Miniature Aluminum Electrolytic Capacitors

NRE-JL Series

ULTRA LOW IMPEDANCE, RADIAL LEADS, POLARIZED, ALUMINUM ELECTROLYTIC

FEATURES

- VERY LOW IMPEDANCE & HIGH RIPPLE CURRENT
- LONG LIFE AT 105°C (4000 ~ 10,000 hrs.)
- HIGH STABILITY AT LOW TEMPERATURE
- IDEALLY FOR SWITCHING POWER SUPPLIES & CONVERTORS

CHARACTERISTICS

Rated Voltage Range	6.3 ~ 100Vdc								
Capacitance Range	0.47 ~ 15,000µF								
Operating Temperature Range	-40°C ~ +105°C								
Capacitance Tolerance	±20% (M)								
Maximum Leakage Current After 2 Minutes at 20°C	0.01CV or 3µA whichever is greater								
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	6.3	10	16	25	35	50	63	100
	S.V. (Vdc)	8	13	20	32	44	63	79	125
	C ≤ 1,000µF	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	C = 2,200µF	0.24	0.21	0.18	0.16	0.14	0.12	-	-
	C = 3,300µF	0.26	0.23	0.20	0.18	0.16	-	-	-
	C = 4,700µF	0.28	0.25	0.22	0.20	-	-	-	-
	C = 6,800µF	0.32	0.29	0.26	-	-	-	-	-
	C = 10,000µF	0.40	0.37	-	-	-	-	-	-
	C = 15,000µF	0.50	-	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2
	Z-40°C/Z+20°C	8	6	4	3	3	3	3	3
Load Life Hours Load Life Test at Rated W.V. & 105°C	Case Diameter	Life Hours							
		6.3V to 10V				16V to 100V			
	φ5mm	4,000				5,000			
	φ6.3mm & φ8mm	6,000				7,000			
	φ10mm ~ φ16mm	8,000				10,000			
	Capacitance Change	Within ±25% (6.3V ±30%) of initial measured value							
	Tan δ	Less than 200% of specified value							
	Leakage Current	Less than specified value							
Shelf Life Test 105°C 1,000 Hours No Load	Capacitance Change	Within ±25% of initial measured value							
	Tan δ	Less than 200% of specified value							
	Leakage Current	Less than specified value							

PART NUMBER SYSTEM

NRE-JL 102 M 25V 10X20 TB F

- F — RoHS Compliant
- TB = Tape & Box*
- 10X20 — Case Size (mm)
- 25V — Working Voltage
- M — Tolerance Code M=20%
- 102 — Capacitance Code in µF
- NRE-JL — Series

*see tape specification for details

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

STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D ϕ x L (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mArms) +105°C/100KHz	Max. Z (Ω) 100KHz		Load Life Hours @+105°C
					+20°C	-10°C	
NRE-JL101M6.3V5X11F	100	6.3	0.22	150	0.90	3.6	4,000
NRE-JL221M6.3V5X11F	220		0.22	250	0.40	1.2	4,000
NRE-JL331M6.3V6.3X11F	330		0.22	340	0.22	0.87	6,000
NRE-JL471M6.3V6.3X11F	470		0.22	400	0.22	0.87	6,000
NRE-JL102M6.3V8X11.5F	1000		0.22	640	0.13	0.52	6,000
NRE-JL222M6.3V10X16F	2200		0.24	1300	0.062	0.25	8,000
NRE-JL332M6.3V10X20F	3300		0.26	1400	0.046	0.18	8,000
NRE-JL472M6.3V12.5X25F	4700		0.28	2230	0.032	0.11	8,000
NRE-JL682M6.3V12.5X25F	6800		0.32	2230	0.032	0.11	8,000
NRE-JL103M6.3V16X25F	10000		0.40	2930	0.021	0.060	8,000
NRE-JL153M6.3V16X35.5F	15000		0.50	3610	0.015	0.044	8,000
NRE-JL101M10V5X11F	100	10	0.19	150	0.9	3.6	4,000
NRE-JL221M10V5X11F	220		0.19	250	0.4	1.2	4,000
NRE-JL331M10V6.3X11F	330		0.19	400	0.22	0.87	6,000
NRE-JL471M10V6.3X11F	470		0.19	400	0.22	0.87	6,000
NRE-JL102M10V10X12.5F	1000		0.19	865	0.080	0.32	8,000
NRE-JL222M10V10X20F	2200		0.21	1400	0.046	0.18	8,000
NRE-JL332M10V12.5X20F	3300		0.23	1900	0.041	0.14	8,000
NRE-JL472M10V12.5X25F	4700		0.25	2230	0.032	0.11	8,000
NRE-JL682M10V16X25F	6800		0.29	2930	0.021	0.060	8,000
NRE-JL103M10V16X31.5F	10000		0.37	3450	0.019	0.056	8,000
NRE-JL470M16V5X11F	47	16	0.16	250	0.40	1.2	5,000
NRE-JL101M16V5X11F	100		0.16	250	0.40	1.2	5,000
NRE-JL221M16V6.3X11F	220		0.16	400	0.22	0.87	7,000
NRE-JL331M16V6.3X11F	330		0.16	400	0.22	0.87	7,000
NRE-JL471M16V8X11.5F	470		0.16	640	0.13	0.52	7,000
NRE-JL102M16V10X16F	1000		0.16	1210	0.062	0.25	10,000
NRE-JL222M16V12.5X20F	2200		0.18	1900	0.041	0.14	10,000
NRE-JL332M16V12.5X25F	3300		0.20	2230	0.032	0.11	10,000
NRE-JL472M16V16X25F	4700		0.22	2930	0.021	0.060	10,000
NRE-JL682M16V16X31.5F	6800		0.26	3450	0.019	0.056	10,000
NRE-JL330M25V5X11F	33	25	0.14	250	0.40	1.2	5,000
NRE-JL470M25V5X11F	47		0.14	250	0.40	1.2	5,000
NRE-JL101M25V5X11F	100		0.14	250	0.40	1.2	5,000
NRE-JL221M25V6.3X11F	220		0.14	400	0.22	0.87	7,000
NRE-JL331M25V8X11.5F	330		0.14	640	0.13	0.52	7,000
NRE-JL471M25V10X12.5F	470		0.14	865	0.080	0.32	10,000
NRE-JL102M25V10X20F	1000		0.14	1400	0.046	0.18	10,000
NRE-JL222M25V12.5X25F	2200		0.16	2230	0.032	0.11	10,000
NRE-JL332M25V16X25F	3300		0.18	2930	0.021	0.060	10,000
NRE-JL472M25V16X31.5F	4700		0.20	3450	0.019	0.056	10,000
NRE-JL330M35V5X11F	33	35	0.12	250	0.40	1.2	5,000
NRE-JL470M35V5X11F	47		0.12	250	0.40	1.2	5,000
NRE-JL101M35V6.3X11F	100		0.12	400	0.22	0.87	7,000
NRE-JL221M35V8X11.5F	220		0.12	640	0.13	0.52	7,000
NRE-JL331M35V10X12.5F	330		0.12	865	0.080	0.32	10,000
NRE-JL471M35V10X16F	470		0.12	1210	0.062	0.25	10,000
NRE-JL102M35V12.5X20F	1000		0.12	1900	0.041	0.14	10,000
NRE-JL222M35V16X25F	2200		0.14	2930	0.021	0.060	10,000
NRE-JL332M35V16X31.5F	3300		0.16	3450	0.019	0.056	10,000
NRE-JLR47M50V5X11F	0.47	50	0.10	17	5.5	12.0	5,000
NRE-JL1R0M50V5X11F	1.0		0.10	30	4.0	8.0	5,000
NRE-JL2R2M50V5X11F	2.2		0.10	43	2.5	6.0	5,000
NRE-JL3R3M50V5X11F	3.3		0.10	53	2.2	5.6	5,000
NRE-JL4R7M50V5X11F	4.7		0.10	88	1.9	5.0	5,000
NRE-JL100M50V5X11F	10		0.10	100	1.5	4.0	5,000
NRE-JL220M50V5X11F	22		0.10	150	0.90	3.6	5,000
NRE-JL330M50V5X11F	33		0.10	250	0.70	2.8	5,000
NRE-JL470M50V6.3X11F	47		0.10	250	0.40	1.6	7,000
NRE-JL101M50V8X11.5F	100		0.10	400	0.25	1.0	7,000

STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D ϕ x L (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mArms) +105°C/100KHz	Max. Z (Ω) 100KHz		Load Life Hours @+105°C
					+20°C	-10°C	
NRE-JL221M50V10X16F	220	50	0.10	770	0.12	0.46	10,000
NRE-JL331M50V10X20F	330		0.10	1050	0.078	0.30	10,000
NRE-JL471M50V12.5X20F	470		0.10	1300	0.062	0.21	10,000
NRE-JL102M50V16X25F	1000		0.10	1850	0.034	0.096	10,000
NRE-JL222M50V16X35.5F	2200		0.12	3150	0.019	0.057	10,000
NRE-JL100M63V5X11F	10	63	0.09	173	0.88	3.5	5,000
NRE-JL220M63V5X11F	22		0.09	173	0.88	3.5	5,000
NRE-JL330M63V6.3X11F	33		0.09	278	0.35	1.4	7,000
NRE-JL470M63V6.3X11F	47		0.09	278	0.35	1.4	7,000
NRE-JL101M63V10X12.5F	100		0.09	725	0.15	0.60	10,000
NRE-JL221M63V10X20F	220		0.09	1200	0.078	0.31	10,000
NRE-JL331M63V12.5X20F	330		0.09	1570	0.060	0.19	10,000
NRE-JL470M63V12.5X25F	470		0.09	1990	0.043	0.14	10,000
NRE-JL102M63V16X25F	1000		0.09	2730	0.032	0.096	10,000
NRE-JLR47M100V5X11F	0.47	100	0.08	15	6.0	17.0	5,000
NRE-JL1R0M100V5X11F	1.0		0.08	20	4.5	15.0	5,000
NRE-JL2R2M100V5X11F	2.2		0.08	30	3.0	13.0	5,000
NRE-JL3R3M100V5X11F	3.3		0.08	40	2.7	11.0	5,000
NRE-JL4R7M100V5X11F	4.7		0.08	65	2.5	10.0	5,000
NRE-JL100M100V5X11F	10		0.08	163	1.4	5.6	5,000
NRE-JL220M100V6.3X11F	22		0.08	267	0.57	2.3	7,000
NRE-JL330M100V8X11.5F	33		0.08	462	0.36	1.4	7,000
NRE-JL470M100V8X16F	47		0.08	585	0.25	1.0	7,000
NRE-JL101M100V10X20F	100		0.08	1040	0.12	0.52	10,000
NRE-JL221M100V12.5X25F	220		0.08	1620	0.060	0.23	10,000
NRE-JL331M100V16X25F	330		0.08	2210	0.044	0.16	10,000

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

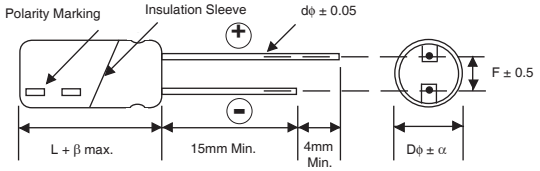
Frequency (Hz) 6.3V ~ 50V	120	1K	10K	≤100K
0.47 ~ 10	0.42	0.60	0.80	1.00
22 ~ 33	0.55	0.75	0.90	1.00
47 ~ 330	0.70	0.85	0.95	1.00
470 ~ 1,000	0.75	0.90	0.98	1.00
2,200 ~ 1,5000	0.80	0.95	1.00	1.00
Frequency (Hz) 63V ~ 100V	120	1K	10K	≤100K
All Cap Values	0.42	0.60	0.80	1.00

DIAMETER AND LEADSPACE (mm)

Case Dia. (Dϕ)	5	6.3	8	10	12.5	16
Lead Dia. (dϕ)	0.5	0.5	0.6	0.6	0.6	0.8
Lead Spacing (F)	2.0	2.5	3.5	5.0	5.0	7.5
Dim. α	0.5	0.5	0.5	0.5	0.5	0.5

β = L ≤ 16mm = 1.5mm, L ≥ 20mm = 2.0mm

DIMENSIONS (mm)

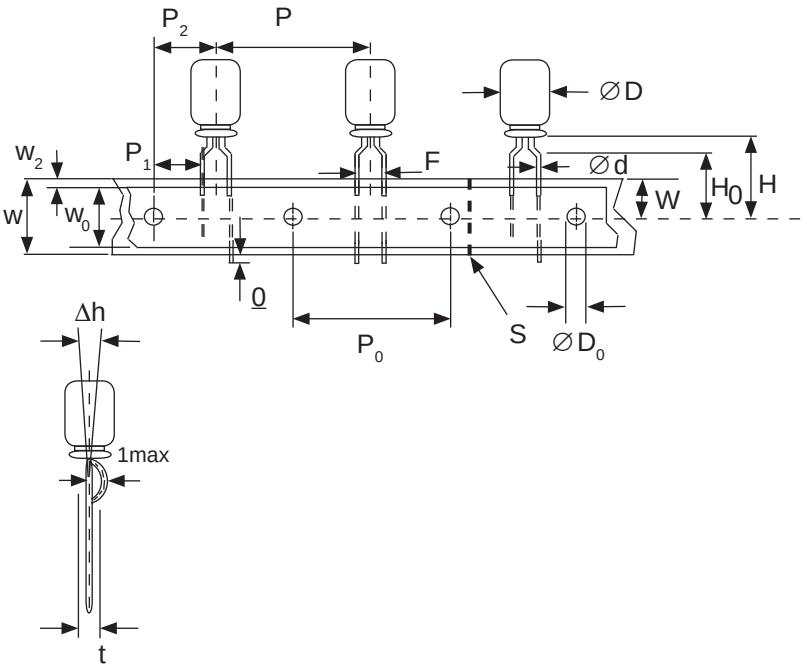


Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

STANDARD RADIAL TAPING (5mm LEAD SPACING, FORMED LEADS) TB

Taping Dimensions (mm)

Case Dia. (Dϕ)	4	5		6.3		8
Case Size / Dim.	4x5 4x7	5x5 5x7	5x11	6.3x5 6.3x7	6.3x11	8x11.5
dϕ ±0.05	0.45	0.45	0.5	0.45	0.5	0.6
H ±0.75	17.5	17.5	18.5	17.5	18.5	20.0
F +0.8 ~ -0.2	5.0 -02 ~ +0.8					
P	12.7 ±1.0					
P_0	12.7 ±0.2					
P_1	3.85 ±0.5 (at end of tape)					
P_2	6.35 ±1.0					
W	18.0 ±0.5					
W_0	11.5 min.					
W_1	9.0 ±0.5					
W_2	0 ~ 2.5					
H_0	16.0 ±0.5					
I	1.0 max.					
$D_0\phi$	4.0 ±0.2					
Δh	0 ±1.0 (at top of can)					
t	0.7 ±0.2 (not including lead)					



STANDARD RADIAL TAPING (5mm LEAD SPACING, STRAIGHT LEADS) TB

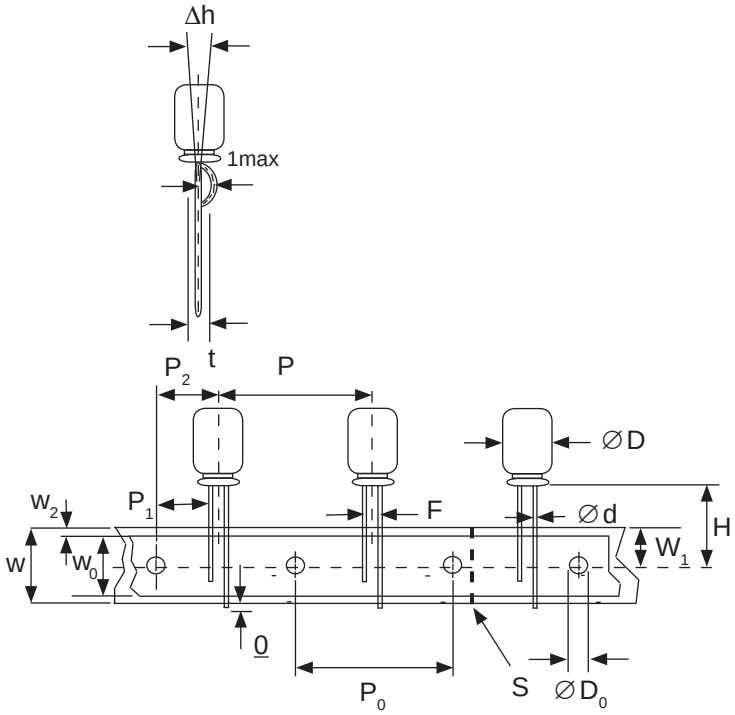
Taping Dimensions (mm)

Case Dia. (Dϕ)	10	12.5
Case Size / Dim.	All	All
dϕ ±0.05	0.6	0.6
H ±0.75	19.0	19.0
F +0.8 ~ -0.2	5.0	5.0
P ±1.0	25.4*	
P_0	12.7 ±0.2	
P_1	3.85	
P_2	6.35 ±1.0	
W	18.0 ±0.5	
W_0	11.5 min	
W_1	9.0 ±0.5	
W_2	0 ~ 2.5	
H_0	16.0 ±0.5	
I	1.0 max.	
$D_0\phi$	4.0 ±0.2	
Δh	0 ±1.0 (at top of can)	
t	0.7 ±0.2 (not including lead)	

***Optional Taping Speci cations**

10mm diameter available with P dim. = 12.7mm (P/N Suffix: TB12.7MMP)

12.5mm diameter available with P dim. = 15mm, P_1= 5.0mm, P_0 = 15.0mm & P_2 = 7.5mm (P/N Suffix: TB15MMP)

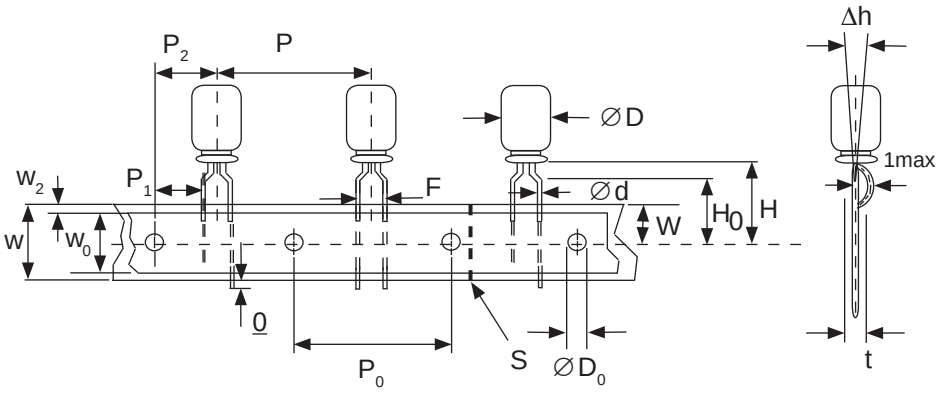


NOTE: ANODE (+) LEAD FEEDS OFF FIRST. FOR OPTION OF NEGATIVE (–) LEAD FIRST, SPECIFY "TBN".

SPECIAL RADIAL TAPING (2.5mm LEAD SPACING, FORMED LEADS) TBF1

Taping Dimensions (mm)

Case Dia. (Dϕ)	4	5	
Case Size Dim.	4x5 4x7	5x5 5x7	5x11
dϕ ±0.05	0.45	0.45	0.5
H ±0.75	17.5	17.5	18.5
H_0 ±0.5	16.0	-	-
F	2.5 -02 ~ +0.8		
P	12.7 ±1.0		
P_0	12.7 ±0.2		
P_1	5.1 ±0.5		
P_2	6.35 ±1.0		
W	18.0 ±0.5		
W_0	11.5 min.		
W_1	9.0 ±0.5		
W_2	0 ~ 1.5		
I	1.0 max.		
D_0ϕ	4.0 ±0.2		
Δh	0 ±1.0		
t	0.7 ±0.2		

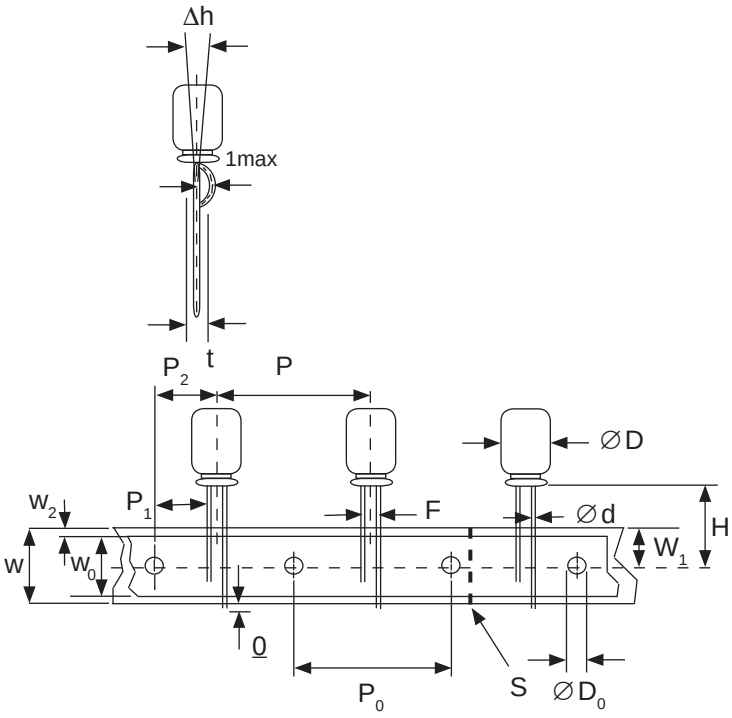


SPECIAL STRAIGHT LEAD TAPING TBST

Taping Dimensions (mm)

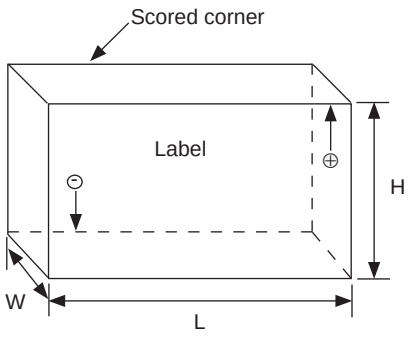
Case Dia. (Dϕ)	4	5		6.3		8
Case Size Dim.	4x5 4x7	5x5 5x7	5x11	6.3x5 6.3x7	6.3x11	8x11.5
dϕ ±0.05	0.45	0.45	0.5	0.45	0.5	0.6
H ±0.75	17.5	17.5	18.5	17.5	18.5	20.0
F +0.8 ~ -0.2	2.0*	2.0	2.0	2.5	2.5	3.5
P ±1.0	12.7 ±0.2					
P_0	12.7 ±0.2					
P_1	5.1	5.1	5.1	5.1	5.1	4.6
P_2	6.35 ±1.0					
W	18.0 ±0.5					
W_0	11.5 min.					
W_1	9.0 ±0.5					
W_2	0 ~ 2.5					
H_0	16.0 ±0.5					
I	1.0 max.					
D_0ϕ	4.0 ±0.2					
Δh	0 ±1.0 (at top of can)					
t	0.7 ±0.2 (not including lead)					

* Parts with 4mm diameter are taped with a slight flare in the lead and a 2.0mm lead-space.



RADIAL TAPED PACKAGING

Ammo Box Dimensions (mm)



Ammo Box (Tape & Box) TB, TBF1, TBST

Size of box and component quantity

Case Dia (Dϕ) or Case Size	Q'ty per Box (pcs)	Dim. L	Dim. H	Dim. W
4x5, 4x7	2,000	331	175	43
5x5, 5x7	2,000	331	220	43
5x11	2,000	340	255	55
6.3x5, 6.3x7	2,000	331	280	43
6.3x11	2,000	331	280	48
8x11.5, 8x12.5	1,000	335	235	53
10x12.5*	500	335	190	53
10x16*	500	335	300	53
10x20*	500	335	300	55
12.x20*	500	335	300	55
12.5x25*	500	335	300	61

*Special Taping Consult Factory For Availability