REG EMC FCC Summary

Engineering Technical Summary Report | Regenesis Pod Certification Update

Standard: EN IEC 55014-1 Class A / FCC	**Target Limits (3M):** 30–230 MHz: 49.5 dBµV/m | 230M–1 GHz: 56.5 dBµV/m
DUT: Regenesis Pod System (V3.1 / F3.X)	**Date:** August 2026 | **Location:** Bali Production & Operations

1. Executive Summary & Compliance Overview

This report consolidates the electromagnetic compatibility (EMC) pre-compliance testing, near-field probe diagnostics, far-field 3-meter chamber measurements, and hardware/software mitigation actions executed for the **Regenesis Pod System**. Testing evaluated full system compliance against the **EN IEC 55014-1 Class A / FCC** regulatory standard.

2. Module-by-Module Improvement Breakdown

A. Power Supply Box Improvements

- [✓] **PSU MDR-05 Replacement:** Replaced PSU MDR-05 with wider input, higher EMI-rated Mean Well WDR-05.
- [✓] **PSU EDR-12 Replacement:** Replaced main 12V supply PSU EDR-12 with Class A Mean Well NDR-12.
- [✓] **PSU NDR-24 Removal:** Removed 1 redundant PSU NDR-24 unit to eliminate unnecessary switching noise.
- [✓] **Unified Grounding (Star Ground):** Connected all PSU GND terminals into a single unified GND tied to PE.
- [✓] **Power Hub PCB Upgrade:** Replaced legacy PCB HUB_Power_V1.4 with upgraded PCB HUB_Power_F3.X_V1.6.

B. Audio Box System Improvements

- [✓] **New Shielded Enclosure:** Deployed new Audio Box enclosure engineered with minimal gap spacing.
- [✓] **Removed Binaural Amp Module:** Removed the binaural amplifier module from the WONDOM PAM board.
- [✓] **New PCB Audio Front Panel:** Designed and installed new EMI-optimized PCB Audio Front Panel.
- [✓] **Removed Extra Fans:** Omitted extra cooling fans in the Audio Box to eliminate motor noise and aperture leaks.
- [✓] **Audio Isolator Integration:** Added audio isolator circuit at input to prevent ground loop / common-mode noise.

C. PC Area & Computing Improvements

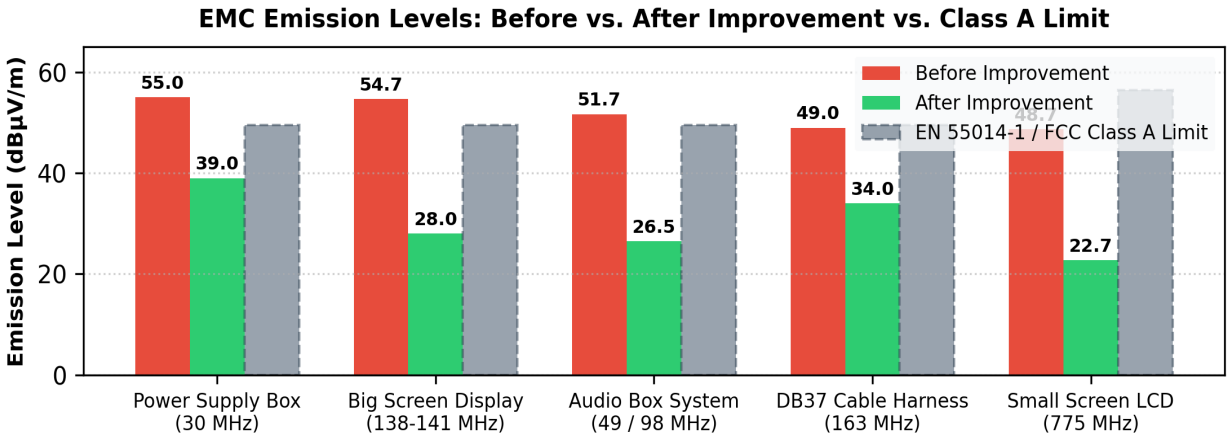
- [✓] **Custom Metal PC Enclosure:** New PC metal enclosure designed and in active production by LTV since 07/24/26 to form a complete Faraday cage.
- [✓] **Non-AI PC (Small Form-Factor Mini PC) Implementation:** Implemented a non-AI small PC (Mini PC) architecture to significantly reduce high-frequency clock emissions, GPU power rail ripple, and thermal radiation.

D. Electronic Box Improvements

- [✓] **New Olfactory PCB:** Redesigned Olfactory board eliminating DC-DC voltage booster switching noise.
- [✓] **New EEBOX Enclosure:** Redesigned Electronic Box enclosure with minimized hole gaps to suppress RF leakage.
- [✓] **New Motherboard PCB:** Redesigned main controller motherboard featuring continuous ground planes.
- [✓] **New USB Hub PCB:** Redesigned 4-layer USB Hub PCB for controlled impedance and reduced data line EMI.

3. EMC Compliance Progress Analytics

Data extracted from the **EMC Progress Dashboard** (https://emcprogress.netlify.app/) and RF testing sweeps confirm major noise suppression across all core subsystems:



Subsystem / DUT	Dominant Freq.	Before Imp. (dBµV/m)	After Imp. (dBµV/m)	EN 55014-1 / FCC Limit	Status
Power Supply Box	30 MHz	55.0	39.0	49.5 dBµV/m	PASSED
Audio Box System	49 / 98 MHz	51.7	26.5	49.5 dBµV/m	PASSED
Big Screen Display (OLED)	138 - 141 MHz	54.7	28.0	49.5 dBµV/m	PASSED
DB37 Cable Harness	163 MHz	49.0	34.0	49.5 dBµV/m	PASSED
PC Area (Small Mini PC)	31 - 165 MHz	25.8	25.8	49.5 dBµV/m	PASSED
Electronic Box (EEBOX)	36 - 163 MHz	36.0	Pending PCB	49.5 dBµV/m	PLANNED

4. Improvement Delta Analysis

