Panasonic Ceramic Disc Capacitors

Type RS, Class 1 Safety

Ceramic disc capacitors, Type RS, are recognized by the following safety regulations: • UL1414 (125 VAC) and CSA (125 VAC) • European safety regulations for "Class I" equipment: VDE, SEV, BSI, SEMKO, FIMKO, NEMKO and DEMKO.

Specifications:

Oper Temp. Range	-25 to 85 °V	
Rated Voltage	Applicable Standards	Rated Voltage
	UL, CSA	125 VAC
	VDE (565-1)	250 VAC
	VDE (560-2), FIMKO, SEV, BS, SEMKO, NEMKO, DEMKO	400 VAC
Dielectric Withstanding Voltage	T.C.	Voltage
	B, E	2600 VAC for 1 min
	V	2500 VAC for 1 min
Capacitance	Within the tolerance, when measured at 1 kHz, 5 Vrms max. and 20 °C	
Dissipation Factor	B, E: 0.025 max. V: 0.05 max when measured at 1 kHz, 5 Vrms max. and 20 °C	
Insulation Resist.	10000 MΩ min. at 500 VDC, 1 minute	
Temperature Characteristics	T.C. / Cap. Change / Temp. Range	
	B / ±10% max. / -25 to 85 °C	
	E / +20/-55% max / -25 to 85 °C	
	V / +30/-80% max / 0 to 70 °C	
	The reference temperature: 20 °C	

Class 2

High Dielectric Constant 25V DC, 50 V DC, 500 V DC **Features:** • Large capacitance in small size • Minimum coating resin on leads **Applications:** • Coupling and By-pass, where low losses and high stability of capacitance are not so important **Specifications:** • Operating Temperature Range; -25 to 85 °C • Rated Voltage; 25 VDC, 50VDC, 500VDC • Dielectric Withstanding Voltage; 250% of the rated voltage for 1 to 5 seconds - no damage occurs when the test voltage is applied between terminals • Capacitance; measured at 1 kHz±10 %, 1 Vrms and 20 °C - within the specified tolerance; standard capacitance tolerance [Y5P]; ±10% [Y5V, Z4V]: +80/-20% • Dissipation Factor; [Y5P]: D.F. ≤ 0.025 [Y5V, Z4V]: D.F.≤0.05 • Insulation Resistance; measured at the rated voltage and 1 minute electrification - C≤0.02 µF: I.R. ≥ 10000 MΩ - C>0.02 µF: CR products ≥ 200 MΩ • µF • Temperature Characteristics;

$$\text{Cap. Change} = \frac{\triangle C}{C20} \times 100\%$$

Where C20: Capacitance value in pF at the specified reference temperature of 20 °C.
△C: Capacitance drifts in pF from the capacitance value at 20 °C over the specified temperature range.

Temp. Char.	Max. Cap. Change	Temp. Range
Y5P	± 10%	-25 to 85 °C
Y5V	+30/-80%	-25 to 85 °C
Z4V	+30/-80%	0 to 70 °C

Class 1

Temperature Compensating 50 VDC, 500 VDC. **Features:** • Wide product range for temperature compensation • Liner temperature coefficient of capacitance • High stability of capacitance and close tolerance • Low loss at wide range of frequency. **Applications:** • Temperature compensation of resonant circuit and filters • Where low losses and high stability of capacitance tolerance and high insulation resistance are required **Specifications:** Operating Temperature Range; -25 to 85 °C • Rated Voltage; 50 VDC, 500 VDC • Dielectric Withstanding Voltage; 300% of the rated voltage for 1 to 5 seconds - No damage occurs when the test voltage is applied between terminals • Capacitance; measured at 1 MHz±20%, 5 Vrms. max. and 20 °C - Within the specified tolerance Standard capacitance tolerance; ±0.25 pF (1 to 5 pF), ±0.5 pF (1 to 10 pF), ±1 pF (10pF), ±5% (Over 10 pF NPO), ±10% (Over 10 pF GP) • Q Factor ; Cap. <30 pF: Q≥400+20XC (c: Rated capacitance in pF), Cap≥30 pF: Q≥1000. • Insulation Resistance; Measured at the rated voltage and 1 minute electrification - I.R. ≥ 10000 MΩ. • Temperature Coefficient of Capacitance; Temperature Range: -25 to 85 °C, Reference Temperature; 20 °C, T.C. $= \frac{\triangle C}{C_{20} \times \triangle T}$

Where: C20: Capacitance value in pF at the specified reference temperature of 20 °C. △C: Capacitance drifts in pF from the capacitance value at 20 °C. △T: The specified temperature range to be measured in °C.

Capacitance (pF)	Rated temperature Coefficient (ppm/°C)	
	NPO	GP
1 to 2	±250	+350
3	±120	to
4 and above	±60	-1000

E

Voltage	Capacitance	Tolerance	Temp. Char.	Dimensions (mm) Dia.	Thickness	Lead Space	Digi-Key Part No.	Price Each 10	100	1,000	Panasonic Part No.
RS Safety Type Class 1											
125	150pf	±20%	B	9.5	7.0	7.5	P4463A-ND	.29	.21	.12	ECK-DRS151MB
125	1500pf	±20%	E	10.0	7.0	7.5	P4467A-ND	.43	.31	.17	ECK-DRS152ME
125	4700pf	+80, -20%	V	11.5	7.0	7.5	P4472A-ND	.36	.26	.15	ECK-DRS472ZV
Class 2 High Dielectric Constant											
25	.01µF	+80, -20%	Z4V	5.0	3.5	2.5	P4300A-ND•	.10	.07	.04	ECK-F1E103ZV
25	.022µF	+80, -20%	Z4V	6.5	3.5	5.0	P4303A-ND•	.12	.08	.04	ECK-F1E223ZV
25	.033µF	+80, -20%	Z4V	8.5	3.5	5.0	P4305A-ND•	.13	.09	.05	ECK-F1E333ZV
25	.047µF	+80, -20%	Z4V	8.5	3.5	5.0	P4307A-ND•	.15	.10	.06	ECK-F1E473ZV
25	.1µF	+80, -20%	Z4V	12.5	3.5	5.0	P4201-ND•	.23	.16	.09	ECK-F1E104ZV
50	100pf	±10%	Y5P	5.0	3.5	2.5	P4037A-ND	.10	.07	.04	ECK-F1H101KB
50	120pf	±10%	Y5P	5.0	3.5	2.5	P4038A-ND	.10	.07	.04	ECK-F1H121KB
50	150pf	±10%	Y5P	5.0	3.5	2.5	P4039A-ND	.10	.07	.04	ECK-F1H151KB
50	180pf	±10%	Y5P	5.0	3.5	2.5	P4040A-ND	.10	.07	.04	ECK-F1H181KB
50	220pf	±10%	Y5P	5.0	3.5	2.5	P4041A-ND	.10	.07	.04	ECK-F1H221KB
50	270pf	±10%	Y5P	5.0	3.5	2.5	P4042A-ND	.10	.07	.04	ECK-F1H271KB
50	330pf	±10%	Y5P	5.0	3.5	2.5	P4043A-ND	.10	.07	.04	ECK-F1H331KB
50	390pf	±10%	Y5P	5.0	3.5	2.5	P4044A-ND	.10	.07	.04	ECK-F1H391KB
50	470pf	±10%	Y5P	5.0	3.5	2.5	P4045A-ND	.10	.07	.04	ECK-F1H471KB
50	560pf	±10%	Y5P	5.0	3.5	2.5	P4046A-ND	.10	.07	.04	ECK-F1H561KB
50	680pf	±10%	Y5P	5.0	3.5	2.5	P4047A-ND	.10	.07	.04	ECK-F1H681KB
50	820pf	±10%	Y5P	5.0	3.5	2.5	P4048A-ND	.10	.07	.04	ECK-F1H821KB
50	1000pf	±10%	Y5P	5.0	3.5	2.5	P4049A-ND	.11	.08	.04	ECK-F1H102KB
50	1200pf	±10%	Y5P	5.0	3.5	2.5	P4050A-ND	.11	.08	.04	ECK-F1H122KB
50	1500pf	±10%	Y5P	5.0	3.5	2.5	P4051A-ND	.11	.08	.04	ECK-F1H152KB
50	1800pf	±10%	Y5P	6.5	3.5	5.0	P4052A-ND	.11	.08	.04	ECK-F1H182KB
50	2200pf	±10%	Y5P	6.5	3.5	5.0	P4053A-ND	.12	.08	.05	ECK-F1H222KB
50	2700pf	±10%	Y5P	6.5	3.5	5.0	P4054A-ND	.12	.08	.05	ECK-F1H272KB
50	3300pf	±10%	Y5P	8.0	3.5	5.0	P4055A-ND	.12	.08	.05	ECK-F1H332KB
50	3900pf	±10%	Y5P	8.0	3.5	5.0	P4056A-ND	.13	.09	.05	ECK-F1H392KB
50	4700pf	±10%	Y5P	8.0	3.5	5.0	P4057A-ND	.13	.09	.05	ECK-F1H472KB
50	5600pf	±10%	Y5P	9.5	3.5	5.0	P4058A-ND	.13	.09	.05	ECK-F1H562KB
50	6800pf	±10%	Y5P	9.5	3.5	5.0	P4059A-ND	.21	.15	.09	ECK-F1H682KB
50	1000pf	+80, -20%	Y5V	4.5	3.5	2.5	P4060A-ND•	.10	.07	.04	ECK-F1H102ZF
50	1500pf	+80, -20%	Y5V	5.0	3.5	2.5	P4061A-ND•	.10	.07	.04	ECK-F1H152ZF
50	2200pf	+80, -20%	Y5V	5.0	3.5	2.5	P4062A-ND•	.10	.07	.04	ECK-F1H222ZF
50	3300pf	+80, -20%	Y5V	5.0	3.5	2.5	P4063A-ND•	.11	.07	.04	ECK-F1H332ZF
50	4700pf	+80, -20%	Y5V	5.0	3.5	2.5	P4064A-ND•	.10	.07	.04	ECK-F1H472ZF
50	6800pf	+80, -20%	Y5V	6.5	3.5	5.0	P4065A-ND•	.11	.07	.04	ECK-F1H682ZF
50	10000pf	+80, -20%	Y5V	6.5	3.5	5.0	P4066A-ND	.11	.07	.04	ECK-F1H103ZF
50	22000pf	+80, -20%	Y5V	8.5	3.5	5.0	P4067A-ND	.21	.15	.08	ECK-F1H223ZF
500	100pf	±10%	Y5P	6.0	4.0	5.0	P4100A-ND•	.12	.08	.04	ECK-D2H101KB5
500	150pf	±10%	Y5P	6.0	4.0	5.0	P4102A-ND•	.12	.08	.04	ECK-D2H151KB5
500	180pf	±10%	Y5P	6.0	4.0	5.0	P4103A-ND	.12	.08	.04	ECK-D2H181KB5
500	220pf	±10%	Y5P	6.0	4.0	5.0	P4104A-ND•	.12	.08	.04	ECK-D2H221KB5
500	270pf	±10%	Y5P	6.0	4.0	5.0	P4105A-ND	.12	.08	.04	ECK-D2H271KB5
500	330pf	±10%	Y5P	6.0	4.0	5.0	P4106A-ND•	.12	.08	.04	ECK-D2H331KB5
500	390pf	±10%	Y5P	6.0	4.0	5.0	P4107A-ND	.12	.08	.04	ECK-D2H391KB5
500	470pf	±10%	Y5P	6.0	4.0	5.0	P4108A-ND•	.12	.08	.04	ECK-D2H471KB5
500	560pf	±10%	Y5P	6.0	4.0	5.0	P4109A-ND	.12	.08	.04	ECK-D2H561KB5
500	680pf	±10%	Y5P	6.0	4.0	5.0	P4110A-ND•	.12	.08	.04	ECK-D2H681KB5

Voltage	Capacitance	Tolerance	Temp. Char.	Dimensions (mm) Dia.	Thickness	Lead Space	Digi-Key Part No.	Price Each 10	100	1,000	Panasonic Part No.
500	820pf	±10%	Y5P	7.0	4.0	5.0	P4111A-ND	.12	.08	.04	ECK-D2H821KB5
500	1000pf	±10%	Y5P	7.0	4.0	5.0	P4112A-ND	.18	.12	.07	ECK-D2H102KB5
500	1500pf	±10%	Y5P	7.0	4.0	5.0	P4115A-ND	.18	.12	.07	ECK-D2H152KB5
500	1800pf	±10%	Y5P	8.5	4.0	5.0	P4116A-ND	.18	.12	.07	ECK-D2H182KB5
500	2200pf	±10%	Y5P	8.5	4.0	5.0	P4165A-ND	.18	.12	.07	ECK-D2H222KB5
500	2700pf	±10%	Y5P	10.0	4.0	5.0	P4166A-ND	.19	.14	.08	ECK-D2H272KB5
500	3300pf	±10%	Y5P	10.0	4.0	5.0	P4167A-ND	.19	.14	.08	ECK-D2H332KB5
500	3900pf	±10%	Y5P	11.0	4.0	5.0	P4168A-ND	.19	.14	.08	ECK-D2H392KB5
500	4700pf	±10%	Y5P	13.0	4.0	10.0	P4169A-ND	.23	.17	.09	ECK-D2H472KB5
500	5600pf	±10%	Y5P	13.0	4.0	10.0	P4170A-ND	.23	.17	.09	ECK-D2H562KB5
500	6800pf	±10%	Y5P	14.0	4.0	10.0	P4171A-ND	.24	.17	.09	ECK-D2H682KB5
500	8200pf	±10%	Y5P	16.0	4.0	10.0	P4172A-ND	.24	.17	.09	ECK-D2H822KB5
500	10000pf	±10%	Y5P	17.5	4.0	10.0	P4198A-ND	.24	.17	.09	ECK-D2H103KB5
Class 1 Temperature Compensating											
50	10pf	±0.5pf	GP	5.0	3.5	2.5	P4012A-ND	.09	.06	.03	ECC-F1H100D
50	12pf	±5%	GP	5.0	3.5	2.5	P4013A-ND	.10	.07	.04	ECC-F1H120J
50	15pf	±5%	GP	5.0	3.5	2.5	P4014A-ND	.10	.07	.04	ECC-F1H150J
50	18pf	±5%	GP	5.0	3.5	2.5	P4015A-ND	.10	.07	.04	ECC-F1H180J
50	22pf	±5%	GP	5.0	3.5	2.5	P4016A-ND	.10	.07	.04	ECC-F1H220J
50	27pf	±5%	GP	5.0	3.5	2.5	P4017A-ND	.10	.07	.04	ECC-F1H270J
50	33pf	±5%	GP	5.0	3.5	2.5	P4018A-ND	.10	.07	.04	ECC-F1H330J
50	39pf	±5%	GP	5.0	3.5	2.5	P4019A-ND	.10	.07	.04	ECC-F1H390J
50	47pf	±5%	GP	5.0	3.5	2.5	P4020A-ND	.10	.07	.04	ECC-F1H470J
50	56pf	±5%	GP	5.0	3.5	2.5	P4021A-ND	.10	.07	.04	ECC-F1H560J
50	68pf	±5%	GP	5.0	3.5	2.5	P4022A-ND	.10	.07	.04	ECC-F1H680J
50	82pf	±5%	GP	5.0	3.5	2.5	P4023A-ND	.10	.07	.04	ECC-F1H820J
50	100pf	±5%	GP	5.0	3.5	2.5	P4024A-ND	.10	.07	.04	ECC-F1H101J
50	120pf	±5%	GP	5.0	3.5	2.5	P4025A-ND	.10	.07	.04	ECC-F1H121J
50	150pf	±5%	GP	5.0	3.5	2.5	P4026A-ND	.10	.07	.04	ECC-F1H151J
50	180pf	±5%	GP	5.0	3.5	2.5	P4027A-ND	.10	.07	.04	ECC-F1H181J
50	220pf	±5%	GP	6.5	3.5	5.0	P4028A-ND	.10	.07	.04	ECC-F1H221J
50	270pf	±5%	GP	6.5	3.5	5.0	P4029A-ND	.12	.08	.05	ECC-F1H271J
50	330pf	±5%	GP	6.5	3.5	5.0	P4030A-ND	.12	.08	.05	ECC-F1H331J
50	390pf	±5%	GP	8.0	3.5	5.0	P4031A-ND	.12	.08	.05	ECC-F1H391J
50	470pf	±5%	GP	8.0	3.5	5.0	P4032A-ND	.13	.09	.05	ECC-F1H471J
50	560pf	±5%	GP	9.5	3.5	5.0	P4033A-ND	.13	.09	.05	ECC-F1H561J
50	680pf	±5%	GP	9.5	3.5	5.0	P4034A-ND	.13	.09	.05	ECC-F1H681J
50	820pf	±5%	GP	10.5	3.5	5.0	P4035A-ND	.13	.09	.05	ECC-F1H821J
50	1000pf	±5%	GP	10.5	3.5	5.0	P4036A-ND	.19	.13	.08	ECC-F1H102J
50	10pf	±0.5pf	NPO	5.0	3.5	2.5	P4444A-ND	.16	.11	.06	ECC-F1H100DC
50	12pf	±5%	NPO	5.0	3.5	2.5	P4445A-ND	.16	.11	.06	ECC-F1H120JC
50	15pf	±5%	NPO	5.0	3.5	2.5	P4446A-ND	.16	.11	.06	ECC-F1H150JC
50	18pf	±5%	NPO	5.0	3.5	2.5	P4447A-ND	.16	.11	.06	ECC-F1H180JC
50	22pf	±5%	NPO	5.0	3.5	2.5	P4448A-ND	.16	.11	.06	ECC-F1H220JC
50	27pf	±5%	NPO	5.0	3.5	2.5	P4449A-ND	.16	.11	.06	ECC-F1H270JC
50	33pf	±5%	NPO	5.0	3.5	2.5	P4450A-ND	.16	.11	.06	ECC-F1H330JC
50	39pf	±5%	NPO	5.0	3.5	2.5	P4451A-ND	.16	.11	.06	ECC-F1H390JC
50	47pf	±5%	NPO	5.0	3.5	2.5	P4452A-ND	.20	.14	.08	ECC-F1H470JC4
50	56pf	±5%	NPO	6.5	3.5	5.0	P4453A-ND	.20	.14	.08	ECC-F1H560JC
50	68pf	±5%	NPO	6.5	3.5	5.0	P4454A-ND	.20	.14	.08	ECC-F1H680JC
50	82pf	±5%	NPO	6.5	3.5	5.0	P4455A-ND	.20	.14	.08	ECC-F1H820JC4
50	100pf	±5%	NPO	6.5	3.5	5.0	P4456A-ND	.24	.17	.10	ECC-F1H101JC4
50	120pf	±5%	NPO	8.0	3.5	5.0	P4457A-ND	.24	.17	.10	ECC-F1H121JC4
50	150pf	±5%	NPO	8.0	3.5	5.0	P4458A-ND	.27	.19	.11	ECC-F1H151JC4