

PE43xxx Monolithic RF UltraCMOS™ Digital Step Attenuators

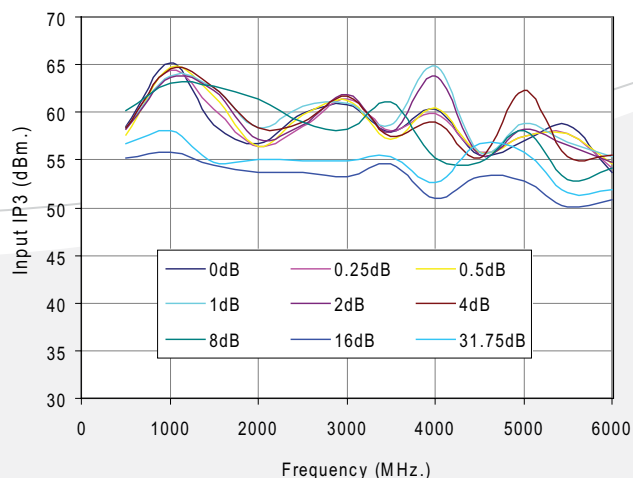
New PE43x0x series provides versatile HaRP™-enhanced 5, 6 and 7-bit DSAs with high linearity

The PE43xxx family of Digital Step Attenuators (DSAs) features unprecedented levels of broadband linearity, attenuation accuracy and programming flexibility which provide exquisite design solutions for today's prolific RF applications. Manufactured on the Company's proprietary UltraCMOS™ silicon-on-sapphire process technology, the products draw from many years of high-performance RF CMOS and mixed-signal IC experience.

Specific capabilities of the DSA products include:

- ▶ Industry-leading attenuation accuracy
- ▶ 0.25 dB step size
- ▶ High linearity to near DC
- ▶ Industry leading insertion loss of 1.5 dB
- ▶ Single power supply voltage: +3.0 V, or +3.3/5.0V
- ▶ High ESD tolerance: up to 2kV HBM
- ▶ Serial-Addressable, Serial and Parallel interface logic
- ▶ Preset power-up attenuation states, a function afforded due to the monolithic CMOS fabrication process

The new HaRP™-enhanced PE43x0x DSA series extends Peregrine's portfolio up to 7-bits. The PE43703 is the first device to offer a Serial-Addressable programming mode and highly flexible attenuation options by covering a 31.75 dB attenuation range in either 0.25 dB, 0.5 dB, or 1.0 dB steps. All PE43x0x DSAs deliver unprecedented linearity (up to 59 dBm); high ESD tolerance (500 V HBM); and operate with either 3.3V



or 5V Vdd while maintaining exceptional RF performance. This allows the use of a single device in both the RF and IF radio sections to save board space and cost.

The extraordinary performance of the Peregrine DSAs, including high accuracy and IP3 down to 100 KHz, makes them ideal for new designs. Return Loss (RL) for the newest DSAs is 17 dB through 6.0 GHz, making them a much better solution than their competitors and uniquely compatible with termination sensitive components. Compared to GaAs solutions, they offer higher IP3, accuracy, better temperature stability, lower distortion, ESD Protection, no blocking caps and lower power consumption. These aspects combine for optimal performance and cost-effectiveness.

APPLICATIONS

The devices are ideal for many RF applications such as:

- ▶ Cellular base stations, repeaters and femtocells
- ▶ Test Equipment and ATE
- ▶ Power amplifier distortion canceling loops
- ▶ CATV headend and distribution systems
- ▶ Cable and Satellite STB

TECHNICAL SUPPORT AND ORDER INFORMATION

Products samples, unit pricing and volume production are available now through Peregrine and its worldwide distributors. Visit us online to find a sales office near you.

RF DIGITAL STEP ATTENUATORS (MONOLITHIC) - 50 Ω

Product Description	Attenuation	Programming Mode	Operating Freq. (MHz)	Insertion Loss (dB)	Input IP3 (dBm)	Attenuation Accuracy (1 GHz)	Switching Speed (μs)	Package
PE4302 - 6-bit, 50Ω	31.5 range / 0.5 dB steps	Parallel, Serial	DC - 4000	1.5	52	±(0.10+3% of setting)	1	20L 4x4 QFN
PE4305 - 5-bit, 50 Ω	15.5 range / 0.5 dB steps	Parallel, Serial	DC - 4000	1.5	52	±(0.25+3% of setting)	1	20L 4x4 QFN
PE4306 - 5-bit, 50 Ω	31 range / 1.0 dB steps	Parallel, Serial	DC - 4000	1.5	52	±(0.30+3% of setting)	1	20L 4x4 QFN
PE4309 - 6-bit, 50 Ω	31.5 range / 0.5 dB steps	Parallel	DC - 4000	1.6	52	±(0.10+3% of setting)	1	24L 4x4 QFN
NEW PE43204 - 2-bit, 50 Ω	18 range / 6 dB steps	Parallel	DC - 4000	0.6	61	-0.1±0.5	0.03	12L 3x3 QFN
NEW PE43501 - 5-bit, 50 Ω	7.75 range / 0.25 dB steps	Parallel, Ser-Addressable	DC - 6000	2.3	58	±(0.15+4% of setting)	0.65	32L 5x5 QFN
NEW PE43502 - 5-bit, 50 Ω	15.5 range / 0.5 dB steps	Parallel, Serial	DC - 6000	2.4	58	±(0.3+3% of setting)	0.65	24L 4x4 QFN
NEW PE43503 - 5-bit, 50 Ω	31 range / 1 dB steps	Parallel, Serial	DC - 6000	2.4	58	±(0.3+3% of setting)	0.65	24L 4x4 QFN
NEW PE43601 - 6-bit, 50 Ω	15.75 range / 0.25 dB steps	Parallel, Ser-Addressable	DC - 6000	2.3	57	±(0.2+4% of setting)	0.65	32L 5x5 QFN
NEW PE43602 - 6-bit, 50 Ω	31.5 range / 0.5 dB steps	Parallel, Serial	DC - 5000	2.2	58	±(0.3+3% of setting)	0.65	24L 4x4 QFN
NEW PE43701 - 7-bit, 50 Ω	31.75 range / 0.25 dB steps	Parallel, Ser-Addressable	DC - 4000	1.9	59	±(0.2+1.5% of setting)	0.65	32L 5x5 QFN
NEW PE43702 - 7-bit, 50 Ω	31.75 range / 0.25 dB steps	Parallel, Serial	DC - 4000	2.0	57	±(0.2+3% of setting)	0.65	24L 4x4 QFN
NEW PE43703 - 7-bit, 50 Ω	31.75 / 0.25, 0.5, 1.0 steps	Parallel, Ser-Addressable	DC - 6000	1.9	59	±(0.2+1.5% of setting)	0.65	32L 5x5 QFN

BROADBAND DIGITAL STEP ATTENUATORS (MONOLITHIC) - 75 Ω

Product Description	Attenuation	Programming Mode	Operating Freq. (MHz)	Insertion Loss (dB)	Input IP3 (dBm)	Attenuation Accuracy (1 GHz)	Switching Speed (μs)	Package
PE4304 - 6-bit, 75 Ω	31.5 range / 0.5 steps	Parallel, Serial	DC - 2000	1.4	52	±(0.15+4% of setting)	1	20L 4x4 QFN
PE4307 - 5-bit, 75Ω	15.5 range / 0.5 steps	Parallel, Serial	DC - 2000	1.4	52	±(0.15+4% of setting)	1	20L 4x4 QFN
PE4308 - 5-bit, 75 Ω	31 range / 1.0 steps	Parallel, Serial	DC - 2000	1.4	52	±(0.20+4% of setting)	1	20L 4x4 QFN
NEW PE43404 - 4-bit, 75 Ω	15 range / 1.0 steps	Parallel, Serial	DC - 2000	1.4	52	±(0.25+7% of setting)	1	20L 4x4 QFN

Note 1: Parallel Modes: Latched and Direct

About UltraCMOS™ Technology

UltraCMOS™ mixed-signal process technology is a patented variation of silicon-on-insulator (SOI) technology. It is the first commercially qualified use of Ultra-Thin-Silicon (UTSi®) on sapphire substrates with high yields and competitive costs. Since sapphire is a near perfect insulator, UltraCMOS products can integrate high-quality passive devices directly into the IC, combining high-performance RF, mixed-signal, passive elements, nonvolatile memory and digital functions in a single device. UltraCMOS products are fabricated in standard high-volume CMOS facilities, achieving the economy, scalability and integration of CMOS, while enabling significant performance advantages over competing mixed-signal processes such as GaAs, SiGe BiCMOS and bulk silicon CMOS in applications where RF performance, low power and integration are paramount.

About Peregrine Semiconductor

Peregrine Semiconductor designs, manufactures, and markets high-performance communications RFICs. Manufactured on the Company's proprietary UltraCMOS™ mixed-signal process technology, Peregrine products are ideally suited for high-growth RF/Wireless applications such as WCDMA, EDGE and GSM digital cellular and mobile TV; broadband communications such as DTV/PCTV/DVR; and in high-reliability applications such as telecom infrastructure, industrial, automotive, military and satellite systems. Peregrine UltraCMOS devices are manufactured in world-class CMOS foundries located in Australia, Asia and Japan. The Company, headquartered in San Diego, California, maintains global sales support and a worldwide technical distribution network.



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