

Product Features

- RF frequency: 3 to 18 GHz
- Insertion Loss: 2 dB
- Amplitude Balance: 0.4 dB
- Phase Balance: 1 deg
- High Power Handling
- Die Size: X=1250 um, Y=2170 um, Z=100 um
- Package Size: 3x3, 10Lead, 0.5mm pitch DFN

Application

- Instrumentation
- Wireless Communication
- SATCOM
- Radar, EW
- WLAN, WiMax

Product Description

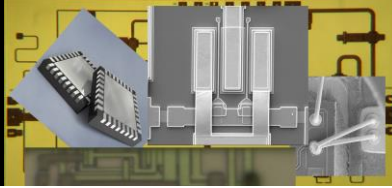
The TMC811-1D is a wideband low loss MMIC balun (balanced to unbalanced transformer) die with an impedance ratio of 1:2 . TMC811-1D is designed for use in 5G wireless, SATCOM, Instrumentation, high-speed track-and-hold amplifiers, digital-to-analog converters, balanced amplifiers, signal integrity and Military Radar and EW applications. The TMC811-1D is a 50 Ω matched, DC-coupled and ROHS-compliant design. To ensure rugged and reliable operation and moisture protection, the TMC811-1D is designed and fabricated for maximum repeatability with low insertion loss, low amplitude unbalance, low phase unbalance, and excellent common mode rejection. Both bond pad and backside metallization are Au-based that are compatible with ribbon and wedge bonding and high conductivity epoxy and eutectic die attach methods. TMC811-1D is layed out symmetrically and is in die format thus enabling the integration of the balun directly into hybrid modules. DXF drawings and S3P files are available upon request. TMC811-1 is the packaged DFN version.

Electrical Performance				
	min	Typ	Max	Units
Frequency	3		18	GHz
Excess Insertion Loss		2		dB
Return Loss		10		dB
Common Mode Rejection		35		dB
Amplitude Balance		0.4		dB
Phase Match		1		deg

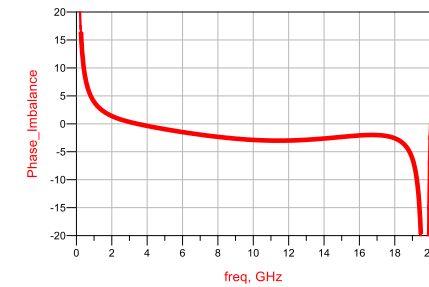
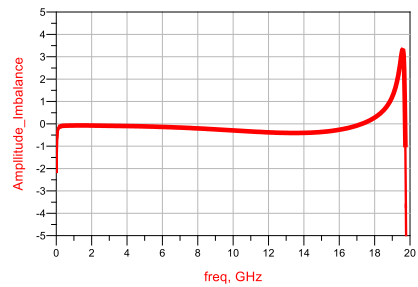
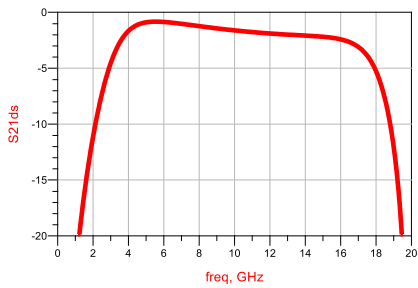
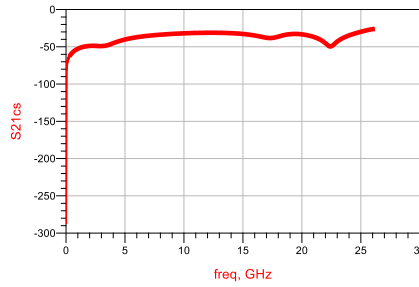
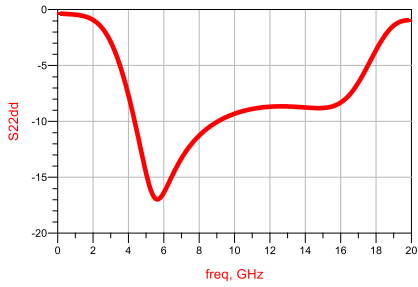
TMC811-1D

3-18 GHz

Low Loss Balun



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$$\text{Eqn } S22dd = \text{dB}(0.5 * (S22 - S23 - S32 + S33))$$

$$\text{Eqn } S21ds = \text{dB}((1/\sqrt{2}) * (S(2,1) - S(3,1)))$$

$$\text{Eqn } S21cs = \text{dB}((1/\sqrt{2}) * (S(2,1) + S(3,1)))$$

$$\text{Eqn } \text{CMRR} = 20 * \log(S21ds / S21cs)$$

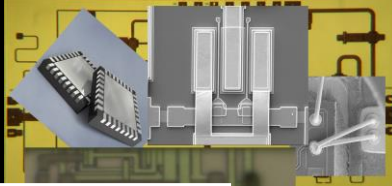
$$\text{Eqn } \text{Amplitude_Imbalance} = \text{dB}(-S21/S31)$$

$$\text{Eqn } \text{Phase_Imbalance} = \text{phase}(-S21/S31)$$

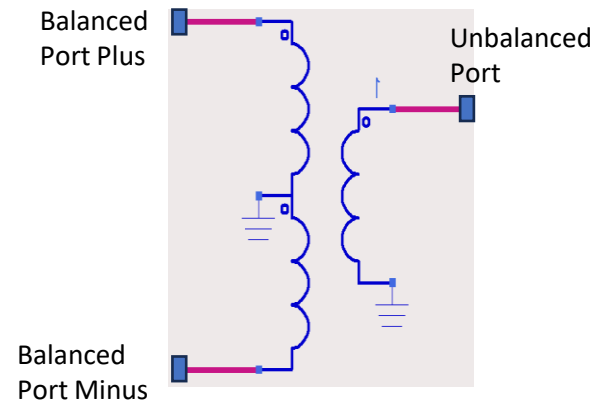
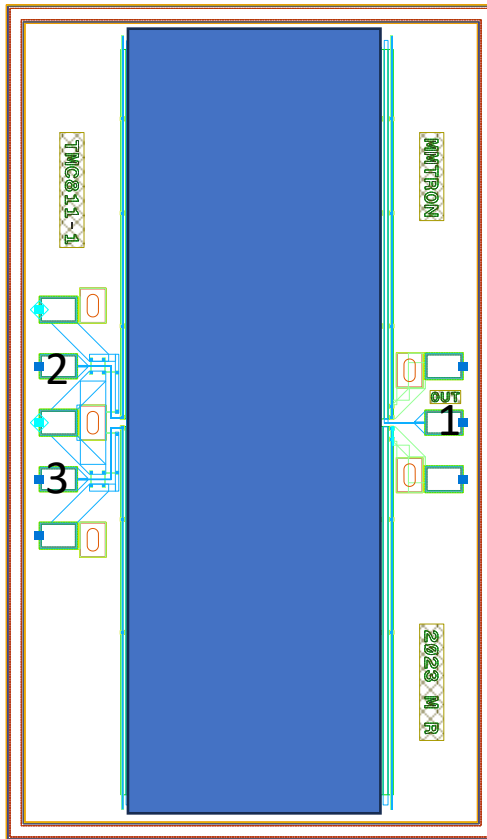
TMC811-1D

3-18 GHz

Low Loss Balun



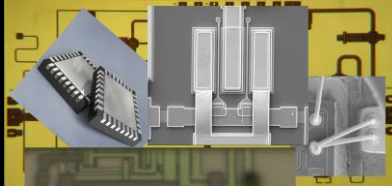
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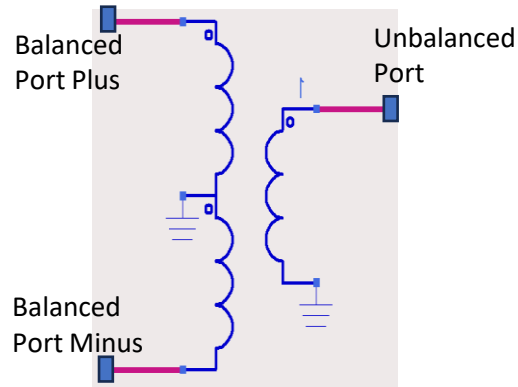
Pad #	Function
1	Unbalanced Common port
2	Balanced Port Plus
3	Balanced Port Minus

Pad 1 is open to ground and pads 2 and 3 are short to ground.
The remaining 5 pads are GND.

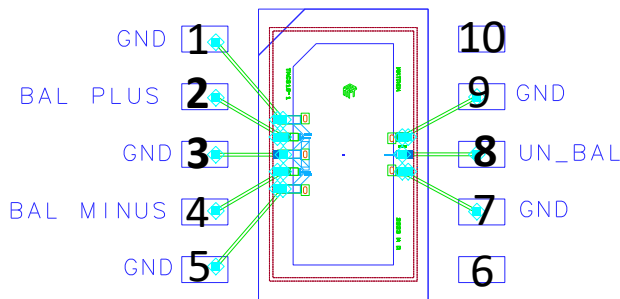
TMC811-1D
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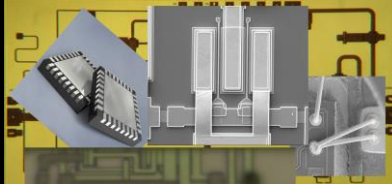


Pad #	Function
8	Unbalanced port
2	Balanced Port Plus
4	Balanced Port Minus
1,3,5,7,9	GND



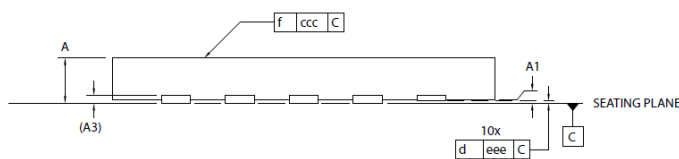
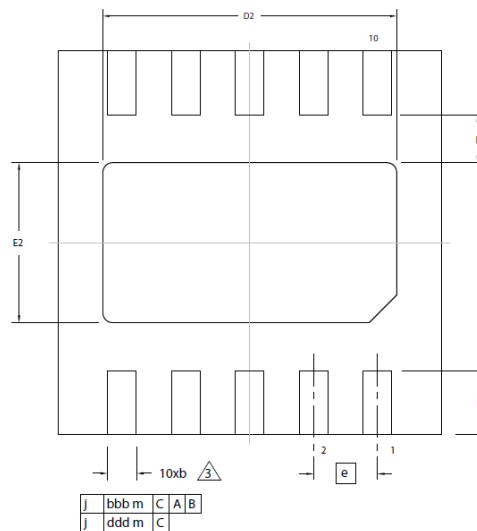
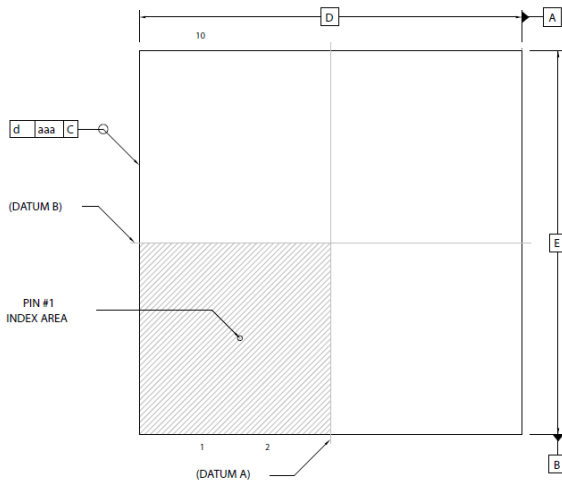
Packaged Version

TMC811-1
3-18 GHz
Low Loss High Power Balun



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REVISIONS		
REV	DESCRIPTION	DATE
B	ADDED PACKAGE THICKNESS OPTIONS	4-1-2016



NOTES:
 1) ALL DIMENSIONS IN MM
 2) DIMENSIONING AND TOLERANCING PER ASME Y14.5-2009
 3) DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM TERMINAL TIP

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SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A, V	0.80	1.00	E2	1.15	1.35
A, W	0.70	0.80	e	0.50 BSC	
A, L	1.40	1.70	k	0.20	-
A1	0.00	0.05	L	0.45	0.55
A3	0.20 REF		aaa	0.10	
b	0.18	0.30	bbb	0.10	
D	3.00 BSC		ccc	0.10	
D2	2.20	2.40	ddd	0.05	
E	3.00 BSC		eee	0.08	



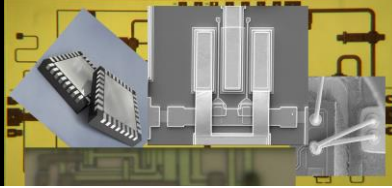
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TITLE: **DFN 10L 3x3 mm 0.50 PITCH PACKAGE OUTLINE**

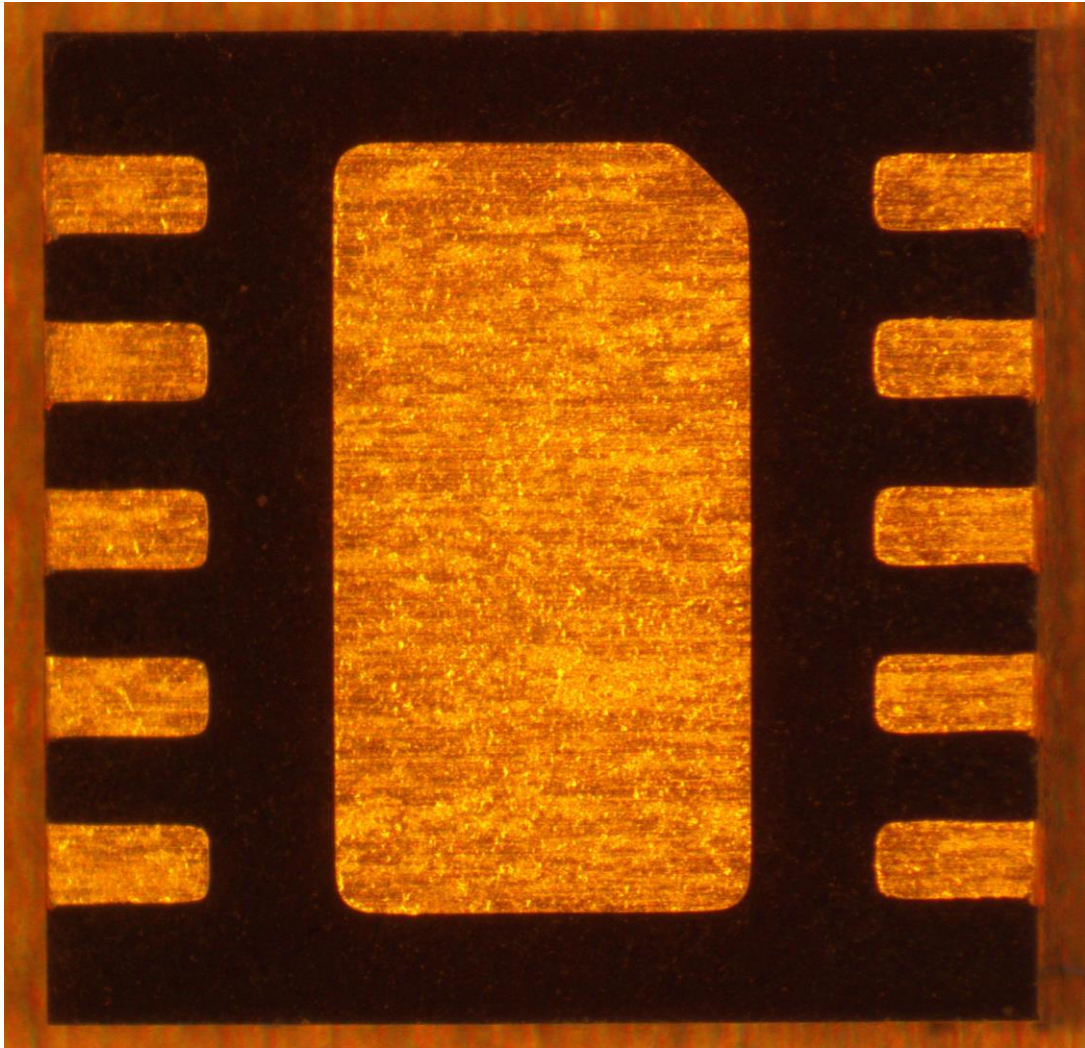
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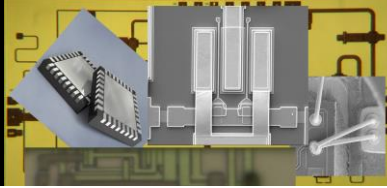
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TMC811-1
3-18 GHz
Low Loss High Power Balun



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- **Assembly Techniques**

- The TMC811-1D is fabricated using a GaAs-based semiconductor material structure. The die is back-metalized and can be mounted with standard assembly techniques. The mounting surface should be clean and flat.

- **ESD Warning**

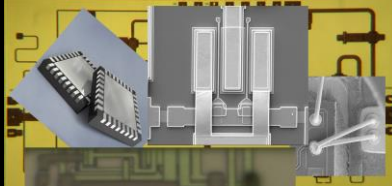
- III-V MMICs are ESD-sensitive. Preventative ESD measures must be employed in all aspects of storage, handling, and assembly. MMIC ESD precautions, handling considerations, and die-attach and bonding methods are critical factors in successful III-V MMIC performance and reliability.

- **RoHS Compliance**

- This part is RoHS compliant, meeting the requirements of the EU Restriction of Hazardous Substances Directive 2002/95/EC, commonly known as RoHS. Six substances are regulated: lead, mercury, cadmium, chromium VI (hexavalent chromium), polybrominated biphenyls (PBB), and polybrominated biphenyl ethers (PBDE). RoHS compliance requires that any residual concentration of these substances is below the Directive's maximum concentration values (MCV): cadmium 100ppm by weight and all others 1000ppm by weight.

- **Maximum Ratings**

Parameter	Function
Operating Temperature	-55 °C to 100 °C
Input RF Power	35 dBm at 25 °C



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