

HRE

Radial Lead Type
series

Low ESR, High ripple current
Load life of 4,000h at 135°C
Compliance with AEC-Q200



• Specifications

Items	Characteristics										
Category temperature range	-55 to +125°C										
Rated voltage range	25 to 80Vdc										
Capacitance range	33 to 680μF										
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)										
Leakage current	I=0.01CV or 3μA whichever is greater (at 20°C, after 2 minutes)										
Tangent of loss angle(tanδ)	<table border="1"> <thead> <tr> <th>Rated voltage(V)</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Tanδ</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> </tbody> </table>	Rated voltage(V)	25	35	50	63	Tanδ	0.14	0.12	0.10	0.08
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Tanδ	0.14	0.12	0.10	0.08							
	(at 20°C, 120Hz)										
ESR	Less than or equal to the value of Standard Ratings (at 20°C, 100kHz)										
Low temperature characteristics (Impedance ratio at 100kHz)	$Z(-25\text{ }^{\circ}\text{C}) / Z(+20\text{ }^{\circ}\text{C}) \leq 1.5$ $Z(-55\text{ }^{\circ}\text{C}) / Z(+20\text{ }^{\circ}\text{C}) \leq 2.0$										
Endurance	135°C, 4,000 hrs apply the rated ripple current without exceeding the rated voltage										
	Capacitance change	Within±30% of the initial value									
	Tangent of loss angle (tanδ)	≤200% of the initial specified value									
	ESR(mΩ)	≤200% of the initial specified value									
	Leakage current	≤The initial specified value									
Shelf life	After storage for 1,000 hrs at 135°C with no voltage applied and then being stabilized at 20°C, capacitors shall meet the specified values for the endurance characteristics listed above.(with voltage treatment)										
	85°C, 85% RH, 2,000 hrs, rated voltage applied										
Damp Heat (Steady State)	Capacitance change	Within±30% of the initial value									
	Tangent of loss angle (tanδ)	≤200% of the initial specified value									
	ESR(mΩ)	≤200% of the initial specified value									
	Leakage current	≤The initial specified value									

• Part numbering system

Example: HRE series, 25V / 470μF

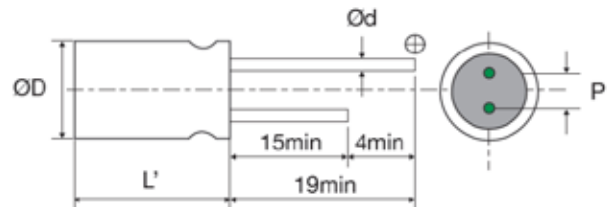
25	HRE	470	M	E	11
Voltage	Series	Capacitance	Tolerance	Diameter	Length

• Marking and Dimensions



• Frequency coefficient for ripple current

Frequency	120Hz	1kHz	10kHz	100kHz
Coefficient	0.15	0.40	0.75	1.00



Size	ØD±0.5	L	L'	P±0.5	Ød
8.0×9.5		9.5	L±1.0	3.5	0.60
10.0×10.5	10.0	10.5		5.0	0.60
10.0×11.5	10.0	11.5		5.0	0.60
10.0×16.0	10.0	16.0		5.0	0.60

• Standard Ratings

Rated Voltage [Vdc]	Rated Capacitance [μF]	Size ØD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz) [mA rms]		Part Number
				125°C	135°C	
25	470	10.0 x 11.5	14	3500	2500	25HRE470ME11
	560	10.0 x 16.0	11	4000	2900	25HRE560ME16
	680	10.0 x 16.0	11	5700	4100	32HRE680ME16
35	330	10.0 x 11.5	14	3500	2500	35HRE330ME11
	470	10.0 x 16.0	11	4000	2900	35HRE470ME16
50	150	10.0 x 11.5	17	3200	2250	50HRE150ME11
	220	10.0 x 16.0	13	3700	2600	50HRE220ME16
63	100	10.0 x 11.5	19	3000	2100	63HRE100ME11
	150	10.0 x 16.0	15	3500	2400	63HRE150ME16
	180	10.0 x 16.0	15	4900	3500	63HRE180ME16
80	33	8.0 x 9.5	45	2500	1700	80HRE33MD10
	56	10.0 x 10.5	36	3200	2200	80HRE56ME10
	100	10.0 x 16.0	16	4400	3200	80HRE100ME16