NOTICE OF CHANGE

INCH-POUND

MIL-STD-1835B
NOTICE 1
26 February 1997

DEPARTMENT OF DEFENSE

INTERFACE STANDARD FOR
MICROCIRCUIT CASE OUTLINES

TO ALL HOLDERS OF MIL-STD-1835B:

1. THE FOLLOWING PAGES OF MIL-STD-1835B HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
iii	3 September 1996	iii	REPRINTED WITHOUT CHANGE
iv	26 February 1997	iv	3 September 1996
v	26 February 1997	v	3 September 1996
15	3 September 1996	15	REPRINTED WITHOUT CHANGE
16	26 February 1997	16	3 September 1996
143	3 September 1996	143	REPRINTED WITHOUT CHANGE
144	26 February 1997	144	3 September 1996
145	26 February 1997	145	3 September 1996
146	26 February 1997	146	3 September 1996
147	26 February 1997	147	3 September 1996
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151	26 February 1997	151	3 September 1996
152	26 February 1997	152	3 September 1996
153	26 February 1997	NEW	
154	26 February 1997	NEW	
155	26 February 1997	NEW	
156	26 February 1997	NEW	
157	26 February 1997	NEW	
158	26 February 1997	NEW	
159	26 February 1997	NEW	

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-1835B will verify that page changes and additions indicated above have been entered. This notice will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the standard is completely revised or canceled.

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - EC
Air Force - 17
NASA - NA

Review activities:
Army - AR, MI, SM
Navy - AS, CG, MC, OS, SH
Air Force - 19, 85, 99

Civil Agency Coordinating Activities:
DOT-FAA(RD-650)

Preparing activity:
DLA - CC

(Project 5962-1727)

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TABLE VI. Package case outline list - Continued.

Descriptive package type designator	Case outline letter, Figure no., Configuration letter	1/ Dimensions reference letter	2/ θ_{JC} (°C/W)	Terminal count and row-to-row spacing (inch)	Terminal pitch (inch)	3/ EIA similar package designation
Gullwing lead chip carrier style 4/						
GQCC1-G44	16	C-G1	20	44	.050	MO-084 AB
GQCC1-G68	"	C-G2	"	68	"	MO-084 AD
GQCC1-G84	"	C-G3	"	84	"	MO-084 AE
CQCC1-G132	17	C-G7	"	132	.025	MO-104 AA
"J" lead chip carrier style 4/						
GQCC1-J28	18	C-J7	20	28	.050	MO-087 AA
CQCC2-J28	19	C-J9	"	28	"	MO-107 AA
GQCC1-J44	18	C-J1	"	44	"	MO-087 AB
CQCC2-J44	19	C-J4	"	44	"	MO-107 AB
GQCC1-J52	18	C-J8	"	52	"	MO-087 AC
CQCC2-J52	19	C-J10	"	52	"	MO-107 AC
GQCC1-J68	18	C-J2	"	68	"	MO-087 AD
CQCC2-J68	19	C-J5	"	68	"	MO-107 AD
GQCC1-J84	18	C-J3	"	84	"	MO-087 AE
CQCC2-J84	19	C-J6	"	84	"	MO-107 AE
Unformed-lead chip carrier style 4/						
CQCC1-F84	20	C-U1	20	84	.025	MO-090 AA
CQCC1-F100	"	C-U2	"	100	"	MO-090 AF
CQCC1-F132	"	C-U3	"	132	"	MO-090 AB
CQCC1-F144	"	C-U4	"	144	"	MO-090 AC
CQCC1-F172	"	C-U5	"	172	"	MO-090 AD
CQCC1-F196	"	C-U6	"	196	"	MO-090 AE

See footnotes at end of table VII.

TABLE VI. Package case outline list - Continued.

Descriptive package type designator	Case outline letter, Figure no., Configuration letter	1/ Dimensions reference letter	2/ θ_{JC} (°C/W)	Terminal count and row-to-row spacing (inch)	Terminal pitch (inch)	3/ EIA similar package designation
Grid array style 4/ 5/						
CMGA1-PN	21	P-AA	20	81 MAX	.100	MO-067 AA
CMGA2-PN	"	P-AB	"	100 MAX	"	MO-067 AB
CMGA3-PN	"	P-AC	"	121 MAX	"	MO-067 AC
CMGA4-PN	"	P-AD	"	144 MAX	"	MO-067 AD
CMGA5-PN	"	P-AE	"	169 MAX	"	MO-067 AE
CMGA6-PN	"	P-AF	"	196 MAX	"	MO-067 AF
CMGA7-PN	"	P-AG	"	225 MAX	"	MO-067 AG
CMGA8-PN	"	P-AH	"	256 MAX	"	MO-067 AH
CMGA9-PN	"	P-AJ	"	289 MAX	"	MO-067 AJ
CMGA10-PN	"	P-AK	"	324 MAX	"	MO-067 AK
CMGA11-PN	"	P-AL	"	361 MAX	"	MO-067 AL
CMGA12-PN	"	P-AM	"	400 MAX	"	MO-067 AM
CMGA13-PN	"	P-BA	"	81 MAX	"	MO-066 AA
CMGA14-PN	"	P-BB	"	100 MAX	"	MO-066 AB
CMGA15-PN	"	P-BC	"	121 MAX	"	MO-066 AC
CMGA16-PN	"	P-BD	"	144 MAX	"	MO-066 AD
CMGA17-PN	"	P-BE	"	169 MAX	"	MO-066 AE
CMGA18-PN	"	P-BF	"	196 MAX	"	MO-066 AF
CMGA19-PN	"	P-BG	"	225 MAX	"	MO-066 AG
CMGA20-PN	"	P-BH	"	256 MAX	"	MO-066 AH
CMGA21-PN	"	P-BJ	"	289 MAX	"	MO-066 AJ
CMGA22-PN	"	P-BK	"	324 MAX	"	MO-066 AK
CMGA23-PN	"	P-BL	"	361 MAX	"	MO-066 AL
CMGA24-PN	"	P-BM	"	400 MAX	"	MO-066 AM
* CMGA25-PN	26	P-CA	"	145 MAX	"	MO-128 AA
* CMGA26-PN	"	P-CB	"	181 MAX	"	MO-128 AB
* CMGA27-PN	"	P-CC	"	221 MAX	"	MO-128 AC
* CMGA28-PN	"	P-CD	"	265 MAX	"	MO-128 AD
* CMGA29-PN	"	P-CE	"	313 MAX	"	MO-128 AE
* CMGA30-PN	"	P-CF	"	365 MAX	"	MO-128 AF
* CMGA31-PN	"	P-CG	"	421 MAX	"	MO-128 AG
* CMGA32-PN	"	P-CH	"	481 MAX	"	MO-128 AH
* CMGA33-PN	"	P-CJ	"	545 MAX	"	MO-128 AJ
* CMGA34-PN	"	P-CK	"	613 MAX	"	MO-128 AK
* CMGA35-PN	"	P-CL	"	685 MAX	"	MO-128 AL
* CMGA36-PN	"	P-CM	"	761 MAX	"	MO-128 AM
* CMGA37-PN	"	P-CN	"	841 MAX	"	MO-128 AN
* CMGA38-PN	"	P-CP	"	1013 MAX	"	MO-128 AP
* CMGA39-PN	"	P-CQ	"	1301 MAX	"	MO-128 AQ

See footnotes at end of table VII.

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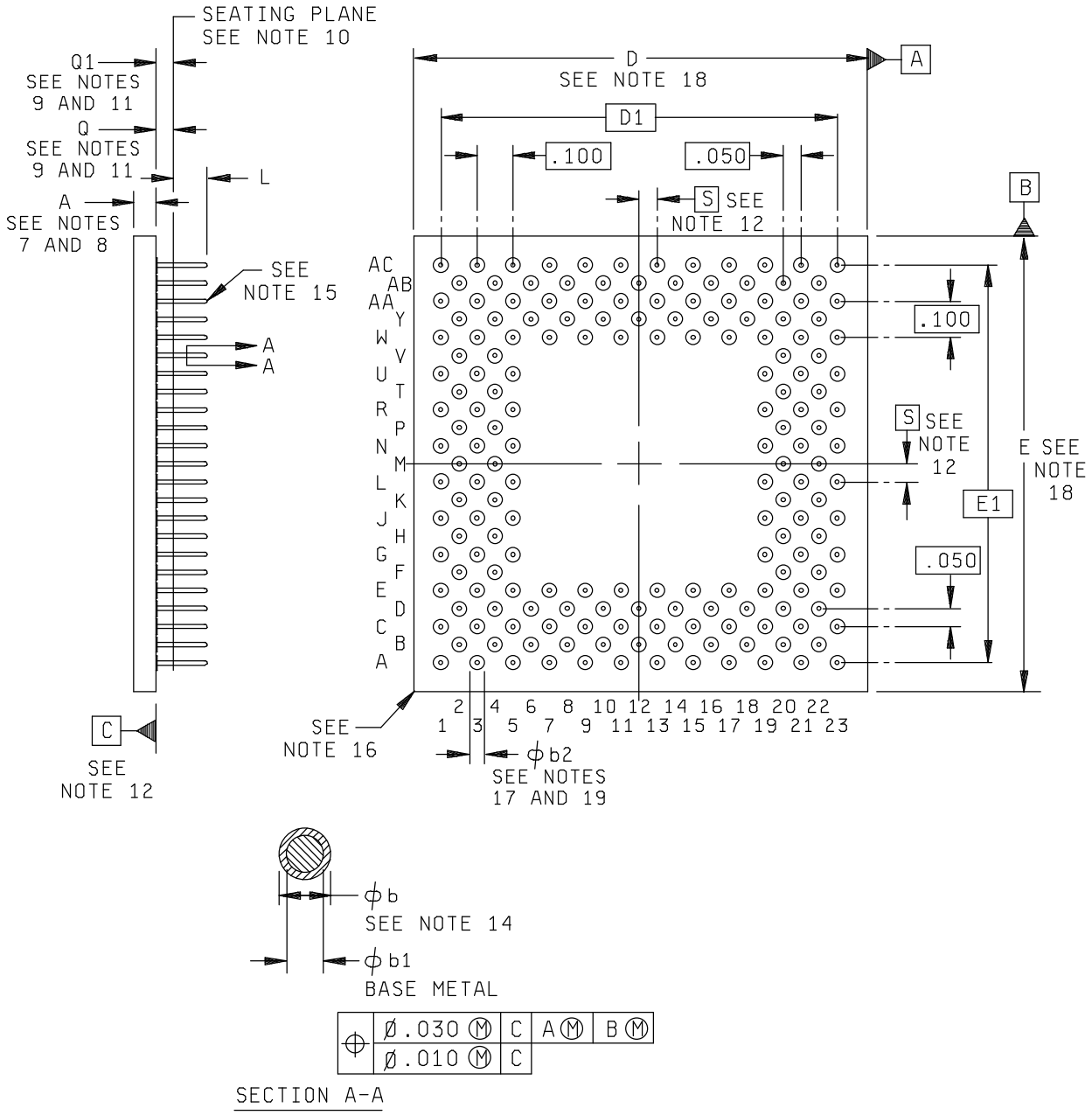
	Variations (all dimensions in millimeters)											
	Z-1				Z-2				Z-3			
Symbol	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	9.30	---	11.15		11.45	---	13.35		11.45	---	13.35	
A1	0.40	---	1.50		0.40	---	1.50		0.40	---	1.50	
A2	8.90	9.25	9.65		11.05	11.45	11.85		11.05	11.45	11.85	
b	0.35	---	0.65		0.35	---	0.65		0.35	---	0.65	
b1	0.35	0.45	0.60	5	0.35	0.45	0.60	5	0.35	0.45	0.60	5
b2	0.90	---	1.65		0.90	---	1.65		0.90	---	1.65	
c	0.20	---	0.45		0.20	---	0.45		0.20	---	0.45	
c1	0.20	0.25	0.40	5	0.20	0.25	0.40	5	0.20	0.25	0.40	5
D	25.90	26.65	27.45		31.00	31.75	32.50		36.05	36.85	37.60	
E	2.40	---	3.45	7	2.40	---	3.45	7	2.40	---	3.45	7
E1	2.15	2.55	2.95		2.15	2.55	2.95		2.15	2.55	2.95	
e/2	1.27 BSC				1.27 BSC				1.27 BSC			
eA	2.54 BSC				2.54 BSC				2.54 BSC			
L	3.20	---	5.10		3.20	---	5.10		3.20	---	5.10	
S	0.90	1.25	1.65		0.90	1.25	1.65		0.90	1.25	1.65	
N	20			4	24			4	28			4
Note	1,2,3,6,8											

NOTES:

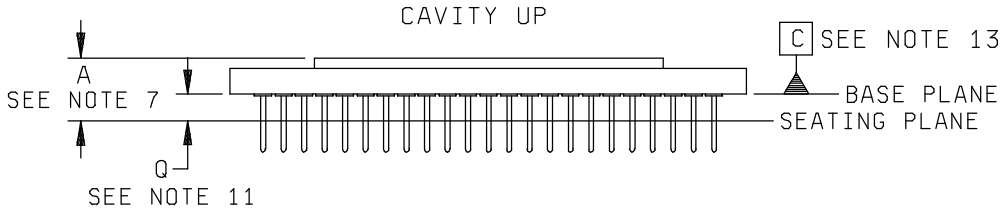
1. See table VI for descriptive type designator.
2. A lead one identification mark shall be located adjacent to lead one within the shaded area shown.
3. Corner shape (square, chamfer, radius, etc.) may vary at the manufacturers option.
4. N indicates the maximum number of leads.
5. Dimension b1 and c1 apply to base metal only.
6. 20 lead device shown for illustration purposes only.
7. Dimension E1 does not include lid thickness.
8. Nominal dimensions are the dimensions recommended for design and manufacture.

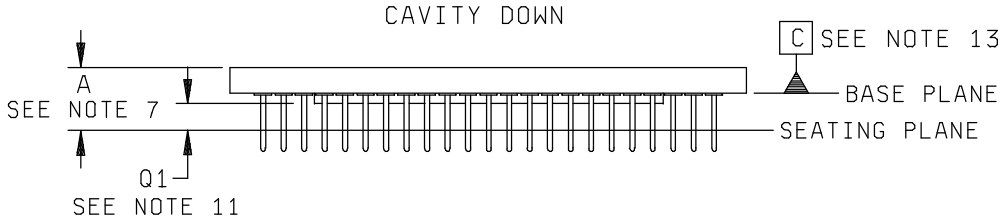
FIGURE 25. Ceramic, zig-zag in-line package style - continued.



* FIGURE 26. Ceramic, staggered pin grid array.

REFERENCE DRAWING





* FIGURE 26. Ceramic, staggered pin grid array - continued.

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Symbol	Variations (all dimensions shown in inches)											
	P-CA				P-CB				P-CC			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	.070	---	.165	7,8	.070	---	.165		.070	---	.165	
ϕb	.0165	---	.0215	14	.0165	---	.0215	14	.0165	---	.0215	14
ϕb1	.016	---	.020		.016	---	.020		.016	---	.020	
ϕb2	---	---	.060	19	---	---	.060	19	---	---	.060	19
D	.940	.960	.980	18	1.040	1.060	1.080	18	1.140	1.160	1.180	18
D1		.800 BSC				.900 BSC				1.000 BSC		
E	.940	.960	.980	18	1.040	1.060	1.080	18	1.140	1.160	1.180	18
E1		.800 BSC				.900 BSC				1.000 BSC		
L	.120	---	.140		.120	---	.140		.120	---	.140	
Q	.040	---	.075	9,11	.040	---	.075	9,11	.040	---	.075	9,11
Q1	.015	---	.075	9,11	.015	---	.075	9,11	.015	---	.075	9,11
S		.000 BSC				.050 BSC				.000 BSC		
M		17		4		19		4		21		4
N			145	5			181	5			221	5
Notes	1, 2, 3, 6, 9, 16,											

Symbol	Variations (all dimensions shown in inches)											
	P-CD				P-CE				P-CF			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	.070	---	.165	7,8	.070	---	.165		.070	---	.165	
ϕb	.0165	---	.0215	14	.0165	---	.0215	14	.0165	---	.0215	14
ϕb1	.016	---	.020		.016	---	.020		.016	---	.020	
ϕb2	---	---	.060	19	---	---	.060	19	---	---	.060	19
D	1.240	1.260	1.280	18	1.340	1.360	1.380	18	1.440	1.460	1.480	18
D1		1.100 BSC				1.200 BSC				1.300 BSC		
E	1.240	1.260	1.280	18	1.340	1.360	1.380	18	1.440	1.460	1.480	18
E1		1.100 BSC				1.200 BSC				1.300 BSC		
L	.120	---	.140		.120	---	.140		.120	---	.140	
Q	.040	---	.075	9,11	.040	---	.075	9,11	.040	---	.075	9,11
Q1	.015	---	.075	9,11	.015	---	.075	9,11	.015	---	.075	9,11
S		.050 BSC				.000 BSC				.050 BSC		
M		23		4		25		4		27		4
N			265	5			313	5			365	5
Notes	1, 2, 3, 6, 9, 16,											

Symbol	Variations (all dimensions shown in inches)											
	P-CG				P-CH				P-CJ			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	.070	---	.165	7,8	.070	---	.165		.070	---	.165	
ϕb	.0165	---	.0215	14	.0165	---	.0215	14	.0165	---	.0215	14
ϕb1	.016	---	.020		.016	---	.020		.016	---	.020	
ϕb2	---	---	.060	19	---	---	.060	19	---	---	.060	19
D	1.540	1.560	1.580	18	1.640	1.660	1.680	18	1.740	1.760	1.780	18
D1		1.400 BSC				1.500 BSC				1.600 BSC		
E	1.540	1.560	1.580	18	1.640	1.660	1.680	18	1.740	1.760	1.780	18
E1		1.400 BSC				1.500 BSC				1.600 BSC		
L	.120	---	.140		.120	---	.140		.120	---	.140	
Q	.040	---	.075	9,11	.040	---	.075	9,11	.040	---	.075	9,11
Q1	.015	---	.075	9,11	.015	---	.075	9,11	.015	---	.075	9,11
S		.000 BSC				.050 BSC				.000 BSC		
M		29		4		31		4		33		4
N			421	5			481	5			545	5
Notes	1, 2, 3, 6, 9, 16,											

* FIGURE 26. Ceramic, staggered pin grid array - continued.

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Symbol	Variations (all dimensions shown in millimeters)											
	P-CA				P-CB				P-CC			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	1.78	---	4.19	7,8	1.78	---	4.19	7,8	1.78	---	4.19	7,8
ϕb	0.42	---	0.55	14	0.42	---	0.55	14	0.42	---	0.55	14
ϕb1	0.41	---	0.51		0.41	---	0.51		0.41	---	0.51	
ϕb2	---	---	1.52	19	---	---	1.52	19	---	---	1.52	19
D	23.88	24.38	24.89	18	26.42	26.92	27.43	18	28.96	29.46	29.97	18
D1		22.35 BSC				22.86 BSC				25.40 BSC		
E	23.88	24.38	24.89	18	26.42	26.92	27.43	18	28.96	29.46	29.97	18
E1		22.35 BSC				22.86 BSC				25.40 BSC		
L	3.05	---	3.56		3.05	---	3.56		3.05	---	3.56	
Q	1.02	---	1.91	9,11	1.02	---	1.91	9,11	1.02	---	1.91	9,11
Q1	0.38	---	1.91	9,11	0.38	---	1.91	9,11	0.38	---	1.91	9,11
S		.00 BSC				1.27 BSC				.00 BSC		
M		17		4		19		4		21		4
N			145	5			181	5			221	5
Notes	1, 2, 3, 6, 9, 16,											

Symbol	Variations (all dimensions shown in millimeters)											
	P-CD				P-CE				P-CF			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	1.78	---	4.19	7,8	1.78	---	4.19	7,8	1.78	---	4.19	7,8
ϕb	0.42	---	0.55	14	0.42	---	0.55	14	0.42	---	0.55	14
ϕb1	0.41	---	0.51		0.41	---	0.51		0.41	---	0.51	
ϕb2	---	---	1.52	19	---	---	1.52	19	---	---	1.52	19
D	31.50	32.00	32.51	18	34.04	34.54	35.05	18	36.58	37.08	37.59	18
D1		29.94 BSC				30.48 BSC				33.02 BSC		
E	31.50	32.00	32.51	18	34.04	34.54	35.05	18	36.58	37.08	37.59	18
E1		29.94 BSC				30.48 BSC				33.02 BSC		
L	3.05	---	3.56		3.05	---	3.56		3.05	---	3.56	
Q	1.02	---	1.91	9,11	1.02	---	1.91	9,11	1.02	---	1.91	9,11
Q1	0.38	---	1.91	9,11	0.38	---	1.91	9,11	0.38	---	1.91	9,11
S		1.27 BSC				.00 BSC				1.27 BSC		
M		23		4		25		4		27		4
N			265	5			313	5			365	5
Notes	1, 2, 3, 6, 9, 16,											

Symbol	Variations (all dimensions shown in millimeters)											
	P-CG				P-CH				P-CJ			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	1.78	---	4.19	7,8	1.78	---	4.19	7,8	1.78	---	4.19	7,8
ϕb	0.42	---	0.55	14	0.42	---	0.55	14	0.42	---	0.55	14
ϕb1	0.41	---	0.51		0.41	---	0.51		0.41	---	0.51	
ϕb2	---	---	1.52	19	---	---	1.52	19	---	---	1.52	19
D	39.12	39.62	40.13	18	41.66	42.16	42.67	18	44.20	44.70	45.21	18
D1		35.56				38.10				40.64		
E	39.12	39.62	40.13	18	41.66	42.16	42.67	18	44.20	44.70	45.21	18
E1		35.56				38.10				40.64		
L	3.05	---	3.56		3.05	---	3.56		3.05	---	3.56	
Q	1.02	---	1.91	9,11	1.02	---	1.91	9,11	1.02	---	1.91	9,11
Q1	0.38	---	1.91	9,11	0.38	---	1.91	9,11	0.38	---	1.91	9,11
S		.00 BSC				1.27 BSC				.00 BSC		
M		29		4		31		4		33		4
N			421	5			481	5			545	5
Notes	1, 2, 3, 6, 9, 16,											

* FIGURE 26. Ceramic, staggered pin grid array - continued.

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Symbol	Variations (all dimensions shown in inches)											
	P-CK				P-CL				P-CM			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	.070	---	.165	7,8	.070	---	.165		.070	---	.165	
ϕb	.0165	---	.0215	14	.0165	---	.0215	14	.0165	---	.0215	14
ϕb1	.016	---	.020		.016	---	.020		.016	---	.020	
ϕb2	---	---	.060	19	---	---	.060	19	---	---	.060	19
D	1.840	1.860	1.880	18	1.940	1.960	1.980	18	2.040	2.060	2.080	18
D1		1.700 BSC				1.800 BSC				1.900 BSC		
E	1.840	1.860	1.880	18	1.940	1.960	1.980	18	2.040	2.060	2.080	18
E1		1.700 BSC				1.800 BSC				1.900 BSC		
L	.120	---	.140		.120	---	.140		.120	---	.140	
Q	.040	---	.075	9,11	.040	---	.075	9,11	.040	---	.075	9,11
Q1	.015	---	.075	9,11	.015	---	.075	9,11	.015	---	.075	9,11
S		.000 BSC				.050 BSC				.000 BSC		
M		35		4		37		4		39		4
N			613	5			685	5			761	5
Notes	1, 2, 3, 6, 9, 16,											

Symbol	Variations (all dimensions shown in inches)											
	P-CN				P-CP				P-CQ			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	.070	---	.165	7,8	.070	---	.165		.070	---	.165	
ϕb	.0165	---	.0215	14	.0165	---	.0215	14	.0165	---	.0215	14
ϕb1	.016	---	.020		.016	---	.020		.016	---	.020	
ϕb2	---	---	.060	19	---	---	.060	19	---	---	.060	19
D	2.140	2.160	2.180	18	2.340	2.360	2.380	18	2.640	2.660	2.680	18
D1		2.000 BSC				1.200 BSC				1.300 BSC		
E	2.140	2.160	2.180	18	2.340	2.360	2.380	18	2.640	2.660	2.680	18
E1		2.000 BSC				1.200 BSC				1.300 BSC		
L	.120	---	.140		.120	---	.140		.120	---	.140	
Q	.040	---	.075	9,11	.040	---	.075	9,11	.040	---	.075	9,11
Q1	.015	---	.075	9,11	.015	---	.075	9,11	.015	---	.075	9,11
S		.050 BSC				.000 BSC				.050 BSC		
M		41		4		45		4		51		4
N			841	5			1013	5			1301	5
Notes	1, 2, 3, 6, 9, 16,											

* FIGURE 26. Ceramic, staggered pin grid array - continued.

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Symbol	Variations (all dimensions shown in millimeters)											
	P-CK				P-CL				P-CM			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	1.78	---	4.19	7,8	1.78	---	4.19	7,8	1.78	---	4.19	7,8
ϕb	0.42	---	0.55	14	0.42	---	0.55	14	0.42	---	0.55	14
ϕb1	0.41	---	0.51		0.41	---	0.51		0.41	---	0.51	
ϕb2	---	---	1.52	19	---	---	1.52	19	---	---	1.52	19
D	46.74	47.24	47.75	18	49.28	49.78	50.29	18	51.82	52.32	52.83	18
D1		43.18 BSC				45.72 BSC				48.26 BSC		
E	46.74	47.24	47.75	18	49.28	49.78	50.29	18	51.82	52.32	52.83	18
E1		43.18 BSC				45.72 BSC				48.26 BSC		
L	3.05	---	3.56		3.05	---	3.56		3.05	---	3.56	
Q	1.02	---	1.91	9,11	1.02	---	1.91	9,11	1.02	---	1.91	9,11
Q1	0.38	---	1.91	9,11	0.38	---	1.91	9,11	0.38	---	1.91	9,11
S		.00 BSC				1.27 BSC				.00 BSC		
M		35		4		37		4		39		4
N			613	5			685	5			761	5
Notes	1, 2, 3, 6, 9, 16,											

Symbol	Variations (all dimensions shown in millimeters)											
	P-CN				P-CP				P-CQ			
	Min	Nom	Max	Note	Min	Nom	Max	Note	Min	Nom	Max	Note
A	1.78	---	4.19	7,8	1.78	---	4.19	7,8	1.78	---	4.19	7,8
ϕb	0.42	---	0.55	14	0.42	---	0.55	14	0.42	---	0.55	14
ϕb1	0.41	---	0.51		0.41	---	0.51		0.41	---	0.51	
ϕb2	---	---	1.52	19	---	---	1.52	19	---	---	1.52	19
D	54.36	54.86	55.37	18	59.44	59.94	60.45	18	67.06	67.56	68.07	18
D1		50.80 BSC				55.88 BSC				63.50 BSC		
E	54.36	54.86	55.37	18	59.44	59.94	60.45	18	67.06	67.56	68.07	18
D1		50.80 BSC				55.88 BSC				63.50 BSC		
L	3.05	---	3.56		3.05	---	3.56		3.05	---	3.56	
Q	1.02	---	1.91	9,11	1.02	---	1.91	9,11	1.02	---	1.91	9,11
Q1	0.38	---	1.91	9,11	0.38	---	1.91	9,11	0.38	---	1.91	9,11
S		1.27 BSC				.00 BSC				1.27 BSC		
M		41		4		45		4		51		4
N			841	5			1013	5			1301	5
Notes	1, 2, 3, 6, 9, 16,											

* FIGURE 26. Ceramic, staggered pin grid array - continued.

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NOTES:

1. See table VI for descriptive type designator.
2. Refer to the appendix which lists and defines dimensioning symbols.
3. Terminal position designation shall be in accordance with figure 21, note 16 herein.
4. “M” represents the pin matrix size.
5. “N” represents the maximum allowable number of pins.
6. 23 x 23 matrix sizes are shown for illustration only.
7. Dimension “A” includes the package body and lid for both cavity up and down configurations (see reference drawing).
8. Dimension “A” does not include integral heatsink or attached features.
9. Standoffs should be located on the pin matrix diagonals.
10. The seating plane is the outer standoff surface facing away from the ceramic body.
11. Dimension “Q” applies to cavity up configuration only. Dimension “Q1” applies to cavity down configuration only (see reference drawing).
12. “S” is measured with respect to datum A and datum B and defines the position of the center pin in the outer row, when there is an odd number of pins in the outer row, “S” = .000 inch, when an even number are used, “S” = .050 inch (1.27 mm). All pins in a given row must be on a .100 inch (2.54 mm) grid. Adjacent rows offset by .050 inch (1.27 mm).
13. Datum C is the plane of pin to package interface for both cavity up and down configurations (see reference drawing).
14. Pin diameter includes solder dip or custom finishes.
15. Pin tips shall have a radius or chamfer.
16. There must be some type of A1 corner identification on both top and bottom surfaces of the package. ID type is optional and may consist of notches, ID pins, metallized markings or other features. The features used on each surface may be of differing types.
17. There must be .010 inch (0.254 mm) minimum spacing between any two metallized features on the package.
18. Dimension “D” and “E” do not include ceramic protrusions. Such protrusions may not exceed more than .003 inch (0.076 mm) on any side. Corners of the package body may have chamfers for mechanical protection or identification.
19. This dimension defines the maximum size for the braze pads, pins must be positioned entirely on the braze pads.

* FIGURE 26. Ceramic, staggered pin grid array - continued.

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Packages conforming to the requirements of this standard are intended for use in military electronic equipment.

6.2 Tailoring guidance for contractual application. For purposes of this standard, tailoring refers to the selection of optional package features when they are specified on the drawing figures. For example, one may select top and bottom terminals and thermal conduction pads on certain chip carrier packages.

6.3 Subject term (key word) listing.

ANSI
Basic dimension
Ceramic
Classification
EIA
Gullwing
Interchangeability
Lead position overlay
Package style
Quad
Tailoring
Type designator

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6.4 Package cross-reference list. The following table provides a cross-references of package type numbers (and configuration numbers where applicable) that were listed in appendix C of MIL-M-38510, to the package descriptive type designators listed in this standard. Packages were deleted from appendix C of MIL-M-38510 with the publication of this standard. The appendix C numbers are in alphanumeric sequence; underlined descriptive type designators are inactive (see table VIII).

TABLE VIII. Package cross-reference list.

Old MIL-M-38510 appendix C type no./ config. no.	New descriptive package type Designator
A1	MACY1-X8
A2	MACY1-X10
A3	MACY1-X12
C-1	CQCC1-N16
C-10	CQCC3-N18
C-10A	CQCC4-N18
C-11	CQCC3-N28
C-11A	CQCC4-N28
C-12	CQCC1-N32
C-12A	CQCC2-N32
C-13	CQCC3-N20
C-13A	CQCC4-N20
C-1A	CQCC2-N16
C-2	CQCC1-N20
C-2A	CQCC2-N20
C-3	CQCC1-N24
C-3A	CQCC2-N24
C-4	CQCC1-N28
C-4A	CQCC2-N28
C-5	CQCC1-N44
C-6	CQCC1-N52
C-7	CQCC1-N68
C-8	CQCC1-N84
C-9	CQCC1-N18
C-9A	CQCC2-N18
C-G1	GQCC1-G44
C-G2	GQCC1-G68
C-G3	GQCC1-G84
C-G7	CQCC1-G132
C-J1	GQCC1-J44
C-J10	CQCC2-J52
C-J2	GQCC1-J68
C-J3	GQCC1-J84
C-J4	CQCC2-J44
C-J5	CQCC2-J68
C-J6	CQCC2-J84
C-J7	GQCC1-J28

Old MIL-M-38510 appendix C type no./ config. no.	New descriptive package type designator
C-J8	GQCC1-J52
C-J9	CQCC2-J28
C-U1	CQCC1-F84
C-U2	CQCC1-F100
C-U3	CQCC1-F132
C-U4	CQCC1-F144
C-U5	CQCC1-F172
C-U6	CQCC1-F196
D-1,3	CDIP2-T14
D-1,1	GDIP1-T14
D-10,3	CDIP2-T28
D-10,1	GDIP1-T28
D-11,3	CDIP6-T24
D-11,1	GDIP5-T24
D-12,3	CDIP2-T50
D-12,1	GDIP1-T50
D-13,3	CDIP1-T64
D-14,3	CDIP2-T48
D-14,1	GDIP1-T48
D-15,3	CDIP3-T28
D-15,1	GDIP4-T28
D-2,3	CDIP2-T16
D-2,1	GDIP1-T16
D-3,3	CDIP2-T24
D-3,1	GDIP1-T24
D-4,3	CDIP2-T8
D-4,1	GDIP1-T8
D-5,3	CDIP2-T40
D-5,1	GDIP1-T40
D-6,3	CDIP2-T18
D-6,1	GDIP1-T18
D-7,3	CDIP2-T22
D-7,1	GDIP1-T22
D-8,3	CDIP2-T20
D-8,1	GDIP1-T20
D-9,3	CDIP4-T24
D-9,1	GDIP3-T24

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TABLE VIII. Package cross-reference list - Continued.

Old MIL-M-38510 appendix C type no./ config. no.	New descriptive package type Designator
F-10,1	GDFP1-F18
F-11,1	GDFP2-F28
F-11A,2	CDFP3-F28
F-12,2	CDFP4-F28
F-13,1	GDFP1-F16
F-14,1	GDFP2-F18
F-15,1	GDFP1-F20
F-16,1	GDFP2-F24
F-17,1	GDFP1-F28
F-2,1	GDFP1-F14
F-2,2	GDFP2-F14
F-2A,2	CDFP3-F14
F-4,1	GDFP1-F10
F-4,2	CDFP2-F10
F-4A,2	CDFP3-F10
F-5,1	GDFP2-F16
F-5,2	CDFP3-F16
F-5A,2	CDFP4-F16
F-9,1	GDFP2-F20
F-9,2	CDFP3-F20
F-9A,2	CDFP4-F20
P-AA	CMGA1-PN
P-AB	CMGA2-PN

Old MIL-M-38510 appendix C type no./ config. no.	New descriptive package type designator
P-AC	CMGA3-PN
P-AD	CMGA4-PN
P-AE	CMGA5-PN
P-AF	CMGA6-PN
P-AG	CMGA7-PN
P-AH	CMGA8-PN
P-AJ	CMGA9-PN
P-AK	CMGA10-PN
P-AL	CMGA11-PN
P-AM	CMGA12-PN
P-BA	CMGA13-PN
P-BB	CMGA14-PN
P-BC	CMGA15-PN
P-BD	CMGA16-PN
P-BE	CMGA17-PN
P-BF	CMGA18-PN
P-BG	CMGA19-PN
P-BH	CMGA20-PN
P-BJ	CMGA21-PN
P-BK	CMGA22-PN
P-BL	CMGA23-PN
P-BM	CMGA24-PN

INACTIVE	
D-1,2	CDIP3-T14
D-10,2	CDIP4-T28
D-11,2	CDIP9-T24
D-12,2	CDIP3-T50
D-2,2	CDIP3-T16
D-3,2	CDIP7-T24
D-4,2	CDIP3-T8
D-5,2	CDIP3-T40
D-6,2	CDIP3-T18
D-7,2	CDIP3-T22
D-8,2	CDIP3-T20
D-9,2	CDIP8-T24

INACTIVE	
F-1,4	CDFP6-F14
F-1,3	GDFP5-F14
F-3,3	GDFP4-F14
F-6,4	CDFP6-F24
F-6,3	GDFP5-F24
F-8,4	CDFP8-F24
F-8,3	GDFP7-F24
F-9,4	CDFP5-F20

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6.5 Plastic encapsulated microcircuit packages. The plastic encapsulated microcircuit packages listed in Table IX are recommended for use in those DoD systems that are using plastic packages. The dimensions and tolerances for the plastic packages listed in table IX are available for use in the JEP-95 outline shown and should be directly invoked from that document.

TABLE IX. Plastic encapsulated microcircuit packages.

Descriptive package type designator	Terminal count	Row-to-row spacing/body width	Terminal pitch	EIA JEP-95 standard outline and variation
Dual-in-line package				
PDIP-T	8	.300"	.100"	MS-001 BA
PDIP-T	14	.300"	"	MS-001 AA
PDIP-T	16	.300"	"	MS-001 BB
PDIP-T	18	.300"	"	MS-001 BC
PDIP-T	20	.300"	"	MS-001 AD
PDIP-T	22	.400"	"	MS-010 AA
PDIP-T	24	.300"	"	MS-001 AF
PDIP-T	24	.600"	"	MS-011 AA
PDIP-T	28	.300"	"	MS-001 BF
PDIP-T	28	.600"	"	MS-011 AB
PDIP-T	40	.600"	"	MS-011 AC
PDIP-T	48	.600"	"	MS-011 AD
Dual small outline package, gullwing lead				
PDSO-G	8	3.75 MM	1.27 MM	MS-012 AA
PDSO-G	14	3.75 MM	"	MS-012 AB
PDSO-G	16	3.75 MM	"	MS-012 AC
PDSO-G	16	7.50 MM	"	MS-013 AA
PDSO-G	18	7.50 MM	"	MS-013 AB
PDSO-G	20	7.50 MM	"	MS-013 AC
PDSO-G	24	7.50 MM	"	MS-013 AD
PDSO-G	28	7.50 MM	"	MS-013 AE
Dual small outline package, J-bend lead				
PDSO-J	20 1/	.300 "	.050 "	MS-023 AB
PDSO-J	24 1/	.300 "	"	MS-023 AC
PDSO-J	28	.300 "	"	MS-023 AD
PDSO-J	40	.400 "	"	MS-027 AF

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TABLE IX. Plastic encapsulated microcircuit packages - Continued.

Descriptive package type designator	Terminal count	Row-to-row spacing/body width	Terminal pitch	EIA JEP-95 standard outline and variation
Quad chip carrier package, J-bend lead				
PQCC-J	20	.353 "	.050 "	MS-018 AA
PQCC-J	28	.453 "	"	MS-018 AB
PQCC-J	32	.450"x .550"	"	MS-016 AE
PQCC-J	44	.653 "	"	MS-018 AC
PQCC-J	68	.954 "	"	MS-018 AE
PQCC-J	84	1.154 "	"	MS-018 AF
Quad flatpack, gullwing lead				
PQFP-G	44	10 MM	0.80 MM	MS-022 AB
PQFP-G	64	14 MM	0.80 MM	MS-022 BE
PQFP-G	80	20 x 14 MM	0.80 MM	MS-022 GB-1
PQFP-G	100	20 x 14 MM	0.65 MM	MS-022 GC-1
PQFP-G	120	28 MM	0.80 MM	MS-022 DA-1
PQFP-G	128	28 MM	0.80 MM	MS-022 DB-1
PQFP-G	144	28 MM	0.65 MM	MS-022 DC-1
PQFP-G	160	28 MM	0.65 MM	MS-022 DD-1

1/ Depopulated from a 26 terminal dimensioned packaged.

6.6 Changes from previous issue. The margin of this standard is marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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APPENDIX

DIMENSIONING SYMBOLS

10. SCOPE

10.1 Scope. This appendix lists and defines the dimensioning symbols used in this standard. This appendix is not a mandatory part of this standard. The information contained herein is intended for guidance only.

20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

30. DEFINITIONS

30.1 Dimensioning symbols. The dimensioning symbols used are as follows:

A: Body dimensions.
ϕb: Terminal lead diameters.
b: Terminal lead widths.
c: Terminal lead thicknesses.
ϕD: Body diameters.
D: Body lengths.
E: Body widths.
e: Terminal lead spacings.
F: Flange dimensions.
k: Index dimensions, length.
L: Terminal lead lengths.
Q: Standoff height. The height from the seating plane to the base plane or a reference plane parallel to the seating plane.
S: Distance between terminal leads and the body end or body center lines.
α: Angular dimensions.
h: Chamfered corner dimension.
R: Radius Dimensions.

 : Straightness.

 : Flatness.

 : Profile of a line.

 : Profile of a surface.

 : Perpendicularity.

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APPENDIX

DIMENSIONING SYMBOLS - Continued

⌖ : Position.

Ⓜ : At maximum material condition.

Ⓛ : At least material condition.

Ⓟ : Projected tolerance zone.

ϕ : Diameter.

[e] : Basic dimension.

REF : Reference dimension.

▶—[A] : Datum feature.

[⌖ | .010 Ⓜ | E | L Ⓜ | G] : Feature control frame.

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