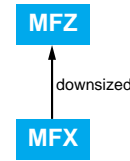


## Alchip® MFZ/MFX Series

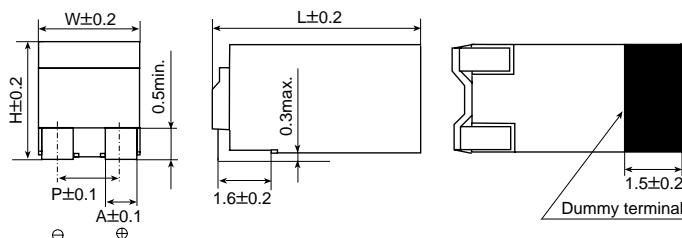
- Manganese dioxide is employed as electrolyte
- For digital equipment
- High heat reflow capability
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)



### ◆ SPECIFICATIONS

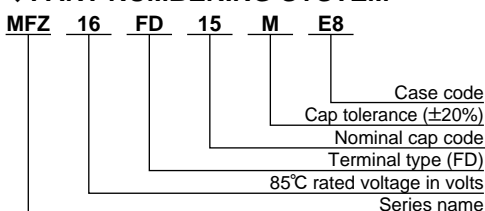
Items	Characteristics										
Category											
Temperature Range	-55 to +105°C										
Rated Voltage Range	4 to 20V <sub>dc</sub> ±20% of the initial value (For the maximum operating voltage at 105°C, see STANDARD RATINGS)										
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)										
Surge Voltage	105°C : (value at 105°C in STANDARD RATINGS) × 1.15 85°C and below : Rated voltage × 1.15 (V)										
Leakage Current	I = 0.1CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	0.12max. (at 20°C, 120Hz)										
Low Temperature Characteristics	Z(-25°C)/Z(+20°C) ≤ 1.5 Z(-55°C)/Z(+20°C) ≤ 2.0 (at 500kHz)										
Endurance	The following specifications shall be satisfied after the capacitors are subjected to DC voltage at 85°C or 105°C for 1000 hours with the specified rated ripple current applied. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±10% of the initial value</td></tr> <tr><td>D.F. (tanδ)</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ ±10% of the initial value	D.F. (tanδ)	≤ 150% of the initial specified value	ESR	≤ 150% of the initial specified value	Leakage current	≤ The initial specified value
Appearance	No significant damage										
Capacitance change	≤ ±10% of the initial value										
D.F. (tanδ)	≤ 150% of the initial specified value										
ESR	≤ 150% of the initial specified value										
Leakage current	≤ The initial specified value										
Bias Humidity	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 500 hours. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±10% of the initial value</td></tr> <tr><td>D.F. (tanδ)</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ ±10% of the initial value	D.F. (tanδ)	≤ 150% of the initial specified value	ESR	≤ 150% of the initial specified value	Leakage current	≤ The initial specified value
Appearance	No significant damage										
Capacitance change	≤ ±10% of the initial value										
D.F. (tanδ)	≤ 150% of the initial specified value										
ESR	≤ 150% of the initial specified value										
Leakage current	≤ The initial specified value										
Surge Voltage Test	The capacitors shall be subjected to 1000 cycles to charge the surge voltage specified at 85°C or 105°C for 30 seconds through a protective resistor (R=1kΩ), then discharge for 5-1/2 minutes through a resistor with the same value. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±5% of the initial value</td></tr> <tr><td>D.F. (tanδ)</td><td>≤ The initial specified value</td></tr> <tr><td>ESR</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ ±5% of the initial value	D.F. (tanδ)	≤ The initial specified value	ESR	≤ 150% of the initial specified value	Leakage current	≤ The initial specified value
Appearance	No significant damage										
Capacitance change	≤ ±5% of the initial value										
D.F. (tanδ)	≤ The initial specified value										
ESR	≤ 150% of the initial specified value										
Leakage current	≤ The initial specified value										
Reverse Voltage	The capacitors shall be subjected to 15% of the rated voltage at 85°C, or 15% of the maximum operating voltage at 105°C, in the reverse polarity direction for 125 hours, and shall be subjected to the rated voltage at 85°C, or the maximum operating voltage at 105°C, in the forward polarity direction for 125 hours. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±10% of the initial value</td></tr> <tr><td>D.F. (tanδ)</td><td>≤ The initial specified value</td></tr> <tr><td>ESR</td><td>≤ The initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ ±10% of the initial value	D.F. (tanδ)	≤ The initial specified value	ESR	≤ The initial specified value	Leakage current	≤ The initial specified value
Appearance	No significant damage										
Capacitance change	≤ ±10% of the initial value										
D.F. (tanδ)	≤ The initial specified value										
ESR	≤ The initial specified value										
Leakage current	≤ The initial specified value										
Thermal Shock	After the capacitors are subjected to -55°C, for 30 minutes and +125°C for 30 minutes for 5 cycles, they shall be conducted in accordance with the endurance test or the bias humidity test specified above.										
Failure Rate	1% per 1000 hours maximum (Confidence level 60% at 105°C)										
Others	IEC 384-18-1 (Fixed Aluminum Electrolytic Chip Capacitors with Solid Electrolyte)										

### ◆ DIMENSIONS (Terminal Type=FD) [mm]



Case code	L	W	H	P	A
D6	6.4	4.6	4.6	3.3	1.1
E8	8.4	5.7	5.7	4.0	1.5

### ◆ PART NUMBERING SYSTEM



Capacitance	Code
6.8μF	6R8
10μF	10
33μF	33

## Alchip® MFZ/MFX Series

### ◆STANDARD RATINGS

#### MFZ

Case code	Rated voltage (V <sub>dc</sub> )	Cap (μF)	ESR (mΩ) [20°C/500kHz]	Temp. (°C)	Max operating voltage (V <sub>dc</sub> )	Rated ripple (mA <sub>rms</sub> )			Case code	Rated voltage (V <sub>dc</sub> )	Cap (μF)	ESR (mΩ) [20°C/500kHz]	Temp. (°C)	Max operating voltage (V <sub>dc</sub> )	Rated ripple (mA <sub>rms</sub> )		
						500kHz	300kHz	100kHz							500kHz	300kHz	100kHz
D6	4	27	270	105	3.2	320	300	270	E8	4	56	180	105	3.2	390	370	350
				85	4	500	480	440					85	4	580	550	530
				60	4	570	540	490					60	4	700	660	630
				45	4	660	630	570					45	4	810	770	740
	6.3	22	270	105	5	320	300	270		105	5	390	370	350			
				85	6.3	500	480	440		85	6.3	580	550	530			
				60	6.3	570	540	490		60	6.3	700	660	630			
				45	6.3	660	630	570		45	6.3	810	770	740			
	10	15	270	105	8	320	300	270		105	8	390	370	350			
				85	10	500	480	440		85	10	580	550	530			
				60	10	570	540	490		60	10	700	660	630			
				45	10	660	630	570		45	10	810	770	740			
	16	6.8	425	105	13	130	110	100		105	13	320	300	270			
				85	16	190	170	150		85	16	500	480	440			
				60	16	220	200	180		60	16	570	540	490			
				45	16	250	230	200		45	16	660	630	570			
				105	16	320	300	270	105	16	320	300	270				
				85	20	500	480	440	85	20	500	480	440				
				60	20	570	540	490	60	20	570	540	490				
				45	20	660	630	570	45	20	660	630	570				

#### MFX

Case code	Rated voltage (V <sub>dc</sub> )	Cap (μF)	ESR (mΩ) [20°C/500kHz]	Temp. (°C)	Max operating voltage (V <sub>dc</sub> )	Rated ripple (mA <sub>rms</sub> )			Case code	Rated voltage (V <sub>dc</sub> )	Cap (μF)	ESR (mΩ) [20°C/500kHz]	Temp. (°C)	Max operating voltage (V <sub>dc</sub> )	Rated ripple (mA <sub>rms</sub> )		
						500kHz	300kHz	100kHz							500kHz	300kHz	100kHz
D6	4	22	270	105	3.2	320	300	270	E8	4	47	180	105	3.2	390	370	350
				85	4	500	480	440					85	4	580	550	530
				60	4	570	540	490					60	4	700	660	630
				45	4	660	630	570					45	4	810	770	740
	6.3	15	270	105	5	320	300	270		105	5	390	370	350			
				85	6.3	500	480	440		85	6.3	580	550	530			
				60	6.3	570	540	490		60	6.3	700	660	630			
				45	6.3	660	630	570		45	6.3	810	770	740			
	10	10	270	105	8	320	300	270		105	8	390	370	350			
				85	10	500	480	440		85	10	580	550	530			
				60	10	570	540	490		60	10	700	660	630			
				45	10	660	630	570		45	10	810	770	740			
	16	4.7	425	105	13	130	110	100		105	13	320	300	270			
				85	16	190	170	150		85	16	500	480	440			
				60	16	220	200	180		60	16	570	540	490			
				45	16	250	230	200		45	16	660	630	570			