

MAIN APPLICATION

IGBT protection circuits, Snubber networks, Energy conversion and control in power electronics, Protection circuits in SMPS.

CONSTRUCTION

Polypropylene film, aluminium foil plus metallised polypropylene film wound in a series connection

TEMPERATURE RANGE

-25 °C to 85 °C

APPLICABLE SPECIFICATION

IEC 384-17,

CAPACITANCE VALUE & RATED VOLTAGE (DC / AC)

Refer dimension chart.

CAPACITANCE TOLERANCE

, ±5% , ±10%

VOLTAGE PROOF

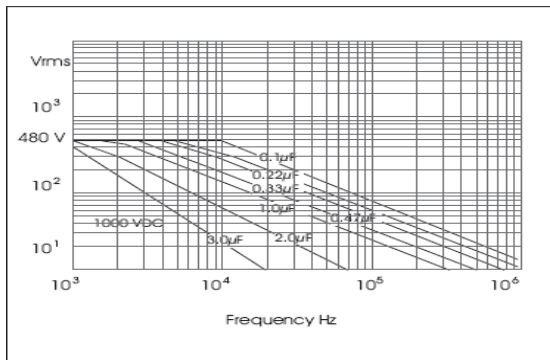
Between terminals: 1.6 times of rated voltage for 2 seconds.

INSULATION RESISTANCE (at 25 °C at a test voltage of 500 VDC applied for 1 minute)

$C \leq 0.33 \mu F$ $C \geq 0.33 \mu F$
 $\geq 1\,000,000 \text{ M}\Omega$ $\geq 20,000 \text{ M}\Omega$

FREQUENCY DERATING

AC Voltage Derating v/s Frequency at 10°C Internal Temperature Rise (general reference)



TAN δ (DISSIPATION FACTOR) AT 25°C

Frequency (kHz) $C_R < 0.1 \mu F$ $0.1\text{mfd} < C_R \leq 1.5 \mu F$

At 1 KHz 0.05% 0.05%

At 10 KHz 0.1% 0.1%

At 100 KHz 0.3% 0.5%

LIFE TEST CONDITIONS (DC) : (Loading at elevated temperature)

Loaded at 1.25 times of rated DC voltage at 85°C f or 1000 hours.

After the test:

$\Delta c/c: \leq 3\%$ of initial value.

Increase of Tan δ: ≤ 0.002

Insulation resistance: $\geq 50\%$ of the value mentioned in IR chart

LIFE TEST CONDITIONS (AC) : (Loading at elevated temperature)

Loaded at 1.25 times of rated AC voltage at 70°C f or 1000 hours.

After the test:

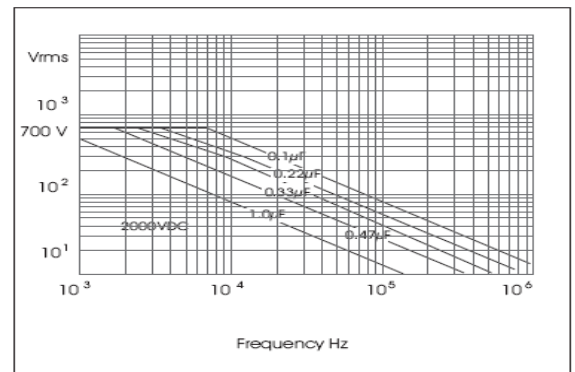
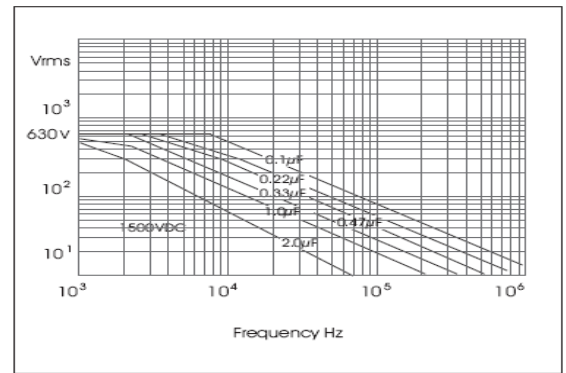
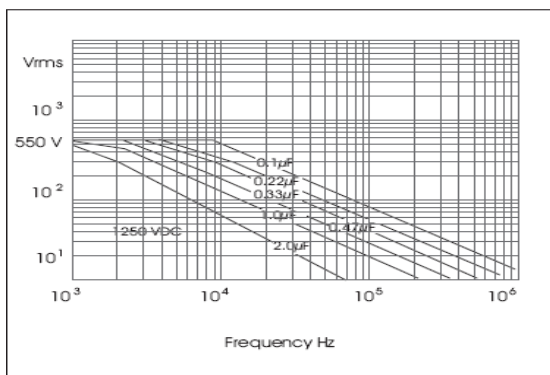
$\Delta c/c: \leq 3\%$ of initial value.

Increase of Tan δ: ≤ 0.002 ,

Insulation resistance: $\geq 50\%$ of the value mentioned in IR chart.

APPROVALS

Capacitors are tested as per IEC 384-17

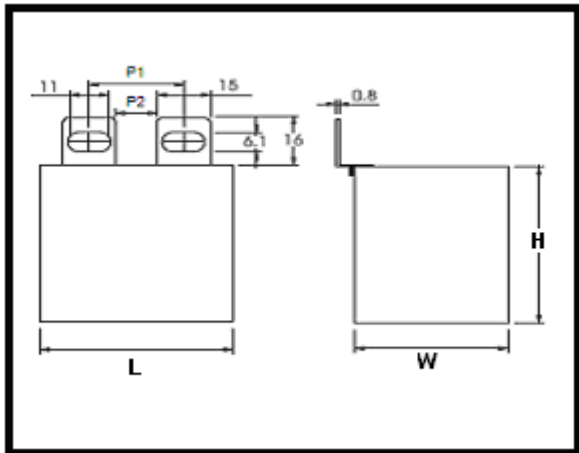


El-Ci-Ar[®] MPF-71 IGBT SNUBBER CAPACITORS

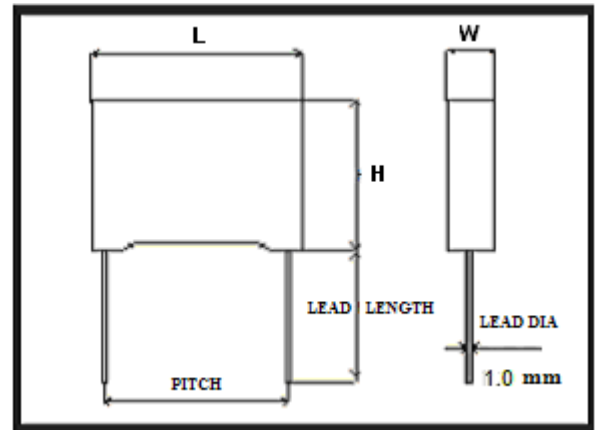
Ordering code for IGBT SNUBBER TYPE capacitor

Rated voltage (VDC)	Rated Cap. (u F)	Maximum Dimensions (mm)			Dv/dt (V/μsec)	I Peak (Amps)	Terminal Styles	P1 (mm)	P2 (mm)	PITCH (W Type) (mm)
		W	H	L						
1000	0.22	17	29	42	1200	264	W,L	25.0	8.0	38.0
1000	0.47	17	29	42	1000	470	W,L	25.0	8.0	38.0
1000	1	24	38	45	900	900	L	25.0	9.0	-
1000	1.5	35	42	45	900	1350	L	27.0	12.0	-

*Dimensions are subject to change.



L TYPE



W TYPE

* CUSTOM DESIGNED CAPACITORS AVAILABLE ON REQUEST.

Accelerated Pulse Handling Capability:

Test Conditions:

A capacitor under test will be charged through an impedance of a magnitude greater than the discharging impedance. The capacitor under test will be charged to the rated DC voltage and discharged through an impedance capable of producing a minimum voltage gradient with time (DV/DT). The test will be performed in accordance with the requirements for the voltage gradient multiplier and charge and discharge cycles as listed below.

Voltage Gradient Multiplier	Test Cycles
6x	100
4x	1000
2x	1 million

Example:

An *El-Ci-Ar* part rated 1.0 uF 1,000 VDC has a DV/DT rating of 900 volts per microsecond. This part would be capable of withstanding 100 cycles at a minimum of 5,400 volts/microsecond, 1000 cycles at 3,600 volts/microsecond, or 1 million cycles at 1,800 volts/microsecond.

Performance Criteria After Testing

Capacitance Delta < 3%

Tangent of loss angle < 150% of original measured value

Why Use Snubber Capacitors?

With the evolution of power technology, new higher speed Insulated Gate Bipolar Transistors (IGBTs) make it possible for high power converters to operate up to 10 kHz or more. IGBTs are replacing the slower Darlington transistors, simplifying circuit design and reducing cost. IGBT power modules are now being designed into AC and DC motor drive inverters, uninterruptible power systems, electric vehicles and alternate energy production systems. Power systems containing IGBTs must be designed so the transient voltages caused by the high di/dt that occurs at gate turn off is minimized. Left uncontrolled, this transient voltage can exceed the blocking voltage rating of the IGBT and cause it to fail. To reduce the transient voltage, either di/dt or the parasitic DC bus inductance of the power circuit must be reduced. This is best achieved by decoupling the parasitic bus inductance using a non-inductive wound film capacitor mounted as near as possible to the IGBT module terminals. Snubber capacitors, constructed of polypropylene film dielectric and aluminium foil plus metallised polypropylene film, are the optimal capacitor design for IGBT applications. While film/foil capacitors are often used because of their superior current carrying capability, they fail in a short circuit mode, which may cause damage to the IGBT module. *El-Ci-Ar*'s snubber capacitors combine high current carrying capability with low inductance, low dielectric losses and capacitance stability across a wide frequency range. They offer the self-healing property of metallized film (not failing in a short circuit mode) with the high peak current carrying capability (dv/dt) of film/foil construction.

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