



Mini-Circuits

USB

Solid State SP2T Switch

USB-1SP2T-A44

50Ω 0.1 to 43.5 GHz

THE BIG DEAL

- Super wide bandwidth, solid-state design
- High isolation, 60 dB @ 43.5 GHz
- USB control and automation
- Daisy-chain control of up to 25 switches

APPLICATIONS

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



Model No.	USB-1SP2T-A44
Case Style	UE3202
Connectors	2.92 mm (female) (Compatible with SMA and 3.5 mm)

DOWNLOAD

SOFTWARE PACKAGE

Refer to our website for compliance methodologies and qualifications



PRODUCT OVERVIEW

Mini-Circuits' USB-1SP2T-A44 is a fast switching solid-state SP2T covering an ultra-wide bandwidth, from 0.1 to 43.5 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 2.92 mm RF connectors.

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 43.5 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.

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Rev. E
ECO-016633
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USB-1SP2T-A44
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ELECTRICAL SPECIFICATIONS AT 0 TO 50°C

Parameter	Ports	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range	-	-	0.1		43.5	GHz
Insertion Loss	COM to any active port	0.1 - 18	-	1.50	3.00	dB
		18 - 26	-	2.70	4.00	
		26 - 35	-	3.30	4.50	
		35 - 40	-	4.00	5.50	
		40 - 43.5	-	5.50	7.00	
Isolation	Between ports J1 & J2	0.1 - 18	53	65	-	dB
		18 - 26	45	60	-	
		26 - 35	45	56	-	
		35 - 40	43	52	-	
		40 - 43.5	41	47	-	
	COM to any terminated port (active states)	0.1 - 18	53	65	-	
		18 - 26	45	55	-	
		26 - 35	45	52	-	
		35 - 40	42	50	-	
		40 - 43.5	39	46	-	
	COM to any terminated port (including disconnected state - ports 1 & 2 terminated)	0.1 - 18	50	65	-	
		18 - 26	43	52	-	
		26 - 35	43	51	-	
		35 - 43.5	40	48	-	
		40 - 43.5	40	48	-	
Return Loss	COM port ¹ (in all active states)	0.1 - 18	-	21	11.5	dB
		18 - 26	-	14	9.5	
		26 - 35	-	11.5	8.1	
		35 - 40	-	11	7.7	
		40 - 43.5	-	9.5	5.1	
	Any port connected to COM	0.1 - 18	-	21	13	
		18 - 26	-	14	9.5	
		26 - 35	-	11.5	7.4	
		35 - 40	-	11	7.4	
		40 - 43.5	-	8.5	5.1	
	Any terminated port	0.1 - 18	-	21	14	
		18 - 26	-	17.5	11.5	
		26 - 35	-	14	10	
		35 - 40	-	10	7.4	
		40 - 43.5	-	10	7.4	
Power Input @1 dB Compression	COM to any active port	0.1 - 43.5	-	+27	-	dBm
IP3 ²	COM to any active port	0.1 - 43.5	-	50	-	dBm
Transition Time ³	-	-	-	10	-	ns
Minimum Dwell Time ⁴	High speed mode	-	-	15	-	µs
Switching Time (USB) ⁵	-	-	-	2	-	ms
Supply Voltage (Vcc)	USB port	-	4.75	5	5.25	V _{DC}
Supply Current (Icc) ⁶		-	-	100	150	mA
Current Pass-through ⁷		-	-	-	500	
Operating RF Input Power	Between COM & active port (Hot & Cold switching)	0.1 - 40	-	-	+24	dBm
		40 - 43.5	-	-	+23	
	COM to any port	0.1 - 40	-	-	+24	
		40 - 43.5	-	-	+23	
	Into any termination	0.1 - 40	-	-	+24	
		40 - 43.5	-	-	+23	

1. COM port is reflective in disconnected state.

2. IP3 is tested with 1 MHz span between signals, +12 dBm per tone.

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

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

5. 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.

6. Current consumption specified for a single unit without any slave modules.

7. 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.



**USB**

Solid State SP2T Switch

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ABSOLUTE MAXIMUM RATINGS

Operating Temperature	0°C to 50°C	
Storage Temperature	-20°C to 60°C	
DC supply voltage max.	6V	
RF power in each port	0.1-40 GHz	+25 dBm
	40-43.5 GHz	+24 dBm
RF power in with DC supply disconnected	+20 dBm	
DC voltage @ RF Ports ⁸	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.

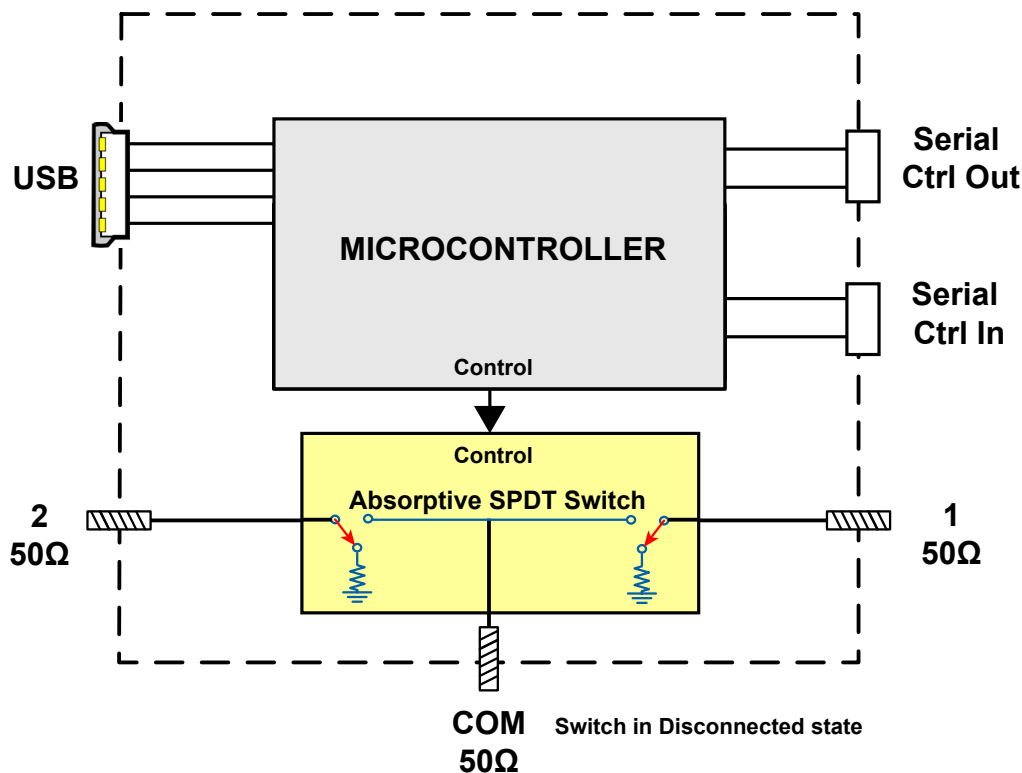
8. If your signal has a DC component use a DC block such as [BLK-K44+](#) to prevent damage to the switch..

CONNECTIONS

Port Name	Connector Type
RF Ports (COM, 1 & 2)	2.92 mm female
USB	USB type-C receptacle
Serial Control Out	10 Pin Digital Snap Fit female ⁹
Serial Control In	10 Pin Digital Snap Fit female ⁹

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

BLOCK DIAGRAM



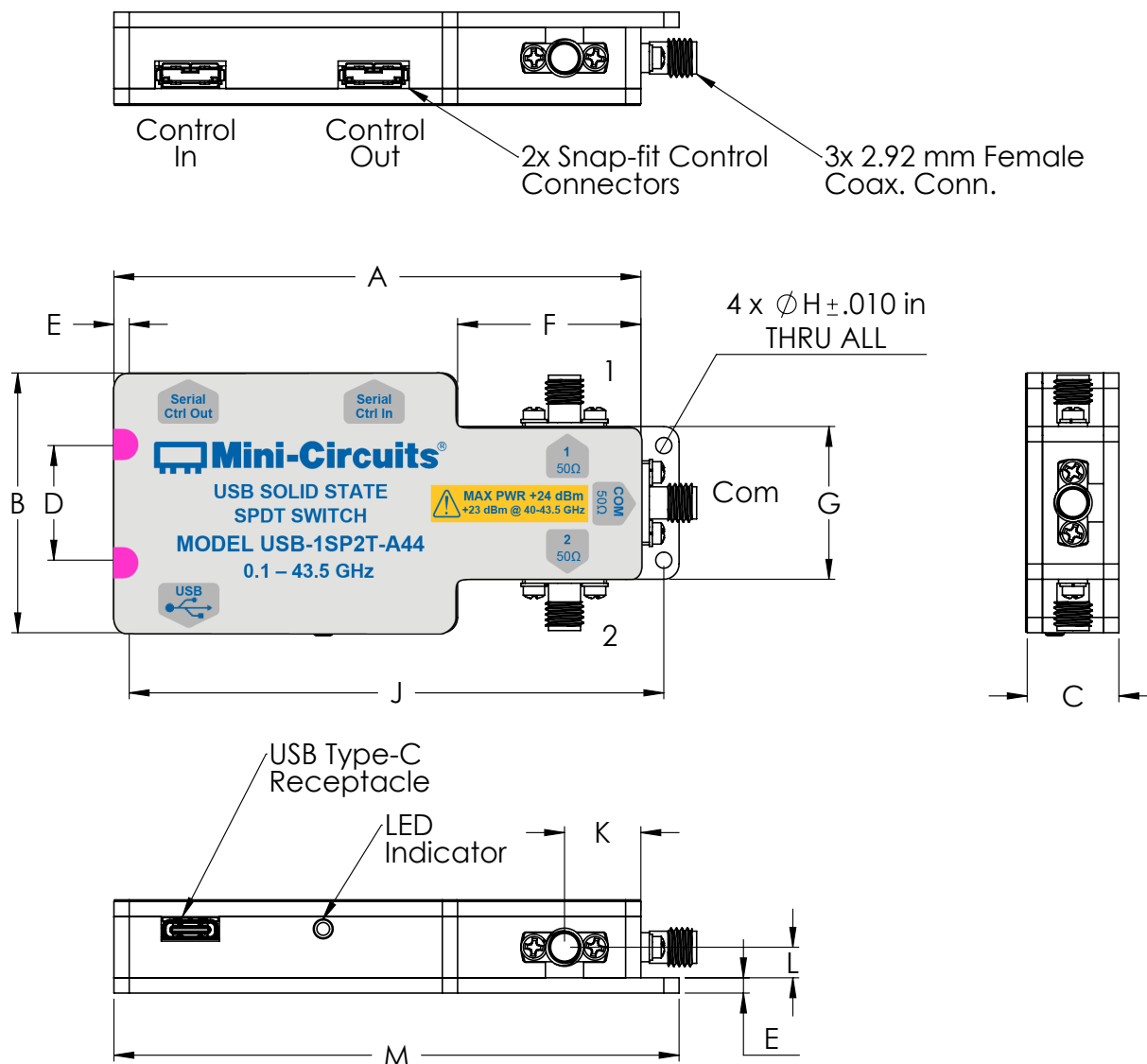


USB

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OUTLINE DRAWING (UE3202)



OUTLINE DIMENSIONS (INCH)

A	B	C	D	E	F	G	H	J	K	L	M	weight
3.45	1.700	0.60	0.75	0.10	1.20	1.00	0.106	3.50	0.50	0.20	3.70	grams
87.63	43.185	15.24	19.05	2.54	30.48	25.40	2.690	88.90	12.70	5.08	93.98	550





USB

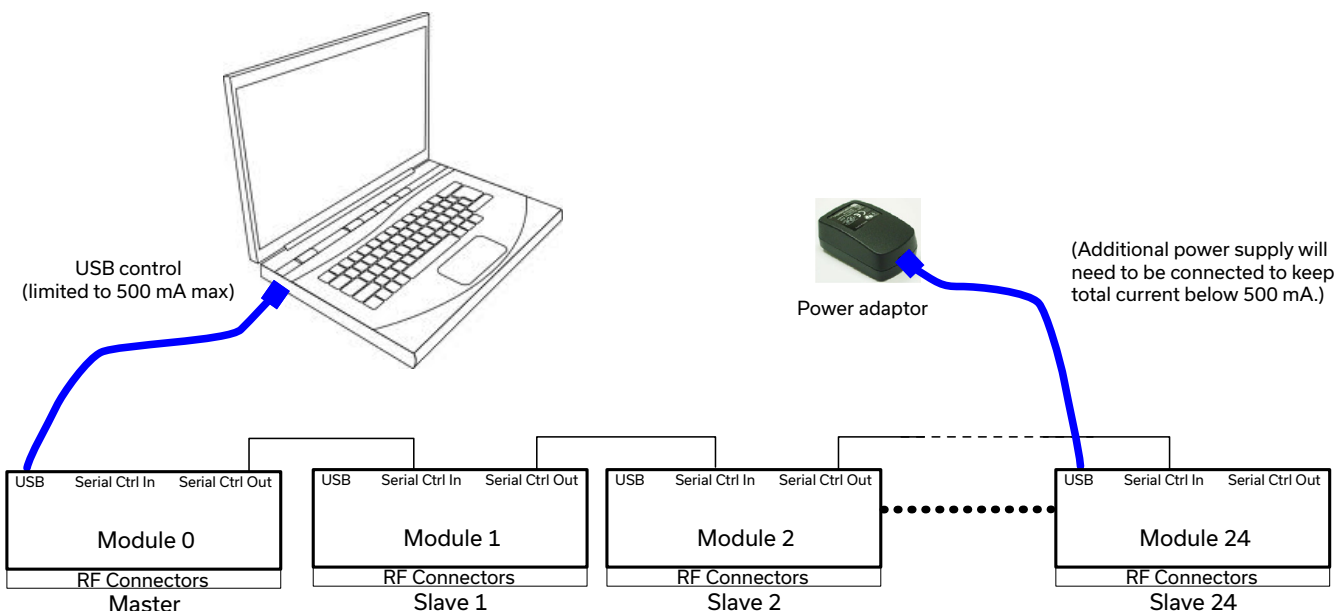
Solid State SP2T Switch

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CONNECTING MULTIPLE MODULES (DAISY CHAIN)

The USB-1SP2T-A44 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.



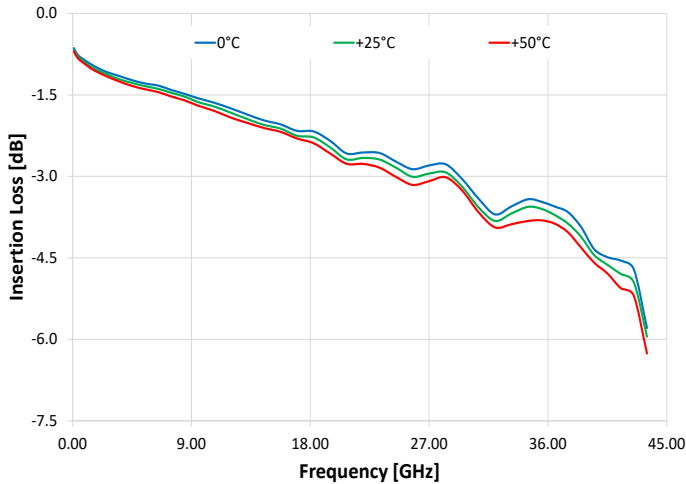
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Solid State SP2T Switch

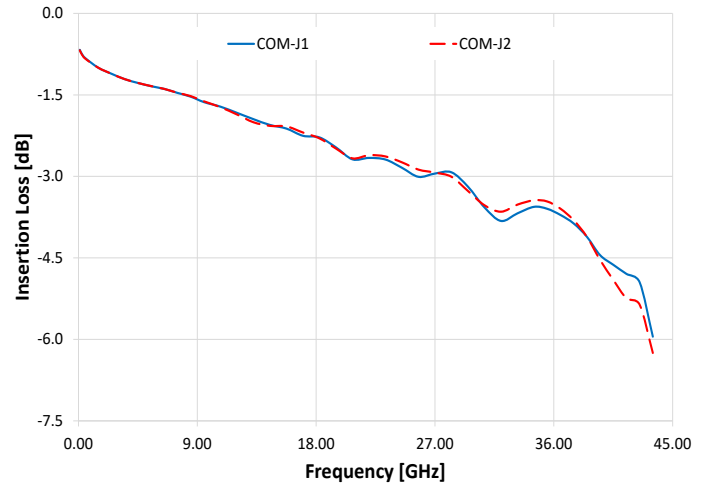
USB-1SP2T-A44

TYPICAL PERFORMANCE CURVES

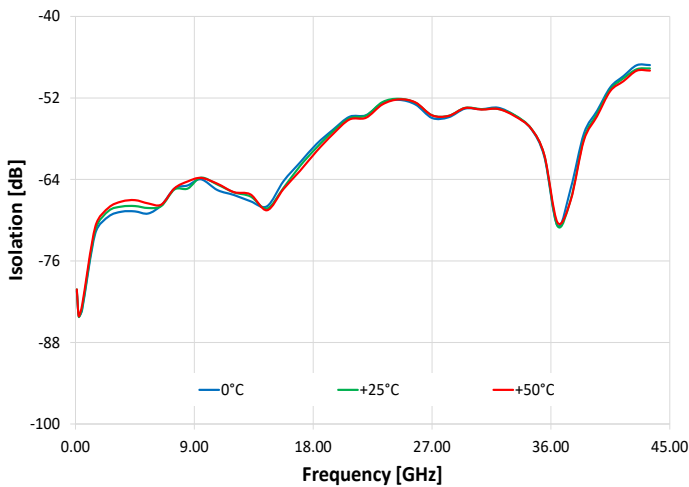
Insertion Loss over Temperature (J1 Active)



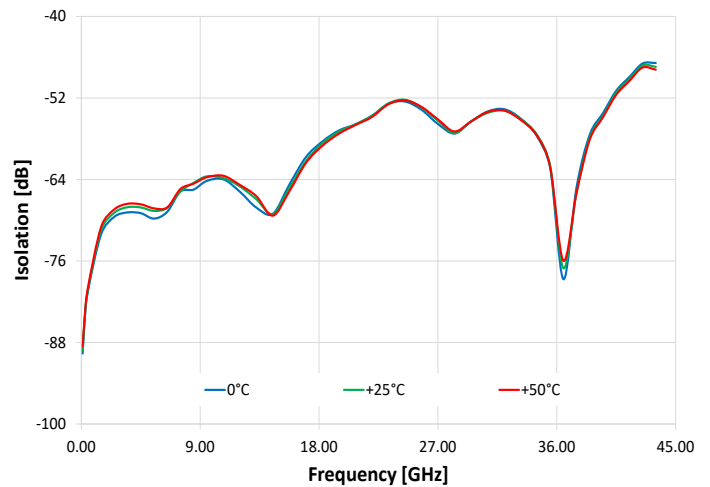
Insertion Loss J1 - J2 Active



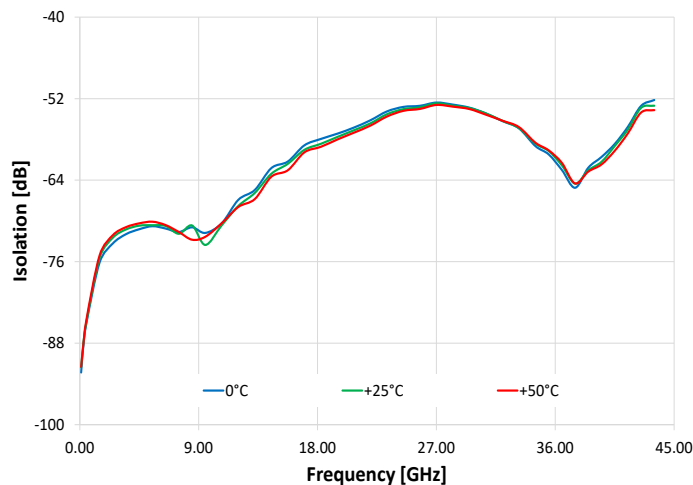
Isolation Com to J1 (J2 Active)



Isolation Com to J2 (J1 Active)



Isolation J1 to J2 (J1 Active)





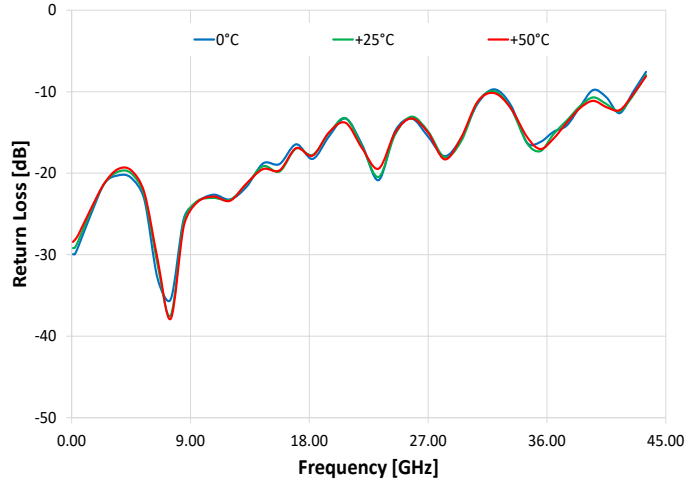
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Solid State SP2T Switch

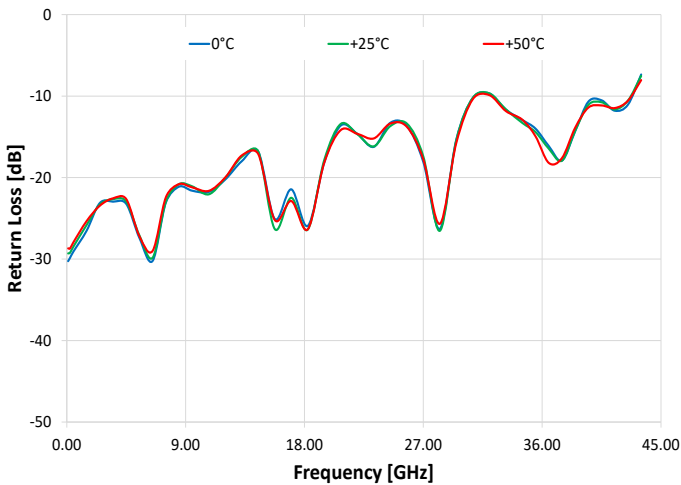
USB-1SP2T-A44

TYPICAL PERFORMANCE CURVES (CONTINUED)

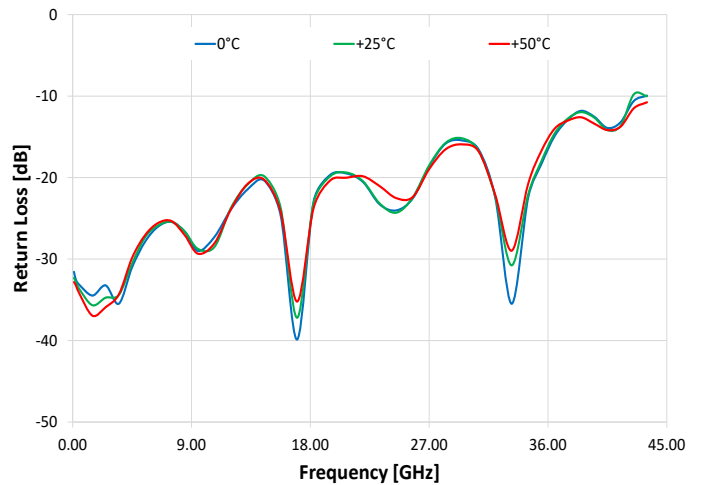
Return Loss @ COM over Temperature (J1 Active)



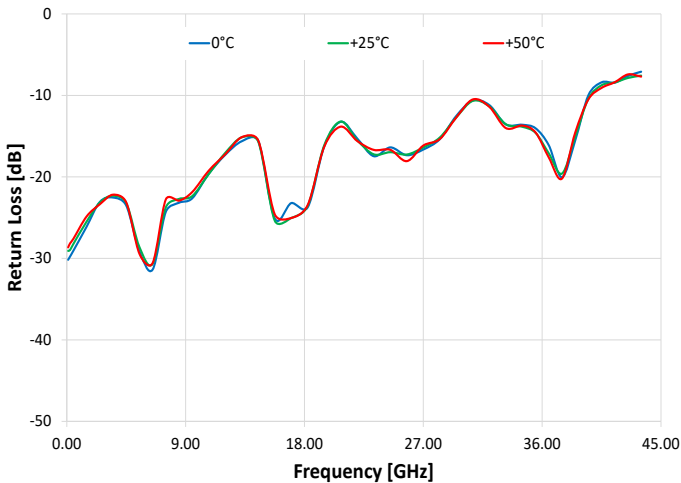
Return Loss @ J1 over Temperature (J1 Active)



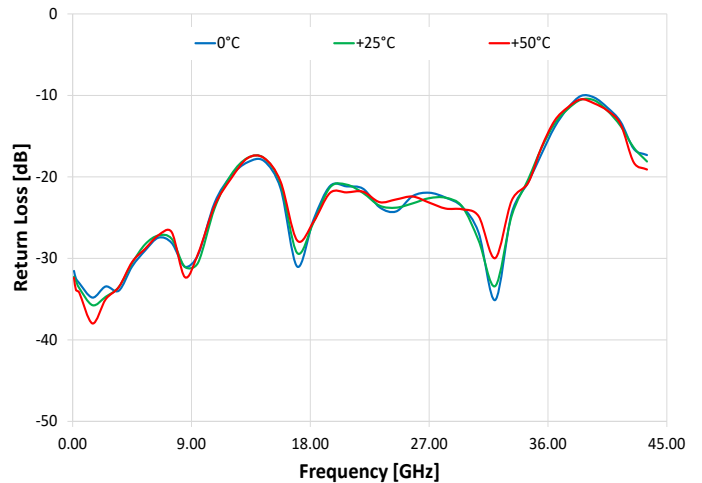
Return Loss @ J1 over Temperature (J1 Terminated)



Return Loss @ J2 over Temperature (J2 Active)



Return Loss @ J2 over Temperature (J2 Terminated)



**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 7 or later
	USB API DLL	Windows 7 or later and programming environment with ActiveX or .NET support
	USB Direct Programming	Linux, Windows 7 or later
	Daisy Chain dynamic addressing	An additional Mini-Circuits model supporting dynamic addressing
Hardware	Intel i3 (or equivalent) or later	

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

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.



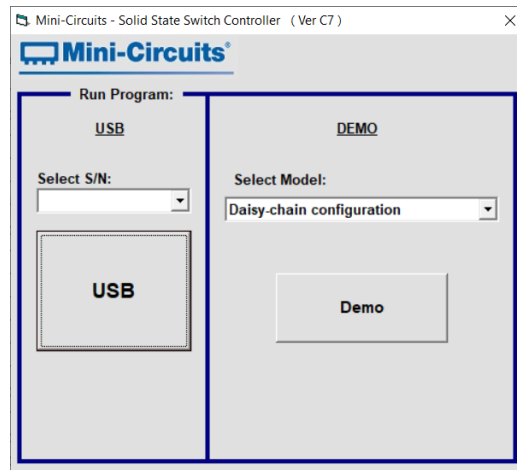
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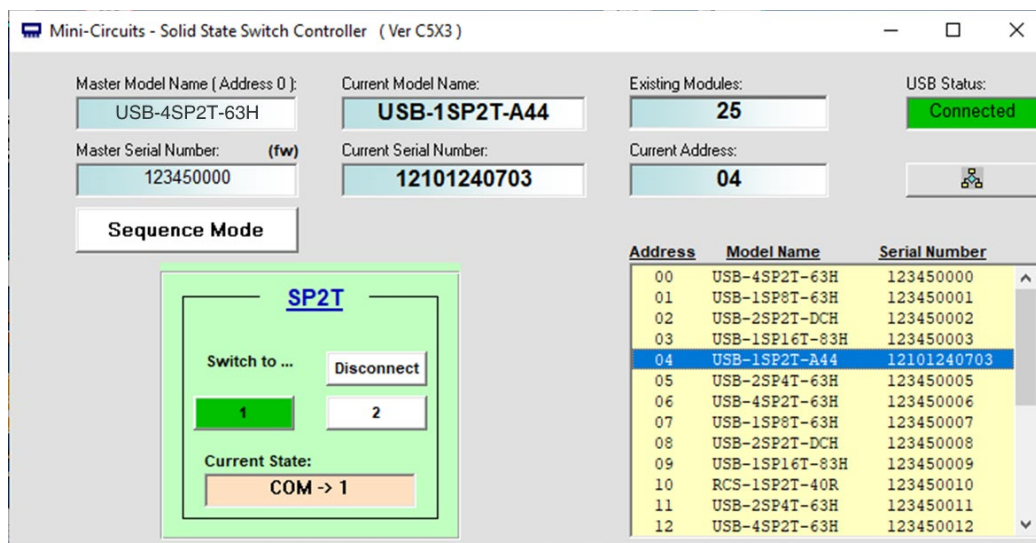
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GRAPHICAL USER INTERFACE (GUI) FOR WINDOWS - KEY FEATURES

- 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



**ORDERING INFORMATION**

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

Model	Description
USB-1SP2T-A44	USB RF SP2T 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+ (Spare)	3.3 ft (1.0 m) USB cable: USB type A (Male) to USB type C (Male)
USB-CBL-CC-3+	3.3 ft (1.0 m) USB Cable: USB type C (Male) to USB type C (Male)
CBL-5FT-MMD+	5.0 ft (1.5 m) Digital Snap Fit (male-male) cable assembly (daisy chain)
CBL-1.5FT-MMD+	1.5 ft (0.5 m) Digital Snap Fit (male-male) cable assembly (daisy chain)
USB-AC/DC-5	AC/DC +5V power adaptor with USB connector ^{10, 11}

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

11. 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:

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- 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 <https://www.minicircuits.com/terms/viewterm.html>

Solid State

USB SPDT Switch

USB-1SP2T-A44

Typical Performance Data

TEST CONDITIONS: @Temperature = 0°C, Pin=8dBm

Frequency (MHz)	Insertion Loss		VSWR, Active Ports			VSWR, Internally Terminated Ports	
	(dB)		(:1)			(:1)	
	COM-1	COM-2	J1	J2	COM	J1	J2
100	0.64	0.65	1.06	1.06	1.07	1.05	1.05
500	0.79	0.79	1.07	1.07	1.08	1.04	1.05
1000	0.88	0.89	1.09	1.09	1.09	1.04	1.04
1500	0.95	0.95	1.10	1.10	1.12	1.04	1.04
2000	1.02	1.02	1.12	1.12	1.15	1.04	1.04
2500	1.07	1.07	1.15	1.15	1.19	1.04	1.04
3000	1.12	1.12	1.16	1.16	1.21	1.04	1.04
3500	1.15	1.15	1.16	1.17	1.22	1.04	1.05
4000	1.20	1.19	1.15	1.15	1.22	1.04	1.05
4500	1.23	1.22	1.15	1.14	1.21	1.06	1.06
5000	1.25	1.24	1.13	1.11	1.18	1.07	1.07
5500	1.29	1.27	1.09	1.07	1.14	1.08	1.07
6000	1.31	1.30	1.05	1.04	1.09	1.10	1.08
6500	1.33	1.32	1.06	1.06	1.04	1.11	1.09
7000	1.36	1.35	1.11	1.09	1.01	1.11	1.09
7500	1.42	1.40	1.15	1.13	1.03	1.11	1.08
8000	1.45	1.43	1.18	1.15	1.06	1.10	1.07
8500	1.47	1.44	1.20	1.16	1.08	1.10	1.06
9500	1.55	1.53	1.18	1.16	1.12	1.07	1.07
10500	1.64	1.63	1.17	1.21	1.18	1.08	1.13
11500	1.70	1.71	1.20	1.29	1.22	1.12	1.20
12500	1.78	1.81	1.23	1.34	1.21	1.15	1.25
13500	1.88	1.91	1.31	1.41	1.28	1.20	1.29
14500	1.97	1.97	1.34	1.40	1.30	1.21	1.28
15500	2.02	1.97	1.15	1.17	1.21	1.15	1.21
16500	2.12	2.03	1.11	1.06	1.23	1.06	1.11
17500	2.18	2.14	1.21	1.18	1.34	1.08	1.04
18500	2.19	2.19	1.10	1.16	1.33	1.17	1.13
19500	2.33	2.33	1.28	1.36	1.47	1.23	1.19
20500	2.54	2.52	1.48	1.54	1.57	1.22	1.19
21500	2.60	2.53	1.56	1.53	1.49	1.24	1.20
22500	2.52	2.44	1.37	1.32	1.21	1.17	1.15
23500	2.59	2.53	1.38	1.32	1.24	1.13	1.14
24500	2.73	2.61	1.55	1.36	1.38	1.13	1.13
25500	2.85	2.71	1.57	1.32	1.43	1.16	1.17
26500	2.82	2.75	1.42	1.34	1.46	1.21	1.17
27500	2.79	2.82	1.19	1.38	1.43	1.30	1.17
28500	2.89	2.96	1.14	1.44	1.44	1.39	1.16
29500	3.05	3.10	1.41	1.62	1.55	1.41	1.14
30500	3.33	3.30	1.76	1.76	1.71	1.39	1.10
31500	3.64	3.51	1.99	1.85	1.96	1.22	1.04
32500	3.69	3.48	1.92	1.70	1.80	1.11	1.06
33500	3.50	3.31	1.66	1.51	1.51	1.04	1.13
34500	3.42	3.24	1.58	1.53	1.30	1.16	1.21
35500	3.40	3.22	1.48	1.48	1.31	1.29	1.33
36500	3.57	3.43	1.38	1.38	1.41	1.44	1.51
37500	3.65	3.56	1.29	1.22	1.45	1.58	1.71
38500	3.93	3.87	1.47	1.40	1.65	1.69	1.92
39500	4.33	4.39	1.82	1.92	1.95	1.60	1.87
40500	4.50	4.75	1.85	2.22	1.94	1.50	1.73
41500	4.55	4.94	1.69	2.21	1.82	1.56	1.56
42500	4.71	5.19	1.77	2.44	2.16	1.79	1.33
43500	5.79	6.10	2.50	2.58	2.63	1.93	1.32

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Typical Performance Data

TEST CONDITIONS: @Temperature = 0°C, Pin=8dBm

Frequency (MHz)	Isolation @ Active states (dB)			Isolation @ Disconnected state (dB)		
	COM-1	COM-2	J1-J2	COM-1	COM-2	J1-J2
100	80.47	89.62	92.32	74.67	84.62	105.77
500	83.24	80.48	85.07	80.98	77.48	93.02
1000	75.20	74.91	79.38	71.94	71.45	87.51
1500	71.95	72.08	76.13	68.50	68.38	84.27
2000	70.22	70.36	74.29	67.00	66.80	81.84
2500	69.47	69.49	73.33	65.94	65.89	79.88
3000	68.78	68.95	72.21	65.70	65.45	78.02
3500	68.75	68.82	72.14	65.43	65.50	77.21
4000	68.57	68.81	71.56	65.83	65.83	75.39
4500	68.71	69.04	71.24	66.20	65.45	74.48
5000	69.01	69.71	71.28	65.80	65.90	73.73
5500	68.96	69.78	70.74	65.28	65.19	72.37
6000	68.90	69.86	70.72	67.25	68.07	72.13
6500	67.80	68.77	71.14	65.02	66.45	71.94
7000	66.30	67.14	70.96	68.34	69.50	71.27
7500	65.28	65.84	71.88	69.47	70.73	72.87
8000	64.94	65.14	72.02	68.00	69.57	76.08
8500	65.43	65.32	71.17	72.40	72.11	79.74
9500	63.74	64.15	71.55	71.34	71.55	79.52
10500	64.90	64.33	71.26	73.23	70.07	75.59
11500	66.47	65.18	68.03	71.75	70.21	75.69
12500	66.66	66.47	66.48	67.47	67.12	77.83
13500	67.11	68.46	64.52	63.51	64.62	78.56
14500	67.92	69.10	62.29	60.48	61.48	77.99
15500	64.75	65.17	61.40	58.02	59.03	80.03
16500	62.69	62.60	59.88	56.93	56.80	76.09
17500	60.51	59.28	58.07	56.34	54.86	73.62
18500	58.17	58.00	57.88	55.24	54.76	72.45
19500	56.66	56.80	57.20	53.47	53.44	70.41
20500	54.90	55.92	56.38	51.53	52.44	69.09
21500	55.09	55.48	55.84	52.10	51.78	70.50
22500	53.80	54.02	54.67	51.36	51.14	69.49
23500	52.46	52.62	53.70	50.20	50.25	66.96
24500	52.27	52.52	53.22	49.60	50.02	64.37
25500	52.84	53.64	53.29	49.39	50.77	63.59
26500	54.02	54.77	52.76	49.96	50.83	62.86
27500	55.40	56.97	52.73	51.91	51.84	63.64
28500	54.53	57.13	53.03	53.21	53.43	63.73
29500	53.57	55.47	53.33	54.93	55.39	63.52
30500	53.69	54.18	54.06	56.67	57.42	62.37
31500	53.51	53.79	54.92	58.80	59.65	59.63
32500	53.63	54.03	55.62	61.80	62.07	56.97
33500	54.71	55.44	56.80	67.31	65.37	55.40
34500	56.56	57.66	58.99	64.50	62.91	53.80
35500	60.54	62.29	60.22	58.94	58.74	52.36
36500	70.95	77.84	62.44	55.67	55.48	51.74
37500	65.30	65.21	65.24	53.39	53.12	50.91
38500	57.23	57.40	62.20	51.35	51.20	49.81
39500	53.80	54.23	60.89	49.66	49.45	49.25
40500	50.39	50.92	58.64	47.65	47.55	48.17
41500	48.82	48.99	56.20	46.47	46.22	47.36
42500	47.19	46.95	53.13	45.51	45.20	46.26
43500	47.16	46.85	52.20	46.22	45.40	46.06

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Solid State

USB SPDT Switch

USB-1SP2T-A44

Typical Performance Data

TEST CONDITIONS: @Temperature = 25°C, Pin=8dBm

Frequency (MHz)	Insertion Loss		VSWR, Active Ports			VSWR, Internally Terminated Ports	
	(dB)		(:1)			(:1)	
	COM-1	COM-2	J1	J2	COM	J1	J2
100	0.67	0.68	1.07	1.07	1.08	1.05	1.05
500	0.82	0.83	1.08	1.08	1.08	1.04	1.04
1000	0.92	0.93	1.09	1.10	1.10	1.04	1.04
1500	1.00	1.00	1.11	1.11	1.13	1.03	1.03
2000	1.06	1.06	1.12	1.13	1.16	1.04	1.04
2500	1.11	1.11	1.15	1.15	1.19	1.04	1.04
3000	1.17	1.17	1.16	1.16	1.21	1.04	1.04
3500	1.21	1.21	1.16	1.17	1.23	1.04	1.05
4000	1.26	1.25	1.16	1.16	1.24	1.05	1.05
4500	1.28	1.28	1.15	1.15	1.23	1.06	1.06
5000	1.30	1.30	1.13	1.12	1.19	1.08	1.07
5500	1.34	1.34	1.09	1.08	1.15	1.09	1.08
6000	1.37	1.36	1.06	1.04	1.10	1.10	1.09
6500	1.39	1.39	1.07	1.06	1.05	1.11	1.09
7000	1.43	1.42	1.11	1.10	1.02	1.11	1.09
7500	1.48	1.47	1.15	1.13	1.03	1.11	1.09
8000	1.51	1.50	1.18	1.16	1.05	1.10	1.07
8500	1.52	1.51	1.21	1.16	1.08	1.10	1.06
9500	1.62	1.61	1.19	1.16	1.12	1.07	1.06
10500	1.70	1.71	1.17	1.21	1.19	1.07	1.12
11500	1.77	1.80	1.20	1.29	1.21	1.12	1.19
12500	1.86	1.91	1.25	1.36	1.22	1.16	1.26
13500	1.97	2.02	1.33	1.44	1.27	1.21	1.31
14500	2.05	2.07	1.34	1.39	1.27	1.23	1.30
15500	2.10	2.07	1.15	1.17	1.18	1.16	1.22
16500	2.21	2.14	1.10	1.04	1.23	1.06	1.12
17500	2.27	2.25	1.17	1.15	1.32	1.07	1.06
18500	2.31	2.33	1.10	1.16	1.35	1.17	1.13
19500	2.45	2.47	1.29	1.37	1.49	1.23	1.19
20500	2.66	2.65	1.51	1.54	1.57	1.23	1.20
21500	2.69	2.64	1.54	1.50	1.46	1.23	1.19
22500	2.63	2.58	1.38	1.33	1.22	1.18	1.16
23500	2.72	2.68	1.38	1.32	1.24	1.14	1.14
24500	2.84	2.74	1.52	1.33	1.35	1.13	1.14
25500	2.98	2.86	1.59	1.32	1.43	1.17	1.15
26500	2.97	2.92	1.44	1.34	1.47	1.22	1.16
27500	2.93	2.99	1.18	1.39	1.46	1.32	1.17
28500	3.02	3.12	1.15	1.45	1.45	1.39	1.16
29500	3.19	3.27	1.41	1.60	1.53	1.42	1.14
30500	3.50	3.49	1.78	1.78	1.74	1.38	1.10
31500	3.77	3.66	2.00	1.83	1.90	1.22	1.05
32500	3.80	3.63	1.91	1.68	1.75	1.12	1.07
33500	3.65	3.48	1.66	1.50	1.49	1.07	1.13
34500	3.56	3.44	1.55	1.51	1.30	1.17	1.21
35500	3.53	3.41	1.46	1.45	1.28	1.29	1.36
36500	3.72	3.61	1.36	1.33	1.38	1.46	1.54
37500	3.86	3.80	1.29	1.23	1.49	1.60	1.70
38500	4.11	4.11	1.48	1.42	1.67	1.68	1.85
39500	4.44	4.52	1.77	1.86	1.82	1.61	1.84
40500	4.64	4.91	1.82	2.15	1.81	1.49	1.69
41500	4.79	5.24	1.71	2.22	1.85	1.53	1.52
42500	4.94	5.35	1.83	2.36	2.11	1.93	1.34
43500	5.95	6.25	2.45	2.44	2.50	1.92	1.28

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Solid State

USB SPDT Switch

USB-1SP2T-A44

Typical Performance Data

TEST CONDITIONS: @Temperature = 25°C, Pin=8dBm

Frequency (MHz)	Isolation @ Active states (dB)			Isolation @ Disconnected state (dB)		
	COM-1	COM-2	J1-J2	COM-1	COM-2	J1-J2
100	80.18	89.15	91.54	74.65	82.94	104.08
500	83.00	80.18	84.83	80.24	76.94	92.53
1000	74.66	74.48	78.88	71.14	70.67	87.34
1500	71.49	71.46	75.44	67.91	67.61	83.86
2000	69.61	69.76	73.60	66.07	65.96	81.52
2500	68.63	68.90	72.46	65.14	65.06	80.16
3000	68.08	68.20	71.63	64.70	64.79	77.87
3500	68.03	68.09	71.36	64.44	64.42	76.92
4000	67.75	67.88	70.94	64.50	64.57	75.22
4500	67.94	68.20	70.72	64.66	64.72	74.40
5000	68.35	68.67	70.82	64.63	65.19	73.98
5500	68.17	68.57	70.66	63.90	64.23	71.98
6000	68.46	69.18	70.64	66.03	66.26	71.83
6500	67.92	68.17	70.75	64.46	65.08	71.38
7000	66.57	66.93	70.66	67.23	67.28	70.50
7500	65.45	65.69	71.73	67.80	69.11	72.13
8000	64.78	64.82	72.29	67.03	68.74	76.10
8500	65.42	64.77	70.77	70.87	70.93	80.22
9500	63.68	63.54	73.69	69.91	70.20	78.69
10500	64.37	63.21	71.12	72.08	69.52	75.52
11500	65.85	64.79	68.65	73.68	71.68	75.08
12500	65.77	65.75	67.45	68.91	68.46	75.86
13500	66.26	67.52	65.14	65.28	65.43	76.84
14500	68.18	69.11	63.11	61.72	62.51	77.81
15500	65.50	65.99	62.15	58.95	60.05	82.35
16500	63.31	62.87	60.84	57.61	57.50	79.19
17500	60.81	59.78	58.88	56.90	55.33	74.86
18500	58.73	58.25	58.56	55.69	55.07	74.72
19500	56.89	56.96	57.62	53.89	53.91	73.07
20500	54.94	56.08	56.80	51.75	52.70	69.91
21500	55.16	55.53	56.34	52.22	51.93	71.90
22500	53.75	54.05	55.07	51.59	51.29	70.19
23500	52.44	52.60	54.10	50.34	50.26	67.40
24500	52.11	52.26	53.55	49.52	49.98	64.56
25500	52.58	53.27	53.51	49.36	50.64	63.41
26500	53.64	54.33	52.91	49.87	50.77	62.70
27500	55.01	56.42	52.92	51.77	51.67	63.07
28500	54.40	57.06	53.03	52.83	53.06	63.41
29500	53.46	55.47	53.39	54.47	54.97	63.08
30500	53.75	54.28	54.04	56.43	56.77	62.32
31500	53.59	53.88	54.89	58.15	58.98	59.69
32500	53.76	54.16	55.56	60.82	61.03	57.03
33500	54.80	55.53	56.63	65.93	64.31	55.48
34500	56.49	57.41	58.63	64.47	62.90	53.88
35500	60.31	62.19	59.76	59.24	58.94	52.42
36500	70.57	76.99	61.74	56.03	55.80	51.67
37500	66.92	66.00	64.47	53.65	53.31	51.05
38500	57.95	57.85	62.55	51.47	51.28	50.01
39500	54.29	54.65	61.52	49.60	49.37	49.26
40500	50.78	51.21	59.09	47.81	47.64	48.28
41500	49.09	49.26	56.42	46.77	46.66	47.55
42500	47.77	47.16	53.38	45.95	45.47	46.34
43500	47.65	47.42	53.04	46.32	45.64	46.63

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Solid State

USB SPDT Switch

USB-1SP2T-A44

Typical Performance Data

TEST CONDITIONS: @Temperature = 50°C, Pin=8dBm

Frequency (MHz)	Insertion Loss		VSWR, Active Ports			VSWR, Internally Terminated Ports	
	(dB)		(:1)			(:1)	
	COM-1	COM-2	J1	J2	COM	J1	J2
100	0.70	0.72	1.08	1.08	1.08	1.05	1.05
500	0.85	0.87	1.08	1.09	1.09	1.04	1.04
1000	0.95	0.96	1.10	1.10	1.11	1.03	1.03
1500	1.03	1.04	1.11	1.12	1.14	1.03	1.02
2000	1.09	1.10	1.13	1.13	1.16	1.03	1.03
2500	1.15	1.15	1.14	1.15	1.19	1.03	1.04
3000	1.20	1.18	1.16	1.16	1.22	1.04	1.04
3500	1.25	1.21	1.16	1.18	1.24	1.04	1.05
4000	1.30	1.27	1.16	1.16	1.26	1.05	1.04
4500	1.34	1.32	1.16	1.15	1.24	1.06	1.06
5000	1.36	1.37	1.13	1.12	1.21	1.08	1.07
5500	1.40	1.41	1.09	1.07	1.16	1.10	1.07
6000	1.43	1.43	1.06	1.04	1.11	1.10	1.08
6500	1.45	1.47	1.07	1.06	1.05	1.11	1.09
7000	1.49	1.48	1.12	1.10	1.03	1.12	1.10
7500	1.54	1.53	1.16	1.14	1.04	1.11	1.09
8000	1.58	1.56	1.20	1.18	1.03	1.11	1.08
8500	1.59	1.58	1.21	1.16	1.07	1.10	1.05
9500	1.69	1.66	1.19	1.17	1.13	1.07	1.07
10500	1.78	1.77	1.18	1.23	1.19	1.07	1.13
11500	1.86	1.85	1.20	1.29	1.21	1.11	1.19
12500	1.95	1.96	1.25	1.35	1.21	1.16	1.25
13500	2.03	2.08	1.33	1.44	1.27	1.21	1.31
14500	2.11	2.13	1.32	1.40	1.26	1.21	1.30
15500	2.16	2.14	1.15	1.18	1.19	1.15	1.23
16500	2.25	2.21	1.10	1.04	1.23	1.07	1.13
17500	2.35	2.33	1.17	1.16	1.34	1.07	1.05
18500	2.42	2.40	1.10	1.17	1.35	1.15	1.13
19500	2.56	2.54	1.28	1.36	1.49	1.21	1.17
20500	2.75	2.71	1.45	1.50	1.52	1.21	1.18
21500	2.78	2.71	1.52	1.48	1.45	1.24	1.19
22500	2.76	2.67	1.41	1.34	1.22	1.21	1.16
23500	2.88	2.77	1.43	1.36	1.27	1.18	1.16
24500	3.01	2.84	1.55	1.34	1.37	1.16	1.16
25500	3.12	2.92	1.54	1.26	1.41	1.16	1.18
26500	3.12	3.01	1.42	1.36	1.48	1.21	1.15
27500	3.05	3.08	1.20	1.42	1.46	1.28	1.14
28500	3.09	3.19	1.14	1.42	1.43	1.36	1.14
29500	3.26	3.37	1.39	1.60	1.54	1.38	1.14
30500	3.59	3.59	1.75	1.76	1.71	1.36	1.11
31500	3.90	3.81	1.98	1.85	1.93	1.23	1.08
32500	3.96	3.72	1.89	1.65	1.72	1.13	1.08
33500	3.85	3.59	1.65	1.47	1.49	1.08	1.16
34500	3.82	3.57	1.58	1.52	1.32	1.20	1.20
35500	3.75	3.54	1.43	1.46	1.30	1.35	1.37
36500	3.89	3.72	1.29	1.32	1.39	1.50	1.56
37500	4.02	3.92	1.30	1.21	1.47	1.58	1.74
38500	4.31	4.27	1.51	1.46	1.68	1.61	1.86
39500	4.58	4.66	1.73	1.83	1.79	1.54	1.76
40500	4.80	5.02	1.77	2.07	1.77	1.48	1.66
41500	5.05	5.44	1.73	2.21	1.84	1.52	1.52
42500	5.20	5.51	1.85	2.52	2.12	1.69	1.27
43500	6.26	6.50	2.31	2.40	2.48	1.82	1.25

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Solid State

USB SPDT Switch

Typical Performance Data

USB-1SP2T-A44

TEST CONDITIONS: @Temperature = 50°C, Pin=8dBm

Frequency (MHz)	Isolation @ Active states (dB)			Isolation @ Disconnected state (dB)		
	COM-1	COM-2	J1-J2	COM-1	COM-2	J1-J2
100	80.19	88.56	91.49	74.45	82.66	105.87
500	82.50	79.90	84.50	79.81	76.71	93.08
1000	74.35	74.16	78.42	70.69	70.42	87.61
1500	70.94	70.97	75.06	67.20	67.14	84.41
2000	69.08	69.31	73.13	65.45	65.49	81.59
2500	68.16	68.39	72.10	64.26	64.42	79.88
3000	67.44	67.69	71.27	64.14	63.96	77.98
3500	67.32	67.64	71.01	63.75	63.81	76.81
4000	67.00	67.46	70.54	63.69	63.69	75.31
4500	67.15	67.74	70.53	63.35	64.13	74.53
5000	67.34	67.99	70.53	63.84	64.80	73.41
5500	67.53	68.25	70.10	62.83	63.39	72.27
6000	68.02	68.80	70.33	64.61	65.95	71.84
6500	67.70	68.12	70.64	63.55	64.89	71.47
7000	66.55	66.64	70.56	65.52	66.82	70.92
7500	65.22	65.36	71.77	67.23	68.01	72.58
8000	64.39	64.68	72.78	65.92	66.99	76.41
8500	64.39	64.18	74.93	67.00	68.35	78.73
9500	63.74	63.65	72.97	69.20	69.73	79.84
10500	64.37	63.18	72.56	70.40	68.21	75.17
11500	65.38	64.25	68.94	73.12	70.76	74.35
12500	65.79	65.61	67.46	72.03	69.85	75.41
13500	66.13	67.14	66.01	66.93	66.92	76.75
14500	68.71	69.30	63.52	62.80	63.33	78.04
15500	66.01	66.39	62.57	59.41	60.62	84.07
16500	64.08	63.37	60.98	58.44	57.93	80.17
17500	61.54	60.32	59.18	57.45	55.69	76.06
18500	59.20	58.63	59.00	56.05	55.41	74.30
19500	57.33	57.28	58.02	54.15	54.20	73.86
20500	55.18	56.22	57.14	52.05	52.84	70.91
21500	55.38	55.61	56.62	52.57	52.23	72.51
22500	54.12	54.20	55.50	51.90	51.53	70.77
23500	52.67	52.67	54.48	50.54	50.43	68.75
24500	52.20	52.35	53.79	49.70	50.07	64.96
25500	52.55	53.14	53.76	49.46	50.64	63.84
26500	53.70	54.29	53.10	49.94	50.78	62.98
27500	55.02	56.27	53.08	51.76	51.66	63.55
28500	54.36	56.88	53.16	52.88	53.01	63.53
29500	53.48	55.48	53.53	54.43	54.90	63.44
30500	53.79	54.22	54.23	56.04	56.68	62.57
31500	53.58	53.92	55.03	57.97	58.54	59.84
32500	53.91	54.11	55.63	60.45	60.80	57.14
33500	55.11	55.52	56.45	64.71	63.61	55.64
34500	56.51	57.55	58.49	64.40	62.56	53.86
35500	60.45	61.82	59.53	59.43	58.84	52.49
36500	70.12	74.88	61.40	56.17	55.89	51.86
37500	66.87	65.74	64.62	53.68	53.45	51.09
38500	58.24	58.14	62.75	51.45	51.14	49.96
39500	54.58	54.85	61.70	49.60	49.21	49.25
40500	51.05	51.47	59.60	47.96	47.73	48.44
41500	49.56	49.53	57.06	47.05	46.80	47.76
42500	47.97	47.52	54.11	46.40	45.61	46.67
43500	47.97	47.84	53.69	46.70	45.94	46.88

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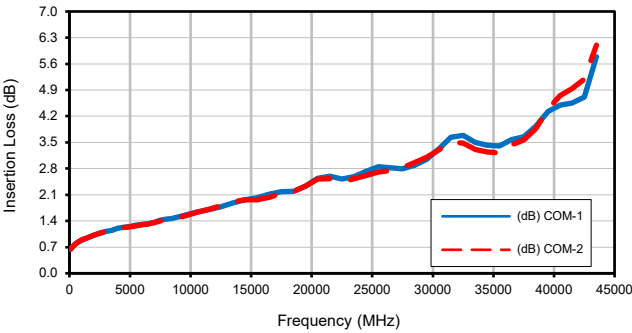
Solid State
USB SPDT Switch

USB-1SP2T-A44

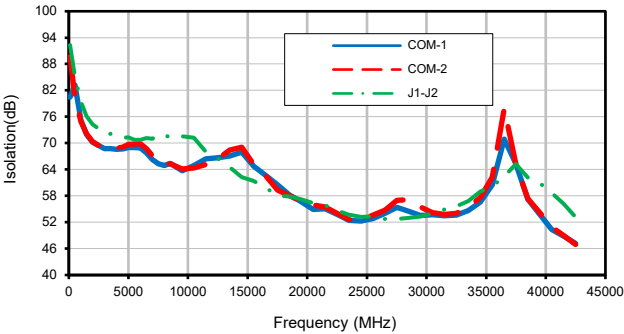
Typical Performance Curves

TEST CONDITIONS: @Temperature = 0°C, Pin=8dBm

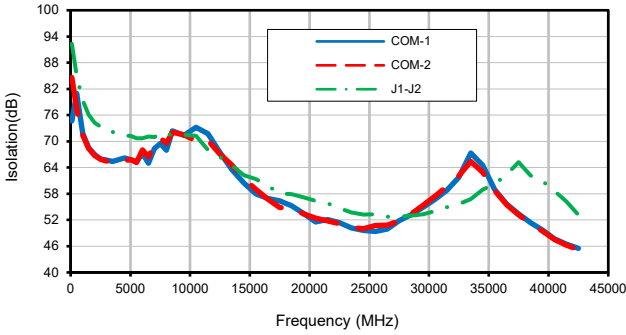
Insertion Loss



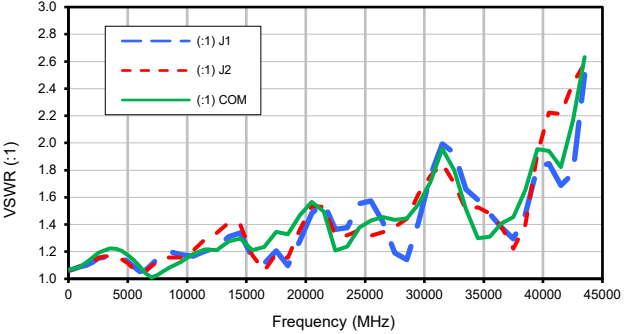
Isolation @ Active states



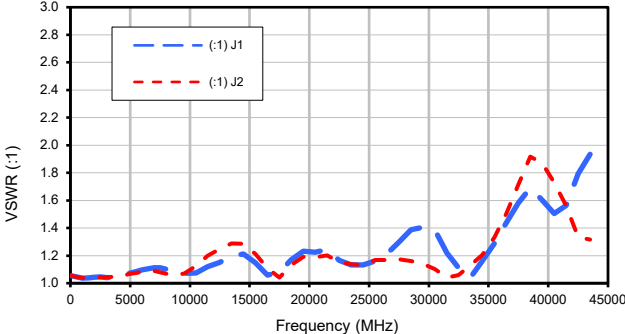
Isolation @ Disconnected state



VSWR, Active Ports



VSWR, Terminated Ports



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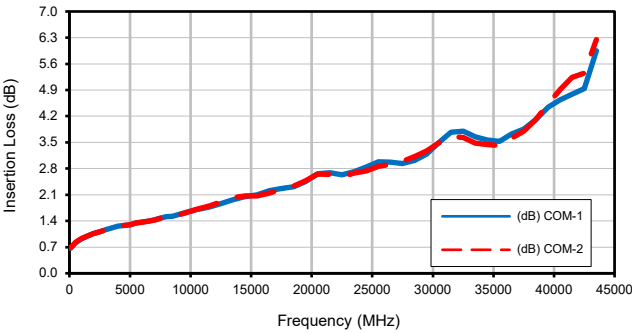
Solid State
USB SPDT Switch

USB-1SP2T-A44

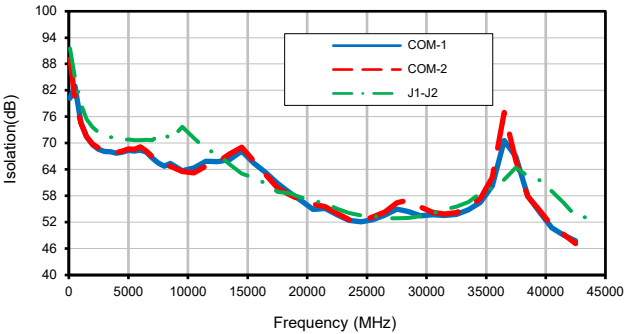
Typical Performance Curves

TEST CONDITIONS: @Temperature = 25°C, Pin=8dBm

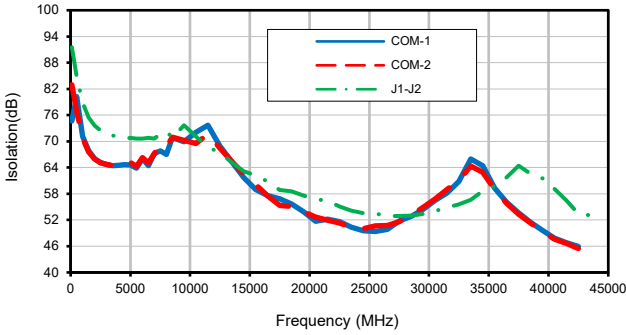
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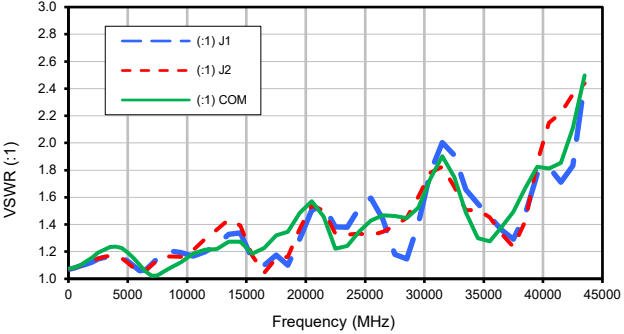
Isolation @ Active states



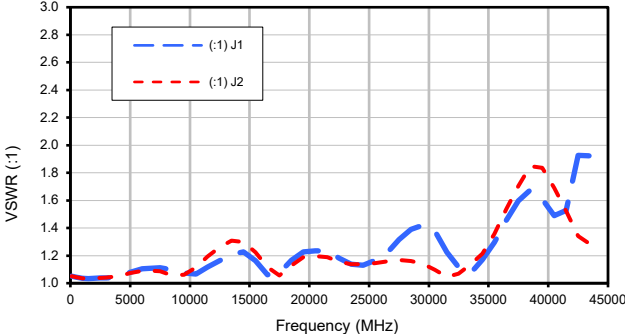
Isolation @ Disconnected state



VSWR, Active Ports



VSWR, Terminated Ports



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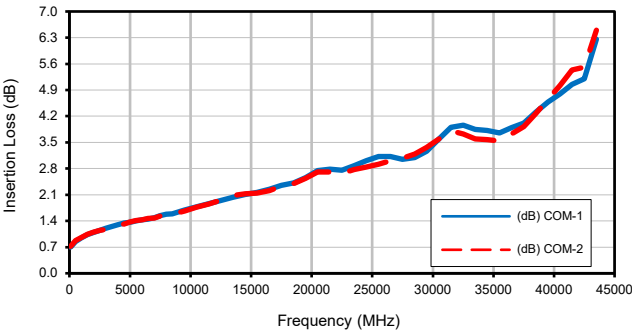
Solid State
USB SPDT Switch

USB-1SP2T-A44

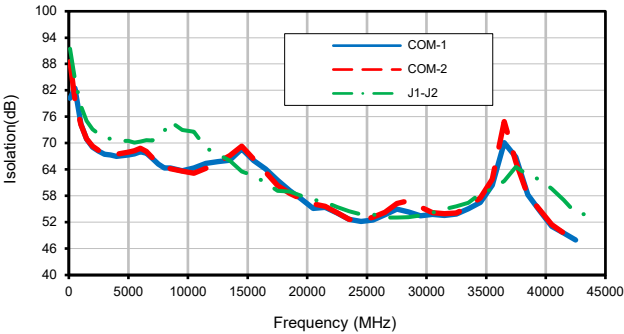
Typical Performance Curves

TEST CONDITIONS: @Temperature = 50°C, Pin=8dBm

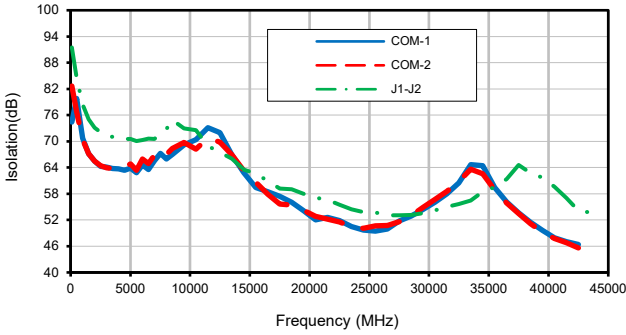
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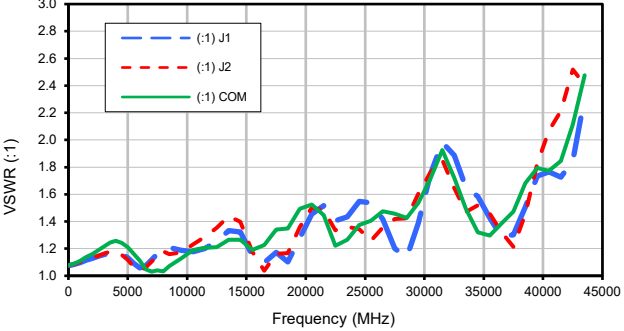
Isolation @ Active states



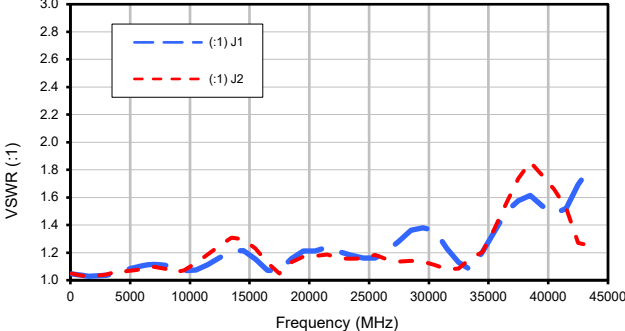
Isolation @ Disconnected state



VSWR, Active Ports



VSWR, Terminated Ports



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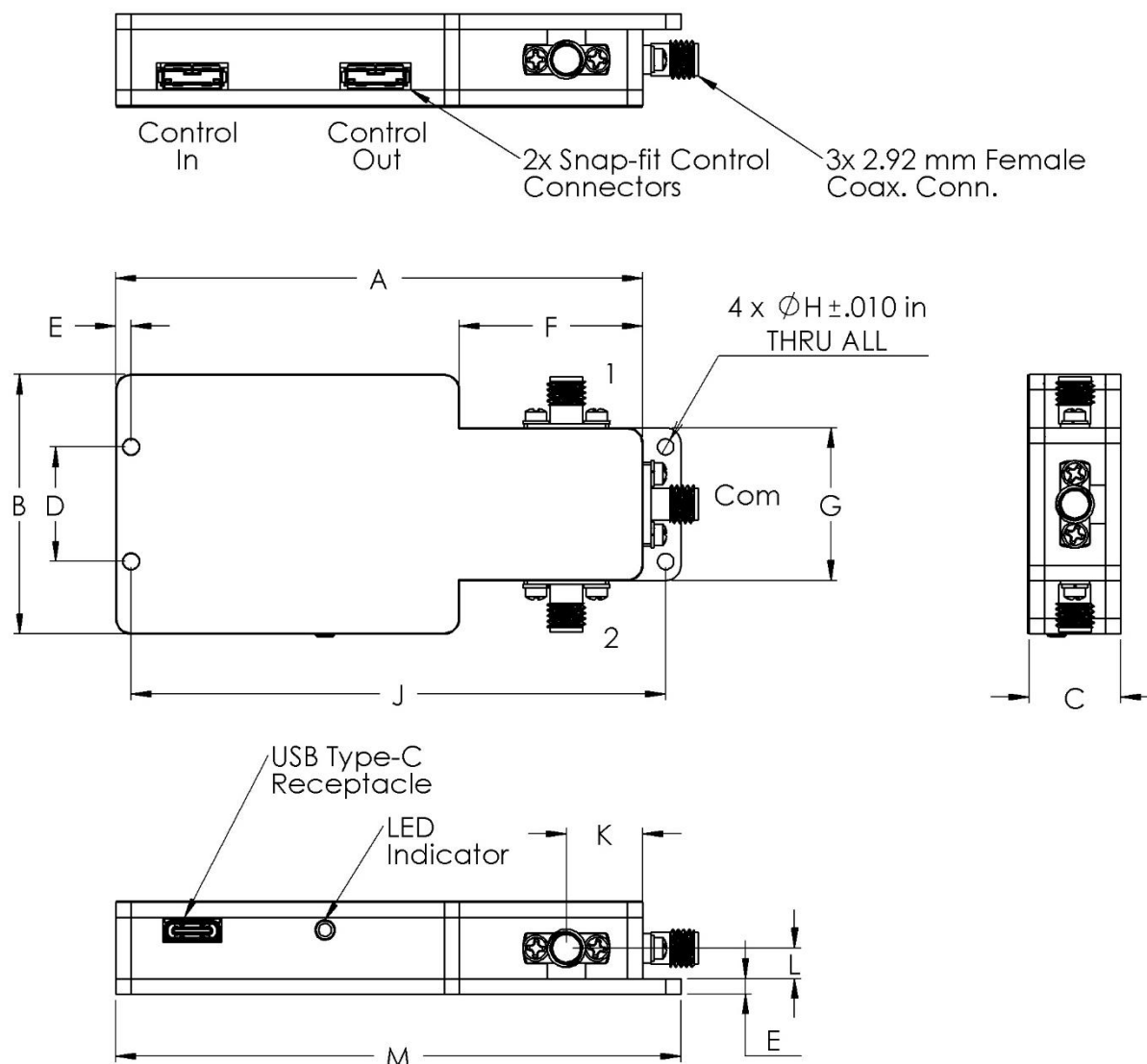


Case Style

UE

Outline Dimensions

UE3202



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
UE3202	3.45 (87.63)	1.70 (43.18)	.60 (15.24)	.750 (19.05)	.10 (2.54)	1.20 (30.48)	1.00 (25.40)	.106 (2.69)	3.500 (88.90)	0.50 (12.70)	.200 (5.08)	3.70 (93.98)	100

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

Notes:

1. Case material: Nickel Plated Aluminum.



INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

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Mini-Circuits ISO 9001 & ISO 14001 Certified



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