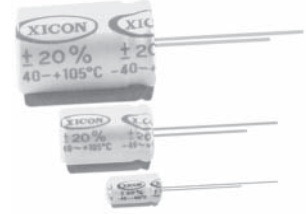




# High Temperature Radial Electrolytic Capacitors HTRL Series

## FEATURES

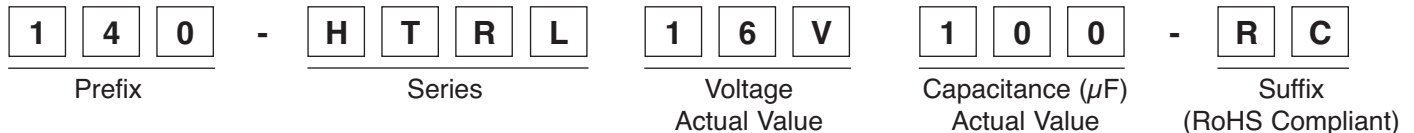
- Excellent temperature performance
- 105°C high operating temperature
- Satisfies characteristic W of JIS-C-5141 standard
- RoHS Compliant



## CHARACTERISTICS

Item		Characteristics											
Operating Temperature Range		-40°C ~ +105°C											
Capacitance Tolerance		±20%, 120Hz, 20°C											
Leakage Current	6.3WV ~ 100WV	I = 0.01CWV or 3μA whichever is greater after 2 minutes of applied rated DC working voltage at 20°C Where: C = rated capacitance in μF; WV = rated DC working voltage											
	160WV ~ 250WV	CWV ≤ 1,000: I = 0.03CWV + 15μA, C = rated capacitance in μF CWV > 1,000: I = 0.02CWV + 25μA, WV = rated DC working voltage in V											
Dissipation Factor (Tan δ, at 20°C 120Hz)	Working voltage (WV)	6.3	10	16	25	35	50	63	100	160	250		
	Tan δ	0.23	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.12	0.17		
For capacitors whose capacitance exceeds 1,000μF, the specification of tan δ is increased by 0.02 for every addition of 1,000μF													
Surge Voltage	Working voltage (WV)	6.3	10	16	25	35	50	63	100	160	250		
	Surge voltage (SV)	8	13	20	32	44	63	79	125	200	300		
Low Temperature Characteristics	Working voltage (WV)	6.3	10	16	25	35	50	63	100	160	250		
	Impedance ratio @ 120Hz	Z(-25°C)/Z(+20°C)	∅D < 16	4	3	3	2	2	2	2	2	3	8
			∅D ≥ 16	6	4	4	3	3	3	3	3	3	3
	Z(-40°C)/Z(+20°C)	∅D < 16	8	6	6	4	4	3	3	3	3	4	10
∅D ≥ 16		12	10	8	8	8	8	8	6	6	4	10	
Life Test	When returned to +20°C after 2,000 hours application of working voltage at +105°C, the capacitor will meet the following limits: Capacitance change is ≤ ±20% of initial value; tan δ is < 200% of initial specified value; leakage current is ≤ initial specified value												
Shelf Life Test	When returned to +20°C after 1,000 hours at +105°C with no voltage applied, the capacitor will meet the following limits: Capacitance change is ≤ ±20% of initial value; tan δ is < 200% of initial specified value; leakage current is ≤ initial specified value												

## PART NUMBERING SYSTEM



## RIPPLE CURRENT AND FREQUENCY MULTIPLIERS

6.3WV ~ 100WV Capacitance (μF)	Frequency (Hz)				
		60	120	500	1K
<100	0.70	1.0	1.30	1.40	1.50
100 ~ 1000	0.75	1.0	1.20	1.30	1.35
>1000	0.80	1.0	1.10	1.12	1.15

Working Voltage (All Capacitances)	Frequency (Hz)					
		60	120	500	1K	10K
160WV ~ 250WV	0.80	1.0	1.10	1.10	1.30	1.35

## RIPPLE CURRENT AND TEMPERATURE MULTIPLIERS

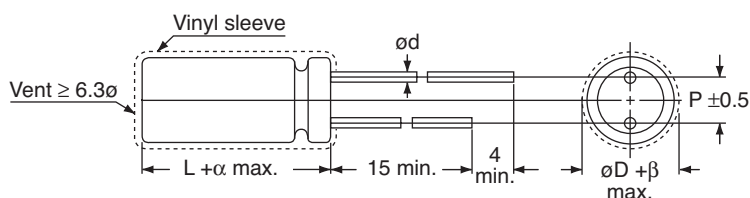
Temperature (°C)	45	70	85	105
Multiplier (6.3WV ~ 100WV)	1.95	1.78	1.40	1.00
Multiplier (160WV ~ 250WV)	2.05	1.45	1.00	1.00

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## ■ DIMENSIONS AND PERMISSIBLE RIPPLE CURRENT



Lead Spacing and Diameter (mm)

$\phi D$	5	6.3	8	10	13	16	18	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	7.5
$\phi d$	0.5	0.5	0.5	0.6	0.6	0.8	0.8	1.0
$\beta$	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0
$\alpha$	1.0 if $L \leq 16$ ; 2.0 if $L \geq 20$							

Value ( $\mu F$ )	Working Voltage; Dimensions: $\phi D \times L$ (mm); Ripple Current: mA/RMS @ 120Hz, 105°C									
	6.3		10		16		25		35	
	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
10					5 x 11	35	5 x 11	43	5 x 11	46
22			5 x 11	49	5 x 11	58	5 x 11	62	5 x 11	71
33	5 x 11	54	5 x 11	60	5 x 11	71	5 x 11	76	6.3 x 11	90
47	5 x 11	65	5 x 11	76	5 x 11	85	5 x 11	97	6.3 x 11	110
100	5 x 11	95	5 x 11	105	6.3 x 11	133	6.3 x 11	142	8 x 11.5	180
220	6.3 x 11	160	6.3 x 11	175	8 x 11.5	215	8 x 11.5	236	10 x 12.5	300
330	8 x 11.5	195	8 x 11.5	245	8 x 11.5	270	10 x 12.5	335	10 x 16	400
470	8 x 11.5	270	8 x 11.5	290	10 x 12.5	370	10 x 16	440	10 x 20	520
680	10 x 12.5	325	10 x 16	395	10 x 20	465	--	--	--	--
1000	10 x 12.5	460	10 x 16	550	10 x 20	640	13 x 20	770	13 x 25	920
2200	10 x 20	810	13 x 20	869	13 x 25	1000	16 x 25	1170	16 x 32	1340
3300	13 x 20	960	13 x 20	1100	16 x 25	1300	16 x 36	1460	18 x 36	1650
4700	16 x 25	1330	16 x 25	1400	16 x 32	1600	18 x 36	1780	18 x 40	1920

Value ( $\mu F$ )	Working Voltage; Dimensions: $\phi D \times L$ (mm); Ripple Current: mA/RMS @ 120Hz, 105°C									
	50		63		100		160		250	
	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
0.1	5 x 11	3.2	5 x 11	3.5	5 x 11	4				
0.22	5 x 11	4.9	5 x 11	5.1	5 x 11	6				
0.33	5 x 11	6	5 x 11	7.5	5 x 11	8				
0.47	5 x 11	7.1	5 x 11	9.0	5 x 11	9.0				
1	5 x 11	13	5 x 11	15	5 x 11	15	5 x 11	17	8.5 x 11	27
2.2	5 x 11	20	5 x 11	30	5 x 11	30	6.3 x 11	29	6.3 x 11	35
3.3	5 x 11	30	5 x 11	31	5 x 11	31	6.3 x 11	36	8 x 11.5	50
4.7	5 x 11	33	5 x 11	36	6.3 x 11	40	6.3 x 11	43	8 x 11.5	60
10	5 x 11	50	5 x 11	54	8 x 11.5	66	10 x 12.5	87	10 x 16	115
22	6.3 x 11	78	6.3 x 11	86	8 x 11.5	99	10 x 20	158	13 x 20	255
33	6.3 x 11	96	8 x 11.5	114	10 x 12.5	148	10 x 20	190	13 x 25	348
47	6.3 x 11	130	8 x 11.5	141	10 x 16	180	13 x 20	265	16 x 25	468
100	8 x 11.5	188	10 x 16	235	13 x 20	320	16 x 25	485	16 x 36	610
220	10 x 20	355	10 x 20	450	16 x 25	570	16 x 32	660		
330	10 x 20	460	13 x 20	540	16 x 32	700	18 x 36	820		
470	13 x 25	610	16 x 25	720	18 x 36	880				
1000	16 x 25	1080	16 x 32	1210	22 x 40	1760				
2200	18 x 36	2120	18 x 40	2340						
3300	22 x 40	2290								

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