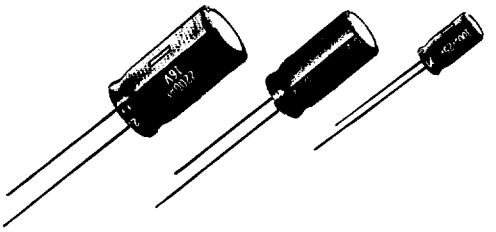
SU Series
Radial Leads Type

FEATURES



- **Standard Grade**
- **Life : 2000 hours at +85°C**
- **Wide Range of Rated Working Voltage from 6.3V to 450V**
- **Fan Fold Box Packaging for Automatic Insertion**
- **Anti-solvent : Freon-TE, TES, TP35 or equivalents for 6.3V to 250V Rating**

SPECIFICATIONS

<table>
<tr><th>Item</th><th colspan="8">Performance Characteristics</th></tr>
<tr><td>Rated Working Voltage Range</td><td colspan="4">6.3V to 100V Rating</td><td colspan="4">160V to 450V Rating</td></tr>
<tr><td>Operating Temperature Range</td><td colspan="4">−40°C to +85°C</td><td colspan="4">−25°C to +85°C</td></tr>
<tr><td>Capacitance Tolerance</td><td colspan="8">±20% (120Hz, +20°C)</td></tr>
<tr><td>Leakage Current</td><td colspan="8">Leakage current shall be measured after a period of time specified below with an application of rated working voltage at +20°C.
<table>
<tr><td>Rated W.V. / measurement</td><td>after 1 min</td><td>after 2 min</td></tr>
<tr><td>6.3V to 100V DC</td><td>I ≤ 0.03C·V or 4 [μA] whichever is greater</td><td>I ≤ 0.01C·V or 3 [μA] whichever is greater</td></tr>
<tr><td>160V to 450V DC</td><td>−</td><td>I ≤ 0,06C·V + 10 [μA]</td></tr>
</table>
(C = nominal capacitance in micro-farads, V = rated working voltage in volts)</td></tr>
<tr><td>Tangent of Loss Angle</td><td colspan="8">
<table>
<tr><td>Rated working voltage [V]</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr>
<tr><td>tan δ (120Hz, +20°C) : ≤</td><td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td></tr>
</table>
<table>
<tr><td>Rated working voltage [V]</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr>
<tr><td>tan δ (120Hz, +20°C) : ≤</td><td>0.08</td><td>0.16</td><td>0.18</td><td>0.18</td><td>0.20</td><td>0.20</td><td>0.20</td></tr>
</table>
For capacitance > 1000μF, add 0.02 per another 1000μF</td></tr>
<tr><td>Surge Voltage</td><td colspan="8">
<table>
<tr><td>Rated working voltage [V]</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr>
<tr><td>Surge voltage [V]</td><td>8</td><td>13</td><td>20</td><td>32</td><td>44</td><td>63</td><td>79</td></tr>
</table>
<table>
<tr><td>Rated working voltage [V]</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr>
<tr><td>Surge voltage [V]</td><td>125</td><td>200</td><td>250</td><td>300</td><td>400</td><td>450</td><td>500</td></tr>
</table></td></tr>
<tr><td>Ripple Current</td><td colspan="8">Refer to standard products table</td></tr>
<tr><td>Ripple Current Correction Factor for Frequency</td><td colspan="8">
<table>
<tr><td>Frequency [Hz]</td><td>50 / 60</td><td>120</td><td>1k</td><td>10k</td></tr>
<tr><td>Correction factor (Multiplier)</td><td>0.7</td><td>1</td><td>1.3</td><td>1.7</td></tr>
</table></td></tr>
</table>

SPECIFICATIONS (continued)

<table>
<tr><th>Item</th><th>Performance Characteristics</th></tr>
<tr><td>Low Temperature Characteristics</td><td>
<table>
<tr><td colspan="2">Rated working voltage [V]</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr>
<tr><td rowspan="2">Impedance ratio (120Hz) : ≤</td><td>−25°C / +20°C</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr>
<tr><td>−40°C / +20°C</td><td>8</td><td>6</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td></tr>
</table>
<table>
<tr><td colspan="2">Rated working voltage [V]</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr>
<tr><td rowspan="2">Impedance ratio (120Hz) ≤</td><td>−25°C / +20°C</td><td>2</td><td>2</td><td>2</td><td>3</td><td>5</td><td>15</td><td>15</td></tr>
<tr><td>−40°C / +20°C</td><td>3</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
</table>
For capacitance > 1000μF : Add 0.5 per another 1000μF for −25°C / +20°C.
Add 1.0 per another 1000μF for −40°C / +20°C.
</td></tr>
<tr><td>High Temperature Loading</td><td>
Test conditions
<table>
<tr><td>Duration</td><td>2000h</td></tr>
<tr><td>Ambient temperature</td><td>+85°C</td></tr>
<tr><td>Applied voltage</td><td>Rated DC working voltage</td></tr>
</table>
Post test requirements (+20°C)
<table>
<tr><td>Leakage current</td><td>≤ Initial specified value</td></tr>
<tr><td>Capacitance change</td><td>≤ ±20% of initial measured value</td></tr>
<tr><td>tan δ</td><td>≤ 150% of initial specified value</td></tr>
</table>
</td></tr>
<tr><td>Shelf Life</td><td>
Test conditions
<table>
<tr><td>Duration</td><td>1000h</td></tr>
<tr><td>Ambient temperature</td><td>+85°C</td></tr>
<tr><td>Applied voltage</td><td>(None)</td></tr>
</table>
Post test conditioning by application of voltage
<table>
<tr><td>Applied voltage</td><td>Rated working voltage</td></tr>
<tr><td>Duration</td><td>30min</td></tr>
<tr><td>Ambient temperature</td><td>+20°C</td></tr>
<tr><td>Discharge after application of voltage</td><td>Discharge through a resistor</td></tr>
<tr><td>Stabilization time</td><td>24h to 48h after discharge</td></tr>
</table>
Post test requirements (+20°C) : Same limits for high temperature loading
<table>
<tr><td>Leakage current</td><td>≤ Initial specified value</td></tr>
<tr><td>Capacitance change</td><td>≤ ±20% of initial measured value</td></tr>
<tr><td>tan δ</td><td>≤ 150% of initial specified value</td></tr>
</table>
</td></tr>
<tr><td>Cleaning</td><td>
Capacitors rated working voltage range of 6.3V to 250V, shall be capable of withstanding exposure to following cleaning solvents.
<table>
<tr><td colspan="2">Conditions</td><td>Solvent structure</td><td>Exposure time</td><td>Temperature</td><td>Ultrasonic wave</td></tr>
<tr><td>Solvents</td><td>Freon-TE, TES, TP35 or equivalents</td><td>Liquid or vapor</td><td>≤ 5 min (total)</td><td>≤ boiling point at 1 atm</td><td>Acceptable</td></tr>
</table>
</td></tr>
</table>

PART NUMBER SYSTEM

E C E A □ □ U □ □ □ □

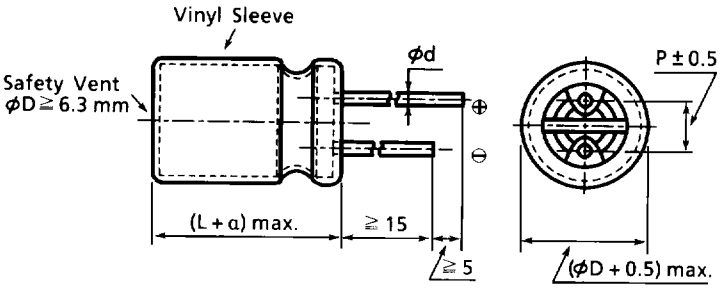
W.V. Code	
Code	W.V.
0J	6.3V
1A	10V
1C	16V
1E	25V
1V	35V
1H	50V
1J	63V
2A	100V
2C	100V
2D	200V
2E	250V
2V	350V
2G	400V
2W	450V

Capacitance Code in μF	
First two digits	Significant figures
Third digits	Number of zeros following
An "R" in first two blocks	Decimal point. In this case all figures are significant

Suffix for Configuration		
Suffix	Configuration	Packaging
(none)	Long lead	Bulk
*E	Snap-in lead Lead spacing: Case diameter [mm] 5mm: φD : 5 to 12.5 7.5mm: φD : 16 to 18	Bulk
*B	Taping Lead spacing: Case diameter [mm] 5mm: φD : 5 to 12.5 7.5mm: φD : 16 to 18 (L : ≦ 25)	Fan fold box φD: Pcs/box 5 - 6.3: 2 000 8: 1 000 10 - 12.5: 500 16 - 18: 250
*I	Taping Lead spacing: Case diameter [mm] 2.5mm: φD : 5 to 6.3	Fan fold box φD: Pcs/box 5 - 6.3: 2 000

※ Not standard.

DIMENSIONS



φD	5	6.3	8	10	12.6	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
P	2	2.5	3.5	5	5	7.5	7.5

α	L
1.0 mm	≦ 16 mm
2.0 mm	≧ 20mm

STANDARD PRODUCTS TABLE

W.V. (S.V.)	Cap. [μF]	Part No.	Cap. tol. [%] (120Hz/+20°C)	D.C.L. [μA] (+20°C/2 min) max.	tan δ (120Hz/+20°C) max.	Ripple Current [mA] rms (120Hz/+85°C) max.	Dim. [mm] φD	Dim. [mm] L
6.3 (8)	100	ECEA0JU101	±20	6.3	0.22	130	5	11
	220	ECEA0JU221		13.8	0.22	240	6.3	11.2
	330	ECEA0JU331		20.7	0.22	300	6.3	11.2
	470	ECEA0JU471		29.6	0.22	380	8	11.5
	1,000	ECEA0JU102		63.0	0.22	580	10	12.5
	2,200	ECEA0JU222		138.6	0.24	890	12.5	20
	3,300	ECEA0JU332		207.9	0.26	1020	12.5	20
	4,700	ECEA0JU472		296.1	0.28	1170	16	25
	6,800	ECEA0JU682		428.4	0.32	1270	16	25
	10,000	ECEA0JU103		630.0	0.40	1450	16	31.5
	15,000	ECEA0JU153		945.0	0.50	1700	18	35.5
10 (13)	33	ECEA1AU330	±20	3.3	0.19	60	5	11
	47	ECEA1AU470		4.7	0.19	90	5	11
	100	ECEA1AU101		10.0	0.19	150	5	11
	220	ECEA1AU221		22.0	0.19	250	6.3	11.2
	330	ECEA1AU331		33.0	0.19	330	8	11.5
	470	ECEA1AU471		47.0	0.19	400	8	12.5
	1,000	ECEA1AU102		100.0	0.19	630	10	16
	2,200	ECEA1AU222		220.0	0.21	920	12.5	20
	3,300	ECEA1AU332		330.0	0.23	1090	12.5	25
	4,700	ECEA1AU472		470.0	0.25	1200	16	25
	6,800	ECEA1AU682		680.0	0.29	1400	16	31.5
	10,000	ECEA1AU103		1000.0	0.37	1600	18	35.5
16 (20)	22	ECEA1CU220	±20	3.5	0.16	75	5	11
	33	ECEA1CU330		5.2	0.16	110	5	11
	47	ECEA1CU470		7.5	0.16	130	5	11
	100	ECEA1CU101		16.0	0.16	180	6.3	11.2
	220	ECEA1CU221		35.2	0.16	280	8	11.5
	330	ECEA1CU331		52.8	0.16	350	8	12.5
	470	ECEA1CU471		75.2	0.16	440	10	12.5
	1,000	ECEA1CU102		160.0	0.16	680	10	20
	2,200	ECEA1CU222		352.0	0.18	1000	12.5	25
	3,300	ECEA1CU332		528.0	0.20	1200	16	25
	4,700	ECEA1CU472		752.0	0.22	1360	16	31.5
	6,800	ECEA1CU682		1088.0	0.26	1600	18	35.5
25 (32)	22	ECEA1EU220	±20	5.5	0.14	90	5	11
	33	ECEA1EU330		8.2	0.14	110	5	11
	47	ECEA1EU470		11.7	0.14	130	5	11
	100	ECEA1EU101		25.0	0.14	180	6.3	11.2
	220	ECEA1EU221		55.0	0.14	310	8	12.5
	330	ECEA1EU331		82.5	0.14	390	10	12.5
	470	ECEA1EU471		117.5	0.14	480	10	16
	1,000	ECEA1EU102		250.0	0.14	850	12.5	20
	2,200	ECEA1EU222		550.0	0.16	1200	16	25
	3,300	ECEA1EU332		825.0	0.18	1300	16	31.5
	4,700	ECEA1EU472		1175.0	0.20	1500	18	35.5
35 (44)	4.7	ECEA1VU4R7	±20	3.0	0.12	35	5	11
	10	ECEA1VU100		3.5	0.12	60	5	11
	22	ECEA1VU220		7.7	0.12	95	5	11
	33	ECEA1VU330		11.5	0.12	110	5	11
	47	ECEA1VU470		16.4	0.12	130	6.3	11.2
	100	ECEA1VU101		35.0	0.12	210	8	11.5
	220	ECEA1VU221		77.0	0.12	350	10	12.5
	330	ECEA1VU331		115.5	0.12	440	10	16
	470	ECEA1VU471		164.5	0.12	550	10	20
	1,000	ECEA1VU102		350.0	0.12	900	12.5	25
	2,200	ECEA1VU222		770.0	0.14	1250	16	31.5
	3,300	ECEA1VU332		1155.0	0.16	1400	18	35.5

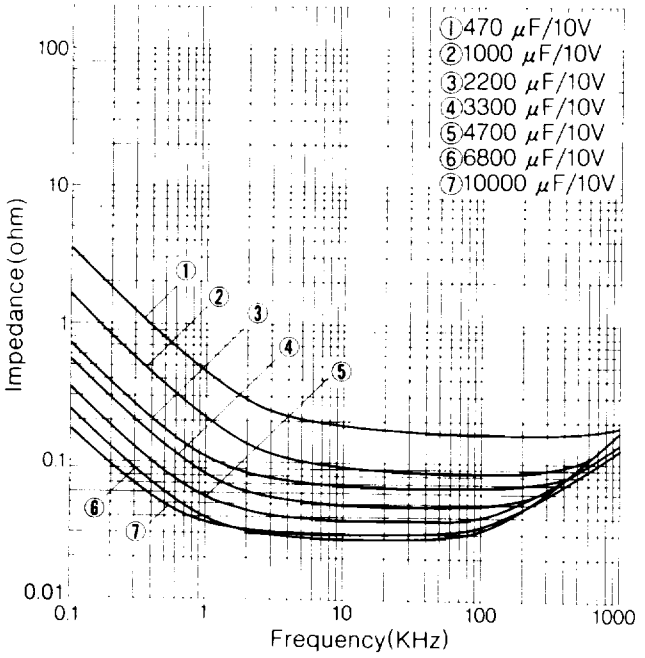
STANDARD PRODUCTS TABLE

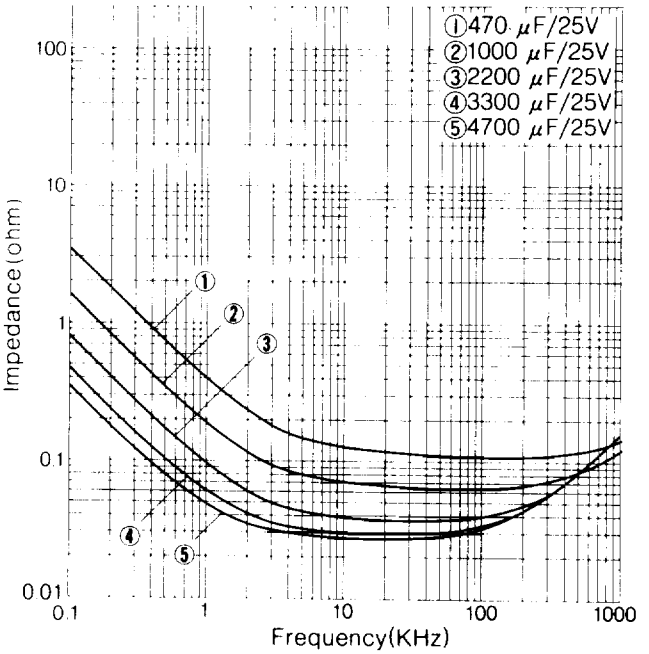
W.V. (S.V.)	Cap. [μF]	Part No.	Cap. tol. [%] (120Hz/+20°C)	D.C.L. [μA] (+20°C/2 min) max.	tan δ (120Hz/+20°C) max.	Ripple Current [mA] rms (120Hz/+85°C) max.	Dim. [mm] φD	L
50 (63)	0.47	ECEA1HUR47	±20	3.0	0.10	5	5	11
	1	ECEA1HU010		3.0	0.10	10	5	11
	2.2	ECEA1HU2R2		3.0	0.10	20	5	11
	3.3	ECEA1HU3R3		3.0	0.10	35	5	11
	4.7	ECEA1HU4R7		3.0	0.10	45	5	11
	10	ECEA1HU100		5.0	0.10	65	5	11
	22	ECEA1HU220		11.0	0.10	100	5	11
	33	ECEA1HU330		16.5	0.10	110	6.3	11.2
	47	ECEA1HU470		23.5	0.10	130	6.3	11.2
	100	ECEA1HU101		50.0	0.10	250	8	12.5
	220	ECEA1HU221		110.0	0.10	400	10	16
	330	ECEA1HU331		165.0	0.10	500	10	20
	470	ECEA1HU471		235.0	0.10	650	12.5	20
	1,000	ECEA1HU102		500.0	0.10	1,050	16	25
	2,200	ECEA1HU222		1100.0	0.12	1,300	18	35.5
63 (79)	0.47	ECEA1JUR47	±20	3.0	0.09	5	5	11
	1	ECEA1JU010		3.0	0.09	10	5	11
	2.2	ECEA1JU2R2		3.0	0.09	29	5	11
	3.3	ECEA1JU3R3		3.0	0.09	40	5	11
	4.7	ECEA1JU4R7		3.0	0.09	45	5	11
	10	ECEA1JU100		6.3	0.09	70	5	11
	22	ECEA1JU220		13.8	0.09	105	6.3	11.2
	33	ECEA1JU330		20.7	0.09	130	6.3	11.2
	47	ECEA1JU470		29.6	0.09	160	8	11.5
	100	ECEA1JU101		63.0	0.09	270	10	12.5
	220	ECEA1JU221		138.6	0.09	450	10	20
	330	ECEA1JU331		207.9	0.09	550	12.5	20
	470	ECEA1JU471		296.1	0.09	750	12.5	25
	1,000	ECEA1JU102		630.0	0.09	1,100	16	31.5
100 (125)	0.47	ECEA2AUR47	±20	3.0	0.08	10	5	11
	1	ECEA2AU010		3.0	0.08	20	5	11
	2.2	ECEA2AU2R2		3.0	0.08	30	5	11
	3.3	ECEA2AU3R3		3.3	0.08	40	5	11
	4.7	ECEA2AU4R7		4.7	0.08	50	5	11
	10	ECEA2AU100		10.0	0.08	70	6.3	11.2
	22	ECEA2AU220		22.0	0.08	115	8	11.5
	33	ECEA2AU330		33.0	0.08	145	10	12.5
	47	ECEA2AU470		47.0	0.08	180	10	16
	100	ECEA2AU101		100.0	0.08	350	12.5	20
	220	ECEA2AU221		220.0	0.08	550	16	25
	330	ECEA2AU331		330.0	0.08	700	16	25
	470	ECEA2AU471		470.0	0.08	900	16	31.5
160 (200)	0.47	ECEA2CUR47	±20	14.5	0.16	9.5	5	11
	1	ECEA2CU010		19.6	0.16	13	6.3	11.2
	2.2	ECEA2CU2R2		31.1	0.16	22	6.3	11.2
	3.3	ECEA2CU3R3W		41.6	0.16	31	6.3	11.2
	4.7	ECEA2CU4R7		55.1	0.16	40	8	11.5
	10	ECEA2CU100		106.0	0.16	66	10	12.5
	22	ECEA2CU220W		221.2	0.16	110	10	16
	33	ECEA2CU330W		326.8	0.16	144	10	20
	47	ECEA2CU470W		461.2	0.16	180	12.5	20
	100	ECEA2CU101		970.0	0.16	300	16	25
	220	ECEA2CU221W		2122.0	0.16	510	18	31.5

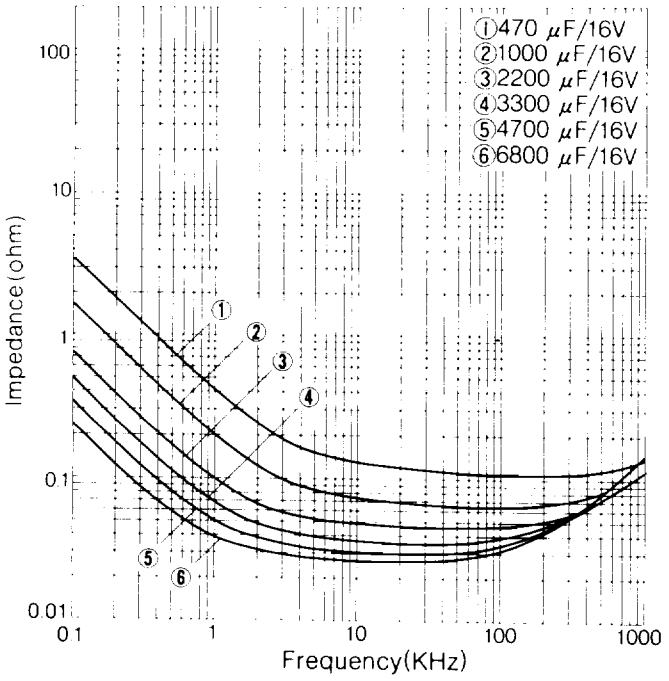
STANDARD PRODUCTS TABLE

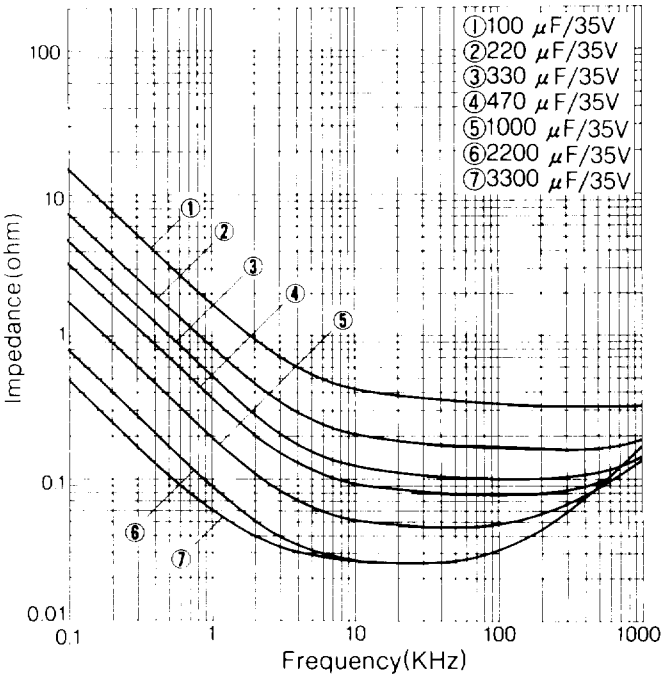
W.V. (S.V.)	Cap. [μF]	Part No.	Cap. tol. [%] (120Hz/+20°C)	D.C.L. [μA] (+20°C/2 min) max.	tan δ (120Hz/+20°C) max.	Ripple Current [mA] rms (120Hz/+85°C) max.	Dim. [mm] φD	L
200 (250)	1	ECEA2DU010	±20	22.0	0.18	16	6.3	11.2
	2.2	ECEA2DU2R2		36.4	0.18	27	6.3	11.2
	3.3	ECEA2DU3R3		49.6	0.18	36	8	11.5
	4.7	ECEA2DU4R7		66.4	0.18	45	10	12.5
	10	ECEA2DU100		130.0	0.18	72	10	16
	22	ECEA2DU220		274.0	0.18	126	10	20
	33	ECEA2DU330W		406.0	0.18	160	12.5	20
	47	ECEA2DU470		574.0	0.18	193	12.5	25
	100	ECEA2DU101		1210.0	0.18	330	16	31.5
250 (300)	1	ECEA2EU010	±20	25.0	0.18	18	6.3	11.2
	2.2	ECEA2EU2R2		43.0	0.18	31	8	11.5
	3.3	ECEA2EU3R3		59.5	0.18	40	10	12.5
	4.7	ECEA2EU4R7		80.5	0.18	49	10	12.5
	10	ECEA2EU100W		160.0	0.18	81	10	16
	22	ECEA2EU220W		340.0	0.18	144	12.5	20
	33	ECEA2EU330		505.0	0.18	171	12.5	25
	47	ECEA2EU470		715.0	0.18	210	16	25
	100	ECEA2EU101W		1510.0	0.18	320	18	31.5
350 (400)	1	ECEA2VU010	±20	31.0	0.20	18	6.3	11.2
	2.2	ECEA2VU2R2		56.2	0.20	28	10	12.5
	3.3	ECEA2VU3R3		79.3	0.20	35	10	16
	4.7	ECEA2VU4R7		108.7	0.20	40	10	16
	10	ECEA2VU100		220.0	0.20	70	10	20
	22	ECEA2VU220		472.0	0.20	110	12.5	25
	33	ECEA2VU330		703.0	0.20	140	16	25
	47	ECEA2VU470		997.0	0.20	170	16	31.5
400 (450)	1	ECEA2GU010	±20	34.0	0.20	18	8	11.5
	2.2	ECEA2GU2R2		62.8	0.20	28	10	12.5
	3.3	ECEA2GU3R3		89.2	0.20	35	10	16
	4.7	ECEA2GU4R7		122.8	0.20	45	10	16
	10	ECEA2GU100		250.0	0.20	70	12.5	20
	22	ECEA2GU220		538.0	0.20	110	16	25
	33	ECEA2GU330		802.0	0.20	140	16	25
	47	ECEA2GU470		1138.0	0.20	170	16	31.5
450 (500)	1	ECEA2WU010	±20	37.0	0.20	19	10	12.5
	2.2	ECEA2WU2R2		69.4	0.20	29	10	16
	3.3	ECEA2WU3R3		99.1	0.20	35	10	20
	4.7	ECEA2WU4R7		136.9	0.20	50	12.5	20
	10	ECEA2WU100		280.0	0.20	75	12.5	25
	22	ECEA2WU220		604.0	0.20	110	16	31.5
	33	ECEA2WU330		901.0	0.20	150	18	31.5

IMPEDANCE CHARACTERISTICS (at + 20°C)









IMPEDANCE CHARACTERISTICS (at+20°C)