

DC–18 GHz SP6T Terminated RF Switch (24 V, TTL, Indicators)

Compact electromechanical SP6T coaxial switch for signal routing up to 18 GHz. Terminated output ports (absorptive throws) with reflective common port. 24 V control with TTL-compatible channel selection and indicator outputs via DIP-DC interface.

FREQUENCY

DC–18 GHz

INSERTION LOSS

0.30–0.50 dB

ISOLATION

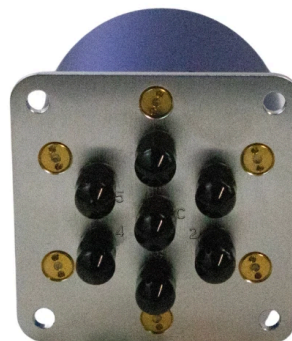
60–70 dB

SWITCHING

≤15 ms

HIGHLIGHTS

- Electromechanical SP6T, DC–18 GHz
- Terminated output ports (absorptive throws); reflective common port
- 24 V control with TTL-compatible channel inputs
- Indicator outputs via “Indicator COM” + per-channel indicator pins
- 2.92 mm RF connectors (6 throws + common)



Images are for reference only. Final appearance depends on configuration.

APPLICATIONS

- ATE / automated RF routing
- Lab switching matrices and RF test benches
- Broadband measurement setups (terminated idle paths)
- Receiver path selection and signal distribution

Electrical specifications are typical at 25 °C, sea level. Performance may deteriorate at high/low temperature. 50 Ω system impedance assumed.

Electrical Summary

Typical values @ 25 °C, $Z_S=Z_L=50\ \Omega$

Parameter	Value	Unit	Notes
VSWR	≤1.3–1.5	:1	Band dependent
Power supply	24	VDC	Control supply
Control interface	TTL	—	One-hot channel lines (CH1–CH6)
Indicators	Yes	—	Closure to Indicator COM for active channel

Electrical Specifications

Max/Min values as specified. 50 Ω system, typical @ 25 °C unless noted.

Frequency band	Insertion loss	VSWR	Isolation	Avg power	Units
DC–6 GHz	≤ 0.30	≤ 1.30	≥ 70	≤ 45	dB / :1 / dB / W
6–12 GHz	≤ 0.40	≤ 1.40	≥ 60	≤ 40	dB / :1 / dB / W
12–18 GHz	≤ 0.50	≤ 1.50	≥ 60	≤ 27	dB / :1 / dB / W

Terminated output ports (absorptive throws) are designed to reduce reflections on unselected paths. The common port is reflective.

Control Characteristics

24 V supply, TTL channel selection,
DIP-DC interface

Item	Value	Unit	Notes
Control method	TTL / Failsafe	—	TTL channel inputs
Rated voltage (DC)	24	V	Control supply
Drive current	≤ 200	mA	DC @ 20 °C
Reset current	≤ 1200	mA	DC @ 20 °C
Control interface	DIP-DC	—	2×8 control header
Switching time	≤ 15	ms	Max
Life	$\geq 5,000,000$	cycles	Minimum

INDICATOR OUTPUTS (SUMMARY)

- Indicator pins provide a closure to **Indicator COM** for the active channel.
- Common usage: connect Indicator COM to GND and read indicator pins as active-low closures.
- Detailed pinout and recommended wiring are provided on Page 4.

Environmental Characteristics

As specified

Parameter	Value	Unit	Notes
Operating temperature	–45 to +65	°C	Standard
Storage temperature	–55 to +85	°C	—
Humidity	5 to 85	%	Non-condensing
Protection level	IP63	—	—
Shock (power off)	50 G, 11 ms	—	1/2 sine
Vibration (power on)	10 G RMS	Hz	20–2000

For repeatable RF measurements, terminate unused RF ports with 50 Ω loads and use short, high-quality coaxial leads.

Mechanical Specifications

Outline, interfaces, and mounting

Item	Value	Unit	Notes
Mounting footprint	58.4 × 58.4	mm	Front plate outline (see drawing)
Body diameter	Ø58	mm	Main body
Overall height	62	mm	From plate face (see drawing)
Mounting holes	4 × Ø4.3	mm	Through
RF connectors	2.92 mm (×7)	—	6 throws + common
Control connector	DIP-DC (2×8)	—	Channel + indicators

INTEGRATION NOTES

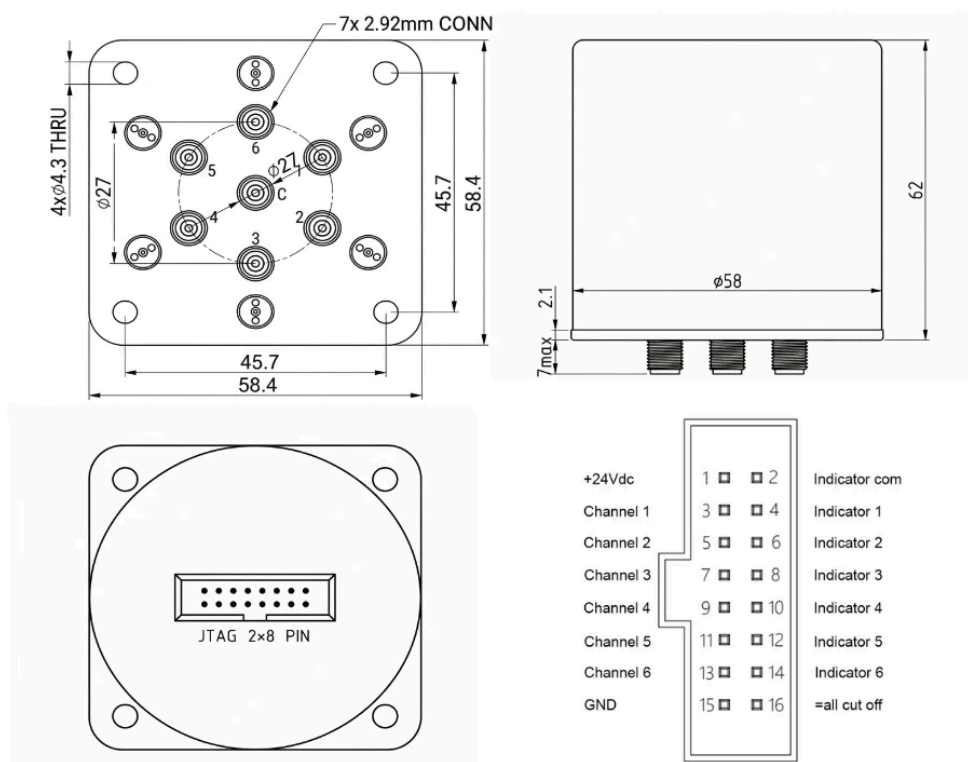
- Mount on a flat, rigid surface to avoid mechanical stress and connector misalignment.
- Use high-quality 2.92 mm torque wrenches and controlled torque for repeatable RF performance.
- Provide strain relief on coaxial cables to avoid side-load on connectors.

HANDLING

- ESD precautions recommended during handling and integration.
- Avoid impact/shock while mounted; mechanical switches can be sensitive to misalignment forces.
- Do not use RF connectors as mechanical supports.

Outline Drawing

Reference mechanical drawing (interfaces and pin legend)



DIP-DC Control Interface (2×8)

24 V supply, TTL channel selection, indicator outputs

Pin	Signal	Type	Description
1	+24V	Power	24 VDC control supply
2	Indicator COM	Common	Common reference for indicator closures
3	CH1	Logic in	Channel 1 select (TTL/logic input)
4	IND1	Contact	Closure to Indicator COM when CH1 active
5	CH2	Logic in	Channel 2 select (TTL/logic input)
6	IND2	Contact	Closure to Indicator COM when CH2 active
7	CH3	Logic in	Channel 3 select (TTL/logic input)
8	IND3	Contact	Closure to Indicator COM when CH3 active
9	CH4	Logic in	Channel 4 select (TTL/logic input)
10	IND4	Contact	Closure to Indicator COM when CH4 active
11	CH5	Logic in	Channel 5 select (TTL/logic input)
12	IND5	Contact	Closure to Indicator COM when CH5 active
13	CH6	Logic in	Channel 6 select (TTL/logic input)
14	IND6	Contact	Closure to Indicator COM when CH6 active
15	GND	Power	Control return
16	ALL CUT OFF	Logic in	All channels off / inhibit (per drawing)

CHANNEL SELECTION LOGIC

- TTL compatible channel inputs (CH1–CH6).
- One-hot operation recommended (only one channel HIGH).
- Selected channel routes Common port to the corresponding throw.
- Unselected throws remain internally terminated (absorptive).

INDICATOR BEHAVIOR

- Active channel provides a closure between INDx and Indicator COM.
- Outputs are passive contact closures (not voltage-driven).
- Use external pull-up resistor for logic monitoring.

Channel Selection Summary

One-hot TTL control (recommended)

Active Input	RF Path	Indicator Closure
CH1	Common → Port 1	IND1 → COM
CH2	Common → Port 2	IND2 → COM
CH3	Common → Port 3	IND3 → COM
CH4	Common → Port 4	IND4 → COM
CH5	Common → Port 5	IND5 → COM
CH6	Common → Port 6	IND6 → COM

Multiple simultaneous channel assertions are not recommended. Undefined behavior may occur if more than one channel input is driven HIGH.

RECOMMENDED WIRING PRACTICE

- Connect Indicator COM to system ground.
- Use pull-up resistors on INDx lines when interfacing to logic inputs.
- Ensure only one CHx input is active at any time.
- Apply 24 V supply before asserting channel inputs.

Recommended Operation & Power Sequencing

Best practice for repeatable RF performance and long service life

ON Power-up & Channel Selection

1. Ensure all RF ports are properly terminated ($50\ \Omega$ where required).
2. Apply +24 V control supply.
3. Assert one channel input (CH1–CH6).
4. Verify selected path via indicator output if required.
5. Apply RF signal after mechanical switching is complete.

OFF Shutdown Sequence

1. Remove RF signal.
2. De-assert channel input.
3. Remove +24 V supply.

Fail-Safe Behavior

Mechanical return when supply is removed

- Failsafe operation when 24 V supply is removed.
- All throw ports remain internally terminated.
- The common port is reflective when no channel is asserted.
- Switch returns to its defined mechanical rest state upon power removal.

Safety & Usage Notes

Mechanical RF switching considerations

RF OPERATION

- Hot switching is not recommended unless specifically qualified.
- Operate within specified average power limits per frequency band.
- Unterminated or mismatched loads may affect long-term reliability.

CONTROL & WIRING

- Use clean, regulated 24 V supply.
- Avoid floating TTL inputs.
- Use external pull-ups for indicator monitoring.
- Do not exceed rated control current limits.

Available Configurations (Switch Family)

Select frequency, control voltage, actuation mode, and control connector

FAMILY OVERVIEW

E-REON offers a modular family of terminated electromechanical coaxial switches (SP3T to SP6T) for automated test equipment (ATE), instrumentation, defense, and laboratory switching. Variants are available to match system frequency, control voltage, and I/O harnessing.

CORE OPTIONS

- **Switch type:** SP3T / SP4T / SP5T / SP6T (terminated throws)
- **RF connectors:** 2.92 mm (default); alternatives on request
- **Control voltage:** 12 V or 24 V versions
- **Actuation mode:** Latching or Normally-Open behavior (per model option)
- **Control connectors:** multiple I/O connectorizations for ATE harnessing

ENVIRONMENTAL OPTIONS

- **Standard temperature:** –25 °C to +65 °C
- **Extended temperature:** –55 °C to +85 °C (option)
- **Vibration (operating):** 10 G RMS, 20–2000 Hz
- **Shock (non-operating):** 30 G, 11 ms, 1/2 sine

Frequency / Performance Classes

Typical band groupings used for family configuration

Frequency class	Typical VSWR	Typical insertion loss	Typical isolation	Notes
DC–6 GHz	≤ 1.3	≈ 0.3 dB	≈ 70 dB	Low-loss baseline
6–12 GHz	≤ 1.4	≈ 0.4 dB	≈ 60 dB	General microwave
12–18 GHz	≤ 1.5	≈ 0.5 dB	≈ 60 dB	Standard 18 GHz class
18–32 GHz	≤ 1.9	≈ 0.8 dB	≈ 55 dB	Extended band option
32–40 GHz	≤ 2.1	≈ 1.3 dB	≈ 50 dB	40 GHz class option

Control & Connectorization Options

Common control I/O formats for integration and ATE harnessing

Option group	Available variants	Notes
Control voltage	12 V (11–14 V), 24 V (20–28 V)	Choose to match system supply
TTL drive	3.5–7 V drive, 25–50 mA per input (typ. range)	Used for channel selection logic
Actuation mode	Latching, Normally-Open behavior	Selection depends on application
Control connector	2×8 header, 2×10 header, D-SUB 9, D-SUB 15	For different harness standards

Important Notice & Disclaimer

Read before use and integration

General

The information contained in this document is provided for reference purposes only and is believed to be accurate and reliable at the time of publication. E-REON B.V. reserves the right to make changes to specifications, design, or manufacturing processes without prior notice.

Use & Application

- Products are intended for professional and industrial use.
- Performance may vary depending on installation, cabling, impedance matching, and environmental conditions.
- Operation beyond specified electrical or environmental limits may result in reduced performance or permanent damage.

RF & Power Handling

- Ensure proper 50 Ω terminations where required.
- Hot switching is not recommended unless explicitly qualified.
- Exceeding rated RF power limits may reduce switching life.

Liability

E-REON B.V. shall not be liable for damages resulting from misuse, improper installation, operation outside specified ratings, or integration into systems without adequate validation. Final system-level qualification remains the responsibility of the system integrator.

Intellectual Property

No license is granted by implication or otherwise under any intellectual property rights of E-REON B.V. Reproduction of this document in whole or in part is prohibited without written consent.