Pulse Amp Pallet

RRP54591K3-43

Product Features

- Frequency from 5.4 ~ 5.9GHz
- GaN HEMT
- 50 Ohm Input/Output impedance
- High efficiency

Applications

- Radar system

Description

The RRP54591K3-43 is a 1.3 kW C-band GaN solid-state power amplifier (SSPA) covering the 5.4 to 5.9 GHz frequency range. Engineered for pulsed radar applications, this GaN HEMT power amplifier delivers high breakdown voltage, wide bandwidth, and high efficiency in a compact, rugged form factor. Leveraging GaN-on-SiC HEMT technology, the module provides 1300 W typical output pulse power, 43 dB power gain, and up to 30% efficiency across the C-band. Its 50 Ohm input/output impedance and pallet design make this solid-state power amplifier well suited for C-band radar, defense, and aerospace microwave systems that demand reliable high-power RF amplification.

Electrical Specifications @ $V_{DS}1$=50V, $V_{DS}2$=6V T=25°C, 50Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	5400	-	5900	f_O
Operating Bandwidth	MHz	-	500	-	BW
Output Pulse Power	W	1120	1300	-	P_O
Input Pulse Power	dBm	-	19	-	P_I
Power Gain	dB	41.5	43	-	G_P
Gain Flatness	dB	-	-	±0.5	ΔG_P
Duty Cycle	%	-	-	10	DC
Pulse Width	us	1	100	200	PW
Efficiency	%	25	30	-	E_{ff}
Amplitude Pulse Droop	dB	-	0.7	1.0	Droop
Harmonics 1 to N	dBc	40	-	-	H_N
Spurious Level	dBc	60	-	-	Spur
Rise Time	ns	-	-	100	t_r
Fall Time	ns	-	-	100	t_f
Input VSWR	dB	-	-	1.5:1	VSWR
Output VSWR	dB	-	-	1.5:1	VSWR
Switching Time	us	-	0.1	-	t_{SW}
Phase Deviation	°	-20	-	20	Δφ

∗ Test Pulse conditions = 100us, 10%

∗ Custom design available

Absolute Maximum Ratings

PARAMETER	UNIT	RATING	SYMBOL
Operating Flange Temperature	°C	-20 ~ 65	T_C
Flange Temperature	°C	-20 ~ 85	$T_{C,MAX}$
Storage Temperature	°C	-40 ~ 125	T_{STG}

* Operating Flange Temperature (TC): flange (case) temperature range over which all specified electrical performance is guaranteed. Flange Temperature (TC,MAX): absolute maximum flange (case) temperature the device can withstand without permanent damage; electrical performance is not guaranteed at this limit (survival rating).

Operating Voltages

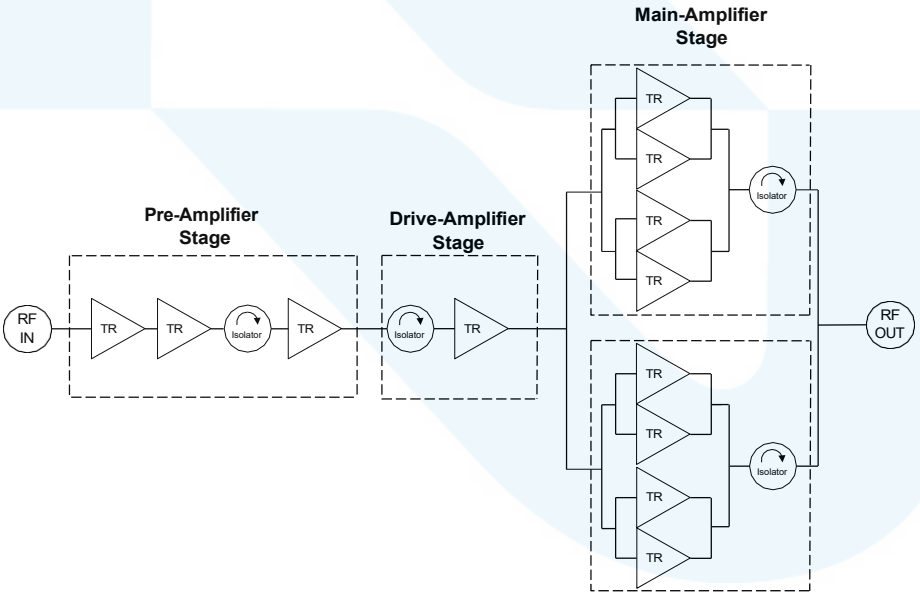
PARAMETER	UNIT	NOMINAL VOLTAGE	VOLTAGE ACCURACY	SYMBOL
Drain-Source Voltage	V	50	± 2%	$V_{DS}1$
Drain-Source Sub Voltage	V	6	± 2%	$V_{DS}2$
On/Off Control Voltage	V	TTL Low(0V) : PA OFF, TTL High(5V) : PA ON		-
Peak Monitor Voltage	V	1.5V@5.65GHz, 60dBm (dB/30mV)		-
Temp Monitor Voltage	V	0.75V@25℃ (1℃/0.01V)		-

Power Supply

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Drain-Source Current(AVG)	A	-	8.0	10	$I_{DS}1$
Drain-Source Sub Current(AVG)	A	-	0.03	0.05	$I_{DS}2$

* Duty Cycle 10%, Pulse Width 200us

Block diagram

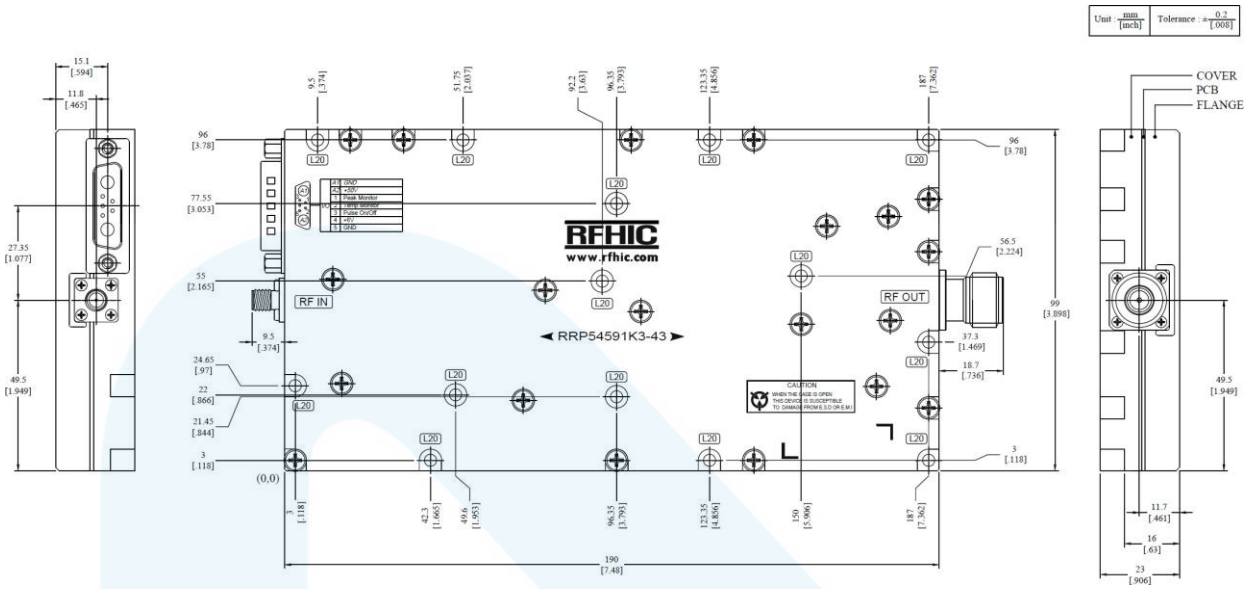


Mechanical Specifications

PARAMETER	UNIT	TYP
Mass	kg	0.8
Dimension	mm	190 x 99 x 23
RF Connector	-	SMA Female : RF Input
		N Female : RF Output
DC Connector	-	D-Sub 7-Pin(7W2), Male : Supply

Outline Drawing

* Unit: mm[inch] | Tolerance ±0.2[.008]



Pin Description

Pin No	Description	Pin No	Description
A1	GND	1	Peak Monitor
A2	V_{DS1}(+50V)	2	Temp Monitor
		3	Pulse On/Off
		4	V_{DS2}(+6V)
		5	GND

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RRP54591K3-43	2019.11.22	0.1	-	Preliminary
RRP54591K3-43	2020.01.13	0.2	-	Preliminary
RRP54591K3-43	2020.01.28	0.3	-	Preliminary
RRP54591K3-43	2026.06.24	1.0	Updated pulse width specification for 200 µs version; released production version.	Production

Certification

This product is manufactured by a company that is certified for the AS9100D quality management system.