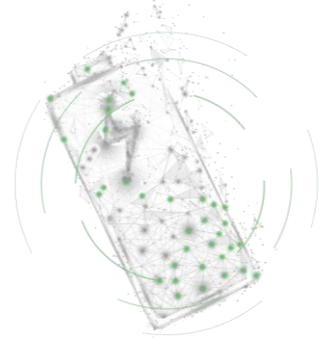




AEM11900

Quick Start Guide EVK



FEATURES

Connectors

- 1 screw connector for the DC source
- 1 screw connector for the storage element
- 1 screw connector for the application circuit

Configuration

- 1 header SRC_MODE to configure the source voltage regulation mode
- 5 headers SRC_CFG[4:0] to configure the source voltage regulation
- 2 headers STO_CFG[1:0] to configure the storage element protection thresholds
- 2 solder bridges to enable/disable the custom mode
- 4 resistor footprints to configure the custom mode
- 2 solder bridges to select the capacitors connected to the source
- 1 header BOOST_CFG to configure the boost converter timings
- 1 header SHIP_MODE to enable/disable the shipping mode
- 1 header SHIP_MODE_CFG to configure the shipping mode
- 2 headers, APP_EN_AEM and STO_APP, to enable the application supply output
- 1 header, above the APP screw connector, to interface the application

Reset

- 2 RESET pads (short each pad to GND from left to right to reset the AEM)

Size

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

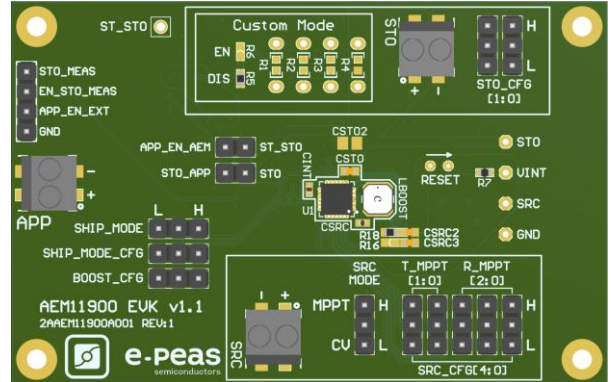
SUPPORT PCB

BOM around the AEM11900:

Designator	Description	Quantity	Manufacturer	Part Number
U1	AEM11900 QFN24	1	e-peas	Order at sales@e-peas.com
LBOOST	Power inductor 33 μ H, 0.68 A, LPS4018	1	Coilcraft	LPS4018-333MRB
CINT	Ceramic Cap 10 μ F, 6.3 V, 20 %, X5R, 0402	1	Murata	GRM155R60J106ME44D
CSRC ¹	Ceramic Cap 4.7 μ F, 10 V, 20 %, X5R, 0402	1	TDK	C1005X5R1A475M050BC
CSRC2 ¹	Ceramic Cap 4.7 μ F, 25 V, 10 %, X5R, 0603	1	Murata	GRT188R61E475KE13D
CSRC3 ¹	Ceramic Cap 10 μ F, 10 V, 20 %, X5R, 0603	1	Murata	GRM188R61A106ME69D
CSTO	Ceramic Cap 47 μ F, 6.3 V, 20 %, X5R, 0603	1	Murata	GRM188R60J476ME15D

1. CSRC is the default source capacitor, with CSRC2 mounted and connected in parallel by default. CSRC3 is mounted but left unconnected.

Footprint & Symbol: information available in the datasheet





STEP 1: Configure the AEM11900

Source voltage regulation:

SRC_MODE and SRC_CFG[4:0] (seen as HIGH if left floating)

SRC_MODE = L (Constant Voltage):

Configuration pins					Voltage [V]
SRC_CFG[4:0]					V _{SRC,REG}
L	L	L	L	L	0.25
L	L	L	L	H	0.30
L	L	L	H	L	0.35
L	L	L	H	H	0.41
L	L	H	L	L	0.45
L	L	H	L	H	0.50
L	L	H	H	L	0.56
L	L	H	H	H	0.60
L	H	L	L	L	0.65
L	H	L	L	H	0.71
L	H	L	H	L	0.75
L	H	L	H	H	0.80
L	H	H	L	L	0.86
L	H	H	L	H	0.90
L	H	H	H	L	0.95
L	H	H	H	H	1.01

SRC_MODE = H (MPPT):

Configuration			Function
SRC_CFG[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	
SRC_CFG[4:3]		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

Storage element protection thresholds: STO_CFG[1:0] (seen as HIGH if left floating)

Configuration pins		Overdischarge voltage [V]	Charge ready voltage [V]	Overcharge voltage [V]	Storage element type
STO_CFG[1:0]		V _{OVDIS}	V _{CHRDY}	V _{OVC}	
L	L	2.51	2.61	3.79	Lithium-ion Super Capacitor (LIC)
L	H	3.00	3.21	4.13	Lithium-ion battery
H	L	3.00	3.21	4.35	LiPo battery
H	H	3.51	3.60	3.90	Li-ion battery (ultra long life)

Custom mode: mount R1 to R4 resistors and put a 0 Ω resistor (or solder bridge) in EN position to use the custom mode, or in DIS position to disable it

Boost timings configuration: BOOST_CFG (seen as HIGH if left floating)

Configuration pin	Function		
	Timing multiplier factor	Minimum L _{BOOST} [μH]	Recommended ¹ L _{BOOST} [μH]
L	x1	3.3	10
H	x3	9.9	33

1. Recommended for best efficiency/current capability trade-off.

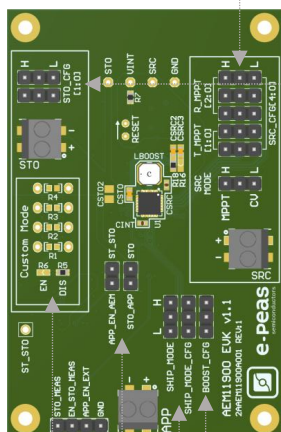
Shipping mode: SHIP_MODE and SHIP_MODE_CFG

The shipping mode feature can be enabled by setting the SHIP_MODE pin HIGH or disabled by setting it LOW. If SHIP_MODE pin is left floating, the feature state is defined by SHIP_MODE_CFG pin (seen HIGH if left floating).

SHIP_MODE_CFG pin state	SHIP_MODE pin state	Shipping Mode Functionality
LOW	LOW	Disabled
	Floating	Enabled
	HIGH	Enabled
HIGH	LOW	Disabled
	Floating	Disabled
	HIGH	Enabled

When the shipping mode is enabled, the boost converter is disabled, avoiding the charge of the storage element.

External output supply: Place both jumpers connecting STO_APP to STO and APP_EN_AEM to ST_STO to enable the APP output supply. Leave these headers floating if not used.





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

STEP 3: Connect the application circuit

STEP 4: Connect the source

- **Boost efficiency** (LBOOST = 33 μ H Coilcraft LPS4018-333MRB; boost timing x3) :

