

TR Series

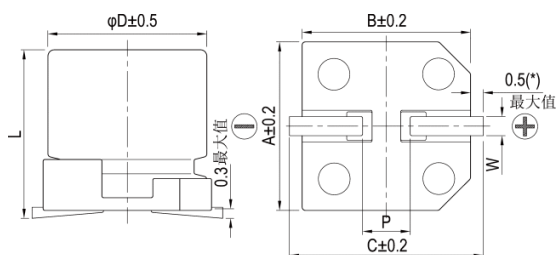
- Designed for surface mounting on high density PC board
- Load life 1,000~5,000 hours at 130°C
- RoHS Compliant



SPECIFICATIONS

Item	Performance Characteristics												
Category Temperature Range	-40 ~ +130℃												
Working Voltage Range	10 ~ 450Vdc												
Capacitance Range	2.2 ~ 1,000 μF												
Capacitance Tolerance	±20% (at 20℃ and 120Hz)												
Dissipation Factor (tanδ) (at 20℃, 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	80	100	160 ~ 250	400 ~ 450		
	Tanδ(Max)	0.24	0.20	0.16	0.14	0.14	0.12	0.12	0.12	0.24	0.30		
Leakage Current	10~100Vdc					160~450Vdc							
	I≤0.03CV or 4μA, Which is greater(2minutes)					I≤0.04CV+ 100μA (1minutes)							
	I: Leakage current (μA) C: Rated capacitance (μF) V: Rated voltage (V)												
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)		10	16	25	35	50	63	80	100	160 ~ 250	400 ~ 450	(at 120Hz)
	06×08-10×14	Z(-25℃)/Z(+20℃)	3	2	2	2	2	2	2	2	6	6	
		Z(-40℃)/Z(+20℃)	6	4	4	3	3	3	3	3	10	18	
	12×14-12×21	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	6	6	
		Z(-40℃)/Z(+20℃)	6	6	4	3	3	3	3	3	10	10	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 1,000 to 5,000 hours at 130℃.												
	Capacitance change		≧ ±30% of the initial value					Size		Life time (hours)			
	Dissipation factor(tanδ)		≧ 300% of the specified value							(10~100WV)	(160~450WV)		
	Dissipation factor(tanδ)		≧ specified value					06×08	1,000	—			
								08×10-10×14	2,000	—			
								12×14-12×16	5,000	—			
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours (400~450Vdc:500 hours) at 130℃ without voltage applied.												
	Capacitance change		≧ ±30% of the initial value										
	Dissipation factor(tanδ)		≧ 300% of the specified value										
	Leakage current		≧ 500% of the specified value										

DIMENSIONS (mm)



Note:(*):5~6.3 Φ 0.4Max

Size	D	L	A	B	C	W	P
06×08	6.3	7.7 ± 0.5	6.6	6.6	7.2	0.5~0.8	1.9
06×10	6.3	10.5 ± 0.5	6.6	6.6	7.2	0.5~0.8	1.9
08×10	8	10.5 ± 0.5	8.3	8.3	9.0	0.7~1.1	3.1
08×12	8	12.5 ± 0.5	8.3	8.3	9.0	0.7~1.1	3.1
08×14	8	13.5 ± 0.5	8.3	8.3	9.0	0.7~1.1	3.1
08×16	8	15.5 ± 0.5	8.3	8.3	9.0	0.7~1.1	3.1
10×10	10	10.5 ± 0.5	10.3	10.3	11.0	0.7~1.1	4.5
10×12	10	12.5 ± 0.5	10.3	10.3	11.0	0.7~1.1	4.5
10×14	10	13.5 ± 0.5	10.3	10.3	11.0	0.7~1.1	4.5
10×16	10	16.5 ± 0.5	10.3	10.3	11.0	0.7~1.1	4.5
12×14	12.5	13.5 ± 1.0	13.0	13.0	13.7	1.0~1.3	4.5
12×16	12.5	16.0 ± 1.0	13.0	13.0	13.7	1.0~1.3	4.5
12×21	12.5	21.0 ± 1.0	13.0	13.0	13.7	1.0~1.3	4.5

PART NUMBER SYSTEM(Example : 400V 2.2 μ F)

E T R 2 G 2 R 2 M 0 8 1 0 0 0 Y

Sleeve code(Yellow)

Lead length code

Lead forming Type code

Size code(0810 : 8×10.5)

Capacitance tolerance code(M: $\pm 20\%$)

Capacitance code (2.2 μ F)

Voltage code(400V)

Series code(TR)

Category code(E)

TR Series

◆ Standard Ratings

WV (Vdc)	Cap (μF)	Size	Max.Rated ripple current @130℃ 100KHz
10	100	06×08	110
	220	06×08	110
	220	08×10	220
	330	08×10	220
	330	10×10	296
	470	10×10	296
	1000	12×14	750
16	100	06×08	110
	100	08×10	220
	220	08×10	220
	330	10×10	296
	470	10×12	340
	680	12×14	750
	1000	12×16	800
25	47	06×08	110
	100	06×08	110
	100	08×10	220
	220	08×10	220
	220	10×10	296
	330	10×10	296
	470	12×14	750
35	680	12×16	800
	33	06×08	110
	47	06×08	110
	100	08×10	220
	220	10×10	296
50	330	12×14	750
	470	12×16	900
	10	06×08	83
	22	06×08	83
	33	06×08	83
	47	08×10	160
	47	10×10	247
	100	10×10	247
	100	12×14	550
63	220	12×14	550
	330	12×16	700
	22	06×08	65
	33	08×10	100
	47	08×10	125
80	100	10×12	270
	220	12×16	600
	10	06×08	95
	22	08×10	110
	22	10×10	215
	33	08×10	130
	47	10×10	245
	100	12×14	475

WV (Vdc)	Cap (μF)	Size	Max.Rated ripple current @130℃ 100KHz
100	10	06×08	90
	22	08×10	105
	33	10×10	200
	47	10×10	230
	68	10×12	275
	100	12×14	405
160	10	10×10	72
	15	08×12	90
	22	10×12	150
	33	10×14	165
	47	10×16	195
	68	12×21	234
	100	12×21	300
200	10	10×10	90
	15	10×12	115
	22	10×16	180
	33	12×16	220
250	47	12×21	240
	4.7	10×10	59
	10	08×14	94
	10	10×10	94
	22	10×16	190
400	33	12×21	210
	47	12×21	256
	2.2	08×10	30
	3.3	08×10	40
	4.7	08×14	65
	4.7	10×10	65
	6.8	10×14	90
450	10	10×16	102
	15	12×16	130
	22	12×21	204
	2.2	10×10	32
	3.3	10×12	36
	4.7	10×14	48
	10	12×16	89
	15	12×21	115

◆ RIRIPPLE CURRENT MULTIPLIERS Frequency Multipliers

Vdc	Cap(μF)	Frequency (Hz)			
		120	1K	10K	100K
10~100	Cap<220	0.40	0.75	0.90	1.00
	220≤Cap<680	0.50	0.85	0.94	1.00
	680≤Cap<1000	0.60	0.87	0.95	1.00
160~450	Cap≤33	0.55	0.83	0.97	1.00
	Cap>33	0.66	0.86	0.93	1.00