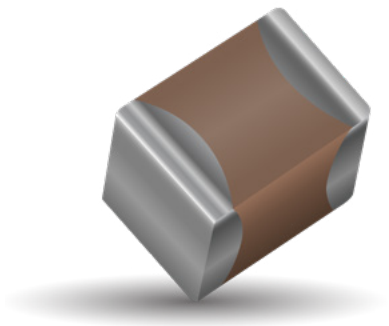
C0G (NP0) Dielectric

General Specifications



C0G (NP0) is the most popular formulation of the "temperature-compensating," EIA Class I ceramic materials. Modern C0G (NP0) formulations contain neodymium, samarium and other rare earth oxides.

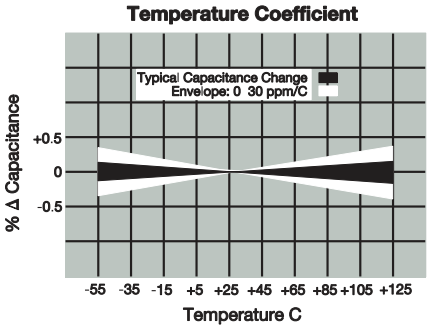
C0G (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is 0 ±30ppm/°C which is less than ±0.3% C from -55°C to +125°C. Capacitance drift or hysteresis for C0G (NP0) ceramics is negligible at less than ±0.05% versus up to ±2% for films. Typical capacitance change with life is less than ±0.1% for C0G (NP0), one-fifth that shown by most other dielectrics. C0G (NP0) formulations show no aging characteristics.

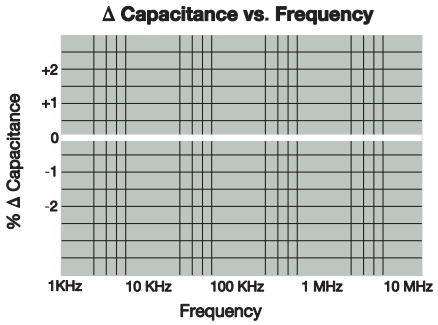
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

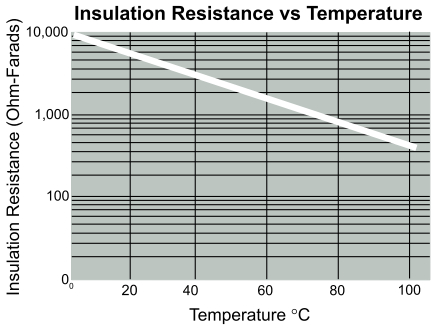
RoHS COMPLIANT

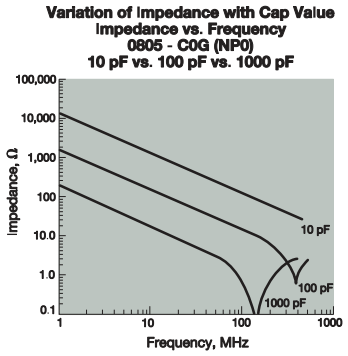
0805	5	A	101	J	A	T	2	A
Size (L" x W")	**Voltage** 6.3V = 6 10V = Z 16V = Y 25V = 3 50V = 5 100V = 1 200V = 2 250V = V 500V = 7	**Dielectric** C0G (NP0) = A	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn **Contact Factory For 1 = Pd/Ag Term 7 = Gold Plated** **NOT RoHS COMPLIANT**	**Packaging** 2 = 7" Reel 4 = 13" Reel U = 4mm TR (01005)	**Special Code** A = Std. Product **Contact Factory For Multiples**

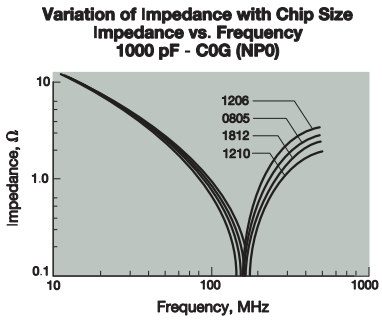
NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.

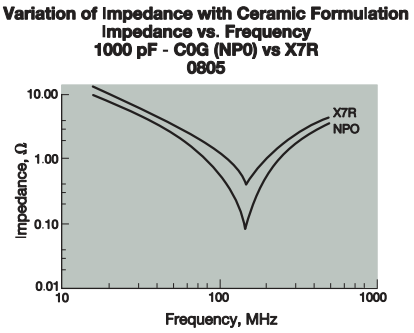






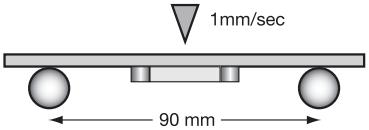






C0G (NP0) Dielectric

Specifications and Test Methods

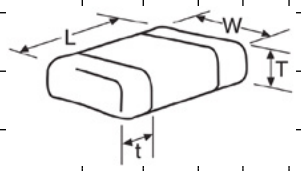
Parameter/Test		NP0 Specification Limits	Measuring Conditions	
Operating Temperature Range		-55ºC to +125ºC	Temperature Cycle Chamber	
Capacitance		Within specified tolerance <30 pF: Q≥ 400+20 x Cap Value ≥30 pF: Q≥ 1000	Freq.: 1.0 MHz ± 10% for cap ≤ 1000 pF 1.0 kHz ± 10% for cap > 1000 pF Voltage: 1.0Vrms ± .2V	
Q				
Insulation Resistance		10,000MΩ or 500MΩ - µF, whichever is less	Charge device with rated voltage for 60 ± 5 secs @ room temp/humidity	
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.	
Resistance to Flexure Stresses	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	±5% or ±.5 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	≥ Initial Value x 0.3		
Solderability		≥ 95% of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 ± 5ºC for 5.0 ± 0.5 seconds	
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal	Dip device in eutectic solder at 260ºC for 60sec- onds. Store at room temperature for 24 ± 2hours before measuring electrical properties.	
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Thermal Shock	Appearance	No visual defects	Step 1: -55ºC ± 2º	30 ± 3 minutes
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater	Step 2: Room Temp	≤ 3 minutes
	Q	Meets Initial Values (As Above)	Step 3: +125ºC ± 2º	30 ± 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 hours at room temperature	
Load Life	Appearance	No visual defects	Charge device with twice rated voltage in test chamber set at 125ºC ± 2ºC for 1000 hours (+48, -0). Remove from test chamber and stabilize at room temperature for 24 hours before measuring.	
	Capacitance Variation	≤ ±3.0% or ± .3 pF, whichever is greater		
	Q (C=Nominal Cap)	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C		
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at 85ºC ± 2ºC/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	≤ ±5.0% or ± .5 pF, whichever is greater		
	Q	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C		
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

C0G (NP0) Dielectric

Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE		0101*	0201		0402			0603					0805						1206						
Soldering		Reflow Only	Reflow Only		Reflow/Wave			Reflow/Wave					Reflow/Wave						Reflow/Wave						
Packaging		All Paper	All Paper		All Paper			All Paper					Paper/Embossed						Paper/Embossed						
(L) Length	mm	0.40 ± 0.02	0.60 ± 0.03		1.00 ± 0.10			1.60 ± 0.15					2.01 ± 0.20						3.20 ± 0.20						
	(in.)	(0.016 ± 0.0008)	(0.024 ± 0.001)		(0.040 ± 0.004)			(0.063 ± 0.006)					(0.079 ± 0.008)						(0.126 ± 0.008)						
W) Width	mm	0.20 ± 0.02	0.30 ± 0.03		0.50 ± 0.10			0.81 ± 0.15					1.25 ± 0.20						1.60 ± 0.20						
	(in.)	(0.008 ± 0.0008)	(0.011 ± 0.001)		(0.020 ± 0.004)			(0.032 ± 0.006)					(0.049 ± 0.008)						(0.063 ± 0.008)						
(t) Terminal	mm	0.10 ± 0.04	0.15 ± 0.05		0.25 ± 0.15			0.35 ± 0.15					0.50 ± 0.25						0.50 ± 0.25						
	(in.)	(0.004 ± 0.0016)	(0.006 ± 0.002)		(0.010 ± 0.006)			(0.014 ± 0.006)					(0.020 ± 0.010)						(0.020 ± 0.010)						
	WVDC	16	25	50	16	25	50	16	25	50	100	200	16	25	50	100	200	250	16	25	50	100	200	250	500
Cap	0.5		A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
(pF)	1.0	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	1.2	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	1.5	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	1.8	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	2.2	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	2.7	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	3.3	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	3.9	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	4.7	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	5.6	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	6.8	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	8.2	B	A	A	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J
	10	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	12	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	15	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	18	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	22	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	27	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	33	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	39	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	47	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	56	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	68	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	82	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	100	B	A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	120				C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	150				C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J	J
	180				C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J	J	J
	220				C	C	C	G	G	G	G	G	J	J	J	J	N	N	J	J	J	J	J	J	J
	270				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	330				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	390				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	470				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	560				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	680				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	750				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	820				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	1000				C	C	C	G	G	G	G		J	J	J	J	N	N	J	J	J	J	J	J	J
	1200							G	G	G			J	J	J	J	P	P	J	J	J	J	J	J	J
	1500							G	G	G			J	J	J	J	P	P	J	J	J	M	Q	P	P
	1800							G	G	G			J	J	J	J	P	P	J	J	M	P	Q	P	P
	2200							G	G	G			P	P	P	P	P	P	J	J	M	P	Q	P	P
	2700							G	G	G			P	P	P	P	P	P	J	J	M	P	Q	P	P
	3300							G	G	G			P	P	P	P	P	P	J	J	M	P	Q	X	P
	3900							G	G	G			P	P	P	P	P	P	J	J	M	P	X	X	X
	4700							G	G	G			P	P	P	P	P	P	J	J	M	P	X	X	X
	5600												P	P	P				J	J	M	P	X	X	X
	6800												P	P	P				M	M	M	P	X	X	X
	8200												P	P	P				P	P	P	P	X	X	
Cap	0.010												P	P	P				P	P	P	P	X	X	
(µF)	0.012												P	P	P				X	X	X	X			
	0.015																		X	X	X	X			
	0.018																		X	X	X	X			
	0.022																		X	X	X	X			
	0.027																		X	X	X				
	0.033																		X	X	X	X			
	0.039																		X	X	X				
	0.047																		X	X	X				
	0.068																		X	X	X				
	0.082																								
	0.1																		X	X	X				
WVDC		16	25	50	16	25	50	16	25	50	100	200	16	25	50	100	200	250	16	25	50	100	200	250	500
SIZE		0101*	0201		0402			0603					0805						1206						



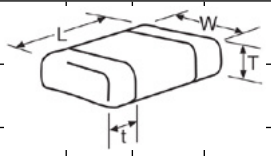
Letter	A	B	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.22 (0.009)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.05 5)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER						EMBOSSED							

C0G (NP0) Dielectric

Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE		1210					1812					1825			2220			2225		
Soldering		Reflow Only					Reflow Only					Reflow Only			Reflow Only			Reflow Only		
Packaging		Paper/Embossed					All Embossed					All Embossed			All Embossed			All Embossed		
(L) Length	mm (in.)	3.20 ± 0.20 (0.126 ± 0.008)					4.50 ± 0.30 (0.177 ± 0.012)					4.50 ± 0.30 (0.177 ± 0.012)			5.70 ± 0.40 (0.225 ± 0.016)			5.72 ± 0.25 (0.225 ± 0.010)		
W) Width	mm (in.)	2.50 ± 0.20 (0.098 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)					6.40 ± 0.40 (0.252 ± 0.016)			5.00 ± 0.40 (0.197 ± 0.016)			6.35 ± 0.25 (0.250 ± 0.010)		
(t) Terminal	mm (in.)	0.50 ± 0.25 (0.020 ± 0.010)					0.61 ± 0.36 (0.024 ± 0.014)					0.61 ± 0.36 (0.024 ± 0.014)			0.64 ± 0.39 (0.025 ± 0.015)			0.64 ± 0.39 (0.025 ± 0.015)		
	WVDC	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200
Cap (pF)	3.9																			
	4.7																			
	5.6																			
	6.8																			
	8.2																			
	10	M	M	M	M	M	P	P	P	P	P									
	12	M	M	M	M	M	P	P	P	P	P									
	15	M	M	M	M	M	P	P	P	P	P									
	18	M	M	M	M	M	P	P	P	P	P									
	22	M	M	M	M	M	P	P	P	P	P									
	27	M	M	M	M	M	P	P	P	P	P									
	33	M	M	M	M	M	P	P	P	P	P									
	39	M	M	M	M	M	P	P	P	P	P									
	47	P	P	P	P	P	P	P	P	P	P									
	56	P	P	P	P	P	P	P	P	P	P									
	68	P	P	P	P	P	P	P	P	P	P									
	82	P	P	P	P	P	P	P	P	P	P									
	100	P	P	P	P	P	P	P	P	P	P									
	120	P	P	P	P	P	P	P	P	P	P									
	150	P	P	P	P	P	P	P	P	P	P									
	180	P	P	P	P	P	P	P	P	P	P									
	220	P	P	P	P	P	P	P	P	P	P									
	270	P	P	P	P	P	P	P	P	P	P									
	330	P	P	P	P	P	P	P	P	P	P									
	390	P	P	P	P	P	P	P	P	P	P									
	470	P	P	P	P	P	P	P	P	P	P									
	560	P	P	P	P	P	P	P	P	P	P									
	680	P	P	P	P	P	P	P	P	P	P									
	820	P	P	P	P	P	P	P	P	P	P									
	1000	P	P	P	P	P	P	P	P	P	P	M	M	M				M	M	P
	1200	P	P	P	P	P	P	P	P	P	P	M	M	M				M	M	P
	1500	P	P	P	P	P	P	P	P	P	P	M	M	M				M	M	P
	1800	P	P	P	P	P	P	P	P	P	P	M	M	M				M	M	P
	2200	P	P	P	P	P	P	P	P	P	P	X	X	M				M	M	P
	2700	P	P	P	P	P	P	P	P	P	Q	X	X	M				M	M	P
	3300	P	P	P	P	P	P	P	P	P	Q	X	X	X			X	M	M	P
	3900	P	P	P	P	P	P	P	P	P	Q	X	X	X			X	M	M	P
	4700	P	P	P	P	P	P	P	P	P	Y	X	X	X	X	X	X	M	M	P
	5600	P	P	P	P	P	P	P	P	P	Y	X	X	X	X	X	X	M	M	P
	6800	P	P	P	X	X	P	P	Q	Q	Y	X	X	X	X	X	X	M	M	P
	8200	P	P	P	X	X	P	P	Q	Q	Y	X	X	X	X	X	X	M	M	P
Cap (pF)	0.010	P	P	X	X	X	P	P	Q	Q	Y	X	X	X	X	X	X	M	M	P
	0.012	X	X	X	X	X	P	P	Q	X	Y	X	X	X	X	X	X	M	M	P
	0.015	X	X	X	Z	Z	P	P	Q	X	Y	X	X	X	X	X	X	M	M	Y
	0.018	X	X	Z	Z		P	P	X	X	Y	X	X	X	X	X	X	M	M	Y
	0.022	X	X	Z	Z		P	P	X	X		X	X	X	X	X		M	Y	Y
	0.027	X	Z	Z	Z		Q	X	X	Z		X	X	Y	X	X		P	Y	Y
	0.033	X	Z	Z	Z		Q	X	X	Z		X	X		X	X		X	Y	Y
	0.039	Z	Z	Z			X	X	Z	Z		X			Y			X	Y	Y
	0.047	Z	Z	Z			X	X	Z	Z		X			Y			X	Z	
	0.068						Z	Z	Z						Z			X	Z	
	0.082						Z	Z	Z						Z			X	Z	
	0.1						Z	Z	Z						Z			Z	Z	
	WVDC	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200
	SIZE	1210					1812					1825			2220			2225		



Letter	A	B	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.22 (0.009)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER						EMBOSSED							

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

AVX:

12061A471JBT2A 05045A102FAT050B 05045A130FAT1A 04025A100JAJ2A 04025A120JAJ2A 04025A151FAJ2A 04025A300GAQ2A 04025A390FAJ2A 04025A390JAQ2A 05083A221MAT2A 06035AVPRFAT2A 08051A151JSTME\1K 08051A331JSTME\500 18125A683JBT1A 02013A1R0BAQ2A 04025A220JAJ2A 04025A220JAQ2A 04025A221JAJ2A 04025A270FAJ2A 04025A270JAQ2A 04025A4R3DA79A 04025A5R6DA79A 04025A8R2DA79A 05041A101JHT6A 05041A221JHT6A 05043A331JHT6A 05045A391JHT6A 05083A100KAT2A 05045C222KAT1A 2225CA183KBJ9A 05045C102MAT1A 05045C102KAT1A 05045C152KAT1A 05045C682JAT1A 06123A101KAT2V 12061A102JBT1A 02013A150JAQ2A 04025A100CAJ2A 04025A470JAJ2A 08051A101JAJ4A 08051A101JSJME\2K 08051AVAEFAT2A 0805VA151KAT2A 12061A221JBT1A 12061A681JBT1A 12062A102FBT1A 12065A392JBT1A 1206CA560GAT2W 12101X273KSTME\500 12105X104KSJME 1808XA331KAT2A 1808XA331KAT4A 18125A103FBT1A 18125A333FBT1A 18125A562FBT1A 18125X104KSJME 18125X184KSJME 18251X104KSJME 18251X154KSJME\500 1206VA472JAT2A 36401A102MAT3A 0402YA120GAJ2A 0402YA130GAJ2A 0402YA140GAJ2A 0402YA150GAJ2A 0402YA160GAJ2A 0402YA180JAJ2A 04025A0R5BAQ2A 04025A1R2CAJ2A 04025A100KAJ2A 04025A120FAJ2A 04025A150FAJ2A 04025A2R7CAJ2A 04025A3R0CAJ2A 04025A3R3CAQ2A 04025A4R7BAQ2A 04025A470JAQ2A 04025A5R0CAJ2A 04025A560JAQ2A 0805PA220KAT2A 08051A510JAJ2A 08055A100JHT6A 08055A182JHT6A 08055A220JAQ2A 08055A221GHT6A 08055A4R3DAQ2A 08055A470JAQ2A 08055A510JAJ2A 08055A8R0DAQ2A 12061A101KSJME\500 04025A560JA76A 18255A223KSTME 18255X274KSJME\500 12062A220JBT1A 12061A102JSJME 12065A122JBT1A 12061X103KSJME\500 12061A102KBT1A 04025A101JA76A 08055A621JSJME