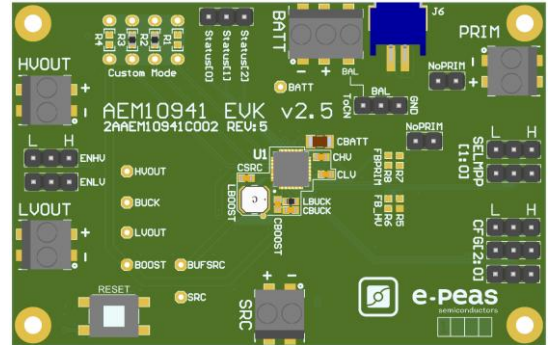


# AEM10941

## Quick Start Guide EVK



### FEATURES

#### Connectors

- 1 screw connector for the photovoltaic cell
- 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
- 6 resistors footprint related to the custom mode (CFG[000])
- 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

#### Size

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

### SUPPORT PCB

#### BOM around the AEM10941

Designator	Description	Quantity	Manufacturer	Part Number
CBOOST	Ceramic Cap 22 $\mu$ F, 10 V, 20%, X5R 0603	1	Murata	GRM188R61A226ME15D
CBUCK	Ceramic Cap 22 $\mu$ F, 10 V, 20%, X5R 0603	1	Murata	GRM188R61A226ME15D
CHV	Ceramic Cap 10 $\mu$ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
CLV	Ceramic Cap 10 $\mu$ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
CSRC	Ceramic Cap 10 $\mu$ F, 10 V, 20%, X5R	1	TDK	C1608X5R1A106M080AC
LBOOST	Power Inductor 10 $\mu$ H - 0,54 A - LPS4012	1	Coilcraft	LPS4012-103MR
	Power Inductor 10 $\mu$ H - 0,8 A - 3015	1	Würth	744 040 321 00
LBUCK	Power Inductor 10 $\mu$ H - 0,25 A	1	TDK	MLZ1608M100WT
U1	AEM10941 - Symbol QFN28	1		order at <a href="mailto:sales@e-peas.com">sales@e-peas.com</a> or <a href="#">Where to buy</a>

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



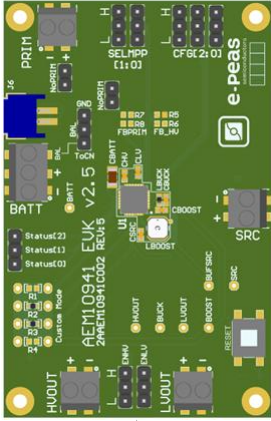


## STEP 1: AEM10941 Configuration



SELMPP[1]	SELMPP[0]	Vmpp/Voc
L	L	70%
L	H	75%
H	L	85%
H	H	90%

- **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 <sub>OVCH</sub>	V <sub>CHRDY</sub>	V <sub>OVDIS</sub>	V <sub>HV</sub>	V <sub>LV</sub>	
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
L	L	L	Custom mode				1.8 V	

- **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

- **LDOs Outputs Voltages:** ENHV (HVOUT) – ENLV (LVOUT)



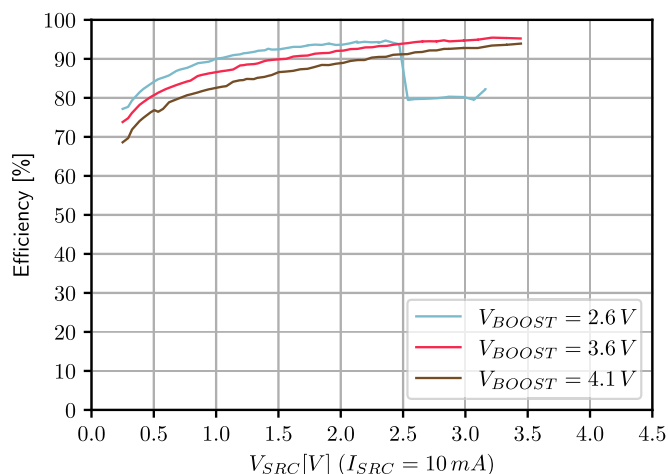
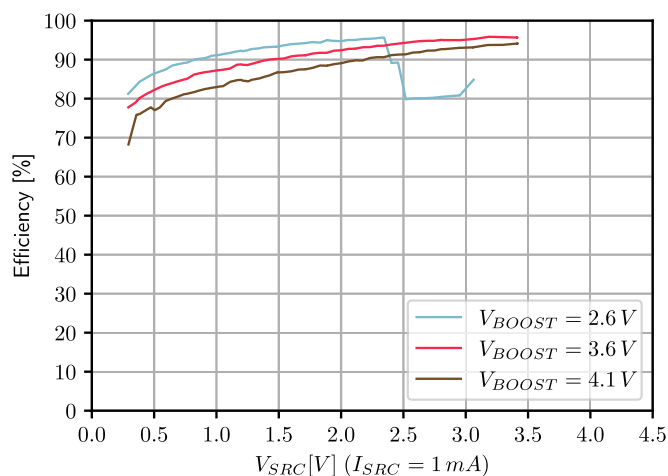
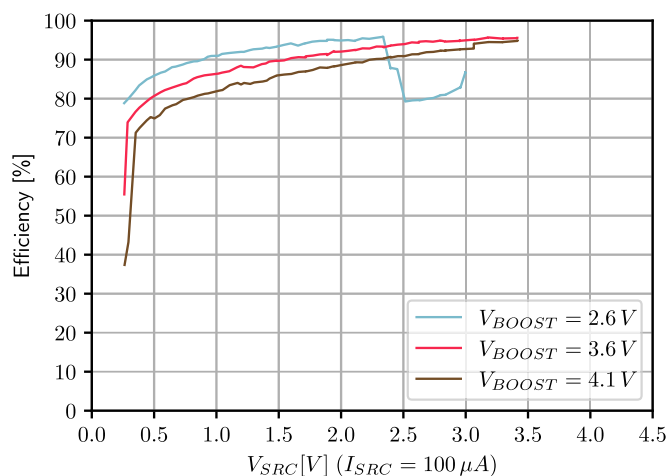


**STEP 2:** Connect the storage element (and the primary battery)

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

**STEP 4:** Connect the Harvester

**Internal Boost efficiency Vs. input voltage 22μH 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.		

