



## 巴伦:低功耗蓝牙伴侣芯片

- BAL-NRF02D3 (配Nordic nRF51 BLE)
- BALF-NRG-02D3(配ST BlueNRG BLE)
- BALF-CC25-01D3(配TI CC25 BLE)

## 键盘

- **ESDALC5-1BF4**
  - a) 单线双向15kV保护
  - b) 0201 封装
- **ESDAVLC6-1BV2**
  - a) 单线双向15kV保护
  - b) 01005 封装



0201 package



ST01005

## USB2.0接口 ECMF02-3F3

- a) 共模滤波器及静电防护
- b) 尺寸:0.83 x 1.23 = 1.02mm<sup>2</sup>



## MIPI接口 CMF2-2457H4

- a) 共模滤波器,2.4G处噪声有-42dB的抑制
- b) 尺寸:0.9x0.7mm=0.63mm<sup>2</sup>







## 音频

- **ESDA5-1BF4**
  - a) 单线双向15kV保护
  - b) 0201 封装
- **EMIF02-SPK03F2**
  - a) 双通道静电保护及EMI滤波器
  - b) 0.5mm管脚间距的WLCSP封装



# STMICROELECTRONICS BALUN PORTFOLIO

RF IC supplier	RF IC	Matched Balun	Frequency (MHz)	Integrated filter	Size	Package
 life.augmented	SPIRIT1	BALF-SPI-01D3	868-915	●	1.4mmx2.0 mm	WLCSP
	SPIRIT1	BALF-SPI-02D3	433	●	1.4mmx2.0 mm	WLCSP
	SPIRIT2	BALF-SPI2-01D3 (2H17)	868-915	●	2.1mm x 1.55 mm	WLCSP
	SPIRIT2	BALF-SPI2-02D3 (2H17)	433	●	2.1mm x 1.55 mm	WLCSP
	STLC2690	BALF-2690-02D3	2400	●	1.64 mm x 0.94 mm	WLCSP
	BLUENRG BLUENRG-MS BLUENRG-1 BLUENRG-2	BALF-NRG-01D3 BALF-NRG-02D3 BALF-NRG-02QxY (2H18) BALF-NRG-02J5 (4Q17)	2400	●	1.4 mm x 0.85 mm	WLCSP WLCSP μQFN-WF Thin WLCSP
	ATWINC1500A	BAL-WILC10-01D3	2400	○	0.95mm x 0.95mm	WLCSP
	ATSAMR21E8 AT86RF233 ATMEGA256	BALF-ATM-01E3	2400	●	2.00mm x 1.25mm	WLCSP
	CC1101	BAL-CC1101-01D3	868-915	○	2.0mmx1.0mm	WLCSP
	CC1120/CC1125	BALF-112X-01D3	868-915	●	1.95mm x 1.87mm	WLCSP
	CC1120/CC1125	BALF-112X-02D3	433	●	1.95mm x 1.87mm	WLCSP
	CC2540/43/45 C2530/31/33	BAL-CC25-01D3	2400	○	0.9mmx0.9mm	WLCSP
	CC2541	BALF-CC25-02D3	2400	●	0.9mmx0.9mm	WLCSP
	CC2650/CC2640 CC2630/CC2620/CC2610	BALF-CC26-05D3	2400	●	0.9mmx0.9mm	WLCSP
	nRF51822-QFAAC/QFABA nRF51422-Qx	BAL-NRF01D3	2400	●	1.5mmx1.0mm	WLCSP
	nRF51822-CTAx	BALF-NRF01J5 (4Q17)	2400	●	1.4mmx0.85mm (height<350μm)	Thin WLCSP
	nRF51822-C nRF51422-C	BAL-NFR02D3	2400	●	1.4mmx0.9mm	WLCSP
	nRF51822-QFAAH/QFACA nRF51422-QFAAF/QFACA	BALF-NRF01E3	2400	●	1.5mmx1.0mm	LGA
	nRF51822-QFAAG/QFABB nRF51422-QFAAE/QFABA	BALF-NRF01D3	2400	●	1.5mmx1.0mm	WLCSP



# 0201 ESD Single Line Protection

**C<sub>LINE</sub>**  
Line capacitance

< 30 pF

**LC**  
Low Capa

< 10 pF

**VLC**  
Very Low Capa

< 2 pF

**ULC**  
Ultra Low Capa

< 0.5 pF

**XLC**  
eXtra Low Capa

## Standard

### 0201

**ESDALC6V1-1U2**  
12 pF

**ESDALC14V2-1U2**  
6 pF

**ESDALC6V1-1BU2**  
5 pF

**ESDAULC6-1U2**  
0.8pF

**ESDAXLC6-1BU2**  
0.4pF

## Low clamping

### 0201

**ESDA5-1BF4**  
45 pF, 11V @ 30ns

**ESDALC8-1BF4**  
30pF, 16V @ 30ns

**ESDALC14-1BF4**  
22 pF, 18V @ 30ns

**ESDALC5-1BF4**  
10 pF, 14V @30ns

**ESDAVLC5-1BF4**  
7pF, 20V @ 30ns

**ESDAULC5-1BF4**  
1.5pF, 13.5V @ 30ns

**ESDAXLC18-1BF4**  
0.45pF, 29V @ 30ns,

**ESDARF02-1BU2CK**  
0.2pF, 19V @ 30ns,

## Ultra low clamping

### 0201

**ESDA5-1F4**  
110pF, +9V @ 30ns

**ESDZL5-1BF4**  
8pF, +9V @ 30ns

**ESDZV5-1BF4**  
5pF, +8V @ 30ns

**ESDZV5H-1BF4**  
4pF, +8V @ 30ns

*Z series*  
*Snapback with very*  
*lower Vcl<10V !*



**ESDAXLC5-1BU2**  
0.5pF, +10V @ 30ns

### 01005

**ESDAVLC6-1BV2**  
7.5pF

**ESDAVLC6-1V2**  
5pF

**ESDAVLC12-1BV2**  
7.5 pF, VBR=12V



# ST 01005 ESD Single Line Protection

- 2x smaller
- Same voltage range



0201

5pF

**ESDZV5-1BF4 / -1BU2**  
5pF, 8V @30ns, Ipp 7A

10pF

**ESDZL5-1F4**  
10pF, 9V@30ns, Ipp 7A  
**ESDALC5-1BF4**  
10pF, 14V@30ns, Ipp 2.5A

12V

**ESDALC14-1BF4**  
22F, 18V @ 30ns, Ipp 5A

01005

5pF

**ESDZV5-1BV2**  
5pF, 7V @30ns, Ipp 5A

10pF

**ESDAVLC6-1BV2**  
7.5pF, 29V@30ns, Ipp 2.5A

10.5V

**ESDALC12-1BV2**  
7.5pF, 30V @ 30ns, Ipp 2A

# ECMF PORTFOLIO

## DIFFERENTIAL BANDWIDTH compliant with following standards

### Speed Class 1

- MIPI D-PHY (DSI & CSI)
- USB 2.0, MHL 2.0
- HDMI 1.4
- DisplayPort
- SATA

### Speed Class 2

- Speed Class 1 interfaces
- MIPI M-PHY (DSI & CSI)
- USB 3.0
- USB3.1
- HDMI 2.0

New  
New  
New

Part Number (Note 2)	Number of Lanes			Peak Rejection Frequency (> - 20dB) (GHz)				Z <sub>CC21</sub> @ 100MHz (Ω)	SPEED CLASS		Package Type	Package Size X x Y (mm)
	1	2	3	0.7-0.9	1.5	1.8-2.4	5		I	II		
ECMF02-3F3	•			•				24	•		Flip-Chip	0.83 x 1.33
ECMF02-2BF3	•			•	•			14	•		Flip-Chip	0.83 x 1.23
ECMF02-4CMX8	•			•	•			16	•		μQFN-8L	1.20 x 2.50
ECMF02-2HSMX6	•			•	•	•	•	50		•	μQFN-6L	1.50 x 1.70
ECMF02-2AMX6	•			•	•			16	•		μQFN-6L	1.50 x 1.70
ECMF02-3HSM6	•			•				30		• (*)	μQFN-6L	1.35 x 1.60
ECMF04-4HSM10		•		•				30		• (*)	μQFN-10L	1.35 x 2.60
ECMF04-4HSMW10		•			•	•		30		•	μQFN-10L	1.35 x 2.60
ECMF04-4AMX12		•		•	•			16	•		μQFN-12L	1.50 x 3.30
ECMF06-6HSM16			•	•				30		• (*)	μQFN-16L	1.35 x 4.10
ECMF06-6AM16			•	•	•	•		15	•		μQFN-16L	1.35 x 3.30
ECMF2-0730V12M12	•			•	•	•			•		μQFN-12L	1.35 x 2.6
ECMF4-20A42N10		•			•	•				•	μQFN-10L	1.35 x 2.2
ECMF2-24I10F3		•			•	•			•		Flip-Chip	0.95 x 1.35

# CMF PORTFOLIO

**DIFFERENTIAL BANDWIDTH**  
compliant with following standards

**Speed Class 1**

- MIPI D-PHY (DSI & CSI)
- USB 2.0, MHL 2.0
- HDMI 1.4
- DisplayPort
- SATA

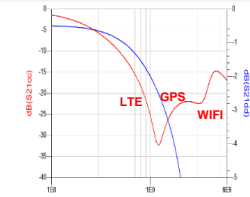
**Speed Class 2**

- Speed Class 1 interfaces
- MIPI M-PHY (DSI & CSI)
- USB 3.0
- USB3.1
- HDMI 2.0

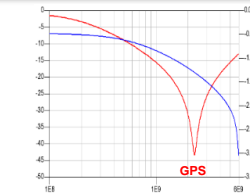
Part Number (Note 2)	Number of Lanes		Peak Rejection Frequency (> -20dB) (GHz)					Filtering Pattern Shape	Z <sub>CC21</sub> @ 100MHz (Ω)	SPEED CLASS		Footprint Compliance	Package Size X x Y (mm)
	1	2	0.7 - 0.9	1.5	1.8- 2.4	5	I			II			
CMF2-08A30H3	•		•				V	9.1	•		0605 0806	0.78 x 0.68	
CMF4-08A30H3		•	•			1608					1.44 x 0.78		
CMF2-15A48H3	•			•		9		0605 0806	•		0605 0806	0.78 x 0.68	
CMF4-15A48H3		•		•							1608	1.44 x 0.78	
CMF2-24A60H3	•				•	8.9		0605 0806	•		0605 0806	0.78 x 0.68	
CMF4-24A60H3		•			•						1608	1.44 x 0.78	
CMF2-50A60H3	•					1.7		0605 0806	•		0605 0806	0.78 x 0.68	
CMF4-50A60H3		•									1608	1.44 x 0.78	
CMF2-2450A48H3	•				•	9.3		0806 (GND)		•	0806 (GND)	0.78 x 0.94	
CMF4-2450A48H3		•			•						1608 (GND)	0.78 x 1.74	
CMF2-0824A24H3	•		•		•	W	6	•		0806 (GND)	0.78 x 0.94		
CMF2-0815A20H3	•		•	•						5.7	•		0806 (GND)
CMF4-0815A20H3		•	•	•			1608 (GND)	0.78 x 1.74					
CMF2-0824A25H4	•		•		•		6	•		No	0.66 x 0.78		
CMF2-24A57H4	•				•	9	•	•		No	0.66 x 0.78		
CMF2-24A57H7	•				•					9	•	No	0.66 x 0.78
CMF2-0930A14H3	•		•	•	•	U	8.8	•		0806 (GND)	0.78 x 0.94		
CMF2-0650A09H3	•		•	•	•					7	•	No	1.18 x 0.74

New  
New

**U shape**



**V shape**



**W shape**

