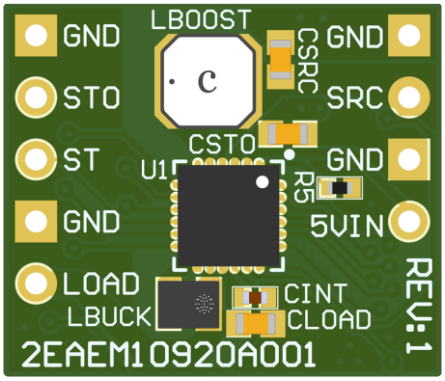
AEM10920
Quick Start Guide mini EVK



FEATURES

Headers

- 1 header for the DC source.
- 1 header for the storage element.
- 1 header for the load / application circuit.
- 1 header for the 5 V DC power input.
- 1 header for ST_STO.

Configuration

- 3 solder bridges R_MPP[2:0] to configure the source MPP ratio.
- 2 solder bridges T_MPP[1:0] to configure the source MPP timings.
- 2 solder bridges STO_CFG[1:0] to define the storage element protection levels.
- 2 solder bridges LOAD_CFG[1:0] to configure the application circuit regulated voltage.
- 1 resistor to configure the 5 V charger maximum current (R5).
- 1 solder bridge to configure the boost converter timings.
- 1 solder bridge to enable the shipping mode.
- 1 solder bridge to disable the custom mode.

Reset

- To reset the AEM, short nodes to GND following the sequence: SRC, VINT, LOAD.

Size

- 18mm x 16mm.

SUPPORT PCB

BOM around the AEM10920:

Designator		Description	Quantity	Manufacturer	Part Number
Mandatory	U1	AEM10920	1	e-peas	order at sales@e-peas.com
	CSRC	Ceramic Capacitor 22 µF, 10 V, 20%, X5R 0603	1	Murata	GRM188R61A226ME15D
	LBOOST	Power Inductor 33 µH, 0.68 A, LPS4018	1	Coilcraft	LPS4018-333MRB
	CINT	Ceramic Capacitor 10 µF, 6.3 V, 20%, X5R, 0402	1	Murata	GRM155R60J106ME44D
Optional	CSTO	Ceramic Capacitor 47 µF 6.3 V, 20%, X5R, 0603	1	Murata	GRM188R60J476ME15D
	R_5VIMAX	Resistor (to be defined)	1	To be defined	
	LBUCK	Power Inductor 10 µH TDK VLS-CX-1	1	TDK	VLS252012CX-100M-1
	CLOAD	Ceramic Capacitor 22 µF, 10 V, 20%, X5R, 0603	1	Murata	GRM188R61A226ME15D
	R1	Resistors (to be defined)	1	To be defined	
	R2		1		
	R3		1		
	R4		1		

Footprint & Symbol: information available in the datasheet.

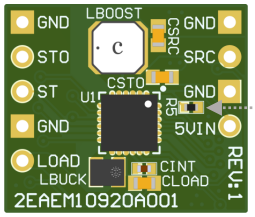
STEP 1: Configure the AEM10920

- **SRC MPP ratio and timings:** R_MPP[2:0] and T_MPP[1:0] (seen as HIGH if left floating)

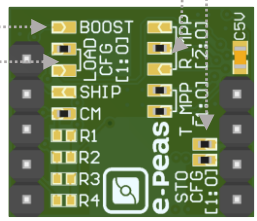
Configuration			Function
R_MPP[2:0]			V_{MPP} / V_{OC}
L	L	L	35%
L	L	H	50%
L	H	L	65%
L	H	H	70%
H	L	L	75%
H	L	H	80%
H	H	L	85%
H	H	H	90%

Configuration		Function	
T_MPP[1:0]		$T_{MPPT,PERIOD}$ [s]	$T_{MPPT,SAMPLING}$ [s]
L	L	15	0.25
L	H	15	0.50
H	L	25	0.25
H	H	25	0.50

Top view



Bottom view



- **Storage element threshold voltages:** STO_CFG[1:0] (seen as HIGH if left floating)

Configuration pins		Overdischarge voltage [V]	Charge ready voltage [V]	Overcharge voltage [V]	Battery Type
STO_CFG[1:0]		V_{OVDIS}	V_{CHRDY}	V_{OVCH}	
L	L	2.50	2.55	3.80	Lithium-ion Super Capacitor (LiC)
L	H	3.00	3.20	4.12	Lithium-ion battery
H	L	3.00	3.20	4.35	LiPo battery
H	H	3.50	3.55	3.90	Li-ion battery (ultra long life)

- **Load configuration:** LOAD_CFG[1:0] (seen as HIGH if left floating)

Configuration pins		LOAD voltage [V]
LOAD_CFG[1:0]		V_{LOAD}
L	L	OFF
L	H	2.2
H	L	2.5
H	H	2.8

- **Boost timing configuration:** BOOST_CFG (seen as HIGH if left floating)

Configuration pin	Function	
BOOST_CFG	Timing multiplication factor	Minimum L_{BOOST} inductance [µH]
L	x1	4
H	x3	12

- **5V charger configuration:**

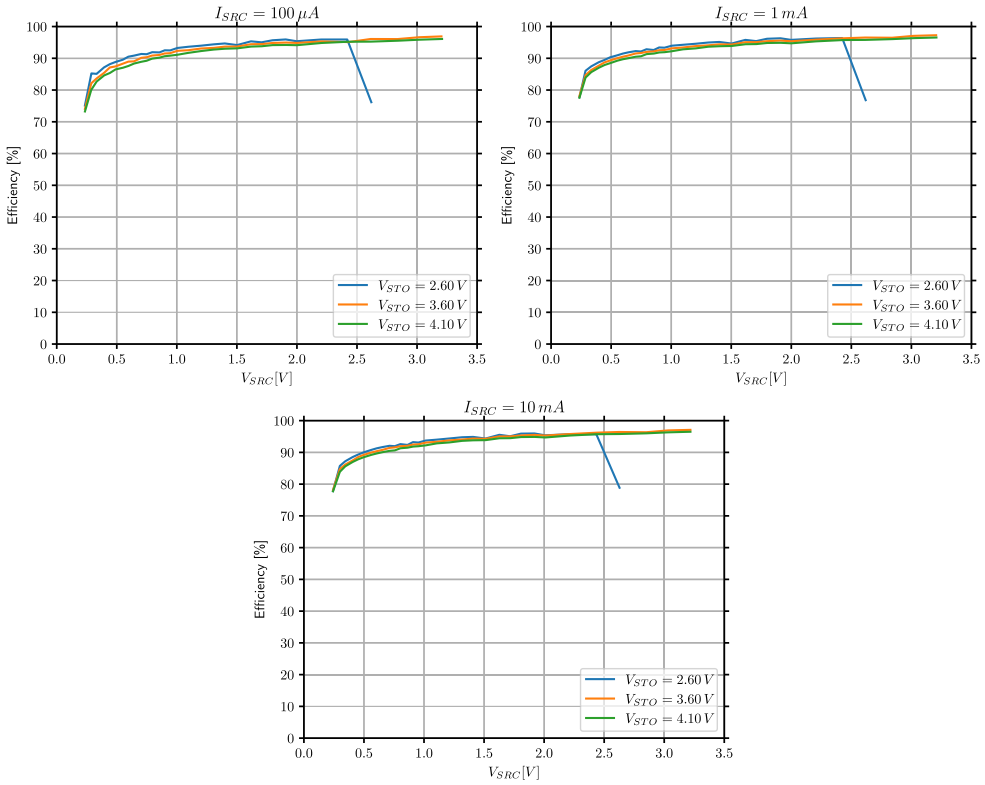
Resistor [Ω]	Maximum Charging Current [mA]
R_{5V_IMAX}	$I_{5V,CC}$
370	135.0
680	73.5
1500	33.3
3700	13.5

STEP 2: Connect a storage element with a voltage higher than 2.4 V

STEP 3: Connect the source or the 5 V power input

STEP 4: Connect the application circuit

- **Boost efficiency** (Lboost = 33 µH Coilcraft LPS4018-333MRB; boost timing x3) :



- **Buck efficiency** (Lbuck = 10 µH TDK VLS252012CX-100M-1) :