



Capacitors - Ceramic Chip Components

Automotive Grade Mid-Voltage High Capacitance



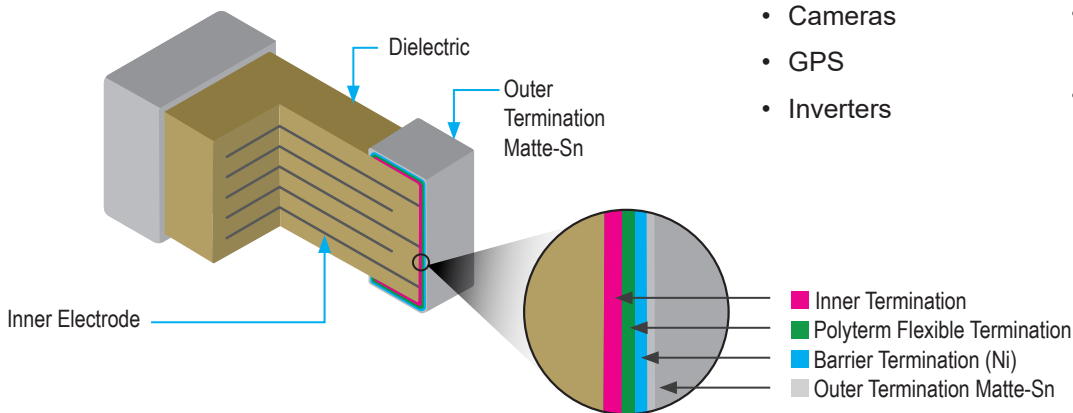
Features:

- Capacitance Range: .2pF to 220pF
- Operating Temperature: -55°C to 125°C
- Termination Meets AEC-Q200 Requirement
- RoHS Compliant
- Lead-free Termination

Application:

- Audio
- Infotainment Systems
- Climate Control Systems
- Key Fobs
- Touchscreen
- Cameras
- GPS
- Inverters
- Control Modules
- Engine Control Modules
- LED Lighting Systems
- Battery Management Systems (BMS)
- Automotive-48V DC/DC Converters
- EV on Board Charger (OBC)

Basic Construction



HOW TO ORDER

AM	DD	500	W	475	M	1	GF	002	E
Subfamily	Size	Voltage	DTC	Capacitance	Tolerance	Mark	Term	Special Code	Pack
AM = Automotive Grade Mid-Voltage High Capacitance	DD = 1206 DF = 1210 DP = 1808 EF = 2220	500 = 50V 101 = 100V 251 = 250V 631 = 630V 102 = 1000V	W = X7R G = NPO	1st two digits are significant; 3rd digit denotes number of zeros. 475 = 475 pF 102 = 1000 pF;	J = ±5% K = ±10% M = ±20%	1 = No Mark	GF = Polyterm Sn (RoHS)	002 = AEC-Q200	B = Bulk E = 7" Reel Emb Tape U = 13" Reel Emb Tape

Example: **AMDD500W475M1GF002E** Automotive Grade Mid-Voltage, 1206, X7R, 50.0V, 4.700µF±20%, Polyterm Sn (RoHS), 7" Reel Embossed Tape, AEC Q200 Qualified



Mechanical Characteristics

EIA (Metric)	1206 (3216)		1210 (3225)		1808 (4520)		2220 (5750)		Mechanical Characteristics
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	
Length "L"	0.130 ± 0.012	3.3 ± 0.30	0.130 ± 0.016	3.3 ± 0.40	0.177 ± 0.016	4.5 ± 0.40	0.224 ± 0.020	5.7 ± 0.50	
Width "W"	0.063 ± 0.012	1.6 ± 0.30	0.098 ± 0.012	2.5 ± 0.30	0.079 ± 0.010	2.0 ± 0.25	0.197 ± 0.016	5.0 ± 0.40	
Thickness "T"	See "Thickness" detail next page								
Endband "EB"	0.024 ± 0.008	0.6 ± 0.20	0.030 to 0.014	0.75 ± 0.35	0.033 ± 0.014	0.85 ± 0.35	0.033 ± 0.014	0.85 ± 0.35	

Electrical Characteristics

Rated Voltage (VDC)	50, 100, 250, 630, 1000 Volts DC
Capacitance Range (EIA)	2.2 nF to 15 uF (See size, capacitance & voltage range chart below)
Capacitance Tolerance	J, K, M
Test Parameters	1 MHz ± 50 kHz @ 1.0 ± 0.2 VRMS, 25°C
Temperature Coefficient	NP0: 0% ± 30 ppm/°C from -55 to 125°C X7R: ± 15% from -55 to 125°C
Quality Factor	Q > 1,000 at 1 MHz ± 50 kHz, 25°C, 1.0 ± 0.2 VRMS
Insulation Resistance	> 10 GΩ
Operating Environment Range	-55 to 125°C
Breakdown Voltage	<1000 WVDC x 2.5 min., 25°C, 50 mA Max > 1000 WVDC x 1.2 min., 25°C, 50 mA Max



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Standard Cap Values (nF), Rated Voltage and Thickness

1206 (3216) - EIA (Metric)

Cap Values (nF)																
2.2	10	22	33	47	68	100	150	220	330	470	680	1,000	1,500	2,200	3,300	4,700

Voltage

1000	630	250	250	250	250	250	250	250	100	100	100	100	50	50	50	50
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Thickness Max

"0.053 (1.35)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.071 (1.80)"	"0.075 (1.90)"	"0.075 (1.90)"	"0.075 (1.90)"	"0.075 (1.90)"	"0.075 (1.90)"	"0.075 (1.90)"	"0.075 (1.90)"
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Thickness Min

"0.045 (1.15)"	"0.055 (1.4)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.055 (1.40)"	"0.059 (1.50)"	"0.059 (1.50)"	"0.059 (1.50)"	"0.059 (1.50)"	"0.059 (1.50)"	"0.059 (1.50)"	"0.059 (1.50)"
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1210 (3225) - EIA (Metric)

Cap Values (nF)																	
10	22	33	47	68	100	150	220	330	470	680	1,000	1,500	2,200	3,300	4,700	6,800	10,000

Voltage

1000	631	631	200	200	200	200	200	200	200	200	100	100	100	100	100	50	50
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Thickness Max

"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"
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Thickness Min

"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.055 (1.80)"	"0.055 (1.80)"	"0.055 (1.80)"	"0.055 (1.80)"	"0.055 (1.80)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"
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1808 (4520) - EIA (Metric)

Cap Values (nF)
2.2

Voltage

1000

Thickness Max

0.071 (1.80)

Thickness Min

0.055 (1.40)

2220 (5750) - EIA (Metric)

Cap Values (nF)																
100	150	220	330	470	680	1,000	1,500	2,200	3,300	4,700	6,800	10,000	15,000			

Voltage

500	500	500	500	500	500	250	630	100	100	100	100	100	100	100	100	100
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Thickness Max

"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.122 (3.10)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"	"0.110 (2.80)"
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Thickness Min

"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.098 (2.50)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"	"0.087 (2.20)"
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Legend

- Blue shade represents NPO Dielectric
- Red shade represents X7R Dielectric



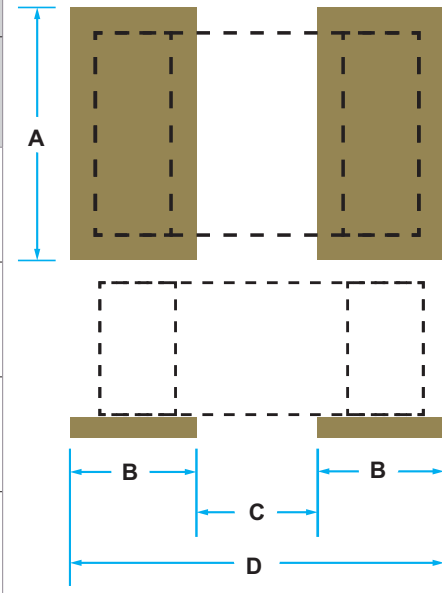
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AM
SERIES

Recommended Land Pattern

Dimension	1206		1210		1808		2220	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
A	0.089	2.2606	0.122	3.099	0.125	3.175	0.247	6.274
B	0.040	1.0160	0.045	1.1430	0.061	1.537	0.066	1.676
C	0.072	1.8288	0.059	1.499	0.109	2.769	0.145	3.683
D	0.152	3.8608	0.149	3.785	0.23	5.842	0.277	7.036



Storage Life & Temperatures

In The Original Packaging	<ul style="list-style-type: none"> • Chip component terminations should generally be protected from moisture. • All chip components, including tape and reel, should be kept in an area where the temperature is between 5°C and 40°C and where the humidity is 20% to 70%. • The chip components should be used within two years. • The solderability of the chip components should be checked if they are not used in 24 months. • Peel strength and shelf life of tape will remain within specification up to 2 years when stored as stated in 8.1.2.
Post Solder Assembly Storage	<ul style="list-style-type: none"> • The capacitor will withstand non-operational storage after the solder process over the temperature range of -55°C to +150°C (Non-Operating)