

RF SWITCHES FAMILY



K_{|z|}, Constant Impedance: Renesas's K_{|z|} innovation improves system hot switching ruggedness, minimizes LO pulling in VCOs, and reduces phase and amplitude variations in distribution networks. It is also ideal for dynamic switching between multiple amplifiers while avoiding damage to sensitive upstream / downstream devices such as PAs and ADCs.

Insertion Loss: Low insertion loss improves overall system performance and data throughput, helping improve receiver sensitivity and minimize unwanted signal loss in the transmitter path. With a typical insertion loss of only < 0.5dB at 2GHz, Renesas RF switches provide low path loss while maintaining high isolation.

IM3 Distortion: As data rates increase to keep up with rising consumer demands, systems require RF components with higher linearity to maintain system signal-to-noise ratio (SNR). The switches were designed to provide an input IP3 of 65dBm at 2GHz to help designers maintain high levels of system performance.

Advantages

Renesas RF Switches utilize advanced RF silicon semiconductor technology offering advantages over other technologies such as GaAs

- Manufacturing robustness in terms of:
 - Higher electrostatic discharge (ESD) immunity
 - MSL1 moisture sensitivity-level performance
- Excellent RF performance over temperature with low current drain
- Higher reliability
- Higher levels of integration with simpler packaging assemblies that improve thermal performance and lower total cost

Family features and benefits

- Wide range of throw counts and configurations
- K_{|z|}, Constant Impedance Technology
 - K_{|z|} provides near-constant impedance when switching between RF ports
- Very low insertion loss
- High IIP3 linearity
- High isolation
- Wide operating frequency ranges
- Designed for high reliability applications
 - Silicon reliability
 - Wide operating temperature ranges
 - Excellent thermal performance
- 50Ω and 75Ω impedances
- Absorptive and Reflective termination options

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Extended Temperature Range: As data rates increase and system enclosures shrink in size, ambient temperatures inside these enclosures continue to rise, driving the need for thermally efficient, higher reliability, RF switches with improved temperature performance. The switches are designed for high-reliability applications and have an extended operating temperature range as wide as -55 to $+125^{\circ}\text{C}$. The thermally efficient monolithic silicon design has excellent temperature stability over this extended temperature range and is well suited for a wide variety of high-performance RF applications.

Isolation: As end equipment evolves to include multiple frequency bands and multiple modes, RF switches must possess high isolation to maintain signal integrity and reduce cross talk without sacrificing low insertion loss. Switches that maintain an isolation of at least 50dB between the RF common port and either RF output port provide the high isolation designers need to support today's demanding high-performance applications.

Wide Frequency Bandwidth: The crowded RF spectrum combined with short product development cycle times requires components that maintain excellent RF performance characteristics over wide frequency bandwidths. Our switches are designed to maintain low insertion loss, high isolation and low distortion over wide frequency ranges up to 9 kHz to 9000 MHz, meeting the needs of a wide range of broadband equipment applications and minimizing design cycle time.

| Part Number | Description | Frequency (GHz) | Type | IL (dB) | IP0.1dB (dBm) | IP1dB (dBm) | IIP3 (dBm) | Voltage (V) | Current (mA) | Package (mm) |
|-------------|-------------|-----------------|------------|---------|---------------|-------------|------------|-------------|--------------|------------------|
| F2910 | SPST | 0.03 – 8 | Absorptive | 0.55 | 34 | 35 | 67 | 3.3 | 0.19 | 2 x 2, 8-Pin |
| F2911 | SPST 75Ω | 0.001 – 3.5 | Absorptive | 0.33 | 33 | 34 | 64 | 3.3 | 0.19 | 2 x 2, 8-Pin |
| F2912 | SPDT | 0.000009 – 9 | Absorptive | 0.4 | – | 30 | 66 | 3.3 | 0.02 | 4 x 4, 20-Pin |
| F2913 | SPDT | 0.05 – 6 | Absorptive | 0.79 | – | 36 | 65 | 3.3 | 0.09 | 4 x 4, 20-Pin |
| F2914 | SP4T | 0.05 – 8 | Absorptive | 1.1 | 35 | – | 60 | 3.3 | 0.29 | 4 x 4, 24-Pin |
| F2915 | SP5T | 0.05 – 8 | Absorptive | 1.1 | 35 | 36.5 | 60.5 | 3.3 | 0.29 | 4 x 4, 24-Pin |
| F2923 | SPDT | 0.0003 – 8 | Absorptive | 0.48 | – | 32 | 66 | 3.3 | 0.127 | 4 x 4, 20-Pin |
| F2932 | SPDT | 0.05 – 8 | Absorptive | 0.79 | 32.3 | 36.5 | 64 | 5 | 0.26 | 4 x 4, 16-Pin |
| F2933 | SPDT | 0.05 – 8 | Absorptive | 0.79 | 32.3 | 36.5 | 64 | 5 | 0.26 | 4 x 4, 16-Pin |
| F2934 | SPDT | 0.05 – 8 | Absorptive | 0.79 | 32.3 | 36.5 | 64 | 5 | 0.26 | 3 x 3, 16-Pin |
| F2955 | SPDT | 0.05 – 8 | Absorptive | 1.1 | 35 | 36.5 | 60.5 | 3.3 | 0.29 | 4 x 4, 24-Pin |
| F2956 | SPDT | 0.1 – 8 | Reflective | 0.58 | – | 40 | 69 | 3.3 | 0.17 | 1.5 x 1.5, 6-Pin |
| F2970 | SPDT 75Ω | 0.005 – 3 | Absorptive | 0.32 | – | 32 | 63 | 3 | 0.02 | 4 x 4, 20-Pin |
| F2971 | SPDT 75Ω | 0.005 – 3 | Absorptive | 0.31 | – | 32 | 67 | 3 | 0.02 | 4 x 4, 20-Pin |
| F2972 | SPDT | 0.005 – 10 | Reflective | 0.4 | 40 | – | 77 | 3.3 | 0.08 | 2 x 2, 12-Pin |
| F2976 | SPDT | 0.005 – 10 | Reflective | 0.4 | 40 | – | 77 | 3.3 | 0.08 | 2 x 2, 12-Pin |
| F2977 | SPDT | 0.03 – 6 | Reflective | 0.38 | 40 | – | 77 | 3.3 | 0.08 | 2 x 2, 12-Pin |

To request samples, download documentation or learn more visit: idt.com/rfswitches



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