

24-BALL BGA PACKAGES



24-ball BGA 6x8 mm

- Compliant with RoHS, REACH regulations and practices
- Contains no Red Phosphorus
- Lead free
- Standard reflow profile
- Compatible with similar low-power

SRAM products and other nonvolatile RAM products



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COMPLIANCE WITH ENVIRONMENTAL REGULATIONS AND DIRECTIVES

Table 1 – Environmental Regulation and Directive Compliance

Environment	Statement Summary	Download Full Statement
ISO9001:2008	Everspin Technologies is in conformance with ISO9001:2008	Certificate
RoHS Directives	Statement of RoHS 1 and the recast Directive 2011/65/EU is commonly referred to as RoHS 2 Compliance. Everspin MRAM products are also “halogen-free”.	Full Statement
REACH Regulations	REACH regulations require article suppliers to inform recipients if an article contains a Substance of Very High Concern (SVHC) in excess of 0.1% by weight. Based on the material content certifications provided by Everspin’s suppliers, none of these substances are present in the materials we use in our products, including packing and shipping materials.	Full Statement
Red Phosphorus	Everspin Technologies, Inc. MRAM products do not contain Red Phosphorus CAS# 7723-14-0 as an intentional additive.	Full Statement

MULTIPLE REFLOW CYCLES AND MOISTURE RESISTANCE

All Everspin packages are qualified by the procedure defined in IPC/JEDEC joint specification IPC/JEDEC J-STD-020D.1. They are guaranteed to withstand up to three reflow cycles without permanent damage, provided the conditions for the rated moisture resistance level for the part are observed prior to reflow.

Everspin parts are generally rated for MSL Level 3. Exceptions may exist and are noted in their respective data sheet. Please check the latest individual product data sheet to confirm the rated MSL for the product.

RECOMMENDED REFLOW TEMPERATURES AND TIMING

Everspin products can be assembled using a standard assembly lead-free reflow profile. The profile below is based on IPC/JEDEC J-STD-020D.1.

Figure 1 – JEDEC J-STD-020D.1 Assembly Reflow Profile

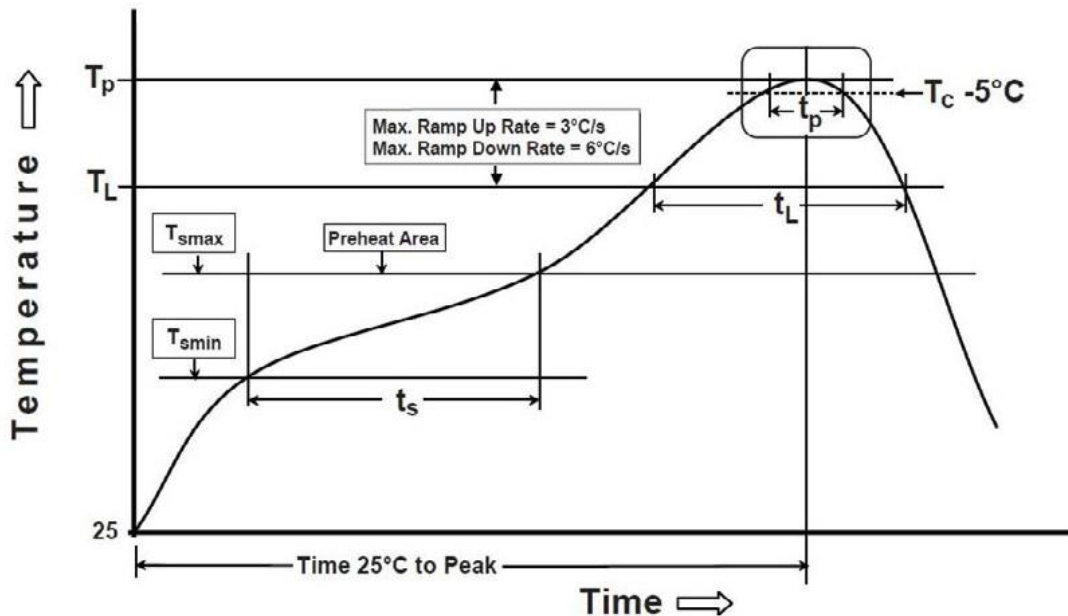


Table 2 – Recommended Reflow Times and Temperatures - All Packages

Profile Step	Parameter	Symbol	Time/Tem p	Unit
Preheat / Soak	Temperature minimum	T_{SMIN}	150	°C
	Temperature maximum	T_{SMAX}	200	°C
	Soak Time	t_s	60 - 120	Seconds
Ramp Up	Rate from T_L to T_p	T_L to T_p	3° / Sec Max	° / Sec
	25°C to T_p		8 minutes max	Minutes
Reflow	Liquidous Temperature	T_L	217	°C
	Time Above T_L		60 - 150	Seconds
	Peak Package Body Temperature	T_p	260	°C
	Time within 5° of Peak Package Body Temperature		20 - 40	Seconds

Ramp Down	Rate from T_p to T_L	T_p to T_L	6° / Sec Max	° / Sec
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THERMAL RESISTANCE

Table 3 – Thermal Resistance MR10Q010 6x8 mm 24-BGA

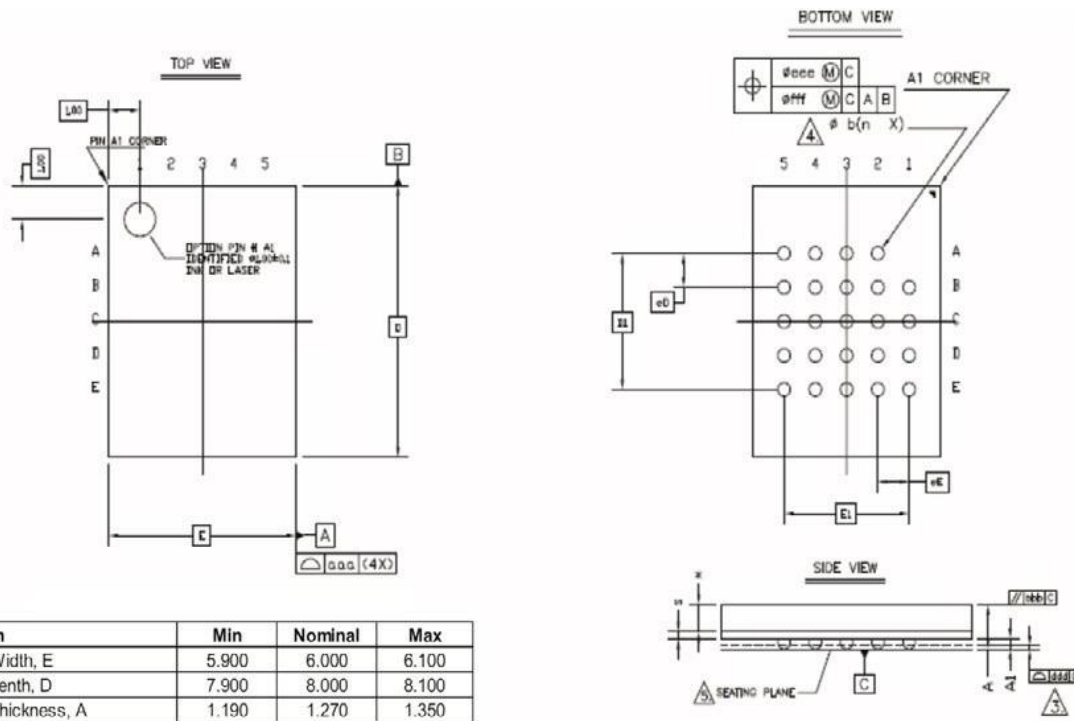
Power (W)	T _A (°C)	T _J (°C)		Θ _{JA} (°C/W)		Ψ _{JT} (°C/W)	Θ _{JB} (°C/W)
		0 m/s	1 m/s	0 m/s	1 m/s		
0.36	70	94.6	92.8	68.33	63.33	1.67	47.28

Table 4 – Thermal Resistance EM064LX 6x8 mm 24-BGA

Mode	Power	Package	Die Stack	T _a (C)	Θ _{JA} (C/W)		Θ _{JB} (C/W)	Θ _{JC} (C/W)	Ψ _{JT} (C/W)	
					0 m/s	1 m/s			0 m/s	1 m/s
XSPI	0.5W	BGA	x1	25	65.39	52.84	46.66	14.43	0.72	1.64
XSPI	0.5W	BGA	X2	25	53.07	43.19	34.31	7.95	0.63	2.73

PACKAGE OUTLINES BY PRODUCT FAMILY

Product Family	Density and I/O Width	BGA Package Outline Drawing
MR10Q010	1Mb x8	6x8mm 24-BGA Figure 2 on page 6
EM064LX	64 Mbit xSPI	6x8mm 24-BGA Figure 3 on page 7



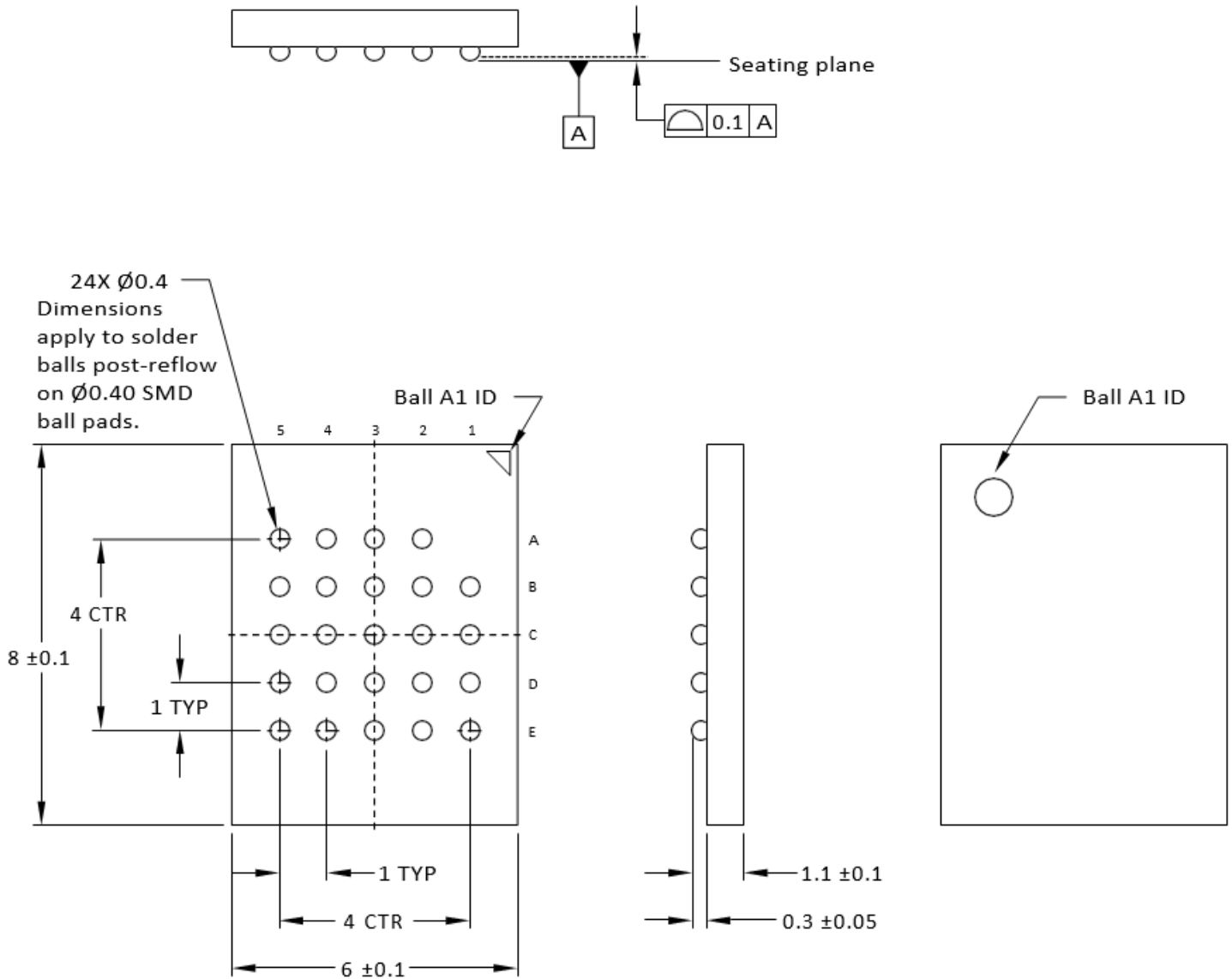
Dimension	Min	Nominal	Max
Package Width, E	5.900	6.000	6.100
Package Length, D	7.900	8.000	8.100
Package Thickness, A	1.190	1.270	1.350
Solder Ball Stand-Off, A1	0.220		0.320
Solder Ball Width, b	0.320		0.420
Solder Ball Diameter		0.350	
Solder Ball Pitch, eE		1.000	
Solder ball Pitch, eD		1.000	
package Edge Tolerance, aaa		0.100	
Mold Flatness, bbb		0.200	
Solder Ball Coplanarity, ddd		0.080	
Solder Offset (Package)		0.150	
Solder Offset (Ball)		0.080	
Edge Ball Center to Center, E1		4.000	
Edge Ball Center to Center, D1		4.000	
Ball Count, n		24	

Notes:	
1	Dimensions and tolerances per ASME Y14.5M - 1994.
2	Solder ball position designation per JEDEC 95-1, SPP-010.
3	This dimension includes stand-off height, package body thickness and lid height, but does not include attached features, e.g. external heatsink or chip capacitors. An integral heatslug is not considered an attached feature.
4	Dimension is measured at the maximum solder ball diameter, parallel to primary Datum C.
5	Primary Datum C and the seating plane are defined by the spherical crowns of the solder balls.
6	All dimensions are in millimeters.

24-BGA PACKAGE OUTLINE DRAWINGS

Figure 2 – Package Outline 6x8mm 24-ball BGA

24-Ball TBGA, 5 x 5 ball array



Notes: 1. All dimensions are in millimeters.

Figure 3 – Package Outline 6x8 24-ball TBGA

REVISION HISTORY

Revision	Date	Description of Change
1.0	May 21, 2018	Initial release.
1.1	June 28, 2022	Added EM064LX Product Family

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