1 V3.4 (09-Nov-2016)

- Bluetooth Smart changed to Bluetooth low energy as per Bluetooth SIG directive.
- Language and title capitalization changed to US English.
- Back page:
  - Definition for datasheet status Final clarified.
  - Disclaimer updated with trademarks statement.
  - RoHS statement updated.

2 V3.3 (08-Jun-2016)

- DA14580 qualified to Bluetooth Specification 4.2. Datasheet title and document content changed accordingly.
- Section 4.7.2 (Wake-up timer), p.14: Added minimum pulse width of 2 sleep clock cycles for wake-up via GPIO.
- Table 127 (SPI_CTRL_REG), p.95: Definition of SPI_MINT corrected:
  - ICU changed to Interrupt Controller.
  - Note on shared interrupts (SPI_INT and AD_INT) removed: not applicable.
- Table 257 (Absolute maximum ratings), p.141: Maximum value of $V_{PIN(LIM)}$(VDCDC_RF) changed from min(2,VBAT_RF+0.2) to min(3.3,VBAT_RF+0.2).
- Table 258 (Recommended operating conditions), p.142: Maximum value of V_{PIN}(VDCDC_RF) changed from 2 V to 3.3 V.
- Table 273 (RCX Oscillator: Timing characteristics), p.150: Added parameters ΔT_A/t(RCX)100ms, ΔT_A/t(RCX)4s:

ΔT_A/ Δt(RCX)100ms	ambient temperature gradient	buck mode only; connection interval 100 ms			0.66	°C/s
$\Delta T_A/\Delta$t(RCX)4s	ambient temperature gradient	buck mode only; connection interval 4 s			0.33	°C/s

- Figure 15 (WLSCSP34 Package Outline Drawing), p.154: drawing updated to Rev F (Min and Max values added to body size).

3 V3.2 (18-Dec-2015)

- Table 1 (Pin Description), p.8:
  - Programming voltage on pin VPP corrected to 6.7 V ± 0.1 V.
- Ordering information moved to new section 3 (p.9):
  - Table 2: Ordering information (samples).
  - Table 3: Ordering information (production).
  - Table 4: Ordering information (preprogrammed OTP); previously in separate Addendum document.
- Figure 14 (p.157): Package outline drawing of QFN40 updated.
- Table 222 (P01_PADPWR_CTRL_REG), p.130:
  - Notes 3 and 4 updated with limited output current capability in Boost mode.
- Table 223 (P2_PADPWR_CTRL_REG), p.130:
  - Note 5 updated with limited output current capability in Boost mode.
- Table 224 (P3_PADPWR_CTRL_REG), p.131:
  - Note 6 updated with limited output current capability in Boost mode.
- Table 267 (Digital Input/Output: DC characteristics), p.145:

- Note 17 added for V_{OH}(VBAT3V): In Boost mode the output source current is limited to Iout = -250 uA.
- Note 18 added for V_{OL}(VBAT3V): In Boost mode the output sink current is limited to Iout = 250 uA.

- Template updated to new branding guidelines.
- Back page: Contact information updated.

4 V3.1 (January 29, 2015)

- General description partly rephrased.
- Features (p.1):
  - Corrected nominal package size for WLCSP34 package.
  - Package added: KGD (wafer, dice).
- Ordering information (p.5):
  - Reformatted into separate tables for samples and production orders.
  - Table 1 (samples):
    - Discontinued: DA14580-01UN6 (WLCSP34 samples in waffle pack).
    - Replacement: DA14580-01UNA (WLCSP34 samples on mini-reel).
  - Table 2 (production):
    - Added: DA14580-01WO4 (KGD, wafer)
    - Added: DA14580-01WC4 (KGD, dice)
- Section 3.7.1 (p.13):
  - Section title changed to ‘General purpose timers’.
  - Timer 0: formulas for output frequency, duty cycle and interrupt time reformatted.
  - Timer 2:
    - Input clock frequency: corrected from 16 MHz (fixed) to sys_clk/N with N = 1, 2, 4 or 8 and sys_clk = 16 MHz or 32 kHz. Formula reformatted.
    - Output frequency: formula reformatted.
- Section 3.9 (Power management), p.15:
  - Feature ‘On/off control’ removed. Not supported for normal operation.
  - Minimum voltage for Buck mode operation changed from 2.2 V to 2.35 V.
  - Figures 8 and 10 updated accordingly.
- Order of sections ‘Registers’ and ‘Specifications’ reversed.
- Section 4 (Registers):
  - Table 32 (CLK_AMBA_REG), p.31: descriptions of fields PCLK_DIV and HCLK_DIV rephrased.
  - Tables 240, 241 and 242 (Px_PADPWR_CTRL_REG), p.134: Note added:
    “For buck mode the output must be powered by the 3V rail, for boost mode by the 1V rail.”
- Section 5 (Specifications), p.142:
  - Definition of MIN/MAX specifications rephrased.
  - Default measurement conditions added.
  - Table 281 (Recommended operating conditions), p.145:
    - V_{BAT}(VBAT3V)NO_OTP: parameter removed. V_{BAT}(VBAT3V) also applies when OTP is not programmed.
  - Table 282 (DC characteristics), p.145 and 146:
    - Max value added for: I_{BAT}(DP_SLP)_BOOST_8kB, I_{BAT}(EXT_SLP)_BOOST_50kB, I_{BAT}(ACT_RX)_BOOST, I_{BAT}(ACT_TX)_BOOST, I_{BAT}(DP_SLP)_BUCK_8kB, I_{BAT}(EXT_SLP)_BUCK_50kB, I_{BAT}(ACT_RX)_BUCK, I_{BAT}(ACT_TX)_BUCK.

- Supply voltage condition removed for: I_{BAT}(DP_SLP)_BUCK_1kB, I_{BAT}(DP_SLP)_BUCK_2kB, I_{BAT}(DP_SLP)_BUCK_8kB, I_{BAT}(ACT_RX)_BOOST, I_{BAT}(ACT_TX)_BOOST, I_{BAT}(ACT_RX)_BUCK, I_{BAT}(ACT_TX)_BUCK. Default measurement conditions apply.

- Table 295 (Radio: AC characteristics), p.151: Note 15 (reference to AN-B-017) removed.

5 V3.0 (September 25, 2014)

5.1 CRITICAL CHANGES

- Product status changed to Production, datasheet status changed to Final.
- Section 4 (Specifications), p.17: added MIN/MAX definitions and reference diagrams for Boost and Buck mode (Figures 11 and 12).
- Table 3 (Absolute maximum ratings), p.19:
  - $V_{PIN(LIM)}$(default): condition text corrected, maximum value changed from 3.6 V to min(3.6, VBAT_RF+0.2) V.
  - $V_{BAT(LIM)}$VBAT1V: minimum value changed from 0.9 V to -0.1 V.
  - $V_{BAT(LIM)}$VBAT3V: minimum value changed from 1.8 V to -0.1 V.
  - $V_{PIN(LIM)}$(1V2): minimum value changed from 0 V to -0.2 V, maximum value changed from 1.2 V to min(1.2, VBAT_RF+0.2) V.
  - Added parameter $V_{PIN(LIM)}$(VDCDC_RF) with minimum value -0.2 V, maximum value min(2, VBAT_RF+0.2) V.
  - Added parameter $V_{PIN(LIM)}$(XTAL32Kp) with minimum value -0.2 V, maximum value min(1.5, VBAT_RF+0.2) V.
  - $V_{ESD(MM)}$(WLCSP34): maximum value changed from 175 V to 200 V.
- Table 4 (Recommended operating conditions), p.20:
  - V_{PP}: specification changed from 6.55 V, 6.8 V, 7.05 V (Min, Typ, Max) to 6.6 V, 6.7 V, 6.8 V (Min, Typ, Max); added condition $T_J \leq 50$ °C.
  - V_{BAT}(VBAT3V): also applies to pin VBAT_RF, conditions updated accordingly.
  - Added parameter V_{BAT}(VBAT3V)NO_OTP with minimum value 1.8 V, maximum value 3.3 V and condition ‘OTP not programmed’.
  - V_{PIN}(default): maximum value changed from 3.3 V to min(3.3, VBAT_RF+0.2).
  - Added parameter V_{PIN}(VDCDC_RF) with minimum value 0 V, maximum value 2 V.
  - Note 2: added text ‘Trim values programmed in the OTP as well as the application image, should be copied into RAM while VBAT3V >= 2.5 V.’.
- Table 6 (Timing characteristics), p.22:
  - Added Note 3 to typical values of t_{STA}(BOOST) and t_{STA}(BUCK): ‘Worst-case value under Normal Operating Conditions.’
- Table 7 (16 MHz Crystal Oscillator: Recommended operating conditions), p.22:
  - Δf_{XTAL}(16M): Min/Max values changed from -15/+15 ppm to -20/+20 ppm. Added Note 4: ‘Using the internal varicaps a wide range of crystals can be trimmed to the required tolerance.’
  - Added parameter Δf_{XTAL}(16M)UNT with Min/Max values -40/+40 ppm, condition ‘untrimmed’ and Note 5: Maximum allowed frequency tolerance for compensation by the internal varicap trimming mechanism.’

5.2 NON CRITICAL CHANGES

- Figure 2 and Figure 3 (system diagrams for Boost mode and Buck Mode) moved from section 1 (Block diagram) to section 4 (Specifications) and renamed to Figure 11 and Figure 12.
- Figures 8 and 9 (Supply overview), p.15 and p.16: component values removed.
- Figure 11 (System diagram: Boost mode) updated, p.17:
  - Pin RST not connected
  - Pin VDCDCA renamed to VDCDC_RF

- Pin VBATA renamed to VBAT_RF
- C8 = 1 µF (was: 100 nF)
- C9 = 1 µF (was: NP)

- Figure 12 (System diagram: Buck mode) updated, p.18:
  - Pin RST not connected
  - Pin VDCDCA renamed to VDCDC_RF
  - Pin VBATA renamed to VBAT_RF
  - C8 = 1 µF (was: 100 nF)
  - Added C9 = 1 µF on pin VBAT_RF
  - 32.768 kHz XTAL oscillator optional
- Table 4 (Recommended operating conditions), p.20:
  - V_{BAT}(VBAT3V) and V_{BAT}(VBAT3V)NO_OTP: reference to Note 19 moved from Conditions to Min column.
- Table 5 (DC characteristics), p.20 and p.21:
  - I_{BAT}(DP_SLP)_BOOST_1kB and I_{BAT}(DP_SLP)_BOOST_2kB: condition changed from ‘Typical boost-application’ to ‘Boost configuration’.
  - I_{BAT}(DP_SLP)_BUCK_1kB and I_{BAT}(DP_SLP)_BUCK_2kB: condition changed from ‘Typical buck-application’ to ‘Buck configuration’.
- Table 17 (Radio: DC characteristics), p.25:
  - Note 11: text ‘(VBAT3V = 3 V)’ appended.
- Section 5 (Registers), p.29: added references to ARM Cortex-M0 documentation.
- Table 56 (TRIM_CTRL_REG), p.47: Note 22 added: ‘The period duration of 250 us is derived by dividing the RC16M clock signal by 4000. Consequently, the period duration may vary over temperature.’.
- Table 59 (CLK_RCX20K_REG), p.48: oscillator name ‘RCX32K’ corrected to ‘RCX’.
- Table 85 (UART_MCR_REG), p.56: description of bit UART_AFCE clarified, reference to section “Auto Flow Control” removed (internal design document).
- Table 111 (UART_SRTS_REG), p.79: description of bit UART_SHADOW_REQUEST_TO_SEND clarified.
- Table 125 (UART2_MCR_REG), p.85: description of bit UART_AFCE clarified, reference to section “Auto Flow Control” removed (internal design document).
- Table 151 (UART2_SRTS_REG), p.108: description of bit UART_SHADOW_REQUEST_TO_SEND clarified.
- Table 286 (GP_CONTROL_REG), p.152: description of bit EM_MAP: text ‘Case <n>, available’ removed.
- Back page: contact information updated.

