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**Discrete Semiconductors and Passive Components**

# Series 196 HVC ENYCAP™

## HYBRIDE ENERGY STORAGE CAPACITORS

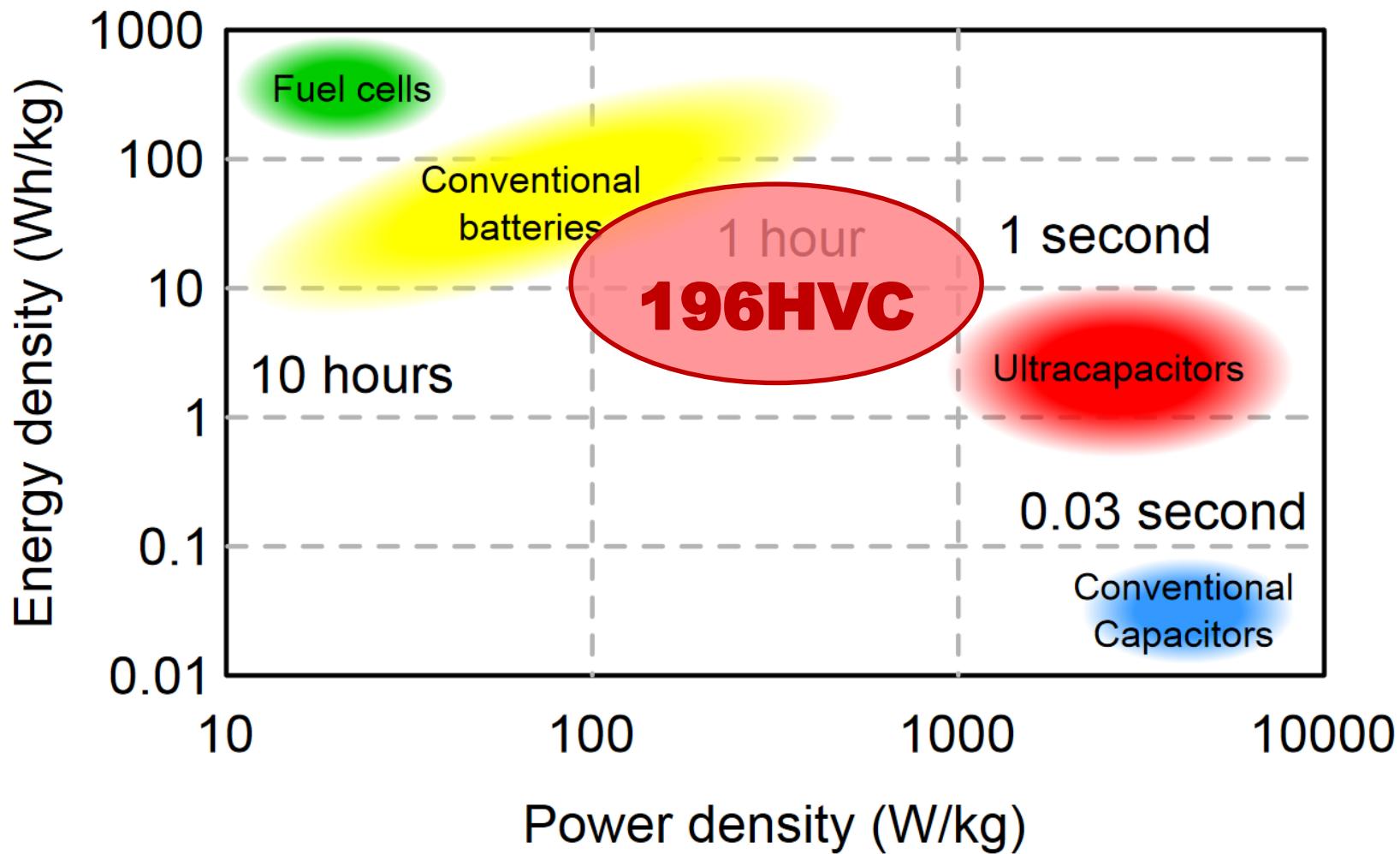
### Summary

**Gerald Tatschl**

**15.10.2014**

Build **Vishay**  
into your **Design**

## 196HVC ENYCAP™ – Hybrid Energy Storage System



Remark:

EDLC plot from [http://upload.wikimedia.org/wikipedia/commons/6/6b/Supercapacitors\\_chart.svg](http://upload.wikimedia.org/wikipedia/commons/6/6b/Supercapacitors_chart.svg) updated with hybrid capacitors series 196

# 196HVC ENYCAP™ – Hybrid Energy Storage System

## Features:

- Polarized energy storage capacitor with high capacitance and high energy density
- Voltage flexibility: 1.4V to 8.4V
- Available in several mounting styles (leaded and SMT)
- Useful life up to 1000h 85°C
- High number of charge discharge cycles (100.000)
- No cell balancing necessary
- Soft charging and discharging characteristics
- Non hazardous electrolyte
- Maintenance free, no service necessary



# 196HVC ENYCAP™ – Hybrid Energy Storage System

## Applications:

Miniaturized Backup Systems for power range up to several Watt

- Power backup for memory controller, flash backup, SRAM, DRAM, RAID systems
- Power failure and write cache protection for enterprise SSD and HDD
- Real time clock source
- Burst power support for flash lights, wireless transmitters
- Backup power for industrial PC's and industrial controls
- Storage device for energy harvesting
- Emergency light and micro UPS power sources



# DIMENSIONS AND BASIC DATA – 196HVC ENYCAP™

QUICK REFERENCE DATA									
DESCRIPTION	VALUE								
	SINGLE CELL	2 CELLS	3 CELLS	4 CELLS	5 CELLS	6 CELLS			
Nominal case size (Ø D x L in mm) Stacked Through-Hole (STH)	7 x 2.5 12 x 2.5 -	7 x 5 12 x 5 35 x 25 x 7.5	7 x 7.5 12 x 7.5 35 x 25 x 10	7 x 10 12 x 10 35 x 25 x 15	7 x 12.5 12 x 12.5 -	7 x 15 12 x 15 -			
Nominal case size (Ø W x L x H in mm) Surface-Mount Flat (SMF)	7 x 7 x 2.5 12 x 12 x 2.5 -	7 x 14 x 2.5 12 x 24 x 2.5 -	13 x 14 x 2.5 22 x 24 x 2.5 -	14 x 14 x 2.5 24 x 24 x 2.5 -	-	-			
Nominal case size (W x L x H in mm) Lay Flat (LFC)	14.5 x 12 x 2.5	14.5 x 24 x 2.5	14.5 x 36 x 2.5	14.5 x 48 x 2.5	14.5 x 60 x 2.5	14.5 x 72 x 2.5			
Rated capacitance range, $C_R$	4.0 F 15.0 F	4.0 F 15.0 F 90.0 F	4.0 F 15.0 F 90.0 F	4.0 F 15.0 F 90.0 F	4.0 F 15.0 F	4.0 F 15.0 F			
Tolerance on $C_R$ at 20 °C	-20 % to +80 %								
Rated voltage, $U_R$	1.4 V	2.8 V	4.2 V	5.6 V	7.0 V	8.4 V			
Maximum surge voltage, $U_S$ (max. 30 s)	1.6 V	3.2 V	4.8 V	6.4 V	8.0 V	9.6 V			
Minimum stored energy	4 Ws 17 Ws	9 Ws 35 Ws 230 Ws	13 Ws 52 Ws 345 Ws	18 Ws 70 Ws 460 Ws	22 Ws 87 Ws	27 Ws 105 Ws			
Energy density	9 Ws/g to 13 Ws/g								
Category temperature range	4.0 F: -20 °C to +70 °C 15.0 F / 90.0 F: -20 °C to +85 °C								
Storage temperature range	-40 °C to +85 °C								
Useful life at $U_R$	4.0 F: at 70 °C: 1000 h at 55 °C: 2800 h at 45 °C: 5600 h			15.0 F / 90.0 F: at 85 °C: 1000 h at 70 °C: 2800 h at 60 °C: 5600 h					
Shelf life	1000 h at upper category temperature								
Climatic category IEC 60068	25/085/21								

## 196HVC ENYCAP™ – Hybrid Energy Storage System

**Series 196HVC hybrid energy storage systems are suited for the growing market\* of re-chargeable energy storage systems with following specific requirements:**

- small size (high energy content per volume)
- low profile to fit portable and compact designs
- required backup time several seconds to hours
- charging time in the application longer than the discharging period
- no or very limited peak-power requirements
- charging power to be supplied by the main system



\* Partial overlap with the application segment for primary and rechargeable cells.

## 196HVC ENYCAP™ – Hybrid Energy Storage System

### Key facts:

- Applications requiring miniaturized Backup Systems for power range up to several Watt
- Operating voltage scalable: 1.4V, 2.8V, 4.2V, 5.6V, 7.0V, 8.4V
- Stored Energy: 4Ws ... 460Ws
- High energy and power density
- High number of charge and discharge cycles

Design Evaluation kit available on request (MAL219699001E3)

## 196HVC ENYCAP™ Hybrid Energy Storage Capacitor

196HVC is targeted as an extension of classical aluminum double layer capacitor series 196 DLC (coin cells)

- smaller dimensions
- higher energy density (higher capacitance)
- extended voltage range (8.4V)
- various layouts (flat, stacked, pins, tabs, ...)
- moderately lower internal resistance compared to 196DLC