

Evaluation Board : AEM40940



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Please follow the next steps when using the AEM40940 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 :** ZMPPT configuration (if used) (DS page 12)
- 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

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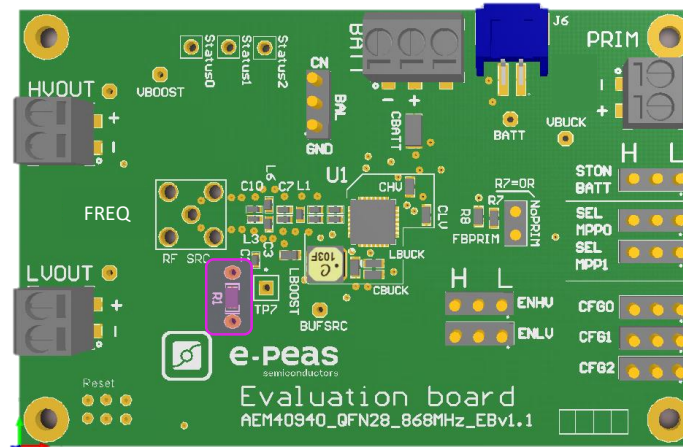
1.

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

Do not leave floating jumpers

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 Do not use



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

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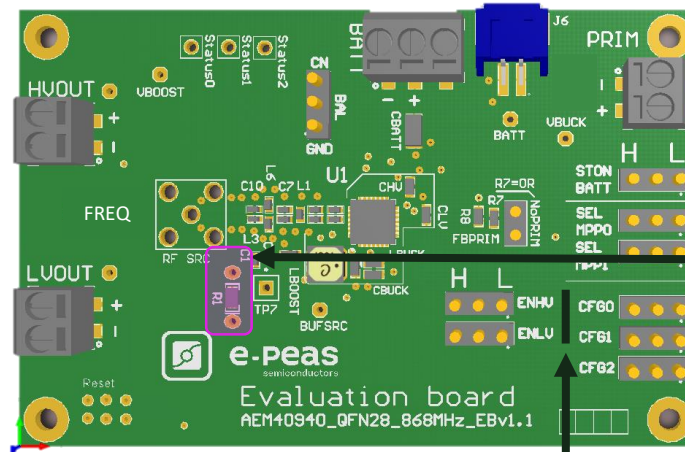


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3.

Do not leave floating jumpers

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



4. ZMPPT configuration
(DS page 12)

4.

Connect a resistor on RZMPPT if ZMPP feature used
Else **do not connect** any resistor



Please see DS page 12

3. LDO outputs configuration
(DS page 9)

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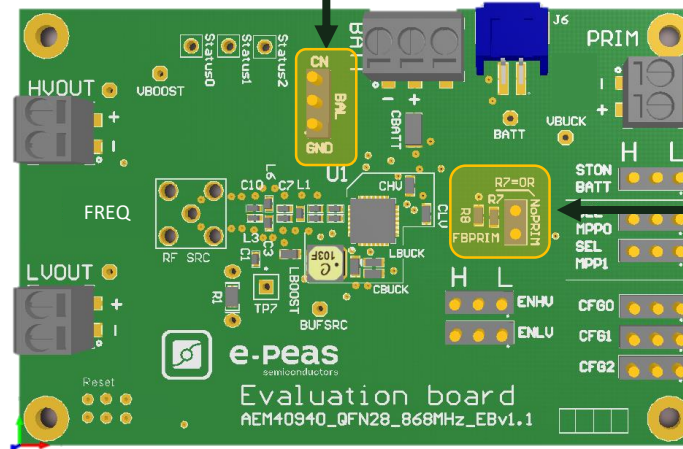
5.

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

$$100 \text{ k}\Omega \leq RP = R7+R8 \leq 500 \text{ k}\Omega$$

V_{PRIM_MIN} = minimum voltage on PRIM

$$R7 = \left(\frac{V_{PRIM_MIN}}{4} * RP \right) / 2.2 \text{ V}$$
$$R8 = RP - R7$$

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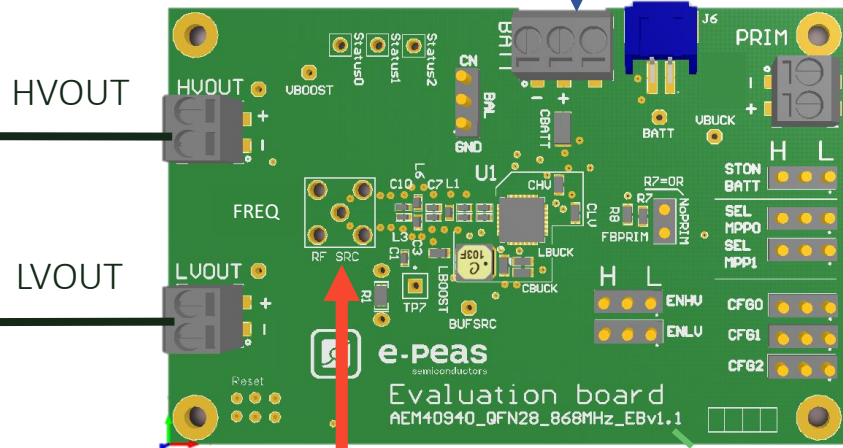


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*For dual-cells supercapacitors, use the BAL connexion and connect the BAL jumper to "ToCN";
Else connect the BAL jumper to "GND".*

7. Storage Element

9. Circuit



8. Primary Battery

If no primary battery, please connect PRIM + to PRIM -

10. Antenna 50Ω



Internal rectifier is designed for the 900 MHz band and for input power below -10dBm

2AAEM40940C0211 = Dedicated frequency : 863 – 868 MHz
2AAEM40940C0311 = Dedicated frequency : 915 – 921 MHz
AEM40940_QFN28_2450MHz_V1.0= Dedicated frequency : 2400 – 2500 MHz

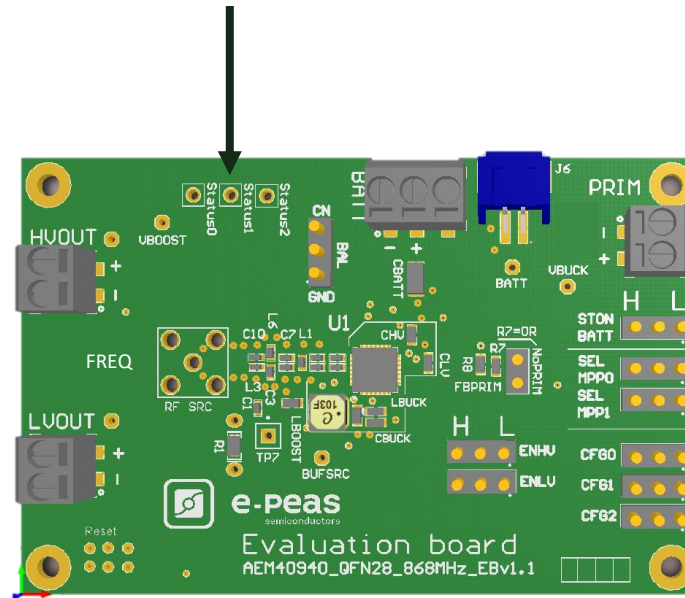
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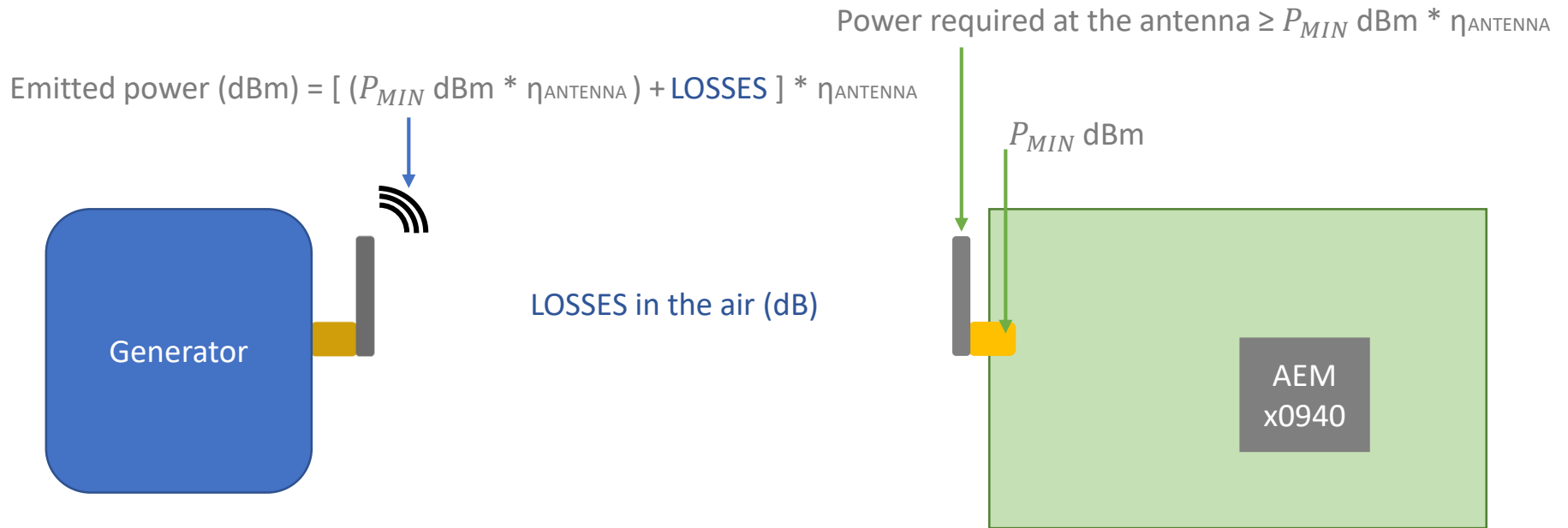
11. AEM Status



- STATUS0** = Asserted when the LDOs can be enabled
- STATUS1** = Asserted if the battery voltage falls under V_{ovdis}
- STATUS2** = Asserted when the AEM performs the MPP tracking

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RF energy harvesting : Losses



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
- G_t = the gain at the antenna emitter
- G_r = the gain at the antenna receiver

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