

MRF300AN 230 MHz TEST FIXTURE

ORDERABLE PART NUMBER: **MRF300AN-230MHZ**



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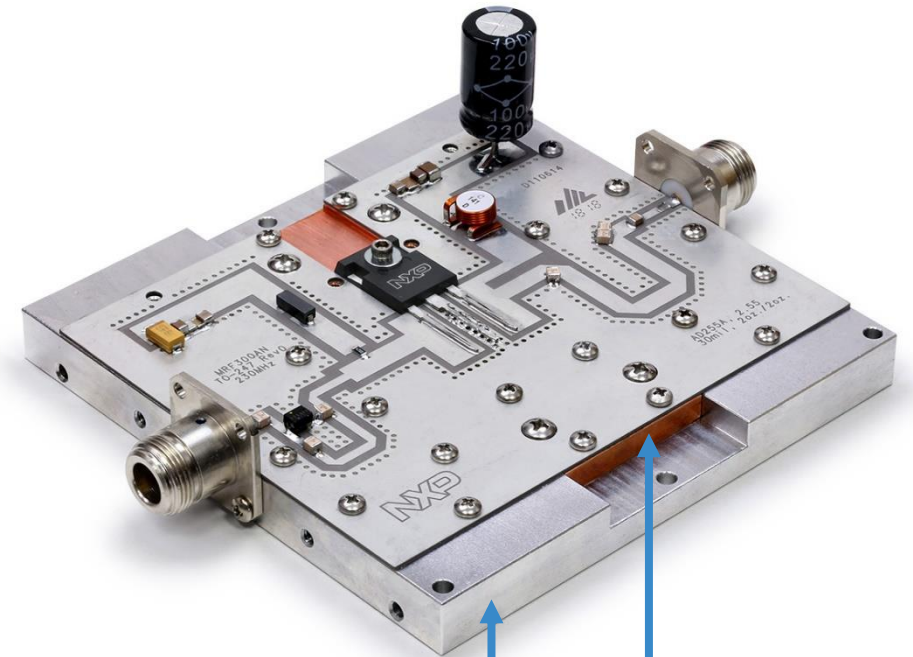
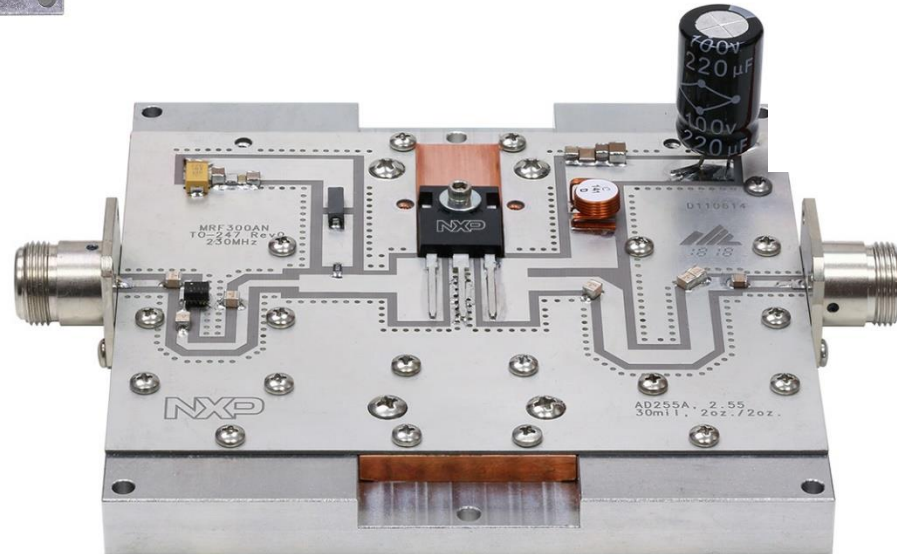
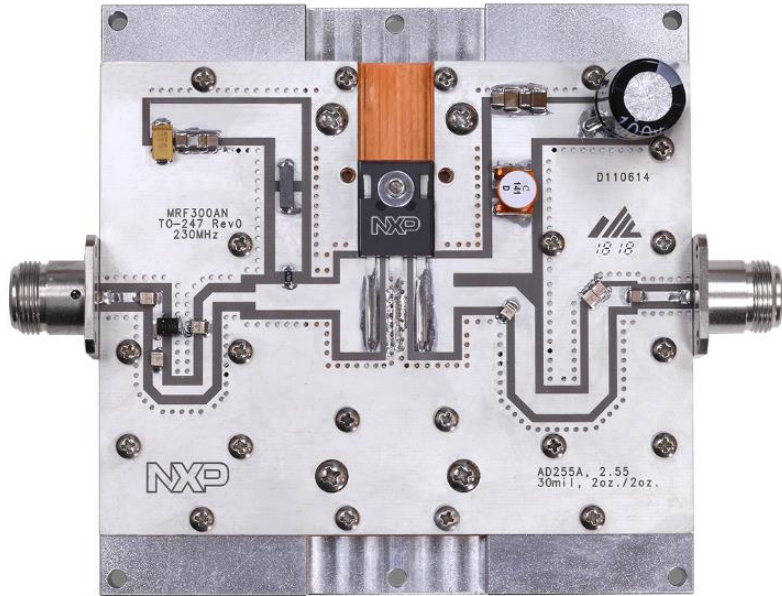
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Introduction

- The NXP MRF300AN is a 1.8-250 MHz, 300 W CW RF power LDMOS housed in a TO-247 over-molded plastic package. Its unmatched input and output allows wide frequency range utilization.
 - Further details about the device, including its data sheet, are available on www.nxp.com/MRF300AN.
- The following pages describe the 230 MHz pulse test fixture.
- The test fixture can be ordered through NXP's distribution partners and etailers using part number MRF300AN-230MHZ.



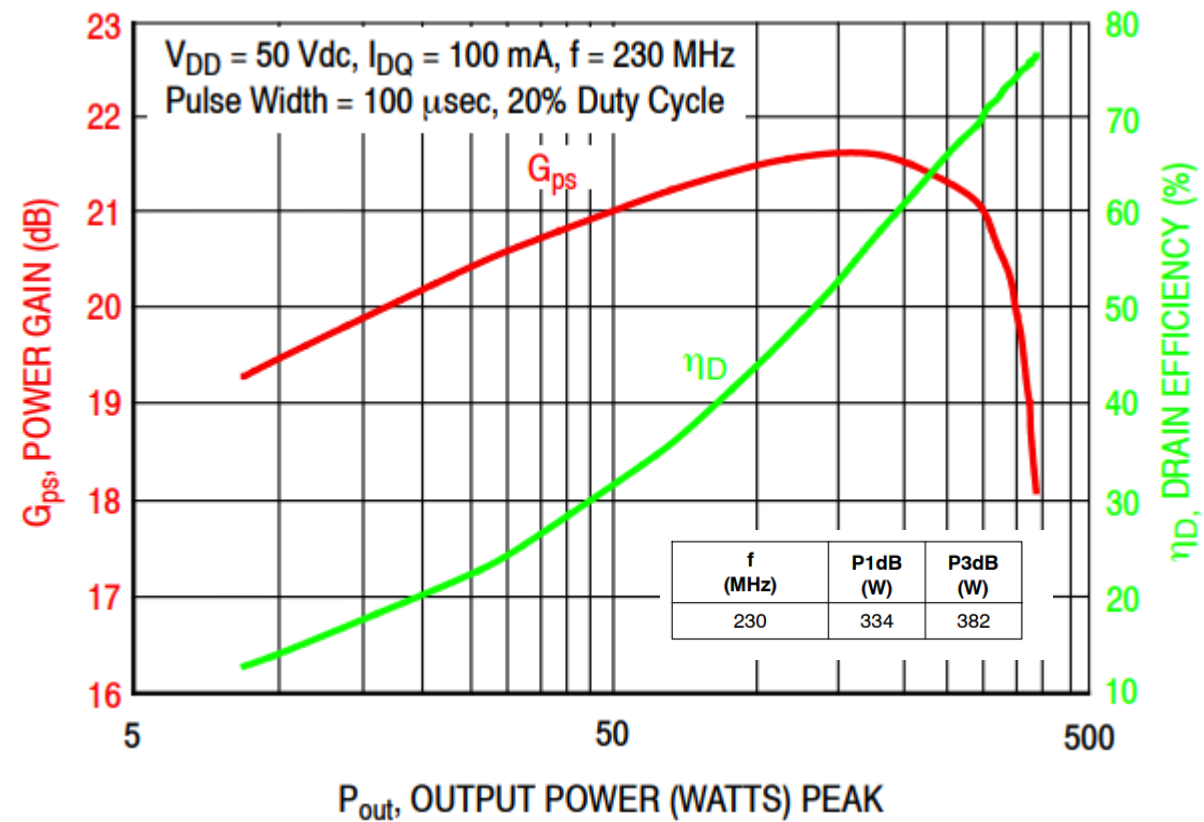
Circuit Overview – 10.16 cm × 12.70 cm (4.0" × 5.0")



Copper insert

Aluminum baseplate

Typical Performance 1/2

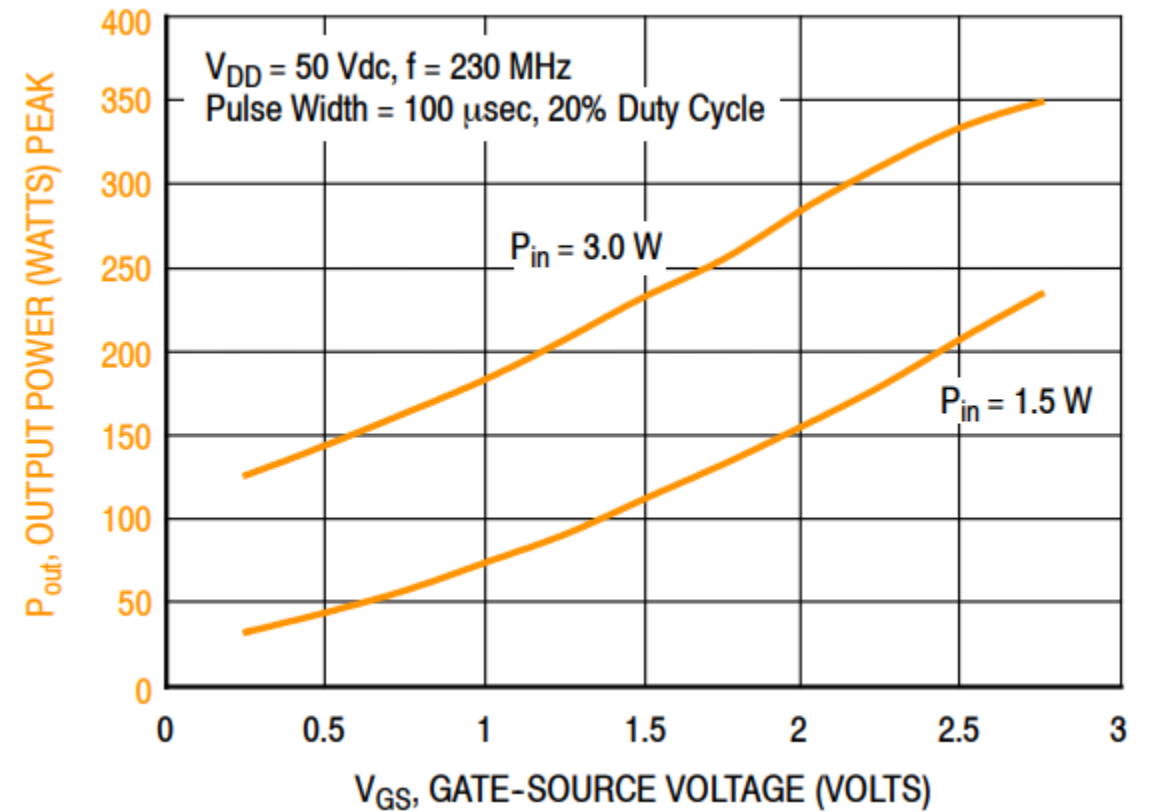
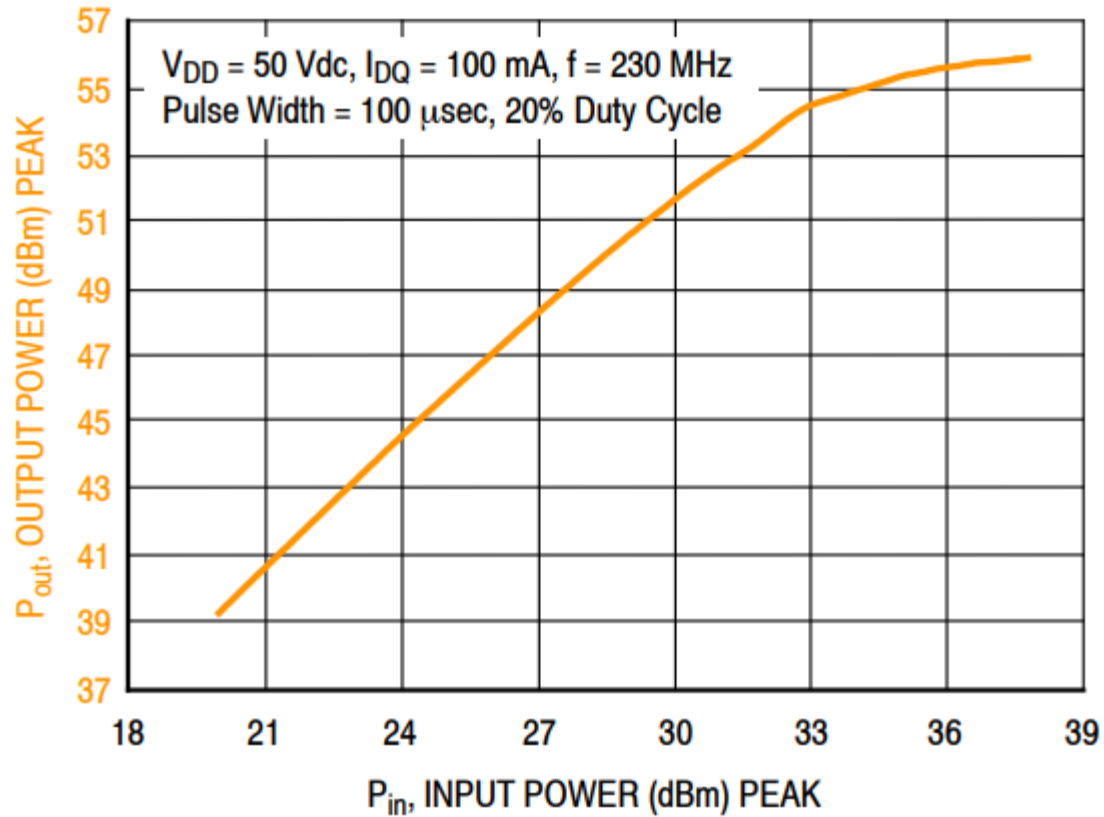


Typical P1dB Performance: $V_{DD} = 50$ Vdc, $I_{DQ} = 100$ mA , $P_{in} = 3$ W (34.8 dBm)

Frequency (MHz)	Signal Type	Output Power (W)	Power Gain (dB)	Drain Efficiency (%)
230	Pulse (100 μ sec, 20% Duty Cycle)	330 Peak	20.4	75.5

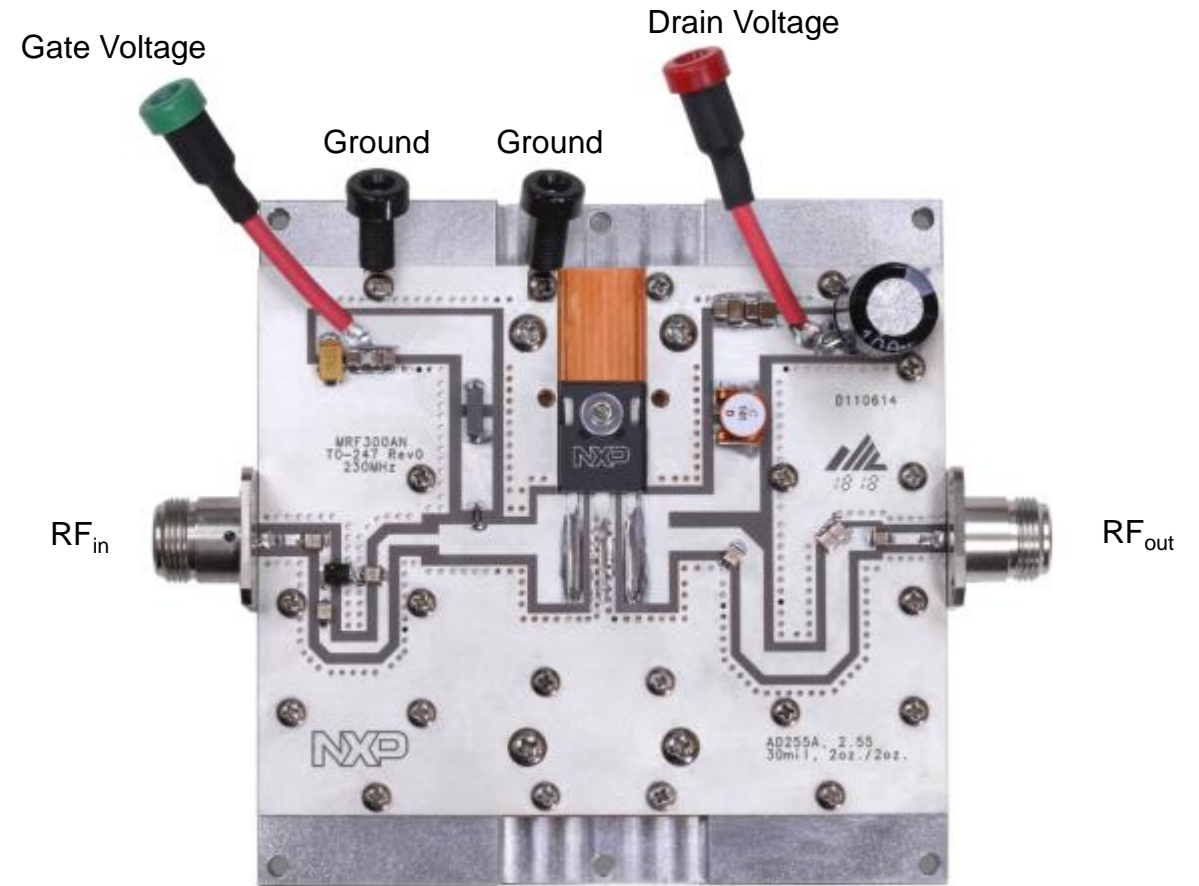


Typical Performance – 2/2

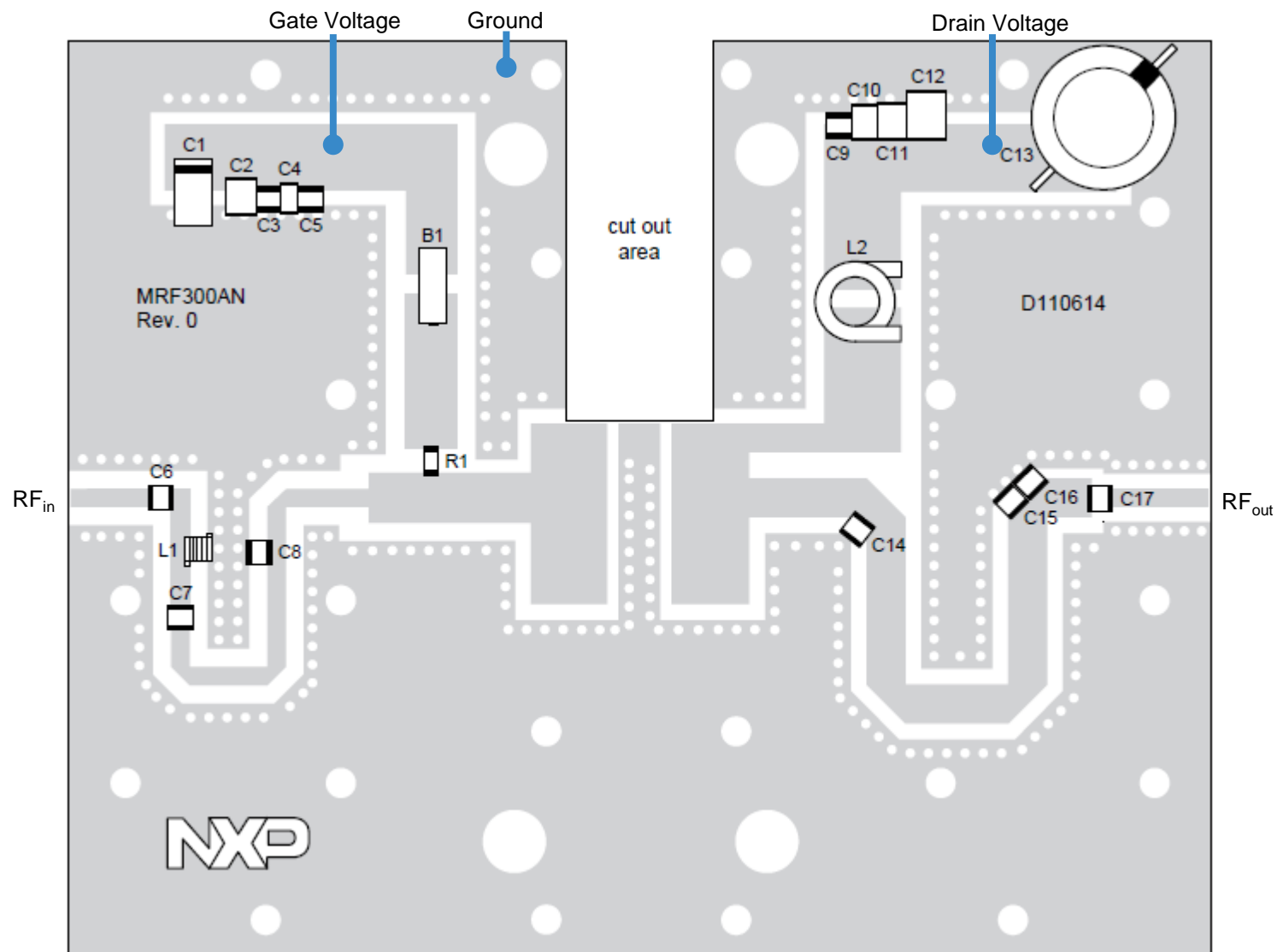


Quick Start

1. Mount the reference circuit onto a heatsink capable of dissipating more than 25 W in order to provide enough thermal dissipation (the circuit is capable for more but has been measured in pulse conditions).
2. Connect the ground.
3. Terminate the RF output with a 50 ohm load capable of handling more than 330 W peak power.
4. Connect the RF input to a 50 ohm source with the RF off.
5. Connect the gate voltage, set to 0 V.
6. Connect the drain voltage (V_{DD}) and raise it slowly to 50 Vdc. Current should be 0 A.
7. Raise the gate voltage slowly until the drain current reaches the desired level (drain quiescent current $I_{DQ} = 100$ mA typically). The gate voltage should be around 2.5 V.
8. Set the RF input to pulse conditions (typically 100 μ s pulse width with 20% duty cycle).
9. Raise the RF input slowly to 3 W (34.8 dBm).
10. Check the RF output power (typically 330 W pulse), the drain DC current (around 9 A peak for this power level) and the temperature of the board.



Component Placement Reference



Bill of Materials

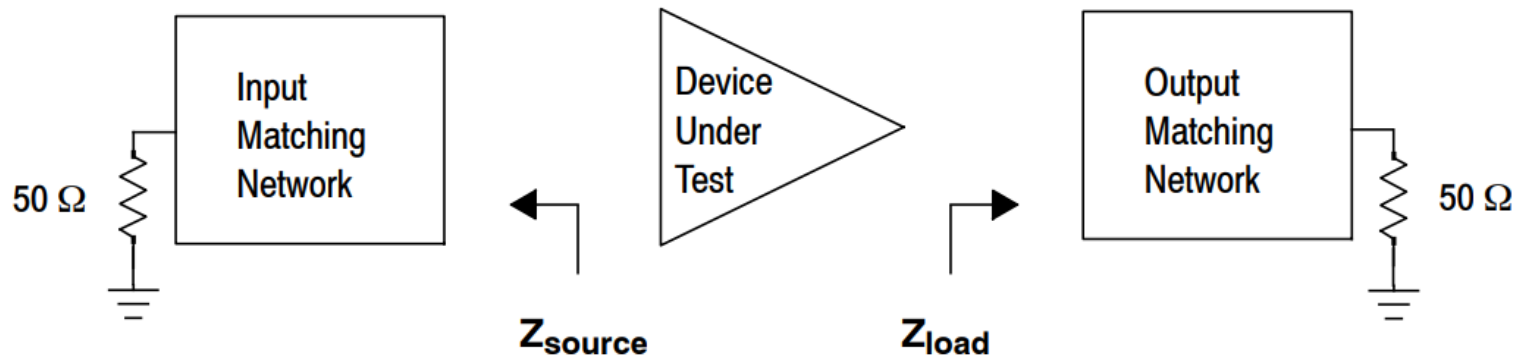
Part	Description	Part Number	Manufacturer
B1	Long Ferrite Bead	2743021447	Fair-Rite
C1	47 μ F, 16 V Tantalum Capacitor	T491D476K016AT	Kemet
C2	2.2 μ F Chip Capacitor	C3225X7R1H225K250AB	TDK
C3	10 nF Chip Capacitor	C1210C103J5GACTU	Kemet
C4	0.1 μ F Chip Capacitor	GRM319R72A104KA01D	Murata
C5, C9	1000 pF Chip Capacitor	ATC800B102JT50XT	ATC
C6, C7	18 pF Chip Capacitor	ATC100B180JT500XT	ATC
C8, C14	56 pF Chip Capacitor	ATC100B560CT500XT	ATC
C10	0.1 μ F Chip Capacitor	C1812104K1RACTU	Kemet
C11	2.2 μ F Chip Capacitor	C3225X7R2A225K230AB	TDK
C12	2.2 μ F Chip Capacitor	HMK432B7225KM-T	Taiyo Yuden
C13	220 μ F, 100 V Electrolytic Capacitor	MCGPR100V227M16X26	Multicomp
C15	1.2 pF Chip Capacitor	ATC100B1R2BT500XT	ATC
C16	24 pF Chip Capacitor	ATC100B240JT500XT	ATC
C17	470 pF Chip Capacitor	ATC800B471JT200XT	ATC
L1	47 nH Chip Inductor	1812SMS-47NJLC	Coilcraft
L2	146 nH Chip Inductor	1010VS-141NME	Coilcraft
R1	470 Ω , 1/4 W Chip Resistor	CRCW1206470RFKEA	Vishay
PCB	Rogers AD255C 0.030", $\epsilon_r = 2.55$, 2 oz. Copper	D110614	MTL

Impedances

f MHz	Z_{source} Ω	Z_{load} Ω
230	$1.77 + j1.90$	$2.50 + j0.78$

Z_{source} = Test circuit impedance as measured from gate to ground.

Z_{load} = Test circuit impedance as measured from drain to ground.



Revision History

- The following table summarizes revisions to the content of the MRF300AN 230 MHz Test Fixture zip file.

Revision	Date	Description
0	September 2019	• Initial Release





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