ATEK274N4

6 to 18 GHz 20W Reflective SPDT GaN Switch

Product Description

The ATEK274N4 is a wideband high power GaN MMIC SPDT reflective switch offering a 20W power handling operating from 6 to 18 GHz. The switch is fabricated on a Gallium Nitride on SiC process to enable high operating output power levels while maintaining fast switching speeds and minimal loss.

The ATEK274N4 exhibits insertion loss of 0.7dB while switching 20W over the full X-band frequency range with 0.3dB compression. The switch has excellent return loss and provides 35dB typical isolation.

The ATEK274N4 is housed in a compact 4x4mm SMD package with input and output matched to 50 ohms internally.

Evaluation Board, bare die, custom package, and module options are available upon request.

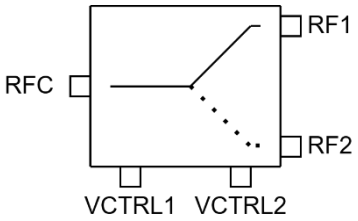
Product Features

- Frequency Range: 6 to 18 GHz
- Low Insertion Loss: 0.7 dB
- Isolation: 35dB
- Input P0.3dB: 20W
- 4x4 mm Compact Size

Applications

- Weather & Marine Radar
- Test & Measurement
- X & Ku Band Transceivers
- EW / ECM / C-UAS

Functional Block Diagram



6 to 18 GHz 20W Reflective SPDT GaN Switch

Electrical Specifications

Conditions unless otherwise specified: V_{CTRL} = 0/-40 V, Typical, T = 25 C, CW.

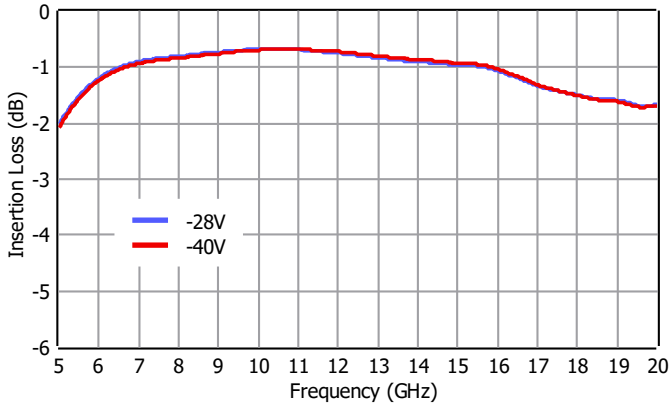
Parameter		Min	Typ	Max	Units
Operational Frequency Range		6		18	GHz
Insertion Loss	6 GHz		1.25		dB
	10 GHz		0.7		
	14 GHz		0.9		
	18 GHz		1.5		
Isolation	6 GHz		30		dB
	10 GHz		36		
	14 GHz		34		
	18 GHz		32		
Input Return Loss			-15		dB
Output Return Loss			-15		dB
Input IP3			TBD		dBm
Loss Compression at 43dBm Power In			0.4		dB
Switching Speed	On		TBD		ns
50% Vctrl to 90% of RF Output	Off		TBD		
0.1dB Settling Time			TBD		ns
Control Voltage (CTRL)	Low		0		V
	High		-40		
Control Current			0.5		mA
Operating Temperature		-40		85	°C

6 to 18 GHz 20W Reflective SPDT GaN Switch

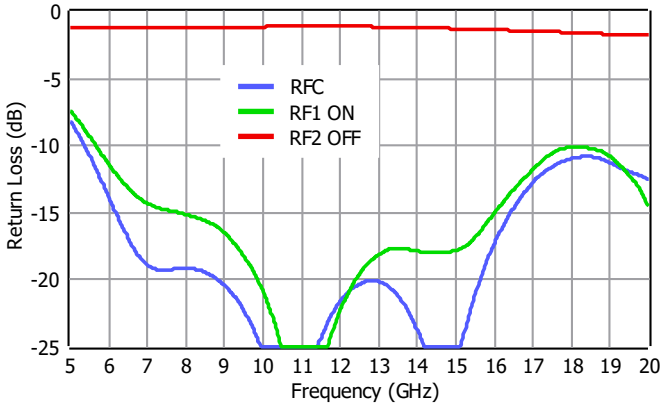
Typical Performance Plots

Conditions unless otherwise specified: V_{CTRL} = 0/-40 V, Typical, T = 25 C, CW.

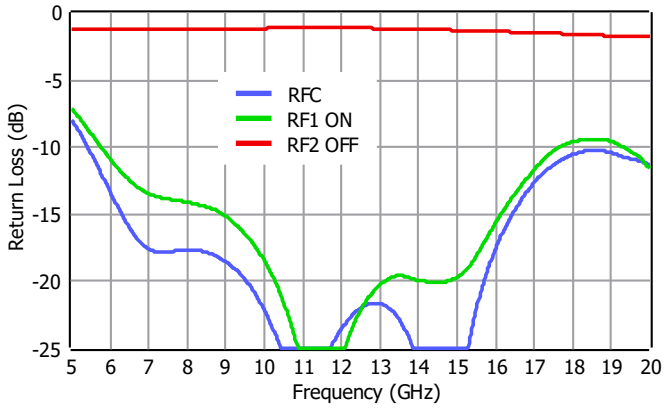
Insertion Loss



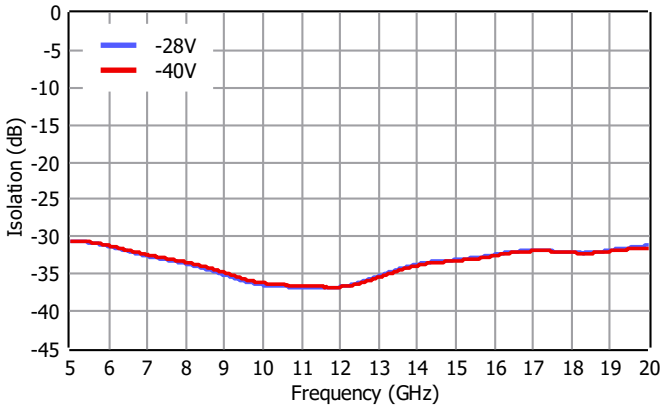
Return Loss at -28V



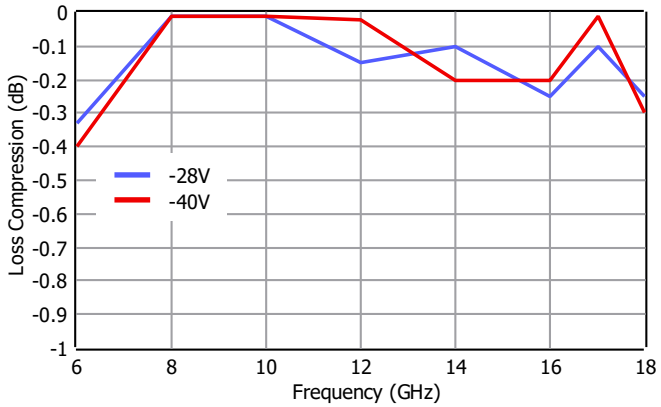
Return Loss at -40V



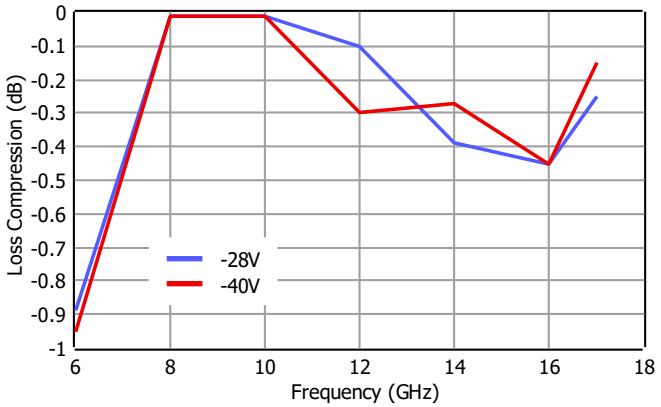
Isolation



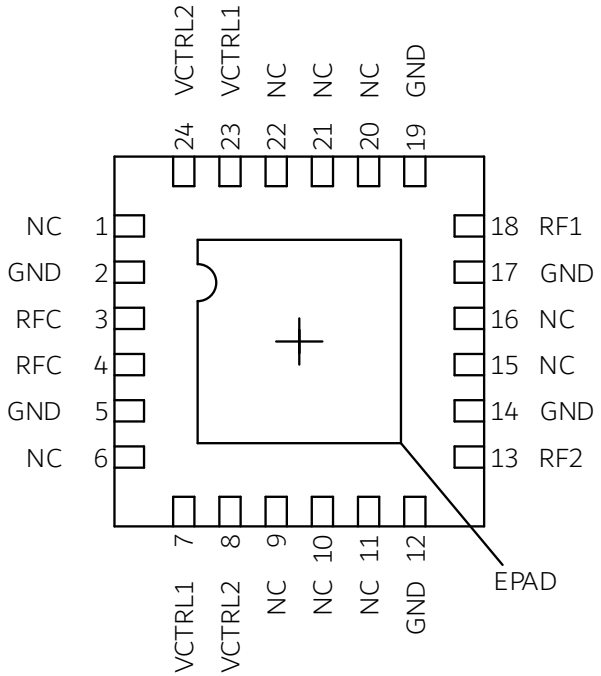
Loss Compression, Pin = +40.5dBm



Loss Compression, Pin = +43dBm



Pin Description



Top View

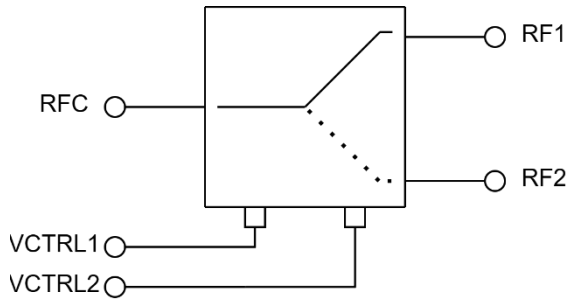
Pin Number	Pin Name	Description
3, 4	RFC	RF input pin. If the DC voltage level on RF lines is not equal to 0 V, an external DC block capacitor is required.
18	RF1	RF output pin. If the DC voltage level on RF lines is not equal to 0 V, an external DC block capacitor is required.
13	RF2	RF output pin. If the DC voltage level on RF lines is not equal to 0 V, an external DC block capacitor is required.
7, 23	VCTRL1	Control pin.
8, 24	VCRTL2	Control pin.
1, 6, 9-11, 15, 16, 20-22	NC	These pins are not internally connected. Can be grounded on the PCB.
2, 5, 12, 14, 17, 19	GND	Ground.
17	EPAD	Exposed Pad on the bottom of the package should be connected to ground with multiple number of vias to reduce the inductance to the GND.

Control Interface

CTRL1	CTRL2	Filter Bank State
LOW	HIGH	RF1
HIGH	LOW	RF2

Applications Information

Signal entering from RFC goes to RF1 or RF2 depending on the switch state set by the user. The switch ports are bi-directional.
A typical application schematic to operate the SPDT switch is given below.



VCTRL1 and VCTRL2 signals are used for setting the switch state.

If needed, to filter out the ripples and unwanted signals on the external CTRL signals, a low pass filter in series R, shunt C configuration can be implemented on the CTRL lines. Note that external RC filtering limits the state switching speed of the SPDT.

Small signal data plots are gathered with probe PCB measurements to generate plots shown in this document.

Large signal data generated with the ATEK274N4 mounted to a connectorized evaluation board. The PCB trace and connector transition losses are de-embedded, to generate plots shown in this document.

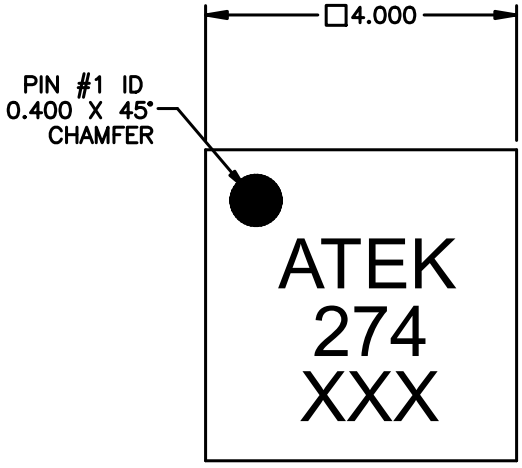
NC pins of the SPDT are connected to the GND on the EVB used to generate the plots shown in this document.

Absolute Maximum Ratings

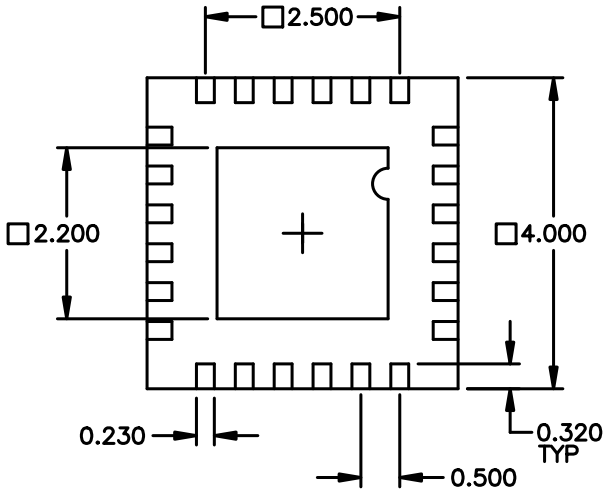
Parameter	Value/Range
Control Voltage (V_{CTRL1}, V_{CTR2})	-50.0V / 0.0V
Control Current (I_{CTRL1}, I_{CTR2})	5mA
RF Input Power (-40, 0V = V_{CTRL1}, V_{CTR2})	+44dBm
Channel Temperature T_{JMAX}	275°C
Power Dissipation	6.45W
Operating Temperature	−40 to +85 °C
Storage Temperature	−55 to +125 °C

Operation of this device outside the parameter ranges given above may cause damage. These conditions should not be applied simultaneously.

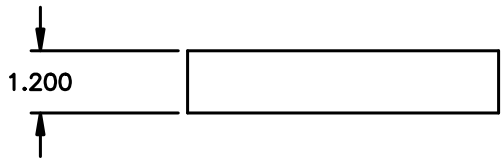
Mechanical and Marking Information



TOP VIEW



BOTTOM VIEW



SECTION A–A

NOTES

1. ALL DIMENSIONS IN MM
2. MARKING XXX INDICATES INTERNAL LOT CODE

Handling Precautions

Caution!
ESD-Sensitive Device
Handle Accordingly

Contact Information

For the latest specifications, additional product information, support, and sales.
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Notice

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Revisions

Revision No	Revision Date	Revision Reason	Section / Page No
0.1	27.04.2026	Initial Release	
0.2	05.06.2026	Product Release	