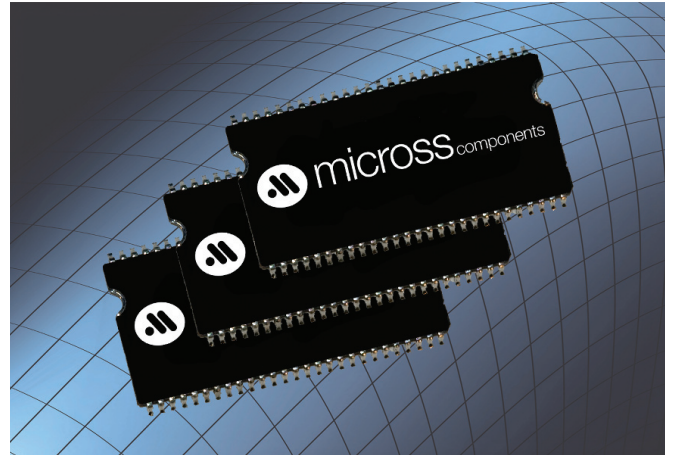


# Copper Lead Frame 54-Pin TSOPII SDRAM Products



## FEATURES

- Clock frequency: up to 133 MHz
- Configurations: 32Mx16, 16Mx16, 8Mx16 & 4Mx16
- Fully synchronous; all signals referenced to a positive clock edge
- Internal pipelined operation; column address can be changed every clock cycle
- Internal banks for hiding row access/precharge
- Power supply: +3.3V +/-0.3V
- LVTTTL interface
- Programmable burst length (1, 2, 4, 8, full page)
- Programmable burst sequence: Sequential/Interleave
- Auto Refresh (CBR)
- Self Refresh Mode (/IT)  
64ms, 8,192 cycle refresh (/IT)  
<24ms, 8,192 cycle refresh (/XT)
- Write recovery (tWR = "2 CLK")
- Random column address every clock cycle
- Programmable CAS latency (2, 3 clocks)
- Burst read/write and burst read/single write operations capability
- Burst termination by burst stop and precharge command
- Available in 54-pin TSOP-II, choice of lead frame:
  - Copper lead frame
  - Alloy 42 lead frame
- Operating Temperature Range:  
Industrial: -40°C to +85°C  
Military: -55°C to +125°C
- Pb/Sn finish or RoHS available
- 100% product screened at temperature extremes & Vcc extremes

## BENEFITS

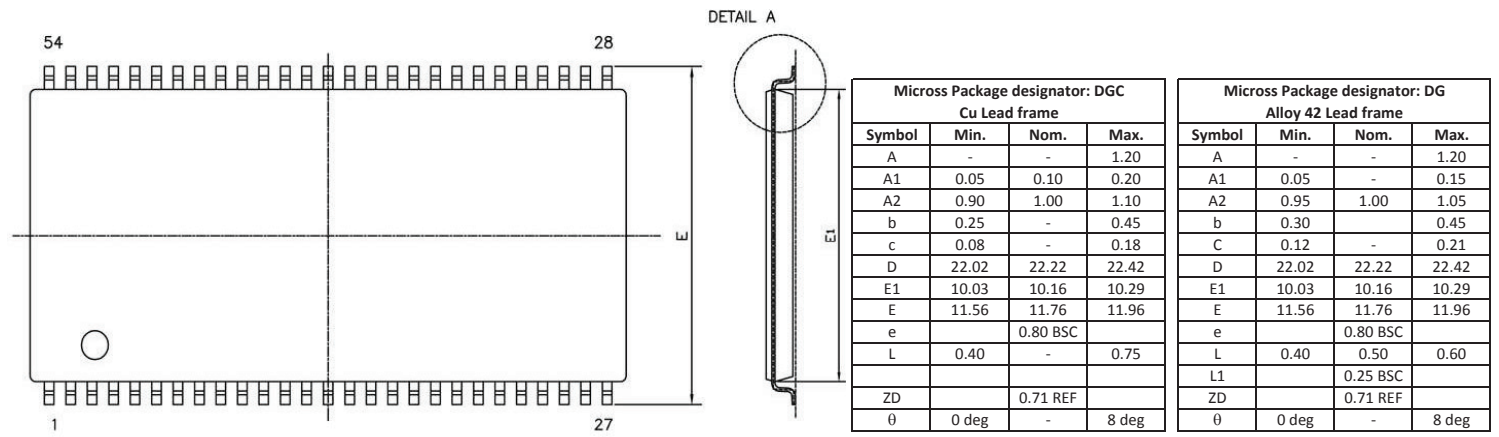
- Enhanced Long-term reliability with copper lead frames
- Superior thermal conductivity improvement: 170 W/m\*K vs. 14 W/m\*K (a 12X difference)
- $\theta_{ja}$  and  $j_c$  characteristics provide up to 3X advantage of heat dissipation capability versus parts with alloy 42 lead frames
- Heat dissipated 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)
  - Most preferred for elimination of risk for whisker growth
- Over broader Military and Industrial temperature ranges, the above benefits are even more important

## APPLICATIONS

Examples Include:

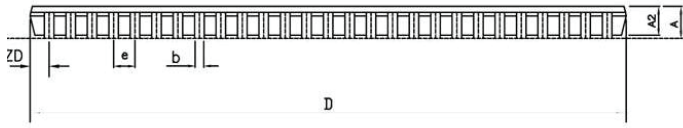
- Military, Aerospace, Avionics
- Cellular Base Stations
- Gas / Oil Exploration
- Engine Control
- On-Board Flight Computers
- Radar / Sonar

# PACKAGE DIAGRAMS



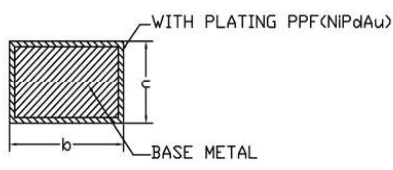
Micross Package designator: DGC Cu Lead frame			
Symbol	Min.	Nom.	Max.
A	-	-	1.20
A1	0.05	0.10	0.20
A2	0.90	1.00	1.10
b	0.25	-	0.45
c	0.08	-	0.18
D	22.02	22.22	22.42
E1	10.03	10.16	10.29
E	11.56	11.76	11.96
e		0.80 BSC	
L	0.40	-	0.75
ZD		0.71 REF	
θ	0 deg	-	8 deg

Micross Package designator: DG Alloy 42 Lead frame			
Symbol	Min.	Nom.	Max.
A	-	-	1.20
A1	0.05	-	0.15
A2	0.95	1.00	1.05
b	0.30	-	0.45
C	0.12	-	0.21
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	0.50	0.60
L1		0.25 BSC	
ZD		0.71 REF	
θ	0 deg	-	8 deg

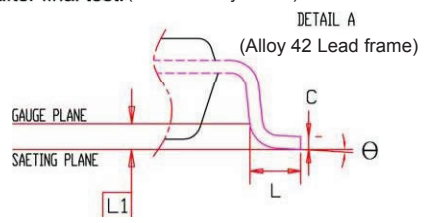
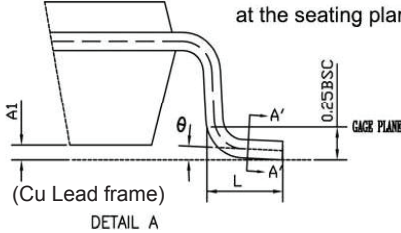


**NOTE :**

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)



SECTION A'-A'



Configuration	Part Number	Speed	VCC	Temp Range	Package	Package Designator	Lead frame	Status
32M x 16	AS4SD32M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DGC & DGCR	Cu	Qual
16M x 16	AS4SD16M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DGC & DGCR	Cu	Production
8M x 16	AS4SD8M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DGC & DGCR	Cu	Production
4M x 16	AS4SD4M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DGC & DGCR	Cu	Production
32M x 16	AS4SD32M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DG	Alloy 42	Production
16M x 16	AS4SD16M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DG	Alloy 42	Production
8M x 16	AS4SD8M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DG	Alloy 42	Production
4M x 16	AS4SD4M16	133 MHz	3.3V	-40°C to +85°C -55°C to +125°C	54 PIN TSOPII	DG	Alloy 42	Production

DG & DGC have Pb / Sn finish, DGCR is RoHS compliant



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