

High Frequency Ceramic Solutions

Sub-GHz Impedance Matched Balun + LPF integrated Passive Component for Texas Instruments' CC1310 Chipset

P/N: 0850BM14E0016

Detail Specification: 9/16/2016

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Do you need a small 900MHz antenna? Go to: www.johansontechnology.com/antennas

General Specifications

| | | |
|---|--|--------------------|
| Part Number | 0850BM14E0016 | |
| Frequency (MHz) | 770 ~ 860 | 860 ~ 928 |
| Unbalanced Impedance (Ω) | 50 | |
| Balanced Impedance (Ω) | Impedance matched to Texas Instruments' CC1310 chipset | |
| Insertion Loss (dB) | 1.3 typ (1.6 max.) | 1.8 typ (2.2 max.) |
| Return Loss (dB) | 9.5 min. | 9.5 min. |
| Phase Difference (deg) | 180 \pm 17 | 180 \pm 15 |
| Amplitude Difference (dB) | 3.5 max. | 2.0 max. |
| Attenuation (dB) | 15 min. @ 1720~1736 MHz 15 min. @ 1736~1856MHz 30 min. @ 2310~2580 MHz 30 min. @ 2580~2784 MHz 33 min. @ 3080~3440MHz 35 min. @ 3440~3712 MHz | |
| Power Capacity | 2W max. CW | |



Texas Instruments - Approved!

| | |
|--|---|
| Quantity/Reel | 4,000 pcs |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature Range | -40°C to +85°C |
| Storage Period | 18 months max |
| Recommended Storage Conditions for unused T&R product | +5 ~ +35 °C, Humidity 45~75%RH, 18 mos. max |

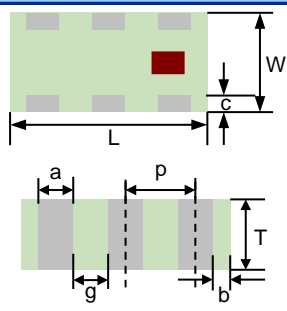
For more TI matched balun-filters, go to: www.johansontechnology.com/ti

Part Number Explanation

| P/N Suffix | Packing Style | Bulk | Suffix = S | eg. 0850BM14E0016S |
|------------|---------------|----------|---------------|---------------------------|
| | | T & R | Suffix = E | eg. 0850BM14E0016T |
| | | 100% Tin | Suffix = None | eg. 0850BM14E0016(T or S) |

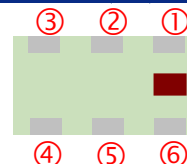
Mechanical Dimensions

| | In | mm |
|----------|-------------------|-----------------|
| L | 0.063 \pm 0.004 | 1.60 \pm 0.10 |
| W | 0.031 \pm 0.004 | 0.80 \pm 0.10 |
| T | 0.024 \pm 0.004 | 0.60 \pm 0.10 |
| a | 0.008 \pm 0.004 | 0.20 \pm 0.10 |
| b | 0.008 +.004/-.008 | 0.20 +0.1/-0.2 |
| c | 0.006 \pm 0.004 | 0.15 \pm 0.10 |
| g | 0.012 \pm 0.004 | 0.30 \pm 0.10 |
| p | 0.020 \pm 0.002 | 0.50 \pm 0.05 |



Terminal Configuration

| No. | Function | No. | Function |
|-----|--------------------|-----|--------------------|
| 1 | Unbalanced Port | 4 | Balanced Port RF_P |
| 2 | RX/TX | 5 | GND |
| 3 | Balanced Port RF_N | | 6 |



Would you like us to review your layout for free? Need an antenna recommendation for your application?

Contact us at:

www.johansontechnology.com/ask-a-question

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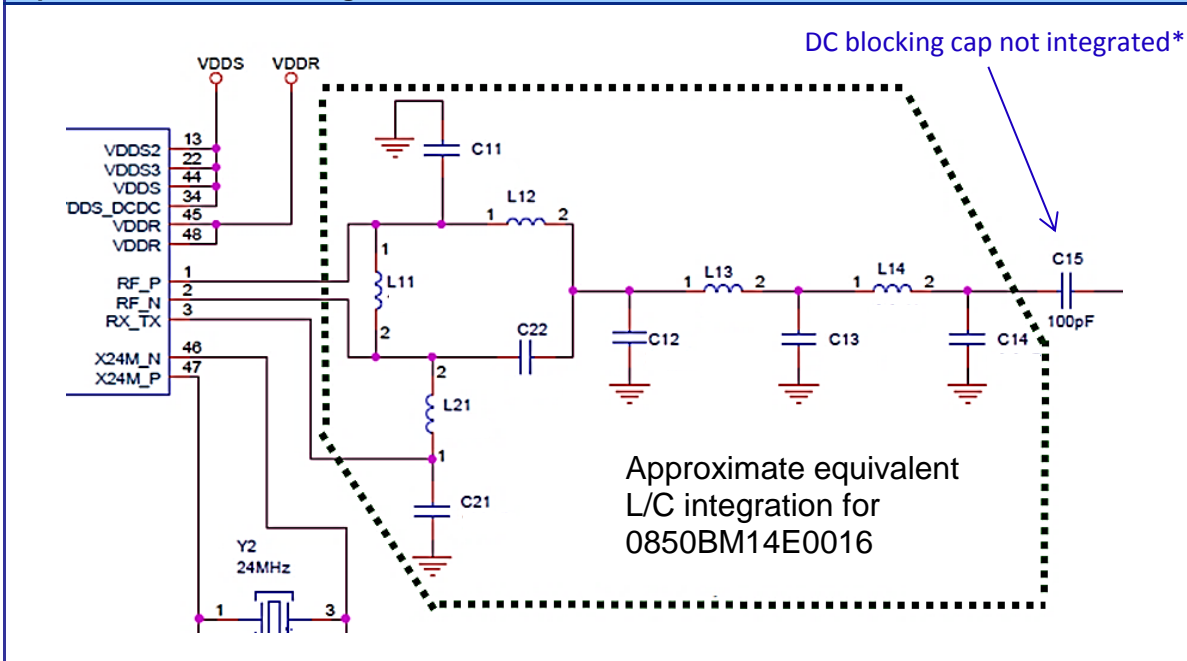
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Equivalent L/C Circuit Integrated into IPC



*Even though Pins 3, 4, and 1 are internally *DC blocked* from GND, Pins 3/4 are *DC coupled* to Pin 1 (there's a DC path between them). We recommend the designer place a DC blocking cap (68-100pF) in series after Pin 1 (between IPC and antenna).

Would you like the reference design, schematic, and gerber files? Need us to review your layout for free or an antenna recommendation for your application? Contact us at:

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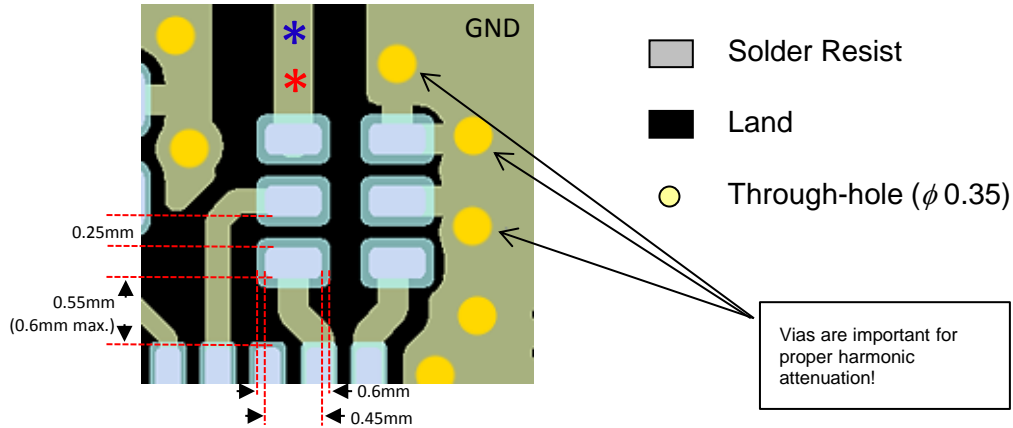
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Pad-Soldermask Guidelines

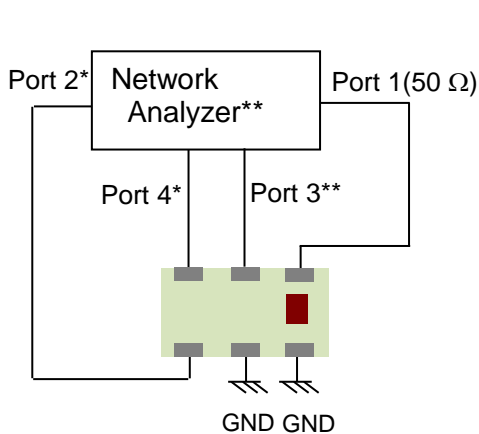
Request reference design, schematic, and gerber files at: www.johansontechnology.com/ask-a-question



* Even though Pins 3, 4, and 1 are DC blocked from GND, Pins 3/4 are DC coupled to Pin 1 (there's a DC path between them). We recommend the designer place a DC blocking cap (68-100pF) in series after Pin 1 (between IPC and antenna) per page 2 of the datasheet.

* Line width should be designed to match 50ohm characteristic impedance, depending on PCB material and thickness. Grounded CPWG is recommended.

Measurement Diagram



Port 1: Unbalanced Port

Ports 2 and 4: Balanced Port

*Ports 2 and 4 Terminate impedance
=Conjugate match to TI CC13XX chipset

Port 3: RX_TX Port

**Port 3 Terminate impedance
=The load Impedance looking into
RX_TX pin of TI CC13XX chipset

$$IL = S_{DS21}$$

$$RL = S_{SS11}$$

$$\text{Amp_balance} = \text{dB}(S(2,1)/S(4,1))$$

$$\text{Phase_balance} = \text{Phase}(S(2,1)/S(4,1))$$

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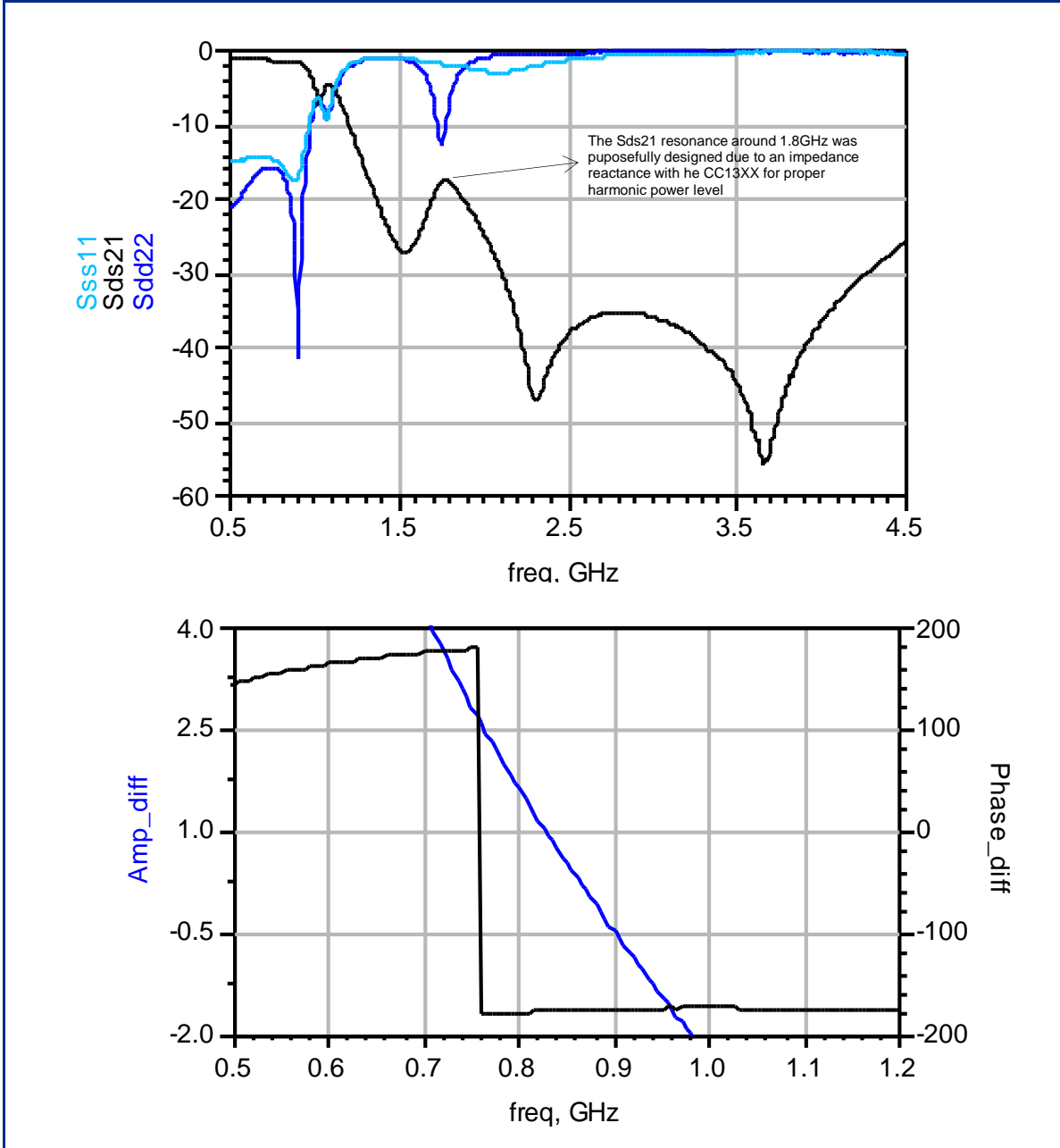
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Typical Electrical Characteristics (T=25°C)



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Application Notes, Layout Files, and more

www.johansontechnology.com/ti

Small SMD 900MHz (or 2.4G, 5G) antennas at:

www.johansontechnology.com/antennas

RoHS Compliance

www.johansontechnology.com/rohs-compliance

Soldering Information

www.johansontechnology.com/ipcsoldering-profile

Antenna layout and tuning techniques

www.johansontechnology.com/tuning

Antenna layout review, tuning, and characterization services

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Packaging information

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