

HEARTFIM

Capacitor for Cardiac Defibrillators

Preliminary data sheet



HEARTFIM

In 1979, THOMSON CSF PASSIVE COMPONENTS (formerly name : LCC) developed the CONTROLLED SELF-HEALING for dry power capacitors.

In 1988, THOMSON CSF PASSIVE COMPONENTS further evolved the CONTROLLED SELF-HEALING technology for use in impregnated DC link filtering capacitors (TRAFIM). This capacitor made great improvements over previous technologies by combining the benefits of the controlled self-healing process and superior power densities due to the impregnation, making it one of the most compact capacitors on the market for given $1/2CV^2$ values.

With the CONTROLLED SELF-HEALING, the capacitance is divided into several millions elementary capacitances protected by "fuse gates". The weak points in the dielectric are now insulated and the capacitor continues functioning normally without short-circuit and explosion.

The capacitor acts like a battery while working it "consumes" a certain amount of the capacitance through the gradual breakdown of the individual capacitance "cells". Over the life of the capacitor, the capacitance gradually decreases. At the end of the capacitors life, we see a decrease of 10 % in the nominal capacitance.

In 1994, based on TRAFIM technology, THOMSON CSF PASSIVE COMPONENTS developed segment metallized and impregnated power capacitors for energy discharge application.

The issued DISFIM technology is used for electromagnetic guns, high power lasers and particle accelerators.

Today, THOMSON CSF PASSIVE COMPONENTS implements the DISFIM technology for cardiac defibrillators capacitors : HEARTFIM series.

TECHNOLOGY

HEARTFIM capacitors employ biological oil impregnant, and controlled self-healing through the use of segmented metallized polypropylene film.

A high level of safety is achieved through this technology as there is no risk of explosion.

DESCRIPTION (see outline drawing)

Cylindrical aluminium case.

Terminals with faston 6.3.

HEARTFIM

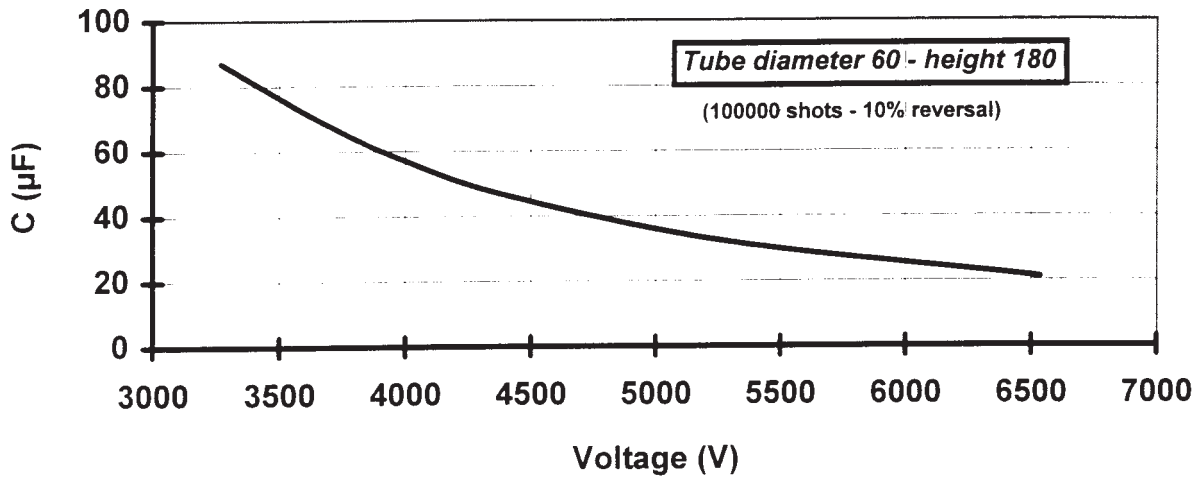
TECHNICAL DATA

Part number : KDHFMAA530326

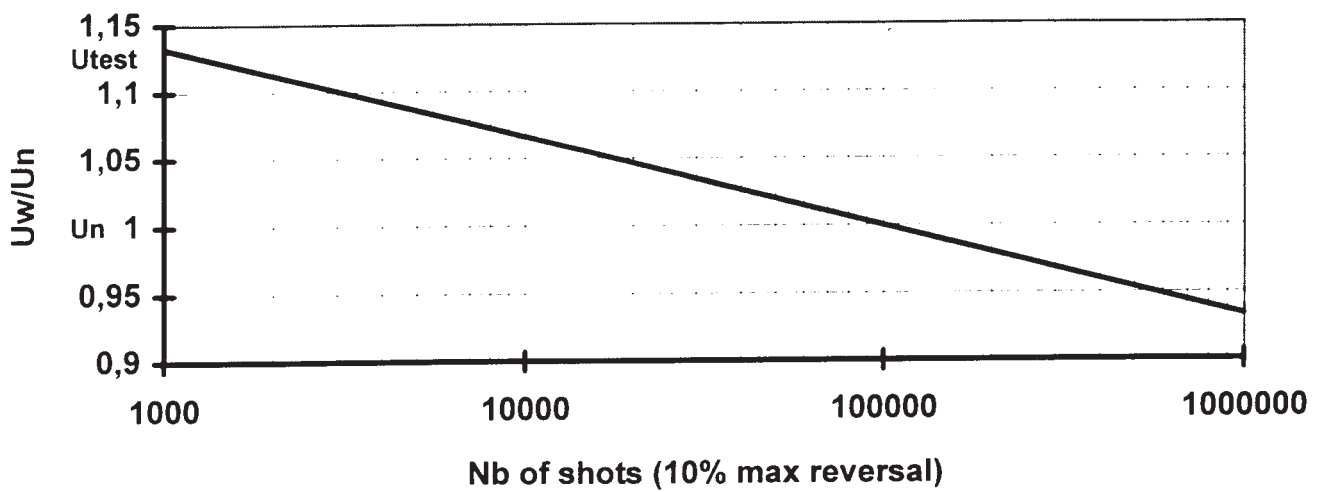
- Capacitance	μF	32
- Tolerance	%	± 5
- U nominal	Vdc	5300
- Max peak current	A	200
- Repetition rate	Hz	0.1
- Operating temperature : - min.	$^{\circ}\text{C}$	- 10
- max.	$^{\circ}\text{C}$	+ 60
- Storage conditions		
Ambient temperature min.	$^{\circ}\text{C}$	- 40
Ambient temperature max.	$^{\circ}\text{C}$	+ 70
- Life time at reversal 10 %	Shots	100 000
- Tests conditions		
Measurement of C. Tg δ		
Test voltage :		
• between terminals U test	kVdc	6 (10 s)
• between shorted terminals and case	kVdc	8 (60 s)
• discharge at 5300 V 10 % reversal	Shots	10
Measurement of C. Tg δ		
- Tangent of loss angle	$\times 10^{-4}$	< 50 (at 100 Hz)
- Insulation resistance (500 V 1 mn)	M	500
- Protection		Controlled self healing
- Design		Aluminium tube
- Dimensions	mm	$\varnothing 60$ h = 180
- Weight	kg	≈ 0.55

HEARTFIM

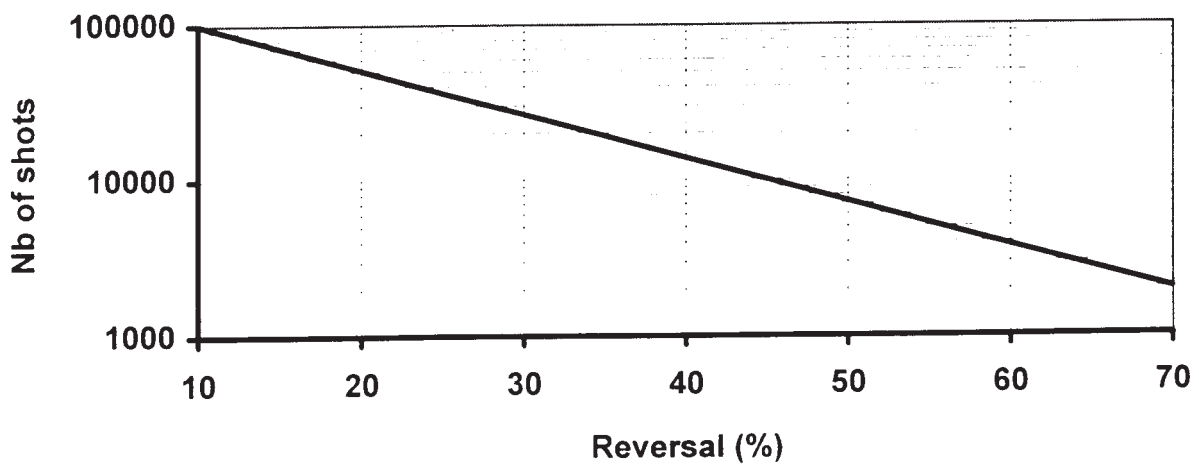
CAPACITANCE vs VOLTAGE



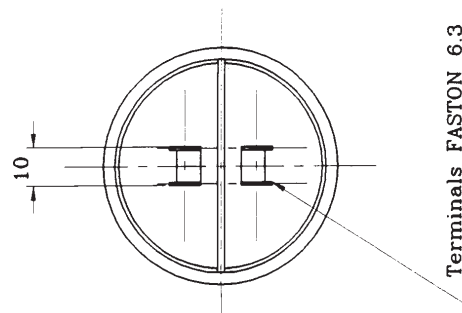
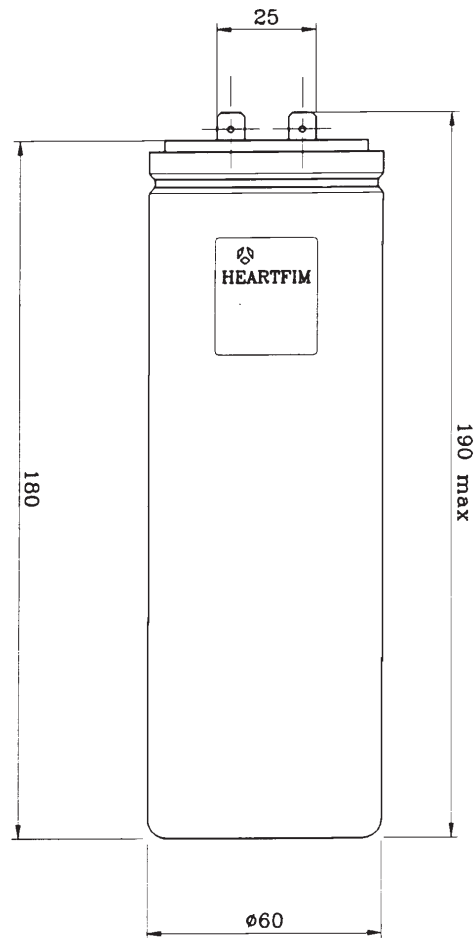
Uworking/Unominal vs LIFETIME



LIFETIME vs REVERSAL



HEARTFIM



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Soft ferrite



Film capacitors



Ceramic capacitors



Non linear resistors



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