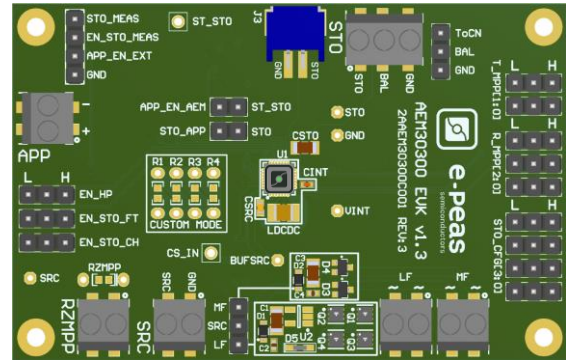


# AEM30300

## Quick Start Guide EVK



### FEATURES

#### Connectors

- 1 screw connector for the DC source + 2 screw connectors for AC input signal.
- 1 screw connector + 1 JST connector for the storage element.
- 1 screw connector for the application circuit.
- 1 screw connector for RZMPP.

#### Configuration

- 3 headers R\_MPP[2:0] to configure the source MPP ratio.
- 2 headers T\_MPP[1:0] to configure the source MPP timings.
- 4 headers STO\_CFG[3:0] to configure the storage element protection levels.
- 4 resistor footprints, R1 to R4, related to the custom mode (STO\_CFG[3:0]=LHHH).
- 1 header to set the dual-cell supercapacitor BAL feature.
- 3 headers to configure the different modes.
- 2 headers to enable the application output supply.
- 1 header to select the rectifier.

#### Size

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

### SUPPORT PCB

#### BOM around the AEM30300

Designator	Description	Quantity	Manufacturer	Part Number
U1	AEM30300 - Symbol QFN 28-pin	1	e-peas	order at sales@e-peas.com
L <sub>DCDC</sub>	Power inductor 10 $\mu$ H - 1.76A	1	Murata	DFE252010F-100M
C <sub>INT</sub>	Ceramic Cap 10 $\mu$ F, 6.3V, 20%, X5R 0402	1	Murata	GRM155R60J106ME15
C <sub>SRC</sub>	Ceramic Cap 22 $\mu$ F, 10V, 20%, X5R 0603	1	Murata	GRM188R61A226ME15D
C <sub>STO</sub> (optional)	Ceramic Cap 150 $\mu$ F, 6.3V, 20%, X5R 1206	1	Murata	GRM31CR60J157ME11L

**Footprint & Symbol:** Information available in the datasheet.





## STEP 1: Configure the AEM30300



- **Source voltage regulation:** R\_MPP[2:0] and T\_MPP[1:0]

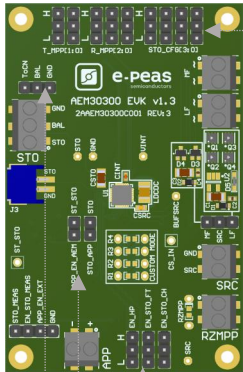
Configuration pins			MPPT ratio
R_MPP[2:0]			$V_{MPP} / V_{OC}$
L	L	L	35%
L	L	H	50%
L	H	L	60%
L	H	H	65%
H	L	L	70%
H	L	H	75%
H	H	L	80%
H	H	H	ZMPP

Configuration pins		MPPT timing	
T_MPP[1:0]		Sampling duration	Sampling period
L	L	3.82 ms	18.28 ms
L	H	5.19 ms	280 ms
H	L	71.6 ms	1.12 s
H	H	1.12 s	71.7 s

- **Storage element voltages protection:** STO\_CFG[3:0]

Configuration pins				Storage element threshold voltages			Typical use
STO_CFG[3:0]				V <sub>OVDIS</sub>	V <sub>CHRDY</sub>	V <sub>OVCH</sub>	
L	L	L	L	3.00 V	3.50 V	4.05 V	LiCoO <sub>2</sub> battery, Li-Po battery, Lithium Titanate (3.8 V) battery (long life).
L	L	L	H	2.80 V	3.10 V	3.60 V	LiFePO <sub>4</sub> battery, Lithium capacitor (LiC).
L	L	H	L	1.85 V	2.40 V	2.70 V	Dual-cell NiMH battery, Lithium-Titanate (2.4V) battery.
L	L	H	H	0.20 V	1.00 V	4.65 V	Dual-cell supercapacitor.
L	H	L	L	0.20 V	1.00 V	2.60 V	Single-cell supercapacitor.
L	H	L	H	1.00 V	1.20 V	2.95 V	Single-cell supercapacitor.
L	H	H	L	1.85 V	2.30 V	2.60 V	Lithium-Titanate battery (2.4V).
L	H	H	H	Custom Mode (single-cell NiMH battery, LiC, etc.)			
H	L	L	L	1.10 V	1.25 V	1.50 V	Ni-Cd single-cell battery.
H	L	L	H	2.20 V	2.50 V	3.00 V	Ni-Cd dual-cell battery.
H	L	H	L	1.45 V	2.00 V	4.65 V	Dual-cell supercapacitor.
H	L	H	H	1.00 V	1.20 V	2.60 V	Single-cell supercapacitor.
H	H	L	L	2.00 V	2.30 V	2.60 V	Solid State battery.
H	H	L	H	3.00 V	3.50 V	4.35 V	LiCoO <sub>2</sub> battery, Li-Po battery, Lithium Titanate (3.8 V) battery.
H	H	H	L	2.60 V	2.70 V	4.00 V	Tadiran TLI.
H	H	H	H	2.60 V	3.50 V	3.90 V	Tadiran HLC.

- **BAL option:** Select “ToCn” to use the balancing or “GND” to disable it.
- **Configuration mode:** Jumper to H to enable or to L to disable the features:
  - EN\_HP: High power mode enabling.
  - EN\_STO\_FT: Source to storage element feed-through enabling.
  - EN\_STO\_CH: Storage element charge enabling.
- **External output supply:** Place both jumpers connecting STO\_APP to STO and APP\_EN\_AEM to ST\_STO to enable the APP output supply.



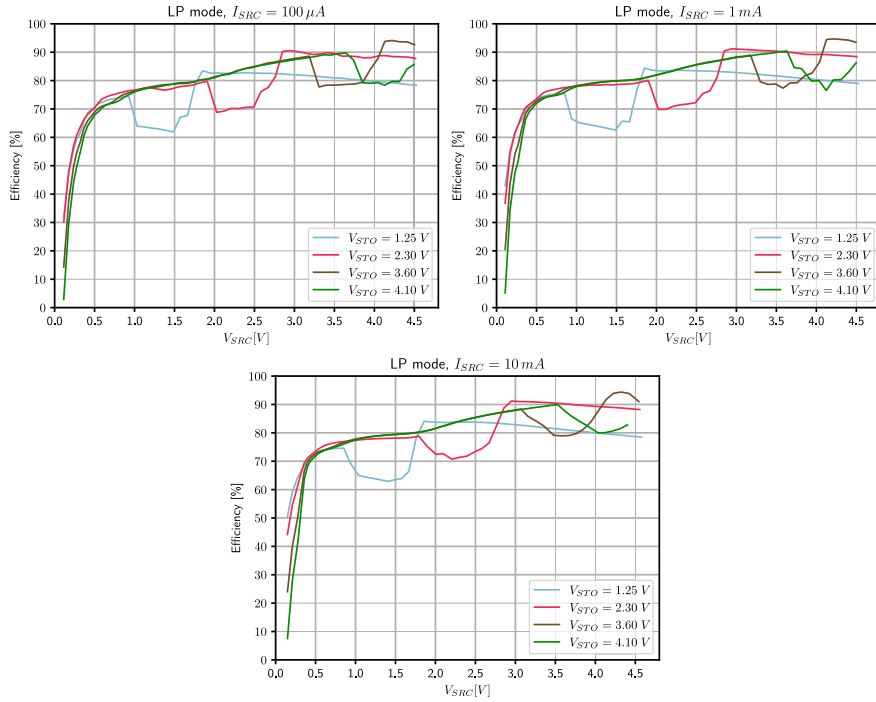


## STEP 2: Connect the storage element

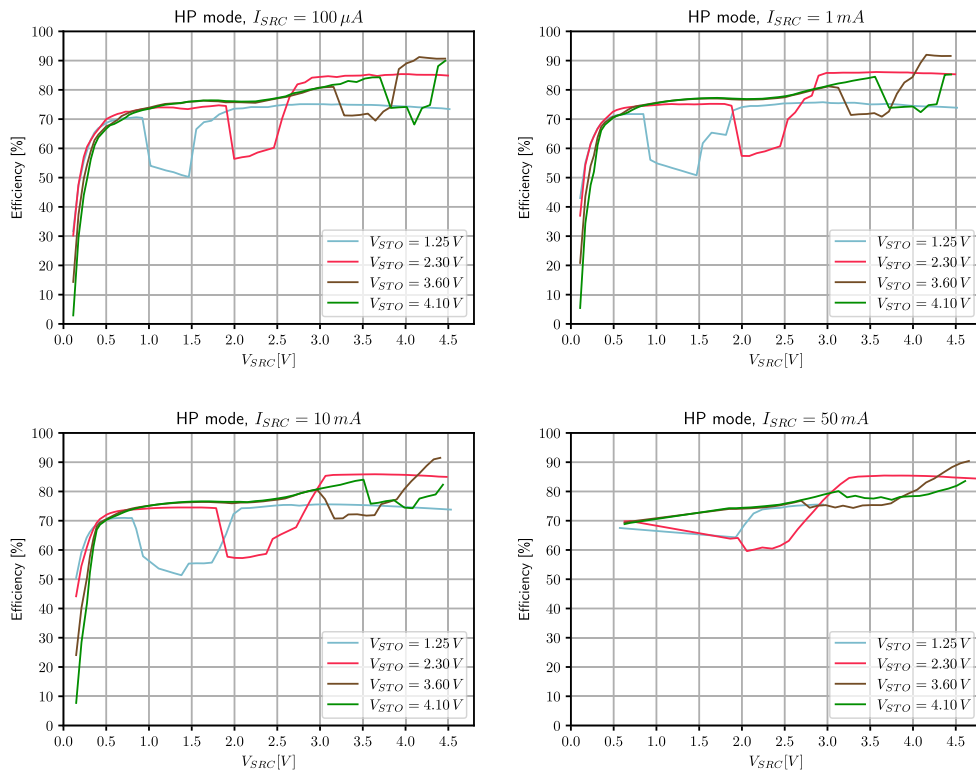
## STEP 3: Connect the harvester



### Internal boost efficiency Vs. input voltage in Low Power mode:



### Internal boost efficiency Vs. input voltage in High Power mode:



## STEP 4: Check the status

Status Pins				
ST_STO	26	Logic Output	HIGH: $V_{STO}$ LOW: $V_{STO}$	HIGH when the storage device voltage $V_{STO}$ rises above $V_{CHRDY}$ threshold. LOW when $V_{STO}$ drops below the $V_{QVDIS}$ threshold.

