0.1–20 GHz SP8T Absorptive RF Switch

Ultra-wideband absorptive SP8T RF switch optimized for signal routing up to 20 GHz. TTL control interface with fast switching speed. RoHS & REACH compliant.

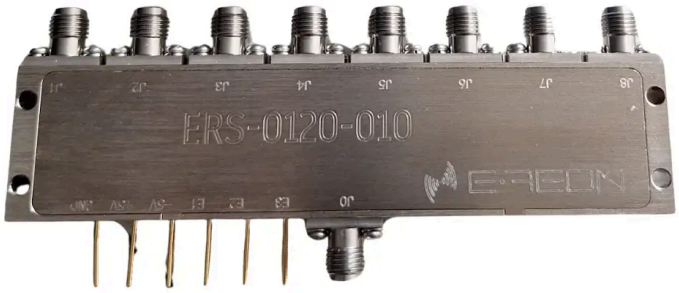
FREQUENCY	INSERTION LOSS	ISOLATION	SWITCHING
0.1–20 GHz	**4.5–5.0** dB	**80** dB typ.	**120** ns typ.

HIGHLIGHTS

- SP8T absorptive design, ultra-wideband 0.1–20 GHz
- Low insertion loss: 4.5–5.0 dB
- High isolation: 80 dB
- Fast switching speed: 120 ns typical
- RoHS & REACH compliant

APPLICATIONS

- ATE / automated RF routing
- Radar, EW, and broadband receivers
- Lab switching matrices and test benches
- Multi-band communication subsystems



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

Electrical specifications are typical at 25 °C, sea level. Performance may deteriorate at high/low temperature.

Electrical Summary

Typical values @ 25 °C, Z_S=Z_L=50 Ω

Parameter	Value	Unit	Notes
Frequency range	0.1–20	GHz	Ultra wide band
Insertion loss	4.5–5.0	dB	Typical across band
VSWR	1.7–2.0	:1	Input/output port
Isolation	80	dB	Typical
Switching speed	120	ns	Typical
Input power	1	W	Power handling

Electrical Specifications

Typical @ 25 °C, sea level, Z_S=Z_L=50 Ω

Description	Units	Min	Typ.	Max
Frequency range	GHz	0.1	—	20
Impedance	Ω	—	50	—
Input power	W	—	—	1
Insertion loss	dB	—	4.5	5.0
VSWR (input/output)	:1	—	1.7	2.0
Isolation	dB	—	80	—
Switching speed	ns	—	120	—
Rise / fall time	ns	—	—	—
Control type	—	—	TTL	—
Control interface	—	—	PIN	—
DC biasing (+5 V)	mA	—	400	—
DC biasing (−5 V)	mA	—	50	—
Operating temperature	°C	−45	—	+85

ELECTRICAL SPECIFICATION NOTES

- Values are typical at 25 °C, sea level.
- Performance may deteriorate at high/low temperature.
- 50 Ω system impedance assumed for all RF measurements.
- Designed for low-power cold switching applications.

SWITCH TIMING DEFINITIONS

- **T-ON**: 50% TTL to 90% RF level
- **T-OFF**: 50% TTL to 10% RF level
- **Rise time**: 10% RF to 90% RF
- **Fall time**: 90% RF to 10% RF

Ensure clean ±5 V rails with proper local decoupling and stable TTL drive levels.

Mechanical Specifications

Outline, interfaces, and mounting

Item	Value	Unit	Notes
Dimensions (L × W × H)	104 × 24 × 10.2	mm	Outline
Weight	65	g	Typical
RF input	SMA-F	—	Stainless steel
RF outputs	SMA-F (×8)	—	Stainless steel
Finish	Nickel plated	—	Housing
Mounting holes	4 × Ø2.7	mm	Through

INTEGRATION NOTES

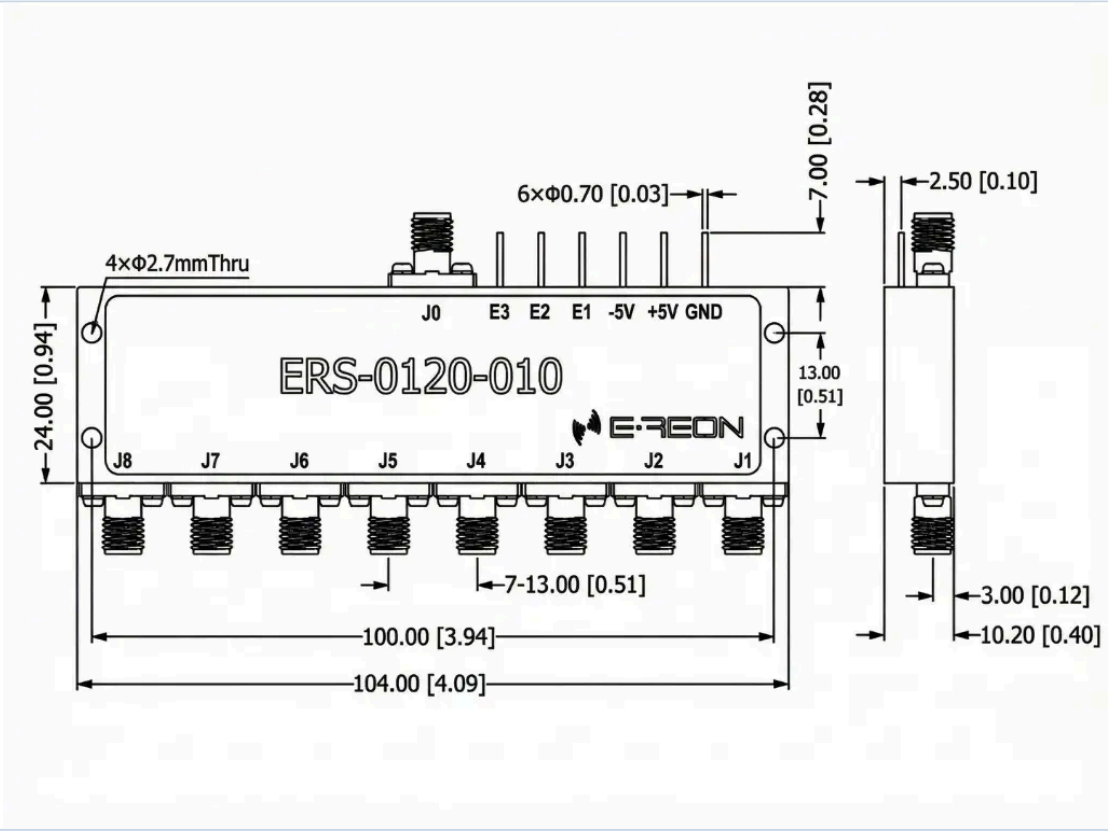
- Dimensions are in mm [inches].
- Tolerances: outline ±0.2 mm, holes ±0.2 mm.
- Use controlled SMA torque and quality cables for repeatable RF performance.
- Mount on a flat surface to avoid mechanical stress and connector misalignment.

HANDLING

- ESD precautions recommended during handling and integration.
- Avoid side-load on SMA connectors during assembly.
- Do not use connectors as mechanical supports.

Outline Drawing

Reference mechanical drawing



Pinout & Control Interface

Logic selection and supply rails

Control: 3-bit TTL (E3/E2/E1) • **Rails:** +5 V, −5 V • Reference: apply rails before toggling control

Common RF: J0

CONTROL HEADER SIGNALS

Signal	Type	Level / Rail	Notes
E1	TTL	0 / 1	LSB select
E2	TTL	0 / 1	Mid select
E3	TTL	0 / 1	MSB select
+5V	Power	+5 V	Typical 400 mA
−5V	Power	−5 V	Typical 50 mA
GND	Return	0 V	Signal & power return

Control is by 3-bit TTL (E3/E2/E1). Apply supply rails within specification before toggling control lines.

TTL LOGIC LEVELS

State	Voltage range	Unit	Meaning
TTL High (1)	2.8 to 5.0	V	Logic “1”
TTL Low (0)	0 to 0.8	V	Logic “0”

Use stable, clean TTL drive levels. Avoid slow edges or floating inputs.

TRUTH TABLE (E3 / E2 / E1)

E3	E2	E1	Signal path state
0	0	0	J0 → J1
0	0	1	J0 → J2
0	1	0	J0 → J3
0	1	1	J0 → J4
1	0	0	J0 → J5
1	0	1	J0 → J6
1	1	0	J0 → J7
1	1	1	J0 → J8

J0 is the common RF port. J1–J8 are routed outputs.

QUICK CHECKS

- Drive E1/E2/E3 with defined logic levels (no floating inputs).
- Provide clean rails (+5 V / −5 V) with local decoupling.
- For best RF repeatability, terminate unused ports with 50 Ω.

Recommended Operation & Safety

Best practice for repeatable measurements and safe use

ON Power-up & routing sequence

1. Terminate all unused RF ports with 50 Ω loads (recommended).
2. Apply supply rails: +5 V and −5 V within specification.
3. Apply TTL control states (E3/E2/E1) to select the desired output path.
4. Apply RF at low power first, then operate within rated power limit.

OFF Shutdown sequence

1. Remove RF drive (set source output OFF).
2. Remove TTL drive (set E1/E2/E3 to a defined state or disable output).
3. Remove supply rails (+5 V / −5 V).

SAFETY & USAGE NOTES

- Designed for low-power cold switching; avoid switching under high RF power.
- Operate within rated input power to prevent permanent damage.
- Use ESD precautions when handling the module and cabling.
- Do not apply out-of-range voltages to control pins.

RECOMMENDED DECOUPLING & TEST SETUP

- Place decoupling close to module power pins.
- Recommended: 100 nF + 10 µF per rail (low-ESR), solid ground return.
- Use short, high-quality SMA cables and controlled SMA torque.
- For repeatable RF results, terminate unused ports with 50 Ω loads.

Important

Final application limits and acceptance criteria must be defined by the system-level test plan and operating conditions.

- Specifications are subject to change without notice as part of continuous improvement.
- Performance may vary with temperature, cabling, and measurement setup.
- Use within the defined electrical limits to maintain long-term reliability.

For support, integration guidance, or volume inquiries, contact E-REON.