MR500XB

50/100 W, 28/40 V, 8.0-10.5 GHz, GaN PA MMIC

Product Features

- Radar band 8.0-10.5 GHz
- Supply voltage 28/40 V
- Saturated output power 50/100 W
- Drain efficiency 36.5/35.2%
- 3-stage power amplifier MMIC
- GaN-HEMT MMIC
- 4.71×7.24 mm^2 size bare die

4.71 mm × 7.24 mm bare die

Applications

- Air Defense Radar
- Weather Radar

Description

The MR500XB is a fully integrated 3-stage power amplifier MMIC designed for radar applications, covering frequency range from 8.0 GHz to 10.5 GHz. The device delivers saturated output power of 50/100 W and has more than 35.2% drain efficiency with operating drain voltage of 28/40 V.

Electrical Specifications

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	CONDITIONS
Frequency range	f	8.0		10.5	GHz	
Small signal gain	G		26.0/28.5		dB	
Gain flatness	ΔG	0.1		2.3	dB	Over any 500 MHz bandwidth
Input return loss	S_{11}		15		dB	
Output return loss	S_{22}		7		dB	
Saturated output power	P_{sat}	47.2/49.7		48.8/50.2	dBm	
Drain efficiency	η	36.5/35.2		41.0/41.9	%	

Note: I_q=450/550 mA, V_{dd}=28/40 V, T=+25°C, 100 μs / 2% pulsed CW signal

DC Characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	CONDITIONS
Gate threshold voltage	V_{GS_TH}		-2.6		V	
Gate quiescent voltage	V_{GS_Q}		-2.3		V	
Saturated drain current	I_{D_SAT}	4900		7200	mA	
Drain-source breakdown voltage	V_{D_B}		120		V	

Absolute Maximum Ratings

PARAMETER	SYMBOL	RATING	UNIT	CONDITIONS
Drain-source voltage	V_{DSS}	120	V_{DC}	
Gate-source voltage	V_{GS}	-10, +2	V_{DC}	

Electrostatic Discharge (ESD) Classifications

PARAMETER	SYMBOL	CLASS	TEST METHODOLOGY
Human body model	HBM	TBD	TBD
Charge device model	CDM	TBD	TBD

Figure 1. Gain and return losses vs. frequency

V_{DD}=28 V, I_Q=450 mA, T=25℃

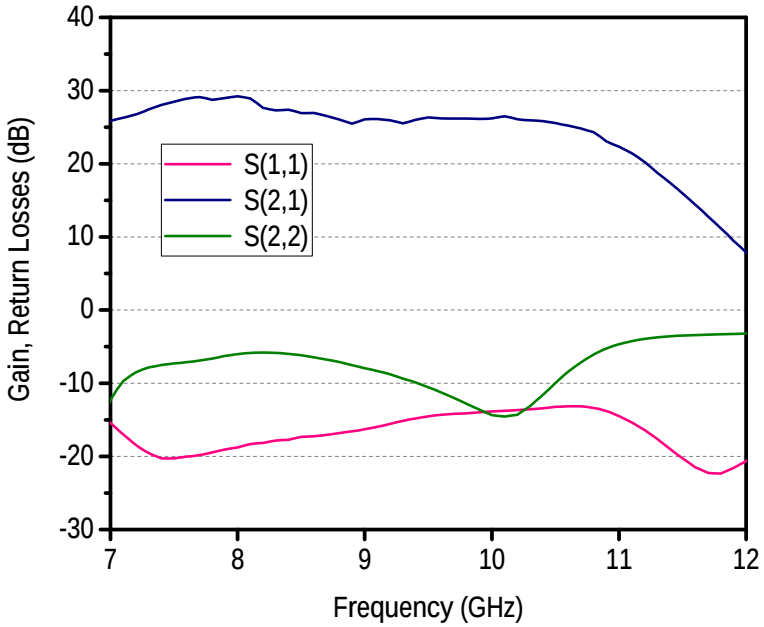


Figure 2. Gain and return losses vs. frequency

V_{DD}=40 V, I_Q=550 mA, T=25℃

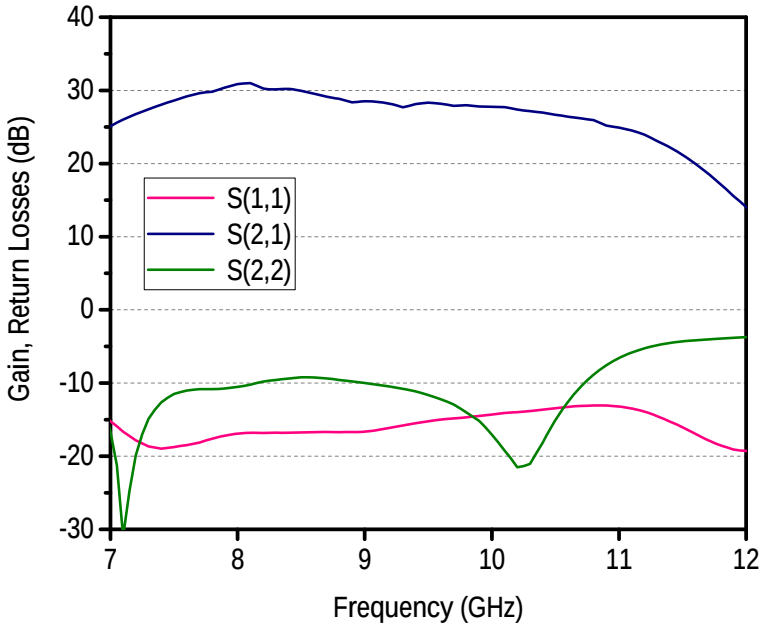


Figure 3. Output power, gain, and drain efficiency vs. frequency
V_{DD}=28 V, I_Q=450 mA, T=25℃, pulse width=100 μs, duty cycle=2%

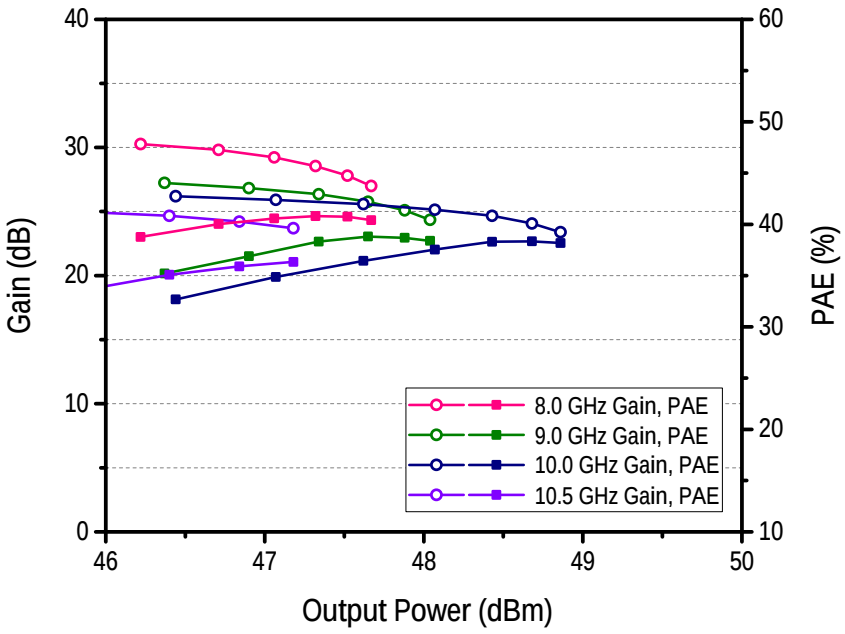
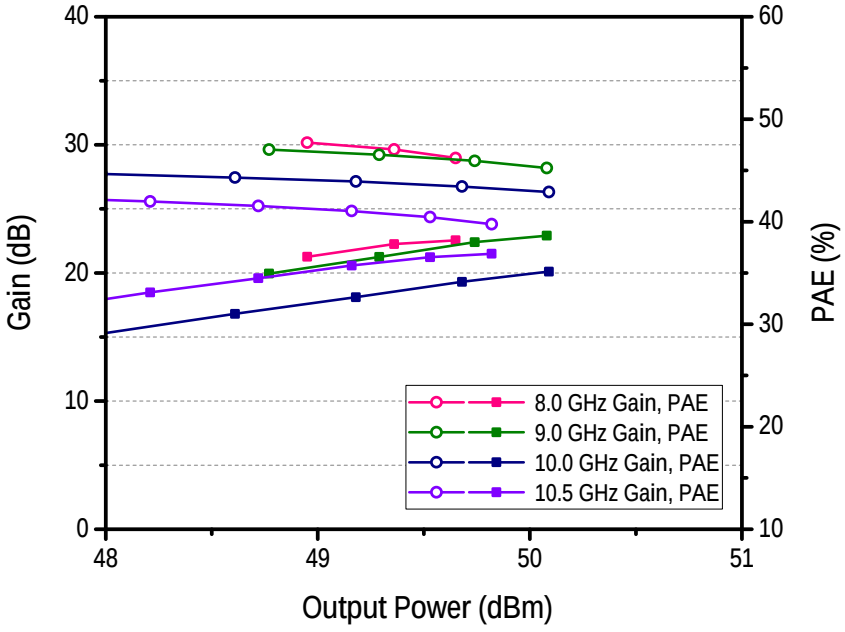
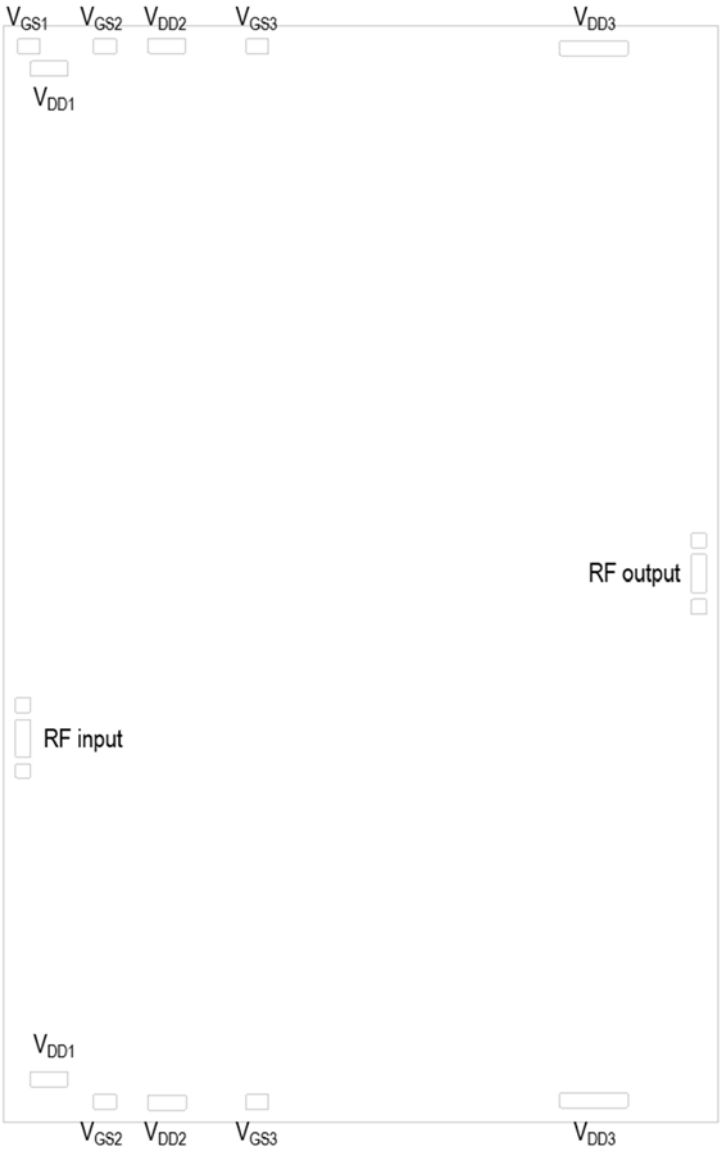


Figure 4. Output power, gain, and drain efficiency vs. frequency
V_{DD}=40 V, I_Q=550 mA, T=25℃, pulse width=100 μs, duty cycle=2%



MR500XB Pin Map



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