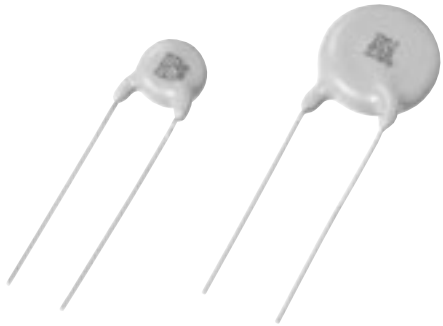
Ceramic Disc Capacitors (Safety Regulations)

Type TS IEC60384-14 Sub-class Y2/X1
Type NS-A IEC384-14 Sub-class Y1/X1
Type BE 250 VAC For Japan Domestic Safety



■ Features

- Related by IEC60384-14 2nd Ed. and approved by European Safety Regulations (Types TS and NS–A)
- Reinforced Body Insulation /0.4mm min. approved by BSI, VDE (Type NS-A)
- Flame-retardant insulating coating applied
- Easy mounting through kinked Lead and Radial Taping

■ Recommended Applications

- Interference suppressor for AC Primary Line of electronic equipments.

■ Explanation of Part Numbers

E	C	K	N	T	S	1	0	2	M	E		Examples

Product Code	
Code	Class
ECK	Class 2

Lead Style	
Code	Style
A	Kinked Lead Bulk
N	Kinked Lead Taped
D*	Straight Lead Bulk
Z*	Straight Lead Taped
R*	Crimped Lead Taped

Type Name	
Code	Type
TS	Type TS
NA	Type NS–A
BE	Type BE

Nominal Capacitance	
Ex.	Cap.
101	100 pF
102	1000 pF
222	2200 pF
472	4700 pF
103	10000 pF

Cap. Tolerance	
Code	Cap. Tol.
K	±10 %
M	±20 %
Z	+80, –20 %

Temp. Char	
Code	Char.
B	B/Y5P
E	E/Y5U
F	F/Y5V

Suffix

*:These code are not standard style

■ Specifications

Characteristics	Type TS	Type NS-A	Type BE
Related Standaeds	IEC 60384-14(Y2 and X1) BSI, VDE, SEV, SEMKO FIMKO, NEMKO, DEMKO UL,CSA	IEC 60384-14(Y1 and X1) BS1, VDE, SEV, SEMKO FIMKO, NEMKO, DEMKO UL,CSA	Japan Domestic Safety
Operating Temperature Range	–25 to 125 ˚C		–25 to 85 ˚C
Rated Voltage	250 VAC/440 VAC		250 VAC
Dielectric Withstanding Voltage	2600 VAC for 1 minute	4000 VAC for 1 minute	1500 VAC for 1 minute
Capacitance	Within the tolerance, when measured at 1 kHz ± 20 %, 1 Vrms, and 20 ˚C		
Dissipation Factor (tanδ)	tan δ ≦ 0.025, when measured at 1 kHz ± 20 %,1 Vrms, and 20 ˚C		tan δ ≦ 0.025 for Char.E tan δ ≦ 0.05 for Char.F at 1 kHz ±20 %, 1 Vrms, and 20 ˚C
Insulation Resistance	10000 MΩ min at 500 VDC 1 minute electrification.		
Temperature Characteristics			

Char.	max. Cap. Change	Temperature Range
B	±10 %	–25 to 85 ˚C
E	+20,–55 %	–25 to 85 ˚C
F	+30, –80 %	–25 to 85 ˚C

■ Precautions for Handling

See Page 57 to 58

■ Packaging Information

See Page 59 to 60

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■ Related Standards and Certificate Numbers

● Type TS

Certificated Body	Related Standard	Certificate Number	Sub-class	Rated Voltage	Dielectric Withstanding Voltage	Operating Temperature Range
BSI (UK)	BS415:1994	8035	Y2, X1	Y2:250 VAC X1:440 VAC	Y2:1500 VAC X1:1892 VDC	–25 to 125°C
VDE (Germany)	EN 132 400:1994 (IEC 60384-14 2nd Ed.)	94646(Char.B) 94647(Char.E) 94648(Char.F)				
SEV (Switzerland)		96,1 10369,06				
SEMKO (Sweden)		9618031 01				
FIMKO (Finland)		192031-01				
NEMKO (Norway)		P96102354				
DEMKO (Denmark)		305880				
UL (USA)	UL 1414	E62674	–	250 VAC	1500 VAC	–25 to 85 °C
CSA (Canada)	CSA C22.2 No.1	LR 58064				

Note:Certification Number sometimes changes with the change of the safety suthorization contents and so on.

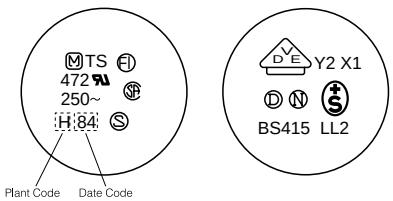
● Type NS-A

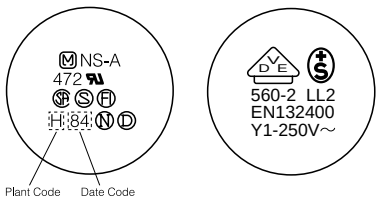
Certificated Body	Related Standard	Certificate Number: Plant Code H (Made in Japan)	Certificate Number: Plant Code K (Made in malaysia)	Sub-class	Rated Voltage	Dielectric Withstanding Voltage	Operating Temperature Range
BSI (UK)	BS 415:1994	226319		Y1, X1	Y1:250 VAC X1:440 VAC	Y1:4000 VAC X1:1892 VDC	–25 to 125 °C
VDE (Germany)	EN 132 400:1994 (IEC 60384-14 2nd Ed.)	087472 (Char.B) 087472 (Char.E)	101343(Char.B) 101344(Char.E)				
SEV (Switzerland)		95,1 10016, 04					
SEMKO (Sweden)		9524071	9716245				
FIMKO (Finland)		183536-01	196050				
NEMKO (Norway)		P95102393	P97101564				
DEMKO (Denmark)		304133	306750				
UL (USA)	UL1414	E62674		–	250 VAC	1500 VAC	–25 to 85 °C
CSA (Canada)	CSA C22.2 No.1	LR58064	LR109829				

Note:Certification Number sometimes changes with the change of the safety suthorization contents and so on.

■ Marking Examples

Marking Items		Examples* (Marking of the face and the reverse)
Manufacturer's Identification	Ⓜ	For Type TS 4700 pF (Ex.)
Type Designation		
sub-class according to EN132400		
Rated Voltage		
Capacitance		
Recognized Marking (Logo or Monogram	BSI(marked on the label)	
	VDE	
	SEV	
	SEMKO	
	FIMKO	
	NEMKO	
	DEMKO	
	UL	
	CSA	
Plant Code		For Type NS-A 4700 pF (Ex.)
Date Code		





Note: * The actual marking is sometimes different from the above example with the change of the safety authorization contents and so on.

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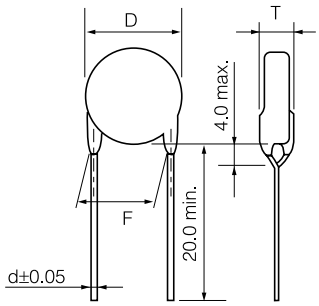
■ Dimensions in mm (not to scale)

Standard lead style are kinked Lead and Kinked Lead Taping as below.
As usual style as Straight Lead, Straight Lead Taping and Crimped Lead Taping are available on special order.

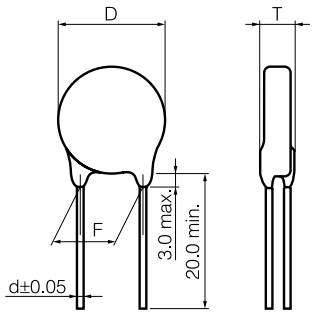
● Kinked Lead Type



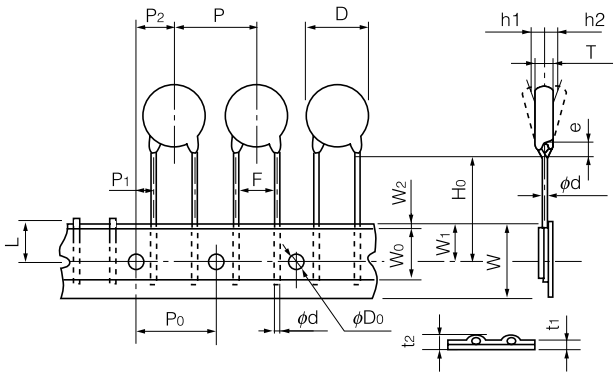
Note:Tolerance of Lead Space

Dim. F(Nominal)	Tolerance of Dim. F
5.0	±1.0
7.5	±1.5
10.0	±1.5 $^{+1.5}_{-1.0}$ for Type NS–A

● Straight Lead Type (For reference)

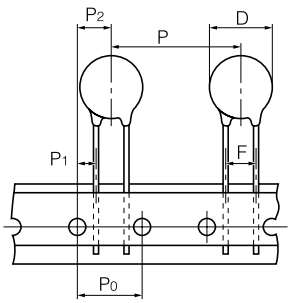


● Kinked Lead Taping

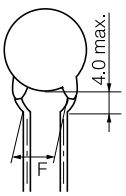


Symbol \ Taping Type	N0	N1	N2
P	12.7±1.0	15.0±2.0	30.0±2.0
P_0	12.7±0.3	15.0±0.3	15.0±0.3
F	5.0±0.8	7.5±1.0	7.5±1.0
P_1	3.85±0.70	3.75±0.80	3.75±0.80
P_2	6.35±1.30	7.5±1.5	7.5±1.5
D	To comply with each individual specification		
W	$18.0^{+1.0}_{-0.5}$		
W_0	10.0 min.		
W_1	9.0±0.5		
W_2	3.0 max.		
H_0	$18.0^{+2.0}_{0}$		
e	4.0 max.		
ϕD_0	4.0±0.2		
ϕd	0.60±0.05	0.65±0.05	
t_1	0.6±0.3		
t_2	1.5 max.		
T	To comply with each individual specification		
Δh_1, Δh_2	2.0 max.		
L	11.0 max.		

Under kinked lead style are applied to only 3300 pF and over have a lead space (F) 7.5 mm of Type TS



Same dimensions as Type N0, N1 except for special dimensions.



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■ Rating and Characteristics

● Type TS (IEC60384-14 Sub-class Y2, X1)

Cap. in pF	Cap. Tol. (%)	Temp. Char.	Dimensions in mm		Kinked Lead Type (Bulk)			Kimked Lead Taped Type			
			D	T max.	Part Number	Dim. in mm F	Dim. in mm d	Part Number	Taped Type	Dim. in mm F	Dim. in mm d
100	±10 or ±20	B/Y5P	7.0±1.0	7.0	ECKATS101□B	7.5	0.65	ECKNTS101□B	N1	7.5	0.65
150	±10 or ±20	B/Y5P	7.0±1.0	7.0	ECKATS151□B	7.5	0.65	ECKNTS151□B	N1	7.5	0.65
220	±10 or ±20	B/Y5P	7.0±1.0	7.0	ECKATS221□B	7.5	0.65	ECKNTS221□B	N1	7.5	0.65
330	±10 or ±20	B/Y5P	7.0±1.0	7.0	ECKATS331□B	7.5	0.65	ECKNTS331□B	N1	7.5	0.65
470	±10 or ±20	B/Y5P	7.0±1.0	7.0	ECKATS471□B	7.5	0.65	ECKNTS471□B	N1	7.5	0.65
680	±10 or ±20	B/Y5P	8.0±1.0	7.0	ECKATS681□B	7.5	0.65	ECKNTS681□B	N1	7.5	0.65
1000	±20	E/Y5U	7.0±1.0	7.0	ECKATS102ME	7.5	0.65	ECKNTS102ME	N1	7.5	0.65
1500	±20	E/Y5U	8.0±1.0	7.0	ECKATS152ME	7.5	0.65	ECKNTS152ME	N1	7.5	0.65
2200	±20	E/Y5U	9.0±1.0	7.0	ECKATS222ME	7.5	0.65	ECKNTS222ME	N1	7.5	0.65
3300	±20	E/Y5U	11.5±1.0	7.0	ECKATS332ME	7.5	0.65	ECKNTS332ME	N1	7.5	0.65
4700	±20	E/Y5U	14.0±1.0	7.0	ECKATS472ME	10.0	0.65	ECKNTS472ME	N2	7.5	0.65
4700	±20	F/Y5V	11.5±1.0	7.0	ECKATS472MF	7.5	0.65	ECKNTS472MF	N1	7.5	0.65
10000	±20	F/Y5V	16.0±1.5	7.0	ECKATS103MF	10.0	0.65	ECKNTS103MF	N2	7.5	0.65

Note: □-- Capacitance Tolerance Code K (±10 %) or M(±20 %)

● Type NS-A (IEC60384-14 Sub-class Y1, X1)

Cap. in pF	Cap. Tol. (%)	Temp. Char.	Dimensions in mm		Kinked Lead Type (Bulk)		
			D max.	T max.	Part Number	Dim. in mm F	Dim. in mm d
100	±10 or ±20	B/Y5P	11.0	8.0	ECKANA101□B	10.0	0.65
220	±10 or ±20	B/Y5P	11.0	8.0	ECKANA221□B	10.0	0.65
330	±10 or ±20	B/Y5P	11.0	8.0	ECKANA331□B	10.0	0.65
470	±10 or ±20	B/Y5P	11.0	8.0	ECKANA471□B	10.0	0.65
1000	±10 or ±20	B/Y5P	11.0	8.0	ECKANA102□B	10.0	0.65
1000	±20	E/Y5U	10.0	8.0	ECKANA102ME	10.0	0.65
1500	±20	E/Y5U	11.0	8.0	ECKANA152ME	10.0	0.65
2200	±20	E/Y5U	11.0	8.0	ECKANA222ME	10.0	0.65
3300	±20	E/Y5U	13.0	8.0	ECKANA332ME	10.0	0.65
4700	±20	E/Y5U	16.0	8.0	ECKANA472ME	10.0	0.65

Note 1: Reinforced Body Insulation for 0.4 mm min. approved by BSI, VDE Approved
2: Radial Taped versions are available. (Lead Spacing is 10.0 mm only)
3: □-- Capacitance Tolerance Code k (±10 %) or M(±20 %)

● Type BE (250 VAC For Japan Domestic Safety)

Cap. in pF	Cap. Tol. (%)	Temp. Char.	Dimensions in mm		Kinked Lead Type (Bulk)			Kimked Lead Taped Type			
			D max.	T max.	Part Number	Dim. in mm F	Dim. in mm d	Part Number	Taped Type	Dim. in mm F	Dim. in mm d
1000	+80 –20	E/Y5U	7.0	5.0	ECKABE102ZE	7.5	0.65	ECKNBE102ZE	N1	7.5	0.65
2200	+80 –20	E/Y5U	8.0	5.0	ECKABE222ZE	7.5	0.65	ECKNBE222ZE	N1	7.5	0.65
3300	+80 –20	E/Y5U	9.0	5.0	ECKABE332ZE	7.5	0.65	ECKNBE332ZE	N1	7.5	0.65
4700	+80 –20	E/Y5U	11.0	5.0	ECKABE472ZE	7.5	0.65	ECKNBE472ZE	N1	7.5	0.65
4700	+80 –20	F/Y5V	8.0	5.0	ECKABE472ZF	7.5	0.65	ECKNBE472ZF	N1	7.5	0.65
10000	+80 –20	F/Y5V	11.0	5.0	ECKABE103ZF	7.5	0.65	ECKNBE103ZF	N1	7.5	0.65

Note: Lead spacing (Dim. F) of 5.0 mm is available instead of 7.5 mm for special order

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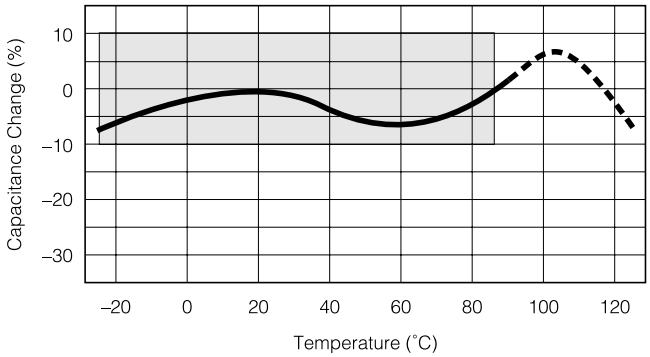
■ Typical Temperature Characteristics (Type TS, Type NS-A)

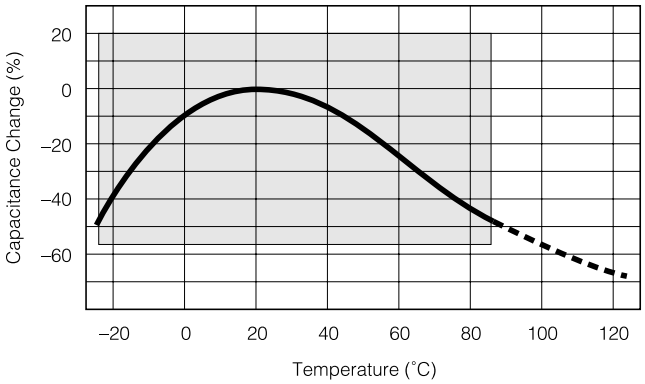
Char. B/Y5P

Temp. Range –25 to 85˚C
Max.Cap.Change ±10 %



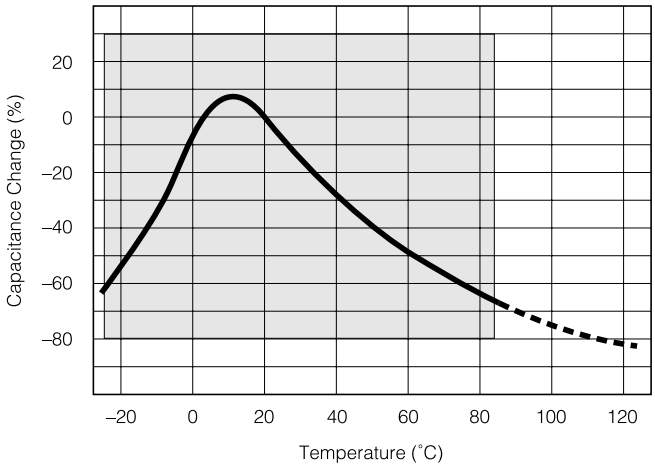
Char. E/Y5U

Temp. Range –25 to 85˚C
Max.Cap.Change +20, –55 %



Char. F/Y5V

Temp. Range –25 to 85˚C
Max.Cap.Change +30, –80 %



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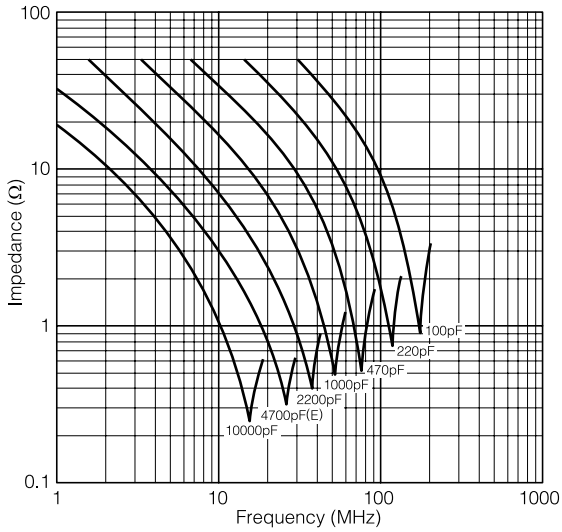
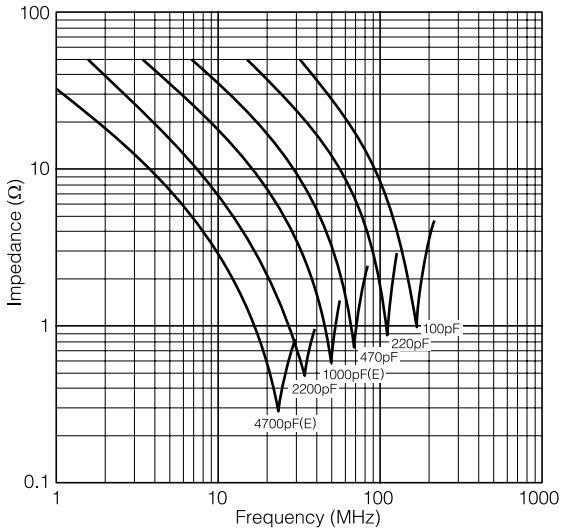
■ Impedance vs. Frequency Characteristics

Type TS



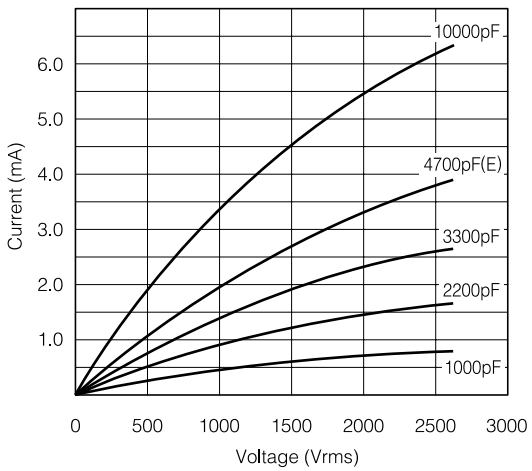
Type NS-A



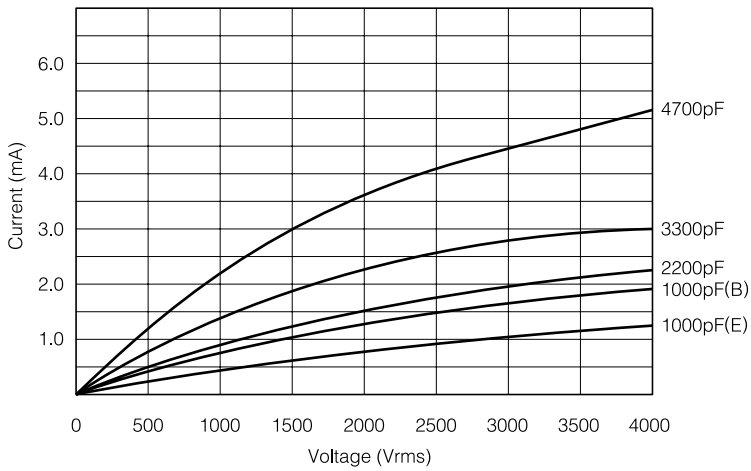
■ Current vs. Voltage (Leakage Current Characteristics)

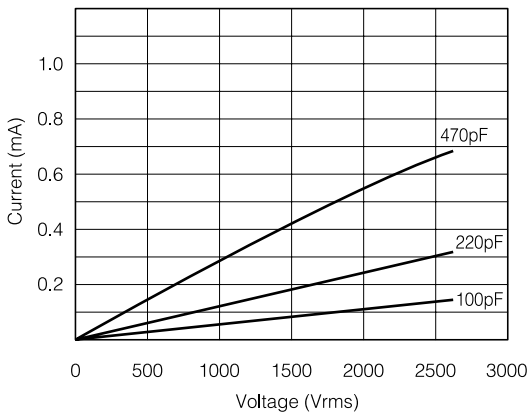
Conditions Temperature: 20 ˚C, Applied Voltage: Sine Wave 60 Hz

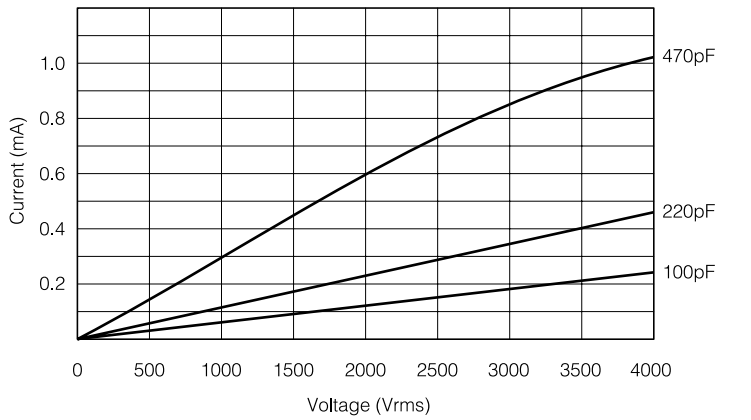
Type TS



Type NS-A







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