ARITEC ELECTRONICS CO., LTD.

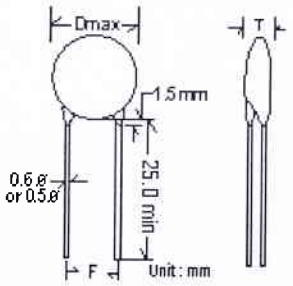
安 利 電 子 有 限 公 司

90 Moo 4 Ladkrabang Ind. Estate, Chalongkrung Road, Bangkok 10520

Sample Data Sheet of Ceramic Disc Capacitor (Class III)

Customer Code:	AEC Code: S224ZYFF082LF

Figure:

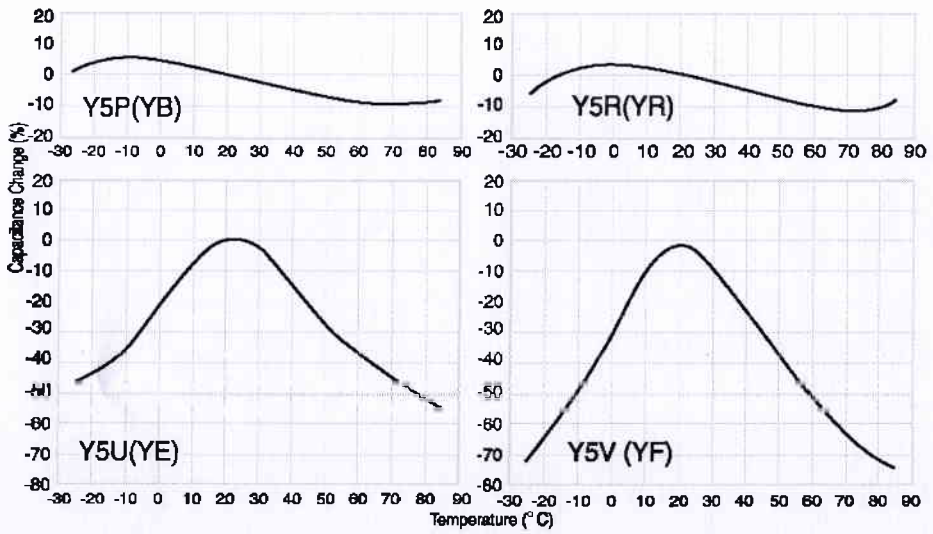


Dimension	(D)	: 9.0 ✓	m/m	max.
Thickness	(T)	: 3.5	m/m	max.
Lead Length	(H)	: 25.0 ✓	m/m	min
Insulation	(I)	: 1.5	m/m	max.
Lead Space	(F)	: 5.0 ±0.5	m/m	
Lead Wire	(d)	: 0.5 ±0.05	m/m	

REMARK : F = RoHS

Item/Symbol		Specifications
Instrument: HP4278A Test Frequency: 1KHz Test Voltage: 0.1Vrms Test Temperature: 25°C	Capacitance Range	176.0 – 396.0 nF
	Power Factor (D)	16V <7% (0.07) 25V , 50V, 100V <5% (0.05)
Temp. Characteristics		YB ☐ YE ☐ YF ☑
Rated Voltage		16V ☐ 25V ☐ 50V☐ 100V ☑
Tolerance		±10%☐ ±20%☐ +80%,-20%☑ ± %☐
Marking		F 224Z ✓ 100V
Insulation Resistance (Measured at working voltage for 1 minute		16V > 100MΩ 25V, 50V, 100V > 1000MΩ
Strength of Terminal		1.5 kgs minimum
Solder Heat		Temp. 270°C ±5°C Dipping Time: 3±0.5 Sec.
Solderability		Temp. 235°C ±5°C Dipping Time: 2±0.5 Sec.

Capacitance Temperature Characteristics



Temperature Compensating (TC) Capacitors 50 (160) ~ 6000WVDC

EIA RS 198 (Class I)
JIS C 6423 (Type I)
GB 5966-86 (CC_1)

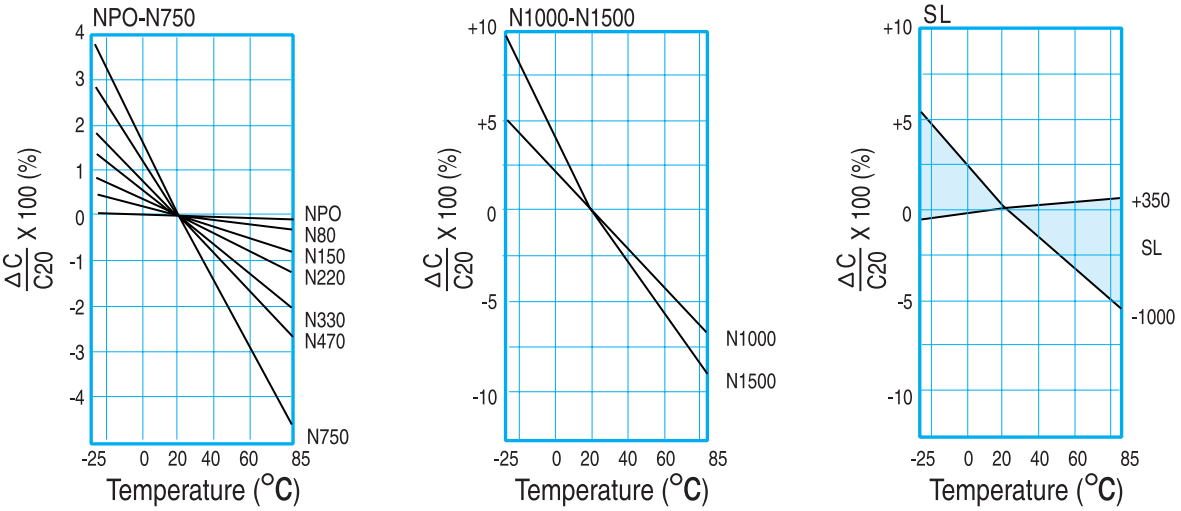
Features:
Δ Application for Resonant, Coupling, Matching CKT
Δ High Stability and High Q Requirement
Δ Low Loss at Wide Range of Frequency
Δ Linear Temperature Coefficient of Capacitance

Specifications:

Operating Temp. Range		–25°C to +85°C								
Capacitance	Range	0.5 to 1000PF measured at 1MHz±10%, 1Vrms, 25°C								
	tolerance	±0.25PF (C), ±0.5PF (D), ±5% (J), ±10% (K)								
Test Voltage		<1000VDC: 3 times of Working Voltage for 1~5 seconds								
		≥1000VDC: 2 times of Working Voltage for 1~5 seconds								
Quality Factor (Q.F.)	NPO~N750, SL	C <30PF	Q ≥400+20xC							
		C ≥30PF	Q ≥1000							
	N1000, N1500	C <30PF	Q ≥200+10xC							
		C ≥30PF	Q ≥500							
Insulation Resistance (I.R.)	10000MΩ min. at working voltage for 1 minute									
Temperature Characteristic –25°C ~ +85°C (Fig.3)	Cap. change PPM/°C	NPO ±60	N150 ±60	N220 ±60	N330 ±60	N470 ±60	N750 ±60	N1000 ±250	N1500 ±250	+350~ –1000
	EIA RS 198	C0H	P2H	R2H	S2H	T2H	U2J	V2K	W2K	S2L
	JIS C 6423	CH	PH	RH	SH	TH	UJ	VK	WK	SL
	GB 5966-86	C	P	R	S	T	U	Q	V	SL
Effect of Soldering	Cap. change within: ±2.5% or ±0.25PF. To be measured after 4~24 hours (Solder Temp.: 270±5°C, Dipping duration: 3±0.5 sec.)									
Life Test	Cap. change : within ±3% or ±3PF. Q.F. : Under 10PF, Q ≥200+10C : 10PF~30PF Q ≥275+5/2C : Over 30PF Q ≥350 I.R. : >1000MΩ							Test Condition and Method: 1. Temp.: 85±3°C 2. Test Duration: 1000 hours at 2 times W.V. 3. To be measured after 1~2 hours at room temp.		
Solderability	It does not remains unsoldered area over 1/4 of the circumference of the lead. (Solder Temp.: 235±5°C, Dipping duration: 2±0.5 sec.)									

Fig. 3

TEMPERATURE CHARACTERISTICS



High Dielectric Constant (Hi-K) Capacitors 50 (160) ~ 6000WVDC

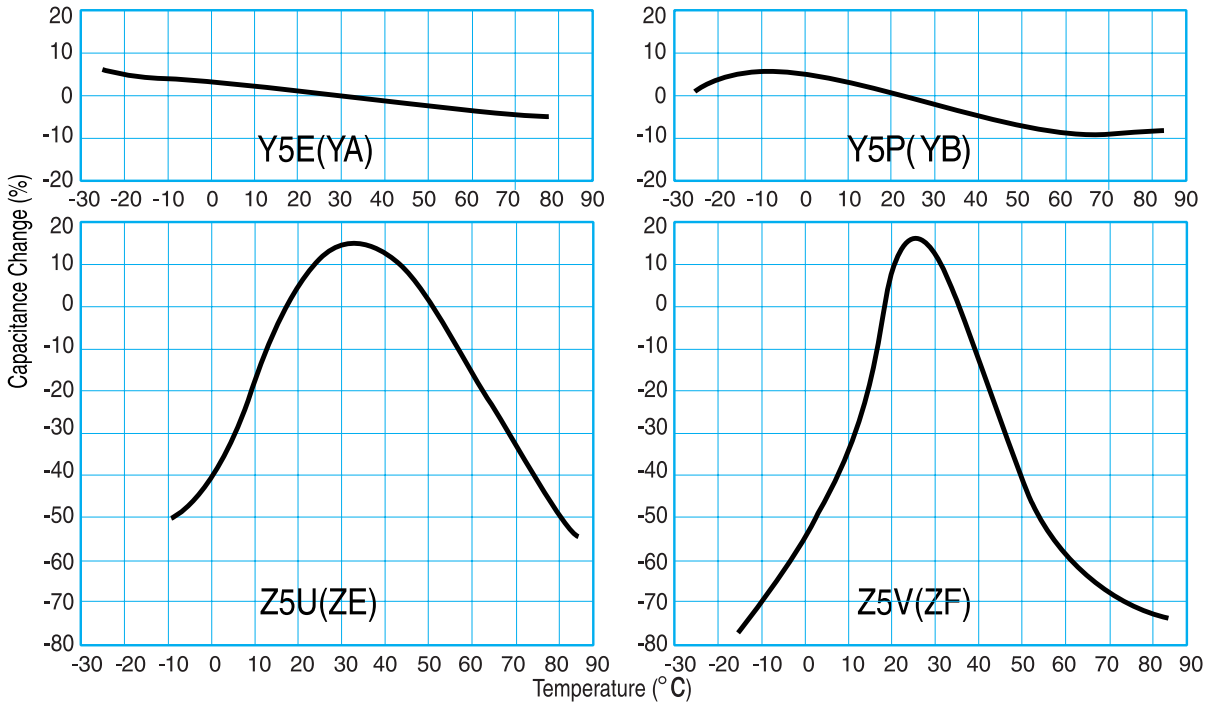
EIA RS 198 (Class II)
JIS C 6422 (Type II)
GB 5968-86 (CT_1)

Features:
Δ Application for Band Filter, By-pass, Coupling CKT
Δ Low dissipation factor and high insulation resistance
Δ Freq. discriminating which Q and stability of cap. char. are not major importance
Δ Non Linear temperature coefficient of capacitance

Specifications:

Operating Temp. Range		+10°C to +85°C for ZE, ZF		–25°C to +85°C for YA, YB		
Capacitance	Range	100PF to 0.1 UF measured at 1KHz±10%, 1Vrms, 25°C				
	Tolerance	±5% (J) for YA, ±10% (K) for YA, YB, ±20% (M) for YB, ZE, $^{+80}_{-20}$% (Z) for ZE, ZF				
Test Voltage		<1000VDC: 2.5 times of Working Voltage for 1~5 seconds				
		≥1000VDC: 2 times of Working Voltage for 1~5 seconds				
Dissipation Factor (D.F.)		2.5% Max. for YA, YB, ZE at 1KHz, 1Vrms, 25°C				
		5% Max for ZF at 1KHz, 1Vrms, 25°C				
Insulation Resistance (I.R.)		10000MΩ min. at working voltage for 1 minute				
Temperature Characteristic –25°C ~ +85°C (Fig.4)		Cap. change within	±5%	±10%	+20/–55%	+30/–80%
		EIA RS 198	Y5E	Y5P	Z5U	Z5V
		JIS C 6422	YA	YB	ZE	ZF
		GB 5968-86		$2B_4$	$2E_4$	$2F_4$
Effect of Soldering		Cap. change within: ±3.5% (YA), ±5% (YB), ±15% (ZE), ±20% (ZF) To be measured after 4~24 hours (Solder Temp.: 270±5°C, Dipping duration: 3±0.5 sec.)				
Life Test		Cap. change: within ±5% (YA), ±10% (YB) ±20% (ZE), ±30% (ZF) D.F. : 5% Max for YA, YB, ZE 7.5% Max for ZF I.R. : >1000MΩ		Test Condition and Method: 1. Temp.: 85±3°C 2. Test Duration: 1000 hrs at 2 times W.V. 3. To be measured after 1~2 hours at room temp.		
Solderability		It does not remain unsoldered area over 1/4 of the circumference of the lead. (Solder Temp.: 235±5°C, Dipping duration: 2±0.5 sec.)				

Fig. 4



Semi-Conductive (S.C.) Capacitors 12 (16) ~ 50 (100)WVDC
(Surface Layer Type)

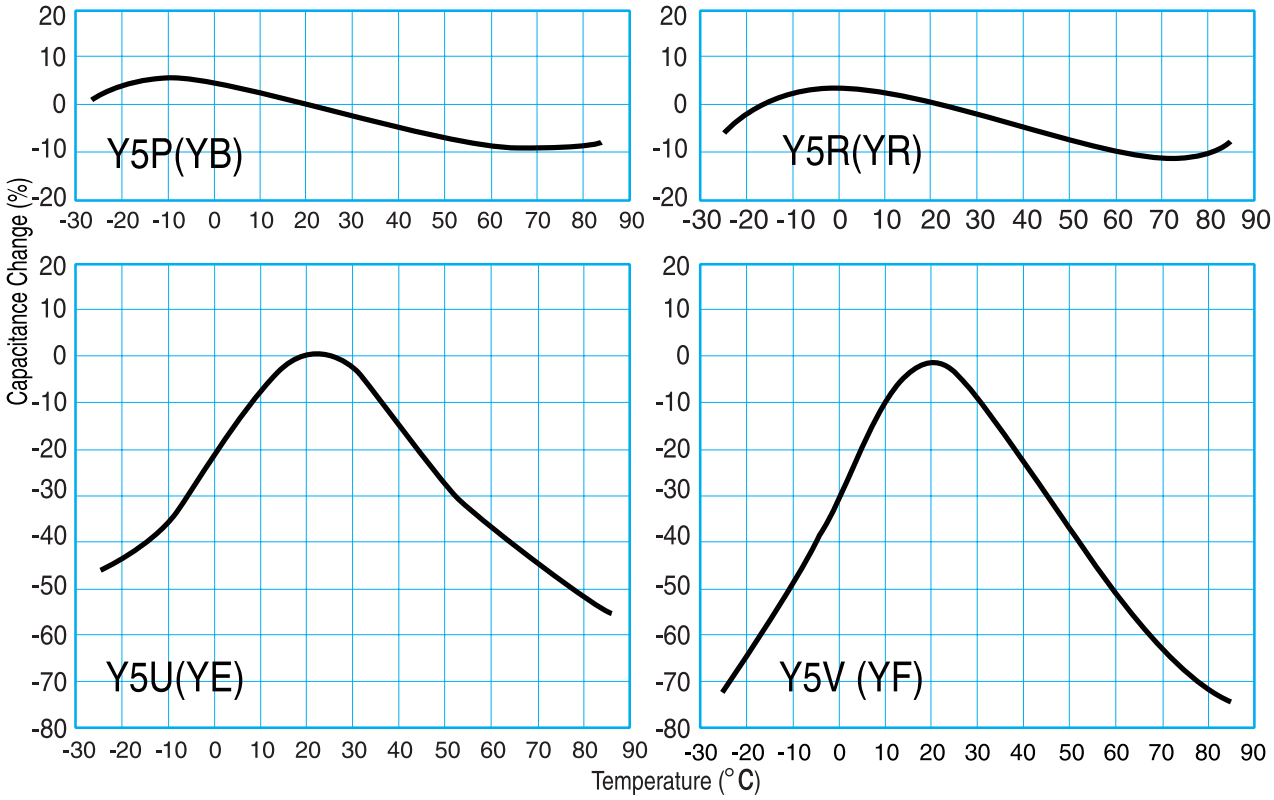
EIA RS 198 (Class III)
JIS C 6422 (Type III)

Features:
- Δ Application for By-pass, Coupling CKT
- Δ Frequency determination, in which dielectric losses (Dissipation Factor) and Insulation Resistance and Cap. Stability are not major importance.
- Δ Large capacitance in small size (Transistorized)

Specifications:

Operating Temp. Range	–25°C to +85°C			
Capacitance Range	0.0027 μF to 0.47 μF measured at 1KHz±10%, 0.1Vrms, 25°C			
Capacitance Tolerance	±10% (K) for YB, ±20% (M) for YB, YE, $^{+80}_{-20}$% (Z) for YE, YF			
Test Voltage	2.5 times of Working Voltage for 1~5 seconds			
Dissipation Factor (D.F.)	16V <7% ; 25V–50V <5% at 1KHz ±10%, 0.1 Vrms, 25°C			
Insulation Resistance (I.R.)	16V >100MΩ ; 25V–50V >1000MΩ at working voltage for 1 minute			
Temperature Characteristic –25°C ~ +85°C (Fig.5)	Cap. change within	±10%	+20/–55%	+30/–80%
	EIA RS 198	Y5P	Y5U	Y5V
	JIS C 6422	YB	YE	YF
Effect of Soldering	Cap. change within: ±5% (YB), ±15% (YE), ±20% (YF), To be measured after 4~24 hours (Solder Temp.: 270±5°C, Dipping duration: 3±0.5 sec.)			
Life Test	Cap. change: within ±10% (YB), ±20% (YE) ±30% (ZF) D.F. : 16V <10%, 25V-50V <7.5% I.R. : 16V >50MΩ, 25V-50V >500MΩ	Test Condition and Method: 1. Temp.: 85±3°C 2. Test Duration: 1000hrs at 1.5 times W.V. 3. To be measured after 1~2 hours at room temp.		
Solderability	It does not remain unsoldered area over 1/4 of the circumference of the lead. (Solder Temp.: 235±5°C, Dipping duration: 2±0.5 sec.)			

Fig. 5



Range Chart (Capacitance in pF)

CLASS I / TYPE I / CC1

T.C. / W.V.DC	CH NPO	PH N150	RH R220	TH N470	UJ N750	SL +350~-100	DIMENSION MAX (MM)
50V/100V	0.5-47	1-33		1-50		1-200	5.5
	50-82	34-56		51-82		200-220	6.5
	100-120	60-82		85-120		240-330	7.5
	130-180	85-110		130-180		340-470	8.5
	200-220	120-150		200-220		500-680	9.5
	230-270	160-220		230-270		820-1000	10.5
	280-330	-		-		-	11.5
	340-390	-		-		-	12.5
	470	-		-		-	14.5

CLASS II / TYPE II / CT1

T.C. / W.V.DC	B ±10%	E +20~-55%	F +30~-80%	DIMENSION MAX (MM)
50V/100V	100-2200	1000-5600	1000-10000	5.5
	2700-3300	6800-10000	10000	6.5
	3900-4700	12000	15000, 18000	7.5
	5600-6800	15000	20000, 220000	8.5
	8200-10000	18000-22000	30000, 330000	9.5
	-	-	390000, 50000	10.5

CLASS III / TYPE III / S.C.

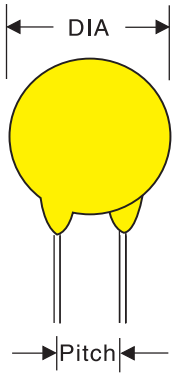
T.C. / W.V.DC	YB ±10%	YE +20~-55%	YF +30~-80%	DIMENSION MAX (MM)
16V	3300-10000	3300-22000	-	5.5
	15000-22000	30000-50000	68000-100000	6.5
	22000-50000	68000-100000	150000-180000	7.5
	68000-100000	-	200000-220000	9.5
	-	220000	330000-470000	10.5
25V	3300-10000	3300-22000	10000-47000	5.5
	15000-22000	30000-50000	68000-100000	6.5
	22000-47000	68000-100000	150000-180000	7.5
	-	-	200000-220000	10.5
50V	3300-10000	3300-22000	10000-47000	5.5
	15000-22000	30000-40000	680000	6.5
	22000-33000	47000-50000	100000	7.5
	47000	68000-100000	-	8.5
	-	-	220000	10.5

Range Chart (Capacitance in pF)

T.C. / W.V.DC	CH NPO	SL +350~-1000	B ±10%	E +20~-55%	F +30~-80%	DIMENSION MAX (MM)
500V	0.5-27	15-68	100-470	1000-1500	1000-3300	5.5
	30-47	82-100	560-1000	2000-3300	4700-5000	6.5
	56-68	120-180	1500, 1800	3900-5000	5600-6800	7.5
	82-100	200-270	2000, 2200	5600, 6800	10000	8.5
	-	300-330	2700, 3300	8200	-	9.5
	-	340-390	3900, 4700	10000	-	10.5
	-	-	5600, 6800	15000	20000, 22000	12.5
	-	-	8200, 10000	20000, 22000	47000	14.5
	-	-	-	-	100000	20.5
1KV	1-22	1-68	100-500	1000	1000-3300	5.5
	-	-	560-1000	1500-2200	4700-5000	6.5
	25-39	75-110	1200-1500	2700	5600	7.5
	-	-	1800-2000	3000-3900	6800	8.5
	47, 50	120-200	2200	4700-5600	-	9.5
	51-100	220-300	2700, 3000	6800, 8200	10000	10.5
	100-120	330-390	3300, 4700	10000	-	12.5
	150	470-560	5600, 6800	15000	22000	14.5
	220	620-750	8200, 10000	-	-	18.5
	330	820-1000	-	-	47000	20.5
2KV	1-22	1-47	100-150	1000, 1200	1000, 1200	7.5
	-	68-100	180-470	-	1500, 1800	8.5
	-	-	500-680	1500, 1800	2000-2700	9.5
	-	-	820, 1000	2000-2700	3000-3900	10.5
	-	-	1200-2200	3000-3900	4700-5600	11.5
	-	-	2700, 3000	4700-5000	6800-10000	13.5
	-	-	2700, 3000	5600	-	15.5
	-	-	3300	6800	-	16.5
	-	-	3900-5000	8200, 10000	15000	17.5
	-	-	5600, 6800	-	-	20.5
	-	-	8200, 10000	-	22000	23.5

Lead pitch v.s. body size

pitch \ DIA	≤6 Ø	7 Ø	8 Ø	9 Ø	10 Ø	11 Ø	12 Ø	14 Ø above
2.5 mm	✓							
5 mm	✓	✓	✓	✓	✓	✓	–	–
7.5 mm	–	★	★	★	◯	◯	✓	✓
10.0 mm	–	–	–	–	–	◯	✓	✓



" ✓ " Standard pitch for each size. " ★ " Standard pitch for w.v. 2kv & above.
" ◯ " available for customers' reguirement

Marking principle

Line 1 : Temperature characteristic

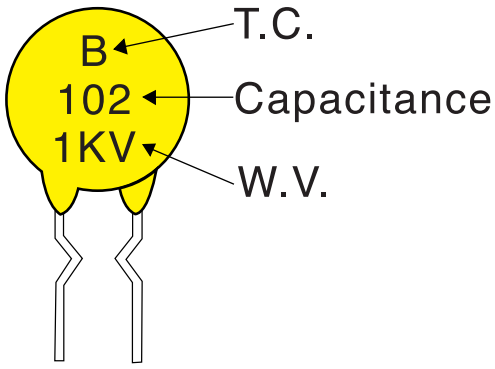
	NPO	N220	N750	SL	Y5P	Y5U (Z5U)	Y5V (Z5V)
Code	CH	RH	UJ	S	B	E	F
Mark	Black dot	Yellow dot	Violet dot	None	B	E	F

Line 2 : Capacitance

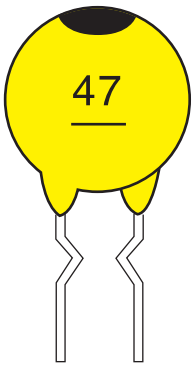
1. show with EIA code
   101=100pf 472=4700pf 104=0.1uf
   221=220pf 563=56000pf
2. show actual value in pf
   which capacitance below 100pf.

Line 3 : Working voltage

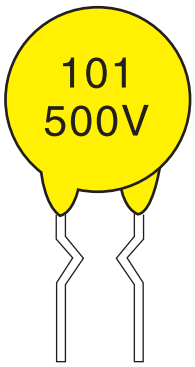
Mark a bar (---) for 50V-100V
otherwise mark the exact volt.



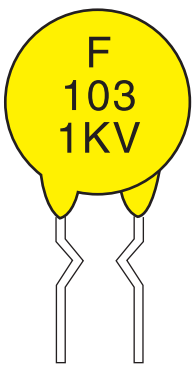
EX:



NPO
47 pf
50V



SL
100 pf
500V



Y5V
10,000pf
1KV

Low D.F. Type

* Low D.F performance v.s. high temperature
* Low power loss in linear circuit "power supply" "monitor" "T.V set"

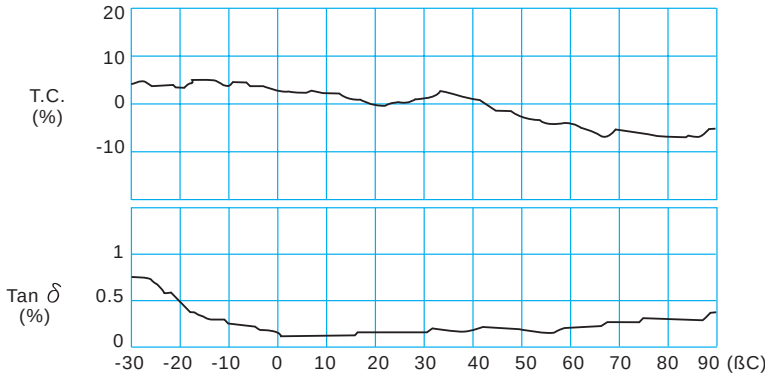
Range Chart

T.C.	D.F	Capacitance	Pitch	Dia. (mm)
Y5P (2KV)	0.5% (max)	100 - 390pF	5, 7.5	7
		470 - 680pF	5, 7.5	9
		820 - 1000pF	5, 7.5	11
		1200pF	7.5, 10	12
		2700pF	7.5, 10	15

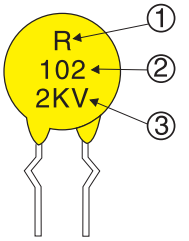
Electrical Specification

	Specification	Test condition
Capacitance	To be within the spec tolerance.	to be measured at 25°C±1°C at 1±0.2 Vrms 1KHz
Dissipation factor	D.F.≤0.5%	
Insulation resistance	I.R.≥10GΩ	To be measured at 500 VDC
Dielectric strength	With Standing 200% W.V.	200% working voltage applied

Temperature characteristic and D.F. curves

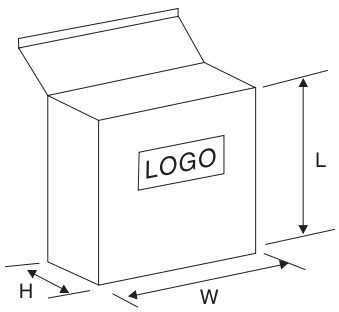


Marking Principle



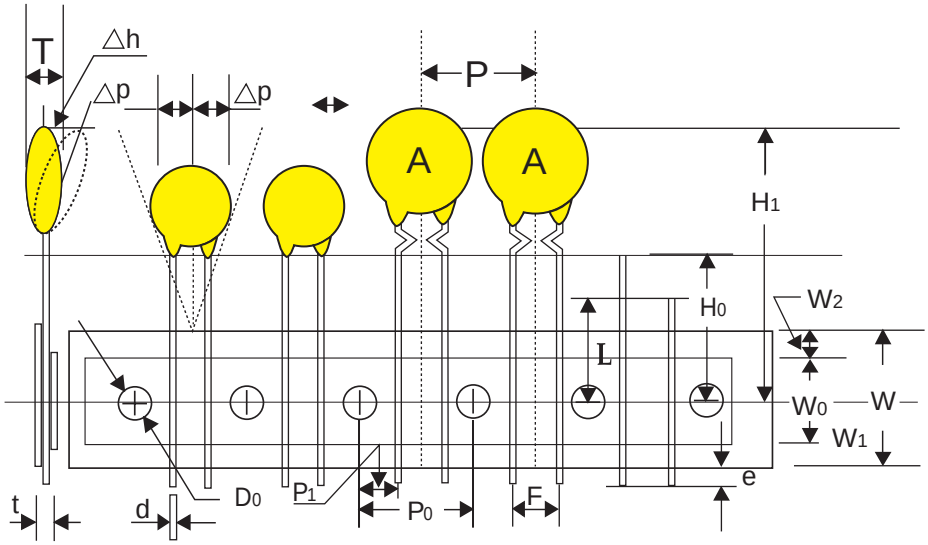
(1) Low D.F. (Y5P) type
(2) Capacitance
(3) Working voltage

Package quantity



Box size: 330×250×50mm (W × L × H)
Ammo : 2000pcs/box
Bulk : 1000pcs/bag

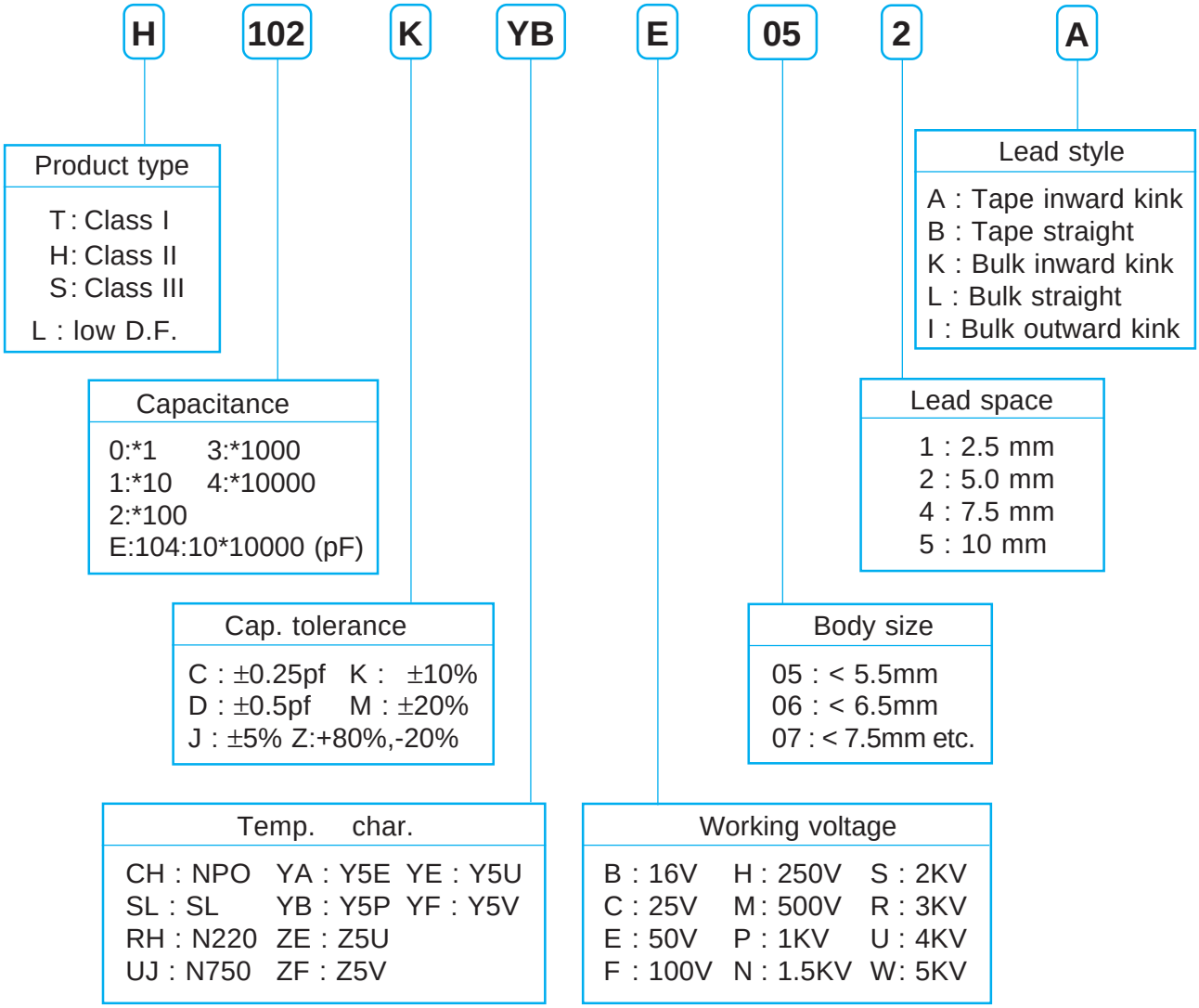
Packing Specification



		unit:mm	unit:inch
Body Dimension	A	11.0*11.0 Max	0.43*0.43 Ref
Body Thickness	T	4.0 Max	0.157 Ref
Wire Lead Dia.	d	0.60±0.05	#24 AWG
Taping Pitch	P	12.7 Ref	0.05 Ref
Feed Hole Pitch (Note:1)	P0	12.7±0.3	0.5 Ref
Plane Deviation	ΔP	+1.0 Max	0.0394 Ref
Feed Hole Off Alignment (2e)	P1	3.81±0.7	0.15 Ref (F=5.08)
(1e)	P1	5.08±0.7	0.20 Ref (F=2.54)
Lead Spacing	F	5.08±0.5	0.2 Ref
	F	2.54±0.5	0.10 Ref
Body Inclination	Δh	0±1.0	0±0.39 Ref
Carrier Tape Width	W	18.0±1.0/-0	0.709 Ref
Adhesive Tape Width	W0	13.0 Ref	0.512 Ref
Feed Hole Ht Off Alignment	W1	9.0+0.75/-0.5	0.354 Ref
Adhesive Tape Width	W2	3.0 Ref	0.118 Ref
Straight Lead Height (Note:2)	H	20.0±0.5	0.787 Ref
Lead Crimp Height	H0	16.0 or 18.0±0.5	0.63 Ref
Top of Component Height	H1	32.0 Max	1.20 Ref
Lead End Protrusion	e	1.0 Max	0.039 Ref
Feed Hole Diameter	D0	4.0±0.3	0.157 Ref
Overall Tape Thickness	t	0.9 Max	0.035 Ref
Rejected Component Cut Height	L	10.0 Max	0.394 Ref

Note :
1. Cumnlative pitch tolerance over 20 consecutive units not to exceed ±1.0 mm
2. H=20.0±0.5 for lead style. L, Ho=16 or 18.0±0.5 mm for lead style K, I
3. Dimensions meet requirement defined in EIA RS468

Part number system



*Please contact with us if your design has a special requirement.

Lead style

Lead Style	M (max)	A
L	2 mm	5 mm ↓ 25 mm
I	5 mm	
K	5 mm