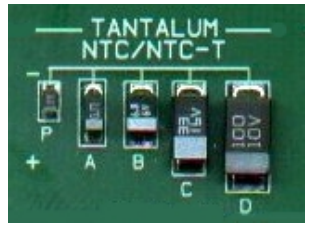
ALTERNATES
TO
SURFACE MOUNT
TANTALUM ELECTROLYTIC
CAPACITORS

NIC COMPONENTS GUIDELINE 090699



September 1999

Recent increased market demand for surface mount (chip) tantalum electrolytic capacitors has exceeded supply, resulting in shortage conditions for these style products.

Lead times exceeding 26 weeks have been reported for popular CV and case sizes.

Expectations are this condition will not change for the next 8 ~ 12 months.

NIC Components Corp markets several alternate SMT capacitors that have advantages over chip tantalum styles:

SMT ALUMINUM ELECTROLYTIC CAPACITORS

- Readily available with steady shorter lead times.
- Less expensive
- Higher safety margin (improved tolerance to transient events and reserve biasing conditions)

SMT CERAMIC CHIP CAPACITORS

- Readily available with steady shorter lead times.
- Less expensive (low CV combinations)
- Non-Polarized (immune to unforeseen reserve biasing/ transient conditions)

CONTENTS

0.1uF / 35VDC

TANTALUM ELECTROLYTIC

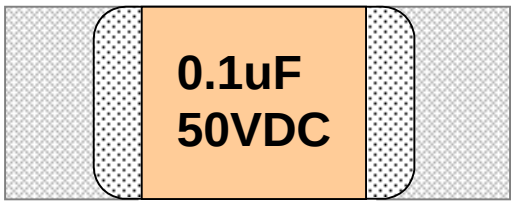
STANDARD PART

A Size (3216) P/N: NTC-T104K35TRA

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	A	3.2mm	1.6mm	1.8mm
CERAMIC	1206	3.2mm	1.6mm	1.5mm
ALUMINUM	3X5.5	3mm	3mm	5.5mm

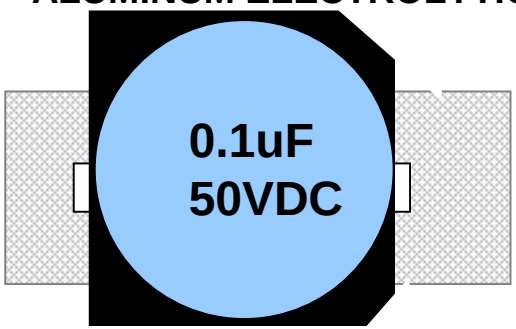
CERAMIC



STANDARD PART (50VDC)

1206 SIZE / X7R / 50VDC
P/N: NMC1206X7R104K50TRPLP

ALUMINUM ELECTROLYTIC



STANDARD PART (50VDC)

3mm DIA. x 5.5mm HEIGHT
P/N: NACER10M50V3X5.5TR

1uF / 16VDC

TANTALUM ELECTROLYTIC

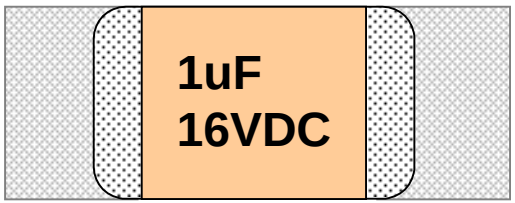
STANDARD PART

A Size (3216) P/N: NTC-T105K16TRA

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	A	3.2mm	1.6mm	1.8mm
CERAMIC	1206	3.2mm	1.6mm	1.5mm
ALUMINUM	4X5.5	4mm	4mm	5.5mm

CERAMIC

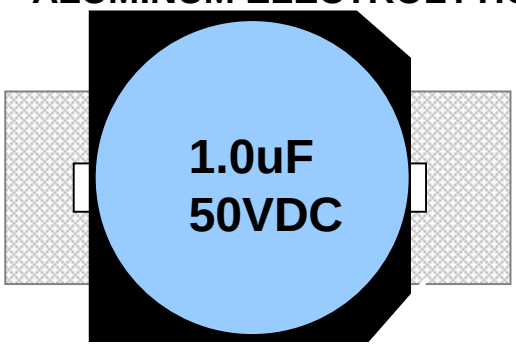


STANDARD PART

1206 SIZE / X7R / 16VDC

P/N: NMC1206X7R105K16TRPLP

ALUMINUM ELECTROLYTIC



STANDARD PART

4mm DIA. x 5.5mm HEIGHT

P/N: NACE1R0M50V4X5.5TR

2.2uF / 20VDC

TANTALUM ELECTROLYTIC

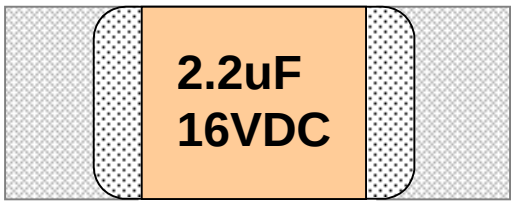
STANDARD PART

A Size (3216) P/N: NTC-T105K16TRA

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	A	3.2mm	1.6mm	1.8mm
CERAMIC	1206	3.2mm	1.6mm	1.5mm
ALUMINUM	4X5.5	4mm	4mm	5.5mm

CERAMIC



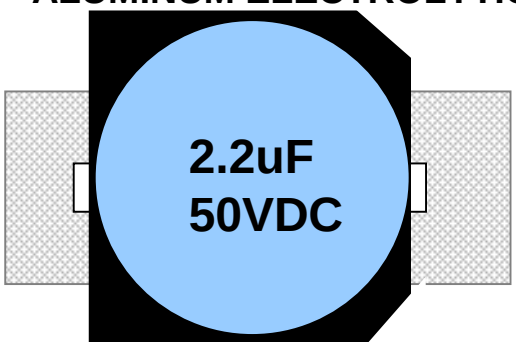
STANDARD PART

16 VDC OPTION

1206 SIZE / Y5V / 16VDC

P/N: NMC1206Y5V225Z16TRPLP

ALUMINUM ELECTROLYTIC



STANDARD PART

4mm DIA. x 5.5mm HEIGHT

P/N: NACE2R2M50V4X5.5TR

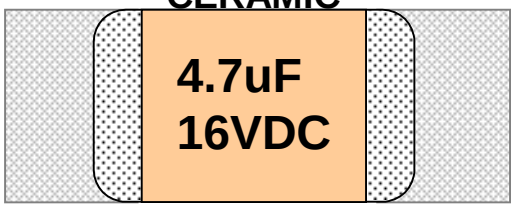
4.7uF / 10VDC

TANTALUM ELECTROLYTIC

STANDARD PART

A Size (3216) P/N: NTC-T475K10TRA

CERAMIC



STANDARD PART

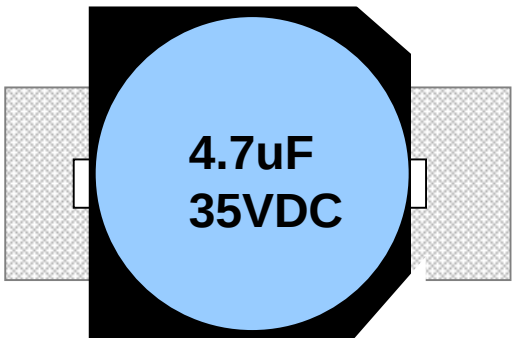
1206 SIZE / Y5V / 16VDC

P/N: NMC1206Y5V475Z16TRPLP

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	A	3.2mm	1.6mm	1.8mm
CERAMIC	1206	3.2mm	1.6mm	1.5mm
ALUMINUM	4X5.5	4mm	4mm	5.5mm
SOLID ALUMINUM	(D) 7343	7.3mm	4.3mm	1.9mm

ALUMINUM ELECTROLYTIC



STANDARD PART

4mm DIA. x 5.5mm HEIGHT

P/N: NACE4R7M35V4X5.5TR

SOLID ALUMINUM ELECTROLYTIC

STANDARD PART

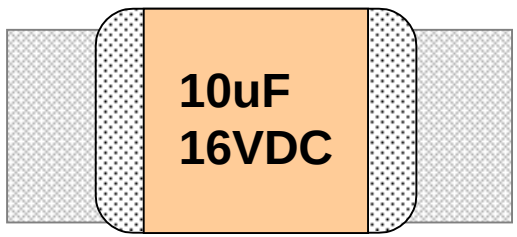
7343 (D) SIZE

P/N: NSP4R7M16DTR

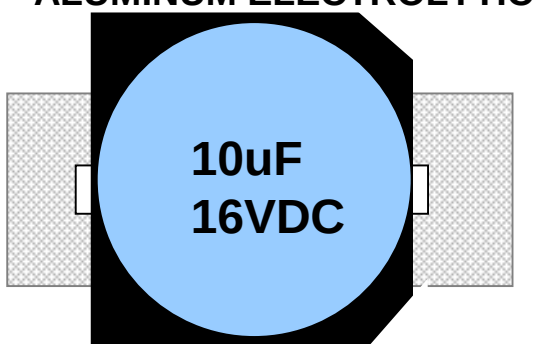
10uF / 16VDC

TANTALUM ELECTROLYTIC

CERAMIC



ALUMINUM ELECTROLYTIC



STANDARD PARTS

B Size (3528) P/N: NTC-T106K16TRB

C Size (6032) P/N: NTC-T106K16TRC

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	B	3.5mm	2.8mm	2.1mm
CERAMIC	1210	3.2mm	2.5mm	1.5mm
ALUMINUM	4X5.5	4mm	4mm	5.5mm

STANDARD PART

1210 SIZE / Y5V / 16VDC

P/N: NMC1210Y5V106Z16TRPLP

STANDARD PART

4mm DIA. x 5.5mm HEIGHT

P/N: NACE100M16V4X5.5TR

10uF / 25VDC

TANTALUM ELECTROLYTIC

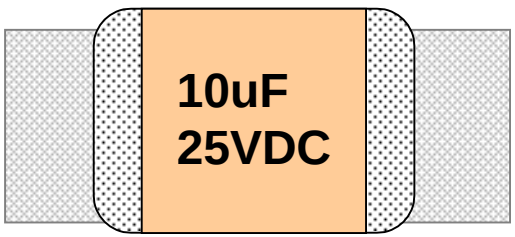
STANDARD PARTS

C Size (6032) P/N: NTC-T106K25TRC

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	C	6.0mm	3.2mm	2.8mm
CERAMIC	1210	3.2mm	2.5mm	1.5mm
ALUMINUM	5X5.5	5mm	5mm	5.5mm

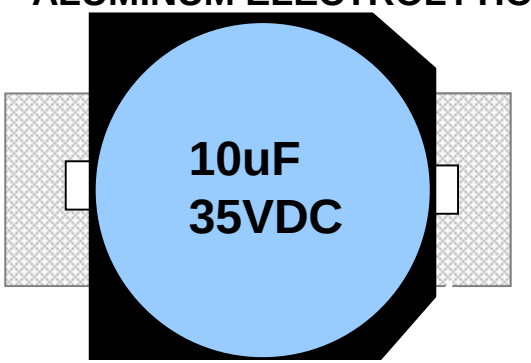
CERAMIC



STANDARD PART

1210 SIZE / Y5V / 25VDC
P/N: NMC1210Y5V106Z25TRPLP

ALUMINUM ELECTROLYTIC



STANDARD PART

5mm DIA. x 5.5mm HEIGHT
P/N: NACE100M35V5X5.5TR

10uF / 35VDC

TANTALUM ELECTROLYTIC

STANDARD PARTS

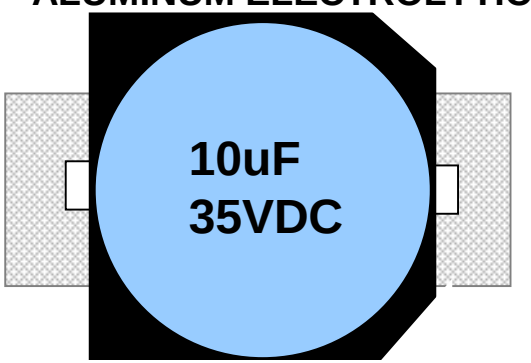
D Size (7343) P/N: NTC-T106K35TRD

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	D	7.3mm	4.3mm	3.1mm
ALUMINUM	5X5.5	5mm	5mm	5.5mm

CERAMIC
N/A

ALUMINUM ELECTROLYTIC



STANDARD PART

5mm DIA. x 5.5mm HEIGHT
P/N: NACE100M35V5X5.5TR

22uF / 25VDC

TANTALUM ELECTROLYTIC

STANDARD PARTS

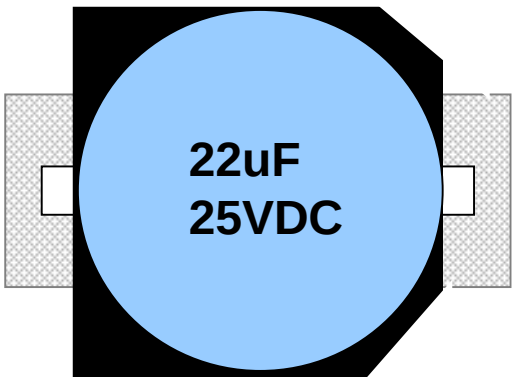
D Size (7343) P/N: NTC-T226K25TRD

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	D	7.3mm	4.3mm	3.1mm
ALUMINUM	6.3X5.5	6.3mm	6.3mm	5.5mm

CERAMIC
N/A

ALUMINUM ELECTROLYTIC



STANDARD PART

6.3mm DIA. x 5.5mm HEIGHT
P/N: NACE220M25V6.3X5.5TR

33uF / 10VDC

TANTALUM ELECTROLYTIC

STANDARD PART

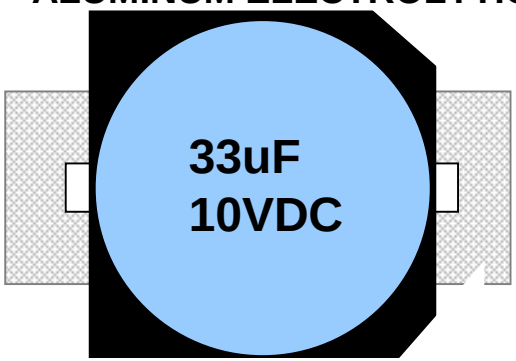
C Size (7343) P/N: NTC-T336K10TRC

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	C	6.0mm	3.2mm	2.8mm
ALUMINUM	5X5.5	5mm	5mm	5.5mm
SOLID ALUMINUM	(D) 7343	7.3mm	4.3mm	1.9mm

CERAMIC
N/A

ALUMINUM ELECTROLYTIC



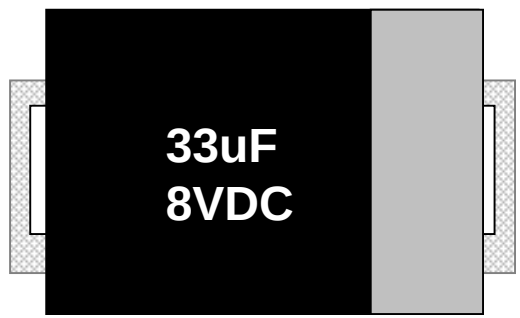
STANDARD PART

5mm DIA. x 5.5mm HEIGHT

P/N: NACE330M10V5X5.5TR

8 VDC OPTION

SOLID ALUMINUM ELECTROLYTIC



STANDARD PART

7343 (D) SIZE

P/N: NSP330M8DTR

47uF / 16VDC

TANTALUM ELECTROLYTIC

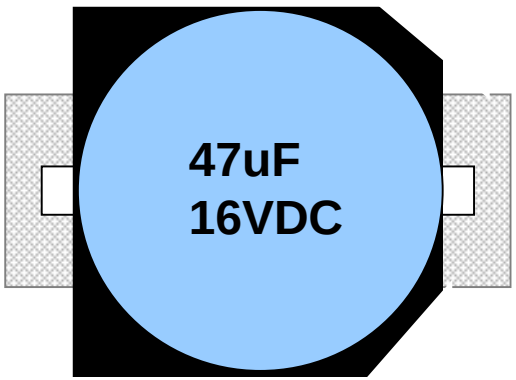
STANDARD PARTS

D Size (7343) P/N: NTC-T476K16TRD

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	D	7.3mm	4.3mm	3.1mm
ALUMINUM	6.3X5.5	6.3mm	6.3mm	5.5mm

ALUMINUM ELECTROLYTIC

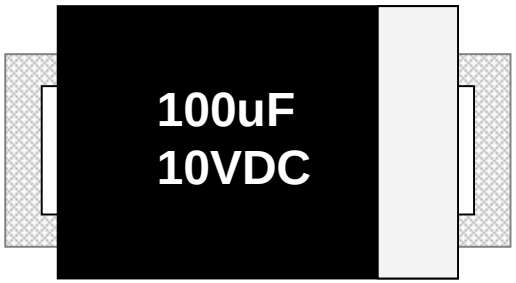


STANDARD PART

6.3mm DIA. x 5.5mm HEIGHT
P/N: NACE470M16V6.3X5.5TR

100uF /10VDC

TANTALUM ELECTROLYTIC



STANDARD PARTS

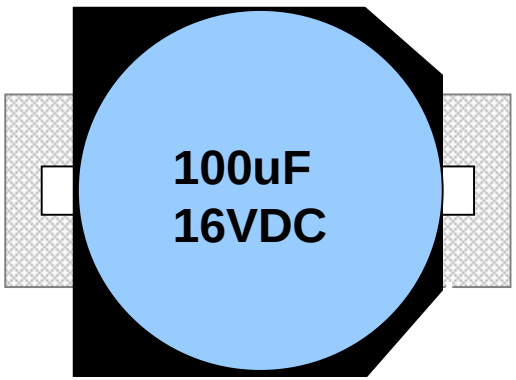
D Size (7343) P/N: NTC-T107K10TRD

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	D	7.3mm	4.3mm	3.1mm
ALUMINUM	6.3X5.5	6.3mm	6.3mm	5.5mm

CERAMIC
N/A

ALUMINUM ELECTROLYTIC



STANDARD PART

6.3mm DIA. x 5.5mm HEIGHT
P/N: NACE101M16V6.3X5.5TR

220uF /10VDC

TANTALUM ELECTROLYTIC

STANDARD PARTS

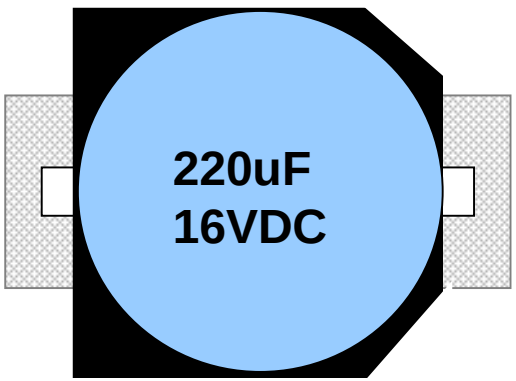
E Size (7343) P/N: NTC-T227K10TRE

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	D	7.3mm	4.3mm	3.1mm
ALUMINUM	6.3X5.5	6.3mm	6.3mm	8.0mm

CERAMIC
N/A

ALUMINUM ELECTROLYTIC



STANDARD PART

6.3mm DIA. x 8.0mm HEIGHT
P/N: NACZ221M16V6.3X8TR

330uF /6.3VDC

TANTALUM ELECTROLYTIC

STANDARD PARTS

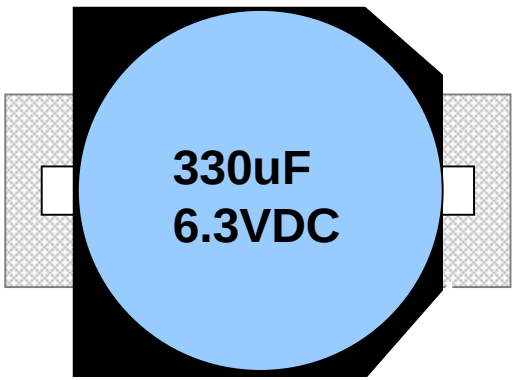
E Size (7343) P/N: NTC-T337K6.3TRE

SIZE COMPARISON

TYPE	*CASE*	*LENGTH*	*WIDTH*	*HEIGHT*
TANTALUM	E	7.3mm	4.3mm	4.3mm
ALUMINUM	6.3X5.5	6.3mm	6.3mm	8.0mm

CERAMIC
N/A

ALUMINUM ELECTROLYTIC



STANDARD PART

6.3mm DIA. x 8.0mm HEIGHT
P/N: NACZ331M6.3V6.3X8TR

ELECTRICAL COMPARISON

P/N	TYPE	CAPACITANCE (uF)	TOLERANCE (%)	WORKING VOLTAGE (Vdc)	LENGTH MAX. (mm)	WIDTH MAX. (mm)	HEIGHT MAX. (mm)	MIN. TEMP. (°C)	MAX. TEMP (°C)	RIPPLE CURRENT @ MAX. TEMP. (mArms) 100KHz	DISSIPATION FACTOR +20°C (120HZ)	ESR +20°C @ 120Hz MAX. (OHM)	ESR +20°C @ 100KHz MAX. (OHM)	LEAKAGE CURRENT MAX. +20°C (uA) after 2 min. @ WVDC	NOTES
NTC-T104K35TRA	TANTALUM CHIP	0.1	10	35	3.2	1.6	1.8	-55	+85	0.065	0.04		18.0	0.5uA	
NMC1206X7R104K50TRPLP	CERAMIC CHIP	0.1	10	50	3.2	1.6	1.5	-55	+125		0.025			<0.1uA	
NACER10M50V3X5.5TR	ALUMINUM CHIP	0.1	20	50	3.0	3.0	5.5	-40	+85	0.002	0.14	1660		3uA	
NTC-T105K16TRA	TANTALUM CHIP	1	10	16	3.2	1.6	1.8	-55	+85	0.087	0.04		10	0.5uA	
NMC1206X7R105K16TRPLP	CERAMIC CHIP	1	10	16	3.2	1.6	1.5	-55	+125		0.035			<0.1uA	
NACE1R0M16V4X5.5TR	ALUMINUM CHIP	1	20	16	4.0	4.0	5.5	-40	+85	0.020	0.10	166		3uA	
NTC-T225K20K16TRA	TANTALUM CHIP	2.2	10	20	3.2	1.6	1.8	-55	+85	0.112	0.06		6.0	0.5uA	
NMC1210Y5V225Z16TRPLP	CERAMIC CHIP	2.2	+80 / -20	16	3.2	2.5	1.5	-30	+85		0.15			<0.1uA	
NACE2R2M50V4X5.5TR	ALUMINUM CHIP	2.2	20	50	4.0	4.0	5.5	-40	+85	0.030	0.10	75.4		3uA	
NTC-T475K10TRA	TANTALUM CHIP	4.7	10	10	3.2	1.6	1.8	-55	+85	0.122	0.08		5.0	0.5uA	
NMC1210Y5V475Z16TRPLP	CERAMIC CHIP	4.7	+80 / -20	16	3.2	2.5	1.5	-30	+85		0.15			<0.1uA	
NACE4R70M35V4X5.5TR	ALUMINUM CHIP	4.7	20	35	4.0	4.0	5.5	-40	+85	0.029	0.12	42.3		3uA	
NSP4R7M16DTR	SOLID ALUM CHIP	4.7	20	16	7.3	4.3	1.9	-40	+105	1.000	0.06		0.18	3uA	
NTC-T106K16TRB	TANTALUM CHIP	10	10	16	3.5	2.8	2.1	-55	+85	0.188	0.06		2.4	1.6uA	
NTC-T106K16TRC	TANTALUM CHIP	10	10	16	6.0	3.2	2.8	-55	+85	0.247	0.06		1.8	1.6uA	
NMC1210Y5V106Z16TRPLP	CERAMIC CHIP	10	+80 / -20	16	3.2	2.5	1.5	-30	+85		0.15			0.32uA	
NACE100M16V4X5.5TR	ALUMINUM CHIP	10	20	16	4.0	4.0	5.5	-40	+85	0.036	0.16	26.5		3uA	
NTC-T106K35TRD	TANTALUM CHIP	10	10	35	7.3	4.3	3.1	-55	+85	0.388	0.06		1.0	1.0uA	
NACE100M35V5X5.5TR	ALUMINUM CHIP	10	20	35	5.0	5.0	5.5	-40	+85	0.044	0.12	19.9		3uA	

ELECTRICAL COMPARISON

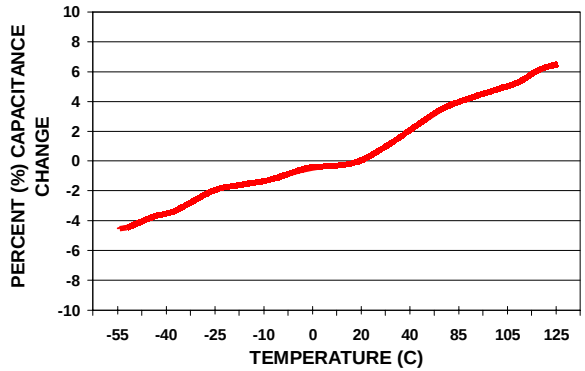
P/N	TYPE	CAPACITANCE (uF)	TOLERANCE (%)	WORKING VOLTAGE (Vdc)	LENGTH MAX. (mm)	WIDTH MAX. (mm)	HEIGHT MAX. (mm)	MIN. TEMP. (°C)	MAX. TEMP (°C)	RIPPLE CURRENT @ MAX. TEMP. (mArms) 100KHz	DISSIPATION FACTOR +20°C (120HZ)	ESR +20°C @ 120Hz MAX. (OHM)	ESR +20°C @ 100KHz MAX. (OHM)	LEAKAGE CURRENT MAX. +20°C (uA) after 2 min. @ WVDC	NOTES
NTC-T226K25TRD	TANTALUM CHIP	22	10	25	7.3	4.3	3.1	-55	+85	0.433	0.06		0.8	5.5uA	
NACE220M25V6.3X5.5TR	ALUMINUM CHIP	22	20	25	6.3	6.3	5.5	-40	+85	0.075	0.14	10.6		5.5uA	
NTC-T336K10TRC	TANTALUM CHIP	33	10	10	6.0	3.2	2.8	-55	+85	0.262	0.08		1.6	3.3uA	
NACE330M10V5X5.5TR	ALUMINUM CHIP	33	20	10	5.0	5.0	5.5	-40	+85	0.056	0.20	10.1		3.3uA	
NSP330M8DTR	SOLID ALUM CHIP	33	20	8	7.3	4.3	1.9	-40	+105	1.600	0.06		0.06	10.6uA	
NTC-T476K16TRD	TANTALUM CHIP	47	10	16	7.3	4.3	3.1	-55	+85	0.433	0.06		0.8	7.5uA	
NACE470M16V6.3X5.5TR	ALUMINUM CHIP	47	20	16	6.3	6.3	5.5	-40	+85	0.088	0.16	5.7		7.5uA	
NTC-T107K10TRD	TANTALUM CHIP	100	10	10	7.3	4.3	3.1	-55	+85	0.463	0.08		0.7	10uA	
NACE101M16V6.3X5.5TR	ALUMINUM CHIP	100	20	16	6.3	6.3	5.5	-40	+85	0.112	0.16	2.7		10uA	
NTC-T227K10TRE	TANTALUM CHIP	220	10	10	7.3	4.3	4.3	-55	+85	0.454	0.10		0.8	22uA	
NACZ221M16V6.3X8TR	ALUMINUM CHIP	220	20	16	6.3	6.3	8.0	-40	+105	0.280	0.16		0.34	22uA	
NTC-T337K6.3TRE	TANTALUM CHIP	330	10	6.3	7.3	4.3	4.3	-55	+85	0.454	0.10		0.8	21uA	
NACZ331M6.3V6.3X8TR	ALUMINUM CHIP	330	20	6.3	6.3	6.3	8.0	-40	+105	0.280	0.24		0.34	21uA	

TEMPERATURE CHARACTERISTICS

TYPICAL CAPACITANCE CHANGE (ΔC) OVER TEMPERTURE

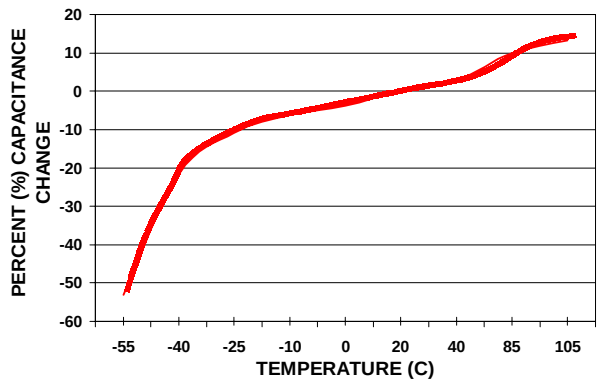
TANTALUM ELECTROLYTIC

ΔC ≈ ±5% OVER -55°C~+85 °C



ALUMINUM ELECTROLYTIC

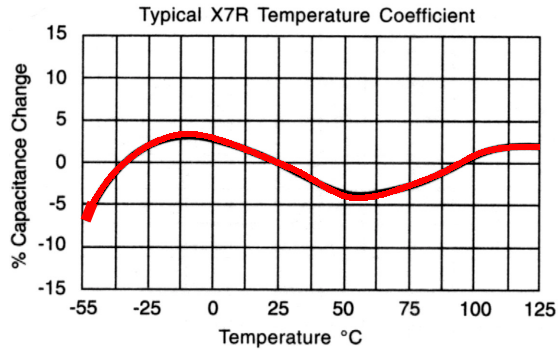
ΔC ≈ ±20% OVER -40°C~+105 °C



CERAMIC

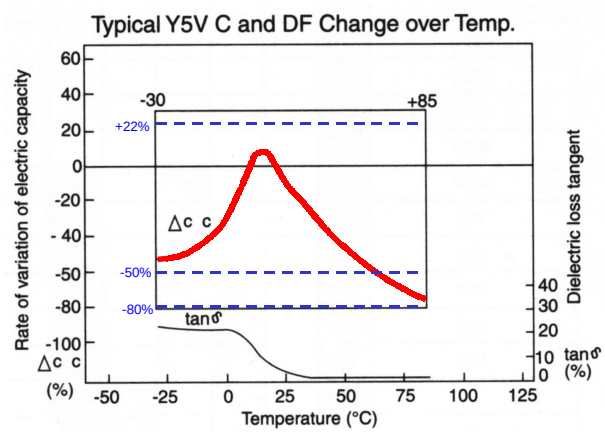
X7R

ΔC = ±15% OVER -55°C ~+125 °C



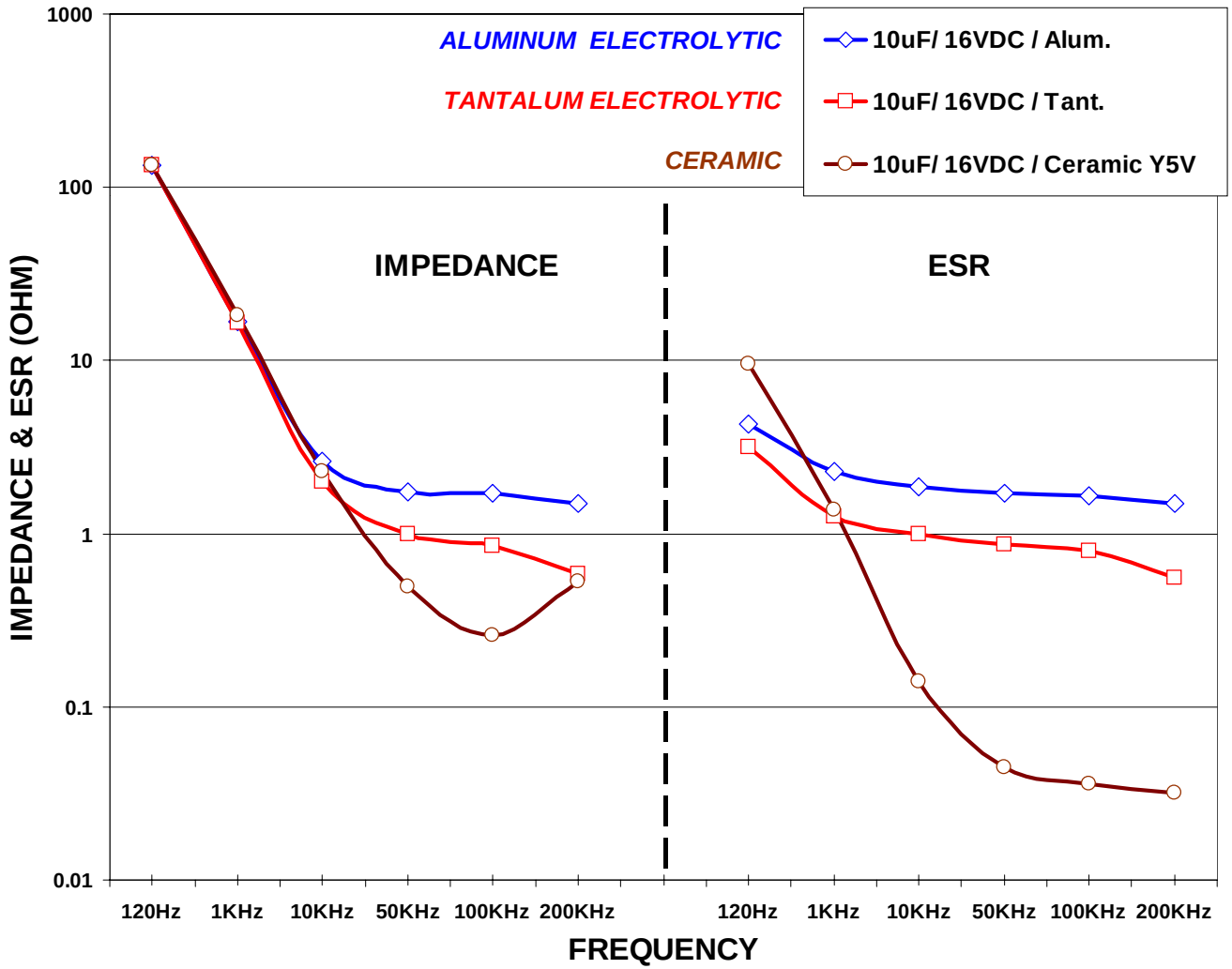
Y5V

ΔC = +22% ~ -82% OVER -30°C~+85 °C



FREQUENCY CHARACTERISTICS

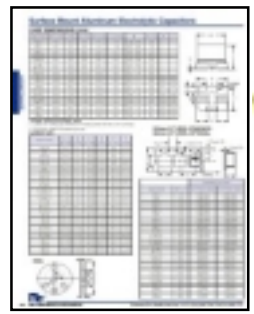
TYPICAL IMPEDANCE AND ESR OVER FREQUENCY 10uF / 16VDC (+25°C)



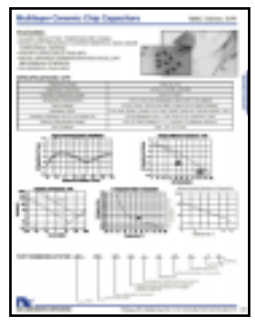
ADDITIONAL RESOURCES

PRODUCT DATA SHEETS

SMT TANTALUM ELECTROLYTIC
NIC CATALOG PAGES 135 ~ 141
NIC WEB SITE: www.niccomp.com
WEB SITE DATA SHEETS:
http://www.niccomp.com/catalog/tancap.html-ssi



SMT ALUMINUM ELECTROLYTIC
NIC CATALOG PAGES 142 ~ 165
NIC WEB SITE: www.niccomp.com
WEB SITE DATA SHEETS:
http://www.niccomp.com/catalog/smcap.html-ssi



SMT CERAMIC
NIC CATALOG PAGES 119 ~ 134
NIC WEB SITE: www.niccomp.com
WEB SITE DATA SHEETS:
http://www.niccomp.com/catalog/ccap.html-ssi

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