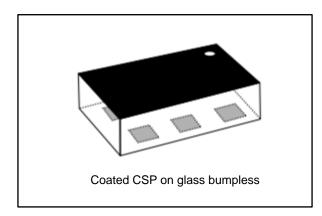
life.augmented

BALF-ATM-01E3

50 ohms / matched to ATSAMR21E18 balun transformer, with integrated harmonic filter

Datasheet - production data



Features

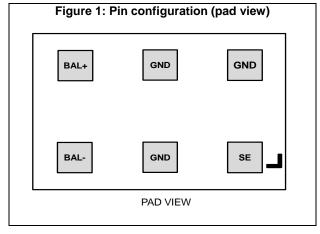
- 2.4 2.5 GHz balun with integrated matching network
- Matching optimized for following chipsets: ATSAMR21E18
- Low insertion loss
- Low amplitude imbalance
- Low phase imbalance
- Coated CSP on glass bumpless
- Small footprint 2.5 mm²

Benefits

- Very low profile
- High RF performance
- PCB space saving versus discrete solution
- BOM count reduction
- Efficient manufacturability

Description

The BALF-ATM-01E3 from STMicroelectronics is an integrated balun, which also integrates a matching network in a monolithic glass substrate. Matching impedance has been customized for the ATMEL chip. The device uses STMicroelectronics' IPD technology on a nonconductive glass substrate to optimize RF performance.



Characteristics BALF-ATM-01E3

1 Characteristics

Table 1: Absolute maximum ratings (limiting values)

Obl	Parameter	Value			1124
Symbol		Min.	Тур.	Max.	Unit
Pin	Input power RF _{IN}		-	4	dBm
V _{ESD}	ESD ratings MIL STD883C (HBM: C = 100 pF, R = 1.5 Ω , air discharge)	2000	-		V
	ESD ratings machine model (MM: C = 200 pF, R = 25 W, L = 500 nH)	500	-		V
TOP	Operating temperature	-40	-	+105	ů

Table 2: Electrical characteristics (T_{amb} = 25 °C)

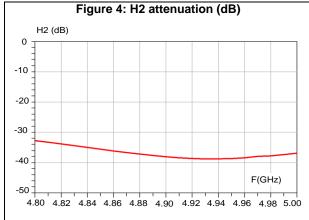
Cumbal	Parameter		Unit		
Symbol	Parameter	Min.	Тур.	Max.	Unit
Z _{OUT}	Nominal differential output impedance	Conjugate	match to ATS	AMR21E18	Ω
Z _{IN}	Nominal input impedance		50		Ω
f	Frequency range (bandwidth)	2400		2500	MHz
I∟	Insertion loss at 2.45 GHz		0.91	1.3	dB
RL	Single ended side at 2.45 GHz	15	26.3		dB
RL	Differential side at 2.45 GHz	15	26.1		dB
ф imb	Phase imbalance at 2.45 GHz	-9	0	9	o
Aimb	Amplitude imbalance at 2.45 GHz	-0.4	0	0.4	dB
H ₂	Harmonic 2 attenuation at 4.9 GHz	20	35		dB
H ₃	Harmonic 3 attenuation at 7.35 GHz	20	25		dB

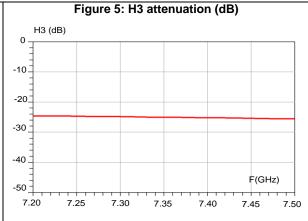
BALF-ATM-01E3 Characteristics

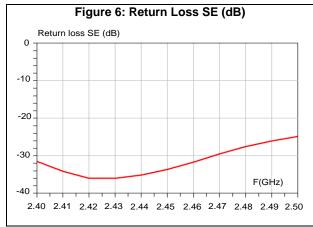
1.1 RF measurement

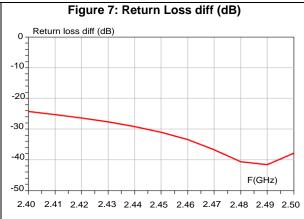




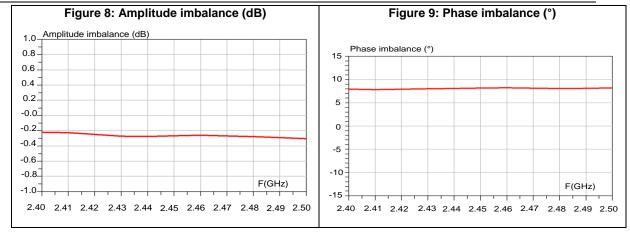






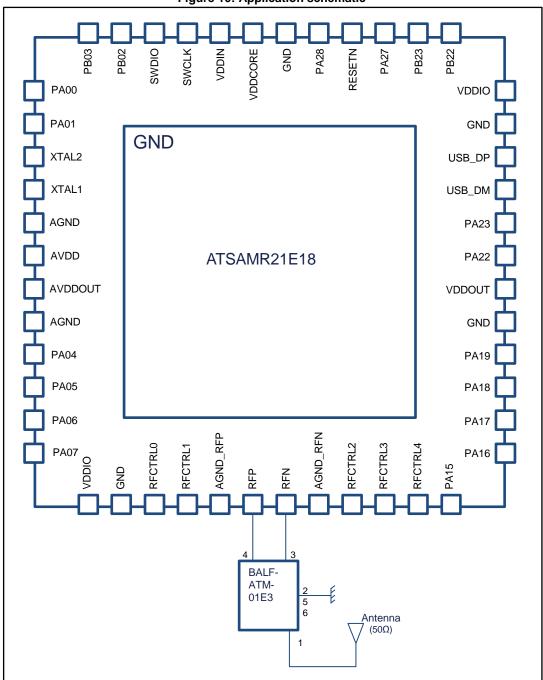


Characteristics BALF-ATM-01E3



2 Application schematic

Figure 10: Application schematic



Package information BALF-ATM-01E3

3 **Package information**

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Coated CSP on glass bumpless package information 3.1

С W a d **PAD VIEW** b

Figure 11: Coated CSP on glass bumpless package outline

Table 3: Coated CSP on glass bumpless dimensions

Doromotor	Dimensions (in mm)			
Parameter	Min.	Тур.	Max.	
L	1.900	2.000	2.100	
W	1.150	1.250	1.350	
Т	0.395	0.425	0.455	
а		0.200		
b		0.200		
С		0.884		
d		0.650		

BALF-ATM-01E3 Package information

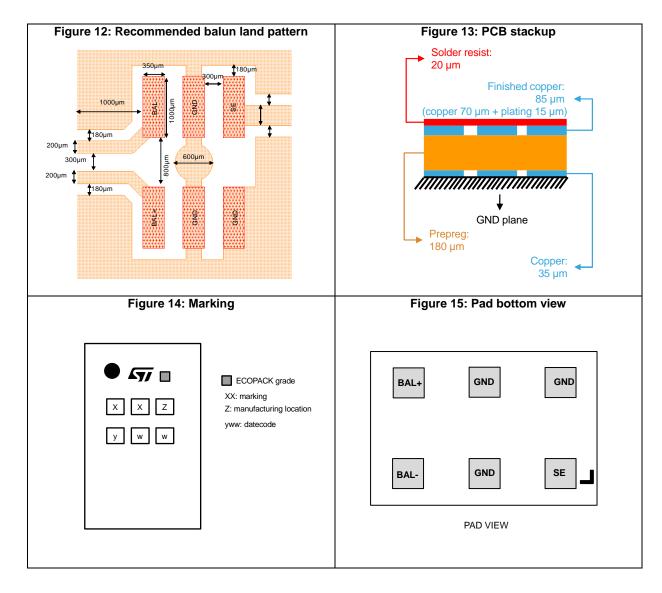


Table 4: Pin description

Pad#	Name	Description
1	SE	Single ended antenna connection
2, 5, 6	GND	Ground connection
3	BAL-	Balun differential negative pin
4	BAL+	Balun differential positive pin

Package information BALF-ATM-01E3

3.2 Coated CSP on glass bumpless packing information

Figure 16: Tape mechanical data

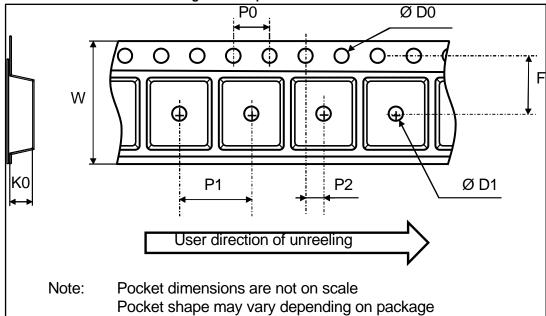
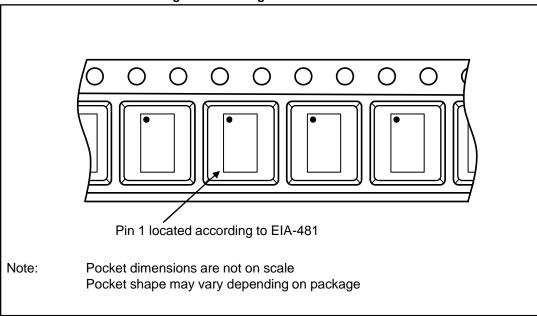


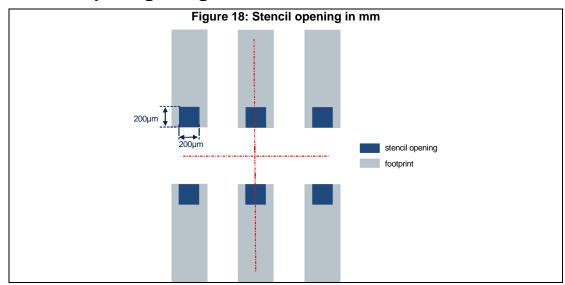
Table 5: Tape dimension definitions

Dof	Dimesions (in mm)				
Ref.	Min.	Тур.	Max.		
P1	3.90	4.00	4.10		
P0	3.90	4.00	4.10		
D0	1.40	1.50	1.60		
D1	0.35	0.40	0.45		
F	3.45	3.50	3.55		
K0	0.47	0.52	0.57		
P2	1.95	2.00	2.05		
W	7.90	8.00	8.30		

Figure 17: Package orientation in reel



3.3 Stencil opening design



3.4 Solder paste

- 1. 100 µm Solder stencil thickness is recommended
- 2. Halide-free flux qualification ROL0 according to ANSI/J-STD-004.
- 3. "No clean" solder paste is recommended.
- 4. Offers a high tack force to resist component movement during high speed.
- 5. Solder paste with fine particles: powder particle size is 20-45 µm.

3.5 Placement

- 1. Manual positioning is not recommended.
- 2. It is recommended to use the lead recognition capabilities of the placement system, not the outline centering
- 3. Standard tolerance of ± 0.05 mm is recommended.
- 4. 3.5 N placement force is recommended. Too much placement force can lead to squeeze out solder paste and cause solder joints to short. Too low placement force can lead to insufficient contact between package and solder paste that could cause open solder joints or badly centered packages.
- 5. To improve the package placement accuracy, a bottom side optical control should be performed with a high resolution tool.
- 6. For assembly, a perfect supporting of the PCB (all the more on flexible PCB) is recommended during solder paste printing, pick and place and reflow soldering by using optimized tools.

BALF-ATM-01E3 Ordering information

4 Ordering information

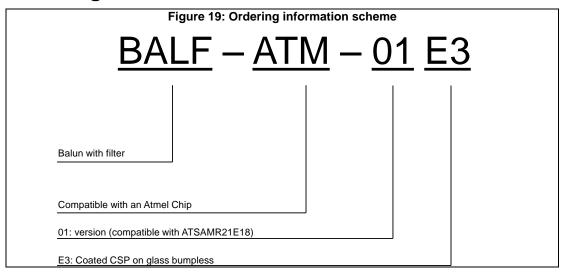


Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
BALF-ATM-01E3	TJ	Coated CSP on glass bumpless	2.28 mg	5000	Tape and reel (7")

5 Revision history

Table 7: Document revision history

Date	Revision	Changes
07-Jun-2017	1	Initial release.

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