Embedded Product Development Checklist

This checklist helps product owners, engineering managers and Chief Technology Officers (CTOs) confirm that a new embedded product is ready to move from one development stage to the next. It covers requirements, architecture, hardware, firmware, validation and production readiness, so missing decisions surface during planning instead of during a costly board respin or field failure.

Technically reviewed by the EmbedCrest engineering team Updated November 16, 2026

How to use this checklist

Review the section for your current stage at each design review, and read later sections early to spot long lead decisions. Record evidence for every confirmed item, such as a document, test report or decision log entry. Items without evidence stay open and block the stage gate.

Requirements

- [ ] Are functional requirements written, numbered and testable rather than described in a slide?
- [ ] Are operating temperature, humidity, ingress protection and vibration ranges specified with units?
- [ ] Are power source, battery life or power budget targets stated in measurable terms?
- [ ] Are target markets listed so required compliance tests and radio rules are known?
- [ ] Are target unit cost, annual volume and product lifetime agreed?
- [ ] Are security requirements, such as secure boot and signed updates, recorded from the start?

Architecture

- [ ] Is the processor or microcontroller choice justified against memory, peripherals, power and supply availability?
- [ ] Is the decision between bare metal, real time operating system (RTOS) and embedded Linux documented with reasons?
- [ ] Are connectivity options, such as Bluetooth Low Energy (BLE), WiFi, cellular or LoRaWAN (Long Range Wide Area Network), chosen against range, power and cost?
- [ ] Is the firmware update strategy, including rollback, defined before hardware is frozen?
- [ ] Are interfaces to cloud, apps or host systems specified with message formats and versions?
- [ ] Are key risks listed with an owner and a plan to retire each one?

Hardware design

- [ ] Has every critical component been checked for lifecycle status, lead time and an approved alternate?
- [ ] Is the power tree analysed for worst case load, startup sequencing and protection?
- [ ] Are test points, a programming interface and debug access included on the board?
- [ ] Has a design for manufacture (DFM) review been done with the intended fabricator and assembler?
- [ ] Are electromagnetic compatibility (EMC) design practices applied to layout, grounding, shielding and cabling?
- [ ] Is the schematic and layout reviewed by an engineer who did not design it?

Firmware

- [ ] Is the firmware built from version control by a scripted, reproducible build?
- [ ] Is a coding standard chosen and checked automatically with static analysis?
- [ ] Are unit tests running for application logic on every change?
- [ ] Are watchdog, brownout and fault handling behaviours designed and tested?
- [ ] Is board bring up complete for every peripheral on production intent hardware?
- [ ] Are logging and diagnostics available for field fault analysis?

Validation

- [ ] Is there a test plan tracing every requirement to at least one test?
- [ ] Are environmental tests planned across the full specified temperature range?
- [ ] Is EMC and safety pre compliance testing scheduled before formal lab testing?
- [ ] Are over the air (OTA) update, rollback and power loss during update tested on real hardware?
- [ ] Are long duration tests planned to catch memory leaks and rare timing faults?

Production readiness

- [ ] Is a controlled bill of materials (BOM) with manufacturer part numbers and alternates released?
- [ ] Is the production test specification written and the test fixture designed?
- [ ] Is the production programming and device provisioning procedure documented?
- [ ] Are engineering, design and production validation test (EVT, DVT and PVT) exit criteria agreed with the manufacturer?
- [ ] Is a plan in place for firmware maintenance and component obsolescence after launch?