

Multilayer Ceramic Chip Capacitors

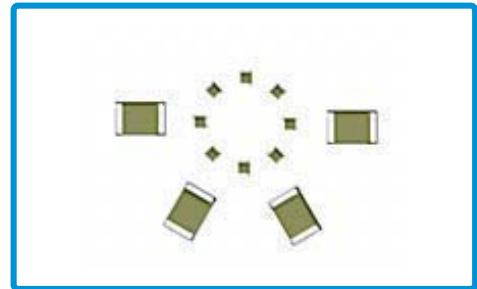


MA Series

MERITEK

FEATURES AND APPLICATIONS

Dielectric	Features	Applications
C0G (NP0)	<ul style="list-style-type: none"> Ultra-stable Low dissipation factor Tight tolerance available Good frequency performance No aging of capacitance 	<ul style="list-style-type: none"> LC and RC tuned circuit Filtering Timing
X7R/X5R	<ul style="list-style-type: none"> Semi-stable high K High volumetric efficiency Highly reliable in high temperature applications High insulation resistance 	<ul style="list-style-type: none"> Blocking Coupling Timing Bypassing Frequency discriminating Filtering
Y5V	<ul style="list-style-type: none"> Highest volumetric efficiency Non-polar construction General purpose, high K 	<ul style="list-style-type: none"> Bypassing Decoupling Filtering



PART NUMBERING SYSTEM

Meritek Series	MA	1206	XR	103	K	500																								
Size																														
Dielectric																														
<table border="1"> <thead> <tr> <th>CODE</th> <th>CG</th> <th>XR</th> <th>XF</th> <th>YV</th> </tr> </thead> <tbody> <tr> <td></td> <td>C0G (NP0)</td> <td>X7R</td> <td>X5R</td> <td>Y5V</td> </tr> </tbody> </table>							CODE	CG	XR	XF	YV		C0G (NP0)	X7R	X5R	Y5V														
CODE	CG	XR	XF	YV																										
	C0G (NP0)	X7R	X5R	Y5V																										
Capacitance																														
<table border="1"> <thead> <tr> <th>CODE</th> <th>8R2</th> <th>101</th> <th>223</th> <th>104</th> </tr> </thead> <tbody> <tr> <td>pF</td> <td>8.2</td> <td>100</td> <td>22000</td> <td>100000</td> </tr> <tr> <td>nF</td> <td>--</td> <td>0.1</td> <td>22</td> <td>100</td> </tr> <tr> <td>μF</td> <td>--</td> <td>--</td> <td>0.022</td> <td>0.1</td> </tr> </tbody> </table>							CODE	8R2	101	223	104	pF	8.2	100	22000	100000	nF	--	0.1	22	100	μF	--	--	0.022	0.1				
CODE	8R2	101	223	104																										
pF	8.2	100	22000	100000																										
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CODE	Tolerance	CODE	Tolerance	CODE	Tolerance																									
B	±.1pF	C	±.25pF	D	±.5pF																									
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K	±10%	M	±20%	Z	+80/-20%																									
For values less than 10 pF C or D tolerance preferred																														
Rated Voltage																														
2 significant digits + number of zeros.																														
<table border="1"> <thead> <tr> <th>Code</th> <th>6R3</th> <th>100</th> <th>160</th> <th>250</th> <th>500</th> <th>101</th> </tr> </thead> <tbody> <tr> <td></td> <td>6.3V</td> <td>10V</td> <td>16V</td> <td>25V</td> <td>50V</td> <td>100V</td> </tr> </tbody> </table>							Code	6R3	100	160	250	500	101		6.3V	10V	16V	25V	50V	100V										
Code	6R3	100	160	250	500	101																								
	6.3V	10V	16V	25V	50V	100V																								

Case Size

Size Inch (mm) L (mm)	W (mm)	Tmax (mm)	M _B min (mm)
0201 (0603)	0.60±0.03	0.3±0.03	0.30
0402 (1005)	1.00±0.05	0.50±0.05	0.55
0603 (1608)	1.60±0.15	0.80±0.15	0.95
0805 (2012)	2.00±0.20	1.25±0.20	1.45
1206 (3216)	3.20±0.20	1.60±0.20	1.80
	3.20+0.3/-0.1	.60+0.3/-0.1	1.90
1210 (3225)	3.20±0.40	2.50±0.30	2.80
1812 (4532)	4.50±0.40	3.20±0.30	2.80
1825 (4563)	4.50±0.40	6.30±0.40	3.00
2220 (5750)	5.70±0.40	5.00±0.40	3.00
2225 (5763)	5.70±0.40	6.30±0.40	3.00

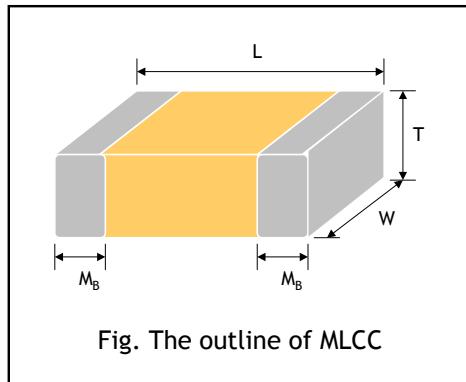


Fig. The outline of MLCC

Multilayer Ceramic Chip Capacitors



MA Series

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GD97-#75H-CBG

Dielectric	C0G(NP0)	X7R/X5R	Y5V
Size	0201, 0402, 0603, 0805, 1206, 1210, 1812	0201, 0402, 0603, 0805, 1206, 1210, 1812, 2220, 2225	0402, 0603, 0805, 1206, 1210, 1812
Capacitance range*	0.3pF to 39nF	100pF to 2.2μF	10nF to 1.0μF
Capacitance tolerance	Cap≤5pF: B (±0.1pF), C (±0.25pF) 5pF<Cap<10pF: C (±0.25pF), D (±0.5pF) Cap≥10pF: F (±1%), G (±2%), J (±5%), K (±10%)	J (±5%), K (±10%), M (±20%)	M (±20%), Z (-20/+80%)
Rated voltage (WVDC)	16V, 25V, 50V	10V, 16V, 25V, 50V	
Tan δ*	Cap<30pF: Q≥400+20C Cap≥30pF: Q≥1000		Note 1
Insulation resistance at Ur	≥10GΩ	≥10GΩ or RxC≥100ΩxF whichever is less	
Operating temperature	-55 to +125°C (-55 to +85°C for X5R)	-25 to +85°C	
Capacitance characteristic	±30ppm	±15%	+30/-80%
Termination	Cu (or Ag)/Ni/Sn (lead-free termination)		

* Measured at the condition of 30~70% related humidity.

C0G(NP0): Apply 1.0±0.2Vrms, 1.0MHz±10% for Cap≤1000pF and 1.0±0.2Vrms, 1.0kHz±10% for Cap>1000pF, 25°C at ambient temperature

X7R/X5R: Apply 1.0±0.2Vrms, 1.0kHz±10%, at 25°C ambient temperature.

Y5V: Apply 1.0±0.2Vrms, 1.0kHz±10%, at 20°C ambient temperature.

Note 1:

X7R/X5R

Y5V

Rated vol.	D.F.	Exception of D.F.
≥50V	≤2.5%	≤3% 0603≥0.047μF; 0805≥0.18μF, 1206≥0.47μF
25V	≤3.5%	≤5% 0805≥1μF; 1210≥10μF
		≤7% 0603≥0.33μF
16V	≤3.5%	≤5% 0402≥0.033μF; 0603≥0.15μF; 0805≥0.68μF; 1206≥2.2μF
		≤10% 1210≥22μF; 0603≥0.68μF
10V	≤5.0%	≤10% 0603≥1μF; 0805≥2.2μF

Rated vol.	D.F.	Exception of D.F.
≥50V	≤5.0%	7.0% 0603≥0.1μF; 0805≥0.47μF
25V	≤5.0%	≤7% 0402≥0.047μF; 0603≥0.1μF; 0805≥0.33μF; 1206≥1μF
		≤9% 0402≥0.068μF; 0603≥0.47μF
16V (C<1.0μF)	≤7.0%	≤9% 0402≥0.068μF; 0603≥0.68μF
		≤12.5% 0805≥4.7μF; 1206≥10μF; 1210≥22μF; 1812≥47μF
10V	≤12.5%	---

Multilayer Ceramic Chip Capacitors



MA Series

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CAPACITANCE RANGE

— Size o

Capacitance	SIZE	0201		
	DIELECTRIC	C0G		
	RATED VOLTAGE (VDC)	16	25	50
0.3pF (0R3)				
0.4pF (0R4)				
0.5pF (0R5)				
1.0pF (1R0)				
1.2pF (1R2)				
1.5pF (1R5)				
1.8pF (1R8)				
2.2pF (2R2)				
2.7pF (2R7)				
3.0pF (3R0)				
3.3pF (3R3)				
3.9pF (3R9)				
4.0pF(4R0)				
4.7pF (4R7)				
5.6pF (5R6)				
6.8pF (6R8)				
8.2pF (8R2)				
10pF (100)				
12pF (120)				
15pF (150)				
18pF (180)				
22pF (220)				
27pF (270)				
33pF (330)				
39pF (390)				
47pF (470)				
56pF (560)				
68pF (680)				
82pF (820)				
100pF (101)				

Capacitance	SIZE	0201							
	DIELECTRIC	X7R				X5R			
	RATED VOLTAGE (VDC)	10	16	25	50	6.3	10	16	25
100pF (101)									
120pF (121)									
150pF (151)									
180pF (181)									
220pF (221)									
270pF (271)									
330pF (331)									
390pF (391)									
470pF (471)									
560pF (561)									
680pF (681)									
820pF (821)									
1,000pF (10 2)									
1,500pF (15 2)									
2,200pF (22 2)									
3,300pF (33 2)									
4,700pF (47 2)									
6,800pF (68 2)									
0.010µF (103)									
0.015µF (153)									
0.022µF (223)									
0.033µF (333)									
0.047µF (473)									
0.068µF (683)									
0.10µF (104)									

Multilayer Ceramic Chip Capacitors



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CAPACITANCE RANGE (C0G/NP0)

— Size o \check{S} \check{s}

Multilayer Ceramic Chip Capacitors



MA Series

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CAPACITANCE RANGE (C0G/NP0)

— Size S S

8-9 @ 7 HF -		7 \$; fBD0E											
G-N9		%\$*				%&\$*				% %&			
F5H98 JC @5; 9 fU87L		%\$	%%	8)) \$	%\$	%%	8)) \$	%\$	%%	8)) \$
		%\$d: f/F/\$L											
		%&d: f/F &L											
		%) d: f/F) L											
		%, d: f/F, L											
		&"d: fBF &L											
		&"d: fBF +L											
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		' " d: f' F - L											
		("+d: f(F +L											
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		, "&d: f' F &L											
		%\$d: f/%%\$L											
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		&&d: fB&S\$L											
		&+d: fB+\$L											
		' " d: f' ' \$L											
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		%&d: f/B%L											
		%) d: f/B% L											
		%, d: f/B% L											
		&&d: fB%&L											
		&+d: fB+&L											
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		%\$S\$Sd: f/%%&L											
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Multilayer Ceramic Chip Capacitors



MA Series

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CAPACITANCE RANGE (X7R)

— Size *o402, o603, o805, 1206*

Multilayer Ceramic Chip Capacitors



MA Series

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CAPACITANCE RANGE (X7R)

— Size 1210, 1812, 1825, 2220, 2225

Multilayer Ceramic Chip Capacitors

MA Series



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CAPACITANCE RANGE (X7R)

— High Capacitance (Size *0603, 0805, 1206, 1210, 1812, 1825, 2220, 2225*)

8-Q @ 7 HF		L+F											
G-N		\$-\$		\$,\$		%\$%		%\$%		%\$%		%\$%	
F5H98 JC@5; 9.1U87L	*	*	*	*	*	*	*	*	*	*	*	*	*
%\$μ: ff(\$)	L												
%μ: ff()	L												
&%μ: ff&	L												
' " μ: ff ')	L												
("+μ: ff(+)	L												
* " μ: ff ,)	L												
%\$μ: ff\$*	L												

8-Q @ 7 HF		L+F											
G-N		%\$%		888\$		888)		888		888)		888	
F5H98 JC@5; 9.1U87L)\$	%\$%	&\$%)\$	%\$%	&\$%)\$	%\$%	&\$%)\$	%\$%	&\$%)\$
%\$μ: ff(\$)	L												
%&μ: ff&	L												
%μ: ff()	L												
&%μ: ff&	L												
&%+μ: ff&	L												
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, "&μ: ff &)	L												
%\$μ: ff\$*	L												

Multilayer Ceramic Chip Capacitors



MA Series

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CAPACITANCE RANGE (X5R)

— Size *o402, o603*

8-9 @ 7 HF		L) F							
G-N9		\$(\$&				\$*\$			
F5H98 JC@5; 9fl87L		* "	%\$	%	&)	* "	%\$	%	&)
7 UHMWbW	\$'\$&μ: ffl+								
	\$'\$' μ: fl ''								
	\$'\$ - μ: fl - '								
	\$'\$' +μ: ff +'								
	\$'\$' *μ: ff *'								
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— High Capacitance (Size *o402, o603, o805, 1206, 1210, 1812*)

8-9 @ 7 HF		L) F							
G-N9		\$(\$&				\$*\$			
F5H98 JC@5; 9fl87L		* "	%\$	%	&)	* "	%\$	%	&)
7 UHMWbW	%\$μ: ffl&)								
	% μ: ffl (
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	%\$μ: ffl&*								
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	(+μ: fl + *							
	%\$μ: ffl&+							

Multilayer Ceramic Chip Capacitors

MA Series



MERITEK

CAPACITANCE RANGE (Y5V)

— Size 0402, 0603, 0805, 1206, 1210, 1812

8-9 @ 7 HF -				M J													
G-N9				\$(\$&)				\$* \$'				\$, \$)					
F5H98 JC@5; 9fU87L				* "	%\$	%	&))\$	* "	%\$	%	&))\$	%\$	%	&))\$
7 UHMWPE	\$\$\$\mu:	f1\$)															
	\$\$\$\mu:	f1\$)															
	\$\$\$\mu:	f1\$)															
	\$\$\$\mu:	f1\$)															
	\$\$\$\mu:	f1\$)															
	\$\$(+μ:	f(+)															
	\$\$(+, μ:	ff,															
	\$%\$μ:	f1\$)															
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	\$%\$μ:	f1\$)															
	\$%\$μ:	f1\$)															

8-9 @ 7 HF -				M J												
G-N9				%\$&*				%\$%				% %&				
F5H98 JC@5; 9fU87L				%\$	%	&))\$	%\$	%	&))\$	%\$	%	&))\$	
7 UHMWPE	\$\$\$\mu:	f1\$)														
	\$\$\$\mu:	f1\$)														
	\$\$\$\mu:	f1\$)														
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8-9 @ 7 HF -				M J												
G-N9				\$(\$&)				\$* \$'				\$, \$)				
F5H98 JC@5; 9fU87L				* "	%\$	* "	%\$	%	&))\$	* "	%\$	%	&))\$	
7 UHMWPE	%\$μ:	f1\$)														
	%\$μ:	f1\$)														
	&%μ:	f1\$)														
	'"μ:	f1')														
	("+μ:	f(+)														
	"", μ:	ff,														
	%\$μ:	f1\$*)														
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	%\$μ:	f1\$+*)														

8-9 @ 7 HF -				M J															
G-N9				%\$&*				%\$%				% %&							
F5H98 JC@5; 9fU87L				* "	%\$	%	&)	'"))\$	* "	%\$	%	&)	'"))\$	%\$	%	&))\$
7 UHMWPE	%\$μ:	f1\$)																	
	%\$μ:	f1\$)																	
	&%μ:	f1\$)																	
	'"μ:	f1')																	
	("+μ:	f(+)																	
	"", μ:	ff,																	
	%\$μ:	f1\$*)																	
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	(+μ:	f(+*)																	
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Multilayer Ceramic Chip Capacitors



MA Series

MERITEK

DA7?5; 9'8-A9BG-CBG

Size	Thickness (mm)	Paper tape	
		7" reel ftlWg	% " reel ftlWg
0201 (0603)	0.30±0.03	15k	-

Size	Thickness (mm)	Paper tape		Plastic tape	
		7" reel ftlWg	% " reel ftlWg	7" reel ftlWg	% " reel ftlWg
0402 (1005)	0.50±0.05	10k	50K	-	-
0603 (1608)	0.80±0.07	4k	15k	-	-
	0.80+0.15/-0.10	4k	15k	-	-
0805 (2012)	0.60±0.10	4k	15k	-	-
	0.80±0.10	4k	15k	-	-
	1.25±0.10	-	-	3k	10k
	1.25±0.20	-	-	3k	-
	0.80±0.10	4k	15k	-	-
1206 (3216)	0.95±0.10	-	-	3k	10k
	1.25±0.10	-	-	3k	10k
	1.60±0.20	-	-	2k	-
	0.95±0.10	-	-	3k	10k
1210 (3225)	1.25±0.10	-	-	3k	10k
	1.60±0.20	-	-	2k	-
	2.50±0.30	-	-	1k	-
	1.25±0.10	-	-	2k	-
1808 (4520)	1.60±0.20	-	-	2k	-
	2.00±0.20	-	-	1k	-
	1.25±0.10	-	-	1k	-
1812 (4532)	1.60±0.20	-	-	1k	-
	2.00±0.20	-	-	1k	-
	2.50±0.30	-	-	0.5k	-
	2.00±0.20	-	-	1k	-
1825 (4563)	2.50±0.30	-	-	0.5k	-
	2.00±0.20	-	-	1k	-
2220 (5750)	2.00±0.20	-	-	1k	-
	2.50±0.30	-	-	0.5k	-
2225 (5763)	2.00±0.20	-	-	1k	-
	2.50±0.30	-	-	0.5k	-

Multilayer Ceramic Chip Capacitors

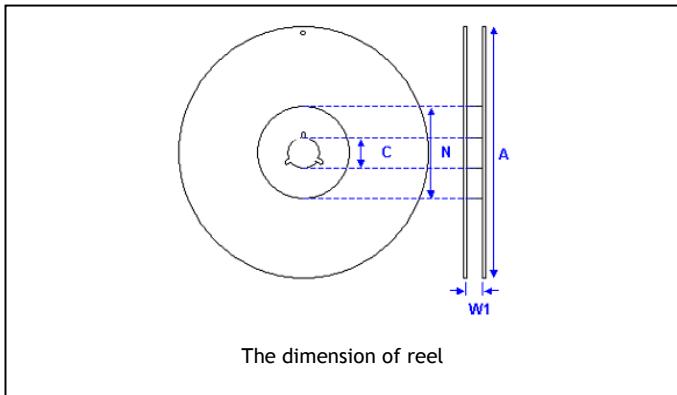


MA Series

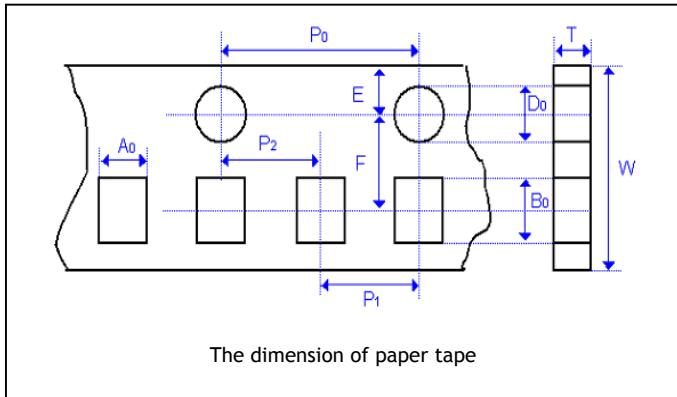
MERITEK

TAPE DIMENSIONS

- Ø



Size	0201	
Reel size	7"	13"
C	13.0+0.5/-0.2	13.0+0.5/-0.2
W ₁	8.4+1.5/-0	8.4+1.5/-0
A	178.0±0.10	330.0±1.0
N	60.0+1.0/-0	100±1.0



Size	0201
Thickness	'0.30±0.03
A ₀	0.38±0.05
B ₀	0.68±0.05
T	0.42±0.05
K ₀	-
W	8.00±0.10
P ₀	4.00±0.10
10xP ₀	40.0±0.10
P ₁	2.00±0.05
P ₂	2.00±0.05
D ₀	1.55±0.05
D ₁	-
E	1.75±0.05
F	3.50±0.05

Multilayer Ceramic Chip Capacitors

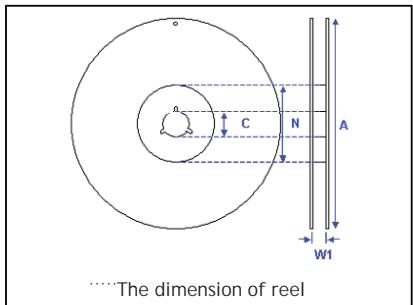
MA Series



MERITEK

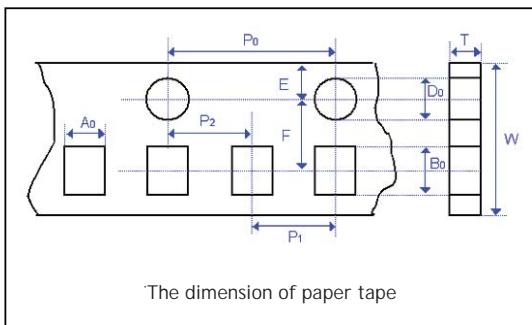
TAPE DIMENSIONS

— Size Š Š Š Š Š Š Š Š

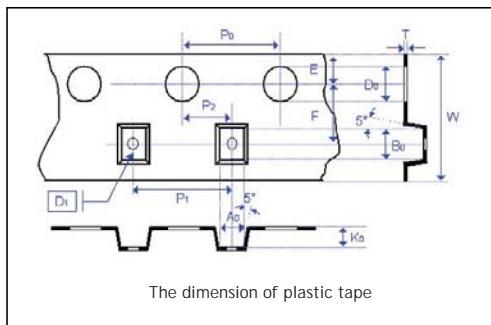


Size	0402, 0603, 0805, 1206, 1210			1812, 1825, 2220, 2225
Reel size	7"	10"	13"	7"
C	13.0±0.5/-0.2	13.0±0.5/-0.2	13.0±0.5/-0.2	13.0±0.5/-0.2
W ₁	8.4±1.5/-0	8.4±1.5/-0	8.4±1.5/-0	12.4±2.0/-0
A	178.0±0.10	250.0±1.0	330.0±1.0	178.0±0.10
N	60.0±1.0/-0	100.0±1.0	100.0±1.0	80.0±1.0

75F86C5F8 'H5 D9 '8 =A9BG=CBG



9A6CGG98 'H5 D9 '8 =A9BG=CBG'



Size	0402	0603		0805		1206			1210	
Chip Thickness	0.50±0.05	0.80±0.07	0.80±0.15/-0.10	0.80±0.10	1.25±0.10 1.25±0.20	0.80±0.10	0.95±0.10 1.25±0.10	1.60±0.20 1.60±0.3/-0/1	0.95±0.10 1.25±0.10	1.25±0.10 1.60±0.20
A ₀	0.62±0.05	1.00±0.05/-0.10	1.02±0.05/-0.10	1.50±0.10	<1.65	2.00±0.10	<2.00	<2.00	<3.05	<3.10
B ₀	1.12±0.05	1.80±0.10	1.80±0.10	2.30±0.10	<2.40	3.50±0.10	<3.60	<3.70	<3.80	<4.00
T	0.60±0.05	0.95±0.05	0.97±0.05	0.95±0.05	0.23±0.05	0.95±0.05	0.23±0.05	0.23±0.05	0.23±0.05	0.23±0.05
K ₀	-	-	-	-	<2.50	-	<2.50	<2.50	<2.50	<3.50
W	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P ₀	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.100	4.00±0.10
10xP ₀	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20
P ₁	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
P ₂	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D ₀	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05	1.50±0.10/-0	1.55±0.05	1.50±0.10/-0	1.50±0.10/-0	1.50±0.10/-0	1.50±0.10/-0
D ₁	-	-	-	-	1.00±0.10	-	1.00±0.10	1.00±0.10	1.00±0.10	1.00±0.10
E	1.75±0.05	1.75±0.05	1.75±0.05	1.75±0.05	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05

Size	1808		1812		1825		2220		2225	
Chip Thickness	1.25±0.10 1.60±0.20	2.00±0.20	1.25±0.10 1.60±0.20 2.00±0.20	2.50±0.30	1.60±0.20 2.00±0.20	2.50±0.30	1.40±0.15 1.60±0.20 2.00±0.20	2.50±0.30	2.00±0.20	2.50±0.30
A ₀	<2.50	<2.50	<3.90	<3.90	<6.80	<6.80	<5.80	<5.80	<6.80	<6.80
B ₀	<5.30	<5.30	<5.30	<5.30	<5.30	<5.30	<6.50	<6.50	<6.50	<6.50
T	0.25±0.05	0.25±0.05	0.25±0.05	0.25±0.05	0.30±0.10	0.30±0.10	0.30±0.10	0.30±0.10	0.30±0.10	0.30±0.10
K ₀	<2.50	<2.50	<2.50	<3.00	<2.50	<3.10	<2.50	<3.10	<2.50	<3.10
W	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20	12.0±0.20
P ₀	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
10xP ₀	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20	40.00±0.20
P ₁	4.00±0.10	4.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P ₂	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D ₀	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0	1.50±0.10/-0/0
D ₁	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10/-0.10	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10/-0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05/-0.05	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05	5.50±0.05