

Peregrine's High-Reliability UltraCMOS™ RF IC Portfolio Expands

New SPDT Switch, Ultra-low Phase Noise PLLs, DSA and Prescalers Lead the Industry

Peregrine Semiconductor's recent advancements on UltraCMOS™ silicon-on-sapphire technology have enabled significant new product performance milestones in the High-Reliability product portfolio. Based on our innovative high-volume commercial products, these products are designed to meet the low-power needs of high-reliability applications, including test instrumentation, telecom infrastructure, down-hole oil/gas, military and space applications.

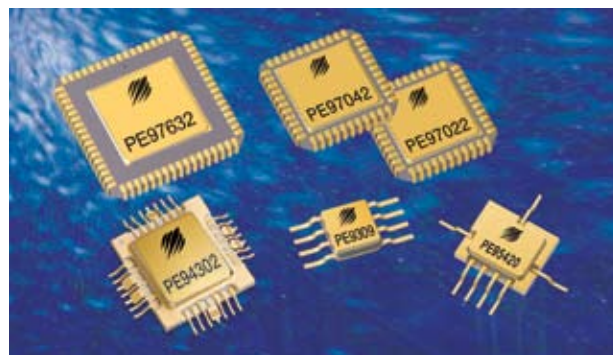
Peregrine's UltraCMOS technology is ideal for the highly demanding rigors of High-Rel applications. Screening is available for commercial space applications. For quick-turn prototyping, we offer Multi-Project Runs (MPRs) on a scheduled basis.

HaRP™-ENHANCED TECHNOLOGY

The new PE95420 SPDT switch is the first High-Rel product to integrate HaRP-technology enhancements. These enhancements give unprecedented linearity, eliminate Gate & Phase Lag, and eliminate Insertion Loss and Phase Drift. This DC – 8.5 GHz part has an input IIP3 of 60 dBm at 6500, High ESD protection 2000V HBM, 1 dB compression point of +30 dBm typ, high isolation of 42 dB at 3000 MHz.

LOWER POWER CONSUMPTION

Ultra-low power utilization ensures that designs incorporating UltraCMOS RF ICs operate with the lowest power requirements. When compared to the higher-voltage GaAs, SiGe or bulk silicon devices, UltraCMOS delivers the most cost-effective solution on the market today. The PE9309 divide-by-4 Prescaler has exceptional



sensitivity and operates in the Ku-band with a range of 3.5-13.0 GHz. It offers the lowest power in the industry, drawing only 16mA at a nominal 2.6V mode of operation.

ULTRA-LOW PHASE NOISE

Superior Phase Noise performance make Peregrine's new Integer-N Phase Locked-Loop (PLL) Frequency Synthesizers ideal choices for applications where ultra-low phase noise is critical. Drop-in compatible with their predecessors PE9702 and PE9704, the PE97022 and PE97042 offer:

- ▶ Dramatically reduced phase noise
- ▶ 10/11 dual modulus prescaler
- ▶ Parallel, Serial or Direct Mode access

MONOLITHIC INTEGRATION

The most fundamental benefit of UltraCMOS products for space applications is its inherent ability to integrate RF, mixed-signal analog, digital and EEPROM on the same device. Very high quality inductors and capacitors deliver QL>40 and QC>100 @ 2 GHz. UltraCMOS is a standard CMOS technology, leveraging all the same low-cost, high-value benefits in manufacturing yields, scalability and ease-of-use.

HIGH-REL INTEGER-N PHASE LOCKED-LOOP (PLL) FREQUENCY SYNTHESIZERS

Product Description	Det Type	Programming Mode	Normalized Phase Noise (dBc/Hz)	Max Input (GHz) RF PLL	Operating Freq (MHz) Ref.	Operating Freq (MHz) Compare	Prescaler	Main Counters M, A	Reference Counters	Typical I _{dd} (mA @ 3 V)	V _{dd} Range (V)	Package Types
PE9601	CP	Par, Ser, Hardwire	-210	2.2	100	20	10/11	9bit, 4bit	6bit	24	2.85-3.15	44L CQFI, DIE
PE9701	CP	Par, Ser, Hardwire	-210	3.0	100	20	10/11	9bit, 4bit	6bit	24	2.85-3.15	44L CQFI, DIE
PE9702	PD	Par, Ser, Hardwire	-210	3.0	100	20	10/11	9bit, 4bit	6bit	24	2.85-3.15	44L CQFI, DIE
NEW PE97022	PD	Par, Ser, Hardwire	-216	3.5	100	50	10/11	9bit, 4bit	6bit	40 ¹	2.85-3.45	44L CQFI, DIE
PE9704	PD	Serial, Hardwire	-210	3.0	100	20	10/11	9bit, 4bit	6bit	24	2.85-3.15	44L CQFI, DIE
NEW PE97042	PD	Serial, Hardwire	-216	3.5	100	50	10/11	9bit, 4bit	6bit	40 ¹	2.85-3.45	44L CQFI, DIE

Note 1. Typical I_{dd} = 40 mA @ 3.3 V

HIGH-REL SWITCHES

Product Description	Operating Frequency (MHz)	IIP3 (dBm @ 2 GHz)	P1dB (dBm @ 2 GHz)	Insertion Loss (dB @ 1 GHz)	Isolation (dB @ 1 GHz)	Typical Idd (μ A @ 3 V)	Vdd Range (V)	Package
PE9354 - SPDT	DC-3000	55	31	0.55	32	28	2.7-3.3	8L CSOIC
NEW PE95420 - SPDT	DC-8500	60	33	0.60	55	100 @ 3.3 V	3.0-3.6	7L CSOIC, DIE

HIGH-REL DELTA-SIGMA MODULATED FRACTIONAL-N PHASE LOCKED-LOOP (PLL) FREQUENCY SYNTHESIZERS

Product Description	Programming Mode	Normalized Phase Noise (dBc/Hz)	Max Input Operating Freq (GHz) RF PLL	(MHz) Ref.	(MHz) Compare	Prescaler	Main Counters M, A, K	Reference Counters	Package Types
PE97632 Ultra Low Phase Noise 3rd order DSM	Serial, Hardwire	-216	3.5	100	50	10/11	9bit, 4bit, 18 bit	6bit	68L CQFJ, DIE
PE9763 Low Phase Noise 3rd order DSM	Serial, Hardwire	-210	3.2	100	50	10/11	9bit, 4bit, 18 bit	6bit	68L CQFJ, DIE

Note PE97632: Vdd Range = 2.85-3.45 V
Typical Idd = 40 mA @ 3.3 V

Note PE9763: Vdd Range = 2.85-3.15 V
Typical Idd = 30 mA @ 3 V

Note: The PE97632 is pin for pin compatible with the PE9763 in up/down mode.

HIGH-REL RF DIGITAL STEP ATTENUATORS (MONOLITHIC) - 50 Ω

Product Description	Attenuation (dB)	Programming Mode	Operating Freq. (MHz)	Insertion Loss (dB)	Input IP3 (dBm)	Attenuation Accuracy (1 GHz)	Switching Speed (μ s)	Package
PE94302 - 6-bit, 50 Ω	31.5 range / 0.5 steps	Parallel, Serial	DC-4000	1.5	52	+/- (0.55dB+7% of setting)	1	28L 4CQFP

HIGH-REL PRESCALERS

Product Description	Input Operating Frequency (MHz)	Divide Ratio	Typical Idd (mA @ 3 V)	Vdd Range (V)	Package
PE9301 - Divide-by-2	1500-3500	2	13	2.85-3.15	8L CSOIC
PE9303 - Divide-by-8	1500-3500	8	14	2.85-3.15	8L CSOIC
NEW PE9309 - Divide-by-4	3500-13000	4	16 @ 2.6 V	2.45-2.75	8L CSOIC, DIE
PE9311 - Divide-by-2	DC-1500	2	6.5	2.85-3.15	8L CSOIC
PE9312 - Divide-by-4	DC-1500	4	6.5	2.85-3.15	8L CSOIC
PE9313 - Divide-by-8	DC-1500	8	6.5	2.85-3.15	8L CSOIC

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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