



Specifications

Items	Condition			Specifications			
Rated voltage (V)	—			2.5	4.0	6.3	10
Surge voltage (V)	—			2.9	4.6	7.2	12
Category temperature range (°C)	—			-55 to +105 / -55 to +85 (Rated temp. 85°C)			
Capacitance tolerance (%)	120Hz/20°C			M : ±20			
Rated capacitance range (μF)	120Hz/20°C			33 to 220			
Dissipation Factor (DF)	120Hz/20°C			Please see the attached characteristics list			
Leakage current	Rated voltage applied, after 5 minutes			Please see the attached characteristics list			
Equivalent series resistance (ESR)	100kHz/20°C			Please see the attached characteristics list			
Characteristics of impedance ratio at high temp. and low temp.	100kHz/+20°C	-55°C	Z/Z _{20°C}	0.6 to 2.0			
		+85°C	Z/Z _{20°C}	0.6 to 2.0			
Endurance	105°C, 1,000h rated voltage applied ※Rated temp, 85°C Products: 85°C, 1,000h, rated voltage applied	ΔC/C		Within±20% of the initial value			
		DF		≤ 1.5 times of the initial limit			
		LC		Within the initial limit			
Damp heat (Steady State)	60°C, 90 to 95%RH, 500h, No-applied voltage	ΔC/C		Within+50%, -20% of the initial value (ETPH220MABC)			
		ΔC/C		Within+40%, -20% of the initial value (Except for above model)			
		DF		≤ 1.5 times of the initial limit			
		LC		≤ 3 times of the initial limit			
Surge	105°C, 1,000 cycles, 1kΩ discharge resistance, surge voltage applied ※Rated temp, 85°C Products:85°C	ΔC/C		Within±5% of the initial value			
		DF		Within the initial limit			
		LC		≤ 3 times of the initial limit			

Marking and dimensions

6TPH100MAEA

※1 The rated voltage is as follows.

R.V.	2.5	4.0	6.3	10
Mark	e	g	j	A

※2 The rated capacitance is as follows.

Capacitance(μF)	33	47	68	100	150	220
Mark	N7	S7	W7	A8	E8	J8

(unit : mm)

Size code	L ±0.2	W ±0.2	H ±0.1	S ±0.2	W1 ±0.1
A09	3.2	1.6	0.9	0.8	1.2
A14	3.2	1.6	1.4	0.8	1.2

Recommended land pattern dimension of PWB

(unit : mm)			
Size code	a	b	c
A09	1.6	1.4	1.0
A14	1.6	1.4	1.0

Size list

RV:Rated voltage

RV	2.5	4.0	6.3	10
μF				
33				A09
47			A09	
68		A09		
100	A09		A14, A09	
150		A14		
220	A14			

TPH series characteristics list

Size code	Part number	Rated voltage (V)	Rated temperature (°C)	Rated capacitance (μF)	Category voltage (V)	Category temperature (°C)	DF (% max)	LC (μA) max/5min.	ESR (mΩmax) 100kHz/20°C	Maximum allowable ripple current (mA rms) 100kHz※1	MSL Reflow temp. ≤ 260°C Reflow temp. ≤ 250°C
A09	ATPH33MAHA	10	85	33	10	85	10	33.0	150	510	3
	6TPH100MAEA	6.3	85	100	6.3	85	10	63.0	100	670	3
	6TPH47MHA	6.3	105	47	6.3	105	10	29.6	150	510	3
	4TPH68MHA	4.0	105	68	4.0	105	10	27.2	150	510	3
	ETPH100MHA	2.5	105	100	2.5	105	10	25.0	150	510	3
A14	6TPH100MABC	6.3	85	100	6.3	85	10	126.0	70	740	3
	4TPH150MABC	4.0	85	150	4.0	85	10	120.0	70	740	3
	ETPH220MABC	2.5	85	220	2.5	85	10	110.0	70	740	3

※1 100k to 500kHz, 45°C