Product Features

- GaN on SiC Technology
- Surface Mount Hybrid Type
- Compact Size
- 50 Ohm Input/Output Impedance

Application

- S-Band Radar System

Package Type : UP-1F

Description

• HR3135-10A is FEM operating at 3.1-3.5GHz (TX) & 2.9~3.5GHz (RX).
• Ant port switch provides duplexer function and has a built in Limiter Diode which protects receiver.
• Receiver switches between LNA-mode and Bypass-mode.
• Built with Aluminum nitride (AlN)-PCBs for excellent thermal dissipation.
• Bias sequencing is required.

TX Electrical Specifications @ Ta=25°C, 50Ω System

PARAMETER		UNIT	MIN	TYP	MAX	Remark
Frequency		GHz	3.1	-	3.5	
Pulse width		us	-	-	100	
Duty Cycle		%	-	-	10	
Input Power		dBm	-	20	-	
Power Gain		dB	21	21.5	-	
Peak Output Power		dBm	41	41.5	-	
Efficiency		%	40	45	-	Pout @ Peak
VSWR	**S11**	-	-	-	2	
Operating Voltage		V	DC +50V, DC +5V, DC +3V DC -3.3V, DC -5V			Control Condition Truth Table

- **Caution: The drain voltage must be supplied to the device after the gate voltage is supplied**

  Turn on → Turn on the Gate voltage supply and last turn on the Drain voltage supplies

  Turn off → Turn off the Drain voltage and last turn off the Gate voltage

RX Electrical Specifications @ Ta=25°C, 50Ω System

PARAMETER		UNIT	MIN	TYP	MAX	Remark
Frequency		GHz	2.9	-	3.5	
RX LNA S21 mean. Gain		dB	18.5	-	21.5	
RX Bypass S21 mean. Gain		dB	-21	-	-19	
RX LNA Noise Figure		dB	-	-	3.5	
VSWR	RX LNA S11	-	-	-	2.5	
	RX LNA S22		-	-	2.1	
	RX Bypass S11		-	-	2.1	
	RX Bypass S22		-	-	2	
Operating Voltage		V	DC +50V, DC +5V, DC +3V DC -3.3V, DC -5V			Control Condition Truth Table

Environmental Specifications

Operating Case Temperature	-30℃ to +85℃

Mechanical Specifications

Dimension (W × D × H)	24mm X 14mm X 3.9mm
Weight	2.5 g

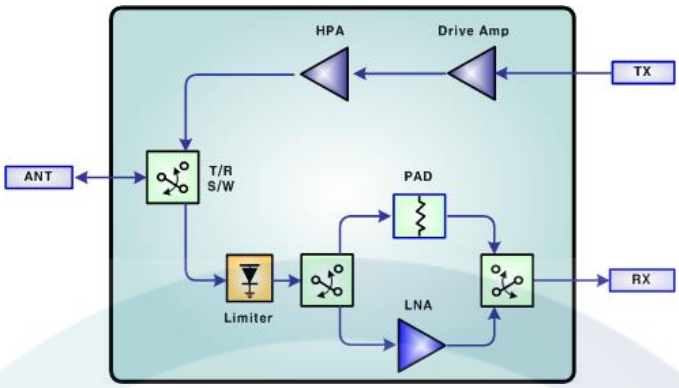
Pin Description

Pin No	Function	Description
1	Switch ANT Bias	Common Switch Control (TTL)
2	ANT Port	-
3	Switch RX Bias	Common Switch Control (TTL)
4	RX Bypass Path Enable	RX Bypass Path Control (LVTTL)
5	RX LNA Path Enable	RX LNA Path Control (LVTTL)
6	LNA Shut Down	LNA Shut Down Pin (LVTTL)
7	LNA Bias	LNA Operating Voltage Pin (TTL)
8	RX LNA Path Enable	RX LNA Path Control (LVTTL)
9	RX Output Port	-
10	RX Bypass Path Enable	RX Bypass Path Control (LVTTL)
11	TX Input Port	-
12	TX Drive Amp Bias	TX Drive Amp Operating Pin (TTL)
13	TX GaN Amp Vgs	TX GaN Amp Gate Bias **(-3.3V & -5V)**
14	TX GaN Amp Vds	TX GaN Amp Drain Bias (+50V)
15	Switch TRX Bias	Common Switch Control (TTL)

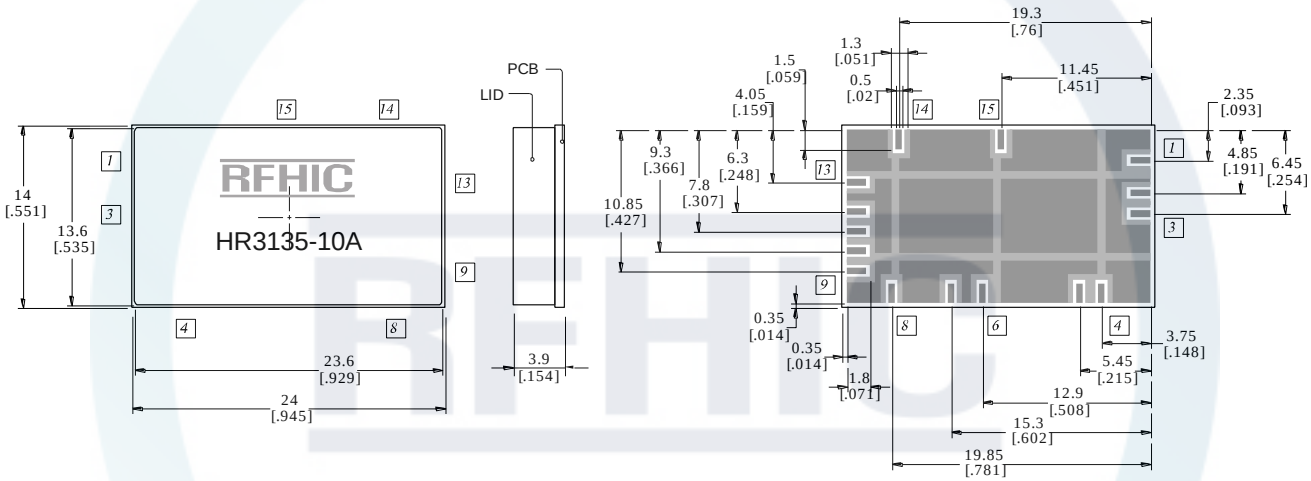
Control Condition Truth Table

Path	ANT Bias	RX Bias	TRX Bias	TX GaN Drain	TX GaN Gate	TX Drive Amp	LNA BIAS	LNA S/D	Bypass CTRL	RX Main CTRL
TX	5V	5V	0	50V	-3.3V	5V	5V	3V	3V	0
RX LNA		0	5V		-5V	0		0	0	3V
RX Bypass								3V	3V	0

Block Diagram

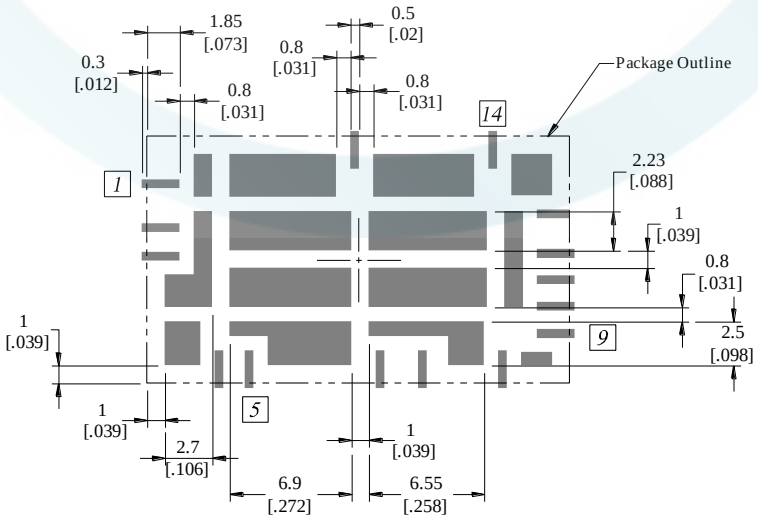


Package Dimension (Type : UP-1F)



* Unit: mm[inch] | Tolerance: ±0.15[.006]

Recommended Pattern



Precautions

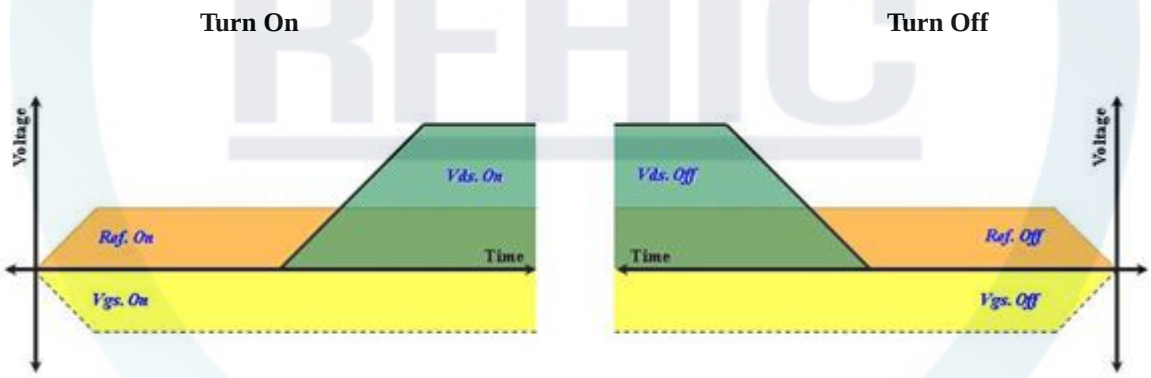
This product is a Gallium Nitride Transistor.
The Gallium Nitride Transistor requires a Negative Voltage Bias which operates alongside a Positive Voltage Bias. These Biases are applied in accordance to the Sequence during Turn-On and Turn-Off.
The Pallet Amplifier does not have a built-in Bias Sequence Circuit. Therefore, users need to either apply positive voltages and negative voltages in the required sequence, or add an external Bias Circuit to this Amplifier.
The required sequence for power supply is as follows.

During Turn-On

1. Connect GND.
2. Apply Vgs.
3. Apply Vds.
4. Apply the RF Power.

During Turn-Off

1. Turn off RF power.
2. Turn off Vds, and then, turn off the Vgs.
3. Remove all connections.



- Sequence Timing Diagram -

Ordering Information

Part Number	Package Design
HR3135-10A	-R (Reel)
	-B (Bulk)
	-EVB (Evaluation Board)

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
HR3135-10A	2020.07.14	0.1	The first written document	Preliminary