



Mini-Circuits

SOLID STATE

USB RF SPDT Switch

50Ω 0.1 to 67 GHz

USB-1SP2T-673

THE BIG DEAL

- Super wide bandwidth, solid-state design
- High isolation, 30 dB @ 67 GHz
- USB control and automation
- Daisy-chain control of up to 25 switches
- LED indicator on active port

APPLICATIONS

- RF signal routing / switch matrices
- Satellite communications up to V band
- Military radio, radar & electronic warfare
- Microwave radio / cellular infrastructure
- Test & measurement systems

PRODUCT OVERVIEW

Mini-Circuits' USB-1SP2T-673 is a fast switching solid-state reflective SPDT covering an ultra-wide bandwidth, from 0.1 to 67 GHz. The solid-state design features an impressive combination of high isolation, low insertion loss and good linearity across the entire band. The switch is supplied in a low profile package with precision 1.85 mm RF connectors. LED indicators on the switch package provide a convenient indicator of the current switch state.

The daisy-chain control interface with "dynamic addressing" simplifies control integration, allowing multiple switches to be combined into a Master / Slave chain. Simply connect, then power on and the whole chain of up to 25 compatible switches can be controlled independently through a single USB and software interface.

Full software support is provided, including our user-friendly GUI application for Windows and a full API with programming instructions for Windows and Linux environments (both 32-bit and 64-bit systems).

KEY FEATURES

Feature	Advantages
Fast switching sequences	Program automated switching sequences to run with extremely fast transitions and no external control.
High performance	Solid-state design combining high isolation with low insertion loss from 0.1 to 67 GHz.
Dynamic daisy-chain control	Control up to 25 switches through a single USB interface.
USB control	USB HID interface provides easy compatibility with a wide range of software setups and programming environments.
Full software support	User friendly Windows GUI (graphical user interface) allows manual control straight out of the box, while the comprehensive API (application programming interface) with examples and instructions allows easy automation in most programming environments.



Model No.	USB-1SP2T-673
Case Style	WP3211
Connectors	1.85 mm

DOWNLOAD

SOFTWARE PACKAGE

RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

Trademarks:

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ECO-012326
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USB-1SP2T-673
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USB RF SPDT Switch

USB-1SP2T-673

ELECTRICAL SPECIFICATIONS AT 0 TO 50°C

Parameter	Ports	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range	-	-	0.1		67	GHz
Insertion Loss	COM to any active port	0.1 - 26	-	1.10	3.50	dB
		26 - 40	-	2.20	4.00	
		40 - 60	-	3.00	6.50	
		60 - 67	-	5.10	9.00	
Isolation	Between ports J1 & J2	0.1 - 26	-	45	-	dB
		26 - 40	-	40	-	
		40 - 60	-	30	-	
		60 - 67	-	30	-	
	COM to Inactive port	0.1 - 26	-	45	-	
		26 - 40	-	40	-	
		40 - 60	-	27	-	
		60 - 67	-	27	-	
VSWR	COM port	0.1 - 18	-	1.25	-	:1
		18 - 26	-	1.75	-	
		26 - 60	-	1.85	-	
		60 - 67	-	3.15	-	
	Any port connected to COM	0.1 - 18	-	1.30	-	
		18 - 26	-	1.65	-	
		26 - 60	-	1.85	-	
		60 - 67	-	4.40	-	
Power Input @1 dB Compression ¹	COM to any active port	0.1 - 67	-	27	-	dBm
IP3	COM to any active port	0.5 - 67	-	40	-	dBm
Transition Time ²	-	-	-	5	-	μs
Minimum Dwell Time ³	High speed mode	-	-	10	-	μs
Switching Time (USB) ⁴	-	-	-	2	-	ms
Supply Voltage (Vcc)	USB port	-	4.75	5	5.25	V _{DC}
Supply Current (Icc) ⁵		-	-	70	120	mA
Current Pass-through ⁶	-	-	-	-	500	mA
Operating RF Input Power ¹	Through path	Hot switching	-	-	+27	dBm
	Through path	Cold switching	-	-	+27	
	Isolation path	-	-	-	+27	

1. Max power derates linearly from +27 dBm @ 2 GHz to +24 dBm @ 100 MHz.

2. Transition time spec represents the time that the RF signal paths are interrupted during switching and thus is specified without communication delays.

3. Minimum dwell time is the shortest time that can be achieved between 2 switch transitions when programming an automated switch sequence.

4. Switching time (USB) is the time from issuing a single software command via USB to the switch state changing. The most significant factor is the host PC, influenced by CPU load and USB protocol. The time shown is an estimate for a medium CPU load and USB 2.0 connection.

5. USB current draw for a single unit with no slave units.

6. Pass through current is the maximum supply current handling of a unit with slave modules attached. If controlling a large number of slave modules additional power supplies should be included to ensure this limit is not exceeded. See page 5 for details.



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USB RF SPDT Switch

USB-1SP2T-673

ABSOLUTE MAXIMUM RATINGS

Operating Temperature	0°C to 50°C
Storage Temperature	-20°C to 60°C
DC supply voltage max.	6V
DC voltage @ RF Ports	0V

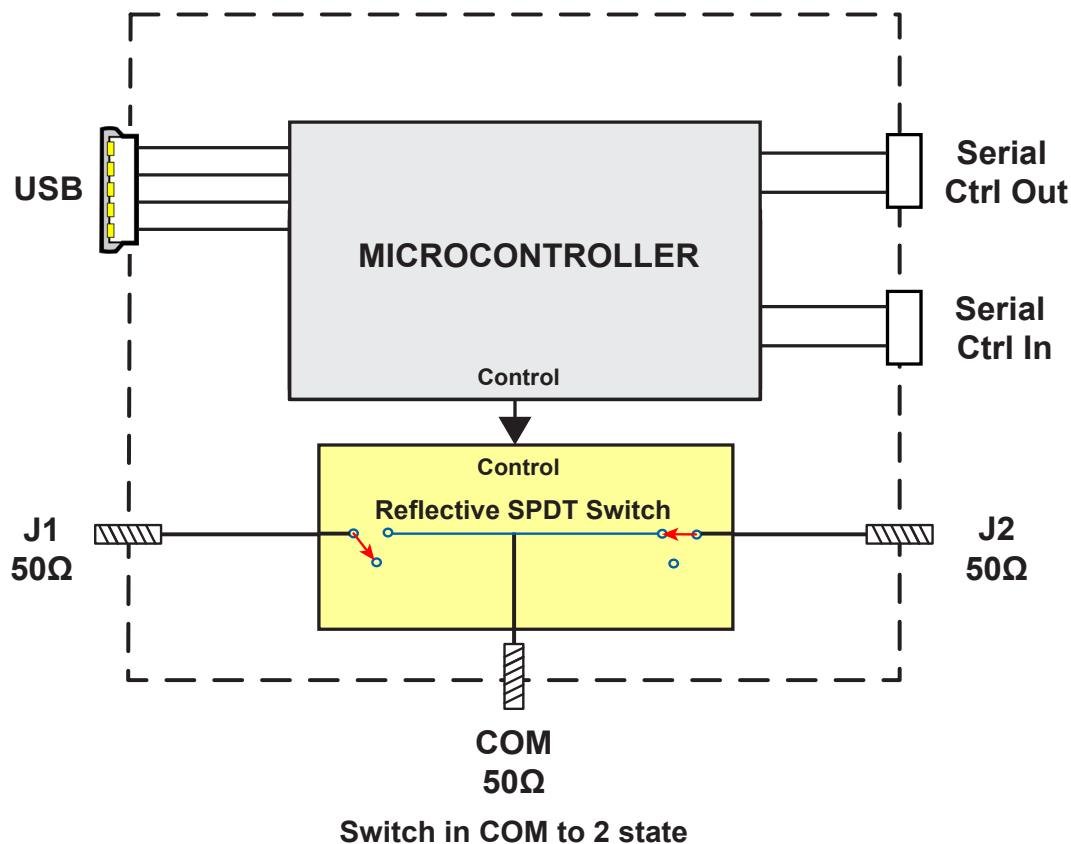
Permanent damage may occur if any of these limits are exceeded. Operating in the range between operating power limits and absolute maximum ratings for extended periods of time may result in reduced life and reliability.

CONNECTIONS

Port Name	Connector Type
RF Ports (COM, 1 & 2)	1.85 mm female
USB	USB type-C receptacle
Serial In (Digital Control 2 port)	Digital Snap Fit Connector ⁷
Serial Out (Digital Control 1 port)	Digital Snap Fit Connector ⁷

7. Mating connector is Hirose ST40X-10S-CV(30).

BLOCK DIAGRAM



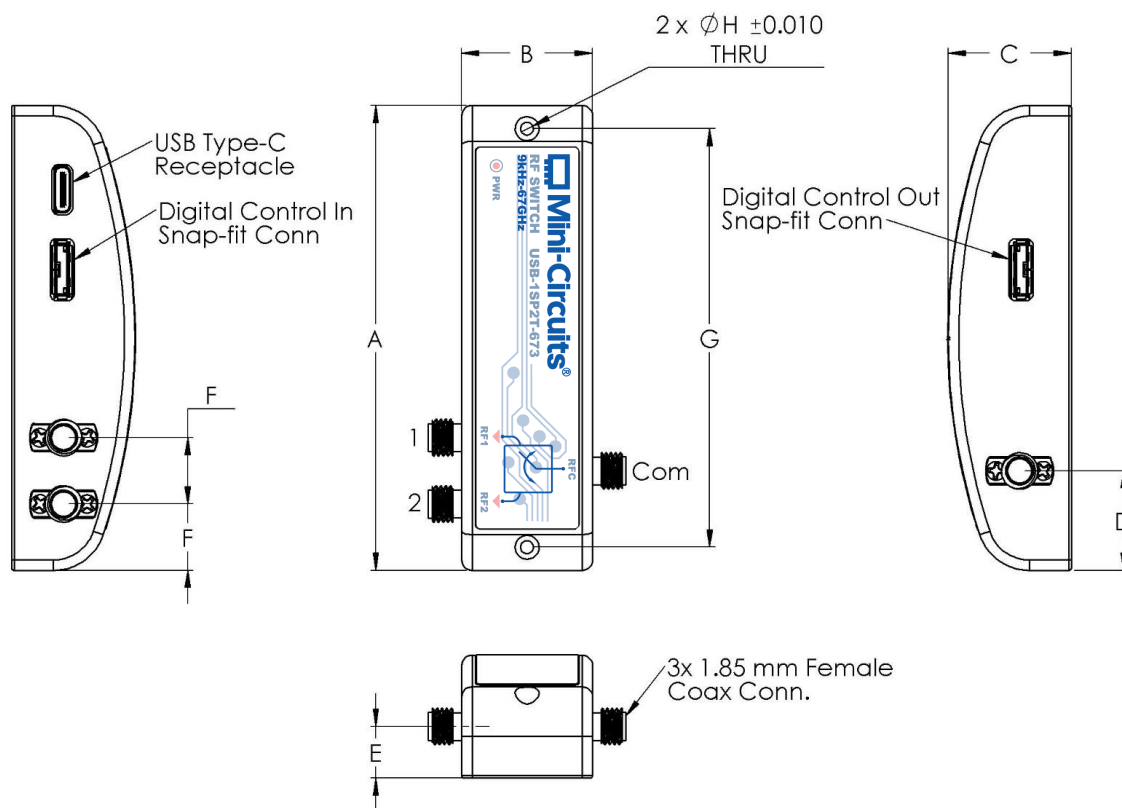


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USB RF SPDT Switch

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OUTLINE DRAWING (WP3211)



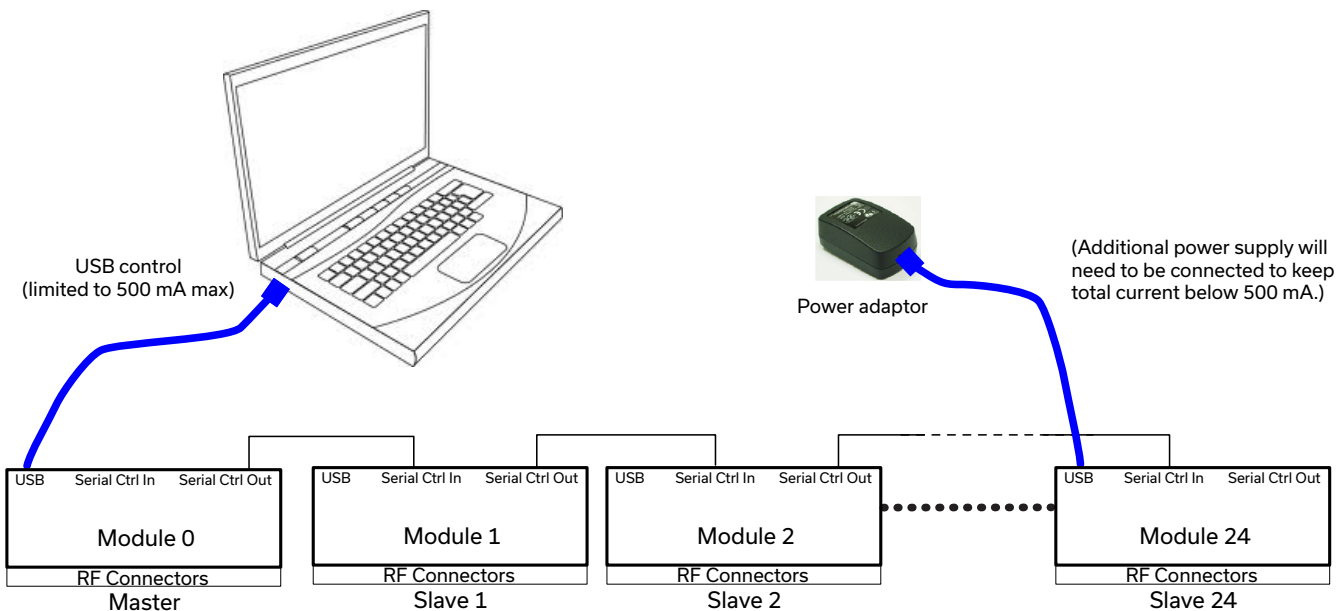
OUTLINE DIMENSIONS ($\frac{\text{INCH}}{\text{MM}}$)

A	B	C	D	E	F	G	H	weight
3.50	0.984	0.925	0.75	0.389	0.50	3.15	0.96	grams
88.90	25.000	23.500	19.00	9.900	12.70	80.00	2.44	94



**CONNECTING MULTIPLE MODULES (DAISY CHAIN)**

The USB-1SP2T-673 model is designed to connect up to 25 modules in series (daisy chain) using dynamic addressing, meaning there is no need to specifically set the address of the modules. The addresses will be set automatically as part of establishing the communications with the computer. The module connected to the computer's USB port will be assigned address 0 (master), the first module connected to it will get address 1 (slave) and subsequent modules incrementing up to address 24 (slave).



Connections between modules will be made using the serial in/out ports with the module connected to the PC act as a master and all other as slave modules. All control will be through the master module (address 0) which is the only one communicating with the PC. Serial control out port of each module should be connected to the serial control in port of the next module.

Power will be supplied from the PC via the master module up to a maximum of 500 mA. Generally, additional power supply will be needed to keep total current below 500 mA. All power supplies should be connected to the module via the module's USB port. Connecting an additional power supply will automatically cut off power draw from the serial control in port for that module.

The serial master/slave bus allows connecting modules of different types to the same daisy chain as long as all support Mini-Circuits Dynamic addressing setup. To add a new module to the setup, simply connect the module and refresh the address listing, no need to reset any of the existing modules or assign addresses manually.

Note: Different module types may have different current consumption which will change the number of units which can be connected before an additional power supply is needed.



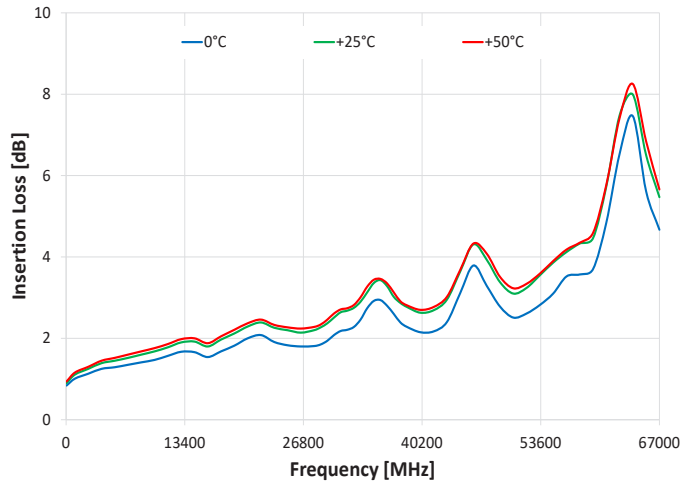
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USB RF SPDT Switch

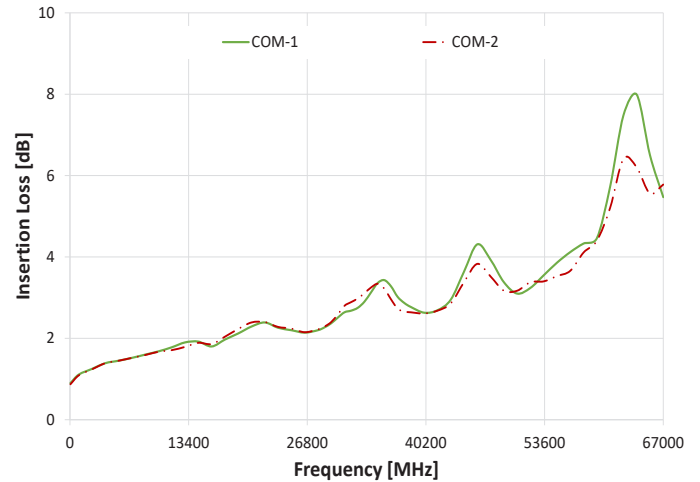
USB-1SP2T-673

TYPICAL PERFORMANCE CURVES

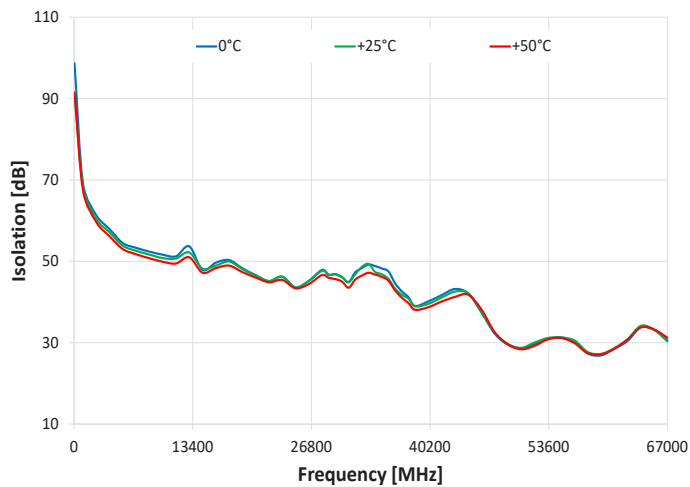
Insertion Loss over Temperature (J1 Active)



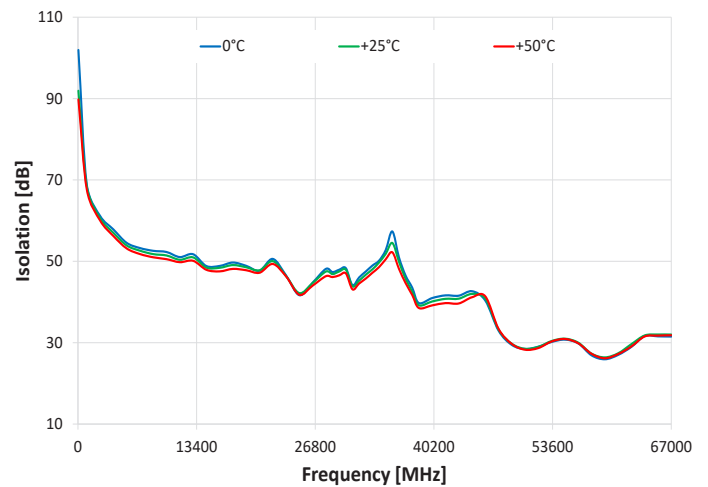
Insertion Loss J1 - J2 Active



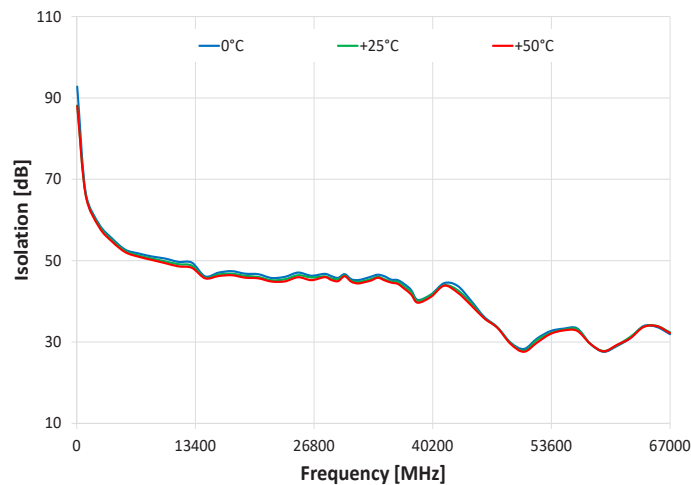
Isolation Com to J1 (J2 Active)



Isolation Com to J2 (J1 Active)



Isolation J2 to J1 (J2 Active)





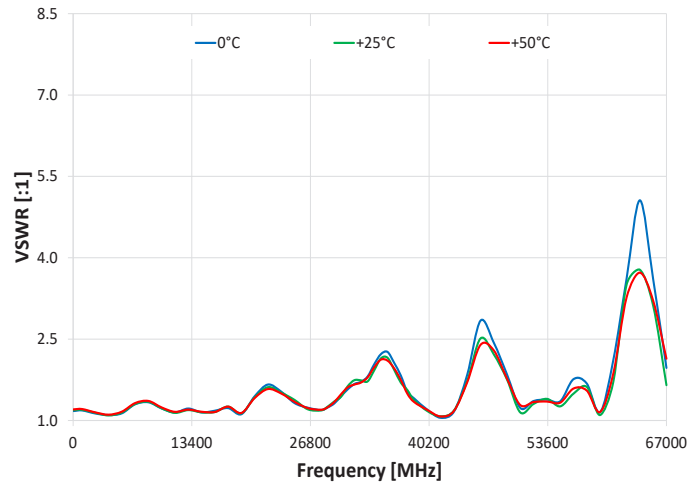
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USB RF SPDT Switch

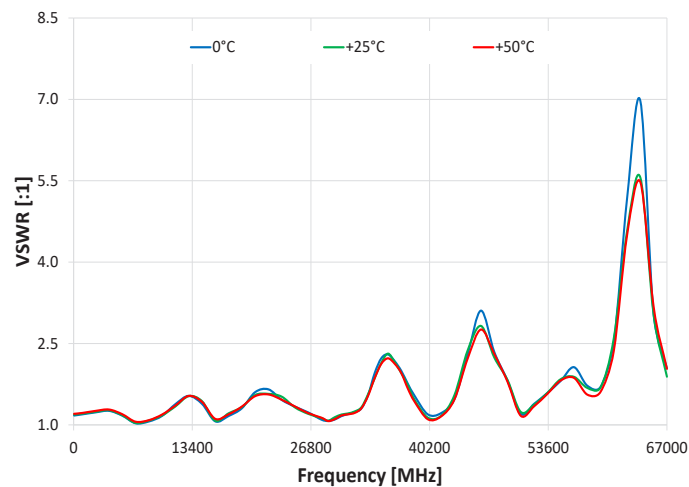
USB-1SP2T-673

TYPICAL PERFORMANCE CURVES (CONTINUED)

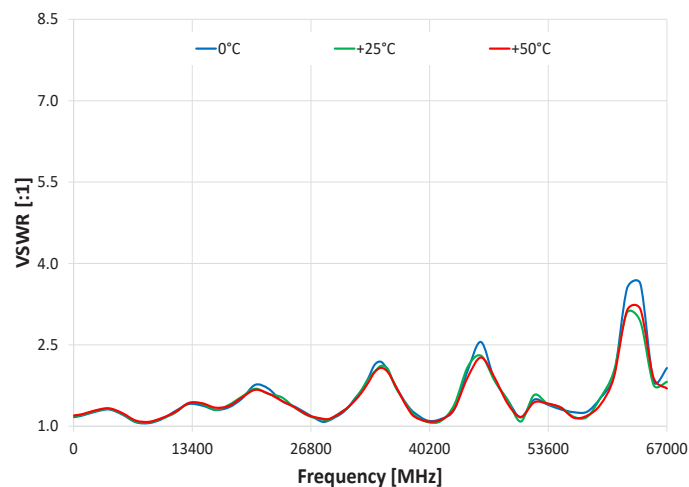
VSWR @ COM over Temperature (J1 Active)



VSWR @ J1 over Temperature (J1 Active)



VSWR @ J2 over Temperature (J2 Active)



**SOFTWARE SPECIFICATIONS****SOFTWARE & DOCUMENTATION DOWNLOAD:**

- Mini-Circuits' full software and support package including user guide, Windows GUI, DLL files, programming manual and examples can be downloaded free of charge from: <https://www.minicircuits.com/softwaredownload/solidstate.html>
- Please contact testsolutions@minicircuits.com for support

MINIMUM SYSTEM REQUIREMENTS:

Parameter	Requirements	
Interface	USB HID or Daisy Chain dynamic addressing	
System Requirements	GUI	Windows 98 or later
	USB API DLL	Windows 98 or later and programming environment with ActiveX or .NET support
	USB Direct Programming	Linux, Windows 98 or later
	Daisy Chain dynamic addressing	An additional Mini-Circuits model supporting dynamic addressing
Hardware	Pentium II or later with 256 MB RAM	

APPLICATION PROGRAMMING INTERFACE (API)**USB SUPPORT (WINDOWS):**

- ActiveX COM DLL file for creation of 32-bit programs
- .NET library DLL file for creation of 32 / 64-bit programs
- Supported by most common programming environments (refer to application note AN-49-001 for summary of supported environments)

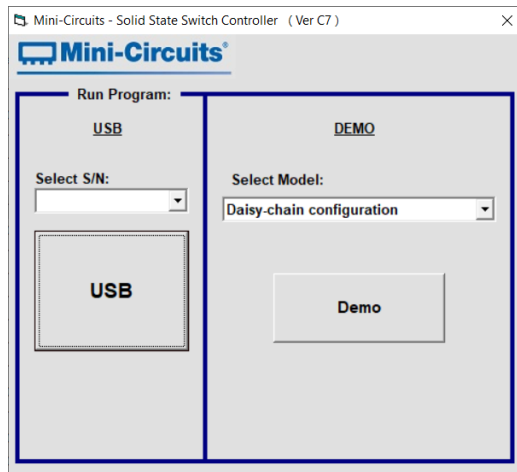
USB SUPPORT (LINUX):

- Direct USB programming using a series of USB interrupt codes
- Full programming instructions and examples available for a wide range of programming environments / languages.

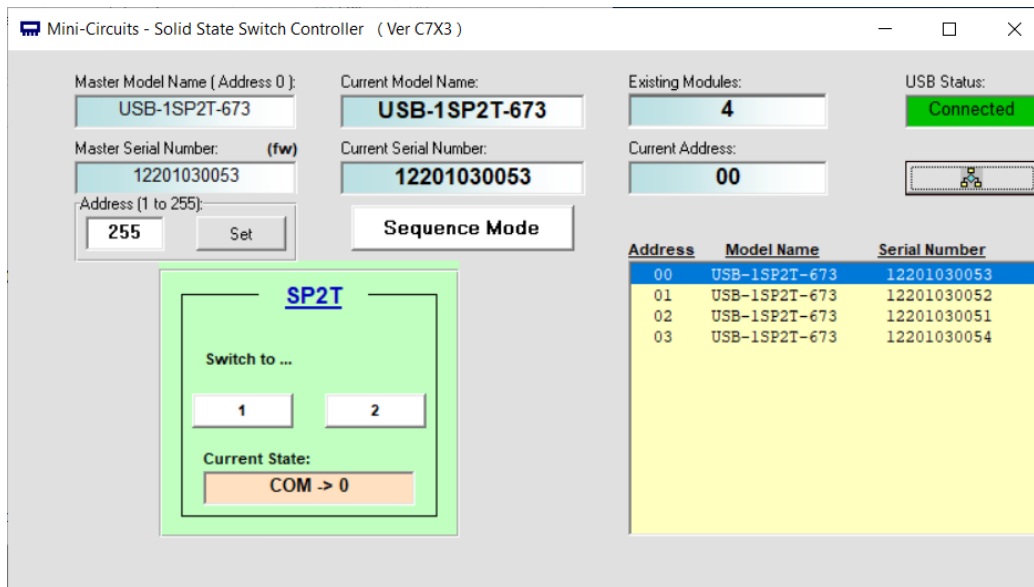


GRAPHICAL USER INTERFACE (GUI) FOR WINDOWS - KEY FEATURES

- Connect via USB
- Run GUI in "demo mode" to evaluate software without a hardware connection



- View and set switch states at the click of a button
- Control up to 25 units from a single USB control
- Configure and run timed switching sequences
- Set start-up switch state





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USB-1SP2T-673

Mini-Circuits

ORDERING INFORMATION

Please contact Mini-Circuits' Test Solutions department for price and availability: testsolutions@minicircuits.com

Model	Description
USB-1SP2T-673	USB RF SPDT switch

Included Accessories	Part No.	Description
	USB-CBL-AC-3+	3.3 ft (1.0 m) USB cable: USB type A (Male) to USB type C (Male)

OPTIONAL ACCESSORIES

USB-CBL-AC-3+	3.3 ft (1.0 m) USB Cable: USB type A (Male) to USB type C (Male)
CBL-1.5FT-MMD+	1.5 ft (0.45 m) cable assembly for serial control Daisy Chain with snap fit connectors
USB-AC/DC-5+	AC/DC +5V power adaptor with USB connector ^{8, 9}

8. The power adaptor may be used to provide additional power via USB port when connecting several units in daisy chain.

9. Includes power plugs for US, UK, EU, IL, AU & China. Plugs for other countries are also available. If you need a power cord for a country not listed please contact testsolutions@minicircuits.com

NOTES:

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- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at <https://www.minicircuits.com/terms/viewterm.html>



Solid State USB RF SPDT Switch

USB-1SP2T-673

Typical Performance Data

TEST CONDITIONS: @Temperature = 0°C, Pin = 0 dBm

Frequency (MHz)	Insertion Loss (dB)		VSWR, Active Ports (:1)		
	COM-1	COM-2	COM	J1	J2
50	0.80	0.77	1.18	1.19	1.18
1000	1.00	0.99	1.18	1.19	1.20
2500	1.11	1.10	1.14	1.23	1.26
4000	1.24	1.24	1.10	1.26	1.31
5500	1.29	1.29	1.12	1.19	1.24
7000	1.34	1.33	1.28	1.04	1.09
8500	1.41	1.39	1.34	1.05	1.05
10000	1.47	1.46	1.25	1.15	1.12
11500	1.56	1.49	1.14	1.37	1.27
13000	1.66	1.54	1.22	1.52	1.39
14500	1.64	1.60	1.16	1.40	1.39
16000	1.54	1.59	1.15	1.12	1.32
17500	1.65	1.72	1.23	1.13	1.34
19000	1.81	1.90	1.12	1.26	1.46
20500	1.97	2.08	1.40	1.58	1.75
22000	2.11	2.13	1.67	1.70	1.75
23500	1.93	1.94	1.57	1.48	1.48
25000	1.84	1.90	1.35	1.35	1.39
26500	1.80	1.81	1.24	1.26	1.25
28000	1.80	1.82	1.20	1.11	1.08
28750	1.84	1.87	1.22	1.10	1.12
29500	1.92	1.96	1.29	1.08	1.15
30250	2.04	2.10	1.40	1.14	1.19
31000	2.16	2.30	1.53	1.20	1.32
31750	2.20	2.39	1.64	1.22	1.47
32500	2.26	2.49	1.69	1.27	1.61
33250	2.41	2.65	1.78	1.46	1.81
34000	2.67	2.84	2.00	1.84	2.06
34750	2.90	2.94	2.23	2.19	2.21
35500	2.96	2.83	2.30	2.32	2.11
36250	2.84	2.58	2.10	2.23	1.85
37000	2.66	2.37	1.91	2.09	1.64
37750	2.44	2.21	1.59	1.79	1.40
38500	2.32	2.19	1.43	1.60	1.30
40000	2.16	2.14	1.25	1.25	1.13
41500	2.16	2.16	1.07	1.19	1.14
43000	2.32	2.28	1.15	1.41	1.25
44500	3.02	2.80	1.72	2.12	1.87
46000	3.75	3.33	2.67	3.10	2.61
47500	3.38	2.97	2.55	2.54	2.00
49000	2.85	2.68	1.93	1.83	1.51
50500	2.50	2.60	1.28	1.27	1.20
52000	2.58	2.75	1.33	1.29	1.41
53500	2.81	2.76	1.43	1.61	1.43
55000	2.99	2.79	1.31	1.72	1.31
56500	3.53	3.03	1.78	2.14	1.32
58000	3.57	3.36	1.67	1.74	1.27
59500	3.68	3.68	1.16	1.63	1.49
61000	4.62	4.21	1.89	2.39	1.88
62500	6.29	5.31	2.97	4.42	3.11
64000	7.49	5.57	5.23	6.44	3.46
65500	5.93	4.71	4.33	3.47	1.84
67000	4.64	4.89	2.14	2.04	2.12

Notes

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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCStore/terms.jsp

REV. OR

USB-1SP2T-673

220123



Solid State USB RF SPDT Switch

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Typical Performance Data

TEST CONDITIONS: @Temperature = 0°C, Pin = 0 dBm

Frequency (MHz)	Isolation @ Active states (dB)		
	COM-1	COM-2	J2-J1
50	73.97	83.28	79.17
1000	69.56	69.19	67.28
2500	62.03	61.99	59.62
4000	58.27	58.22	55.65
5500	54.68	54.79	52.94
7000	53.35	53.40	51.79
8500	52.51	52.64	51.14
10000	51.77	52.51	50.56
11500	51.28	51.02	49.74
13000	53.62	51.75	49.21
14500	48.45	49.12	46.58
16000	49.48	48.81	47.05
17500	50.11	49.37	47.25
19000	48.42	49.03	46.77
20500	46.77	47.87	46.64
22000	45.34	49.85	45.71
23500	46.25	46.93	46.18
25000	43.78	41.72	46.15
26500	44.79	45.10	46.65
28000	48.28	48.95	47.21
28750	47.07	47.11	46.37
29500	46.57	47.43	45.92
30250	46.66	48.38	46.56
31000	44.75	44.54	46.02
31750	46.56	45.36	44.79
32500	48.09	46.92	45.51
33250	49.10	48.46	46.01
34000	49.17	49.75	46.42
34750	47.89	51.80	46.31
35500	48.21	57.99	45.34
36250	45.19	52.90	45.30
37000	42.95	47.56	44.50
37750	41.57	44.22	43.26
38500	39.61	40.64	41.02
40000	40.25	41.10	41.54
41500	41.47	41.42	44.43
43000	43.56	41.70	44.06
44500	42.23	42.23	40.75
46000	38.59	41.82	36.75
47500	32.63	33.53	34.35
49000	29.67	29.75	30.52
50500	28.66	28.40	28.21
52000	29.37	28.89	30.39
53500	30.72	29.95	32.31
55000	31.44	30.79	33.40
56500	30.36	29.98	33.35
58000	27.39	26.83	29.69
59500	26.71	25.71	27.59
61000	28.23	26.81	28.75
62500	29.43	29.06	30.31
64000	33.97	31.89	34.11
65500	33.46	31.73	33.84
67000	30.84	31.44	32.30

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USB-1SP2T-673

Typical Performance Data

TEST CONDITIONS: @Temperature = +25°C, Pin = 0 dBm

Frequency (MHz)	Insertion Loss (dB)		VSWR, Active Ports (:1)		
	COM-1	COM-2	COM	J1	J2
50	0.85	0.84	1.20	1.20	1.19
1000	1.10	1.08	1.20	1.21	1.21
2500	1.22	1.22	1.15	1.23	1.27
4000	1.37	1.37	1.10	1.27	1.32
5500	1.45	1.44	1.12	1.20	1.25
7000	1.51	1.51	1.28	1.05	1.10
8500	1.59	1.58	1.35	1.07	1.06
10000	1.67	1.67	1.25	1.18	1.15
11500	1.77	1.70	1.14	1.36	1.27
13000	1.88	1.76	1.19	1.45	1.34
14500	1.91	1.88	1.16	1.46	1.45
16000	1.80	1.86	1.15	1.17	1.33
17500	1.93	2.00	1.25	1.13	1.31
19000	2.12	2.21	1.15	1.31	1.49
20500	2.28	2.39	1.39	1.61	1.77
22000	2.40	2.41	1.61	1.62	1.65
23500	2.26	2.28	1.52	1.45	1.46
25000	2.20	2.26	1.36	1.39	1.41
26500	2.16	2.17	1.22	1.23	1.22
28000	2.19	2.21	1.17	1.11	1.11
28750	2.25	2.27	1.23	1.09	1.11
29500	2.34	2.37	1.28	1.13	1.18
30250	2.47	2.53	1.46	1.15	1.22
31000	2.61	2.75	1.60	1.22	1.31
31750	2.66	2.85	1.68	1.27	1.50
32500	2.73	2.97	1.71	1.30	1.63
33250	2.85	3.07	1.76	1.45	1.76
34000	3.07	3.22	1.83	1.76	1.96
34750	3.30	3.32	2.07	2.13	2.15
35500	3.45	3.29	2.23	2.33	2.10
36250	3.34	3.04	2.10	2.21	1.84
37000	3.11	2.79	1.76	2.11	1.64
37750	2.87	2.65	1.52	1.69	1.33
38500	2.80	2.64	1.41	1.60	1.29
40000	2.64	2.61	1.26	1.19	1.14
41500	2.68	2.67	1.07	1.15	1.18
43000	2.88	2.81	1.10	1.38	1.25
44500	3.51	3.27	1.65	2.03	1.83
46000	4.27	3.84	2.34	3.12	2.65
47500	4.02	3.56	2.42	2.41	1.89
49000	3.44	3.19	1.66	1.71	1.42
50500	3.12	3.17	1.26	1.32	1.18
52000	3.20	3.34	1.27	1.25	1.35
53500	3.53	3.40	1.33	1.71	1.53
55000	3.73	3.44	1.31	1.70	1.29
56500	4.15	3.69	1.60	1.92	1.22
58000	4.34	4.13	1.60	1.53	1.25
59500	4.43	4.38	1.14	1.63	1.47
61000	5.47	5.06	1.74	2.33	1.86
62500	7.28	6.33	2.93	4.26	3.01
64000	8.03	6.30	4.22	5.39	3.04
65500	6.77	5.60	3.16	3.54	2.08
67000	5.51	5.75	2.04	2.00	1.80

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REV. OR

USB-1SP2T-673

220123



Solid State USB RF SPDT Switch

USB-1SP2T-673

Typical Performance Data

TEST CONDITIONS: @Temperature = +25°C, Pin = 0 dBm

Frequency (MHz)	Isolation @ Active states (dB)		
	COM-1	COM-2	J2-J1
50	84.53	83.87	93.66
1000	68.57	68.80	66.35
2500	61.24	61.22	59.21
4000	57.36	57.40	55.25
5500	54.03	54.09	52.49
7000	52.67	52.72	51.40
8500	51.78	51.94	50.58
10000	50.89	51.53	49.88
11500	50.55	50.38	49.17
13000	52.30	51.09	48.63
14500	48.62	48.66	46.05
16000	48.81	48.34	46.57
17500	49.79	48.80	46.60
19000	48.32	48.68	46.25
20500	46.72	47.83	46.06
22000	45.30	49.66	45.18
23500	46.23	46.70	45.58
25000	43.75	42.06	45.85
26500	44.66	44.72	46.01
28000	47.85	48.01	46.43
28750	46.82	46.73	45.67
29500	46.24	46.77	45.47
30250	46.47	47.82	46.10
31000	44.77	44.28	45.39
31750	46.30	44.86	44.54
32500	48.15	46.39	44.96
33250	49.20	47.74	45.42
34000	48.04	49.13	45.67
34750	46.73	50.71	45.65
35500	46.12	54.96	44.92
36250	43.82	51.32	44.89
37000	41.97	46.71	43.92
37750	41.13	43.39	42.82
38500	39.42	39.93	40.44
40000	39.57	40.27	41.25
41500	40.82	40.77	43.71
43000	43.04	40.85	43.30
44500	42.15	41.69	40.16
46000	38.66	42.44	36.31
47500	32.82	33.86	34.37
49000	29.94	30.10	30.21
50500	28.69	28.46	27.84
52000	29.71	28.85	30.06
53500	31.06	30.18	31.95
55000	31.24	31.01	33.04
56500	30.64	30.08	33.21
58000	27.79	27.36	29.72
59500	27.02	26.15	27.69
61000	28.44	27.15	28.95
62500	29.89	29.47	30.62
64000	34.21	31.87	33.81
65500	33.73	32.14	34.11
67000	30.64	31.92	32.83

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Solid State USB RF SPDT Switch

USB-1SP2T-673

Typical Performance Data

TEST CONDITIONS: @Temperature = +50°C, Pin = 0 dBm

Frequency (MHz)	Insertion Loss (dB)		VSWR, Active Ports (:1)		
	COM-1	COM-2	COM	J1	J2
50	0.91	0.90	1.20	1.21	1.20
1000	1.16	1.14	1.21	1.22	1.22
2500	1.28	1.28	1.16	1.25	1.28
4000	1.43	1.43	1.11	1.28	1.33
5500	1.51	1.51	1.14	1.22	1.26
7000	1.59	1.58	1.30	1.07	1.12
8500	1.66	1.65	1.37	1.07	1.07
10000	1.75	1.73	1.26	1.19	1.15
11500	1.85	1.79	1.16	1.35	1.26
13000	1.96	1.86	1.20	1.49	1.38
14500	1.99	1.96	1.16	1.44	1.43
16000	1.88	1.96	1.14	1.17	1.37
17500	2.01	2.10	1.26	1.14	1.34
19000	2.21	2.31	1.14	1.31	1.49
20500	2.35	2.45	1.37	1.54	1.69
22000	2.47	2.50	1.60	1.61	1.66
23500	2.35	2.37	1.52	1.44	1.46
25000	2.30	2.35	1.37	1.38	1.39
26500	2.25	2.27	1.23	1.24	1.23
28000	2.27	2.31	1.19	1.13	1.13
28750	2.32	2.37	1.23	1.10	1.14
29500	2.43	2.48	1.32	1.11	1.17
30250	2.56	2.64	1.44	1.13	1.21
31000	2.69	2.85	1.58	1.19	1.31
31750	2.72	2.93	1.65	1.23	1.46
32500	2.79	3.03	1.68	1.26	1.55
33250	2.94	3.18	1.75	1.44	1.74
34000	3.20	3.37	1.93	1.78	1.96
34750	3.40	3.45	2.09	2.12	2.11
35500	3.49	3.36	2.14	2.25	2.06
36250	3.39	3.15	1.98	2.17	1.84
37000	3.19	2.92	1.81	2.02	1.61
37750	2.96	2.76	1.55	1.70	1.35
38500	2.84	2.73	1.38	1.51	1.21
40000	2.71	2.72	1.21	1.14	1.10
41500	2.75	2.78	1.08	1.14	1.13
43000	2.96	2.94	1.14	1.37	1.25
44500	3.55	3.34	1.60	2.06	1.82
46000	4.28	3.88	2.31	2.92	2.43
47500	4.14	3.73	2.37	2.48	1.98
49000	3.56	3.35	1.84	1.77	1.45
50500	3.26	3.39	1.34	1.25	1.20
52000	3.30	3.51	1.31	1.25	1.35
53500	3.57	3.53	1.40	1.60	1.45
55000	3.79	3.58	1.33	1.70	1.32
56500	4.19	3.79	1.57	1.81	1.16
58000	4.36	4.20	1.54	1.50	1.22
59500	4.57	4.53	1.17	1.57	1.36
61000	5.58	5.29	1.76	2.26	1.83
62500	7.22	6.37	2.85	3.93	2.79
64000	8.28	6.62	3.83	5.06	2.97
65500	7.10	5.98	3.57	3.23	1.94
67000	5.69	5.89	2.22	1.96	1.76

Notes

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Solid State USB RF SPDT Switch

USB-1SP2T-673

Typical Performance Data

TEST CONDITIONS: @Temperature = +50°C, Pin = 0 dBm

Frequency (MHz)	Isolation @ Active states (dB)		
	COM-1	COM-2	J2-J1
50	79.10	77.97	83.63
1000	67.77	68.49	66.66
2500	60.58	60.63	59.09
4000	56.52	56.67	54.98
5500	53.24	53.41	52.22
7000	51.79	51.95	51.11
8500	50.89	51.08	50.31
10000	49.99	50.55	49.49
11500	49.57	49.89	48.71
13000	51.01	50.15	48.09
14500	47.65	48.32	45.98
16000	48.24	47.49	46.20
17500	48.76	47.93	46.30
19000	47.48	47.96	45.79
20500	46.16	47.27	45.61
22000	44.97	48.90	44.80
23500	45.47	46.62	45.07
25000	43.52	41.86	45.29
26500	43.98	44.05	45.35
28000	46.84	46.91	46.15
28750	46.02	46.08	45.30
29500	45.42	46.07	45.04
30250	45.59	46.96	45.83
31000	43.63	43.53	45.23
31750	44.96	44.15	44.26
32500	46.23	45.19	44.64
33250	47.11	46.92	45.09
34000	47.18	48.21	45.61
34750	46.14	49.48	45.35
35500	45.96	52.21	44.57
36250	43.29	49.15	44.52
37000	41.50	45.38	43.52
37750	40.22	42.50	42.23
38500	38.42	39.31	40.03
40000	38.83	39.21	40.91
41500	39.82	39.59	43.42
43000	41.23	39.69	42.82
44500	41.61	40.61	39.48
46000	39.16	42.82	36.19
47500	33.10	34.04	34.08
49000	29.85	30.10	30.01
50500	28.43	28.34	27.64
52000	28.98	28.54	29.39
53500	30.58	30.03	31.79
55000	31.17	30.95	32.85
56500	30.07	29.98	32.76
58000	27.49	27.30	29.63
59500	26.93	25.96	27.70
61000	28.34	26.93	29.02
62500	29.85	28.86	30.35
64000	33.55	31.55	33.63
65500	33.49	31.94	34.03
67000	31.51	31.82	32.68

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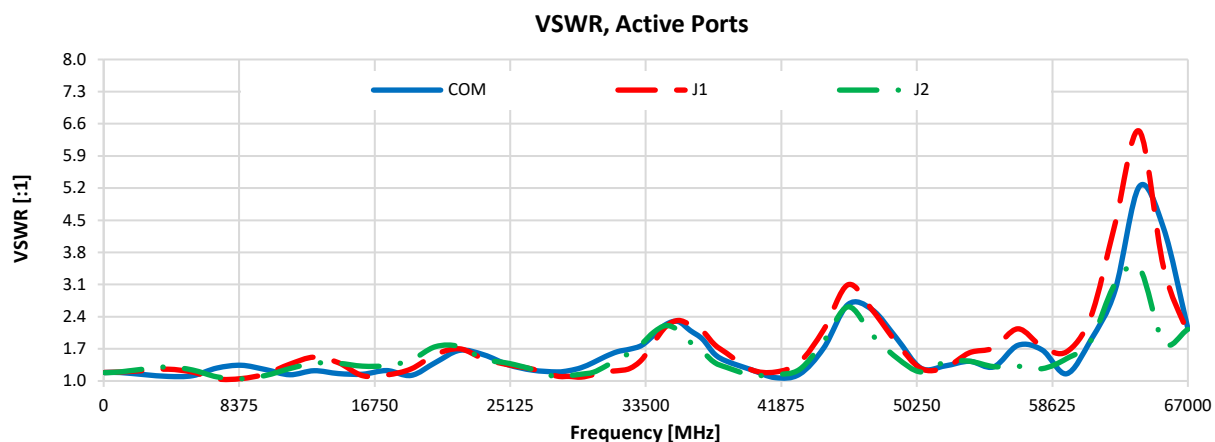
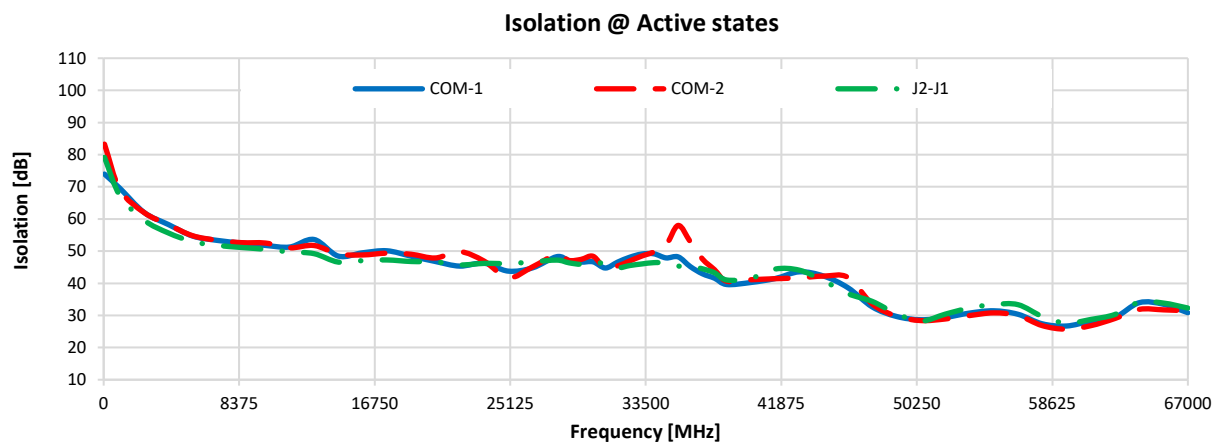
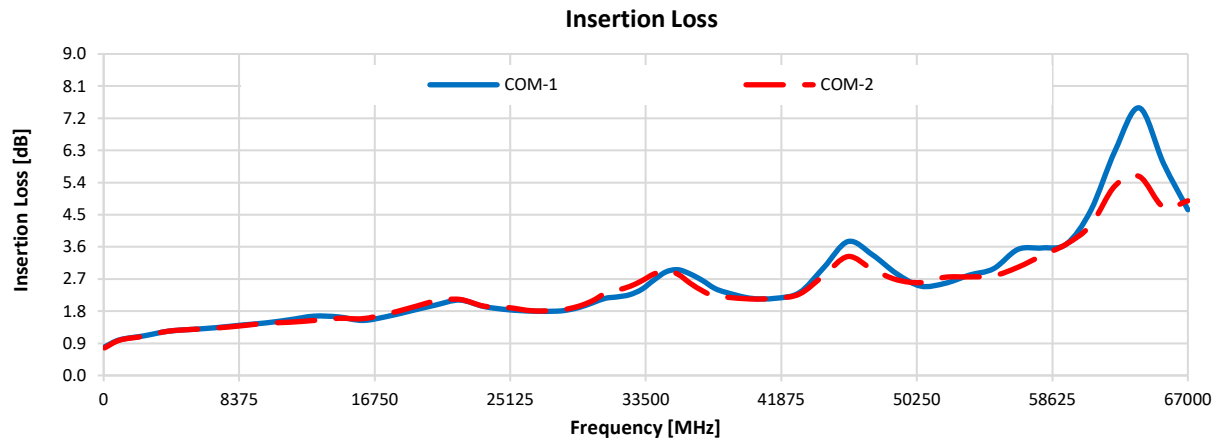
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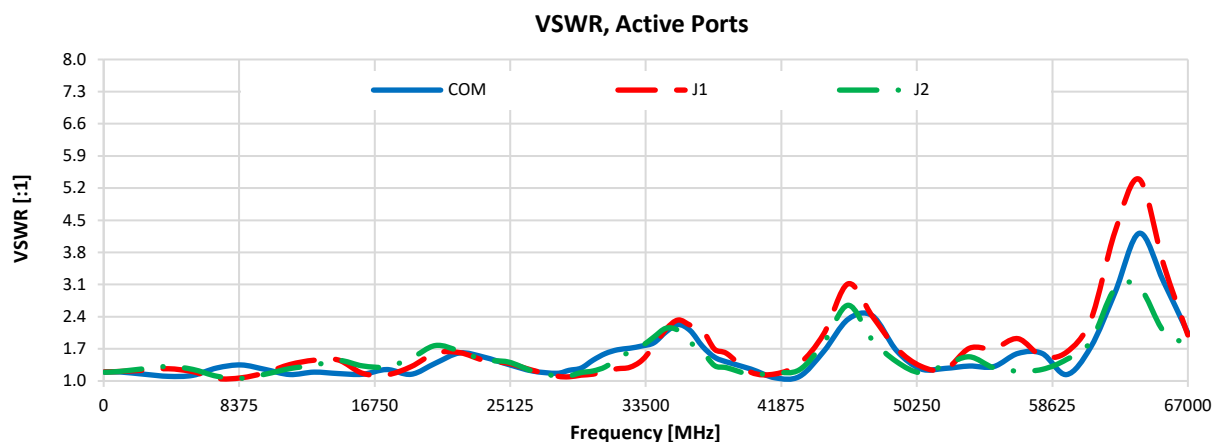
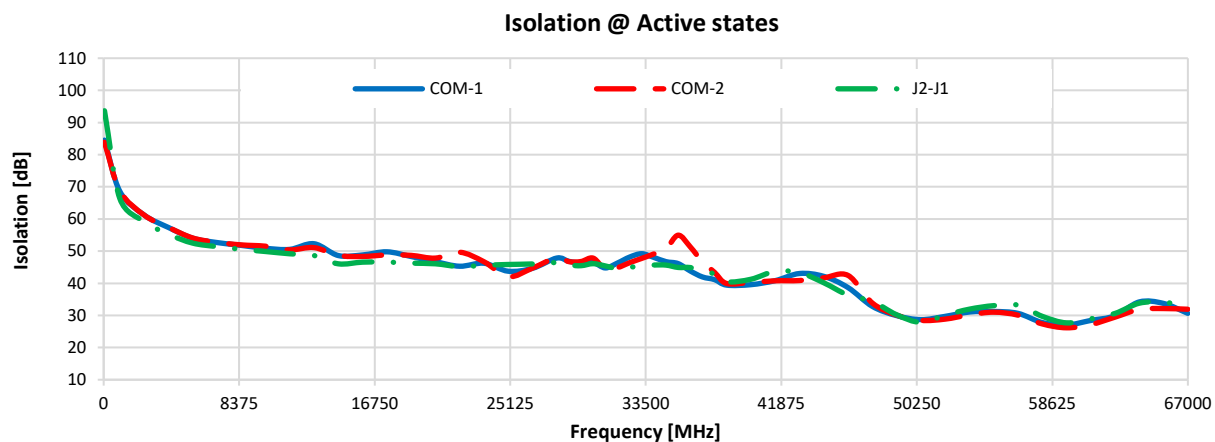
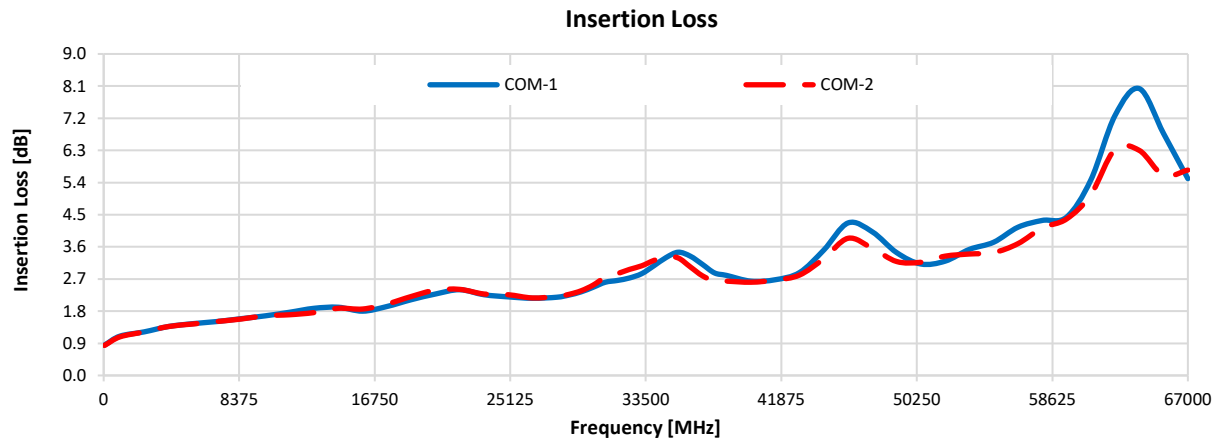
Typical Performance Curves

Test Conditions: @ Temperature = 0°C, pin = 0 dBm



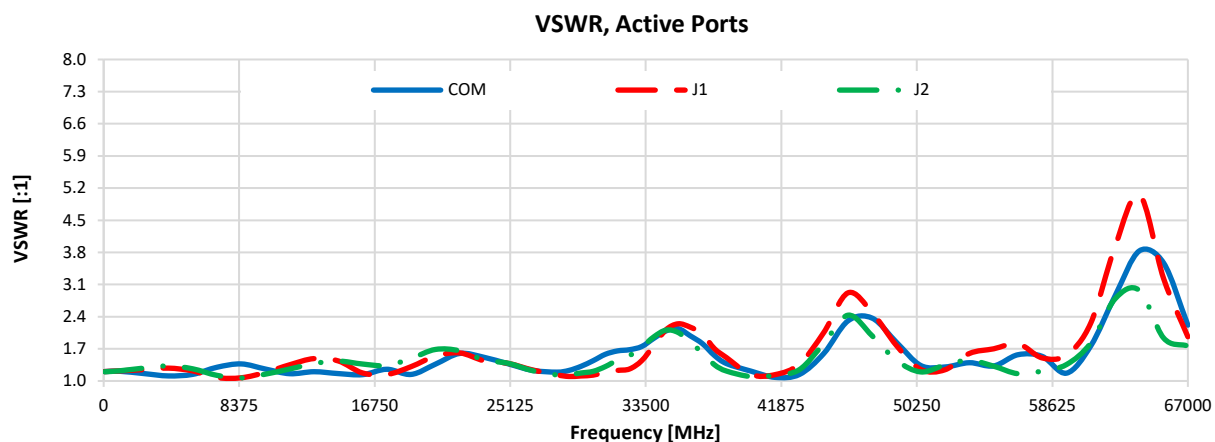
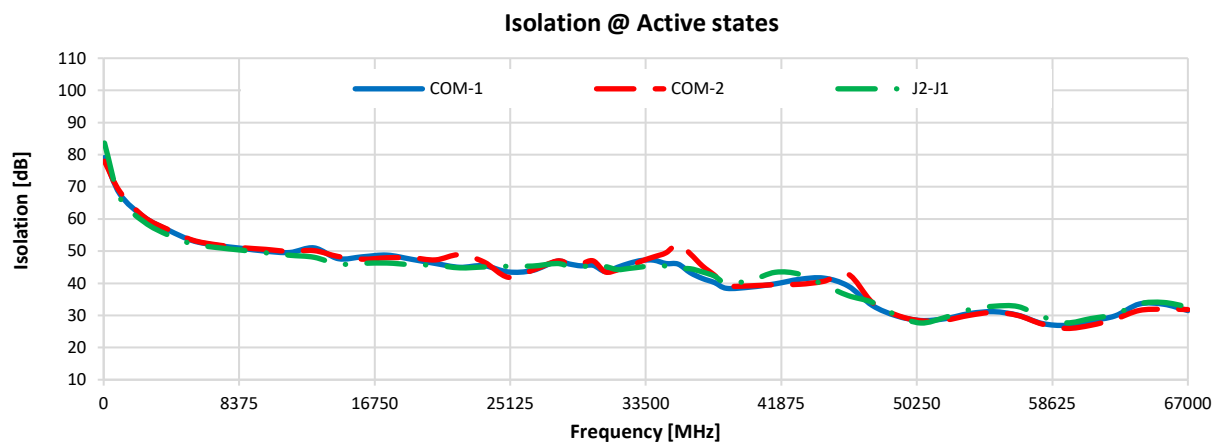
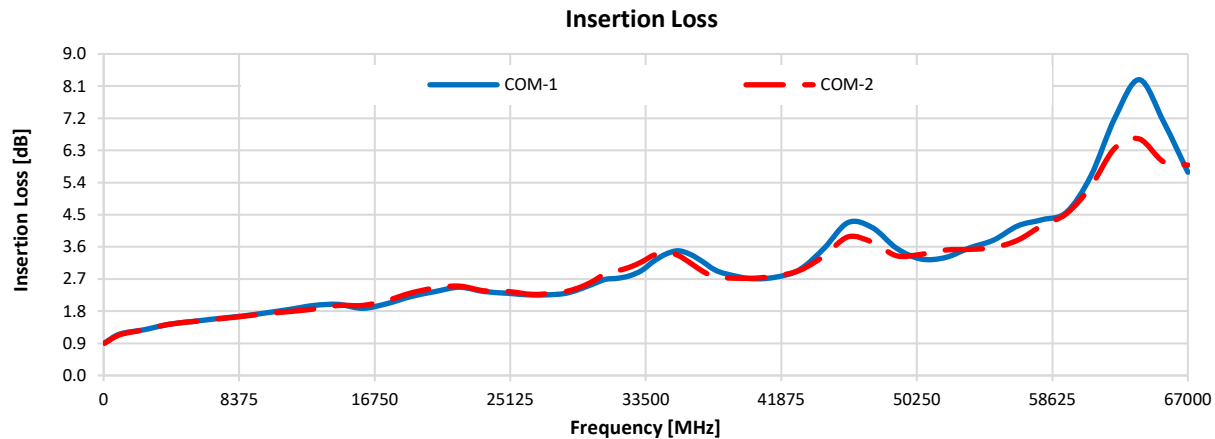
Typical Performance Curves

Test Conditions: @ Temperature = +25°C, pin = 0 dBm



Typical Performance Curves

Test Conditions: @ Temperature = +50°C, pin = 0 dBm

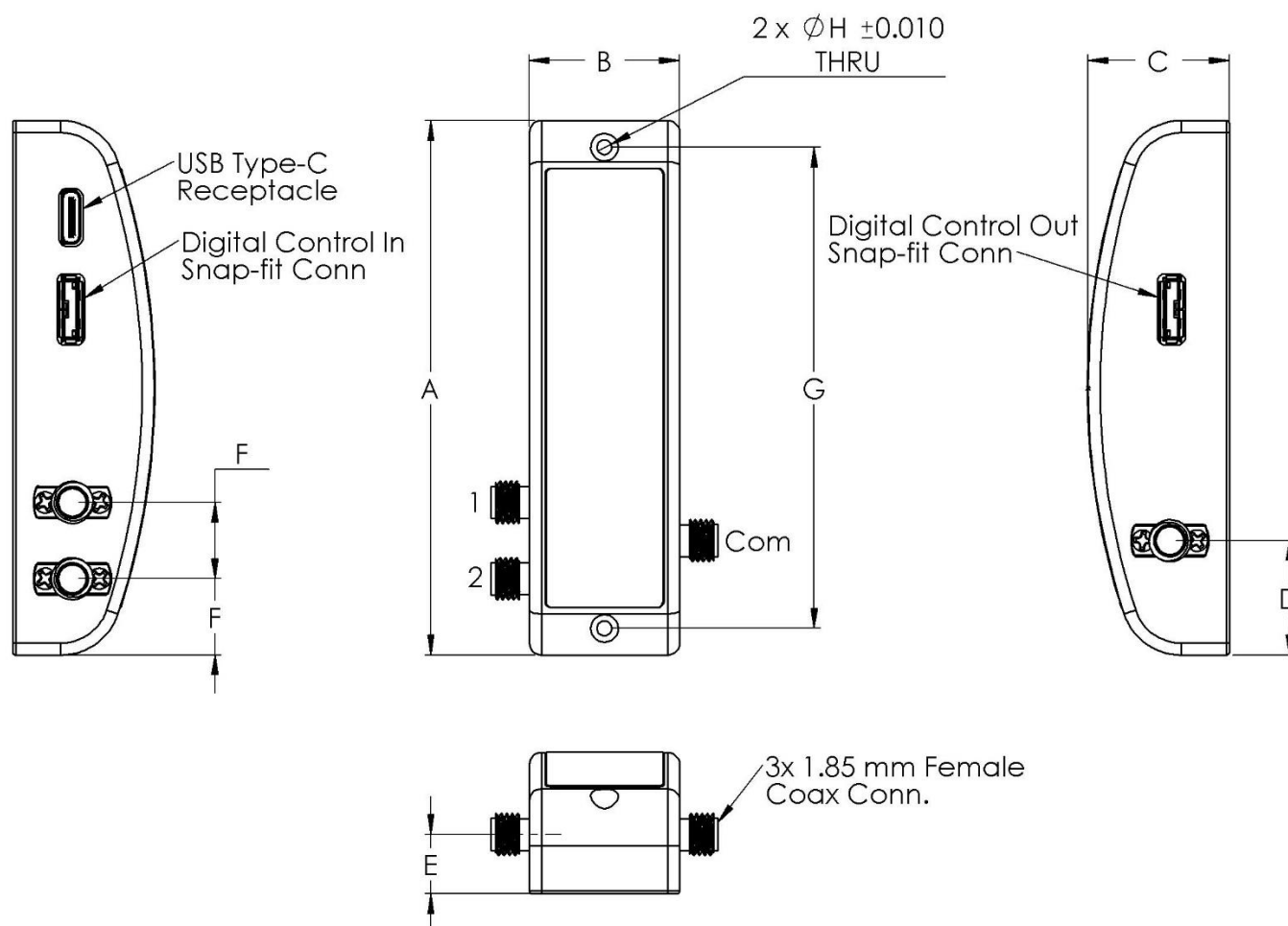
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Outline Dimensions

WP3211



CASE#	A	B	C	D	E	F	G	H	WT. GRAMS
WP3211	3.500 (88.9)	.984 (25.0)	.925 (23.5)	.750 (19.0)	.389 (9.9)	.500 (12.7)	3.150 (80.0)	.096 (2.44)	94

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

Notes:

- Case material: Nickel Plated Aluminum.



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com



Environmental Specifications ENV55

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-0° to 50° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-20° to 60° C Ambient Environment	Individual Model Data Sheet
Operating and Storage Humidity	5% to 85% RH (non-condensing)	Ambient
Bench Handling Test	Bench Top Tip 45° & Drop	MIL-PRF-28800F
Transit Drop Test	Free Fall Drop, 20 cm (7.9 inches)	MIL-PRF-28800F Class 3