

MRF101AN HIGHLIGHTS

100 W RF POWER TRANSISTOR TO-220 PACKAGE

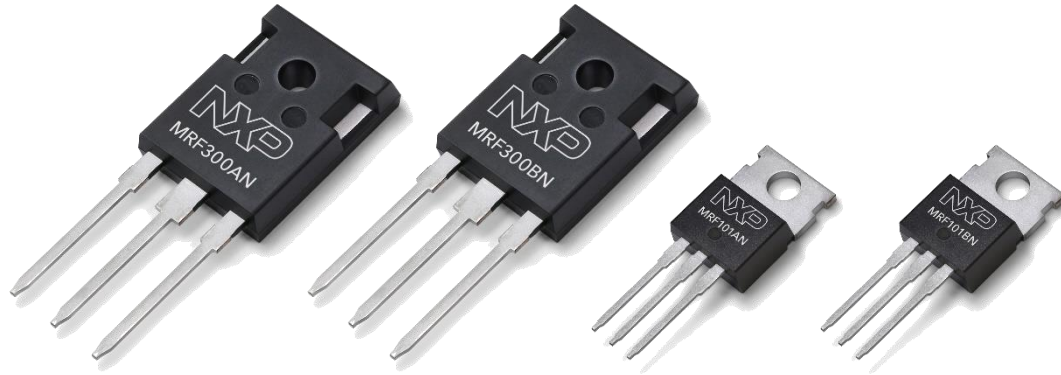
NOVEMBER 2018



SECURE CONNECTIONS
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NXP Brings Industry Standard Packages to RF Power

- NXP has qualified RF LDMOS in industry standard packages TO-247 and TO-220, removing a barrier to entry to RF Power: package mounting.



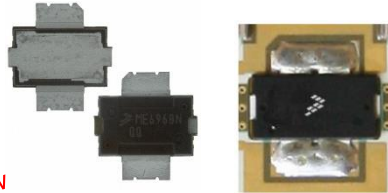
- The MRF300AN and MRF300BN, **300 W CW in TO-247**, are described [here](#).
- The MRF101AN and MRF101BN, **100 W CW in TO-220**, are described in the following pages.
- These 50 V devices address 1-250 MHz applications.



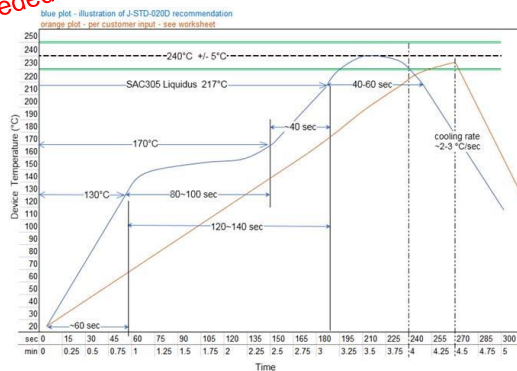
Benefit #1: Low-Cost, Flexible Mounting

- The TO-247 and TO-220 packages make it possible to mount RF Power transistors with a simple thru-hole technology, removing the need for a complex solder-reflow process, dramatically simplifying manufacturing.

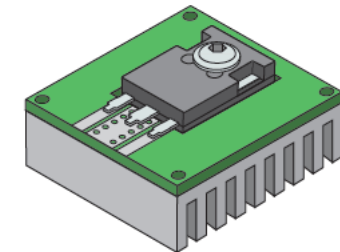
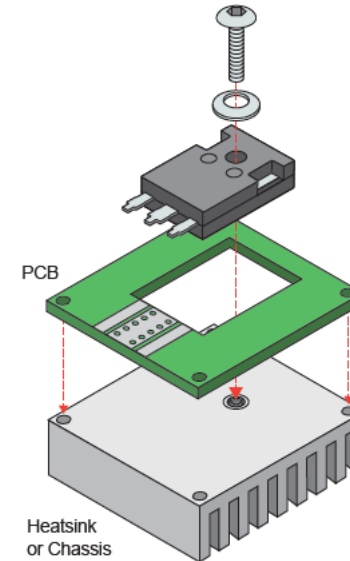
Traditional way of mounting
RF Power transistors in
plastic



Complex reflow
profile needed!



New, manufacturing-friendly
RF Power packages



Final Configuration

Simple Thru-hole
mounting

Benefit #2: PA design reuse over frequencies

- Both devices are supported by a series of reference circuits that share the same PCB layout, enabling RF designers to quickly generate new Power Amplifiers to address other frequencies.

MRF300AN

2" x 3" (5.1 cm x 7.6 cm)



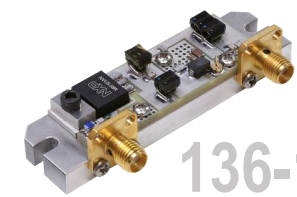
MRF101AN

0.7" x 2.6" (1.8 cm x 6.7 cm)

40.68 MHz

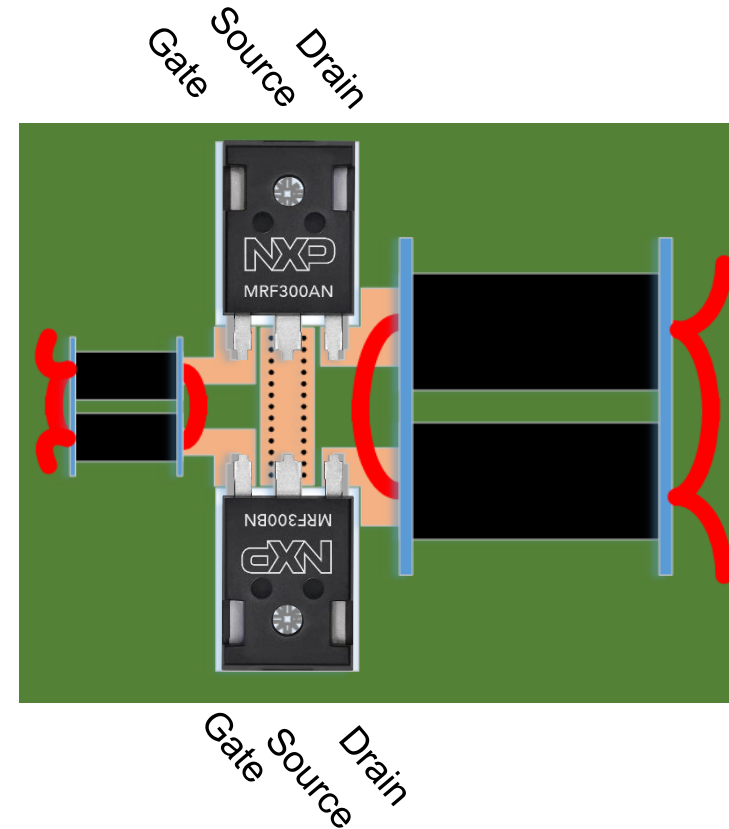


136-174 MHz
(VHF)



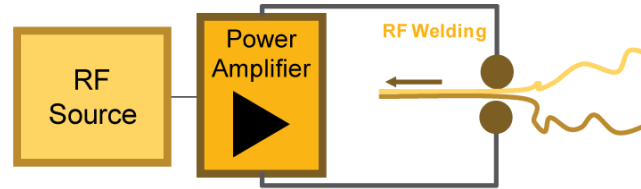
Benefit #3: two pin-configurations enabling wideband designs

- Both transistors comes in 2 pin-out versions mirroring each other, to support push-pull configurations, for further flexibility.



Target Markets

- Traditional RF Power markets in the 1.8-250 MHz looking for ease of use in design and manufacturing, including:
 - Industrial, Scientific, Medical (ISM) market segments
 - HF / VHF communications

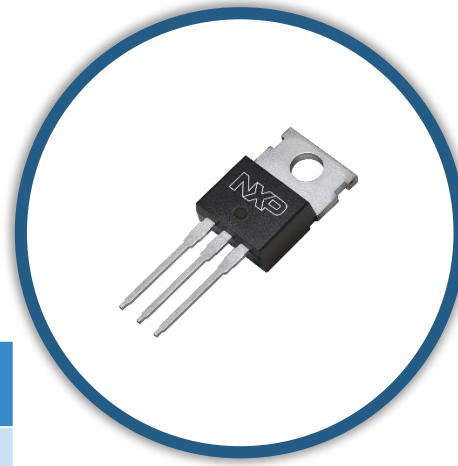


- The MRF101AN and MRF300AN are also expected to find another market in switch-mode power supplies
 - RF transistors enable switching at a higher frequency than existing solutions, reducing the total size and cost of other components of the BoM in the system.

Transistor Details

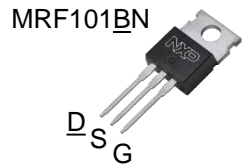
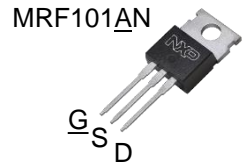
- **100 W CW**
- **1.8-250 MHz**
- **50 V LDMOS**

- Unmatched input and output
- Single Ended
- TO-220 over-molded plastic package
- 1.1°C/W thermal resistance
- Extreme ruggedness: handles 65:1 VSWR
- Warranted availability until 2033 minimum



Comments:

- Designed for ease of use
- In TO-220 package with source pin and bolt down flange
- Modular architecture for scalability: 2 pin-out versions for push-pull configurations
- Supported by compact reference circuits using the same PCB for all frequencies



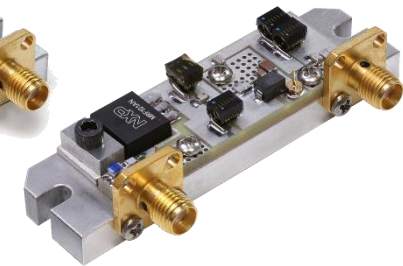
Reference Circuits:

Board Frequency (MHz)	Power (W)	Gain (dB)	Drain Eff. (%)	Size (inch)	Availability
13.56 MHz Compact	130 CW	27.1	79.6	0.7 x 2.6	11/20
27 MHz Compact	130 CW	24.0	81.5	0.7 x 2.6	12/15
40.68 MHz Compact	120 CW	23.8	81.0	0.7 x 2.6	Released
50 MHz Compact	115 CW	23.0	79.5	0.7 x 2.6	12/15
81.36 MHz	120 CW	23.0	79.0	2 x 3	Released
87.5-108 MHz	110 CW	21.3	77.1	2 x 3	1/1/19
136-174 (VHF) Compact	104 CW	21.2	76.5	0.7 x 2.6	Released
230 MHz	115 Pulse	21.1	76.7	4 x 5	Released

Examples of Reference Circuits

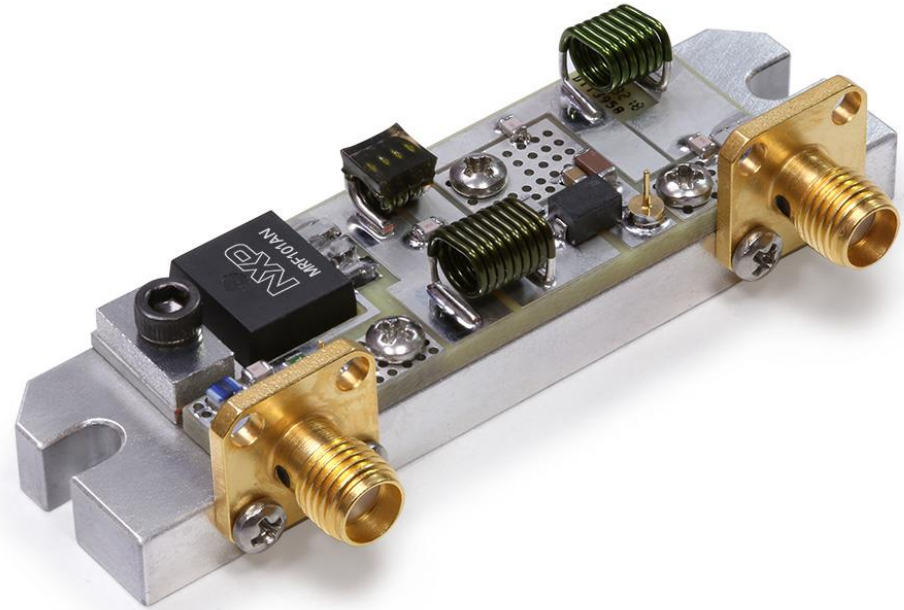
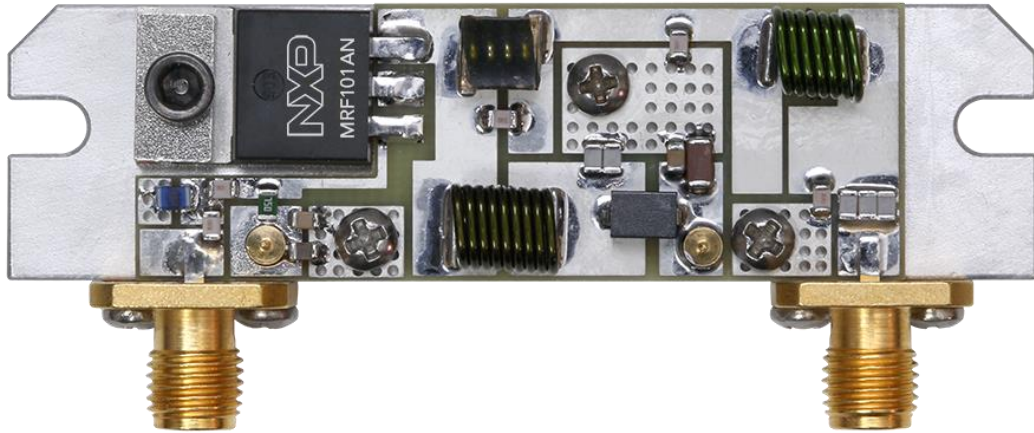
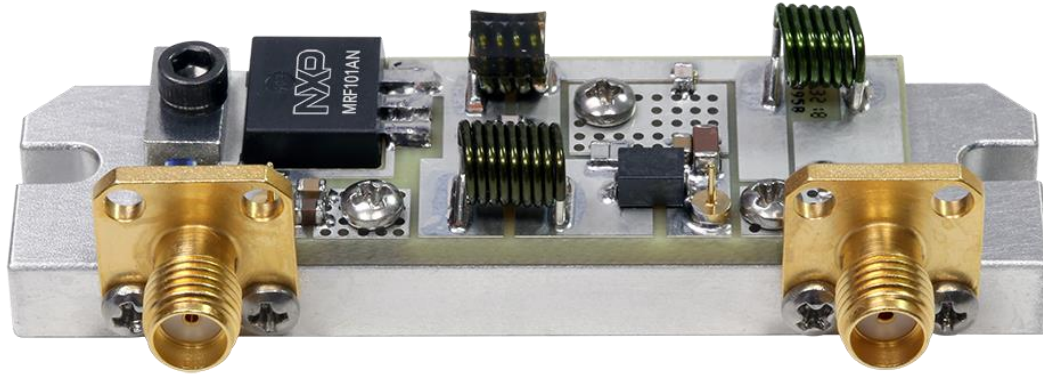


40.68 MHz

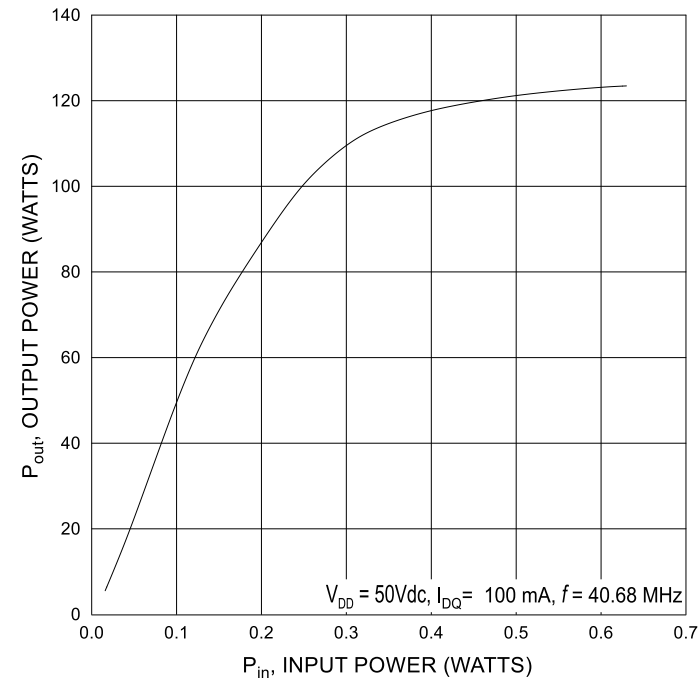
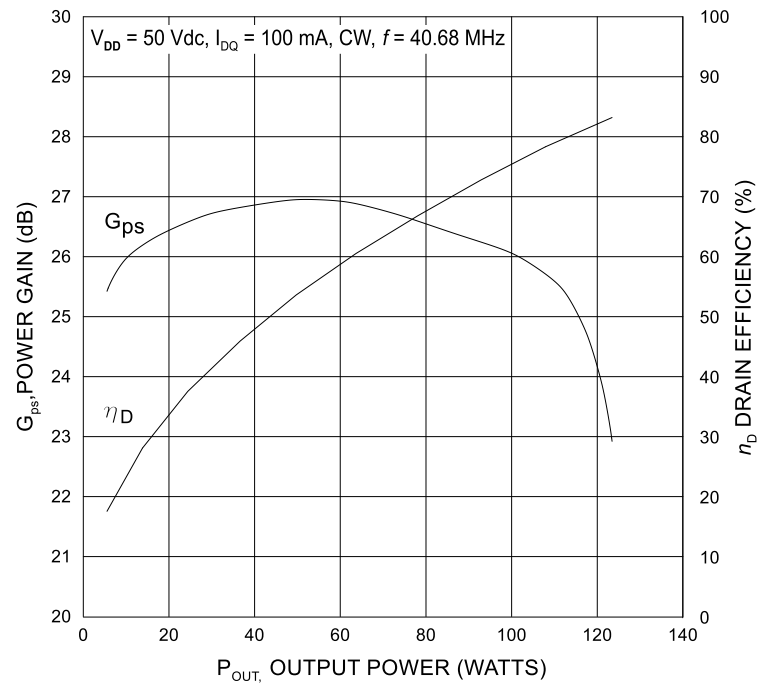


136-174 MHz

40.68 MHz Reference Circuit – 0.71" × 2.64" (1.8 cm × 6.7 cm)



40.68 MHz Typical Performance

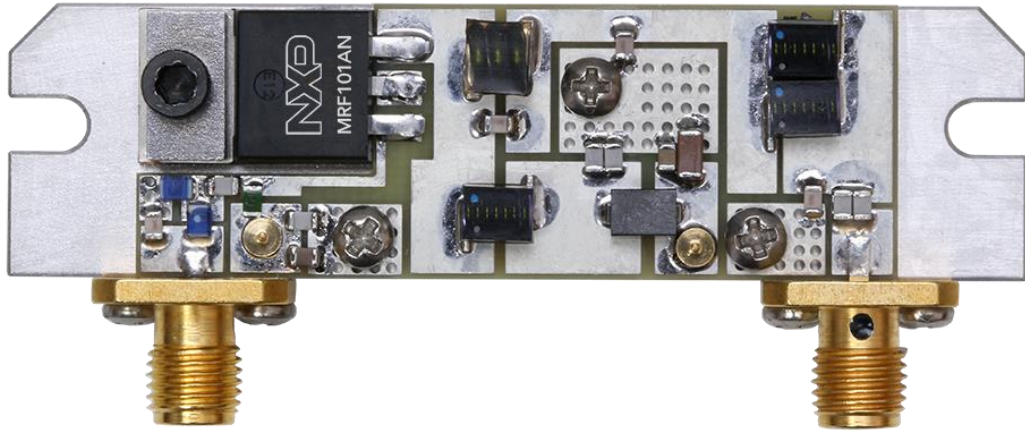
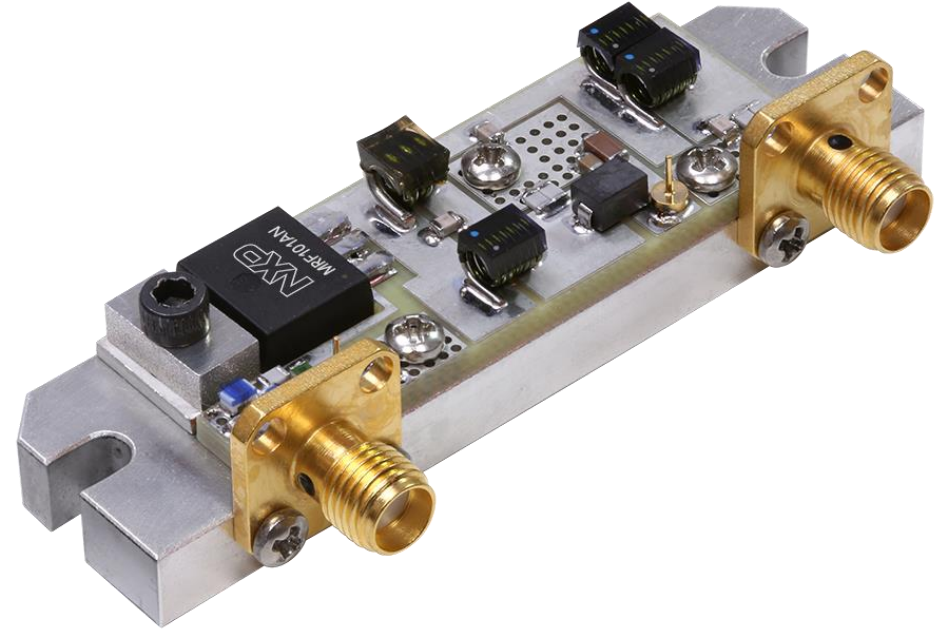
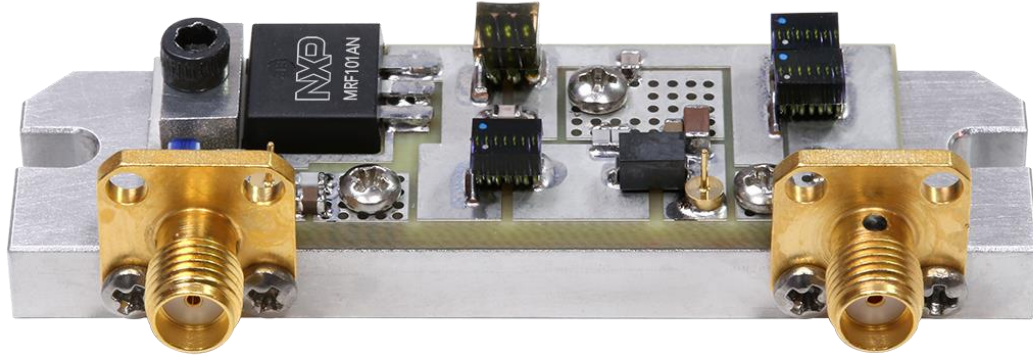


Typical P3dB performance, $I_{DQ} = 100\text{ mA}$, $P_{in} = 27\text{ dBm}$, CW

Frequency (MHz)	Signal Type	Pout (W)	Gps (dB)	Eff (%)
40.68	CW	120	23.8	81.0



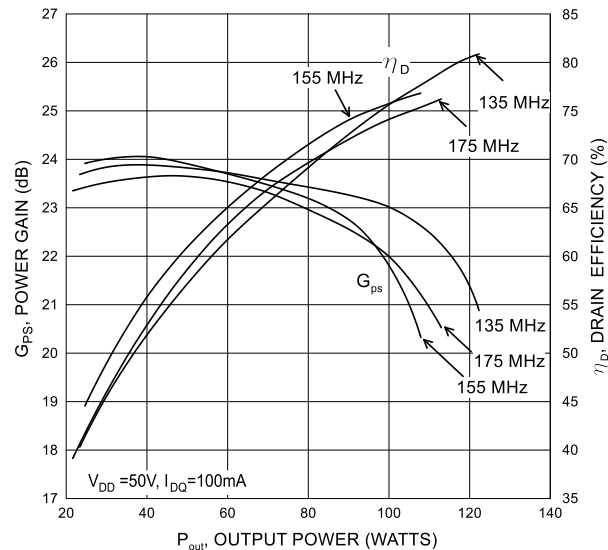
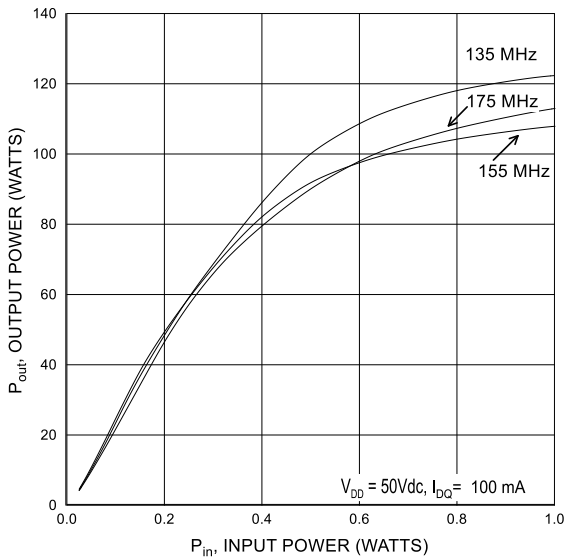
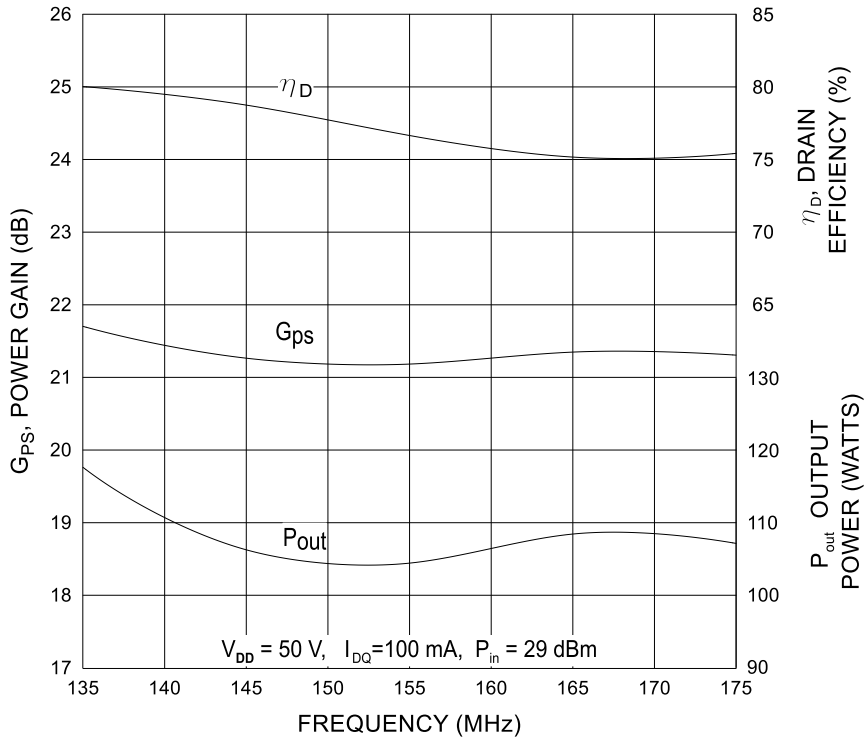
136-174 MHz (VHF) Circuit – 0.71" × 2.64" (1.8 cm × 6.7 cm)



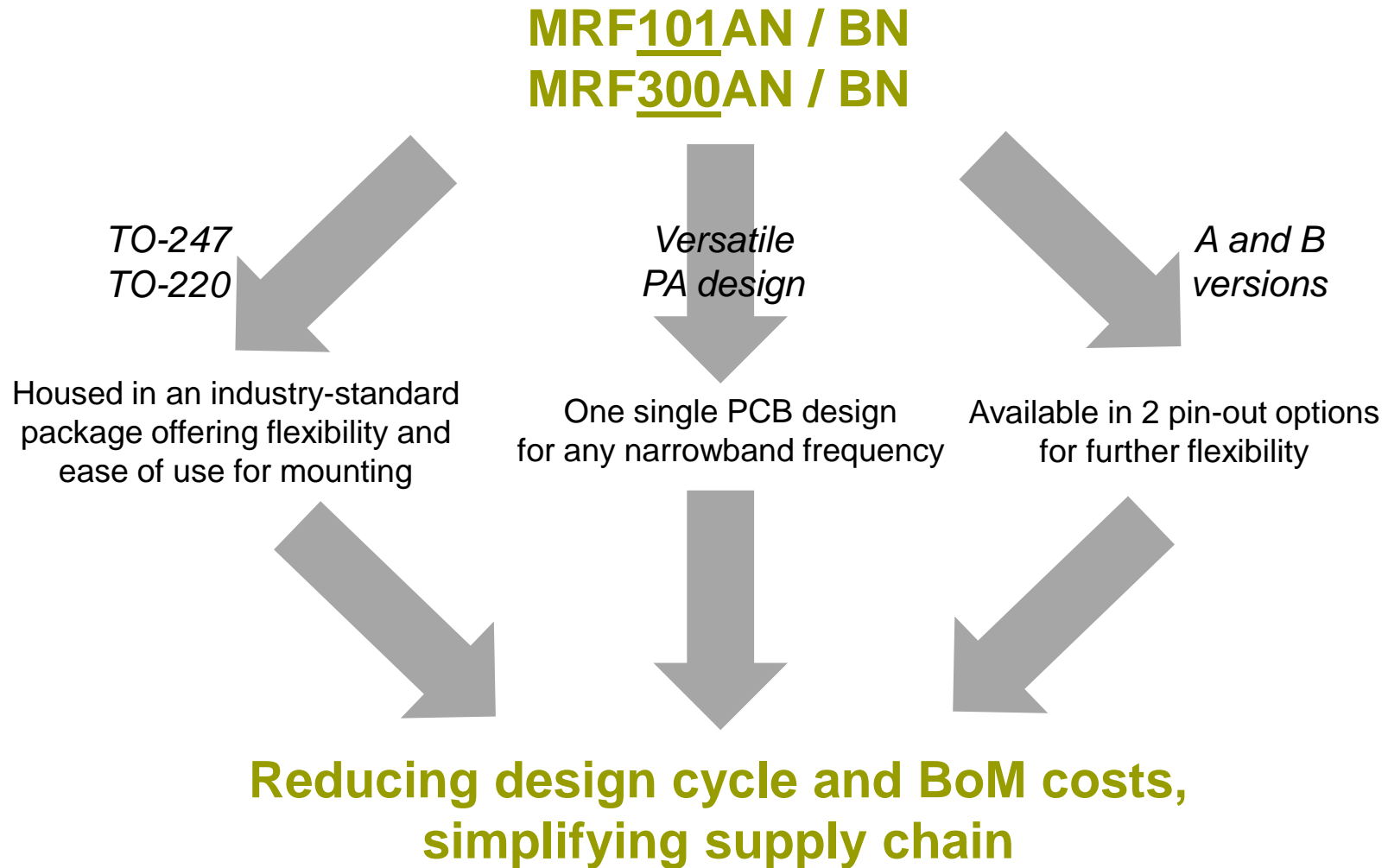
136-174 MHz (VHF) Typical Performance

Typical performance (P3dB at mid-band),
 $I_{DQ} = 100\text{ mA}$, $P_{in} = 29\text{ dBm}$, CW

Frequency (MHz)	Signal Type	Pout (W)	Gps (dB)	Eff (%)
135	CW	117	21.7	80.0
155	CW	104	21.2	76.1
175	CW	107	21.3	75.4



Summary





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