Evaluation Board : AEM30940 RF

Please follow the next steps when using the AEM30940 RF evaluation board

Step 1 : MPP configuration (DS page 12)

Step 2 : System configuration (DS page 11)

Step 3 : LDO outputs configuration (DS page 9)

Step 4 : -

Step 5 : Balun for dual-cells supercapacitor (DS page 10)

Step 6 : Primary battery configuration (DS page 12)

Step 7 : Connect the storage element

Step 8 : Connect the primary battery

Step 9 : Connect the loads

Step 10 : Connect the source

Step 11 : Status

For more information : support@e-peas.com

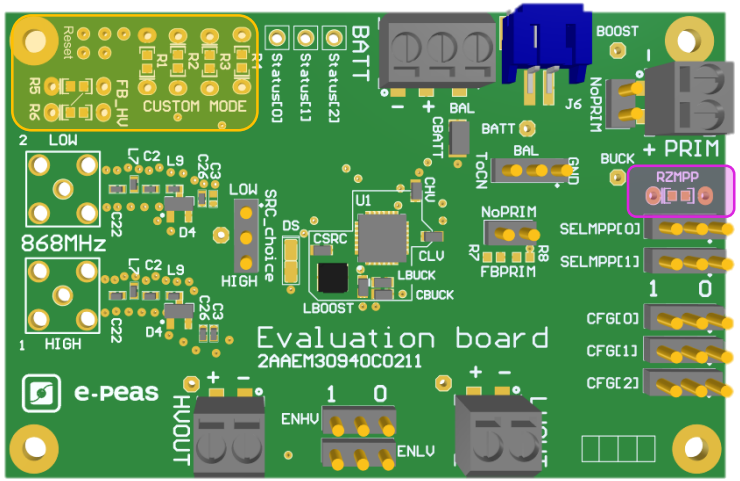
Evaluation Board : AEM30940 RF

1. MPPT configuration

SELMPP1-0	MPPT Ratio (%)
0-0	50
0-1	65
1-0	80
1-1	ZMPP feature

Recommanded value for our matching network

Do not leave floating jumpers



1. MPPT configuration (DS page 12)
2. System configuration (DS page 11)

2.

CFG2-1-0	Storage element type
H-H-H	Li-ion battery
H-H-L	Solid state Battery
H-L-H	Li-ion / NiMH battery
H-L-L	Single cell supercapacitor
L-H-H	Dual cell supercapacitor
L-H-L	Dual cell supercapacitor
L-L-H	LifePo4
L-L-L	Custom mode

Please see DS page 11 « Custom mode »
and use the R1 – R6 resistors

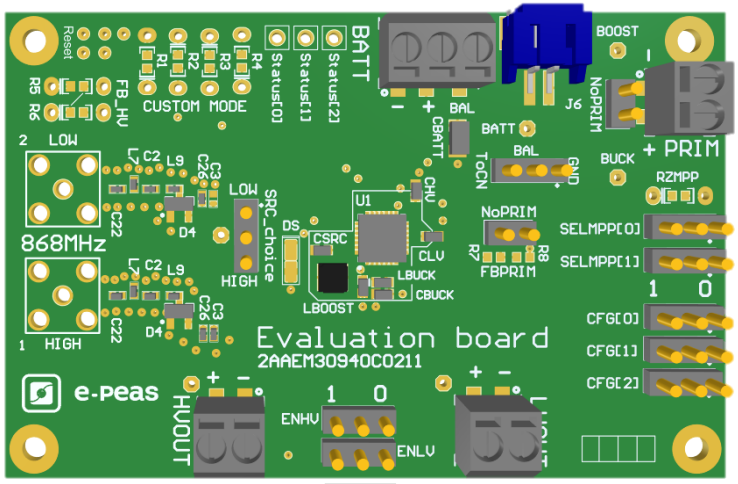
For more information : support@e-peas.com

Evaluation Board : AEM30940 RF

3.

ENLV	ENHV	LVOUT	HVOUT
1	1	Enabled	Enabled
1	0	Enabled	Disabled
0	1	Disabled	Enabled
0	0	Disabled	Disabled

Do not leave floating jumpers



3. LDO outputs configuration (DS page 9)

4. ZMPPT configuration

➔ Available but not used

For more information : support@e-peas.com

Evaluation Board : AEM30940 RF

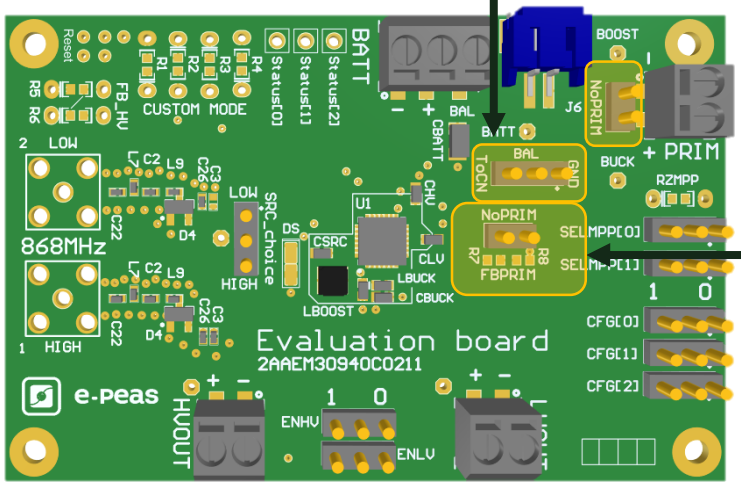
5.

If dual-cell supercapacitor :
BAL connected to the node between the supercapacitors
BAL = ToCN

If not :
BAL = GND

Do not leave floating jumpers

5. Balun for dual-cells supercapacitor (DS page 10)



6. Primary battery configuration (DS page 12)

6.

Connect the jumpers « *NoPRIM* » if no primary battery else

100 kΩ ≤ RP = R7+R8 ≤ 500 kΩ
VPRIM_MIN = minimum voltage on PRIM
R7 = $\left(\frac{VPRIM\_MIN}{4} * RP\right)$ / 2.2 V
R8 = RP – R7

For more information : support@e-peas.com

Evaluation Board : AEM30940 RF

e-peas semiconductors

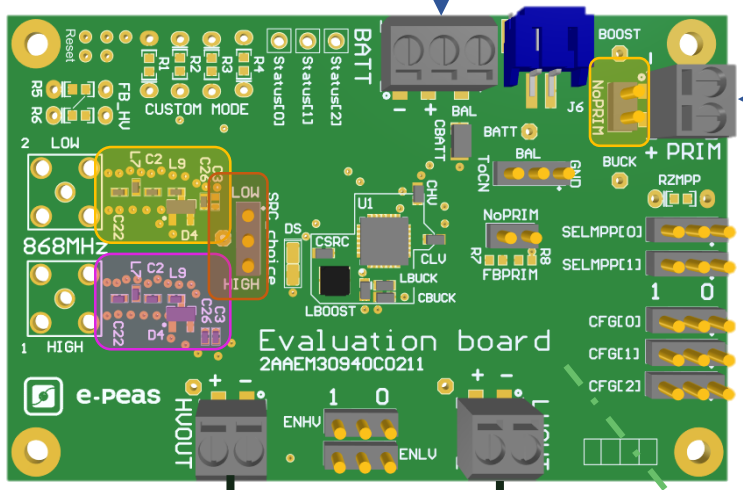
For dual-cells supercapacitors, use the BAL connexion and connect the BAL jumper to "ToCN"; Else connect the BAL jumper to "GND".

7. Storage Element

8. Primary Battery

If no primary battery, please connect the jumpers "NoPRIM"

10. Antenna



HVOUT LVOUT

Circuit **9.**

2AAEM30940C0211 = Dedicated frequency : 863 – 868 MHz
2AAEM30940C0310 = Dedicated frequency : 915 – 921 MHz

For more information : support@e-peas.com

Evaluation Board : AEM30940 RF

e-peas semiconductors

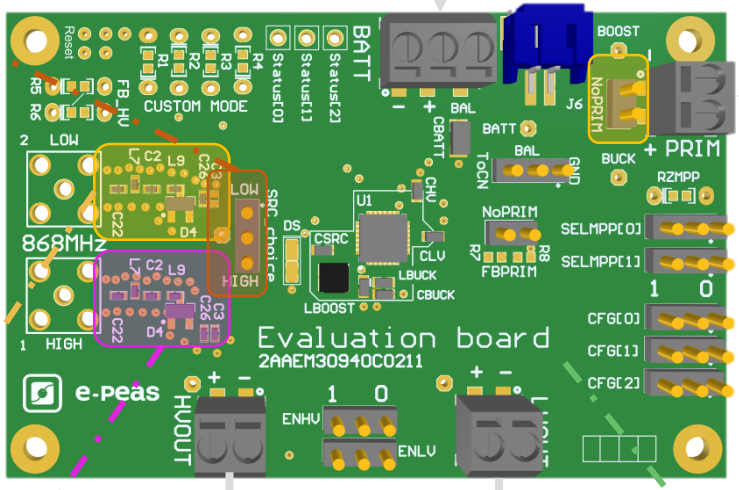
For dual-cells supercapacitors, use the BAL connexion and connect the BAL jumper to "ToCN"; Else connect the BAL jumper to "GND".

7. Storage Element

Jumper to select input range

8. Primary Battery

10. Antenna



If no primary battery, please connect the jumpers "NoPRIM"

HVOUT LVOUT

Circuit **9.**

Matching network with rectifier for input power below -5 dBm

Matching network with rectifier for input power between -5 dBm and +3 dBm

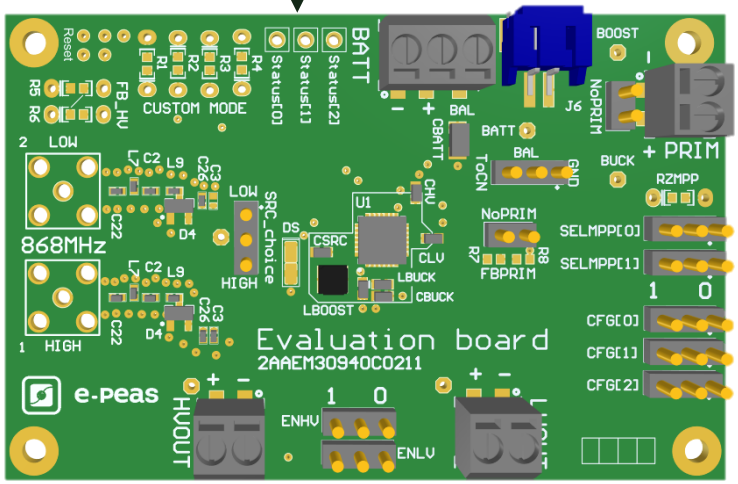
Matching can be optimized for a defined input power range.

2AAEM30940C0211 = Dedicated frequency : 863 – 868 MHz
2AAEM30940C0310 = Dedicated frequency : 915 – 921 MHz

For more information : support@e-peas.com

Evaluation Board : AEM30940 RF

11. AEM Status



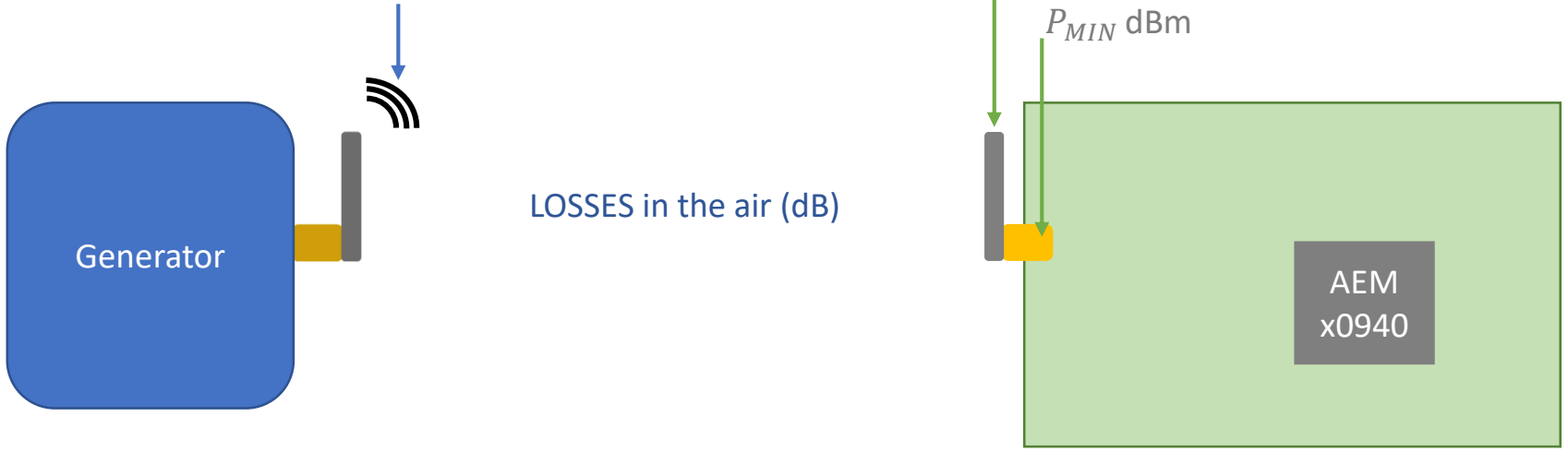
STATUS0 = Asserted when the LDOs can be enabled
STATUS1 = Asserted if the battery voltage falls under Vovdis
STATUS2 = Asserted when the AEM performs the MPP tracking

Evaluation Board : AEM30940 RF

RF energy harvesting : Losses

Power required at the antenna ≥ P_{MIN} dBm * $\eta_{ANTENNA}$

Emitted power (dBm) = [(P_{MIN} dBm * $\eta_{ANTENNA}$) + LOSSES] * $\eta_{ANTENNA}$



LOSSES in the air (dB) :

$$FSPL = 20\log_{10}(d) + 20\log_{10}(f) + 20\log_{10}\left(\frac{4\pi}{c}\right) - G_t - G_r$$

With

d = the distance in meter
f = the frequency in Hz
Gt = the gain at the antenna emitter
Gr = the gain at the antenna receiver

Visit us on

www.e-peas.com

Or contact us at

support@e-peas.com sales@e-peas.com