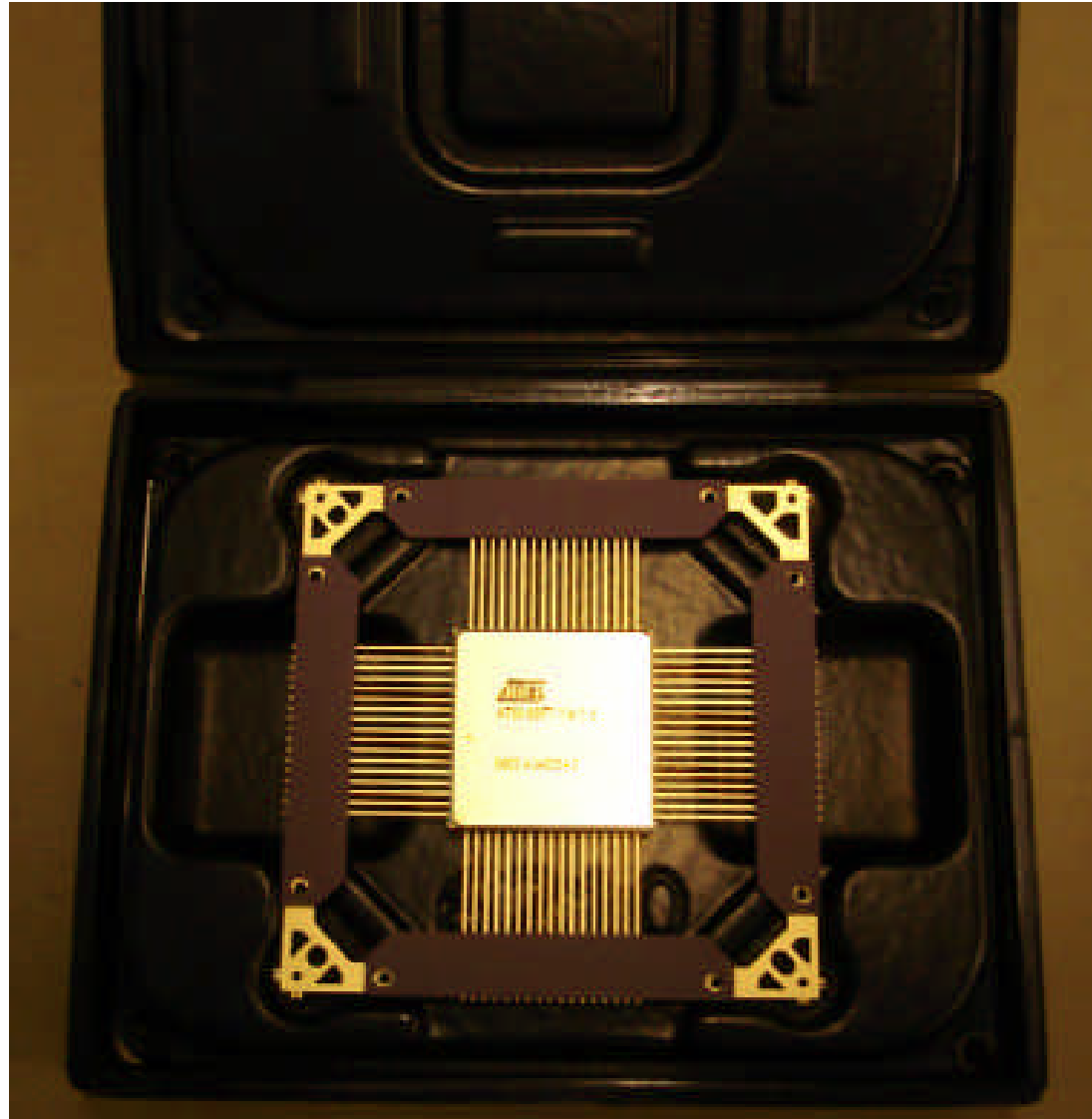


MCM with wire bonding





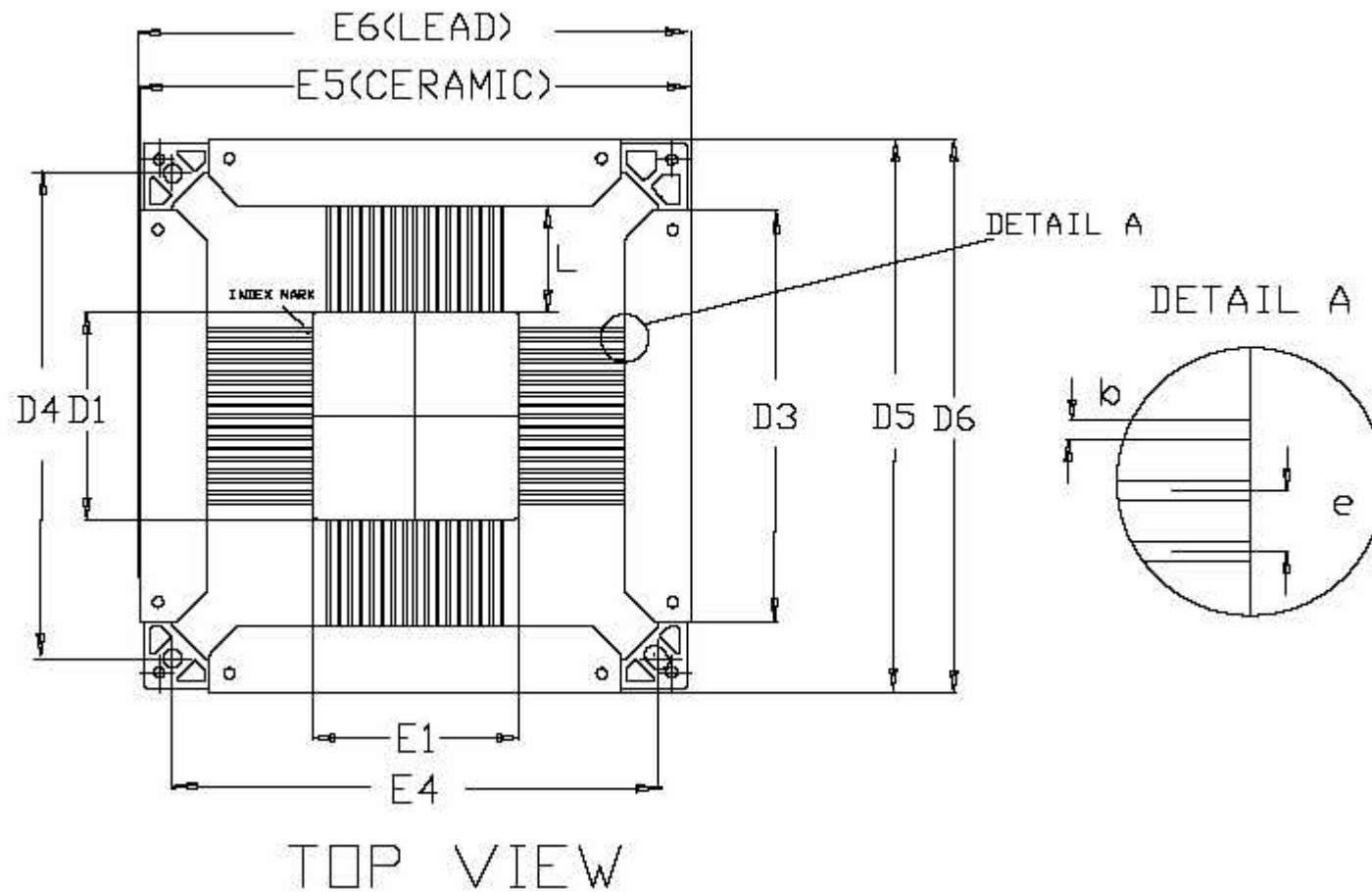
MCM sample in its packing



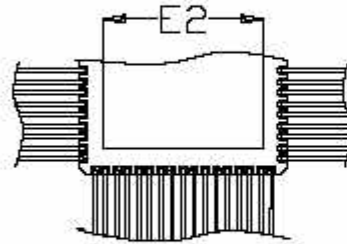
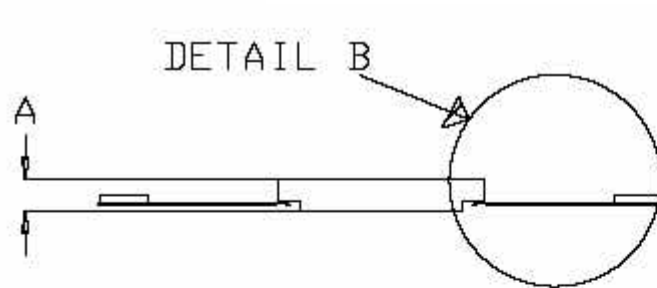


MCM SRAM: outline (1)

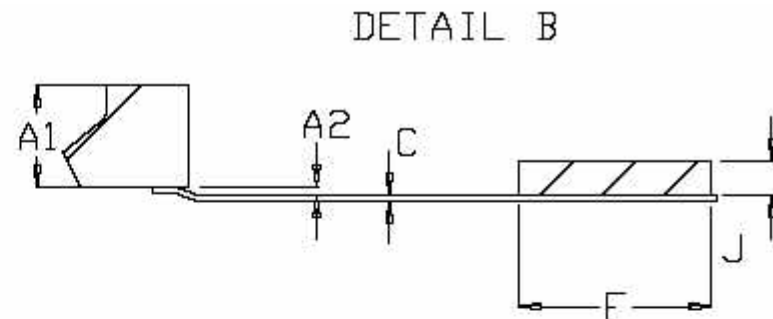
68 LEADS FLAT PACK CERAMIC TIE BAR



MCM SRAM: outline (2)



BOTTOM VIEW



	mm		inch	
	min	max	min	max
E1/D1	24.14	REF	.950	REF
E2	18.30	19.00	.720	.748
D3	42.67	43.69	1.680	1.720
E4/D4	54.36	REF	2.140	REF
E5/D5	63.38	REF	2.495	REF
E6/D6	/	64.14	/	2.525
J	0.76	1.02	.030	.040
L	12.00	REF	.472	REF
F	7.62	REF	.300	REF
C	0.18	0.25	.007	.010
A	3.72	4.70	.146	.185
A1	2.72	3.41	.107	.134
A2	0.20	BSC	.008	BSC
e	1.27	BSC	.050	BSC
b	0.33	0.43	.013	.017



16Mb SRAM MCM: AT68166F/FT (1)

- 4 off 512Kx8 SRAM die (F and/or FT) which can be used as either 1 off 512Kx32, 2 off 512Kx16, or 4 off 512Kx8
- QFP68 pins, 1 sided cavity package for optimized power dissipation
- 3.3+/-0.3V specification, w.o. or w. 5V tolerant Inputs
- 25 ns address access time sampled
- Further improvements will bring the speed down to 20 ns in a first step, and later on, to 15-17 ns

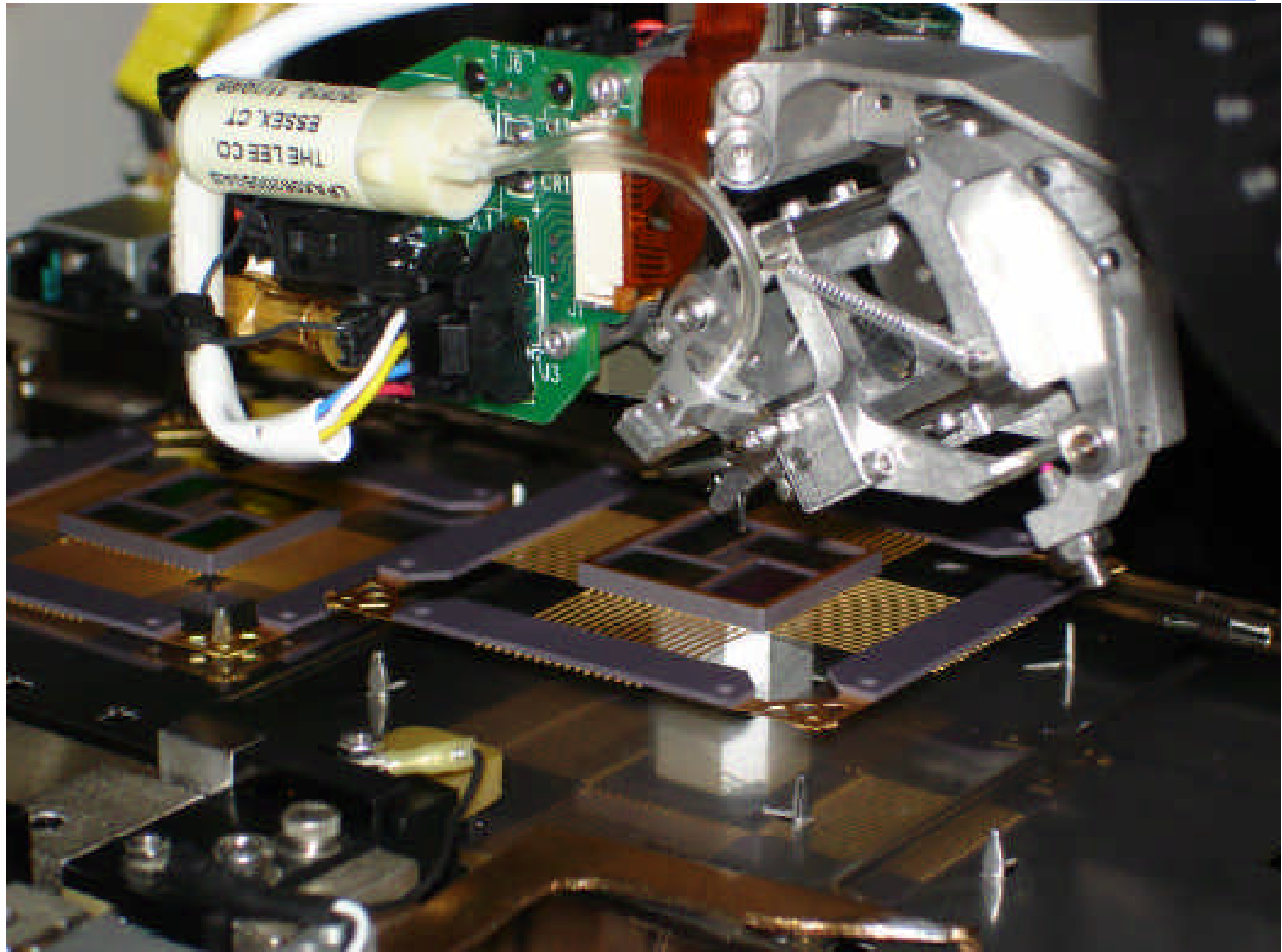


16Mb SRAM MCM: AT68166F/FT (2)

- Latch up immune, tested up to 300Krads
- No MBU
- 2.5 mA stand by current
- 720/680 mA @ 15/17 ns & 3.3V
- ESCC & QML V (5962-06229 available for 25 ns 5V Tol)



MCM wire bonder





MCM industrial capability

- **Die bonding:**
 - ESEC type MICRON equipment
 - Allows for any rotation for each die
 - Up to 4 different types of die
 - Cavity size: 70x70mm max
- **Wire bonding:**
 - Kulicke & Sofa KS8060 equipment
 - Allows for any rotation for each die
 - 32µm Al wire bonding
 - 63.5 x 63.5 mm for automatic bonding

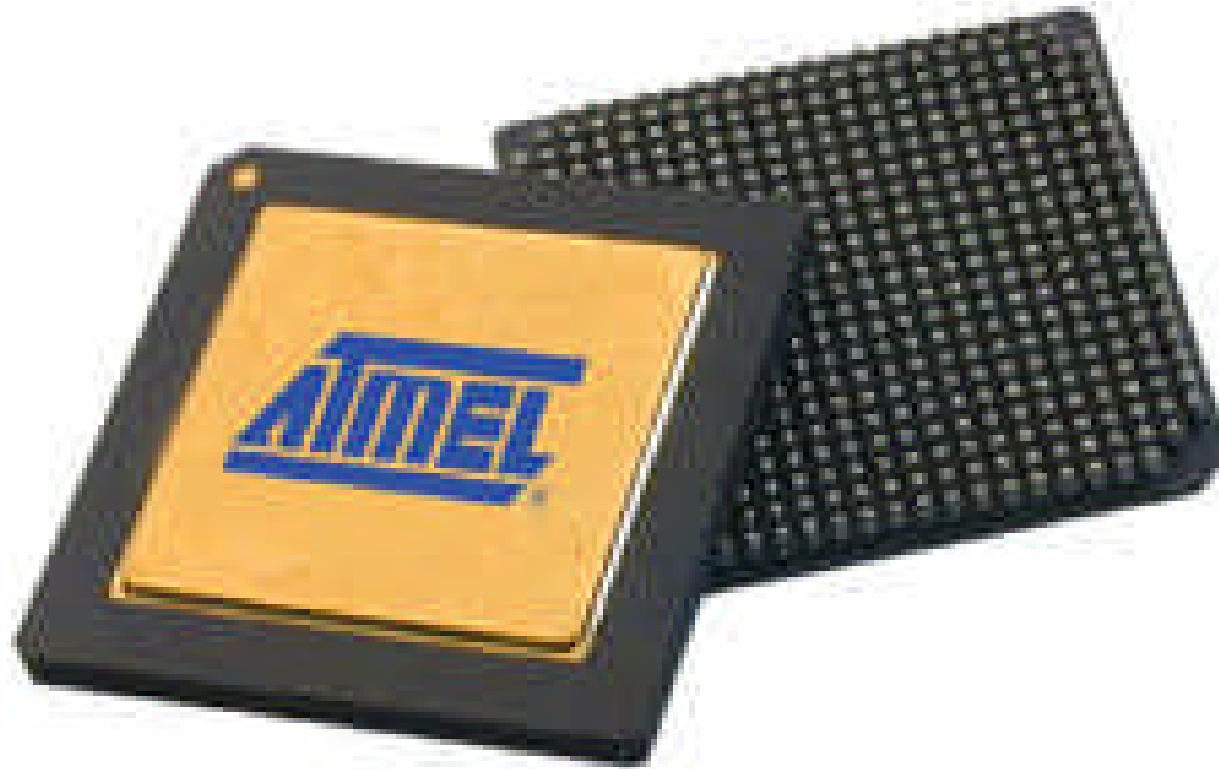


MCM spin off products

- **EEPROM**
- **SRAM and EEPROM**
- **DPR & FIFO**
- **μP with caches**
- **Customized**
- **Guidelines:**
 - **Low die count**
 - **Heterogeneous die MCM size must remain within the limit of the main chip (processor and caches should result in a package size of the processor's one)**



MCGA625





MCGA625 contract status

- **CTB-HYB-DAD 3.14.03 kicked off in December 05**
- **1 mm pitch 625 MCGA**
- **Package design completed and samples received at Grenoble**
- **Daisy chain proposal sent and agreed by Astrium Velizy**
- **List of beta customers approved by the ESA contract technical officer:**
 - **SES**
 - **ASTRIUM**
 - **A2S**
- **A joint evaluation plan to be coordinated by Astrium and approved by end of May**



MCGA625 contract content

- **Work package 1: Design and specify an MCGA625 with embedded daisy chain of connections** **Completed**
- **Work package 2: Check the feasibility of the SCI mounting on the CLGA** **Just started**
- **Work package 3:**
 - **Procure prototypes and define the screening flow (test socket insertion, burn-in temperature...)**
 - **Deliver daisy chain to beta customers**
- **Work package 4: Develop a cavity compatible with the biggest ATC18RHA ASIC size, the ATC18RHA95_504**
- **Work package 5: Final report**



MCGA625 sampling plan

- **Alcatel Alenia Space:**
 - **Alcatel Alenia Space, Toulouse , France** **8#**
 - **Alcatel Alenia Space, Roma, Italy** **8#**
 - **Alcatel Alenia Space, Charlerois, Belgium** **8#**
- **Astrium, in Velizy, France** **16#**
- **Saab Ericsson Space** **16#**
- **TOTAL** **56#**

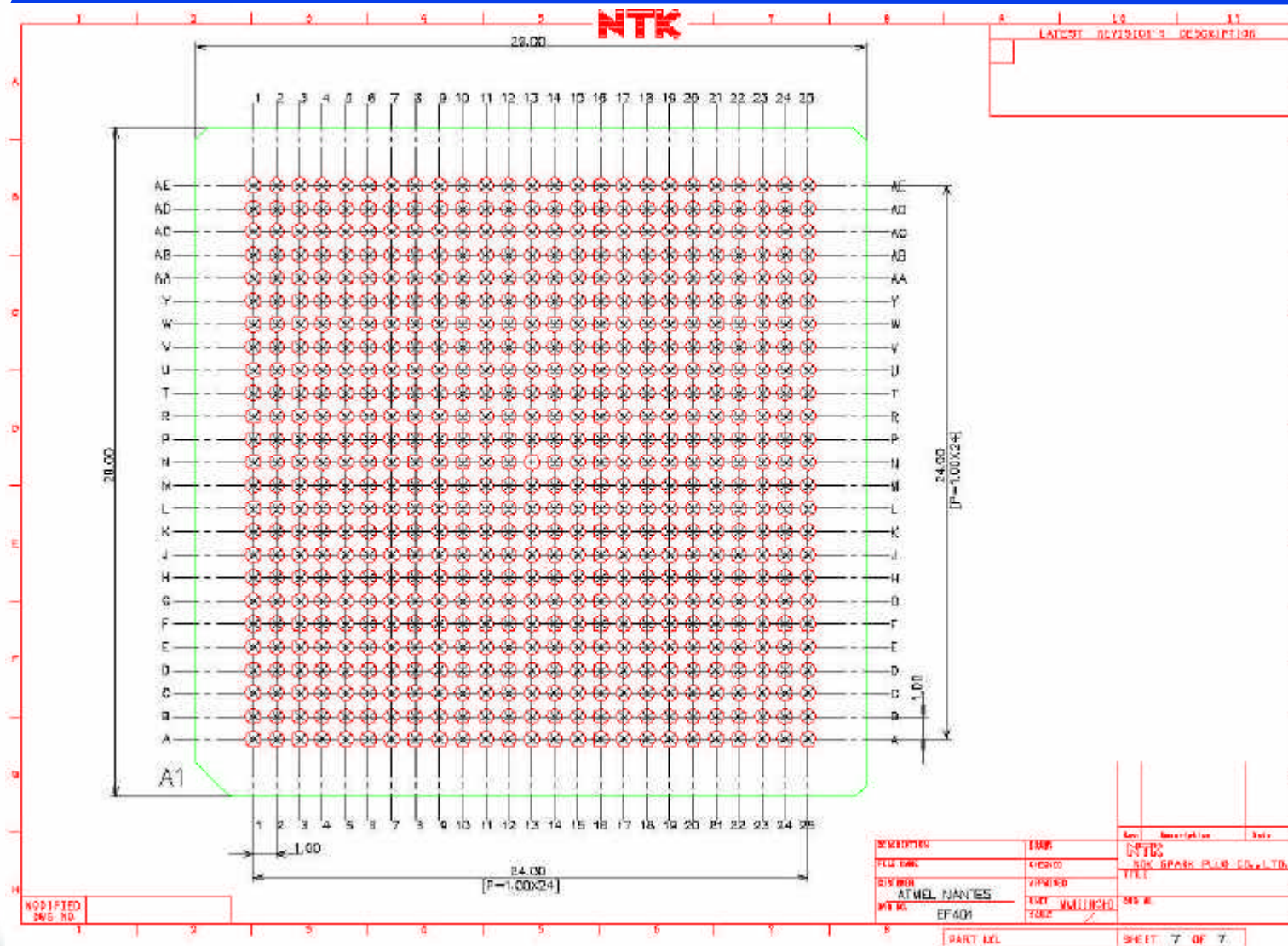


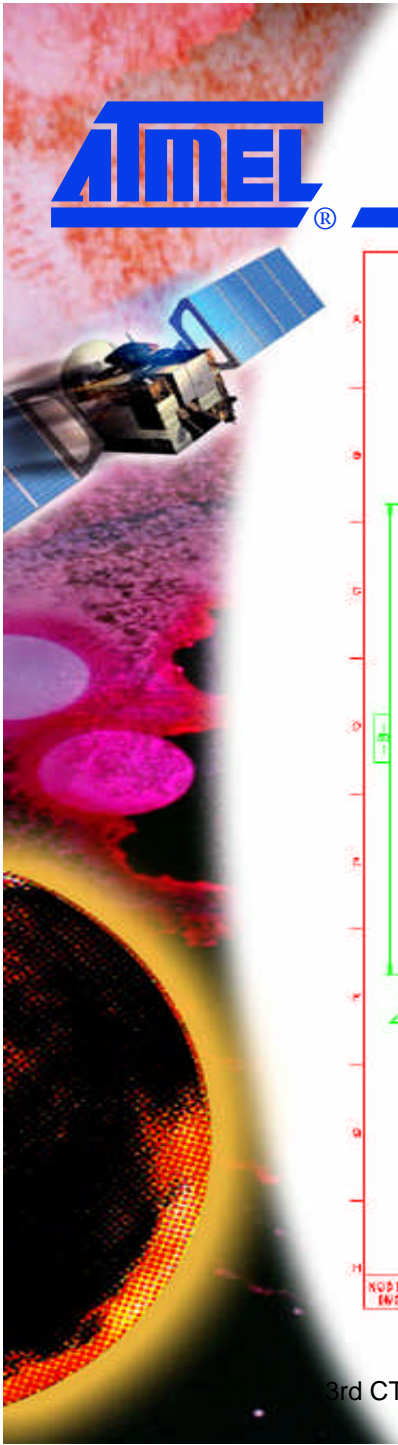
Schedule

	01/06	02/06	03/06	04/06	05/06	06/06	07/06	08/06	09/06	10/06	11/06	12/06	01/07
Work package 1													
Definition of LGA & SCI	=												
Fabrication of SCI	===	===	===	===									
Fabrication of LGA	===	===	===	===									
Work package 2													
Reflow profile definition	===												
Centering tool design	===												
SCI attachment					==	=							
RX inspection						=							
Report validation						==	=						
Electrical tests							==						
Work package 3													
Daisy chain assembly								==					
Daisy chain test									==				
Daisy chain sent to beta										=			
Work package 4													
New cavity design				===	===	===	===	===	===	===	===		
Work package 5													
Final report												===	===

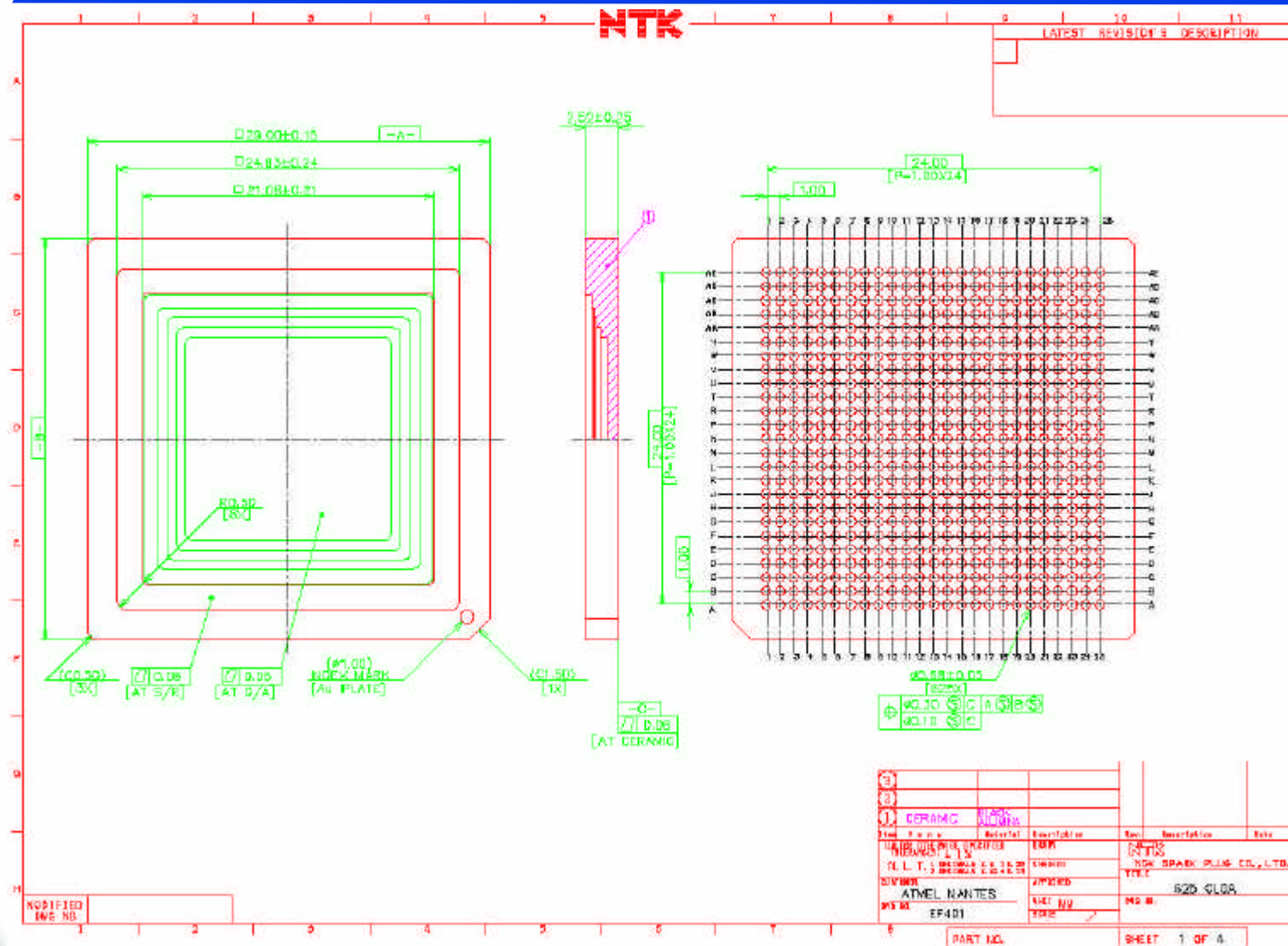


MCGA625 bottom view





MCGA625 top view





Daisy chain connection table

NTK

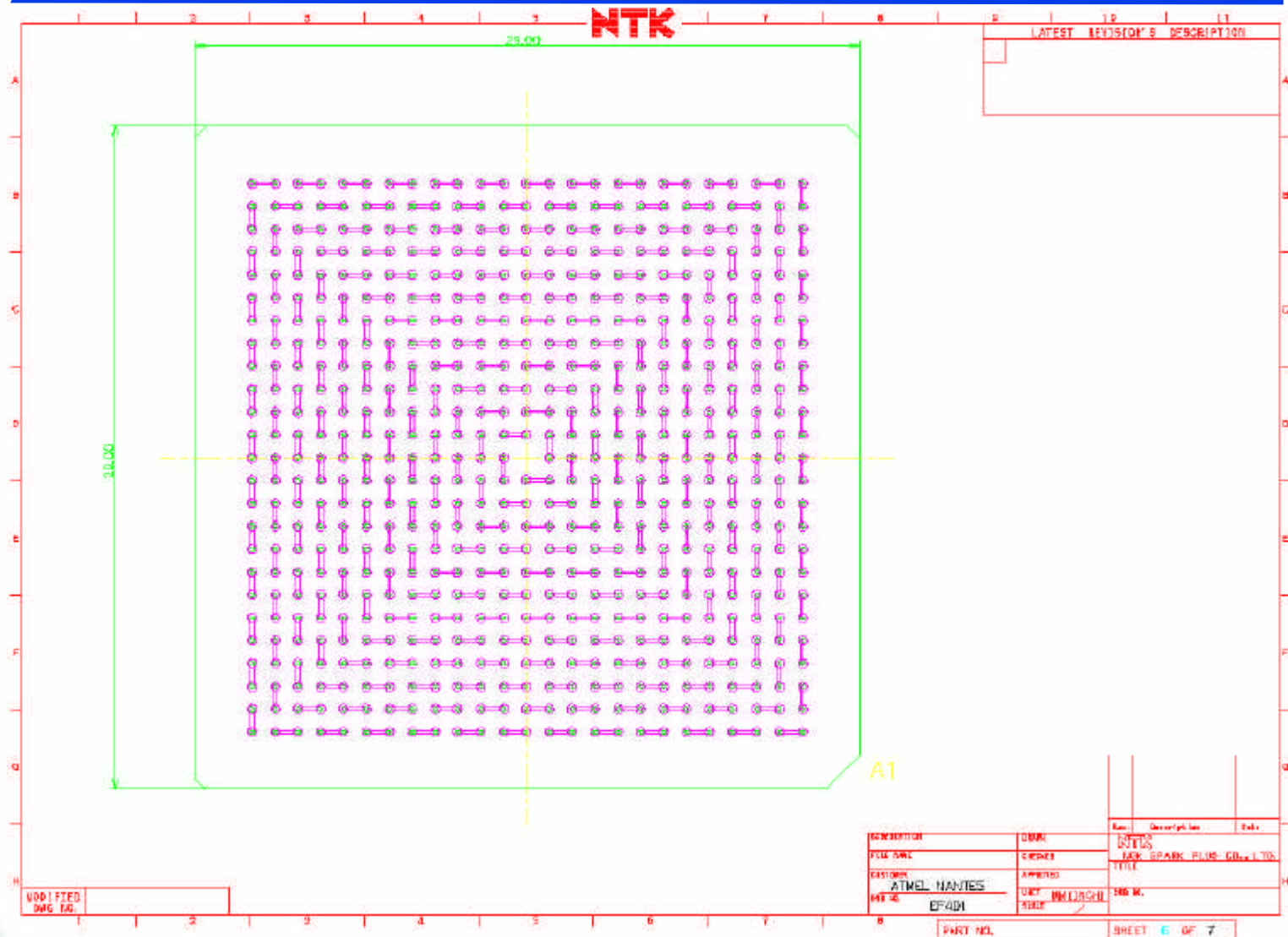
LATEST REVISION'S DESCRIPTION

CONNECTION TABLE

NO																	
PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD	PAD
A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18
A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30	A31	A32	A33	A34	A35	A36
A37	A38	A39	A40	A41	A42	A43	A44	A45	A46	A47	A48	A49	A50	A51	A52	A53	A54
A55	A56	A57	A58	A59	A60	A61	A62	A63	A64	A65	A66	A67	A68	A69	A70	A71	A72
A73	A74	A75	A76	A77	A78	A79	A80	A81	A82	A83	A84	A85	A86	A87	A88	A89	A90
A91	A92	A93	A94	A95	A96	A97	A98	A99	A100	A101	A102	A103	A104	A105	A106	A107	A108
A109	A110	A111	A112	A113	A114	A115	A116	A117	A118	A119	A120	A121	A122	A123	A124	A125	A126
A127	A128	A129	A130	A131	A132	A133	A134	A135	A136	A137	A138	A139	A140	A141	A142	A143	A144
A145	A146	A147	A148	A149	A150	A151	A152	A153	A154	A155	A156	A157	A158	A159	A160	A161	A162
A163	A164	A165	A166	A167	A168	A169	A170	A171	A172	A173	A174	A175	A176	A177	A178	A179	A180
A181	A182	A183	A184	A185	A186	A187	A188	A189	A190	A191	A192	A193	A194	A195	A196	A197	A198
A199	A200	A201	A202	A203	A204	A205	A206	A207	A208	A209	A210	A211	A212	A213	A214	A215	A216
A217	A218	A219	A220	A221	A222	A223	A224	A225	A226	A227	A228	A229	A230	A231	A232	A233	A234
A235	A236	A237	A238	A239	A240	A241	A242	A243	A244	A245	A246	A247	A248	A249	A250	A251	A252
A253	A254	A255	A256	A257	A258	A259	A260	A261	A262	A263	A264	A265	A266	A267	A268	A269	A270
A271	A272	A273	A274	A275	A276	A277	A278	A279	A280	A281	A282	A283	A284	A285	A286	A287	A288
A289	A290	A291	A292	A293	A294	A295	A296	A297	A298	A299	A300	A301	A302	A303	A304	A305	A306
A307	A308	A309	A310	A311	A312	A313	A314	A315	A316	A317	A318	A319	A320	A321	A322	A323	A324
A325	A326	A327	A328	A329	A330	A331	A332	A333	A334	A335	A336	A337	A338	A339	A340	A341	A342
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A361	A362	A363	A364	A365	A366	A367	A368	A369	A370	A371	A372	A373	A374	A375	A376	A377	A378
A379	A380	A381	A382	A383	A384	A385	A386	A387	A388	A389	A390	A391	A392	A393	A394	A395	A396
A397	A398	A399	A400	A401	A402	A403	A404	A405	A406	A407	A408	A409	A410	A411	A412	A413	A414
A415	A416	A417	A418	A419	A420	A421	A422	A423	A424	A425	A426	A427	A428	A429	A430	A431	A432
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A451	A452	A453	A454	A455	A456	A457	A458	A459	A460	A461	A462	A463	A464	A465	A466	A467	A468
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A667	A668	A669	A670	A671	A672	A673	A674	A675	A676	A677	A678	A679	A680	A681	A682	A683	A684
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A955	A956	A957	A958	A959	A960	A961	A962	A963	A964	A965	A966	A967	A968	A969	A970	A971	A972
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A1099	A1100	A1101	A1102	A1103	A1104	A1105	A1106	A1107	A1108	A1109	A1110	A1111	A1112	A1113	A1114	A1115	A1116
A1117	A1118	A1119	A1120	A1121	A1122	A1123	A1124	A1125	A1126	A1127	A1128	A1129	A1130	A1131	A1132	A1133	A1134
A1135	A1136	A1137	A1138	A1139	A1140	A1141	A1142	A1143	A1144	A1145	A1146	A1147	A1148	A1149	A1150	A1151	A1152
A1153	A1154	A1155	A1156	A1157	A1158	A1159	A1160	A1161	A1162	A1163	A1164	A1165	A1166	A1167	A1168	A1169	A1170
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MCGA625 daisy chain physical layout





Ceramic packages offering and roadmap

