

Surface Mount Aluminum Electrolytic Capacitors NACK Series

FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- VERY LOW IMPEDANCE (**Up to 60% lower than NACZ**)
- WIDE TEMPERATURE RANGE (-55 +105°C)
- REDUCED SIZE (**Up to 50% smaller than NACZ**)
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

See **NAZT** for
New Designs



CHARACTERISTICS

Rated Voltage Range	6.3 ~ 100Vdc										
Rated Capacitance Range	3.3 ~ 6,800µF										
Operating Temperature Range	-55°C ~ +105°C										
Capacitance Tolerance	±20%(M)										
Maximum Leakage Current after 2 minutes @ 20°C	0.01CV or 3µA, whichever is greater										
Maximum Tanδ @ 120Hz/20°C	W.V. (Vdc)		6.3	10	16	25	35	50	63	80	100
	S.V. (Vdc)		8.0	13	20	32	44	63	79	100	125
	All Case Sizes	C ≤ 1,000µF	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.08	0.07
		C = 2,200µF	-	0.21	-	0.16	-	-	-	-	-
		C = 3,300µF	0.30	-	0.20	0.18	-	-	-	-	-
C = 4,700µF		-	0.25	0.22	-	-	-	-	-	-	
Low Temperature Stability Impedance Ratio @ 120Hz	Z -25°C/Z +20°C		2	2	2	2	2	2	2	2	2
	Z -40°C/Z +20°C		3	3	3	3	3	3	3	3	3
	Z -55°C/Z +20°C		4	4	4	3	3	3	3	3	3
Load Life Test @ 105°C 4 ~ 10mm Dia. 2,000 Hours 8x10.5mm 5,000 (Opt.) 10x10.5mm 5,000 (Opt.) 12.5 ~ 18mm Dia. 5,000 Hours	Capacitance Change		Within ±30% of initial measured value								
	Tanδ		Less than 200% of specified maximum value								
	Leakage Current		Less than specified maximum value								

**RoHS
Compliant**

includes all homogeneous materials

*See Part Number System for Details

STANDARD PRODUCT AND CASE SIZE Dφ xL (mm)

Cap (µF)	Code	Working Voltage (Vdc)								
		6.3	10	16	25	35	50	63	80	100
3.3	3R3	-	-	-	-	-	-	-	5x6.1	-
4.7	4R7	-	-	-	-	4x6.1	4x6.1	5x6.1	6.3x6.1	-
10	100	-	-	4x6.1	4x6.1	4x6.1 5x6.1	5x6.1 6.3x6.1	6.3x6.1	6.3x8 8x6.5	-
22	220	4x6.1	4x6.1	4x6.1 5x6.1	5x6.1	5x6.1	6.3x6.1	6.3x8 8x6.5	8x10.5	8x10.5
33	330	-	4x6.1 5x6.1	-	5x6.1 6.3x6.1	6.3x1	6.3x8 8x6.5	8x10.5	8x10.5	10x10.5
47	470	4x6.1 5x6.1	-	5x6.1 6.3x6.1	6.3x6.1	6.3x6.1	6.3x8 8x6.5	8x10.5	10x10.5	12.5x14
68	680	-	-	6.3x6.1	6.3x6.1	6.3x8	-	8x10.5	12.5x14	12.5x14
100	101	5x6.1 6.3x6.1	-	6.3x6.1	6.3x8 8x6.5	6.3x8 8x10.5	8x10.5	10x10.5	12.5x14	16x17
150	151	-	6.3x6.1	6.3x8	8x10.5	8x10.5	10x10.5	12.5x14	12.5x14	16x17
220	221	6.3x6.1	6.3x8 8x6.5	6.3x8 8x6.5	8x10.5	8x10.5	10x10.5	12.5x14	-	18x17
330	331	6.3x8 8x6.5	8x10.5	8x10.5	8x10.5	10x10.5	12.5x14	-	16x17	18x17
470	471	8x10.5	8x10.5	8x10.5	10x10.5	12.5x14	16x17	16x17	18x17	-
560	561	-	-	-	-	-	16x17	-	-	-
680	681	-	8x10.5	10x10.5	-	12.5x14	16x17	18x17	-	-
1000	102	8x10.5	10x10.5	-	12.5x14	16x17	16x17	-	-	-
1500	152	10x10.5	-	12.5x14	16x17	16x17	-	-	-	-
2200	222	-	12.5x14	-	16x17	-	-	-	-	-
3300	332	12.5x14	-	16x17	18x17	-	-	-	-	-
4700	472	-	16x17	18x17	-	-	-	-	-	-
6800	682	16x17	18x17	-	-	-	-	-	-	-

Available in "Y" Control Option (for Automotive Equipment)

Not recommended for new designs
(use NACKA series)



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STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

NIC Part Number*	Cap. (μF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. Ripple Current (mA) +105°C/100KHz	Max. Impedance (Ω) +20°C/100KHz	Load Life Hours @ +105°C	
NACK220M6.3V4x6.1TR13F	22	6.3	0.26	90	1.35	2,000	
NACK470M6.3V4x6.1TR13F	47		0.26	90	1.35	2,000	
NACK470M6.3V5x6.1TR13F			0.26	160	0.70	2,000	
NACK101M6.3V5x6.1TR13F	100		0.26	160	0.70	2,000	
NACK101M6.3V6.3x6.1TR13F			0.26	240	0.36	2,000	
NACK221M6.3V6.3x6.1TR13F	220		0.26	240	0.36	2,000	
NACK331M6.3V6.3x8TR13F	330		0.26	280	0.34	2,000	
NACK331M6.3V8x6.5TR13F			0.26	300	0.26	2,000	
NACK471M6.3V8x10.5TR13F	470		0.26	600	0.16	2,000	
NACK471M6.3V8x10.5TR13EF	470		0.26	600	0.16	5,000	
NACK102M6.3V8x10.5TR13F	1000		0.26	600	0.16	2,000	
NACK102M6.3V8x10.5TR13EF	1000		0.26	600	0.16	5,000	
NACK152M6.3V10x10.5TR13F	1500		0.28	850	0.08	2,000	
NACK152M6.3V10x10.5TR13EF	1500		0.28	850	0.08	5,000	
NACK332M6.3V12.5x14TR13F	3300		0.30	1100	0.06	5,000	
NACK682M6.3V16x17TR13F	6800		0.36	1800	0.035	5,000	
NACK220M10V4x6.1TR13F	22		10	0.19	90	1.35	2,000
NACK330M10V4x6.1TR13F	33			0.19	90	1.35	2,000
NACK330M10V5x6.1TR13F		0.19		160	0.70	2,000	
NACK151M10V6.3x6.1TR13F	150	0.19		240	0.36	2,000	
NACK221M10V6.3x8TR13F	220	0.19		160	0.34	2,000	
NACK221M10V8x6.5TR13F		0.19		300	0.26	2,000	
NACK331M10V8x10.5TR13F	330	0.19		600	0.16	2,000	
NACK331M10V8x10.5TR13EF	330	0.19		600	0.16	5,000	
NACK471M10V8x10.5TR13F	470	0.19		600	0.16	2,000	
NACK471M10V8x10.5TR13EF	470	0.19		600	0.16	5,000	
NACK681M10V8x10.5TR13F	680	0.19		600	0.16	2,000	
NACK681M10V8x10.5TR13EF	680	0.19		600	0.16	5,000	
NACK102M10V10x10.5TR13F	1000	0.19		850	0.08	2,000	
NACK102M10V10x10.5TR13EF	1000	0.19		850	0.08	5,000	
NACK222M10V12.5x14TR13F	2200	0.21		1100	0.06	5,000	
NACK472M10V16x17TR13F	4700	0.25		1800	0.035	5,000	
NACK682M10V18x17TR13F	6800	0.29		2060	0.033	5,000	
NACK100M16V4x6.1TR13F	10	16		0.16	90	1.35	2,000
NACK220M16V4x6.1TR13F	22		0.16	90	1.35	2,000	
NACK220M16V5x6.1TR13F			0.16	160	0.70	2,000	
NACK470M16V5x6.1TR13F	47		0.16	160	0.70	2,000	
NACK470M16V6.3x6.1TR13F			0.16	240	0.36	2,000	
NACK680M16V6.3x6.1TR13F	68		0.16	240	0.36	2,000	
NACK101M16V6.3x6.1TR13F	100		0.16	240	0.36	2,000	
NACK151M16V6.3x8TR13F	150		0.16	280	0.34	2,000	
NACK221M16V6.3x8TR13F	220		0.16	280	0.34	2,000	
NACK221M16V8x6.5TR13F			0.16	300	0.26	2,000	
NACK331M16V8x10.5TR13F	330		0.16	600	0.16	2,000	
NACK331M16V8x10.5TR13EF	330		0.16	600	0.16	5,000	
NACK471M16V8x10.5TR13F	470		0.16	600	0.16	2,000	
NACK471M16V8x10.5TR13EF	470		0.16	600	0.16	5,000	
NACK681M16V10x10.5TR13F	680		0.16	850	0.08	2,000	
NACK681M16V10x10.5TR13EF	680		0.16	850	0.08	5,000	
NACK152M16V12.5x14TR13F	1500		0.18	1100	0.06	5,000	
NACK332M16V16x17TR13F	3300		0.20	1800	0.035	5,000	
NACK472M16V18x17TR13F	4700	0.22	2060	0.033	5,000		
NACK100M25V4x6.1TR13F	10	25	0.14	90	1.35	2,000	
NACK220M25V5x6.1TR13F	22		0.14	160	0.70	2,000	
NACK330M25V5x6.1TR13F	33		0.14	160	0.70	2,000	
NACK330M25V6.3x6.1TR13F			0.14	240	0.36	2,000	
NACK470M25V6.3x6.1TR13F	47		0.14	240	0.36	2,000	
NACK680M25V6.3x6.1TR13F	68		0.14	240	0.36	2,000	
NACK101M25V6.3x8TR13F	100		0.14	280	0.34	2,000	

Optional 5,000 hour long life

*See part numbering system for how to denote WT termination style

Not recommended for new designs
(use NACKA series)



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STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

NIC Part Number*	Cap. (μF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. Ripple Current (mA) +105°C/100KHz	Max. Impedance (Ω) +20°C/100KHz	Load Life Hours @ +105°C	
NACK101M25V8x6.5TR13F	100	25	0.14	600	0.26	2,000	
NACK151M25V8x10.5TR13F	150		0.14	600	0.16	2,000	
NACK151M25V8x10.5TR13EF	150		0.14	600	0.16	5,000	
NACK221M25V8x10.5TR13F	220		0.14	600	0.16	2,000	
NACK221M25V8x10.5TR13EF	220		0.14	600	0.16	5,000	
NACK331M25V8x10.5TR13F	330		0.14	850	0.16	2,000	
NACK331M25V8x10.5TR13EF	330		0.14	850	0.16	5,000	
NACK471M25V10x10.5TR13F	470		0.14	1100	0.08	2,000	
NACK471M25V10x10.5TR13EF	470		0.14	1100	0.08	5,000	
NACK102M25V12.5x14TR13F	1000		0.14	1100	0.06	5,000	
NACK222M25V16x17TR13F	2200		0.16	1800	0.035	5,000	
NACK332M25V18x17TR13F	3300		0.18	1800	0.033	5,000	
NACK4R7M35V4x6.1TR13F	4.7	35	0.12	90	1.35	2,000	
NACK100M35V4x6.1TR13F	10		0.12	90	1.35	2,000	
NACK100M35V5x6.1TR13F	10		0.12	160	0.70	2,000	
NACK220M35V5x6.1TR13F	22		0.12	160	0.70	2,000	
NACK330M35V6.3x1TR13F	33		0.12	240	0.36	2,000	
NACK470M35V6.3x6.1TR13F	47		0.12	240	0.36	2,000	
NACK680M35V6.3x8TR13F	68		0.12	280	0.34	2,000	
NACK101M35V6.3x8TR13F	100		0.12	280	0.34	2,000	
NACK101M35V8x10.5TR13F	100		0.12	600	0.16	2,000	
NACK101M35V8x10.5TR13EF	100		0.12	600	0.16	5,000	
NACK151M35V8x10.5TR13F	150		0.12	600	0.16	2,000	
NACK151M35V8x10.5TR13EF	150		0.12	600	0.16	5,000	
NACK221M35V8x10.5TR13F	220		0.12	600	0.16	2,000	
NACK221M35V8x10.5TR13EF	220		0.12	600	0.16	5,000	
NACK331M35V10x10.5TR13F	330		0.12	850	0.08	2,000	
NACK331M35V10x10.5TR13EF	330		0.12	850	0.08	5,000	
NACK471M35V12.5x14TR13F	470		0.12	1100	0.06	5,000	
NACK681M35V12.5x14TR13F	680		0.12	1100	0.06	5,000	
NACK102M35V16x17TR13F	1000		0.12	1800	0.035	5,000	
NACK152M35V16x17TR13F	1500		0.12	1800	0.035	5,000	
NACK4R7M50V4x6.1TR13F	4.7		50	0.10	60	2.9	2,000
NACK100M50V5x6.1TR13F	10			0.10	85	1.52	2,000
NACK100M50V6.3x6.1TR13F	10			0.10	165	0.88	2,000
NACK220M50V6.3x6.1TR13F	22			0.10	165	0.88	2,000
NACK220M50V6.3x8TR13F	22	0.10		195	0.68	2,000	
NACK330M50V8x6.5TR13F	33	0.10		195	0.68	2,000	
NACK470M50V6.3x8TR13F	47	0.10		195	0.68	2,000	
NACK470M50V8x6.5TR13F	47	0.10		195	0.68	2,000	
NACK101M50V8x10.5TR13F	100	0.10		350	0.34	2,000	
NACK101M50V8x10.5TR13EF	100	0.10		350	0.34	5,000	
NACK151M50V10x10.5TR13F	150	0.10		670	0.18	2,000	
NACK151M50V10x10.5TR13EF	150	0.10		670	0.18	5,000	
NACK221M50V10x10.5TR13F	220	0.10		670	0.18	2,000	
NACK221M50V10x10.5TR13EF	220	0.10		670	0.18	5,000	
NACK331M50V12.5x14TR13F	330	0.10		900	0.12	5,000	
NACK471M50V16x17TR13F	470	0.10		1610	0.073	5,000	
NACK561M50V16x17TR13F	560	0.10		1610	0.073	5,000	
NACK681M50V16x17TR13F	680	0.10		1610	0.073	5,000	
NACK102M50V16x17TR13F	1000	0.10		1610	0.073	5,000	
NACK4R7M63V5x6.1TR13F	4.7	63		0.08	50	3.0	2,000
NACK100M63V6.3x6.1TR13F	10			0.08	80	1.5	2,000
NACK220M63V6.3x8TR13F	22			0.08	120	1.2	2,000
NACK220M63V8x6.5TR13F	22			0.08	120	1.2	2,000
NACK330M63V8x10.5TR13F	33			0.08	250	0.65	2,000
NACK470M63V8x10.5TR13F	47		0.08	250	0.65	2,000	

Optional 5,000 hour long life

*See part numbering system for how to denote WT termination style

Not recommended for new designs
(use NACKA series)



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STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

NIC Part Number*	Cap. (μF)	W.V. (Vdc)	Dissipation Factor (Tan δ)	Max. Ripple Current (mA) +105°C/100KHz	Max. Impedance (Ω) +20°C/100KHz	Load Life Hours @ +105°C	
NACK680M63V8x10.5TR13F	68	63	0.08	250	0.65	2,000	
NACK101M63V10x10.5TR13F	100		0.08	400	0.35	2,000	
NACK151M63V12.5x14TR13F	150		0.08	800	0.16	5,000	
NACK221M63V12.5x14TR13F	220		0.08	800	0.16	5,000	
NACK471M63V16x17TR13F	470		0.08	1410	0.082	5,000	
NACK681M63V18x17TR13F	680		0.08	1690	0.08	5,000	
NACK3R3M80V5x6.1TR13F	3.3	80	0.08	25	5.0	2,000	
NACK4R7M80V6.3x6.1TR13F	4.7		0.08	40	3.0	2,000	
NACK100M80V6.3x8TR13F	10		0.08	60	2.4	2,000	
NACK100M80V8x6.5TR13F			0.08	60	2.4	2,000	
NACK220M80V8x10.5TR13F	22		0.08	130	1.3	2,000	
NACK330M80V8x10.5TR13F	33		0.08	130	1.3	2,000	
NACK470M80V10x10.5TR13F	47		0.08	200	0.7	2,000	
NACK470M80V10x10.5TR13F	47		0.08	200	0.7	2,000	
NACK680M80V12.5x14TR13F	68		0.08	500	0.32	5,000	
NACK101M80V12.5x14TR13F	100		0.08	500	0.32	5,000	
NACK151M80V12.5x14TR13F	150		0.08	500	0.32	5,000	
NACK331M80V16x17TR13F	330		0.08	793	0.17	5,000	
NACK471M80V18x17TR13F	470		0.08	917	0.153	5,000	
NACK220M100V8x10.5TR13F	22		100	0.07	130	1.3	2,000
NACK330M100V10x10.5TR13F	33			0.07	200	0.7	2,000
NACK470M100V12.5x14TR13F	47			0.07	500	0.32	5,000
NACK680M100V12.5x14TR13F	68			0.07	500	0.32	5,000
NACK101M100V16x17TR13F	100			0.07	793	0.17	5,000
NACK151M100V16x17TR13F	150	0.07		793	0.17	5,000	
NACK221M100V18x17TR13F	220	0.07		917	0.153	5,000	
NACK331M100V18x17TR13F	330	0.07		917	0.153	5,000	

Optional 5,000 hour long life

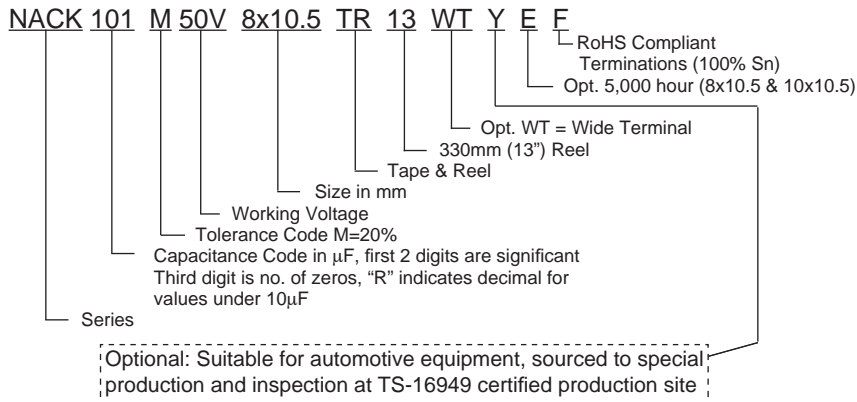
*See part numbering system for how to denote WT termination style

Not recommended for new designs
(use NACKA series)

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency	60Hz	120Hz	1KHz	10KHz	100KHz
Correction Factor	0.7	0.75	0.9	0.95	1.0

PART NUMBER SYSTEM



PRECAUTIONS

Please review the notes on correct use, safety and precautions found on pages T10 & T11 of NIC's Electrolytic Capacitor catalog.
Also found at www.niccomp.com/precautions
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: tpmg@niccomp.com

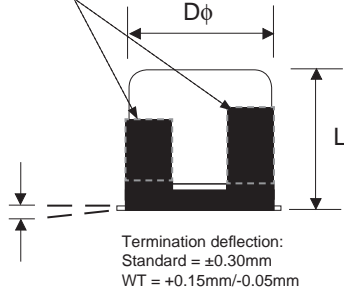


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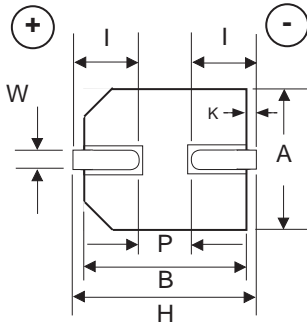
DIMENSIONS (mm)

Case Size	D ϕ ± 0.5	L max.	A, B	H max.	I ± 0.3	P ± 0.3	W	K	R	S	T
4 x 6.1	4.0	6.1	4.3 ± 0.2	5.5	1.8	1.0	0.65 ± 0.15	0.35 ± 0.2	-	-	-
5 x 6.1	5.0	6.1	5.3 ± 0.2	6.5	2.2	1.5	0.65 ± 0.15	0.35 ± 0.2	-	-	-
6.3 6.1	6.3	6.1	6.6 ± 0.2	7.8	2.6	1.8	0.65 ± 0.15	0.35 ± 0.2	-	-	-
6.3 x 8	6.3	8.0	6.6 ± 0.2	7.8	2.6	1.8	0.65 ± 0.15	0.35 ± 0.2	-	-	-
8 x 6.5	8.0	6.5	8.3 ± 0.2	9.5	3.4	2.2	0.65 ± 0.15	0.35 ± 0.2	-	-	-
8 x 6.5WT	8.0	6.8	8.3 ± 0.2	9.5	3.4	2.2	0.70 ± 0.10	0.35 ± 0.2	0.70 ± 0.2	5.3 ± 0.2	1.7 ± 0.2
8 x 10.5	8.0	10.5	8.3 ± 0.2	10.0	3.1	3.1	0.90 ± 0.20	0.70 $\pm 0.2/-0.5$	-	-	-
8 x 10.5WT	8.0	10.8	8.3 ± 0.2	10.0	3.4	3.1	1.20 ± 0.20	0.70 ± 0.2	0.70 ± 0.2	5.3 ± 0.2	1.3 ± 0.2
10 x 10.5	10.0	10.5	10.3 ± 0.2	12.0	3.2	4.6	1.05 ± 0.35	0.70 $\pm 0.2/-0.5$	-	-	-
10 x 10.5WT	10.0	10.8	10.3 ± 0.2	12.0	3.5	4.6	1.20 ± 0.20	0.70 ± 0.2	0.70 ± 0.2	6.9 ± 0.2	1.3 ± 0.2
12.5 x 14	12.5	14.0	13.2 ± 0.6	15.0	4.5	4.6	1.00 ± 0.40	0.70 $\pm 0.3/-0.5$	-	-	-
12.5 x 14WT	12.5	14.3	13.5 ± 0.2	15.0	4.7	4.4	1.20 ± 0.30	0.70 ± 0.3	2.2 ± 0.2	7.1 ± 0.2	2.4 ± 0.2
16 x 17	16.0	17.0	16.7 ± 0.6	19.0	5.2	6.9	1.95 ± 0.15	0.70 $\pm 0.3/-0.4$	-	-	-
16 x 17WT	16.0	17.5	17.0 ± 0.2	20.0	5.5	6.9	1.95 ± 0.15	0.70 $\pm 0.3/-0.4$	3.0 ± 0.2	9.0 ± 0.2	1.9 ± 0.2
18 x 17	18.0	17.0	19.0 ± 0.2	21.0	6.7	6.7	1.20 ± 0.30	0.70 ± 0.3	-	-	-
18 x 17WT	18.0	17.3	19.0 ± 0.2	21.0	6.7	6.7	1.40 ± 0.20	0.70 ± 0.3	3.0 ± 0.2	11.0 ± 0.2	1.9 ± 0.2

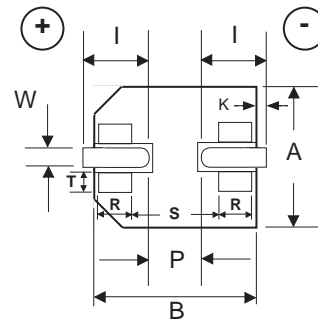
Anti-Vibration Skirt
on WT Style
8mm ~ 18mm Dia.



STANDARD



WT STYLE

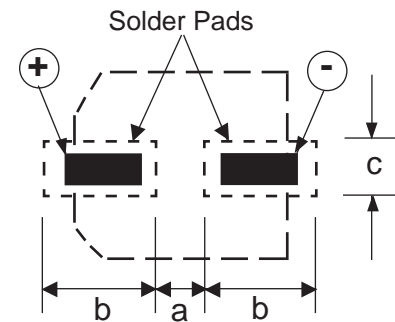


RECOMMENDED LAND PATTERN (mm)

STANDARD TERMINAL

Case Dia.	a	b	c
4x6.1	1.0	2.6	1.8
5x6.1	1.4	3.0	1.8
6.3x6.1	2.1	3.5	1.8
6.3x8	2.1	3.5	1.8
8x6.5	2.2	4.5	1.6
8x10.5	2.8	4.1	2.2
10x10.5	4.5	4.5	2.5
12.5x14	4.3	5.8	2.5
16x17	6.6	6.5	4.0
18x17	6.0	7.5	2.5

STANDARD TERMINATION



RECOMMENDED LAND PATTERN (mm)

WIDE TERMINAL

Case Dia.	d	e	f
8x6.5WT	1.8	4.1	5.0
8x10.5WT	2.7	4.0	4.7
10x10.5 WT	3.9	4.4	4.7
12.5x14WT	3.9	6.0	2.5
16x17WT	4.7	8.4	9.6
18x17WT	4.7	8.4	9.6

WT STYLE TERMINATION

