REQUEST FOR APPROVAL

CUSTOMER	
PRODUCT	CERAMIC CAPACITOR (DISC TYPE)
MODEL	AC HIGH VOLTAGE PRODUCTS (AA,AD 250V,400V)
CONTENTS	● PRODUCT SPECIFICATION ● HAZARD MATERIAL ANALYSIS RESULT ● TAPING SPECIFICATION

DRAFT	REVIEW	DECISION
		
05.06.23	/	05.06.23

NETRON TECH CO., LTD.

Document No.	YU-2	CERAMIC CAPACITOR SPECIFICATION (DISC TYPE)	Draft	Review	Decision
Making Date	2005.06.02.				
Rev. Date(No.)	-				
Written by	L.Y. PARK		06/23	/	06/23

● CUSTOMER :
● PRODUCT : CERAMIC CAPACITOR (DISC TYPE)
● MODEL : AC HIGH VOLTAGE PRODUCT(250V, 400V)

CONTENT

TRADE MARK : NRT
NETRON TECH CO.,LTD.

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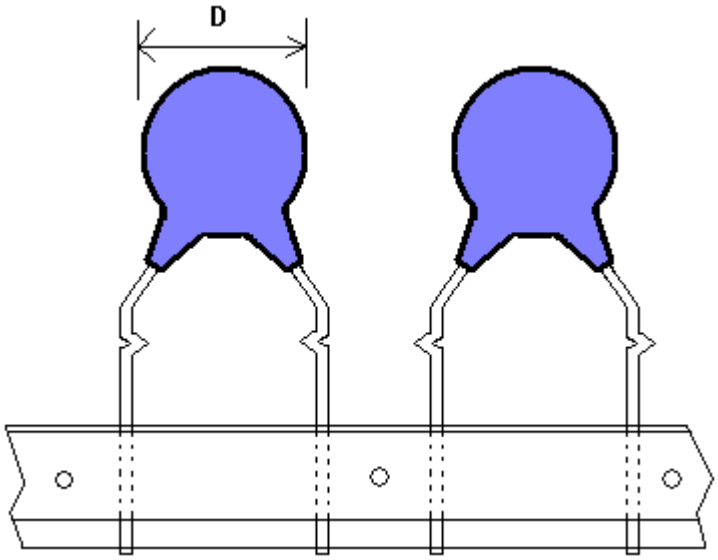
TEL : +86-631-898-5079 , FAX : +86-631-898-5208

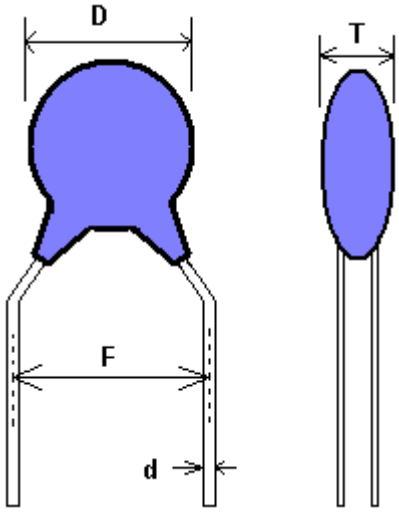
1. SCOPE

: THIS SPECIFICATION IS APPLIED TO THE CAPACITOR WHICH ARE USED TO ANTENNA-COUPLING, LINE-BY-PASS, ACROSS-THE-LINE FOR THE APPLIANCE LIKE POWER SUPPLY, TV, VCR, MONITOR.
OPERATING TEMPERATURE IS -25℃ ~ +85℃.

2. PRODUCT SHAPE



(TAPING)



(BULK)

3. PART NUMBER

: HC (1) YE (2) 2G (3) 102 (4) M (5) AAT(F5) (6)

1) HIGH VOLTAGE PRODUCT(COMMON CODE)
2) TEMPERATURE CHARACTERISTICS
3) RATED VOLTAGE
4) NOMINAL CAPACITANCE
5) CAPACITANCE TOLERANCE
6) SHAPE CODE

2) TEMPERATURE CHARACTERISTICS	
CODE	CAPACITANCE CHANGE
YB	±10%
YE	+20 ~ -55%

3) RATED VOLTAGE	
2E	250V-A.C
2G	400V-A.C

4) NOMINAL CAPACITANCE	
102	1000 pF
151	150 pF

5) CAP. TOLERANCE	
K	±10%
M	±20%

6) SHAPE CODE	
AA	BULK
AAT	TAPING

4. MODEL SPECIFICATION

: REFER TO PAGE 6.

5. INSTRUMENT

1) CAPACITANCE AND DISSIPATION FACTOR : LCR METER(HP 4278A)
2) INSULATION RESISTANCE : HIGH RESISTANCE METER(HP 4339B)
3) VOLTAGE PROOF : WITHSTANDING VOLTAGE TESTER(KIKUSUI TOS-5101)

6. SAFETY CERTIFICATE

INSTITUTE	STANDARD	RATED VOLTAGE	CERTIFICATE NO. (AA / AD)		CAPACITANCE RANGE (pF)	
UL	UL 1414	125/250Vac	E87113	E87113	100~10000	100~4700
CSA	CSA C22,2	125/250Vac	1155420	1155420	100~10000	100~4700
VDE	IEC 384-14 2nd Ed.	250/400Vac	40002893	40002896	100~10000	100~4700
SEMKO		250/400Vac	300739	0047048/01-02	100~10000	100~4700
DEMKO		250/400Vac	134181-01	134170-01	100~10000	100~4700
NEMKO		250/400Vac	P03100096	P03100095	100~10000	100~4700
FIMKO		250/400Vac	FI 16105	FI 16104	100~10000	100~4700
SEV		250/400Vac	01.0056	01.0057	100~10000	100~4700
EK		250/400Vac	SU03005-2001	SU03005-2002	100~10000	100~4700

7. ELECTRICAL TEST

1) NOMINAL CAPACITANCE

: THE CAPACITANCE SHALL BE WITHIN SPECIFIED TOLERANCE WHEN MEASURED AT 20℃ WITH 1±0.1㎑ AND AC 1~5V(r.m.s).

2) DISSIPATION FACTOR (D.F)

: THE DISSIPATION FACTOR MUST SATISFY TABLE-1 WHEN MEASURED AT 20℃ WITH 1±0.1㎑ AND AC 1~5V(r.m.s).

(TABLE 1)

YB, YE	D.F ≤ 2.5%

3) INSULATION RESISTANCE(I.R)

: THE INSULATION RESISTANCE MUST SATISFY TABLE-2 WHEN MEASURED WITH DC500±50V WITHIN 60±5S OF CHARGING.

(TABLE 2)

YB , YE	I.R≥10,000 ㏁

4) VOLTAGE PROOF

: THE CAPACITOR SHALL NOT BE DAMAGE WHEN AC 2,500V(r.m.s) (IN CASE "AD" IS 4,000V) VOLTAGE ARE APPLIED BETWEEN THE LEAD WIRES FOR 1~5S.(CHARGE/DISCHARGE CURRENT≤10㎃)

5) TEMPERATURE CHARACTERISTICS

: THE CAPACITANCE MEASUREMENT SHALL BE MADE AT EACH STEP SPECIFIED IN TABLE-3 AT A SUFFICIENT NUMBER OF INTERMEDIATE TEMPERATURES BETWEEN STEP 2 AND 4. CAPACITANCE CHANGE FROM THE VALUE OF STEP 3 SHALL NOT EXCEED THE LIMIT SPECIFIED WHEN MEASURING CAPACITANCE AFTER KEEPING 30 MINUTE IN EACH STEP.

(TABLE 3)

CHARACTER	1 ~ 5 STEP TEMPERATURE RANGE(℃)	CAPACITANCE CHANGE
YB	(1STEP)+20±2℃, (2STEP)-25±3℃, (3STEP)+20±2℃, (4STEP)+85±2℃, (5STEP)+20±2℃	WITHIN ± 10%
YE		WITHIN +20 ~ -55%

6) HUMIDITY(UNDER STEADY STATE)
: SET THE CAPACITOR FOR 500±12H AT 40±2℃ IN 90 TO 95% RELATIVE HUMIDITY. AND THEN CAPACITOR MUST SATISFY TABLE-4.
※POST-TREATMENT : CAPACITOR SHALL BE STORED FOR 1~2H AT ROOM CONDITION. (ROOM CONDITION : 15~35℃, RELATIVE HUMIDITY = 45~75%)

(TABLE 4)

APPEARANCE	NO MARKED DEFECT
CAPACITANCE CHANGE	YB : WITHIN ±10%, YE : WITHIN ±15%
DISSIPATION FACTOR(D.F)	D.F≤5.0% (YB , YE)
INSULATION RESISTANCE(I.R)	YB , YE : I.R ≥ 3,000 MΩ
VOLTAGE PROOF	PASS THE ITEM 7.4.

7) HUMIDITY LOADING
: APPLY THE RATED VOLTAGE FOR 500±12H AT 40±2℃ IN 90 TO 95% RELATIVE HUMIDITY. AND THEN CAPACITOR MUST SATISFY TABLE-5.
※POST-TREATMENT : CAPACITOR SHALL BE STORED FOR 1~2H AT ROOM CONDITION. (ROOM CONDITION : 15~35℃, RELATIVE HUMIDITY = 45~75%)

(TABLE 5)

APPEARANCE	NO MARKED DEFECT
CAPACITANCE CHANGE	YB : WITHIN ±10%, YE : WITHIN ±15%
DISSIPATION FACTOR(D.F)	D.F≤5.0% (YB , YE)
INSULATION RESISTANCE(I.R)	YB , YE : I.R ≥ 3,000 MΩ
VOLTAGE PROOF	PASS THE ITEM 7.4.

8) LIFE
: APPLY AC 425V(r.m.s) VOLTAGE TO CAPACITOR FOR 1000H AT 85±2℃, RELATIVE HUMIDITY 50% MAXIMUM. CAPACITOR MUST SATISFY TABLE-6.
(EACH 1.0HOUR, THE VOLTAGE SHALL BE INCREASED TO AC 1,000V(r.m.s) FOR 0.1S.)
※POST-TREATMENT : CAPACITOR SHALL BE STORED FOR 1~2H AT ROOM CONDITION. (ROOM CONDITION : 15~35℃, RELATIVE HUMIDITY = 45~75%)

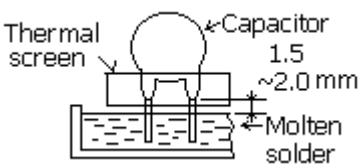
(TABLE 6)

APPEARANCE	NO MARKED DEFECT
CAPACITANCE CHANGE	YB, YE : ±20%
INSULATION RESISTANCE(I.R)	YB , YE : I.R ≥ 3,000 MΩ
VOLTAGE PROOF	PASS THE ITEM 7.4.

9) SOLDERING EFFECT
: THE LEADWIRE SHALL BE IMMERSED INTO THE MELTED SOLDER OF 350±10℃ UP TO ABOUT 1.5~2.0㎜ FROM THE MAIN BODY FOR 3.5±0.5S. (IN CASE 260±5℃ TEST, 10±1S.) CAPACITOR MUST SATISFY TABLE-7.
※PRE-TREATMENT : CAPACITOR SHALL BE STORED AT 85±2℃ FOR 1H, THEN PLACED AT ROOM CONDITION FOR 24±2H BEFORE INITIAL MEASUREMENT.
※POST-TREATMENT : CAPACITOR SHALL BE STORED FOR 1~2 H AT ROOM CONDITION. (ROOM CONDITION : 15~35℃, RELATIVE HUMIDITY = 45~75%)

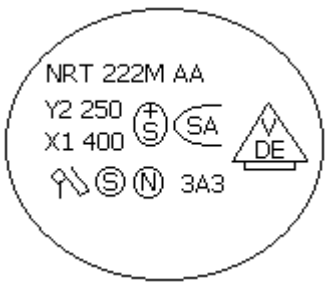
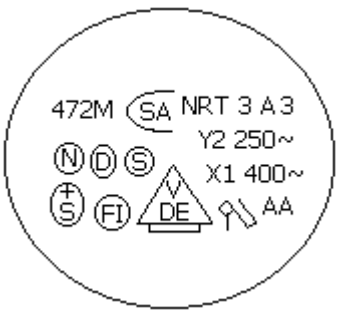
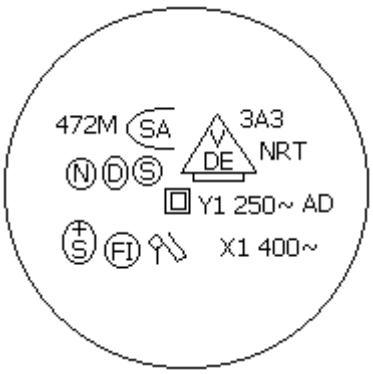
(TABLE 7)

APPEARANCE	NO MARKED DEFECT
CAPACITANCE CHANGE	YB, YE : ±10%
INSULATION RESISTANCE(I.R)	YB , YE : I.R ≥ 10,000 MΩ
VOLTAGE PROOF	PASS THE ITEM 7.4.



8. MARKING

1) COMPANY NAME
   : NRT
2) TEMPERATURE CHARACTERISTICS
   : OMIT
3) TYPE NAME
   : AA
4) NOMINAL CAPACITANCE & TOLERANCE
   : MARK THREE DIGIT AND CAPITAL (222M)
5) MANUFACTURING DATE
   : MARK BY YEAR, MONTH, WEEK (3A3)
6) SAFETY MARK
   : REFER TO THE MARKING EXAMPLE BY MODEL

MODEL	SAFETY MARK	MARKING EXAMPLE	
YB2G101KAA YB2G151KAA YB2G221KAA YB2G331KAA YB2G471KAA YE2G102MAA YE2G152MAA / YB2G101KAD YB2G151KAD YB2G221KAD YB2G331KAD YB2G471KAD YE2G102MAD YE2G152MAD	3EA		
YE2G222MAA	6EA		-
YE2G332MAA YE2G472MAA / YE2G222MAD YE2G332MAD YE2G472MAD	8EA		

■ PRODUCT LIST

NRT CODE	YU CODE	CAPACITANCE (pF)	RATED VOLTAGE	DIMENSION (max.)		SHAPE
				D	T	
YB2G101KAA	-	100	250V	8.0	5.0	BULK
YB2G151KAA	-	150	250V	8.0	5.0	BULK
YB2G221KAA	-	220	250V	8.0	5.0	BULK
YB2G471KAA	-	470	250V	9.5	5.0	BULK
YB2G102KAA	-	1000	250V	12.0	5.0	BULK
YE2G102MAA	-	1000	250V	8.0	5.0	BULK
YE2G152MAA	-	1500	250V	9.5	5.0	BULK
YE2G222MAA	-	2200	250V	10.5	5.0	BULK
YE2G332MAA	-	3300	250V	12.0	5.0	BULK
YE2G472MAA	-	4700	250V	13.5	5.0	BULK
YB2G101KAD	-	100	400V	8.0	5.5	BULK
YB2G151KAD	-	150	400V	8.0	5.5	BULK
YB2G221KAD	-	220	400V	8.0	5.5	BULK
YB2G331KAD	-	330	400V	8.0	5.5	BULK
YB2G471KAD	-	470	400V	9.5	5.5	BULK
YE2G102MAD	-	1000	400V	9.5	5.5	BULK
YE2G152MAD	-	1500	400V	10.0	5.5	BULK
YE2G222MAD	-	2200	400V	11.0	5.5	BULK
YE2G332MAD	-	3300	400V	13.0	5.5	BULK
YE2G472MAD	-	4700	400V	14.5	5.5	BULK

■ HAZARD MATERIAL ANALYSIS RESULT

MODEL	PRODUCT ANALYSIS RESULT	Cd (PPM)	Pb (PPM)	Hg (PPM)	Cr6+ (PPM)	PBBs (PPM)	PBDEs (PPM)	EXAMPLE
YB2G101KAA YB2G151KAA YB2G221KAA YB2G331KAA YB2G471KAA YE2G102MAA YE2G152MAA YE2G222MAA YE2G332MAA YE2G472MAA	OK	<5	<100	<100	<100	<100	<100	
YB2G101KAD YB2G151KAD YB2G221KAD YB2G331KAD YB2G471KAD YE2G102MAD YE2G152MAD YE2G222MAD YE2G332MAD YE2G472MAD	OK	<5	<100	<100	<100	<100	<100	

P A R T N U M B E R E X P L A N A T I O N

HC	YE	2G	222	M	AA	(T	F	07)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

1. Common code

HC	high voltage ceramic capacitor (1~3KVdc & 125~400Vac)

2. Temperature characteristics

Character.	Capacitance tolerance
YB	±10%
YE	+20~-55%
FZ	+30~-95%

3. Rated voltage

2B	2E	2G
125Vac	250Vac	400Vac

4. Nominal capacitance

100	201	222	(ex) 222 : 22×10^{2} =2200
10pF	200pF	2200pF	

5. Capacitance tolerance

Code	Capacitance tolerance
K	± 10%
M	± 20%

6. Type name

Code	Subclass
AA	X1 Y2 - CAP.
AD	X1 Y1 - CAP.

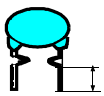
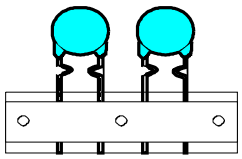
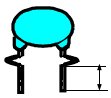
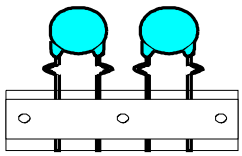
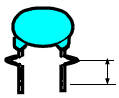
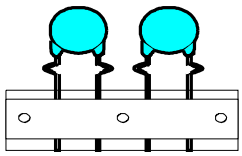
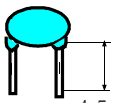
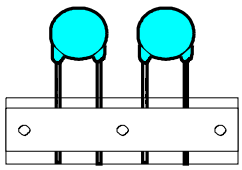
P A R T N U M B E R E X P L A N A T I O N

HC	YE	2G	222	M	AA	(T	F	07)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

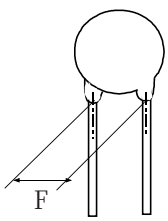
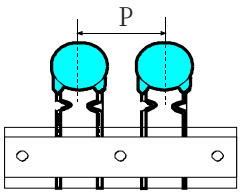
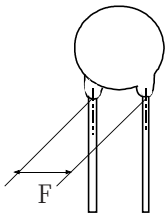
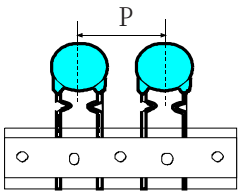
7. Shape code

Code	Type
-	Bulk
T	Taping

8. Lead form style

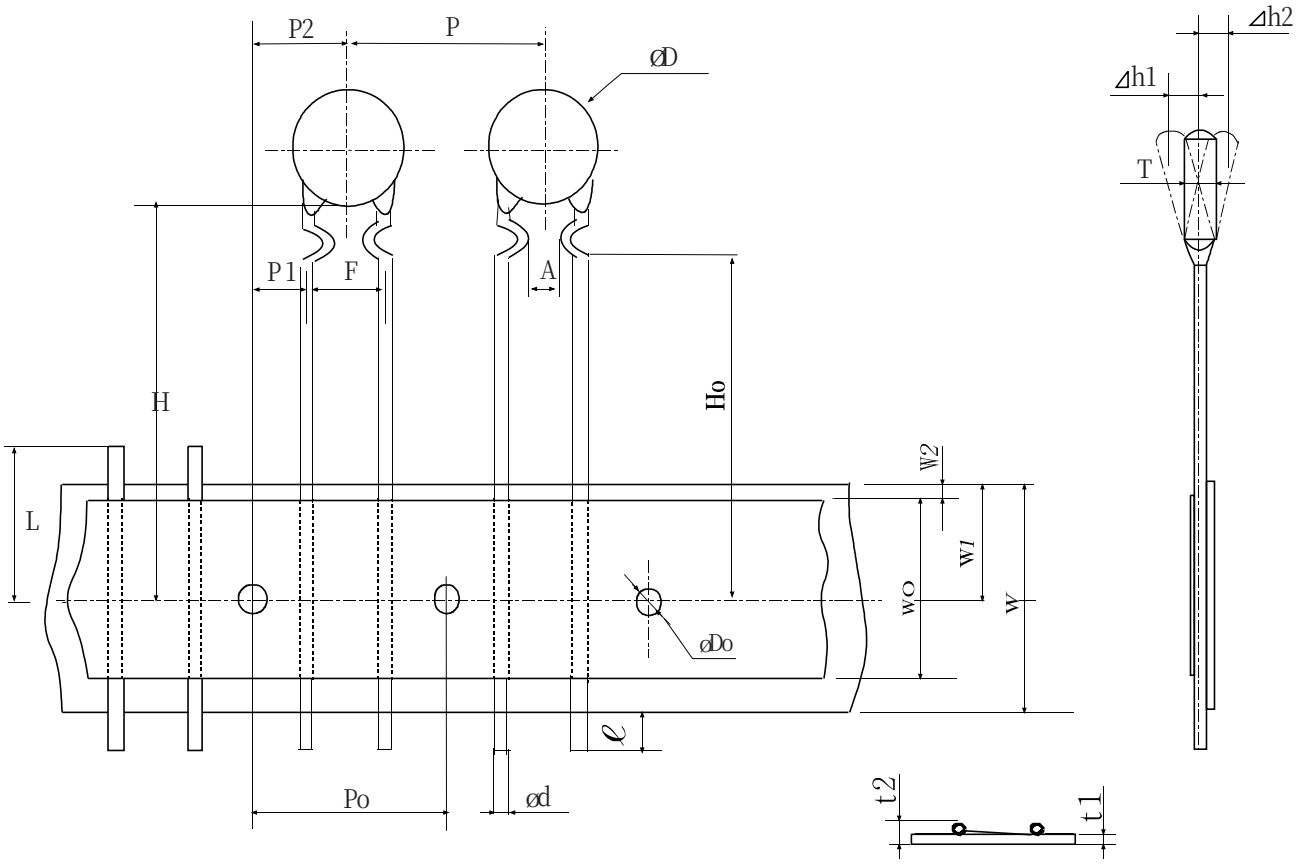
A	informing cutting	 4.5± 0.5 mm	-	informing taping	
B	outforming cutting	 4.5± 0.5 mm	F	outforming taping	
		 3.5± 0.5 mm	F	outforming taping	
C	straight cutting	 4.5± 0.5 mm	H	straight taping	

8. Lead form dimension

	F	P	Bulk	Taping
07	7.5 mm	15.0 mm	 F	 P
10	10 mm	30.0 mm	 F	 P

■ TAPING SPECIFICATION

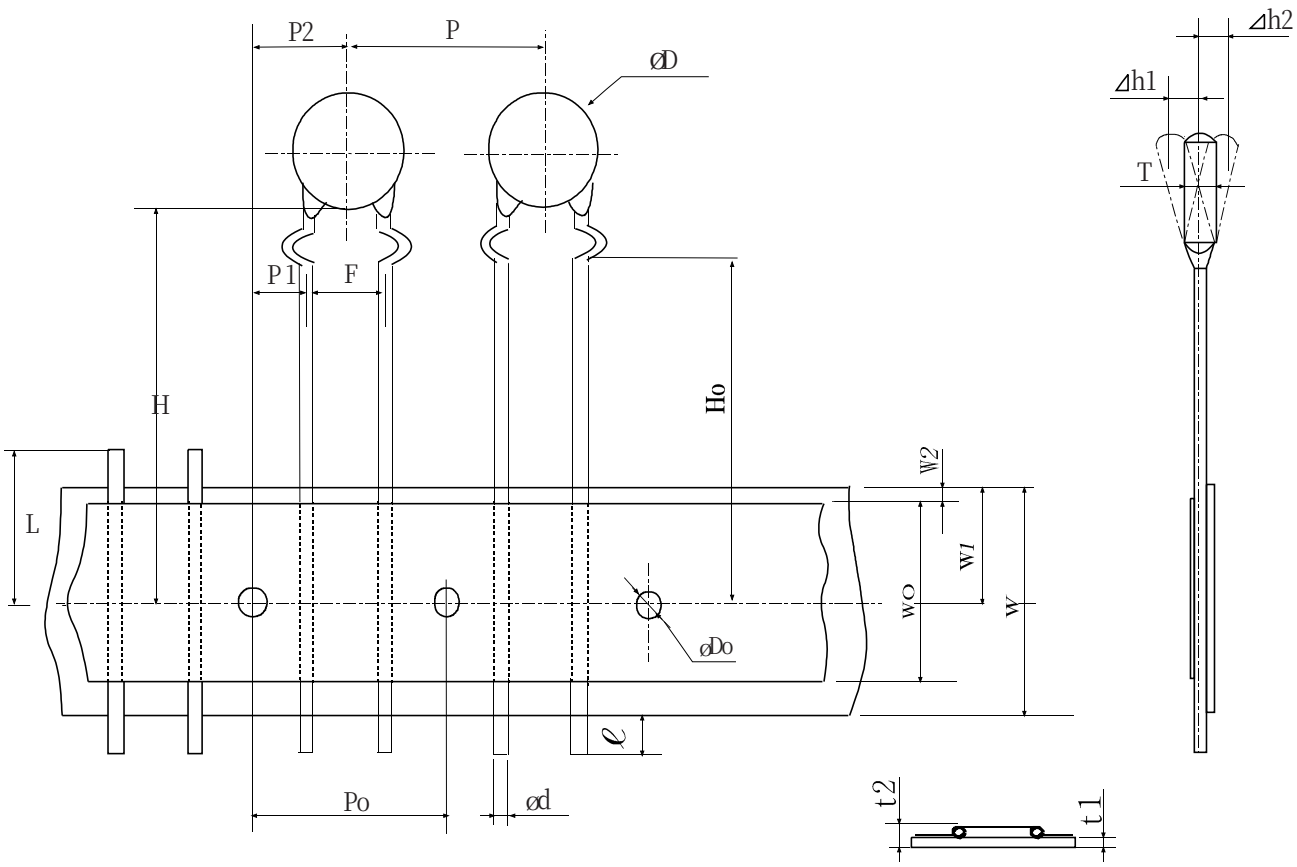
▶ LEAD PITCH : 5mm



Symbol	Dimension	Tolerance	Symbol	Dimension	Tolerance
P	12.7	± 1.0	W2	3.0 Max.	-
Po	12.7	± 0.3	H	20.0	-1.0 ~ +1.5
P1	3.85	± 0.7	-	-	-
P2	6.35	± 1.3	Ho	16.0	-0.0 ~ +0.5
Ød	0.5 ~ 0.6	± 0.05	l	2.0 Max.	-
△h1,△h2	2.0 Max.	-	ØD	3.5 ~ 11.5	-
F	5.0	-0.2 ~ +0.8	ØDo	4.0	± 0.3
W	18	-0.5 ~ +1.0	t1	0.6	± 0.2
Wo	6 Min.	-	t2	1.6 Max.	-
W1	9.0	-0.5 ~ +0.75	L	11 Max.	-

■ TAPING SPECIFICATION

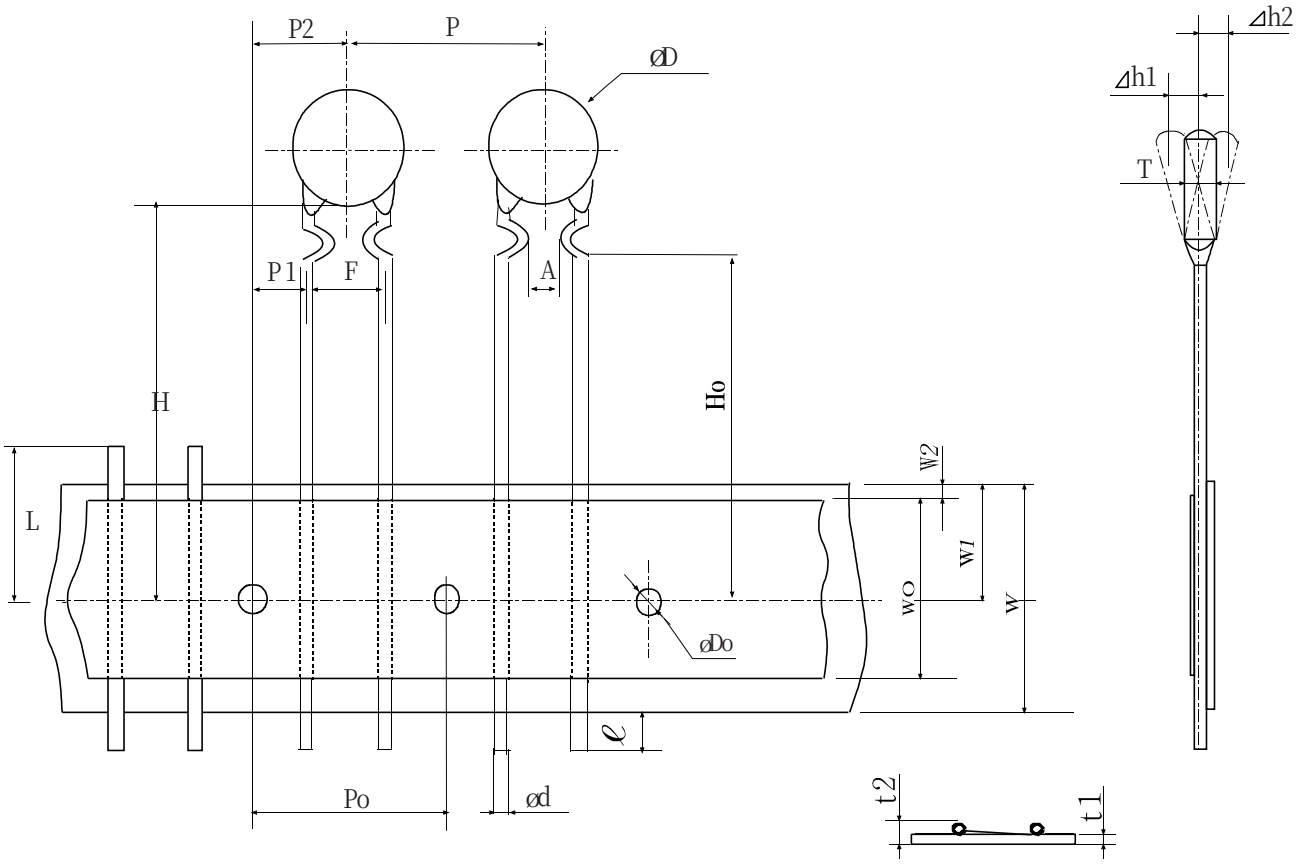
▶ LEAD PITCH : 5mm



Symbol	Dimension	Tolerance	Symbol	Dimension	Tolerance
P	12.7	± 1.0	W2	3.0 Max.	-
Po	12.7	± 0.3	H	20.0	-1.0 ~ +1.5
P1	3.85	± 0.7	-	-	-
P2	6.35	± 1.3	Ho	16.0	-0.0 ~ +0.5
Ød	0.5 ~ 0.6	± 0.05	l	2.0 Max.	-
△h1,△h2	2.0 Max.	-	ØD	3.5 ~ 11.5	-
F	5.0	-0.2 ~ +0.8	ØDo	4.0	± 0.3
W	18	-0.5 ~ +1.0	t1	0.6	± 0.2
Wo	6 Min.	-	t2	1.6 Max.	-
W1	9.0	-0.5 ~ +0.75	L	11 Max.	-

■ TAPING SPECIFICATION

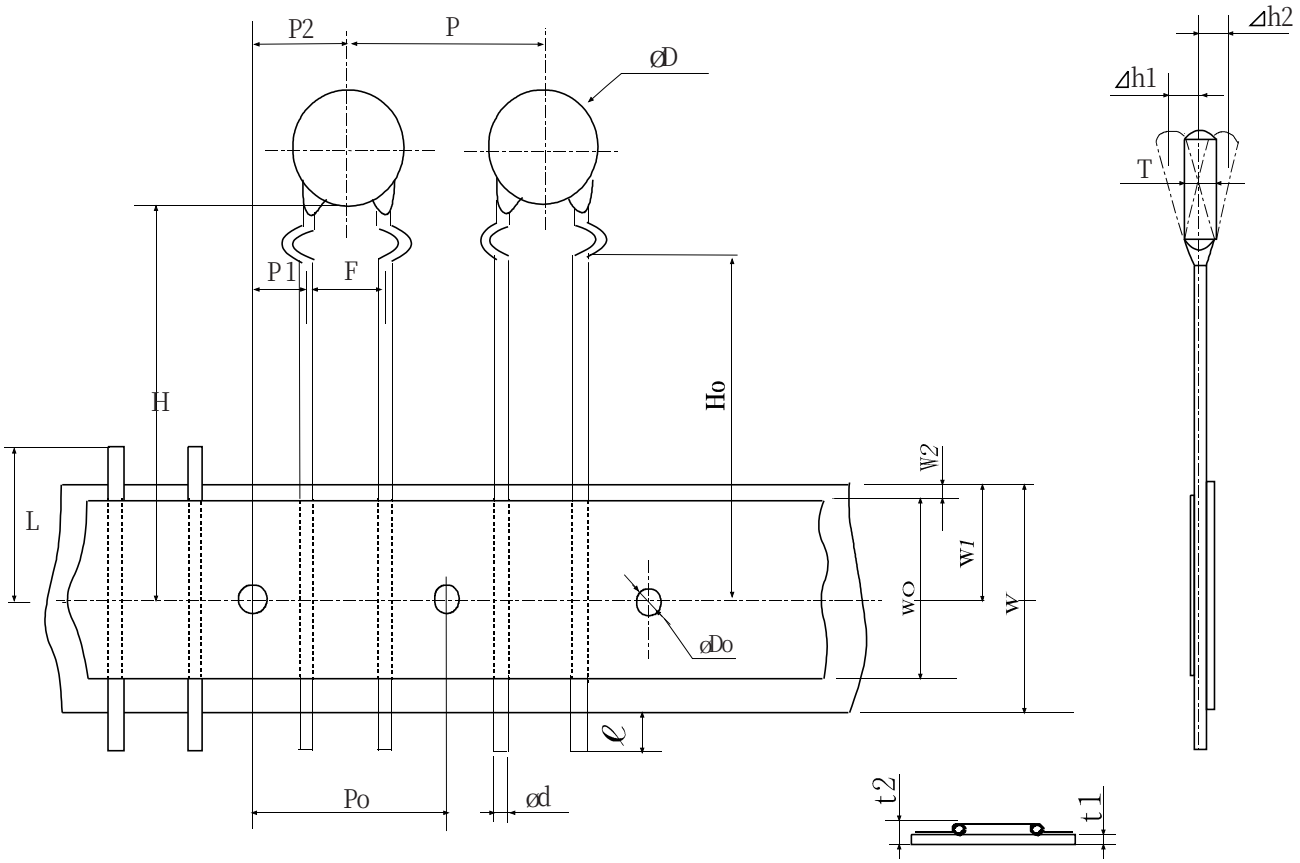
▶ LEAD PITCH : 7.5mm



Symbol	Dimension	Tolerance	Symbol	Dimension	Tolerance
P	15.0	± 1.0	W2	3.0 Max.	-
Po	15.0	± 0.3	H	20.0	-1.0 ~ +1.5
P1	3.75	± 0.7	A	4.5 Min.	-
P2	7.5	± 1.3	Ho	16.0	± 0.5
Ød	0.6 ~ 0.7	± 0.05	l	2.0 Max.	-
△h1,△h2	2.0 Max.	-	ØD	14.5 Max.	-
F	7.5	±0.5	ØDo	4.0	± 0.3
W	18.0	-0.5 ~ +1.0	t1	0.6	± 0.2
Wo	10.0 Min.	-	t2	1.6 Max.	-
W1	9.0	±0.5	L	11 Max.	-

■ TAPING SPECIFICATION

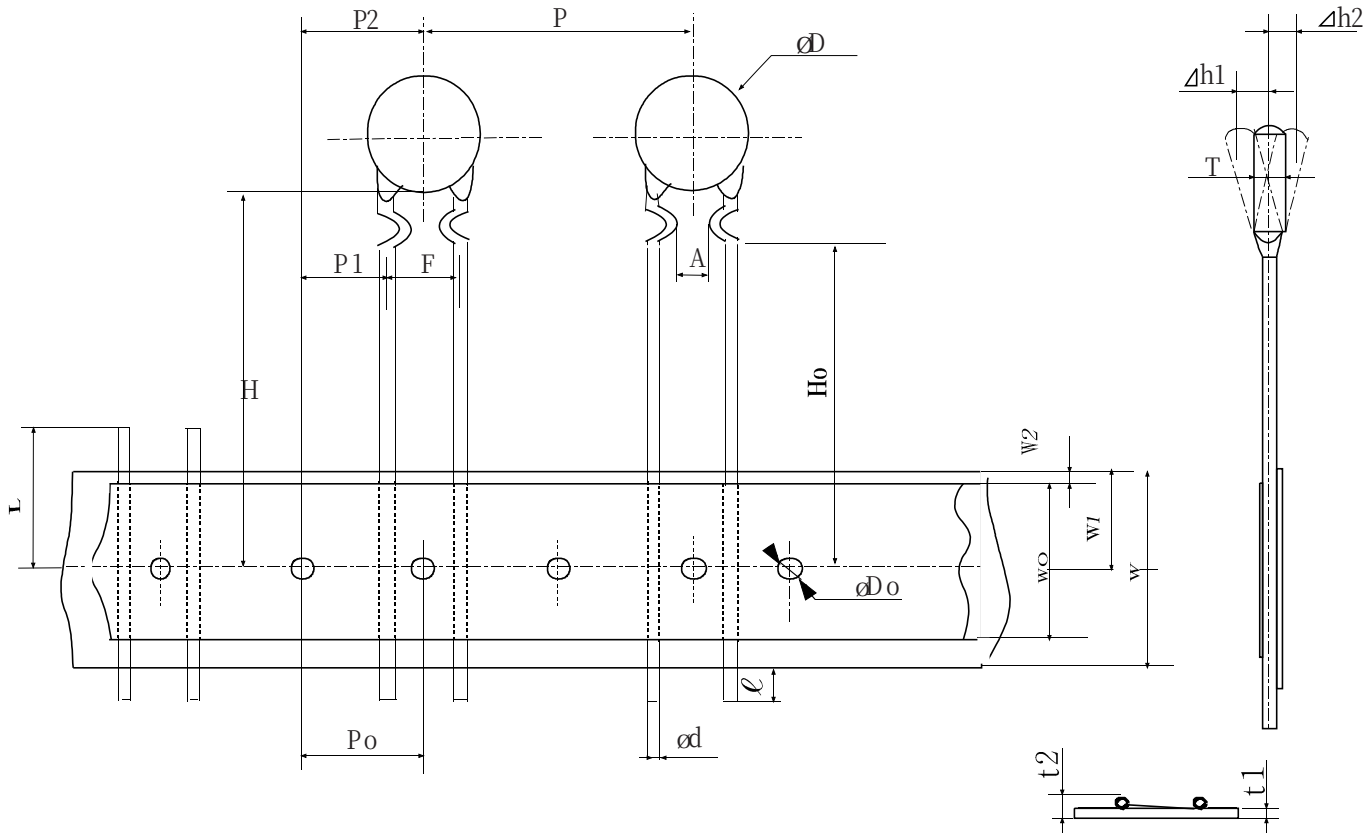
▶ LEAD PITCH : 7.5mm



Symbol	Dimension	Tolerance	Symbol	Dimension	Tolerance
P	15.0	± 1.0	W2	3.0 Max.	-
Po	15.0	± 0.3	H	20.0	-1.0 ~ +1.5
P1	3.75	± 0.7	-	-	-
P2	7.5	± 1.3	Ho	16.0	± 0.5
Ød	0.6 ~ 0.7	± 0.05	l	2.0 Max.	-
△h1,△h2	2.0 Max.	-	ØD	14.5 Max.	-
F	7.5	±0.5	ØDo	4.0	± 0.3
W	18.0	-0.5 ~ +1.0	t1	0.6	± 0.2
Wo	10.0 Min.	-	t2	1.6 Max.	-
W1	9.0	±0.5	L	11 Max.	-

■ TAPING SPECIFICATION

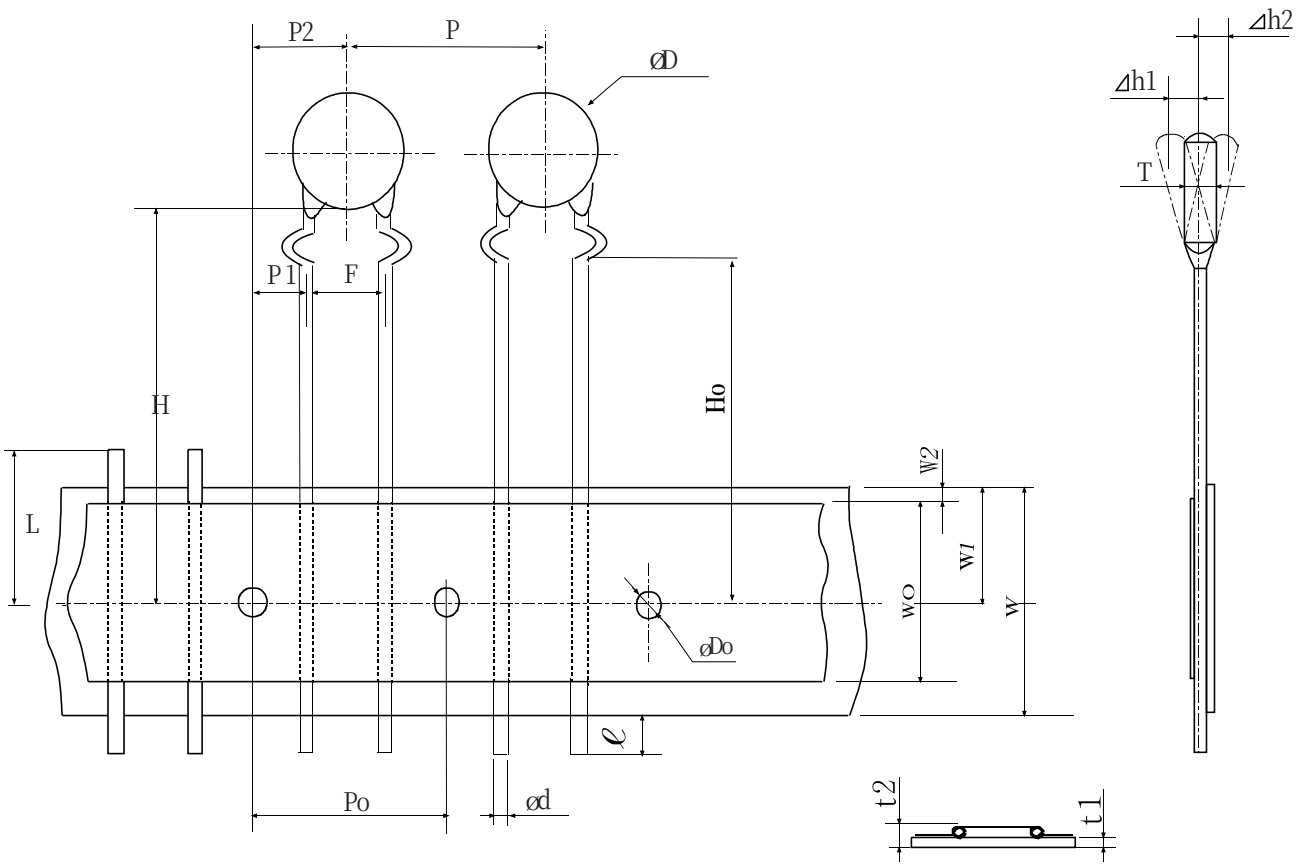
▶ LEAD PITCH : 10mm



Symbol	Dimension (mm)	Tolerance
P	30.0	± 2.0
Po	15.0	± 0.3
P1	10.0	± 0.8
P2	15.0	± 1.5
Ø d	0.65 ~ 0.70	± 0.05
△h1 , △h2	2.0 Max.	-
F	10.0	±0.5
W	18.0	-0.5 ~ +1.0
Wo	10.0 Min.	-
W1	9.0	±0.5
W2	3.0 Max.	-
H	20.0	-1.0 ~ +1.5
A	6.3 Min.	-
Ho	16.0	± 0.5
ℓ	2.0 Max.	-
Ø D	17.0 Max.	-
Ø Do	4.0	± 0.3
t1	0.6	± 0.3
t2	1.6 Max.	-
L	11 Max.	-

■ TAPING SPECIFICATION

▶ LEAD PITCH : 10mm



Symbol	Dimension (mm)	Tolerance
P	30.0	± 2.0
Po	15.0	± 0.3
P1	10.0	± 0.8
P2	15.0	± 1.5
Ø d	0.65 ~ 0.70	± 0.05
△h1 , △h2	2.0 Max.	-
F	10.0	±0.5
W	18.0	-0.5 ~ +1.0
Wo	10.0 Min.	-
W1	9.0	±0.5
W2	3.0 Max.	-
H	20.0	-1.0 ~ +1.5
-	-	-
Ho	16.0	± 0.5
ℓ	2.0 Max.	-
Ø D	17.0 Max.	-
Ø Do	4.0	± 0.3
t1	0.6	± 0.3
t2	1.6 Max.	-
L	11 Max.	-