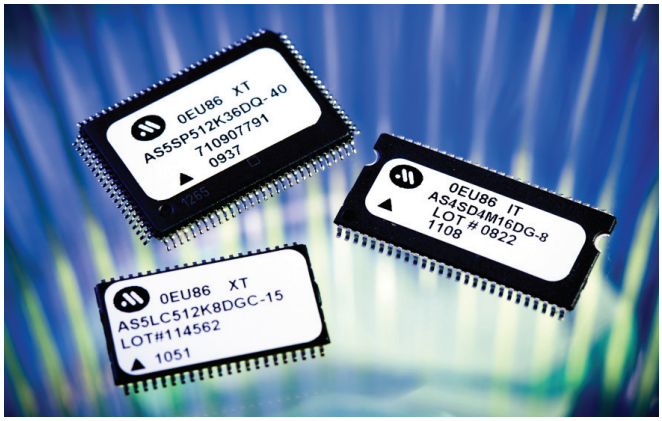
micross components

Copper Lead Frame Memory Products



BENEFITS / FEATURES

- Full Military Temp -55°C to 125°C
- Enhanced Long-term reliability with copper lead frames
- Superior thermal conductivity improvement:
  170 W/m*K vs. 14 W/m*K (a 12X difference)
- θ ja and θ jc characteristics provide up to 3X advantage of heat dissipation capability versus parts with alloy 42 lead frames
- Heat dissipated from the die faster makes it run cooler, leading to longer life
- Solder joint reliability vastly improved
  - CTE of Copper (17 ppm/ °C), matches the CTE of Typical FR4 PWBs (15-17 ppm/°C), whereas CTE of Alloy 42 (5 ppm/°C), is a mismatch
- RoHS Version (NiPdAu plating) and Pb/Sn plating available
- 100% product screened at temperature & Vcc extremes
- Extensive die & package qualification and reliability testing (HTOL, THB, TC, TS, Pre-cond MSL, HAST, PCT)

PRODUCTS

- **SDRAM**
  3.3V, 64Mb to 512Mb
  54-pin TSOPII

- **Async SRAM**
  5V & 3.3V, 256Kb to 16Mb
  32 & 44-pin TSOPII
  48-pin TSOPI

- **SSRAM**
  3.3V & 2.5V, 4Mb to 36Mb
  100-pin TQFP

APPLICATIONS

Examples Include:

- Military, Aerospace, Avionics
- Digital Radio
- Cellular Base Stations
- On-Board Flight Computers
- Radar / Sonar
- Encryption / Detection
- Data Recording “Black Box”
- Image Processing DSP
- SSRAM’s with Power PC

SDRAM

*Available in Mil Temp (-55°C to +125°C), Enhanced Temp (-40°C to +105°C) and Industrial Temp (-40°C to +85°C) Ranges

Configuration	Part Number	Speed	VCC	Package	Package Designator	Lead frame	Status
32M x 16	AS4SD32M16	133 MHz	3.3V	54 PIN TSOPII	DGC & DGCR	Cu	Prod.
16M x 16	AS4SD16M16	133 MHz	3.3V	54 PIN TSOPII	DGC & DGCR	Cu	Prod.
8M x 16	AS4SD8M16	133 MHz	3.3V	54 PIN TSOPII	DGC & DGCR	Cu	Prod.
4M x 16	AS4SD4M16	133 MHz	3.3V	54 PIN TSOPII	DGC & DGCR	Cu	Prod.

Asynchronous SRAM

*Available in Mil Temp (-55°C to +125°C) and Industrial Temp (-40°C to +85°C) Ranges

Configuration	Part Number	Speed (ns)	VCC	Package	Package Designator	Lead frame	Status
512K x 8	AS5LC512K8	10, 12, 15	3.3V	44TSOPII	DGC & DGCR	Cu	Devl.
128K x 8	AS5LC1008	10, 12, 15, 20	3.3V	32TSOPII	DGC & DGCR	Cu	Adv. Devl.[1]
512K x 8	AS5C512K8	12, 15	5V	44TSOPII	DGC & DGCR	Cu	Adv. Devl.[1]
256K x 16	AS5LC256K16	10, 15, 20	3.3V	44TSOPII	DGC & DGCR	Cu	Adv. Devl.[1]
512K x 16	AS5LC512K16	10, 15, 20	3.3V	44TSOPII	DGC & DGCR	Cu	Adv. Devl.[1]
1M x 16	AS5LC1M16	10, 15, 20	3.3V	48TSOPI	DGC & DGCR	Cu	Adv. Devl.[1]
2M x 8	AS5LC2M8	10, 15, 20	3.3V	44TSOPII	DGC & DGCR	Cu	Adv. Devl.[1]

DGC has Pb/Sn lead finish. DGCR is RoHS compliant.

1. Contact Factory for Status

Synchronous SRAM

*Available in Military (-55°C to +125°C), Enhanced (-40°C to +105°C) & Industrial (-40°C to +85°C) Temp Ranges

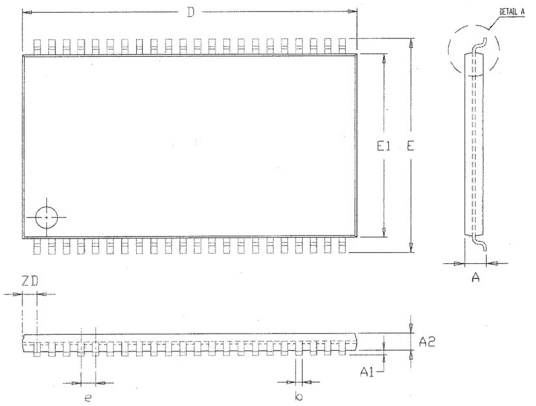
Configuration	Part Number	Speed (MHz)	VDD	Package	Package Designator	Lead frame	Status
128K x 32 Sync Pipeline	AS5SP128K32	200, 166	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
128K x 36 Sync Pipeline	AS5SP128K36	200, 166	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
128K x 36 Sync Burst Flow-thru ZBL[2]	AS5SS128K36	117	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
256K x 18 Sync Burst Flow-thru	AS5SS256K18	113, 100	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
256K x 36 Sync Pipeline	AS5SP256K36	166, 133	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
256K x 36 Sync Burst Flow-thru	AS5SS256K36	117, 100	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
512K x 36 Sync Pipeline	AS5SP512K36	200, 166	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
512K x 36 Sync Burst Flow-thru ZBL[2]	AS5SS512K36	117, 100	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
1M x 18 Sync Pipeline	AS5SP1M18	200, 167	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
1M x 36 Sync Pipeline	AS5SP1M36	166	3.3V[1]	100TQFP	DQC & DQCR	Cu	Devl.
128K x 32 Sync Burst Flow-thru	AS5SS128K32	117	3.3V[1]	100TQFP	DQC & DQCR	Cu	Adv. Devl.[3]
512K x 18 Sync Burst Flow-thru	AS5SS512K18	117	3.3V[1]	100TQFP	DQC & DQCR	Cu	Adv. Devl.[3]

1. VDDQ = 3.3V or 2.5V
2. ZBL = NoBL, Zero Bus Latency, ZBT, No Bus Wait Time
3. Contact Factory for Status

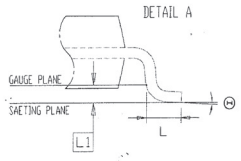
DQ & DQC have Pb/Sn lead finish. DQCR is RoHS compliant.

PACKAGE DRAWINGS

44-PIN TSOPII

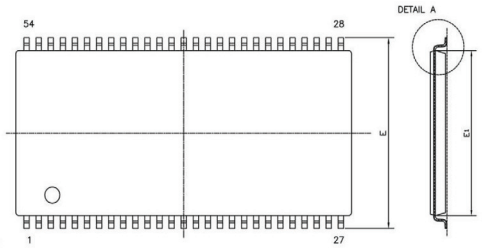


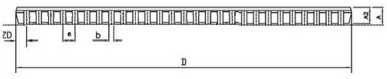
Micross Package Designators DGC & DGCR						
	Millimeters			Inches		
Symbol	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.00	-	1.20	0.039	-	0.047
A1	0.05	-	0.15	0.002	-	0.006
A2	0.95	1.00	1.05	0.037	0.039	0.041
b	0.30	-	0.45	0.012	-	0.018
D	18.28	18.41	18.54	0.720	0.725	0.730
E	11.56	11.76	11.96	0.455	0.462	0.471
E1	10.03	10.16	10.29	0.395	0.400	0.405
e	0.80 BSC.			0.031 BSC.		
L	0.40	-	0.69	0.016	-	0.027
L1	0.25 BSC.			0.010 BSC.		
ZD	0.805 REF.			0.032 REF.		
e	0	-	8°	0	-	8°



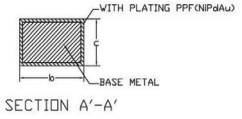
NOTE :
1. CONTROLLING DIMENSION : MM
2. DIMENSION D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION/INTRUSION.

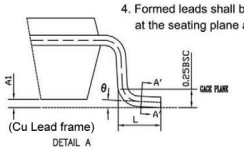
54-PIN TSOPII

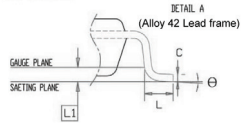




NOTE :
1. Controlling dimension : mm
2. Dimension D and E1 do not include mold protrusion .
3. Dimension b does not include dambar protrusion/intrusion.
4. Formed leads shall be planar with respect to one another within 0.1mm at the seating plane after final test.(Note 4: Alloy 42 LF)

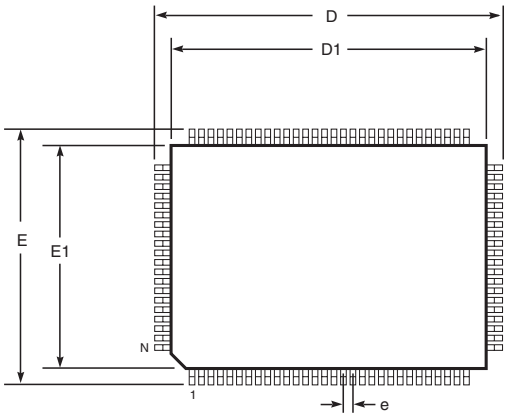


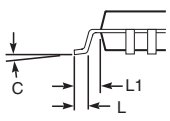


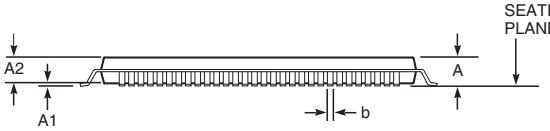


Micross Package Designator: DGC & DGCR Cu Lead frame			
Symbol	Min.	Nom.	Max.
A	-	-	1.20
A1	0.05	0.10	0.20
A2	0.90	1.00	1.10
b	0.25	-	0.45
c	0.08	-	0.18
D	22.02	22.22	22.42
E1	10.03	10.16	10.29
E	11.56	11.76	11.96
e		0.80 BSC	
L	0.40	-	0.75
ZD		0.71 REF	
θ	0 deg	-	8 deg

100-PIN TQFP







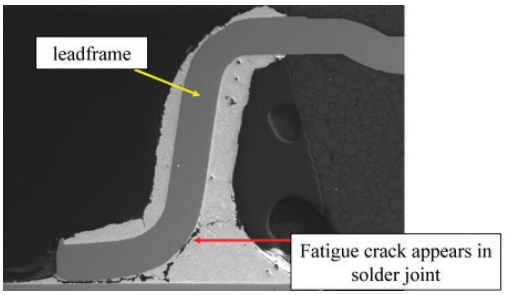
Notes:
1. All dimensioning and tolerancing conforms to ANSI Y14.5M-1982.
2. Dimensions D1 and E1 do not include mold protrusions. Allowable protrusion is 0.25mm per side. D1 and E1 do include mold mismatch and are determined at datum plane -H-.
3. Controlling dimension:millimeters.

Micross Package Designators DGC & DGCR				
	Millimeters		Inches	
Symbol	Min.	Max.	Min.	Max.
Ref. Std.				
No Leads (N) 100				
A	-	1.60	-	0.063
A1	0.05	0.15	0.002	0.006
A2	1.35	1.45	0.053	0.057
b	0.22	0.38	0.009	0.015
D	21.90	22.10	0.862	0.870
D1	19.90	10.10	0.783	0.791
E	15.90	16.10	0.626	0.634
E1	13.90	14.10	0.547	0.555
e	0.65 BSC		0.026 BSC	
L	0.45	0.75	0.018	0.030
L1	1.00 REF.		0.039 REF.	
C	O°	7°	O°	7°

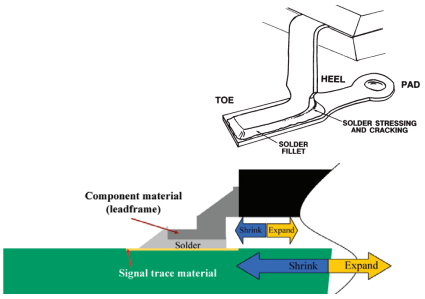
WHY COPPER LEAD FRAMES ARE BEST

BETTER SOLDER JOINT RELIABILITY

- CTE of Copper Lead Frames are best matched to the CTE of FR4 PCBs whereas the Alloy 42 is a mismatch.
- With matching CTE the Copper lead Frame expands and contracts at the same rate of PCB.
- Better CTE match leads to better solder joint reliability.



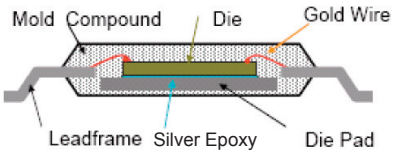
Example: Mismatch CTE solder joint failure with Alloy 42.



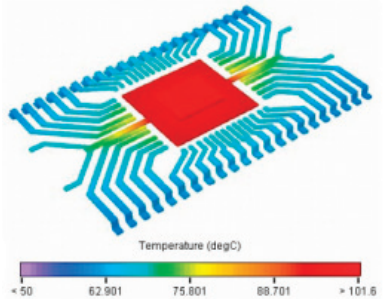
BETTER THERMAL DISSIPATION

- Copper Lead Frames offer 12X better thermal conductivity and 3X advantage in heat dissipation over Alloy 42 lead frame products.
- Heat dissipated from the die faster makes it run cooler, leading to longer component and system life.

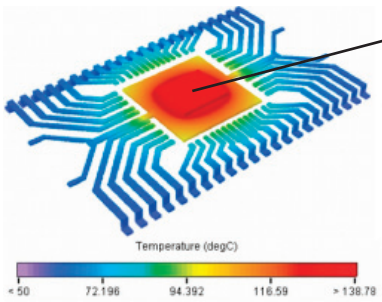
Typical Component Construction



Thermal Imaging:



Alloy 42 Lead Frame

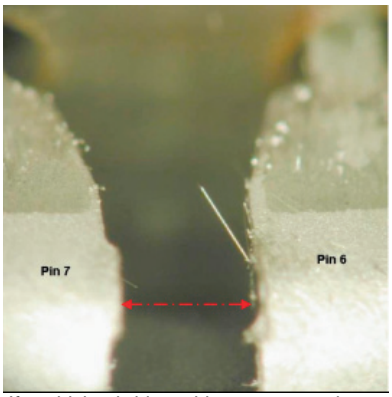


Copper Lead Frame

Less **RED** indicates the die is running cooler

WHISKER PREVENTION

- RoHS versions of these Copper Lead Frame products have a NiPdAu lead finish. (Nickel-Palladium-Gold)
- Traditional finishes on Alloy 42 lead frames containing tin can grow whiskers, leading to bridges between leads, resulting in short circuits and system failure.
- iNEMI (International Electronics Manufacturing Initiative) lists the NiPdAu lead plating as the most preferred for elimination of risk for whiskers.



If a whisker bridges this gap across the pins, or it breaks, there could be a short-circuit and a system could fail.
(Photo by NASA)

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