

AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

Description

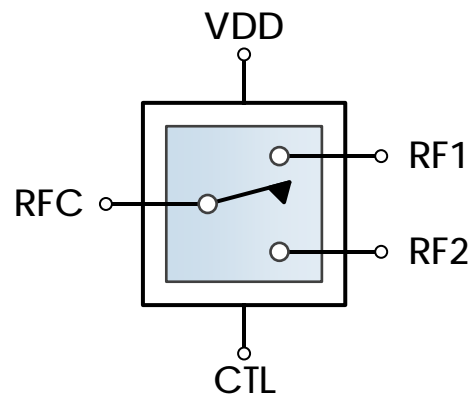
AM6016 is a Single-Pole Double-Throw (SPDT) switch covering the DC to 26.5 GHz frequency range. The positive control device exhibits low insertion loss, flat frequency response, and high isolation over the operating temperature range of -40C to +85C.



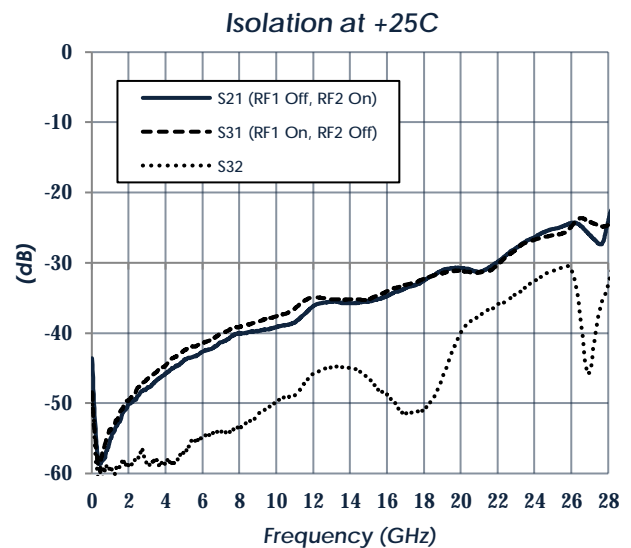
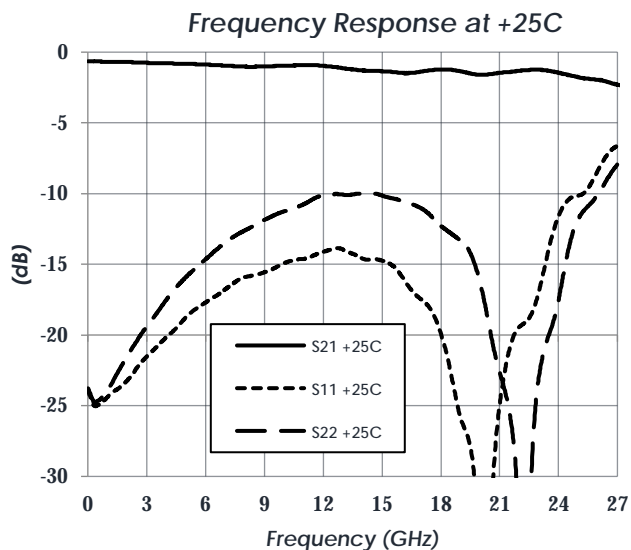
Features

- 1.2 dB Insertion Loss
- +40 dBm Input IP3
- +3.3V to +5V Supply
- +3.3V to +5V Control
- >30 dB Isolation
- 3mm QFN
- -40C to +85C Operation

Functional Diagram



Characteristic Performance



AM6016 – Switch, Reflective

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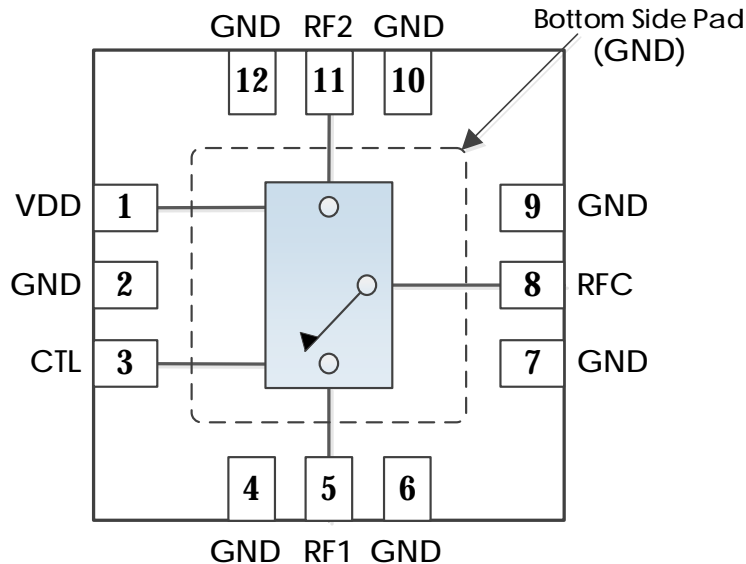
Table of Contents

Description	1	DC Electrical Characteristics.....	5
Features.....	1	RF Performance.....	5
Functional Diagram.....	1	Timing Characteristics.....	5
Characteristic Performance	1	State Table	5
Revision History	2	Typical Performance	6
Pin Layout and Definitions.....	3	Typical Application.....	8
Specifications	4	Evaluation PC Board	9
Absolute Maximum Ratings.....	4	Related Parts.....	9
Handling Information	4	Component Compliance Information.....	10
Recommended Operating Conditions....	4		

Revision History

Date	Revision Number	Notes
October 23, 2019	1	Initial Release
May 13, 2020	2	Updated S-parameter plots. Package information moved to main product page.

Pin Layout and Definitions



Pin Number	Pin Name	Pin Function
1	VDD	DC Power Input
2	GND	Ground - Common
3	CTL	Switch Control
4	GND	Ground - Common
5	RF1	RF1 Output - 50 Ohms - DC Coupled. External DC blocking capacitor required*
6, 7	GND	Ground - Common
8	RFC	RFC Input - 50 Ohms - DC Coupled. External DC blocking capacitor required*
9, 10	GND	Ground - Common
11	RF2	RF2 Output - 50 Ohms - DC Coupled. External DC blocking capacitor required*
12	GND	Ground - Common
Bottom Side Pad	Case GND	Ground - Common

*Note: DC blocking caps not required if in series with other Atlanta Micro parts of the same reference voltage.

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DC to 26.5 GHz SPDT

Specifications

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+6.0 V
RF Input Power		+27 dBm
Operating Junction Temperature	-40 C	+150 C
Storage Temperature Range	-50 C	+150 C

Note: Any device operation beyond the Absolute Maximum Ratings may result in permanent damage to the device. The values listed in this table are extremes and do not imply functional operation of the device at these or any other conditions beyond what is listed under Recommended Operating Conditions. Any part subjected to conditions outside of what is recommended for an extended amount of time may suffer from reliability concerns.

Handling Information

	Minimum	Maximum
Storage Temperature Range (Recommended)	-50 C	+125 C
Moisture Sensitivity Level	MSL 3	



Atlanta Micro products are electrostatic sensitive.
Follow safe handling practices to avoid damage

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage	+2.5 V	+5.0 V	
Operating Case Temperature	-40 C		+85 C
Operating Junction Temperature	-40 C		+125 C

AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
DC Supply Voltage		+2.5 V	+5.0 V	
DC Supply Current	VDD = +3.3 V		1 mA	
	VDD = +5.0 V		1 mA	
Power Dissipated	VDD = +3.3 V		3.3 mW	
	VDD = +5.0 V		5 mW	
Logic Level Low		0.0 V		+0.5 V
Logic Level High		+2.0 V		+ VDD

RF Performance

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		DC		26.5 GHz
Insertion Loss	f = 0.01 GHz		0.6 dB	
	f = 13.25 GHz		1.2 dB	
	f = 26.5 GHz		3 dB	
Return Loss	f = 0.01 GHz		26 dB	
	f = 13.25 GHz		26 dB	
	f = 26.5 GHz		10 dB	
Input IP3	VDD = +5.0 V		+40 dBm	

Timing Characteristics

Parameter	Minimum	Typical	Maximum
Switching Speed (Path Enabled to Disabled)		7 ns	
Switching Speed (Path Disabled to Enabled)		15 ns	

State Table

CTL	State
Low	RFC to RF1
High	RFC to RF2

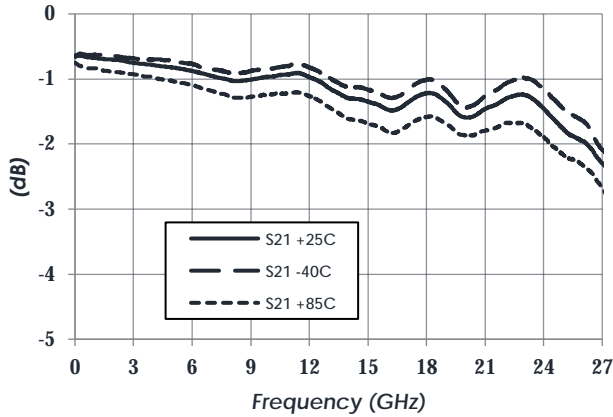
AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

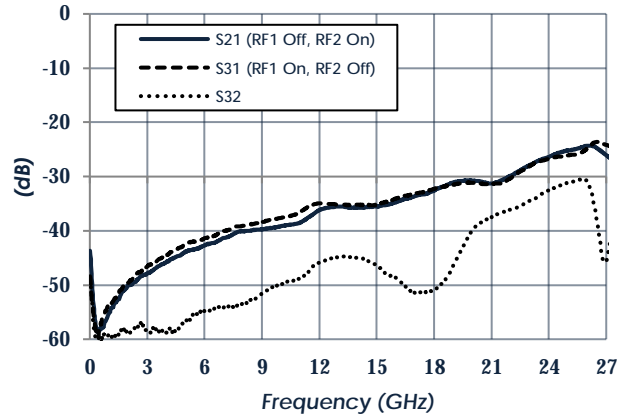
Typical Performance

(VDD = +5.0 V. Data measured via probes outside IC package on 10 mil Rogers RO4350B™)

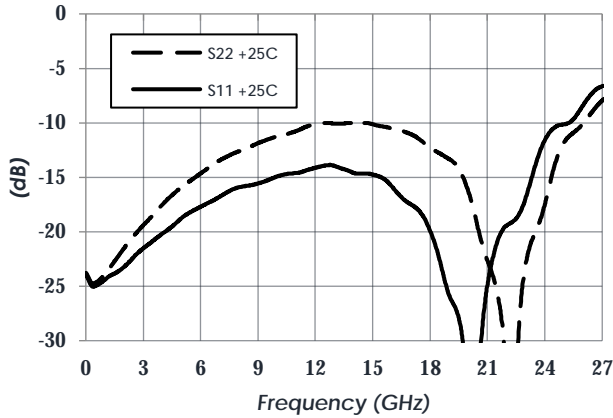
Insertion Loss vs Temperature



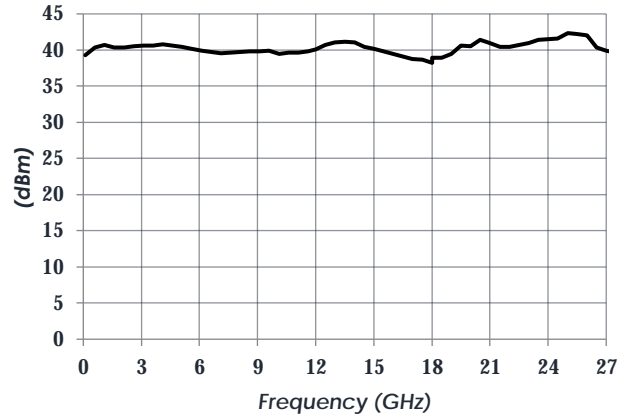
Isolation at +25C



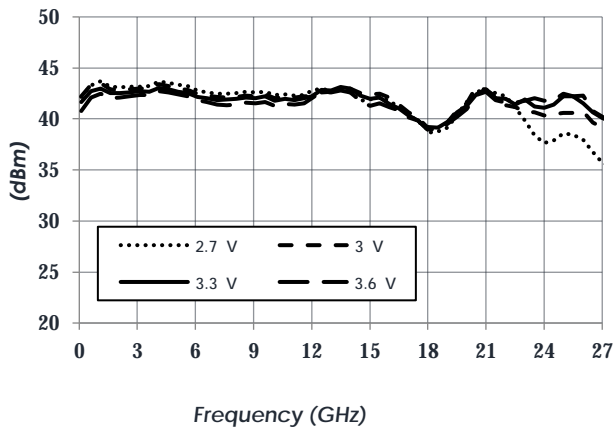
Return Loss at +25C



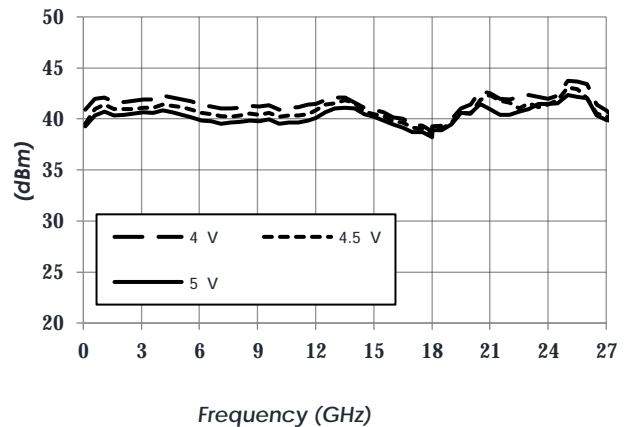
Input IP3 at +25C



Input IP3 at +25 C



Input IP3 at +25 C

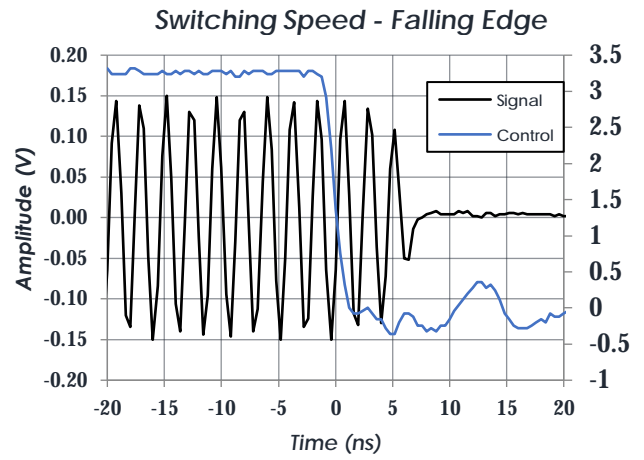
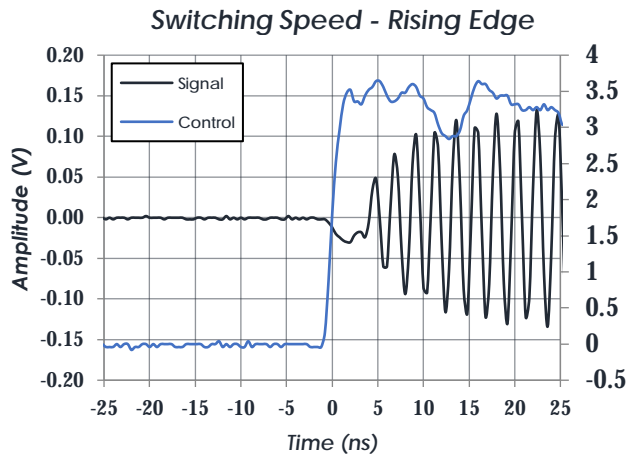


AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

Typical Performance (continued)

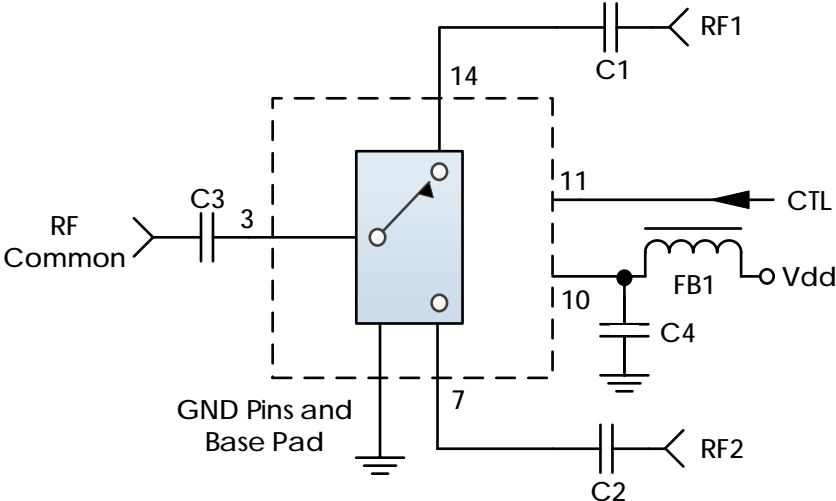
(VDD = +5.0 V, T = 25 C. Data measured on 10 mil Rogers RO4350B™)



AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

Typical Application



Recommended Component List (or equivalent):

Part	Value	Part Number	Manufacturer
C1-C3	0.1 μ F	0201BB104KW160	Passives Plus
C4	0.1 μ F	C1005X7R1H104K050BB	TDK
FB1	-	MMZ1005A222E	TDK

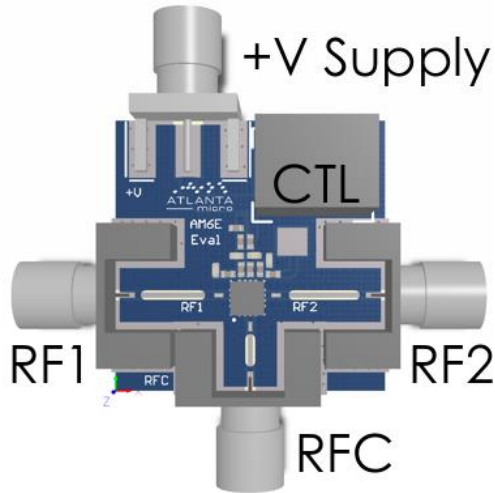
Notes:

1. DC blocking capacitors should be high performance, low-loss, broadband capacitors for optimal performance.
2. RC Filtering on the control line is recommended to prevent digital noise from coupling to the RF path.
 - a. Select control line RC filter values based on desired logic source decoupling and switching speed.

AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

Evaluation PC Board



Related Parts

Part Number	Description		
AM6012	DC	to 18 GHz	SPDT, Reflective
AM6013	DC	to 18 GHz	SP4T, Reflective
AM6015	DC	to 18 GHz	SP6T, Reflective
AM6029	DC	to 18 GHz	SP4T, Reflective
AM6031	DC	to 20 GHz	SPDT, Absorptive

AM6016 – Switch, Reflective

DC to 26.5 GHz SPDT

Component Compliance Information

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Substance List	Allowable Maximum Concentration
Lead (Pb)	<1000 PPM (0.1% by weight)
Mercury (Hg)	<1000 PPM (0.1% by weight)
Cadmium (Cd)	<75 PPM (0.0075% by weight)
Hexavalent Chromium (CrVI)	<1000 PPM (0.1% by weight)
Polybrominated Biphenyls (PBB)	<1000 PPM (0.1% by weight)
Polybrominated Diphenyl ethers (PBDE)	<1000 PPM (0.1% by weight)
Decabromodiphenyl Deca BDE	<1000 PPM (0.1% by weight)
Bis (2-ethylhexyl) Phthalate (DEHP)	<1000 PPM (0.1% by weight)
Butyl Benzyl Phthalate (BBP)	<1000 PPM (0.1% by weight)
Dibutyl Phthalate (DBP)	<1000 PPM (0.1% by weight)
Diisobutyl Phthalate (DIBP)	<1000 PPM (0.1% by weight)

REACH: Atlanta Micro, Inc. neither uses nor intentionally adds any of the substances considered to be a Substance of Very High Concern (SVHC) as defined by the EU Regulation (EC) No. 1907-2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH).

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