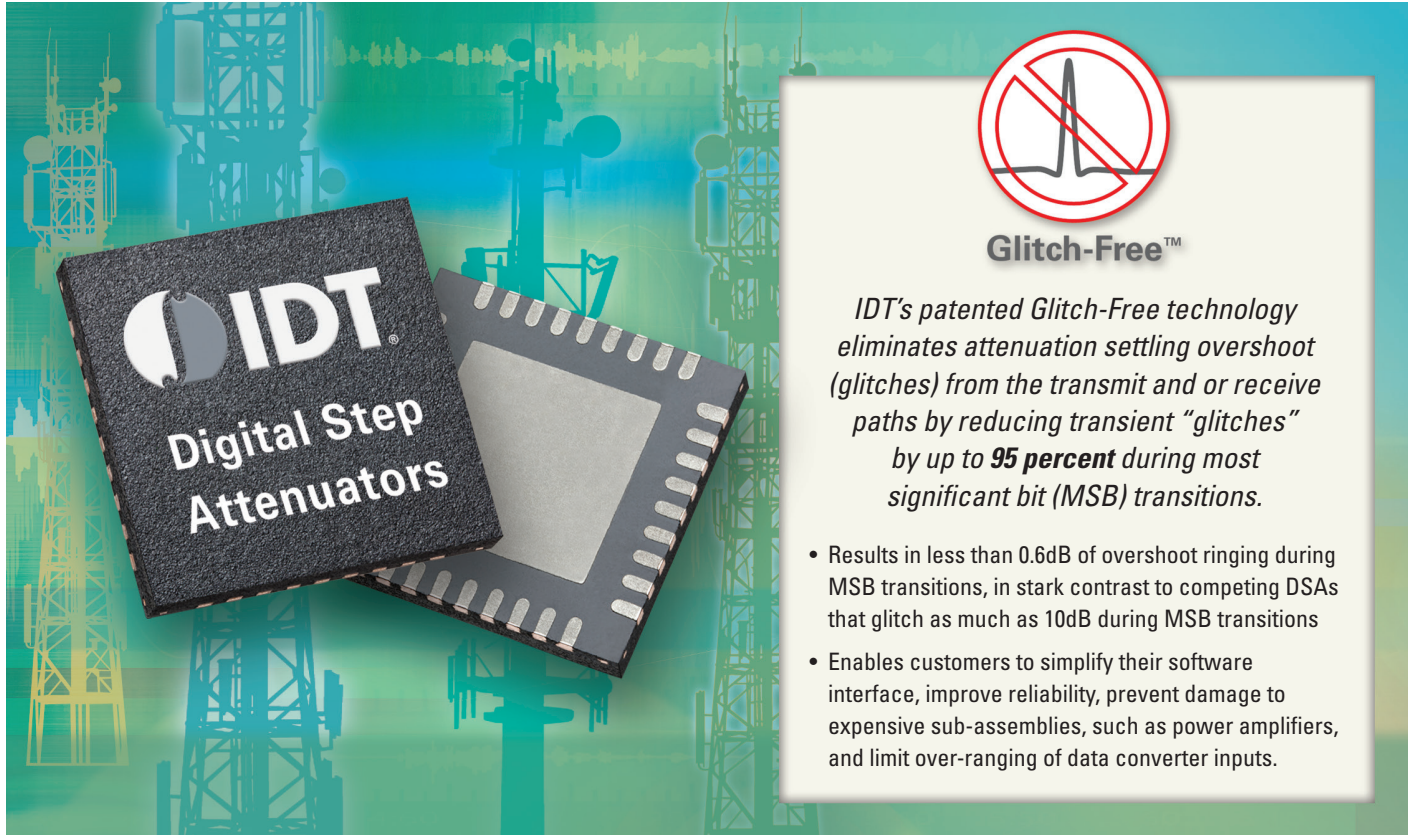
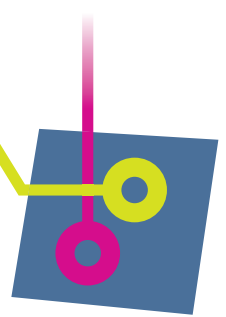


Digital Step Attenuators



Glitch-Free™

*IDT's patented Glitch-Free technology eliminates attenuation settling overshoot (glitches) from the transmit and or receive paths by reducing transient "glitches" by up to **95 percent** during most significant bit (MSB) transitions.*

- Results in less than 0.6dB of overshoot ringing during MSB transitions, in stark contrast to competing DSAs that glitch as much as 10dB during MSB transitions
- Enables customers to simplify their software interface, improve reliability, prevent damage to expensive sub-assemblies, such as power amplifiers, and limit over-ranging of data converter inputs.

FAMILY FEATURES AND BENEFITS:

- Glitch-Free™ Technology:
 - Reduces transient glitches by up to 95%
 - Results in as little as 0.6dB of overshoot ringing during MSB transitions
- Step error of ~0.1dB typical
- Typical absolute attenuation error of ± 0.2 dB
- Low insertion loss: typically 1.2dB @ 2GHz
- Very low distortion devices: typical IP3 of +65dBm
- Silicon-based semiconductor technology
- Very high power handling >34dBm compression point
- Supports 50 Ω and 75 Ω impedances

IDT DIGITAL STEP ATTENUATORS (DSAs) are extremely accurate, enabling precise adjustment of the DSA attenuation value to the desired level with pinpoint accuracy. The step and absolute accuracy hold very well over temperature (-40°C to $+105^{\circ}\text{C}$) which helps customers simplify their software interface. The Glitch-Free technology results in a typical settling time of 400nsec making them ideal for agile TDD systems. These devices are bi-directional with very high power handling characteristics with up to a 28dBm continuous power rating at 105°C and > 34dBm compression point.

LOW INSERTION LOSS: IDT DSAs have a typical insertion loss as low as 1.2dB at 2GHz. Low insertion loss improves overall system performance and data throughput, helping improve receiver sensitivity and minimize unwanted signal loss in the transmitter path.

LOW IM3 DISTORTION: Unwanted signals can generate intermodulation (IM) products, reducing the effective SNR and signal throughput of the system. Applications such as 4G LTE, CATV infrastructure and Fiber access networks have stringent linearity requirements in order to achieve high system data rates, driving the need for high linearity RF components that minimize IM3 distortion. IDT DSAs are very low distortion devices with typical IP3 of only +65 dBm, making them an ideal choice for applications that require high linearity.



Digital Step Attenuators

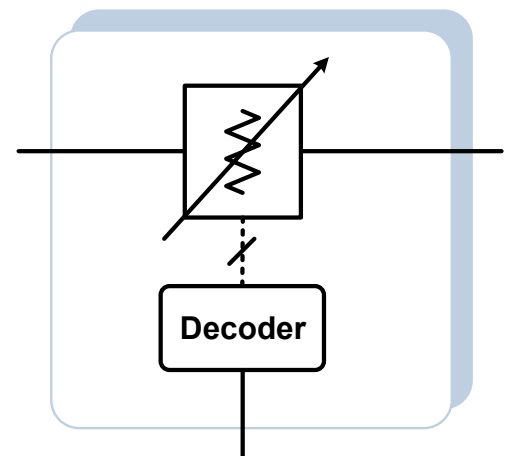
Part Number	Z ₀	Resolution	Attenuation Range	Frequency Range (MHz)	Package
F1951	50	0.5dB	0 to 31.5 dB	100 to 4000	4 x 4 mm 24-TQFN
F1950	50	0.25dB	0 to 31.75 dB	150 to 4000	4 x 4 mm 24-TQFN
F1953	50	0.5dB	0 to 31.5 dB	400 to 4000	4 x 4 mm 20-TQFN
F1956	50	0.25dB	0 to 31.75 dB	1 to 4000	5 x 5 mm 32-QFN
F1912	50	0.5dB	0 to 31.5 dB	1 to 4000	4 x 4 mm 20-TQFN
F1975	75	0.5dB	0 to 31.5 dB	5 to 3000	4 x 4 mm 20-TQFN
F1977	75	0.25dB	0 to 31.75 dB	5 to 3000	5 x 5 mm 32-QFN
F1978	75	0.5dB	0 to 31.5 dB	5 to 3000	4 x 4 mm 20-TQFN

Silicon-based Semiconductor Technology

IDT's DSAs utilize silicon-based semiconductor technology, offering advantages over other technologies such as GaAs.

Silicon Advantages

- 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 versus GaAs
- Higher levels of integration with simpler packaging assemblies that improve thermal performance and lower total cost



To learn more about IDT's RF products, patented technologies, or request samples, visit: idt.com/go/rf