

Etron Technology, Inc. Since 1991

Presented to

DRAM Part Number Decoding

Part Number Decoding Rule – DRAM

EM	6	G	C	16	E	WK	F	-	12	()H
-----------	----------	----------	----------	-----------	----------	-----------	----------	----------	-----------	------------

P/N	Definition	Option	Option Description
EM	Header		n/a
6	Memory	5~8	6:DRAM, 7:Flash, 8:MCP, 5:SRAM
G	Voltage	O/K/G/H/8/A/3	O:1.2/2.5, K:1.2/1.8, G:1.5, H:1.35, 8:1.8, A:2.5, 3:3.3
C	Density	6~F	F:8Gb, E:4Gb, D:2Gb, C:1Gb, B:512Mb A:256Mb, 9:128Mb, 8:64Mb, 6:16Mb
16	Bus Width	16/08/32/04	16:x16, 08:x8, 32:x32, 04:x4
E	Type	N/E/C/0/5	N:DDR4, E:DDR3, C:DDR2, 0:DDR, 5:SDR, H:LPDDR2, K:LPDDR3
WK	Package	Wx(x)/Bx(x)/Vx(x) /TS/GD	Wx:WBGA, Bx:TFBGA, Vx:VFBGA, x:BGA Size, TS:TSOP II, GD:KGD
F	Generation	A~Z	Sequentially assigned for new projects
-	n/a		
12	Speed		Refer to speed Code table
()H	Grade	(-//E/T/A/B)(H/G)	Refer to Grade Code table

Speed Code

Part Number	-	Speed Code	Grade Code	ROHS Code
EMxxxxxxxxx	-	XX	-//E/T/A/B	H/G

Speed	Min. tCK	Max. Freq.	CL-tRCD-tRP	Major Supported DRAM Type
15	1.50ns	667MHz	9-9-9	DDR2/DDR3/3L-1333
16	1.66ns	600MHz	8-8-8	DDR2-1200
18	1.875ns	533MHz	7-7-7	DDR2-1066
25	2.50ns	400MHz	5-5-5	DDR2-800
3	3ns	333MHz	5-5-5	DDR2-667
4	4ns	250MHz	3-4-4	3.3/2.5V DDR-500
5	5ns	200MHz	3-3-3	DDR-400, 3.3V SDR-200
6	6ns	166MHz	3-3-3	SDR-166, 1.8V DDR-333
7	7ns	143MHz	3-3-3	SDR-143,

Speed Code (cont.) & ROHS Code

Part Number	-	Speed Code	Grade Code	ROHS Code
EMxxxxxxxxx	-	xx	-//E/T/A/B	H/G

Speed	Min. tCK	Max. Freq.	CL-tRCD-tRP	Major Supported DRAM Type
62	0.625ns	1600MHz	22-22-22	DDR4-3200
68	0.682ns	1466MHz	21-21-21	DDR4-2933
07	0.750ns	1333MHz	19-19-19	DDR4-2666
08	0.833ns	1200MHz	16-16-16	DDR4-2400
09	0.9375ns	1066MHz	15-15-15	DDR3/3L-2133
10	1.072ns	933MHz	13-13-13	DDR3/3L-1866
12	1.25ns	800MHz	11-11-11	DDR3/3L-1600

ROHS Code	Package Type	Definition
H	BGA	Green & Halogen Free for BGA package
G	TSOP	Green & Halogen Free for non-BGA package

Temperature Grade Code

Part Number	-	Speed Code	Grade Code	ROHS Code
EMxxxxxxxxx	-	xx	-/I/E/T/A/B	H/G

Grade Code	Definition	SDR/DDR (Ta) Ambient Temperature	DDR2/DDR3 (Tc) Case Temperature
-	Commercial	0C ~ 70C	0C ~ 85C ¹
E ³	Wider Temperature Range Commercial	-20C ~ 70C	-20C ~ 85C ¹
I	Industrial	-40C ~ 85C	-40C ~ 95C ¹
T ^{3,5}	Wider Temperature Range Industrial	-40C ~ 105C²	-40C ~ 105C^{1,2}
A ⁴	AEC-Q100 Grade 3	-40C ~ 85C	-40C ~ 95C ¹
B ^{3,4}	AEC-Q100 Grade 2	-40C ~ 105C ²	-40C ~ 105C ^{1,2}

1. Standard Refresh Rate (7.8us) @ 0~85C, Double Refresh Rate (3.9us) @ 85~95C
2. 4X Refresh Rate @ 95~105C, do not support Self Refresh @ 95~105C
3. E/T/B-grade products are produced by demand
4. A/B are Automotive Grade (AEC-Q100 Compliant)
5. E-grade datasheets should be customized for specific customer only

Commonly Used Package Codes

■ DDR4

- WAK : 7.5x13.5 WBGA, 96B x16
- W9 : 7.5x10.6 WBGA, 78B x8

■ DDR3/3L

- WX : 9x13 WBGA, 96B x16
- W5 : 9x13.5 WBGA, 96B x16
- WK : 8x13 WBGA, 96B x16
- WB : 7.5x13 WBGA, 96B x16
- WAK : 7.5x13.5 WBGA, 96B x16
- WU : 8x10.5 WBGA, 78B x8/x4
- W9 : 7.5x10.6 WBGA, 78B x8/x4
- WAH : 7.5x10.5 WBGA, 78B x8
- W3 : 9x10.6 WBGA, 78B x8/x4

■ KGD

- GD : for all KGD

■ DDR2

- WQ : 8x12.5 WBGA, 84B x16
- WA : 8x10 WBGA, 60B x8/x4
- BQ : 8x12.5 PFBGA, 84B x16

■ DDR

- TS : 66P TSOP, x16/x8/x4
- WK* : 8x13 WBGA 60B x16/x8
- BK* : 8x13 FBGA 60B x16/x8
- BI : 12x12 FBGA, 144B x32

■ SDR

- TS : 54/50P TSOP, x16/x8/x4
- TS : 86P TSOP, x32
- BM : 8x8 FBGA, 54B x16/x8
- BK : 8x13 FBGA, 90B x32

* : DDR 60B BGA's ball assignment is different from LPDDR 60B BGA's