

KHU Series

- Lineup of high-capacity products for server power supplies and solar power generation applications.
- Endurance with ripple current : 105°C 3,000 hours
- Rated voltage range : 400 to 500V
- Capacitance range : 120 to 2,180μF
- Non solvent resistant type
- RoHS2 Compliant
- Adaptable for Immersion cooling (70°C max.)

This Engineering bulletin is issued for Engineering sample.

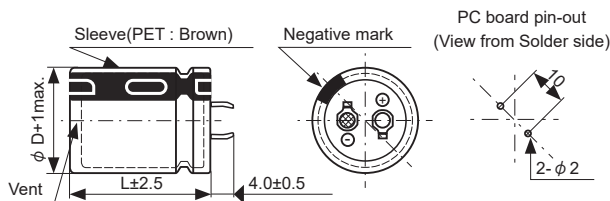
There is possibility to stop mass production due to market situation changed, and product specifications in this bulletin are subject to change without notice.

◆ SPECIFICATION

Items	Characteristics	
Category	-40 to +105°C	
Temperature Range		
Rated Voltage Range	400 to 500V _{dc}	
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)	
Leakage Current	$I \leq 3\sqrt{CV}$ Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)	
Dissipation Factor (tan δ)	Rated voltage (V _{dc})	400 to 500V
	tanδ (Max.)	0.20 (at 20°C, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (V _{dc})	400 to 500V
	Z(-25°C)/Z(+20°C)	8 (at 120Hz)
Endurance (Normal atmosphere)	The following specifications shall be satisfied when the capacitors are restored to 20°C 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°C.	
	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 (Normal atmosphere)	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C 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	≤ ±15% of the initial value
	D.F. (tan δ)	≤ 150% of the initial specified value
	Leakage current	≤ The initial specified value

◆ DIMENSIONS [mm]

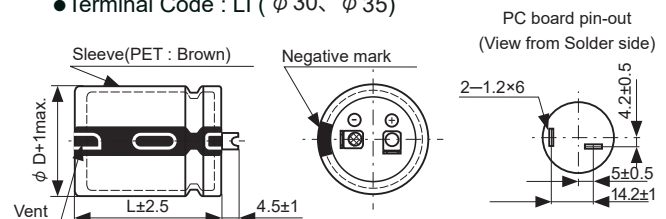
- Terminal Code : VS (φ 25.4 to φ 35) : Standard



The standard design has no plastic disc.

※ Sealed with oil-resistant for immersion type.

- Terminal Code : LI (φ 30、φ 35)



◆ PART NUMBERING SYSTEM

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
E K H U [] [] V S N [] [] M [] [] []

Supplement code
(Standard type:S, Immersion type:R)
Size code
Capacitance tolerance code
Capacitance code(ex. 120μF:121, 950μF:951)
Dummy terminal code
Terminal code(VS,LI)
Voltage code(ex.475V:4H1, 500V:501)
Series code
Category



KHU Series

◆ STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Case size φ D×L(mm)	tan δ	Rated ripple current (Arms/ 105°C, 120Hz)	Part No.	WV (V _{dc})	Cap (μF)	Case size φ D×L(mm)	tan δ	Rated ripple current (Arms/ 105°C, 120Hz)	Part No.
400	240	25.4×25	0.20	1.17	EKHU401VSN241MQ25 □	420	980	35×45	0.20	2.45	EKHU421VSN981MA45 □
	310	25.4×30	0.20	1.37	EKHU401VSN311MQ30 □		1,040	30×60	0.20	2.90	EKHU421VSN1A2MR60 □
	360	30×25	0.20	1.48	EKHU401VSN361MR25 □		1,100	30×65	0.20	3.04	EKHU421VSN112MR65 □
	380	25.4×35	0.20	1.58	EKHU401VSN381MQ35 □		1,120	35×50	0.20	2.68	EKHU421VSN112MA50 □
	450	25.4×40	0.20	1.75	EKHU401VSN451MQ40 □		1,180	30×70	0.20	3.20	EKHU421VSN122MR70 □
	460	35×25	0.20	1.53	EKHU401VSN461MQ50 □		1,250	30×75	0.20	3.35	EKHU421VSN1C2MR75 □
	470	30×30	0.20	1.71	EKHU401VSN471MR30 □		1,260	35×55	0.20	2.86	EKHU421VSN1C2MA55 □
	520	25.4×45	0.20	1.92	EKHU401VSN521MQ45 □		1,340	30×80	0.20	3.52	EKHU421VSN1D2MR80 □
	580	30×35	0.20	1.94	EKHU401VSN581MR35 □		1,400	35×60	0.20	3.04	EKHU421VSN142MA60 □
	590	25.4×50	0.20	2.08	EKHU401VSN591MQ50 □		1,420	35×65	0.20	3.12	EKHU421VSN142MA65 □
	600	35×30	0.20	1.78	EKHU401VSN601MA30 □		1,440	30×85	0.20	3.71	EKHU421VSN1E2MR85 □
	660	25.4×55	0.20	2.24	EKHU401VSN661MQ55 □		1,540	30×90	0.20	3.90	EKHU421VSN1F2MR90 □
	680	30×40	0.20	2.16	EKHU401VSN681MR40 □		1,550	35×70	0.20	3.32	EKHU421VSN1F2MA70 □
	720	25.4×60	0.20	2.38	EKHU401VSN721MQ60 □		1,610	30×95	0.20	4.04	EKHU421VSN1C2MR95 □
	750	35×35	0.20	2.02	EKHU401VSN751MA35 □		1,680	35×75	0.20	3.51	EKHU421VSN172MA75 □
	790	30×45	0.20	2.39	EKHU401VSN791MR45 □		1,700	30×100	0.20	4.21	EKHU421VSN172MRA0 □
	890	35×40	0.20	2.28	EKHU401VSN891MA40 □		1,810	35×80	0.20	3.71	EKHU421VSN182MA80 □
	900	30×50	0.20	2.60	EKHU401VSN901MR50 □		1,940	35×85	0.20	3.90	EKHU421VSN1K2MA85 □
	1,010	30×55	0.20	2.80	EKHU401VSN102MR55 □		2,070	35×90	0.20	4.09	EKHU421VSN2A2MA90 □
	1,040	35×45	0.20	2.53	EKHU401VSN1A2MA45 □	450	200	25.4×25	0.20	1.07	EKHU451VSN201MQ25 □
	1,090	30×60	0.20	2.97	EKHU401VSN112MR60 □		260	25.4×30	0.20	1.25	EKHU451VSN261MQ30 □
	1,160	30×65	0.20	3.12	EKHU401VSN1B2MR65 □		310	30×25	0.20	1.37	EKHU451VSN311MR25 □
	1,180	35×50	0.20	2.75	EKHU401VSN122MA50 □		320	25.4×35	0.20	1.45	EKHU451VSN321MQ35 □
	1,240	30×70	0.20	3.28	EKHU401VSN1C2MR70 □		390	25.4×40	0.20	1.63	EKHU451VSN391MQ40 □
	1,310	30×75	0.20	3.43	EKHU401VSN132MR75 □		390	35×25	0.20	1.41	EKHU451VSN391MA25 □
	1,320	35×55	0.20	2.93	EKHU401VSN132MA55 □		400	30×30	0.20	1.57	EKHU451VSN401MR30 □
	1,410	30×80	0.20	3.61	EKHU401VSN142MR80 □		450	25.4×45	0.20	1.79	EKHU451VSN451MQ45 □
	1,470	35×60	0.20	3.11	EKHU401VSN1E2MA60 □		490	30×35	0.20	1.78	EKHU451VSN491MR35 □
	1,500	35×65	0.20	3.21	EKHU401VSN152MA65 □		510	25.4×50	0.20	1.94	EKHU451VSN511MQ50 □
	1,510	30×85	0.20	3.80	EKHU401VSN152MR85 □		520	35×30	0.20	1.66	EKHU451VSN521MA30 □
	1,610	30×90	0.20	3.98	EKHU401VSN162MR90 □		570	25.4×55	0.20	2.08	EKHU451VSN571MQ55 □
	1,630	35×70	0.20	3.40	EKHU401VSN1G2MA70 □		590	30×40	0.20	2.02	EKHU451VSN591MR40 □
	1,690	30×95	0.20	4.14	EKHU401VSN172MR95 □		620	25.4×60	0.20	2.21	EKHU451VSN621MQ60 □
	1,770	35×75	0.20	3.61	EKHU401VSN1H2MA75 □		640	35×35	0.20	1.87	EKHU451VSN641MA35 □
	1,790	30×100	0.20	4.32	EKHU401VSN182MRA0 □		680	30×45	0.20	2.22	EKHU451VSN681MR45 □
	1,910	35×80	0.20	3.81	EKHU401VSN192MA80 □		770	30×50	0.20	2.40	EKHU451VSN771MR50 □
	2,040	35×85	0.20	4.00	EKHU401VSN2A2MA85 □		770	35×40	0.20	2.12	EKHU451VSN771MA40 □
	2,180	35×90	0.20	4.20	EKHU401VSN222MA90 □		860	30×55	0.20	2.59	EKHU451VSN861MR55 □
420	220	25.4×25	0.20	1.12	EKHU421VSN221MQ25 □		890	35×45	0.20	2.34	EKHU451VSN891MA45 □
	290	25.4×30	0.20	1.32	EKHU421VSN291MQ30 □		940	30×60	0.20	2.76	EKHU451VSN941MR60 □
	340	30×25	0.20	1.44	EKHU421VSN341MR25 □		1,010	30×65	0.20	2.91	EKHU451VSN102MR65 □
	360	25.4×35	0.20	1.54	EKHU421VSN361MQ35 □		1,020	35×50	0.20	2.56	EKHU451VSN102MA50 □
	430	25.4×40	0.20	1.72	EKHU421VSN431MQ40 □		1,080	30×70	0.20	3.06	EKHU451VSN112MR70 □
	430	35×25	0.20	1.48	EKHU421VSN431MA25 □		1,140	30×75	0.20	3.20	EKHU451VSN1B2MR75 □
	440	30×30	0.20	1.65	EKHU421VSN441MR30 □		1,140	35×55	0.20	2.72	EKHU451VSN1B2MA55 □
	490	25.4×45	0.20	1.87	EKHU421VSN491MQ45 □		1,230	30×80	0.20	3.38	EKHU451VSN1C2MR80 □
	550	30×35	0.20	1.89	EKHU421VSN551MR35 □		1,260	35×60	0.20	2.88	EKHU451VSN1C2MA60 □
	560	25.4×50	0.20	2.03	EKHU421VSN561MQ50 □		1,300	35×65	0.20	2.98	EKHU451VSN132MA65 □
	570	35×30	0.20	1.74	EKHU421VSN571MA30 □		1,310	30×85	0.20	3.54	EKHU451VSN132MR85 □
	630	25.4×55	0.20	2.19	EKHU421VSN631MQ55 □		1,400	30×90	0.20	3.71	EKHU451VSN142MR90 □
	650	30×40	0.20	2.12	EKHU421VSN651MR40 □		1,410	35×70	0.20	3.16	EKHU451VSN142MA70 □
	680	25.4×60	0.20	2.31	EKHU421VSN681MQ60 □		1,450	30×95	0.20	3.84	EKHU451VSN1E2MR95 □
	710	35×35	0.20	1.97	EKHU421VSN711MA35 □		1,530	35×75	0.20	3.35	EKHU451VSN1F2MA75 □
	750	30×45	0.20	2.33	EKHU421VSN751MR45 □		1,540	30×100	0.20	4.01	EKHU451VSN1F2MRA0 □
	850	30×50	0.20	2.52	EKHU421VSN851MR50 □		1,650	35×80	0.20	3.54	EKHU451VSN1G2MA80 □
	850	35×40	0.20	2.23	EKHU421VSN851MA40 □		1,770	35×85	0.20	3.73	EKHU451VSN1H2MA85 □
	960	30×55	0.20	2.73	EKHU421VSN961MR55 □		1,890	35×90	0.20	3.91	EKHU451VSN192MA90 □

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◆ STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Case size φ D×L(mm)	tan δ	Rated ripple current (Arms/ 105°C, 120Hz)	Part No.	WV (V _{dc})	Cap (μF)	Case size φ D×L(mm)	tan δ	Rated ripple current (Arms/ 105°C, 120Hz)	Part No.
475	160	25.4×25	0.20	1.07	EKHU4H1VSN161MQ25 □	500	120	25.4×25	0.20	0.93	EKHU501VSN121MQ25 □
	200	25.4×30	0.20	1.23	EKHU4H1VSN201MQ30 □		170	25.4×30	0.20	1.13	EKHU501VSN171MQ30 □
	240	30×25	0.20	1.38	EKHU4H1VSN241MR25 □		190	30×25	0.20	1.23	EKHU501VSN191MR25 □
	250	25.4×35	0.20	1.43	EKHU4H1VSN251MQ35 □		210	25.4×35	0.20	1.31	EKHU501VSN211MQ35 □
	280	35×25	0.20	1.48	EKHU4H1VSN281MA25 □		250	25.4×40	0.20	1.46	EKHU501VSN251MQ40 □
	300	25.4×40	0.20	1.60	EKHU4H1VSN301MQ40 □		250	30×30	0.20	1.43	EKHU501VSN251MR30 □
	310	30×30	0.20	1.59	EKHU4H1VSN311MR30 □		260	35×25	0.20	1.43	EKHU501VSN261MA25 □
	350	25.4×45	0.20	1.76	EKHU4H1VSN351MQ45 □		300	25.4×45	0.20	1.63	EKHU501VSN301MQ45 □
	380	30×35	0.20	1.80	EKHU4H1VSN381MR35 □		320	30×35	0.20	1.65	EKHU501VSN321MR35 □
	380	35×40	0.20	1.75	EKHU4H1VSN381MA30 □		340	25.4×50	0.20	1.76	EKHU501VSN341MQ50 □
	390	25.4×50	0.20	1.89	EKHU4H1VSN391MQ50 □		340	35×30	0.20	1.66	EKHU501VSN341MA30 □
	440	25.4×55	0.20	2.04	EKHU4H1VSN441MQ55 □		380	25.4×55	0.20	1.89	EKHU501VSN381MQ55 □
	450	30×40	0.20	2.01	EKHU4H1VSN451MR40 □		380	30×40	0.20	1.85	EKHU501VSN381MR40 □
	480	35×35	0.20	2.00	EKHU4H1VSN481MA35 □		430	25.4×60	0.20	2.05	EKHU501VSN431MQ60 □
	490	25.4×60	0.20	2.19	EKHU4H1VSN491MQ60 □		430	35×35	0.20	1.89	EKHU501VSN431MA35 □
	520	30×45	0.20	2.22	EKHU4H1VSN521MR45 □		450	30×45	0.20	2.07	EKHU501VSN451MR45 □
	570	35×40	0.20	2.26	EKHU4H1VSN571MA40 □		510	30×50	0.20	2.24	EKHU501VSN511MR50 □
	590	30×50	0.20	2.41	EKHU4H1VSN591MR50 □		520	35×40	0.20	2.16	EKHU501VSN521MA40 □
	660	30×55	0.20	2.59	EKHU4H1VSN661MR55 □		580	30×55	0.20	2.43	EKHU501VSN581MR55 □
	660	35×45	0.20	2.49	EKHU4H1VSN661MA45 □		600	35×45	0.20	2.37	EKHU501VSN601MA45 □
	730	30×60	0.20	2.78	EKHU4H1VSN731MR60 □		640	30×60	0.20	2.60	EKHU501VSN641MR60 □
	750	30×65	0.20	2.87	EKHU4H1VSN751MR65 □		680	30×65	0.20	2.73	EKHU501VSN681MR65 □
	760	35×50	0.20	2.72	EKHU4H1VSN761MA50 □		690	35×50	0.20	2.59	EKHU501VSN691MA50 □
	820	30×70	0.20	3.05	EKHU4H1VSN821MR70 □		750	30×70	0.20	2.92	EKHU501VSN751MR70 □
	860	35×55	0.20	2.96	EKHU4H1VSN861MA55 □		780	35×55	0.20	2.82	EKHU501VSN781MA55 □
	890	30×75	0.20	3.23	EKHU4H1VSN891MR75 □		810	30×75	0.20	3.08	EKHU501VSN811MR75 □
	950	35×60	0.20	3.16	EKHU4H1VSN951MA60 □		860	35×60	0.20	3.01	EKHU501VSN861MA60 □
	960	30×80	0.20	3.42	EKHU4H1VSN961MR80 □		870	30×80	0.20	3.25	EKHU501VSN871MR80 □
	970	30×85	0.20	3.49	EKHU4H1VSN971MR85 □		890	30×85	0.20	3.34	EKHU501VSN891MR85 □
	1,010	35×65	0.20	3.32	EKHU4H1VSN102MA65 □		920	35×65	0.20	3.17	EKHU501VSN921MA65 □
	1,030	30×90	0.20	3.65	EKHU4H1VSN1A2MR90 □		950	30×90	0.20	3.50	EKHU501VSN951MR90 □
	1,100	30×95	0.20	3.83	EKHU4H1VSN112MR95 □		1,010	30×95	0.20	3.67	EKHU501VSN102MR95 □
	1,110	35×70	0.20	3.54	EKHU4H1VSN112MA70 □		1,010	35×70	0.20	3.38	EKHU501VSN102MA70 □
	1,160	30×100	0.20	3.99	EKHU4H1VSN1B2MRA0 □		1,070	30×100	0.20	3.83	EKHU501VSN1A2MRA0 □
	1,200	35×75	0.20	3.75	EKHU4H1VSN122MA75 □		1,090	35×75	0.20	3.58	EKHU501VSN112MA75 □
	1,290	35×80	0.20	3.96	EKHU4H1VSN132MA80 □		1,170	35×80	0.20	3.77	EKHU501VSN1B2MA80 □
	1,300	35×85	0.20	4.04	EKHU4H1VSN132MA85 □		1,190	35×85	0.20	3.87	EKHU501VSN122MA85 □
	1,390	35×90	0.20	4.24	EKHU4H1VSN142MA90 □		1,260	35×90	0.20	4.04	EKHU501VSN1C2MA90 □
	1,480	35×95	0.20	4.45	EKHU4H1VSN152MA95 □		1,350	35×95	0.20	4.25	EKHU501VSN1D2MA95 □
	1,570	35×100	0.20	4.65	EKHU4H1VSN1F2MAA0 □		1,420	35×100	0.20	4.42	EKHU501VSN142MAA0 □

◆ RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

Frequency(Hz)	50	120	300	1k	10k	50k
400 to 450V _{dc}	0.77	1.00	1.10	1.21	1.32	1.33
475,500V _{dc}	0.77	1.00	1.11	1.20	1.25	1.33

The deterioration of aluminum electrolytic capacitors accelerates their life due to the internal heating produced by ripple current.

◆ About specified immersion cooling fluids

Evaluated and confirmed by the following fluids. Please contact us for details.

Fluorine	3M FC-40
HydroCarbon	Shell S3X