

Eaton PHVL supercap pack & SMT MOV intro

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Ihr Vertriebspartner:


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Agenda

1. Why Eaton?
2. NEW PHLV supercap pack intro
 - Key features
 - Product series Features & Benefits
 - Applications
 - Competitors
3. NEW SMT MOV intro
 - Product Series Features & Benefits
 - Product matrix/PN system
 - THT vs. SMT MOV
 - Applications
 - Competitor family cross reference
 - Marketing materials

Why to work with Eaton?



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4+1

Sales persons + FAE to cover
the entire EMEA

85

85% is the sales via
Distribution (only 15% direct!)

7

Only 7 = number of direct
accounts in EMEA

<50

<50M\$ = EMEA POS

>95%

>95% = design registerable parts

To Recap

Only 3 sales persons to cover all EMEA

85% of sales via Distribution (it was 74% in 2016 and 81% in 2017)

Only 7 direct accounts

<50M\$ POS in EMEA

>95% parts are design registerable

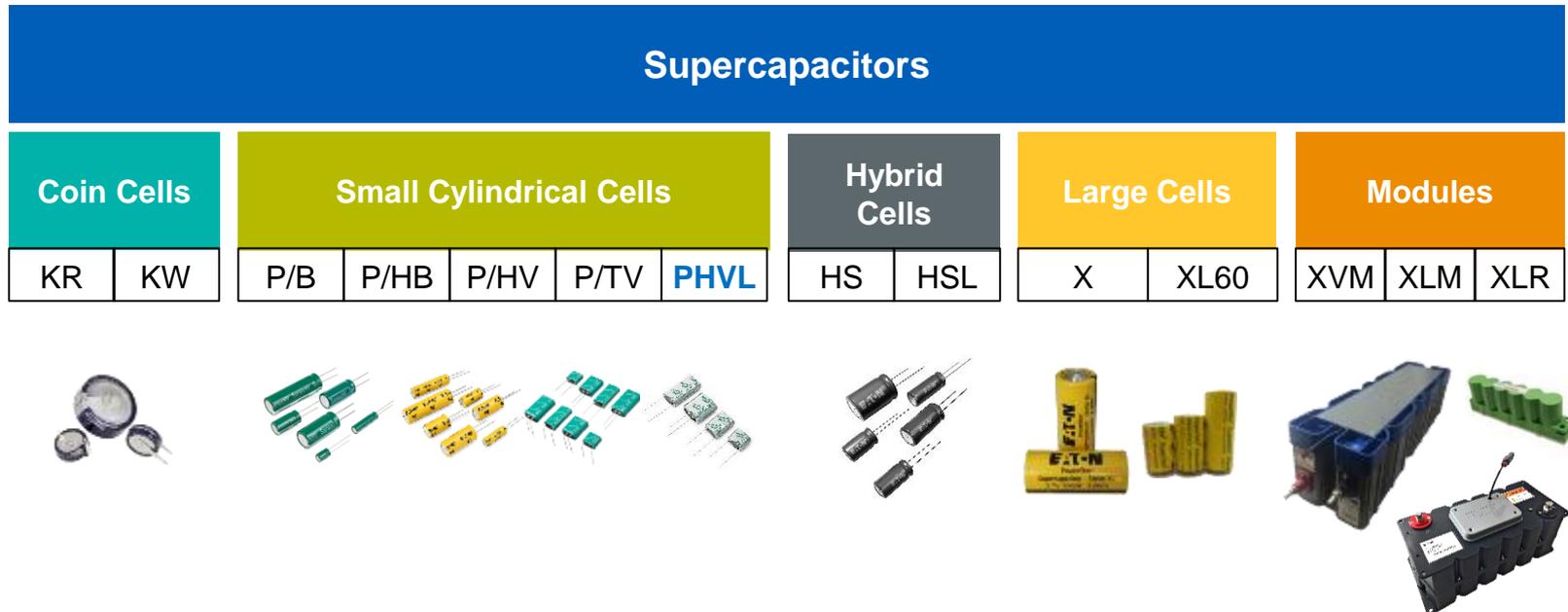
EXL inductor family



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Supercapacitor product breadth

- Broad product offering – 0.1 F to 3400 F cells – for long life, reliable energy storage with leading power and efficiency. Chemistry options to optimize power, energy, safety



PHVL series

Life of the application, up to 20 years, with and lower resistance for very high power and efficiency and operation across industrial temperatures.

Product Description

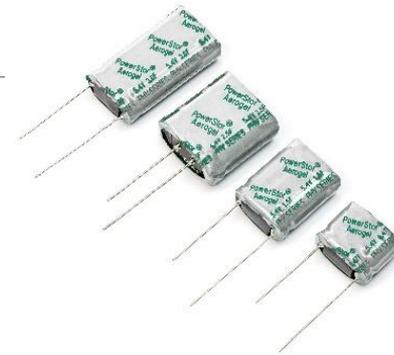
Supercapacitor energy storage pack with low leakage current and self discharge matched to complement or replace a battery.

Features & Benefits

- 3.9 V, 0.47 F to 5 F
- 5000hrs @ 65C
- UL recognized
- Leakage current 10-20% of PHV product line
- Operating temperatures -40 °C to +85 °C
- Ultra low resistance

Applications

- Smart/Automated Utility Meters, esp. water or gas
- Industrial controls
- Vehicle tracking
- IoT
- Automotive backup, pulse power
- Battery life and run time extension



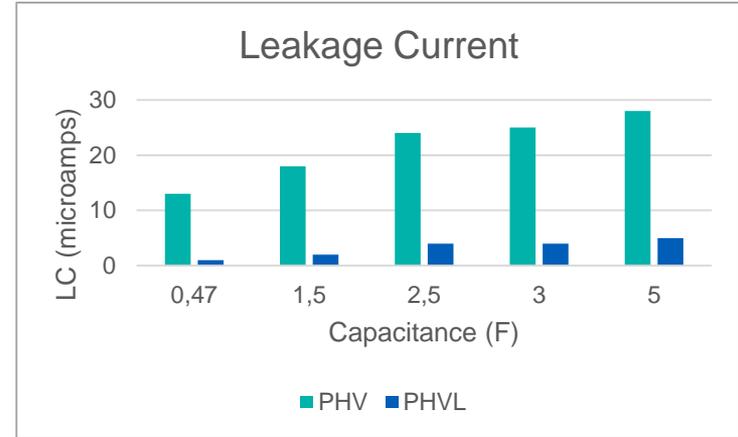
Target Markets/Applications

- Water and gas meters
- Battery assist for peak power
 - Especially Lithium Thionyl (15 year life)
- IoT sensors
- Long duration discharges
 - RTC
 - Memory backup



Advantages vs. PHV in batter powered IoT

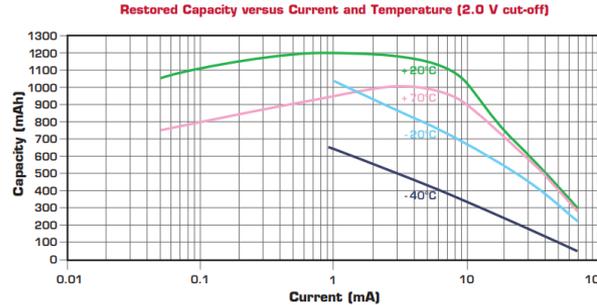
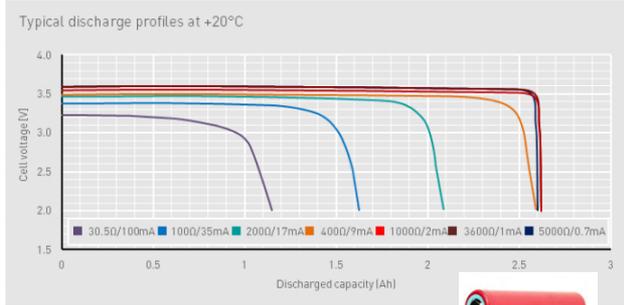
- Leakage current 10-20% of PHV series at rated voltage
- All other specifications the same as PHV
- Maximum rated operating voltage: 3.9 V
- Pulse voltage 5.0 V



	PHV 5F	PHVL 5F
Functional	2W, 5 seconds, 1/day	2W, 5 seconds, 1/day
Leakage current	10uA	1.5uA
Battery capacity taken from 20Ah – D-size cell	1.5Ah	0.2Ah
Battery life expectation	13yrs	15yrs

Smart Metering (LoRa)

- Application: Water meter
- Power source: 1/2AA-size LiSocl2 primary battery
- Power during transmission: 40mA for 5s...daily 1x transmission



Source:
SAFT



Solution #1

AA size LiSocl2 (3.6V/2.6Ah)

With 1x daily transmission 20% extra of total capacity will be consumed by the pulses

Solution #2

AA size LiSocl2 (3.6V/2.6Ah) + 2xsupercaps (2.7V/1F)

Supercaps are sized to take care of the current pulses, but consume ~2uA depending on the balancing => consumes ~10% extra of the total capacity

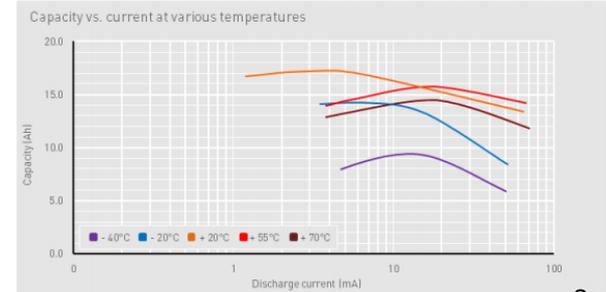
The cost and benefit of both solutions are equivalent if 1x per day transmission pulse

- If more than 1x day is needed or low temperatures present then better using supercaps
- If less than 1x per day is better to use battery only

Smart Metering (GSM)



- Application: Gas meter
- Primary energy source: D-size LiSOCl₂ primary battery
- Power during transmission: 1A for 5s
- Peak current delivery by a secondary power unit: supercap or hybrid supercap as the battery supports 250mA continuous



Source:
SAFT

Solution #1 – for secondary power

PHLV 3.9V/5F pack, no balancing required

Advantage is better performance at cold temperatures + longer lifetime. Disadvantage is the voltage range utilization



Solution #2 – for secondary power

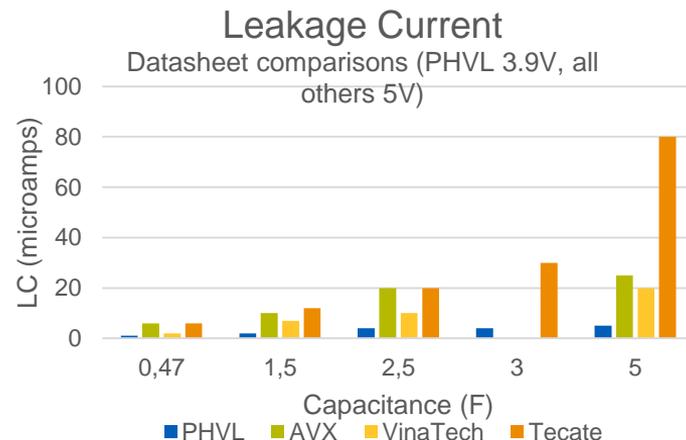
1pc HS0820 (3.8V/30F), no balancing required

Min discharged voltage is over 2.7V => no DCDC converter needed, significantly lower leakage current preserves more battery life



Competition

- Vinatech
 - No special product
 - Leakage current
 - Lower than PHV
 - 2-4x higher than PHVL (although full spec voltage)
- AVX
 - Option in SCM product line, “A” in second to last character
 - SCMQ14C474PRBA1
 - Leakage current
 - 5x higher than PHVL (although full spec voltage)
- Tecate
 - PBL-NB product line
 - Leakage current: 6-10x PHVL



Part Numbers				
Capacitance	Eaton	AVX	Vinatech	Tecate
0.47	PHVL-3R9H474-R	SCMQ14C474PRBA1		
1.5	PHVL-3R9H155-R	SCMR22C155PRBA1		
2.5	PHVL-3R9H255-R	SCMS22C255PRBA1		
3.0	PHVL-3R9H305-R			
5.0	PHVL-3R9H505-R	SCMT22C505PRBA1		
0.47	PHVL-3R9H474-R	SCMQ14C474PRBA0	WEC5R4504QG	PBL-0.47/5.0NB
1.5	PHVL-3R9H155-R	SCMR22C155PRBA0	WEC5R4155QG	PBL-1.65/5.0NB
2.5	PHVL-3R9H255-R	SCMS22C255PRBA0	WEC5R4255QG	PBL-2.5/5.0NB
3.0	PHVL-3R9H305-R			PBL-3.0/5.0NB
5.0	PHVL-3R9H505-R	SCMT22C505PRBA0	WEC5R4505QG	PBL-5.0/5.0NB

Sales Support

- Datasheet
- Product Aid – simplified product highlights and specifications
- Use Case – application example
- Sales note – application and customer targets, key questions
- Video datasheet
- Online Tools
 - [Supercap calculator](#)
 - [Cross reference](#)
- Tech support: ELXTechSupport@eaton.com



Summary

- New product release to target
 - Water, gas meters
 - IoT
 - Battery run devices
 - Long backup devices
- Low leakage current, low self discharge 2 cell pack
- Key specifications
 - 3.9 V to match most battery voltages
 - Leakage current **10-20%** of standard PHV product
- Schedule
 - Target release and sample availability March 2021
 - Distribution stocking April 2021

SMT MOV



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Surface mount MOVs

High surge current withstand metal-oxide varistor in surface mount package

Product Description

Compact metal oxide varistor in 2825 and 4032 EIA surface mount package sizes for high surge current protection

Features & Benefits

- Broadest operating voltage range (up to 510 Vac, 670 Vdc)
- Provides high surge current protection (up to 1200 A)
- SMT pick & place to help reduce assembly cost vs THT
- SMD design can help reduce product height vs thru-hole
- Can achieve UL 1449 4th edition certifications
- Can pair with surface mount brick fuses (6125 & 1025s)

Applications

- Vac COB LED Lighting (driverless LED lighting)
- Smart meter overvoltage protection
- Home appliances
- Industrial equipment
- Test & measurement
- Power supplies



PN Scheme & Spec Table

MOV S xxxx Vyyy

Metal Oxide Varistor
(MOV)

Surface Mount Footprint
(S)

Package Indicator (EIA)
2825 = 2825 4032 = 4032

Working Voltage (V_{RMS})

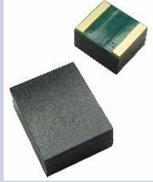
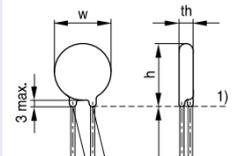
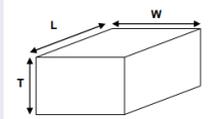
Ex: V060 = 60 V_{RMS}
V300 = 300 V_{RMS}

V120 = 120 V_{RMS}
V420 = 420 V_{RMS}

PN	Vac(V)																													
2825 Package Size	11	14	17	20	25	30	35	40	50	60	75	95	120	130	140	150	180	195	210	230	250	275	300	320	360	390	420	460	485	510
	Surge(A)																													
	150												400																	

PN	Vac(V)																													
4032 Package Size	11	14	17	20	25	30	35	40	50	60	75	95	120	130	140	150	180	195	210	230	250	275	300	320	360	390	420	460	485	510
	Surge(A)																													
	250												1200																	

SMD vs THT

Category	Radial (THT)	Surface Mount (SMD)
Visual		
Dimensional Comparison	<p>250V_{RMS} rated; 1200 A peak current</p>  <p>Dim (mm): 8.5 (W) x 4.5 (th) x <u>11</u> (h)</p>	<p>250V_{RMS} rated; 1200 A peak current</p>  <p>Dim (mm): 8.2 (W) x 10 (L) x <u>4.2</u> (T)</p>
Feature/Benefit Comparison	<ul style="list-style-type: none"> • Without SMT pick and place • Adhesion weakness (can more easily detach with vibration) • Larger footprint/height required 	<ul style="list-style-type: none"> • Allows for SMT pick and place • Better PCB adhesion (vibration withstand) • Compact footprint/lower height

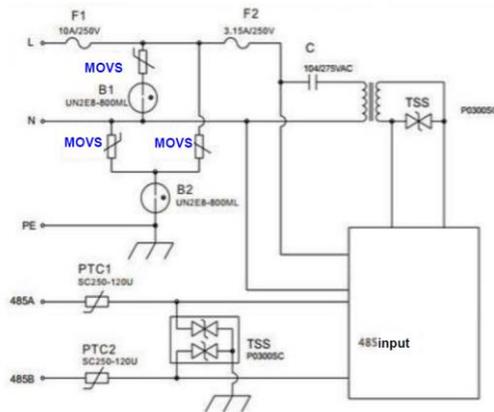
Smart Meter Application

- MOVS provides surge protection for indoor & outdoor meters
- Broad based of existing supercap customers



PN: MOVS4032V485

- Eaton offers UL 1449 (UL File: E340782)
- Up to 1200 A of peak surge current from 220Vac up to 510Vac ratings



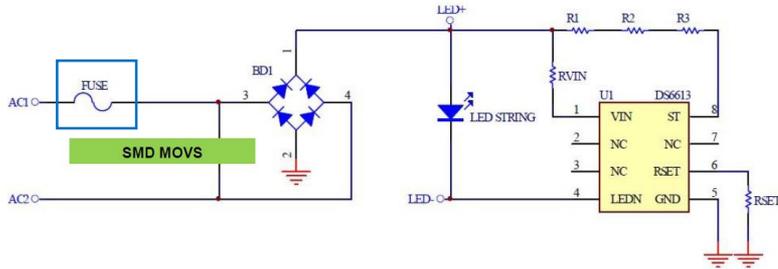
Look to pair with SMD or THT fuses:

- SMD: 1025FA, 1025TD, TCP
- THT: S505SC, S505H, SS-5H, C515, MDL, MDA, MDH

LED Lighting Application

AC COB LED modules

- MOVs offers lower height vs THT
- Match footprint vs surge current requirements
- Vac line voltage protection for up to 480V circuits

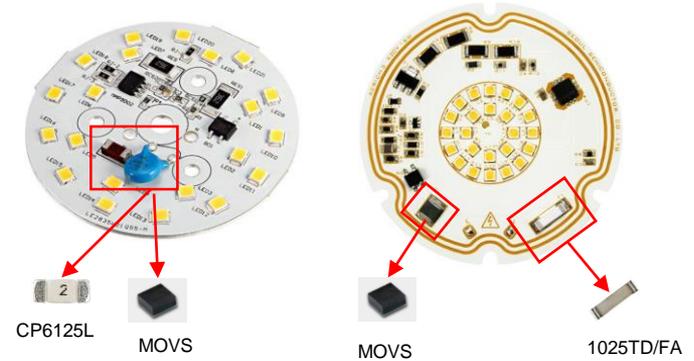


Also pair with SMD Brick Fuses

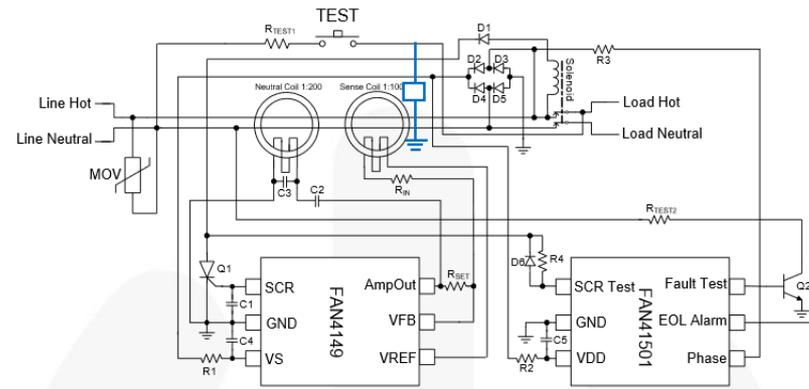
- 125Vac: CP6125L, CB61F, 6125TD
- 250Vac: 1025FA, 1025TD
- 600Vac: TCP

PN	Vac(V)									
	2825 Package Size	120	130	140	150	230	250	275	300	320
Surge(A)										
400										

PN	Vac(V)											
	4032 Package Size	120	130	140	150	230	250	275	300	320	460	485
Surge(A)												
1200												



230 Vac residential/industrial overvoltage protector



Eaton Part Numbers	V _{RMS}	Nominal Varistor Voltage	Clamping Voltage	Peak Current	Footprint
MOVS2825V230	230	360	595 @ 5 A	400 A	2825
MOVS4032V250	250	360	620 @ 5 A	1200 A	4032
MOVS2825V250	250	390	675 @ 5 A	400 A	2825
MOVS4032V250	250	390	650 @ 5 A	1200 A	4032

Cross Reference Table

- Family cross reference table:

Eaton	TDK-EPCOS	Littelfuse	Kemet	Thinking	Bourns	Maida
MOVS2825	CU3225	CH	VP3225	TVB7S	PVxxK3225	SM05
MOVS4032	CU4032	SM7	VP4032	TVB9S	PVxxK4032	SM07

- Full part number cross reference available for each of the competitors above

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