

ULTEM™ UTF120 FILM

FOR HIGH TEMPERATURE CAPACITORS

ULTEM™ UTF120 PEI dielectric film enables the design of lightweight, compact, high-energy-density capacitors that can store large amounts of electrical energy for long periods without significant current leakage or loss of charge at high temperatures. This technology can offer advantages for capacitor applications, beginning with excellent dielectric and insulative properties. It also maintains low heat loss at target frequencies.

The film portfolio, offering different thicknesses to help meet customers' specific voltage requirements, exhibits stable properties through a range of temperatures (-40 °C to +150 °C) and frequency, including stable capacitance, good insulation resistance, high dielectric constant (Dk) and low dissipation factor (Df). The wide operating temperature capability of ULTEM UTF120 film based capacitors can increase reliability and can reduce or even eliminate the need for active cooling for converter applications.

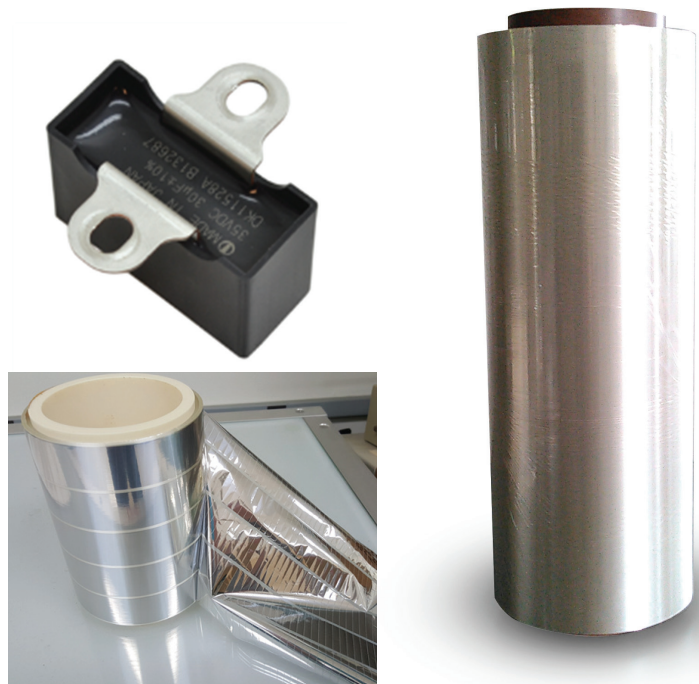
ULTEM UTF120 film also provides excellent handling through metallization, capacitor winding and flattening (squashing). It can be processed on existing equipment, and has been validated with both film-foil and metalized electrodes, including flat, tapered and patterned metalized electrode designs.

KEY FEATURES & BENEFITS

- Stable high dielectric constant and dissipation factor up to 200 °C
- High breakdown strength up to 200 °C
- High temperature dimensional and mechanical stability
- Capable of passing 260 °C reflow soldering process
- Excellent metal adhesion (Al, Zn, Cu)
- Inherent flame resistance
- Available at 5, 7 and 10 µm gauges (+/- 5%), other gauges upon request
- Design and package flexibility

INDUSTRIES & APPLICATIONS

- Automotive
- Mass transportation
- Consumer electronics
- Aerospace
- DC-DC converters
- Electrical compressors
- HID lighting
- LED lighting
- LCD backlight



COMPARATIVE DATA OF DIELECTRIC FILMS

	Units	BOPP	PET	PEN	PPS	PC	ULTEM™ UTF120
BDS 23 °C (ASTM D149)	V/μm	690	800	660	530	660	590
BDS 150 °C (ASTM D149)	V/μm	N/A	N/A	N/A	465	N/A	510
Dk at 1 kHz		2.2	3.3	3.2	3.0	2.7	3.1
Df at 1 kHz	%	0.0007	0.0040*	0.0040**	0.0005	0.0022	0.0020
Temperature Range	°C	-55C to +105	-55C to +125	-55C to +140	-55C to +150	-55C to +125	-55C to +150
Self-Healing 23 °C		Excellent	Moderate	Moderate	Poor	Good	Moderate
Self-Healing 150 °C		No	No	No	Poor	No	Moderate
Metallization		Requires plasma	Good	Good	Moderate	Good	Good
Solder Reflow Capable 260 °C	Y/N	No	No	Yes	Yes	No	Yes
Available Thickness	μm	~2.1	~0.5	~1.2	~1.2	~2.0	5, 7 & 10
Cost		Low	Medium	High	Very High	Very High	High
Certainty of Supply		Excellent	Excellent	Moderate	Limited	Very Limited	Excellent/ moderate
Comments:		Excellent low temperature performance. Limited temperature capability.	* Df climbs exponentially beyond Tg (92 °C)	** Df climbs exponentially beyond Tg (120 °C), similar to PET	Poor self healing. Often requires monomer coating to enhance self healing. Limited availability.	Limited quantity of film available. Max. continuous use temperature 125 °C	Good balance of properties. Other gauge films under development.
Overall Performance at 150 °C		None	None	Poor	Moderate	None	Good

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