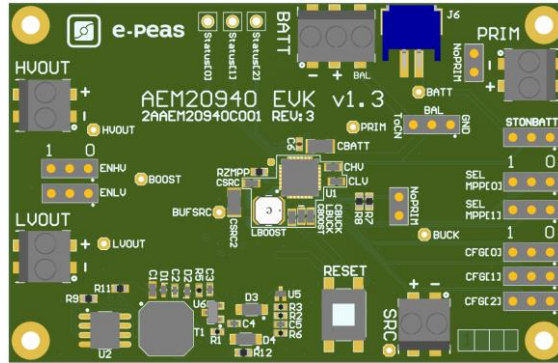


AEM20940

Quick Start Guide EVK



FEATURES

Connectors

- 1 screw connector for the thermo-electric generator
- 1 screw connector + 1 JST connector for the storage element
- 1 screw connector for primary battery
- 1 screw connector for HVOUT LDO output (80mA @ 1.8 – 4.1 V)
- 1 screw connector for LVOUT LDO output (20mA @ 1.2 or 1.8 V)

Configuration

- 2 headers SELMPP[1:0] to define the MPPT ratio linked to the harvester technology
- 3 headers CFG[2:0] to define the storage element protection levels
- 2 headers to enable/disable the internal LDOs
- 2 headers to disable the primary battery feature
- 1 headers to set the dual cell supercapacitor BAL feature
- 1 resistors footprint to use the ZMPP feature (constant impedance)

Size

- 79mm x 49mm
- 4 x M2.5 Mounting holes

SUPPORT PCB

BOM around the AEM20941

Designator	Description	Quantity	Manufacturer	Part Number
CBOOST	Ceramic Cap 22 μ F, 10 V, 20%, X5R 0603	1	Murata	GRM188R61A226ME15D
CBUCK	Ceramic Cap 10 μ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
CHV	Ceramic Cap 10 μ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
CLV	Ceramic Cap 10 μ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
CSRC	Ceramic Cap 10 μ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
LBOOST	Power Inductor 10 μ H - 0,54 A - LPS4012	1	Coilcraft	LPS4012-103MR
	Power Inductor 10 μ H - 0,8 A - 3015	1	Würth	744 040 321 00
LBUCK	Power Inductor 10 μ H - 0,25 A	1	TDK	MLZ1608M100WT
U1	AEM20940 - Symbol QFN28	1		order at sales@e-peas.com or Where to buy
	External cold start circuit ¹	1		more details at support@e-peas.com

*¹ Patented circuit

Footprint & Symbol: Available in the [datasheet](#)





STEP 1: AEM20940 Configuration



SELMPP[1]	SELMPP[0]	Vmpp/Voc
L	L	50%
L	H	55%
H	L	75%
H	H	ZMPP

- **MPPT ratio:** SELMPP[1:0]

- **Storage element voltages protection:** CFG[2:0]

Configuration pins			Storage element threshold voltages			LDOs output voltages		Typical use
CFG[2]	CFG[1]	CFG[0]	V _{OVCH}	V _{CHRDY}	V _{OVDIS}	V _{HV}	V _{LV}	
H	H	H	4.12 V	3.67 V	3.60 V	3.3 V	1.8 V	Li-ion battery
H	H	L	4.12 V	4.04 V	3.60 V	3.3 V	1.8 V	Solid state battery
H	L	H	4.12 V	3.67 V	3.01 V	2.5 V	1.8 V	Li-ion/NiMH battery
H	L	L	2.70 V	2.30 V	2.20 V	1.8 V	1.2 V	Single-cell (super) capacitor
L	H	H	4.50 V	3.67 V	2.80 V	2.5 V	1.8 V	Dual-cell supercapacitor
L	H	L	4.50 V	3.92 V	3.60 V	3.3 V	1.8 V	Dual-cell supercapacitor
L	L	H	3.63 V	3.10 V	2.80 V	2.5 V	1.8 V	LiFePO4 battery

- **BAL option:** Select “ToCn” to use the balancing or “GND” to disable it

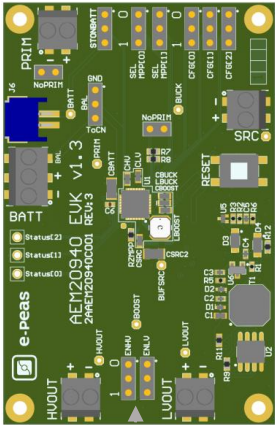
- **PRIM option:** Connect both headers “NoPRIM” to disable the primary battery feature or remove them if a primary battery is connected. Define the lower limit voltage on the primary battery using R7 and R8:

- $RP = R7 + R8$
- $100\text{ k}\Omega \leq RP \leq 500\text{ k}\Omega$
- $R7 = \frac{V_{PRIM,MIN} \cdot RP}{2.2\text{ V}}$
- $R8 = RP - R7$

ENLV	ENHV	LV output	HV output
H	H	Enabled	Enabled
H	L	Enabled	Disabled
L	H	Disabled	Enabled
L	L	Disabled	Disabled

- **ZMPP resistors footprint**

- **LDOs outputs voltages:** ENHV (HVOUT) – ENLV (LVOUT)



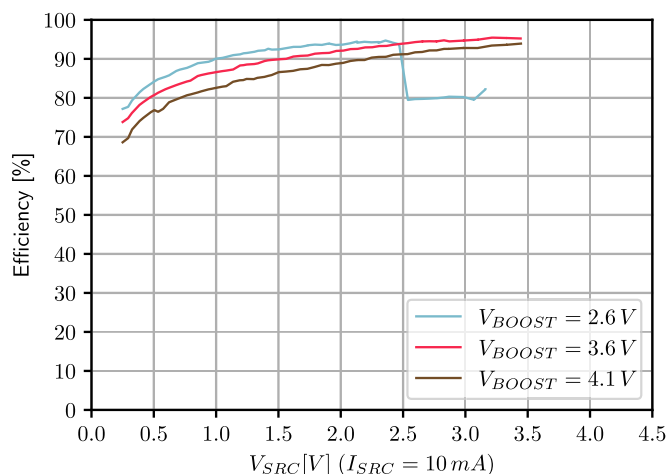
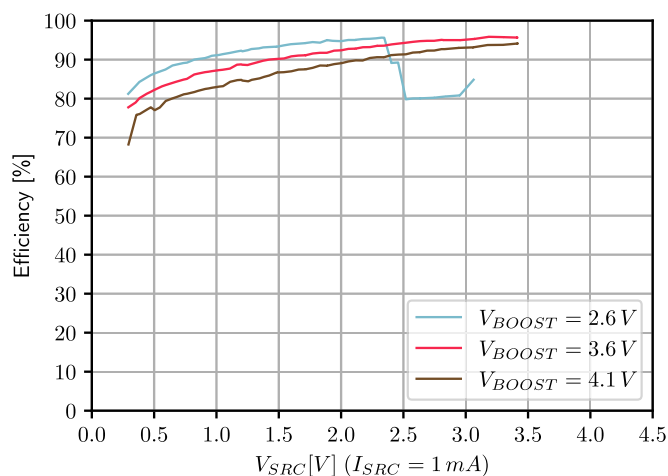
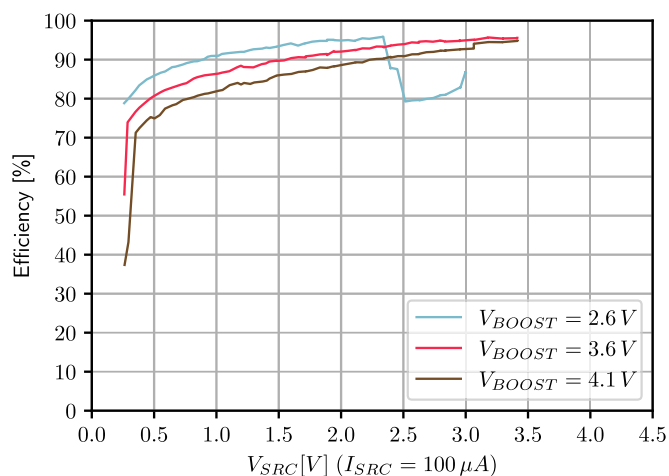


STEP 2: Connect the storage element (and the primary battery)

STEP 3: Connect the Load(s) to HVOUT / LVOUT

STEP 4: Connect the Harvester

Internal Boost efficiency Vs. input voltage 22 μ H LBOOST:



STEP 5: Check the Status

Status signals			
STATUS[2]	Logic output. Asserted when the AEM performs a MPP evaluation.		
STATUS[1]	Logic output. Asserted if the battery voltage falls under Vovdis or if the AEM is taking energy from the primary battery.		
STATUS[0]	Logic output. Asserted when the LDOs can be enabled.		

