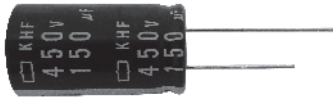
KHF Upgrade! Series

- Ideal for low profile power supply applications
- Downsize, high ripple design
- Rated voltage range : 400 to 450Vdc, Capacitance range : 18 to 270μF
- Endurance with ripple current : 3,000 hours at 105℃
- Non solvent resistant type
- RoHS2 Compliant

KHF
↑ Downsized
KHE

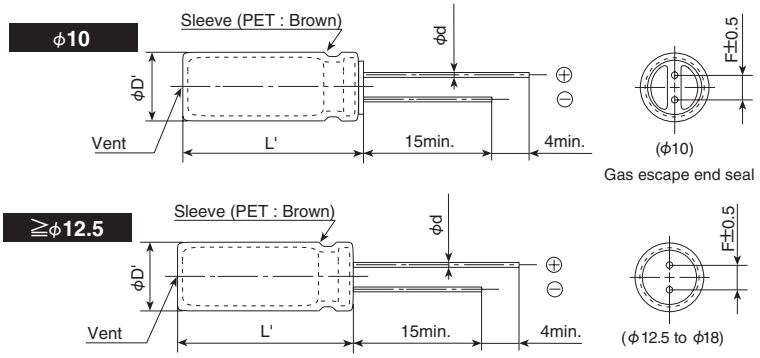


◆SPECIFICATIONS

Items	Characteristics		
Category Temperature Range	-40 to +105℃		
Rated Voltage Range	400 to 450Vdc		
Capacitance Tolerance	±20% (M)		(at 20℃, 120Hz)
Leakage Current		After 1 minute	After 5 minutes
	CV≦1,000	I=0.1CV+40	I=0.03CV+15
	CV>1,000	I=0.04CV+100	I=0.02CV+25
	Where, I : Max. leakage current(μA), C : Nominal capacitance (μF), V : Rated voltage (V)		(at 20℃)
Dissipation Factor (tan δ)	Rated voltage (Vdc)	400 to 450V	
	tan δ (Max.)	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	400 to 450V	
	Z(-25℃)/Z(+20℃)	6	
	Z(-40℃)/Z(+20℃)	10	(at 120Hz)
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 (the peak voltage shall not exceed the rated voltage) for 3,000 hours at 105℃.		
	Capacitance change	≦±20% of the initial value	
	D.F. (tan δ)	≦200% of the initial specified value	
	Leakage current	≦The initial specified value	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.		
	Capacitance change	≦±20% of the initial value	
	D.F. (tan δ)	≦200% of the initial specified value	
	Leakage current	≦500% of the initial specified value	

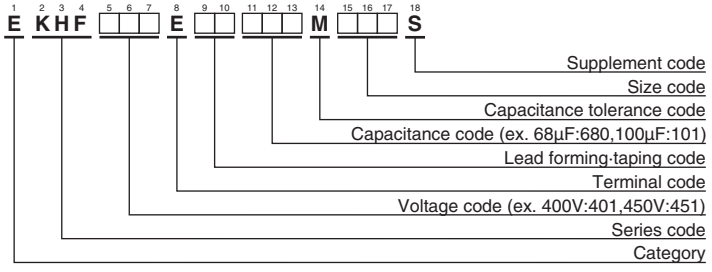
◆DIMENSIONS [mm]

●Terminal Code : E



φD	10	12.5	14.5	16	18
φd	0.6	0.6	0.8	0.8	0.8
F	5.0	5.0	7.5	7.5	7.5
φD'	φD+0.5 max.				
L'	L+2.0 max.				

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

KHF Upgrade! Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (mArms/105℃, 120Hz)	Part No.
400	22	10×20	0.20	235	EKHF401E□□220MJ20S
	27	10×25	0.20	285	EKHF401E□□270MJ25S
	39	10×30	0.20	365	EKHF401E□□390MJ30S
	39	12.5×20	0.20	345	EKHF401E□□390MK20S
	47	10×35	0.20	425	EKHF401E□□470MJ35S
	56	10×40	0.20	485	EKHF401E□□560MJ40S
	56	12.5×25	0.20	450	EKHF401E□□560MK25S
	68	10×45	0.20	555	EKHF401E□□680MJ45S
	68	10×50	0.20	575	EKHF401E□□680MJ50S
	68	12.5×30	0.20	530	EKHF401E□□680MK30S
	68	16×20	0.20	510	EKHF401E□□680ML20S
	82	12.5×35	0.20	610	EKHF401E□□820MK35S
	100	12.5×40	0.20	705	EKHF401E□□101MK40S
	100	14.5×31.5	0.20	680	EKHF401E□□101MUN3S
	100	16×25	0.20	670	EKHF401E□□101ML25S
	100	18×20	0.20	650	EKHF401E□□101MM20S
	120	12.5×45	0.20	800	EKHF401E□□121MK45S
	120	12.5×50	0.20	820	EKHF401E□□121MK50S
	120	14.5×35	0.20	765	EKHF401E□□121MU35S
	120	14.5×40	0.20	810	EKHF401E□□121MU40S
	120	16×31.5	0.20	790	EKHF401E□□121MLN3S
	120	18×25	0.20	755	EKHF401E□□121MM25S
	150	14.5×45	0.20	905	EKHF401E□□151MU45S
	150	16×35	0.20	905	EKHF401E□□151ML35S
	150	18×31.5	0.20	915	EKHF401E□□151MMN3S
	180	16×40	0.20	1020	EKHF401E□□181ML40S
	180	16×45	0.20	1040	EKHF401E□□181ML45S
	180	18×31.5	0.20	1000	EKHF401E□□181MMN3S
	180	18×35	0.20	1020	EKHF401E□□181MM35S
	220	16×50	0.20	1170	EKHF401E□□221ML50S
	220	18×40	0.20	1160	EKHF401E□□221MM40S
	270	18×45	0.20	1310	EKHF401E□□271MM45S
	270	18×50	0.20	1310	EKHF401E□□271MM50S
420	22	10×20	0.20	235	EKHF421E□□220MJ20S
	27	10×25	0.20	285	EKHF421E□□270MJ25S
	39	10×30	0.20	365	EKHF421E□□390MJ30S
	39	12.5×20	0.20	345	EKHF421E□□390MK20S
	47	10×35	0.20	425	EKHF421E□□470MJ35S
	56	10×40	0.20	485	EKHF421E□□560MJ40S
	56	10×45	0.20	505	EKHF421E□□560MJ45S
	56	12.5×25	0.20	450	EKHF421E□□560MK25S
	68	10×50	0.20	575	EKHF421E□□680MJ50S
	68	12.5×30	0.20	530	EKHF421E□□680MK30S
	68	16×20	0.20	510	EKHF421E□□680ML20S
	82	12.5×35	0.20	610	EKHF421E□□820MK35S
	82	14.5×31.5	0.20	615	EKHF421E□□820MUN3S
	82	16×25	0.20	605	EKHF421E□□820ML25S
	82	18×20	0.20	585	EKHF421E□□820MM20S
	100	12.5×40	0.20	705	EKHF421E□□101MK40S
	100	12.5×45	0.20	730	EKHF421E□□101MK45S
	100	14.5×35	0.20	700	EKHF421E□□101MU35S
	120	12.5×50	0.20	820	EKHF421E□□121MK50S
	120	14.5×40	0.20	810	EKHF421E□□121MU40S
	120	16×31.5	0.20	790	EKHF421E□□121MLN3S
	120	18×25	0.20	755	EKHF421E□□121MM25S
	150	14.5×45	0.20	905	EKHF421E□□151MU45S
	150	16×35	0.20	905	EKHF421E□□151ML35S
	150	16×40	0.20	935	EKHF421E□□151ML40S
	150	18×31.5	0.20	915	EKHF421E□□151MMN3S
	180	16×45	0.20	1040	EKHF421E□□181ML45S
	180	18×35	0.20	1020	EKHF421E□□181MM35S
	220	16×50	0.20	1170	EKHF421E□□221ML50S
	220	18×40	0.20	1160	EKHF421E□□221MM40S
	220	18×45	0.20	1190	EKHF421E□□221MM45S
	270	18×50	0.20	1310	EKHF421E□□271MM50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (mArms/105℃, 120Hz)	Part No.
450	18	10×20	0.20	210	EKHF451E□□180MJ20S
	27	10×25	0.20	285	EKHF451E□□270MJ25S
	33	10×30	0.20	335	EKHF451E□□330MJ30S
	33	12.5×20	0.20	320	EKHF451E□□330MK20S
	39	10×35	0.20	385	EKHF451E□□390MJ35S
	47	10×40	0.20	445	EKHF451E□□470MJ40S
	47	12.5×25	0.20	415	EKHF451E□□470MK25S
	56	10×45	0.20	505	EKHF451E□□560MJ45S
	56	10×50	0.20	520	EKHF451E□□560MJ50S
	56	12.5×30	0.20	480	EKHF451E□□560MK30S
	56	16×20	0.20	460	EKHF451E□□560ML20S
	68	12.5×35	0.20	560	EKHF451E□□680MK35S
	82	12.5×40	0.20	640	EKHF451E□□820MK40S
	82	14.5×31.5	0.20	615	EKHF451E□□820MUN3S
	82	16×25	0.20	605	EKHF451E□□820ML25S
	82	18×20	0.20	585	EKHF451E□□820MM20S
	100	12.5×45	0.20	730	EKHF451E□□101MK45S
	100	12.5×50	0.20	750	EKHF451E□□101MK50S
	100	14.5×35	0.20	700	EKHF451E□□101MU35S
	100	16×31.5	0.20	720	EKHF451E□□101MLN3S
	100	18×25	0.20	690	EKHF451E□□101MM25S
	120	14.5×40	0.20	810	EKHF451E□□121MU40S
	120	14.5×45	0.20	835	EKHF451E□□121MU45S
	120	16×35	0.20	810	EKHF451E□□121ML35S
	150	16×40	0.20	935	EKHF451E□□151ML40S
	150	16×45	0.20	950	EKHF451E□□151ML45S
	150	18×31.5	0.20	915	EKHF451E□□151MMN3S
	150	18×35	0.20	935	EKHF451E□□151MM35S
	180	16×50	0.20	1060	EKHF451E□□181ML50S
	180	18×40	0.20	1050	EKHF451E□□181MM40S
	220	18×45	0.20	1190	EKHF451E□□221MM45S
	220	18×50	0.20	1190	EKHF451E□□221MM50S

□□ : Enter the appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

◎Frequency Multipliers

Capacitance(μF) \ Frequency(Hz)	120	1k	10k	100k
18 to 82	1.00	1.50	1.75	1.80
100 to 270	1.00	1.30	1.40	1.50

The deterioration of aluminum electrolytic capacitors accelerates their life due to the internal heating produced by ripple current. For details, refer to Section "5-3 Ripple Current Effect on Lifetime" in the catalog, Technical Note.

■ Always read "Notes on Use" before using the product in order to enable you to use the product correctly and prevent any faults and accidents from occurring.

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