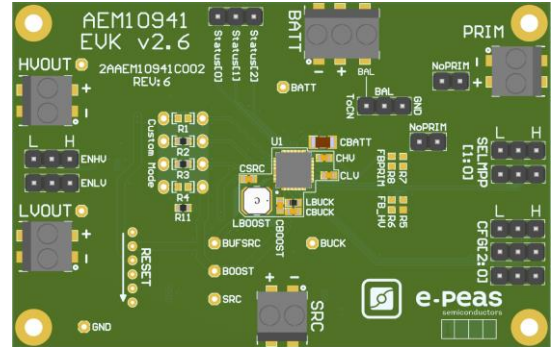


AEM10941

Quick Start Guide EVK



FEATURES

Connectors

- 1 screw connector for the photovoltaic cell
- 1 screw 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[2:0] = LLL)
- 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

- 76mm x 49mm
- 4 x M2.5 Mounting holes

SUPPORT PCB

BOM around the AEM10941

Designator	Description	Quantity	Manufacturer	Part Number
U1	AEM10941	1	e-peas	order at sales@e-peas.com
L _{BOOST}	Power Inductor 22 µH - 0,65 A - LPS4018	1	Coilcraft	LPS4018-223MR
L _{BOOST} (alt.)	Power Inductor 10 µH - 0,90 A - LPS4018	1	Coilcraft	LPS4018-103MR
L _{BOOST} (alt.)	Power Inductor 10 µH - 0,84 A - 3015	1	Würth	744 040 321 00
C _{BOOST}	Ceramic Cap 22 µF, 10 V, 20%, X5R, 0603	1	Murata	GRM188R61A226ME15D
L _{BUCK}	Power Inductor 10 µH - 0,25 A - 0603	1	TDK	MLZ1608M100WT
C _{BUCK}	Ceramic Cap 10 µF, 10 V, 20%, X5R, 0603	1	TDK	C1608X5R1A106M080AC
C _{SRC}	Ceramic Cap 10 µF, 10 V, 20%, X5R, 0603	1	TDK	C1608X5R1A106M080AC
C _{HV}	Ceramic Cap 10 µF, 10 V, 20%, X5R, 0603	1	TDK	C1608X5R1A106M080AC
C _{LV}	Ceramic Cap 10 µF, 10 V, 20%, X5R, 0603	1	TDK	C1608X5R1A106M080AC
C _{BATT}	Ceramic Cap 220 µF, 6.3 V, 20%, X5R, 1206	1	Murata	GRM31CR60J227ME11L

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





STEP 1: Configure the AEM10941



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

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

- **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	
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:

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

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

ENLV	LVOUT
L	Disabled
H	Enabled

ENHV	HVOUT
L	Disabled
H	Enabled

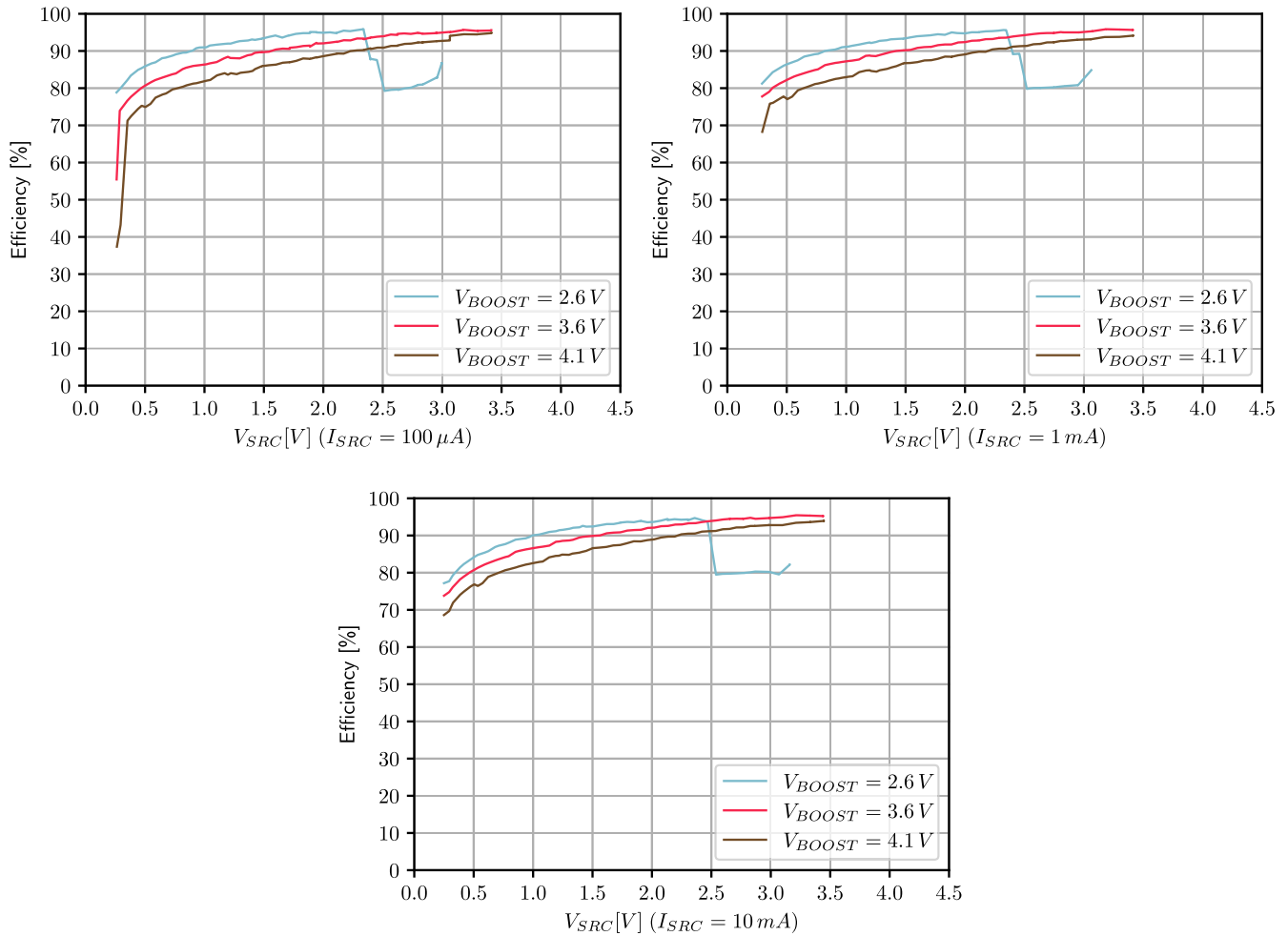


STEP 2: Connect the storage element (and the primary battery)

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

STEP 4: Connect the harvester

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



STEP 5: Check the status

Status pins		
STATUS[2]	19	Logic output. Asserted when the AEM performs a MPP evaluation.
STATUS[1]	20	Logic output. Asserted during 600 ms if the battery voltage falls below V_{OVDIS} or asserted as long as the AEM is taking energy from the primary battery.
STATUS[0]	21	Logic output. Asserted when the LDOs can be enabled.

