Preliminary

GaN Power Amp Pallet

RNP24550-21

Product Features

- 2400 ~ 2500MHz (ISM band)
- 550W CW Peak Power @ 50V
- 55% Drain Efficiency @ 50V
- Excellent Ruggedness
- Excellent Thermal Stability

Applications

- Industrial Heating and Drying
- Scientific
- Medical
- Plasma Lighting

Description

The RNP24550-21 is designed for Industrial, Scientific, Medical (ISM) and Plasma Lighting applications at 2450MHz. This Amplifier is suitable for use in CW, pulse and linear applications. This high efficiency rugged device is targeted to replace Industrial magnetrons and other vacuum tubes currently powering industrial heating, drying, plasma lighting and medical systems.

Electrical Specifications @ V_{DS} =50V, T=25°C, 50Ω System

PARAMETER		UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency		MHz	2400	-	2500	f_O
Operating Bandwidth		MHz	-	100	-	OBW
CW Output Power		dBm	57.4	-	-	Po
Input Power		dBm	-	14.4	-	P_I
Power Gain		dB	43	-	-	G_P
Gain Flatness		dB	-	-	±0.5	G_F
Input Return Loss		dB	-	-	-10	S_{11}
Operating Voltage		V	V_{DC1}: 5.6±1%			-
			V_{DC2}:50 ±1%			
Current Consumption	5.6V	-	-	0.1	0.15	IDD
	50V		-	20	-	
Efficiency @ 57.4dBm		%	55	-	-	Eff
Forward & Reverse Power Detector		V	3.0 ~ 4.0V (Pout:50~57.4dBm)			-
Temp Detector		V	0.9V @ 40°C (1°C/0.01V)			-

* Custom design available

Environmental Characteristics

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Case Temperature	℃	0	-	65	Ta
Storage Temperature	℃	-40	-	100	Tstg
Relative humidity w/o condensation	%	-	-	95	RH

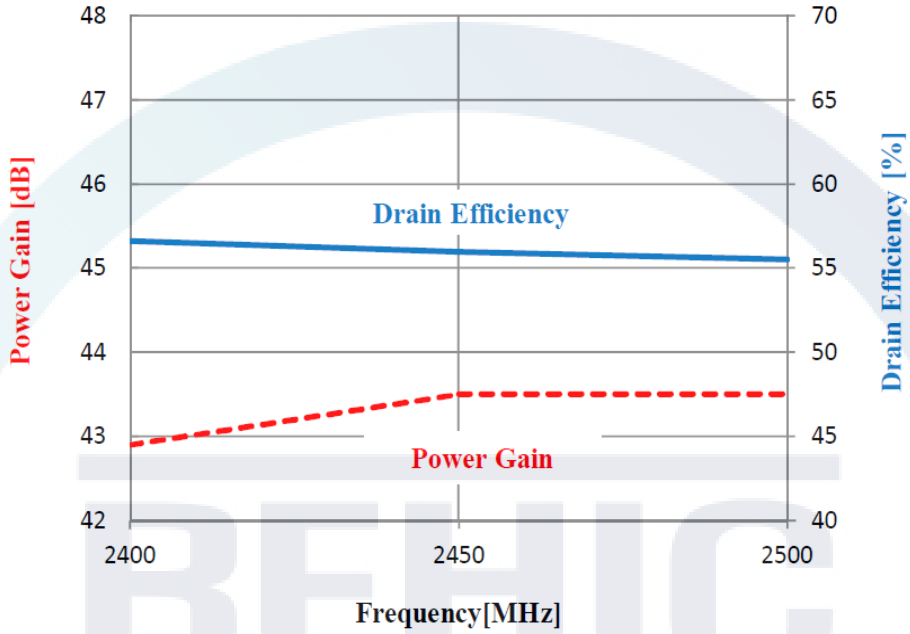
Mechanical Specifications

PARAMETER	UNIT	VALUE
Dimensions (L x W x H)	mm	240 x 198 x 26
Weight	Kg	1.15
RF Input Connector	-	SMA (Female)
RF Output Connector	-	N-type (Female)
I/O Connector	-	D-sub 7W2 (CONEC)
Cooling	-	External Heat-sink & Airflow

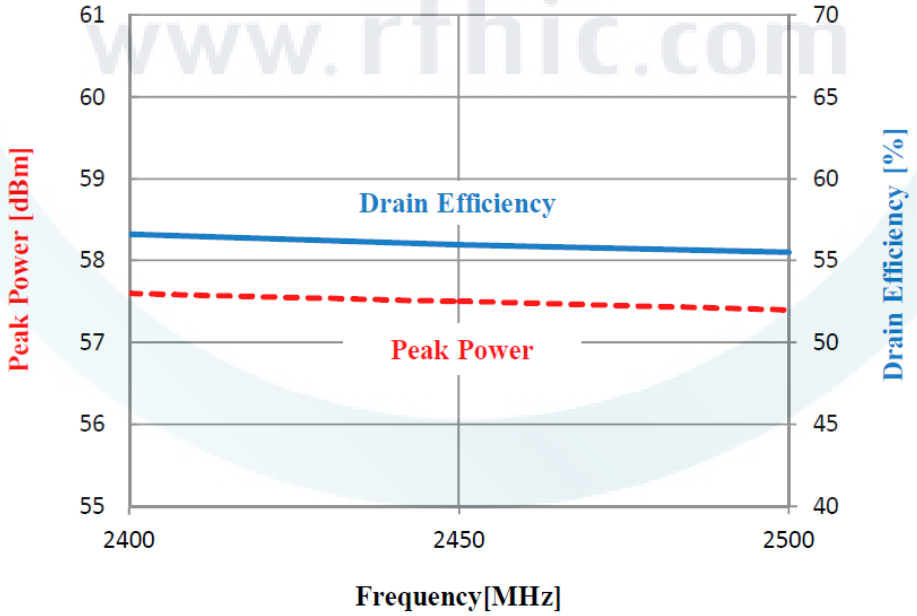
Typical CW Performance Charts

*** Bias condition** (VDS=50V, Tc=25℃)

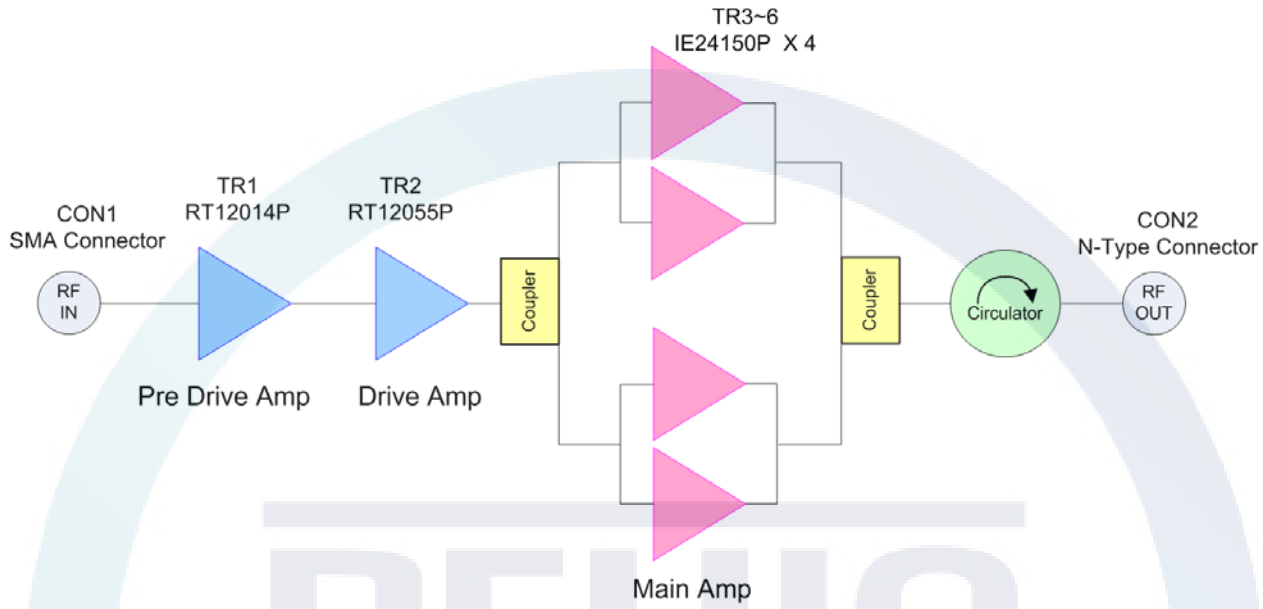
Peak Power, Drain Efficiency vs. Frequency



Power Gain, Drain Efficiency vs. Frequency



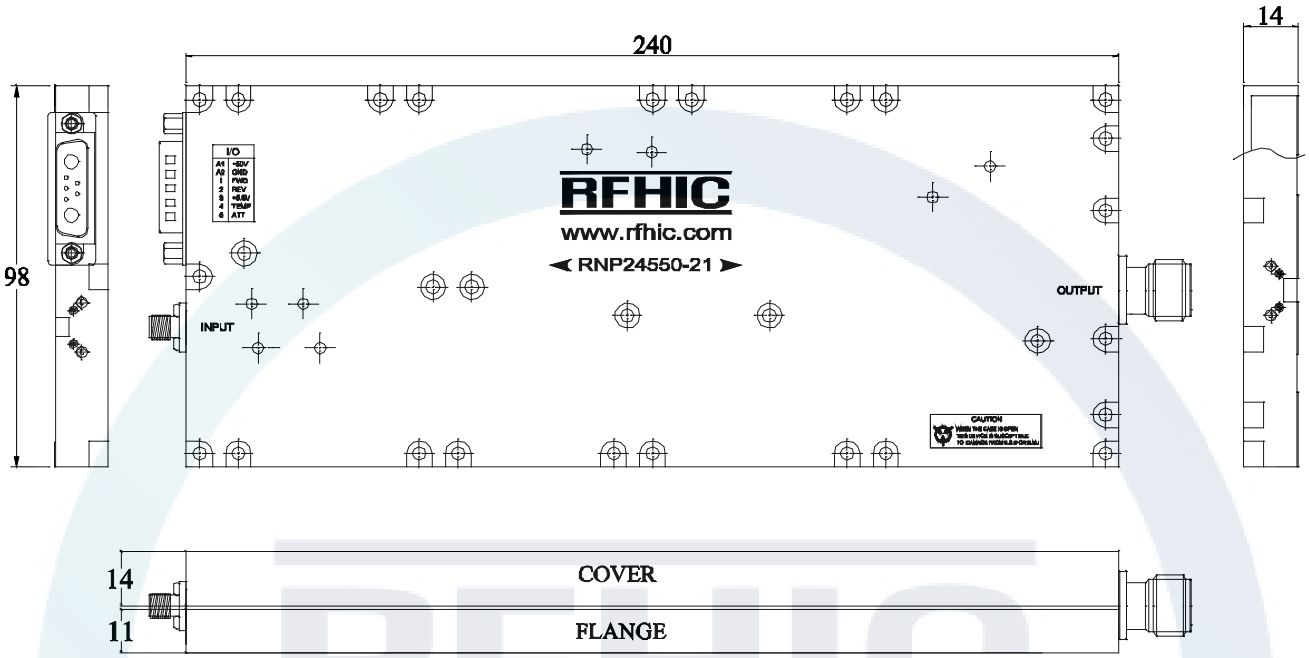
Block Diagram



Characteristic	Unit	RF IN	Variable Attenuator	Pre Driver GaN Amplifier	Driver GaN Amplifier	Symmetric Amplifier	Circulator	RF Out
Pout @ PSAT	dBm	14.4	11.4	28.2	43.4	57.9	-0.5	57.4
Power Gain @ PSAT	dB	-	-3	16.8	15.2	14.5	-0.5	43
Current	A	-	-	0.4	1.6	18	-	20
Efficiency	%	-	-	67.5	68.7	62.4	-	55
Package (or Size)	mm	-	-	NS-CS01	NS-CS01	NS-AS01	25.4*25.4	-

Outline Drawing

* Unit: mm | Tolerance: ±0.2



Note
Connector positions and module mount holes may be subjected change.

Interface Connector

7 Pin-Control (7W2)

Pin No	Description
A1	+50V
A2	GND
1	Forward power detecting
2	Reverse power detecting
3	+5.6V
4	Temperature monitor
5	0 ~+5V (Analog ATT)

Revision History

Part Number	Release Date	Version	Description	Data Sheet Status
RNP24550-21	Mar, 2018	1.0	Initial release of datasheet	-
RNP24550-21	Sep, 2018	2.0	Modify Operating Case Temperature	-