

Contents

1	Introduction	1
1.1	The Fear of Disconnection	1
1.2	Advanced Wireless Communication Systems	2
1.3	Flexible Multi-Standard Operation	4
1.3.1	TX Frontend Key Requirements	5
1.4	High Performance TX Architectures	8
1.5	Quadrature Direct-Conversion Transmitters	11
2	Incremental-Charge-Based Operation	17
2.1	Introduction	17
2.2	Incremental-Charge-Based Operation	23
2.2.1	Noise and Alias Performance	25
2.3	Charge-Based Transmitter	39
2.3.1	Power Efficiency	42
2.4	Conclusion	45
3	Capacitive Charge-Based Transmitter	47
3.1	Introduction	47
3.2	Architecture	48
3.2.1	Operating Principles	49
3.2.2	CQDAC Operation	51
3.2.3	Noise and Alias Performance	53
3.2.4	Harmonic Performance	59
3.3	Circuit Realization	64
3.3.1	CQDAC	64
3.3.2	Mixer and PPA	74
3.3.3	LO Generation	81
3.3.4	Top-Level Description	81

3.4	Measurement Results	84
3.4.1	Measurement Setup	84
3.4.2	CQDAC Measurement Results	85
3.4.3	CQDAC TX Measurement Results	88
3.5	Conclusion	95
4	Resistive Charge-Based Transmitter	97
4.1	Introduction	97
4.2	Architecture	98
4.2.1	Operating Principles	100
4.2.2	RQDAC Operation	102
4.2.3	Noise and Alias Performance	104
4.2.4	Harmonic Performance	111
4.3	Circuit Realization	116
4.3.1	RQDAC	116
4.3.2	Mixer Design	123
4.3.3	LO Generation	124
4.3.4	Top-Level Description	125
4.4	Measurement Results	128
4.4.1	Measurement Setup	128
4.4.2	RQDAC Measurement Results	129
4.4.3	RQDAC TX Measurement Results	130
4.5	Conclusion	139
5	Conclusion	143
5.1	Summary	143
	Bibliography	147

<http://www.springer.com/978-3-319-45786-4>

Charge-based CMOS Digital RF Transmitters

Paro Filho, P.E.; Craninckx, J.; Wambacq, P.; Ingels, M.

2017, XXIX, 152 p. 156 illus., 98 illus. in color.,

Hardcover

ISBN: 978-3-319-45786-4