MICROEJ®

SOFTWARE-DEFINED
EVERYTHING

Efficiently Create and Launch Feature-Rich, Stylish Smartwatches with VEE Wear® Software Platform

VEE Wear stands out as a groundbreaking wearable software solution tailored for the future of wearables. With a memory footprint optimized for low-power microcontrollers and microprocessors, VEE Wear brings the features and capabilities of large operating systems to a downscaled footprint, reducing cost and power consumption.

KEY BENEFITS

1

Smartphone-Like Capability and Ultralow Power on Any Watch

- → Cutting-edge features, including advanced graphics, connectivity, integrated sensors
- → Compatible with both RTOS and Android Wear watches
- → Unlock app monetization opportunities with an integrated application store

2

Ultra-Fast Customization

- → Baseline apps with customizable graphic assets ~ 1 week
- → Unlimited watch faces – typical design ~ 1 day
- → Typical wellness application design ~ 2 weeks

3

Extensible Product Through Apps & Partners

- → Partners for hardware, algorithms and apps
- → Embrace an app ecosystem, encompassing app repository, app monetization, etc.

4

VEE Wear Reference Design to Accelerate Product Design

- → Real smartwatch powered by VEE Wear for low-power, mid-range watches

VEE WEAR SOLUTION FOR WEARABLE

UNMATCHED BATTERY LONGEVITY

Entry level Ultra Low Power – VEE Wear Smartwatches

- VEE Wear serves as the primary Execution Environment
- Ultra-low power and optimized MCU, simple screen and basic features
- **1 Year+ of battery life**

Mid-Range Low Power – VEE Wear Smartwatches

- VEE Wear is the primary Execution Environment
- Low-power MCU-based design, with rich user interface
- **1 Month+ of battery life**

High-end Hybrid – Android / VEE Wear Smartwatches

- Android serves as main OS and VEE Wear as the ambient mode Execution Environment
- Smartwatch with rich ambient mode on advanced SoC like Qualcomm Snapdragon Wear
- **Up to X3 battery life compared to using Android Wear alone**

THE RIGHT BALANCE BETWEEN USER EXPERIENCE AND COSTS

For smartwatches to succeed, they must strike a precise balance between sophistication and affordability. Each component, from the screen to the sensors, contributes to the tailored user experience. Essential elements include swift response times, high-resolution graphics, and robust support, for premium features like customizable watch faces and voice assistants. Therefore, efficient CPU resource utilization is crucial to ensure seamless functionality across applications.

VEE Wear offers a comprehensive suite of tools to fine-tune these design decisions, ensuring optimal performance, extreme low power capabilities, and cost-effectiveness.

INNOVATIVE BUSINESS MODELS WITH APP ECOSYSTEMS

VEE Wear's multi-sandboxing capability empowers manufacturers to foster customer loyalty by offering downloadable apps and watch faces for all VEE-powered devices. This not only enhances product appeal but also opens up **lucrative opportunities** by leveraging a dedicated IoT marketplace, leading to recurring revenues.

With support for C, JavaScript, and Java applications, VEE Wear enables access to a vast pool of over **20 million engineers**. This allows for the creation of distinctive applications across a diverse range of wearables, without being hindered by intricate implementation details.

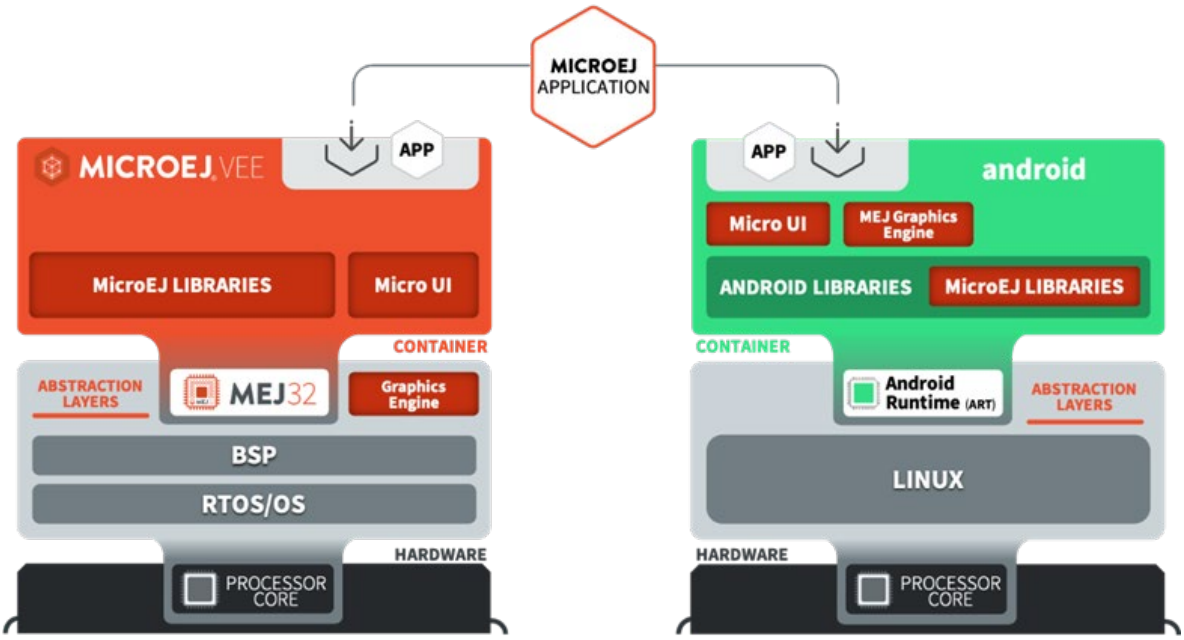
OVER 500,000 WATCH FACES AVAILABLE

With full support for the Facer watch face platform, VEE Wear grants access to an impressive collection of **500,000 watch faces curated by a community of 40,000 developers**. Wearable designers can use the Facer Creator app to craft their own personalized watch faces, and swiftly sync them with any watch. Moreover, Facer seamlessly integrates with your application and can even design a custom watch face store tailored to your needs.

SEAMLESS ANDROID COMPATIBILITY

VEE Wear incorporates a sophisticated offloading framework specifically engineered to **optimize power consumption** in ambient mode. In this configuration, an application processor handles Android operations, while a companion MCU runs VEE Wear. By strategically alternating the execution of applications between low-consumption MCUs and powerful MPUs, our system guarantees peak power efficiency.
This extends battery life to its fullest potential.

Furthermore, with seamless support for Android Studio, developers can streamline their workflow by using the same development tools for both Android and VEE Wear applications. This unified approach simplifies development processes and **maximizes overall efficiency.**



BEAUTIFUL, LOW POWER WEARABLES

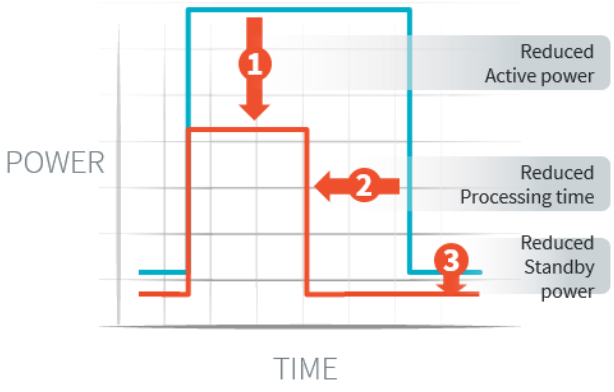
OUTSTANDING UI/UX

VEE Wear empowers you with a suite of powerful graphical user interface libraries and tools, featuring a thread-safe 2D graphics engine, a versatile widget framework, seamless vector drawing support, and beyond. Here's just a glimpse of the possibilities at your fingertips:

- **Graphics**
  - Bitmap & vector graphics (images, fonts)
  - Hardware accelerated whenever possible
- **Performances**
  - Above 30 fps* refresh rate for smooth transitions
  - 5µA* in ambient mode
- **Features**
  - Any types of displays
  - Simple to rich widgets
  - Rich graphical animations & transitions
  - Support for standard images formats (JPEG, PNG, Android Vector)

ULTRA LOW POWER SYSTEM

- Implements frequency-based power management to reduce active power when possible.
- Supports hardware accelerators to reduce execution time and power consumption.
- MicroEJ works closely with hardware vendors to intensively leverage hardware support for standby power optimization of VEE Wear.



See more with our low power webinar:
Achieve 3x Faster Development and 40 Days of Battery Life on Your Wearable Designs Using MICROEJ VEE on NXP i.MX RT500 MCUs

ACCELERATED PRODUCT DESIGNS

TAKE ADVANTAGE OF TRUE DEVICE SIMULATION

VEE Wear includes a comprehensive simulator that allows users to create a software representation of the device, known as a 'Virtual device,' for complete software application development. Additionally, it can simulate sensors, algorithms, and network connections.

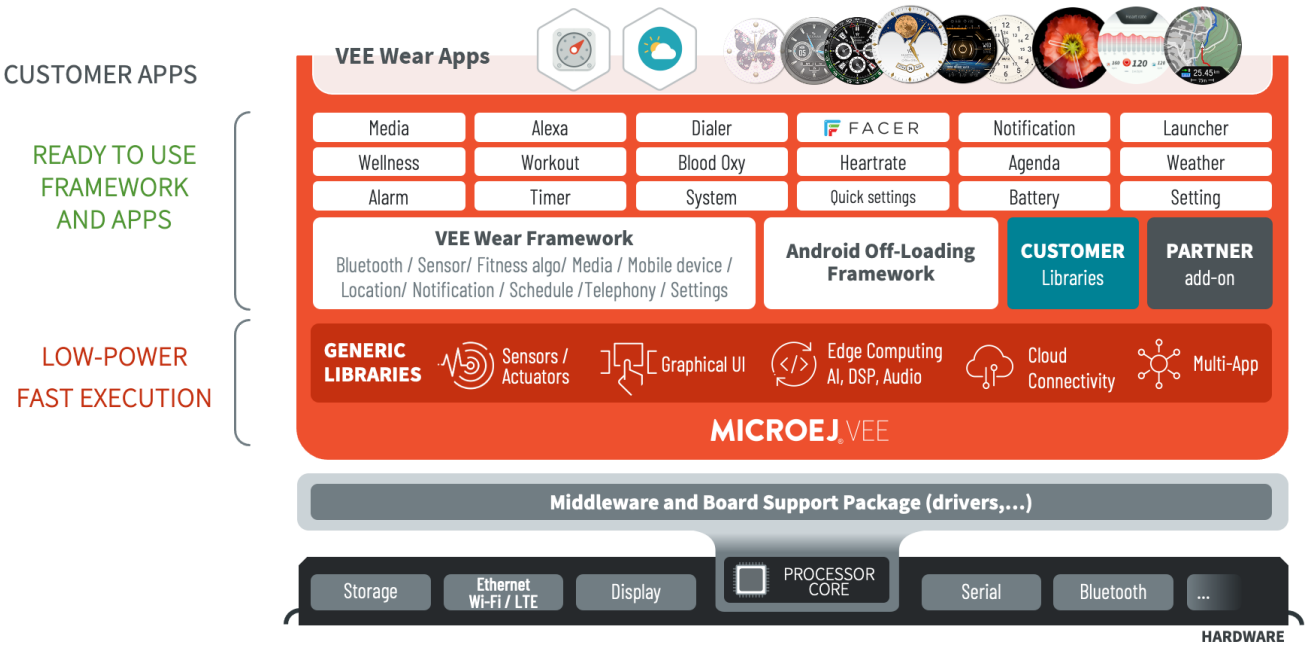
Ultimately, developers can **design the full device on the simulator,** enabling fine-tuning of hardware performance and memory requirements.

EXCLUSIVE SOFTWARE FEATURES

VEE Wear offers an array of unique software features designed to expedite product development:

- The **VEE Wear framework** integrates a wide array of components spanning UX/UI, signal processing, AI, security, Bluetooth, sensors, fitness algorithms, media control, mobile device interface, location services, notifications, scheduling, telephony, settings, and a curated selection of APIs.
- **VEE Wear apps** are a set of example apps for wearable devices, offering customizable templates adaptable to various brands and product variants. These apps expedite customization processes, providing a rapid starting point for smartwatch design and facilitating user feedback collection.
- The **VEE Wear Android offloading framework** empowers manufacturers to craft hybrid smartwatches with unparalleled battery efficiency and smooth ambient mode transitions. With MicroEJ's compatibility with Android, the shift to ambient mode can seamlessly occur, enhancing the user experience.
- **Unique power optimization for popular chipsets**, such as the NXP i.MX RT595 Crossover MCU, ensures the efficient utilization of multiple cores and GPU acceleration, significantly reducing development timelines.
- **Support for Android and iOS runtimes** for wearable apps allow users to benefit from a cohesive mobile app experience, including the seamless integration of watch faces and apps from the smartphone application. This streamlines development efforts, eliminating the need for extensive redevelopment to ensure compatibility across platforms.

VEE WEAR BLOCK DIAGRAM



VEE WEAR REFERENCE DESIGN

MicroEJ presents a reference design showcasing all the features of VEE Wear in one sleek, pre-production model. This smartwatch boasts a low-power processor, multiple sensors, and a fully functional software application provided as an example.

- **Built on a recognized low power MCU: NXP i.MX RT595**
- **All baseline functionality**
  - 400x400 OLED screen
  - Bluetooth BLE
  - Heart rate & activity monitoring
  - Voice (Alexa and sound)
- **Implements VEE Wear**
  - App framework
  - Watch face engine (over 500,000 watch faces available)
- **Used as a reference design or as a blueprint for manufacturing**

Furthermore, VEE Wear has been successfully ported to a variety of processor systems. MicroEJ offers demonstrators for **all major hardware platforms**, including NXP, ST, Qualcomm, Ambiq, and Realtek. Additionally, **VEE Wear runs on any OS/RTOS commonly used in embedded systems** (FreeRTOS, Zephyr Project, QP/C, ucOS, ThreadX, mBed OS, VxWorks, PikeOS, Integrity, Linux,…) and can also run without RTOS (bare-metal) or proprietary RTOS.

EXTENSIBLE WITH PARTNERS

The VEE Wear ecosystem includes partners that bring added value to your wearable through algorithms and software providing unique capabilities. Partner add-ons algorithms and software components have been tested with VEE Wear for seamless integration. Partner add-ons require a license from each partner (not covered by VEE Wear license).

B-Secur can provide smartwatch manufacturers with advanced ECG algorithms and analytics through their HeartKey® technology, enhancing wearable health devices with medical accuracy and operational efficiency.

By licensing Polar's algorithms, a smartwatch manufacturer can enhance their devices with cutting-edge health monitoring features, including activity tracking, training insights, sleep and recovery analytics, and comprehensive wellness assessments.

Smartwatch manufacturers partner with ActiveLook to offer users a unique, augmented reality experience directly from their wrist, enhancing sports training, navigation, and other data-intensive applications with a hands-free, heads-up display.

HARDWARE DESIGN

MicroEJ is teaming up with leading design contract manufacturers and experts to streamline your process. One standout partner is MIJO Connected, a wearable design specialist stemming from Fossil's top-tier connected device team. With over 100 designs and 10 million units shipped across various smartwatch generations, MIJO is uniquely positioned to guide you through the entire watch design journey.

Additionally, software houses like Thundercomm offer accelerated software design on Qualcomm SoCs, while ODMs like GOERTEK, COMPAL, and Flextronics specialize in hardware design and manufacturing services.

STRAIGHTFORWARD LICENSING

VEE Wear is licensed as an add-on to MicroEJ VEE Core and can be purchased royalty-free with a one-time fee plus yearly maintenance fee.

The license to VEE Wear grants the right to duplicate MicroEJ's VEE Wear libraries and apps along with MicroEJ VEE Core for the duration of the VEE Core multi-year contract.

INCLUDED IN VEE WEAR LICENCE

- VEE Wear Framework
- VEE Wear Apps
- Facer Engine
  - Facer watch faces
  - Facer creator for VEE Wear
  - Facer app
- Android off-loading framework
- VEE Wear reference design
- VEE Wear example app

INCLUDED IN VEE CORE LICENSE

- Sandboxed applications
- Virtual devices and SDK
- Extensive software libraries
- Low power optimization

SEPARATE LICENSES FROM PARTNERS

- Partners add-ons

POWERING MILLIONS OF WEARABLES

TRUSTED BY INDUSTRY LEADERS

VEE Wear powers millions of award-winning wearables across all smartwatches market segments. Our robust partnerships with wearable providers and silicon vendors create a dynamic ecosystem of possibilities for OEMs and ODMs in the industry.

BROUGHT TO YOU BY MICROEJ

VEE Wear stands as a registered trademark of MicroEJ, pronounced as “micro-EDGE”.
MicroEJ is a software vendor of cost-driven solutions for embedded and IoT devices. We are focused on providing device manufacturers with secure products in markets where software applications require high performance, compact size, energy efficiency, and cost-effective development.

Today more than 120+ companies in the world with currently over 250 million products sold, have already chosen MicroEJ to design electronic product applications in a large variety of industries, including smart home, wearables, healthcare, industrial automation, retail, telecommunications, smart city, building automation, transportation, etc.

Learn more about VEE Wear at:
www.microej.com/product/veewear or reach out to hello@microej.com for more details.

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