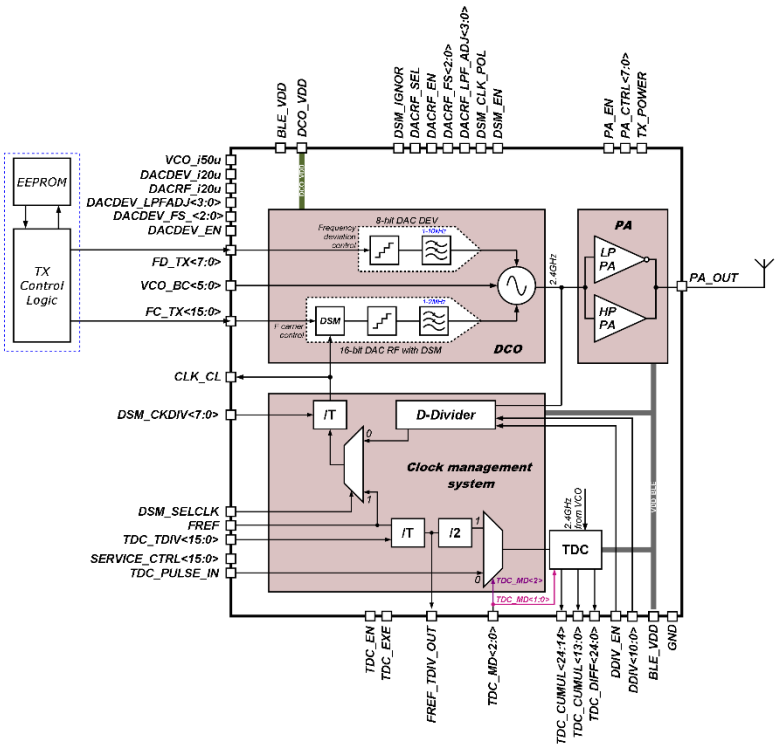
BLE Advertising Transmitter RF Frontend

OVERVIEW

130GF_BLE_01 is a small area transmitter with output frequency range 2.4…2.48GHz. Nominal value of output power can be either -20dBm or 0dBm. The IP does not use any reference frequency, so necessary frequency tolerance is provided by high resolution digital control via frequency control words FC_TX and FD_TX. These control words response, correspondingly, for slow control of carrier frequency and fast control of frequency deviation. Correct generation of these words are performed externally. This external processing may include GFSK signal modulation, storing temperature-dependent constants for frequency adjustment etc. The internal digitally-controlled oscillator (DCO) core is based on LC tank oscillator with two control inputs.



Bus TX_CTRL provides main user control of the IP. Service control bus is dedicated for debugging and testing goals and is not used during normal operation.

IP technology: GF 130 nm Embedded EEPROM.

IP status: pre-silicon verification.

Area: 0.51mm^2

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			min	typ.	max	
BLE_VDD voltage	VDD_{BLE}	-	1.35	1.5	1.65	V
DCO_VDD voltage	VDD_{DCO}	-	1.35	1.5	1.65	V
Operating temperature	T_j	-	-40	25	+85	ºC
BLE_VDD current consumption in TX mode	I_{BLE_TX}	Low power mode	-	1.0	1.36	mA
		High power mode	-	4.8	6.9	
BLE_VDD current consumption in calibration mode	I_{CLBR_BLE}	F_{VCO} = 2.4 GHz; VCO_BC<5:0> = “31”; TX_POWER = “0”	-	1.5	1.8	mA
DCO_VDD current consumption in TX mode	I_{TX}	Low power mode	-	5.2	6.4	mA
		High power mode	-	5.3	6.6	
DCO_VDD current consumption in calibration mode	I_{CLBR_DCO}	F_{VCO} = 2.4 GHz; VCO_BC<5:0> = “31”; TX_POWER = “0”	-	5.2	6.4	mA
VCO frequency	F_{VCO}	Lower frequency	-	-	2.40	GHz
		Upper frequency	2.48	-	-	GHz
PA output power	PA_{OUT}	TX_POWER = “1”; SERVICE_CTRL<2:0> = “001”	-4.6	0	2.5	dBm
		TX_POWER = “0”; SERVICE_CTRL<8:7> = “00”	-25	-20	-18	