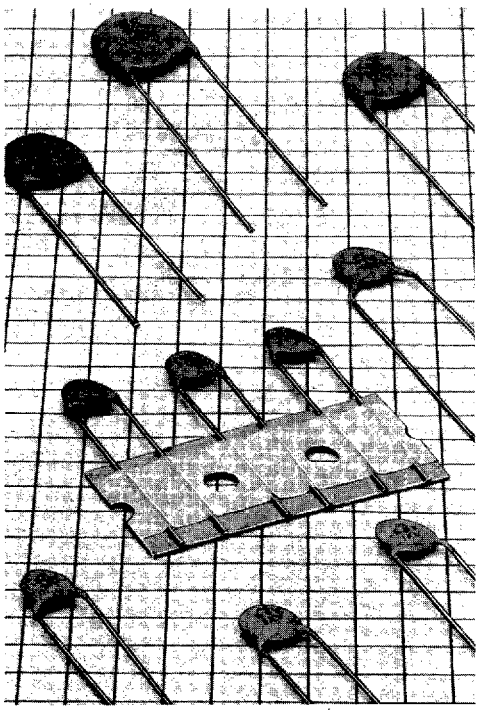
CERAMIC DISC CAPACITORS



SPECIFICATIONS:

TEMPERATURE CHARACTERISTICS: See Table 1
OPERATING TEMPERATURE: See Table 1
TEST VOLTAGE: For 12 through 100 VDC — 250% of rated voltage.
For 1000 VDC — 150% of rated voltage.
INSULATION RESISTANCE: 75,000 Megohms min. @ Working Voltage

Q (Ratio of Reactance to Equivalent Series Resistance)
Capacitance ≤ 30pf Q ≥ 400 + 20xCpf
Capacitance > 30pf Q ≥ 1000

CAPACITANCE VS. TEMPERATURE CHARACTERISTICS:
See performance curves (p. 9)

DISSIPATION FACTOR:
For Z5F, Z5R, Z5U 2.5% Max. @ 1 KC and 25°C
Z5V, 5.0% Max. @ 1 KC and 25°C
S2L, S3N 0.6% Max. @ 1 MC and 25°C

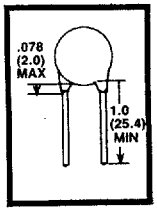
TEST PARAMETERS:
Class III Dielectric
1 KHz±50 Hz
0.5 VRMS, 25°C

Class I Dielectric
1 MHz ±50 Hz,
1.0±0.2 VRms,
under 100 pF, 25°C

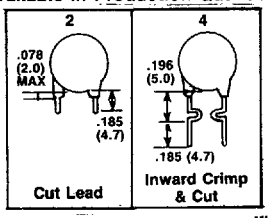
Now Available on Tape & Reel

TYPE	TCO	TCL	TCA	TCD	TCP	TCV	CCD
VOLTAGE	12	16	25	50	100	500	1000

Standard Leads



Alternate Lead Configurations Available in Production Quantities



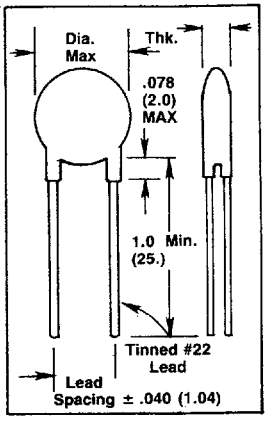
Contact factory for other configurations to your specifications.

General Specifications

Arco Disc Ceramic Capacitors are designed for applications requiring high capacitance and low power factors from 12 to 1000 volts. All units are coated with a rugged "Durez" coating and are available in a variety of tolerancs and EIA characteristics.

These miniature discs are ideally suited for all applications where size is a critical factor.

Arco Disc Ceramics exhibit a level of performance and reliability well above industry standards. The higher voltage ratings allow for improved reliability and provide that extra reserve to meet unexpected surges and temporary overloads.



Arco

Class III — Low Voltage Barrier Capacitors

12 WVDC

Inches (mm)

Cap. Mfd.	Type	Tolerance	TC	Max. Dia.	Max. Thickness	Lead Space
.1	TCO104M	±20%	Y5T	.354 (9.0)	.118 (3.0)	.250 (6.4)
.1	TCO104Z	+80/−20%	Y5T	.354 (9.0)	.118 (3.0)	.250 (6.4)
.22	TCO224M	±20%	Y5T	.512 (13.0)	.118 (3.0)	.250 (6.4)
.22	TCO224Z	+80/−20%	Y5T	.512 (13.0)	.118 (3.0)	.250 (6.4)
.47	TCO474M	±20%	Y5T	.610 (15.5)	.118 (3.0)	.375 (9.5)
.47	TCO474Z	+80/−20%	Y5T	.610 (15.5)	.118 (3.0)	.375 (9.5)

16WVDC

.01	TCL103K	±10%	Y5P	.197 (5.0)	.118 (3.0)	.250 (6.4)
.01	TCL103M	±20%	Z5R	.250 (6.4)	.118 (3.0)	.250 (6.4)
.022	TCL223K	±10%	Y5P	.236 (6.0)	.118 (3.0)	.250 (6.4)
.022	TCL223M	±20%	Z5R	.299 (7.6)	.118 (3.0)	.250 (6.4)
.033	TCL333K	±10%	Y5P	.256 (6.5)	.118 (3.0)	.250 (6.4)
.033	TCL333M	±20%	Z5R	.315 (8.0)	.118 (3.0)	.250 (6.4)
.047	TCL473K	±10%	Y5P	.295 (7.5)	.118 (3.0)	.250 (6.4)
.05	TCL503M	±20%	Y5T	.331 (8.4)	.118 (3.0)	.250 (6.4)
.1	TCL104M	±20%	Y5T	.354 (9.0)	.118 (3.0)	.375 (9.5)
.22	TCL224M	±20%	Y5T	.512 (13.0)	.118 (3.0)	.375 (9.5)
.47	TCL474M	±20%	Y5T	.610 (15.5)	.118 (3.0)	.375 (9.5)

25WVDC

.01	TCA103K	±10%	Y5P	.236 (6.0)	.118 (3.0)	.250 (6.4)
.022	TCA223K	±10%	Y5P	.295 (7.5)	.118 (3.0)	.250 (6.4)
.022	TCA223Z	+80/−20%	Z5V	.315 (8.0)	.118 (3.0)	.250 (6.4)
.033	TCA333K	±10%	Y5P	.315 (8.0)	.118 (3.0)	.250 (6.4)
.033	TCA333Z	+80/−20%	Z5V	.315 (8.0)	.118 (3.0)	.250 (6.4)
.047	TCA473K	±10%	Y5P	.374 (9.5)	.118 (3.0)	.250 (6.4)
.05	TCA503Z	+80/−20%	Z5V	.394 (10.0)	.118 (3.0)	.250 (6.4)
.1	TCA104M	±20%	Y5P	.531 (13.5)	.118 (3.0)	.375 (9.5)
.1	TCA104Z	+80/−20%	Z5V	.516 (13.1)	.118 (3.0)	.375 (9.5)

Class I — Temperature Compensating Disc

50WVDC

Inches (mm)

Cap. pF	Type	Tolerance	TC	Max. Dia.	Max. Thickness	Lead Space
1	TCD010D	±.5pF	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
3	TCD030D	±.5pF	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
5	TCD050D	±.5pF	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
10	TCD100J	±5%	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
12	TCD120J	±5%	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
15	TCD150J	±5%	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
18	TCD180J	±5%	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
20	TCD200J	±5%	NPO	.197 (5.0)	.118 (3.0)	.098 (2.5)
22	TCD220J	±5%	NPO	.248 (6.3)	.118 (3.0)	.197 (5.0)
24	TCD240J	±5%	NPO	.248 (6.3)	.118 (3.0)	.197 (5.0)
25	TCD250J	±5%	NPO	.248 (6.3)	.118 (3.0)	.197 (5.0)
27	TCD270J	±5%	NPO	.248 (6.3)	.118 (3.0)	.197 (5.0)
30	TCD300J	±5%	NPO	.248 (6.3)	.118 (3.0)	.197 (5.0)
33	TCD330J	±5%	NPO	.248 (6.3)	.118 (3.0)	.197 (5.0)
39	TCD390J	±5%	NPO	.315 (8.0)	.118 (3.0)	.197 (5.0)
47	TCD470J	±5%	NPO	.315 (8.0)	.118 (3.0)	.197 (5.0)
50	TCD500J	±5%	NPO	.315 (8.0)	.118 (3.0)	.197 (5.0)
51	TCD510J	±5%	NPO	.315 (8.0)	.118 (3.0)	.197 (5.0)
56	TCD560J	±5%	NPO	.315 (8.0)	.118 (3.0)	.197 (5.0)
62	TCD620J	±5%	NPO	.315 (8.0)	.118 (3.0)	.197 (5.0)
68	TCD680J	±5%	NPO	.394 (10.0)	.118 (3.0)	.197 (5.0)
75	TCD750J	±5%	NPO	.394 (10.0)	.118 (3.0)	.197 (5.0)
82	TCD820J	±5%	NPO	.394 (10.0)	.118 (3.0)	.197 (5.0)
91	TCD910J	±5%	NPO	.394 (10.0)	.118 (3.0)	.197 (5.0)
100	TCD101J	±5%	NPO	.394 (10.0)	.118 (3.0)	.197 (5.0)

Class II — By-pass & Coupling Disc

Inches (mm)

50 WVDC

Cap. Mfd	Type	Tolerance	TC	Max. Dia	Max. Thickness	Lead Space
.001	TCD102Z	±80/—20%	Z5V	.197 (5.0)	.118 (3.0)	.250 (6.4)
.005	TCD502Z	±80/—20%	Z5V	.197 (5.0)	.118 (3.0)	.250 (6.4)
.01	TCD103Z	±80/—20%	Z5V	.236 (6.0)	.118 (3.0)	.250 (6.4)
.02	TCD203Z	±80/—20%	Z5V	.315 (8.0)	.118 (3.0)	.375 (9.5)
.05	TCD503Z	±80/—20%	Z5V	.394 (10.0)	.118 (3.0)	.375 (9.5)
.068	TCD683Z	±80/—20%	Z5V	.512 (13.0)	.118 (3.0)	.375 (9.5)
.1	TCD104Z	±80/—20%	Z5V	.512 (13.0)	.118 (3.0)	.375 (9.5)
.001	TCD102K	±10%	Y5P	.197 (5.0)	.118 (3.0)	.250 (6.4)
.0022	TCD222K	±10%	Y5P	.236 (6.0)	.118 (3.0)	.250 (6.4)
.0033	TCD332K	±10%	Y5P	.315 (8.0)	.118 (3.0)	.250 (6.4)
.0047	TCD472K	±20%	Z5U	.315 (8.0)	.118 (3.0)	.250 (6.4)
.001	TCD102M	±20%	Z5U	.236 (6.0)	.118 (3.0)	.250 (6.4)
.01	TCD103M	±20%	Z5U	.315 (8.0)	.118 (3.0)	.250 (6.4)
.015	TCD153M	±20%	Z5U	.276 (10.0)	.118 (3.0)	.250 (6.4)
.022	TCD223M	±20%	Z5U	.276 (10.0)	.118 (3.0)	.250 (6.4)
.033	TCD333M	±20%	Z5U	.512 (13.0)	.118 (3.0)	.375 (9.5)
.047	TCD473M	±20%	Z5U	.512 (13.0)	.118 (3.0)	.375 (9.5)
.05	TCD503M	±20%	Z5U	.512 (13.0)	.118 (3.0)	.375 (9.5)

100WVDC

.005	TCP502K	±10%	Y5P	.390 (9.9)	.118 (3.0)	.250 (6.4)
.005	TCPR005	±20%	Z5U	.390 (9.9)	.118 (3.0)	.250 (6.4)
.01	TCP103K	±10%	Y5P	.390 (9.9)	.118 (3.0)	.250 (6.4)
.01	TCPR01	±20%	Z5U	.390 (9.9)	.118 (3.0)	.250 (6.4)
.02	TCP203K	±10%	Y5P	.441 (11.2)	.118 (3.0)	.250 (6.4)
.02	TCPR02	±20%	Z5U	.441 (11.2)	.118 (3.0)	.250 (6.4)
.03	TCP303K	±10%	Y5P	.512 (13.0)	.118 (3.0)	.250 (6.4)
.03	TCPR03	±20%	Z5V	.590 (15.0)	.118 (3.0)	.375 (9.5)
.05	TCP503M	±20%	Z5U	.626 (15.9)	.118 (3.0)	.375 (9.5)
.1	TCP104M	±20%	Z5U	.724 (18.4)	.118 (3.0)	.375 (9.5)
.1	TCPR1	±80/—20%	Z5V	.724 (18.4)	.118 (3.0)	.375 (9.5)

500WVDC

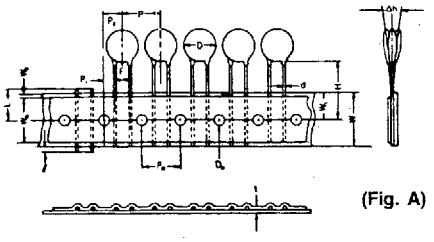
pF						
100	TCV101K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
120	TCV121K	±10%	Y5E	.276 (.70)	.118 (3.0)	250 (6.4)
130	TCV131K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
150	TCV151K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
180	TCV181K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
200	TCV201K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
220	TCV221K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
240	TCV241K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
250	TCV251K	±10%	Y5E	.276 (7.0)	.118 (3.0	.250 (6.4)
270	TCV271K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
300	TCV301K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
330	TCV331K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
390	TCV391K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
470	TCV471K	±10%	Y5E	.276 (7.0)	.118 (3.0)	.250 (6.4)
500	TCV501K	±10%	Y5E	.276 (7.0)	.118 (3.0	.250 (6.4)
510	TCV511K	±10%	Y5E	.256 (7.0)	.118 (3.0)	.250 (6.4)
560	TCV561K	±10%	Y5E	.256 (7.0)	.118 (3.0)	.250 (6.4)
620	TCV621K	±10%	Y5E	.256 (7.0)	.118 (3.0)	.250 (6.4)
680	TCV681K	±10%	Y5E	.256 (7.0)	.118 (3.0)	.250 (6.4)
750	TCV751K	±10%	Y5E	.256 (7.0)	.118 (3.0)	.250 (6.4)
820	TCV821K	±10%	Y5P	.276 (7.0)	.118 (3.0)	.250 (6.4)
910	TCV911K	±10%	Y5P	.276 (7.0)	.118 (3.0)	.250 (6.4)
1000	TCV102K	±10%	Y5P	.276 (7.0)	.118 (3.0)	.250 (6.4)
1200	TCV122K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
1300	TCV132K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
1500	TCV152K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
1600	TCV162K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
1800	TCV182K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
2000	TCV202K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
2200	TCV222K	±10%	Y5P	.335 (8.5)	.118 (3.0)	.250 (6.4)
2400	TCV242M	±20%	Z5U	.335 (8.5)	.118 (3.0)	.250 (6.4)
2500	TCV252M	±20%	Z5U	.335 (8.5)	.118 (3.0)	.250 (6.4)
2700	TCV272M	±20%	Z5U	.335 (8.5)	.118 (3.0)	.250 (6.4)
3000	TCV302M	±20%	Z5U	.335 (8.5)	.118 (3.0)	.250 (6.4)
3300	TCV332M	±20%	Z5U	.335 (8.5)	.118 (3.0)	.250 (6.4)
3900	TCV392M	±20%	Z5U	.394 (10.0)	.118 (3.0)	.250 (6.4)
4700	TCV472M	±20%	Z5U	.394 (10.0)	.118 (3.0)	.250 (6.4)
5000	TCV502M	±20%	Z5U	.394 (10.0)	.118 (3.0)	.250 (6.4)
5600	TCV562M	±20%	Z5U	.394 (10.0)	.118 (3.0)	.250 (6.4)
6800	TCV682M	±20%	Z5U	.492 (12.5)	.118 (3.0)	.250 (6.4)
7500	TCV752M	±20%	Z5U	.492 (12.5)	.118 (3.0)	.250 (6.4)
8200	TCV822M	±20%	Z5U	.492 (12.5)	.118 (3.0)	.250 (6.4)
.010 μF	TCV103M	±20%	Z5U	.492 (12.5)	.118 (3.0)	.250 (6.4)
.015 μF	TCV153M	±20%	Z5U	.669 (17.0)	.118 (3.0)	.275 (9.5)
.022 μF	TCV223M	±20%	Z5U	.669 (17.0)	.118 (3.0)	.375 (9.5)
.1 μF	TCV104M	±20%	Z5U	.906 (23.0)	.158 (4.0)	.354 (9.0)
.1 μF	TCV104Z	±80/—20%	Z5V	.650 (16.5)	.118 (3.0)	.354 (9.0)

TAPE & REEL PACKAGING

Arco ceramic disc capacitors whether straight lead or kink lead configuration are available in tape & reel packaging.

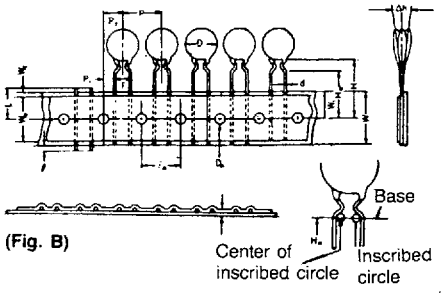
Kind	Figure			Configuration classified symbol	Standard packing quantity
	Packing	Taping product			
Reel-packing	Reel	Straight lead	A	—L46AE or —L46AS	2500 pcs.
		Kink lead	B	—H46CA	

* Taping products of straight lead configuration



(Fig. A)

* Taping products of kink lead configuration



(Fig. B)

Name of each part	Symbol	Dimensions (mm)
Outer diameter of product[1]	D	11.0 max.
Pitch between products	P	12.7 ± 1
Pitch of sprocket hole[2]	P_1	12.7 ± 0.3
Position gap of sprocket hole	P_1	3.85 ± 0.7
Position gap of sprocket hole	P_2	6.35 ± 1.3
Lead wire space	F	5 ± 0.8
Product fall[3]	Δh	0 ± 2
Tape width	W	$18^{+1.0}_{-0.5}$
Sticking tape width	W_2	12.5 min.
Position gap of sprocket hole	W_1	$9^{+0.75}_{-0.5}$
Sticking tape gap	W_2	3 max.
Lower surface position of product	H	$20^{+1.5}_{-1.0}$
Tape thickness (total thickness)[4]	t	0.7 ± 0.2
Lead clinch height[5]	H_2	16 ± 0.5
Lead wire protrusion	ℓ	2 max.
Sprocket hole diameter	D_2	4 ± 0.3
Lead wire diameter	d	$0.6^{+0.06}_{-0.05}$
Cut position of rejected article	L	11 max.

[1] Nominal outer diameter.
[2] Less than 2mm of cumulative error per 20 pitches.
[3] Including fall by bend of lead wire.
[4] Excluding thickness of lead wire.
[5] Available only for kink lead configurations.

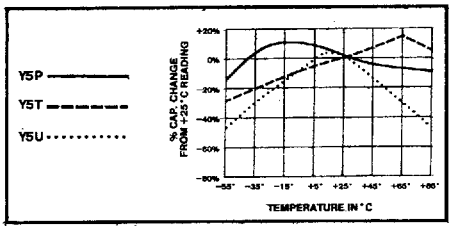
Temperature Characteristics

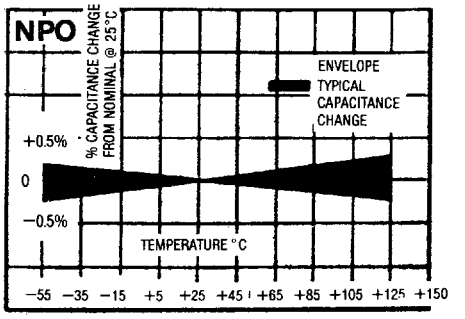
Symbol	Z5	Y5	X5
Temp. Range For Characteristic Determination (°C)	+10 Thru ±85	-30 Thru ±85	-55 Thru ±85

Symbol	E	F	P	R
Max. Cap. Change (%) Over Temp. Range	±4.7	+7.5	±10	+15

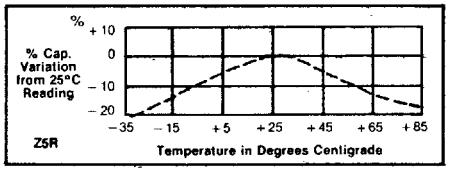
T	U	V
+22	+22	+22
-33	-56	-82

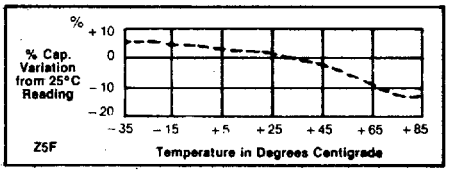
Performance Curves

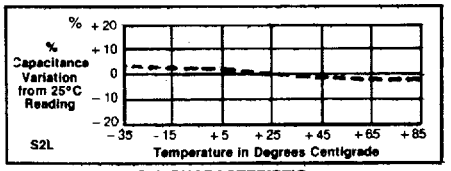




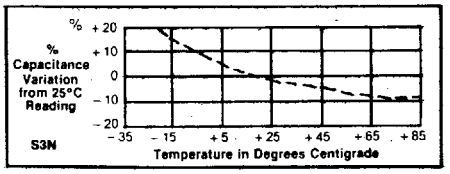
CAPACITANCE CHANGE VS. TEMPERATURE







S2L CHARACTERISTIC:
N330 ±500 parts-per-million per-degree C (PPM/°C) maximum capacitance change from +25°C reading over temperature range of −35°C to +85°C.



S3N CHARACTERISTICS:
N3300 ±2500 parts-per-million per-degree C (PPM/°C) maximum capacitance change from +25°C reading over temperature range of −35°C to +85°C.