Application Note Idea Criteria Checklist

For your idea to be accepted it must meet the following criteria. Some items may require additional input. The application idea must be:

1) Unique

Please make sure that your idea is unique: no other GreenPAK design covers this topic. Check the Application notes page to confirm.

Please note: The configuration should have a certain level of complexity. Simple applications or a combination of a couple of simple ones will be rejected (e.g. voltage monitor, level shifter, glue logic).

2) Broad in application

It incorporates a technique that can be used in many different systems, not one specific use-case. The following table gives examples of Broad vs Specific app note topics:

Broad (More Valuable) Topics	Too Specific (Less Valuable) Topics
Serial-Parallel Conversion	**Using GreenPAK to Monitor the Number of Occupants in a Room**
Constant-Current LED Driver	**Dog Bark Detection**
Rotary Encoder to Analog Converter	**GreenPAK-controlled Skeeball Game**
Solar Tracking	**IoT-based Garden Soil Acidity Controller**

3) Provably valuable to an industry

Specify one or more ICs currently on the market that are functionally similar to your GreenPAK idea.

4) Standardized IO

What are the expected inputs and outputs of the GreenPAK design? They should be functionally equivalent to competing ICs currently on the market. Deviations from industry standard IO must be justified in your answer.

5) Good fit for GreenPAK

GreenPAK ICs excel in low-power, configurable, or low-cost applications. This application idea should have one or more of these metrics as the prime selling point of the GreenPAK.

Ex: electric toothbrushes have a single input button and need to control a small motor. A GreenPAK can handle these requirements while being the lowest-cost solution amongst other compatible ICs.

6) GreenPAK plays an important role in the application

If a microcontroller is already used within the application that has the resources available to accomplish the GreenPAK function the application is not valuable. Removing the GreenPAK from the application should cause the design to lose noticeable functionality that cannot be recovered without the use of additional components.

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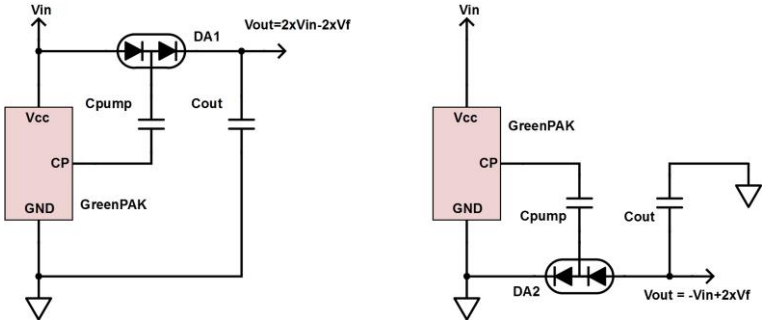
7) The System Design has been planned

Please include a system diagram in **Application Note Idea Proposal** which shows the IO of the system and the macro components that work with the GreenPAK. Below is an example of system designs for a charge pump:



8) The design is suitable to implement using the GreenPAK Designer.

For you **to be sure that your design fits all the requirements, it is crucial to try implementing it using the GreenPAK Designer software.**

You can download it for free following the link: https://www.renesas.com/eu/en/software-tool/go-configure-software-hub

Please, send us your .gp file along with this Application Note Idea Proposal.

9) The GreenPAK Design can create the necessary functional components

List the functional components that need to be created using discrete GreenPAK internal components. Some functions may only require one GreenPAK block, others may require many.

Examples: voltage monitoring using ACMPs, shift register using DFFs & LUTs, PWM control using counters & DFFs & LUTs, ADC using the ADC block…

10) The specific GreenPAK part is appropriate for the application

The chosen GreenPAK should contain the appropriate number and type of resources to accomplish the design without leaving many resources left unused.

11) The design can be fully tested

The application must be one for which you can deliver a clear Results section in the application note.

12) There are clear indicators of pass/fail for your note's "Results" section

If the design is approved, it must be easy to check whether the GreenPAK design has met the functional expectations. What are the criteria needed to show a successful design? Be as specific as possible.

Examples of well-written, complex-design app notes:

1) AN-CM-344 Remote TX and RX Control System for Toy Applications

2) AN-CM-361 Smart speaker LED indication with GreenPAK

Example of well-written, approved app note idea:

Title: Scooter Controller

Description:

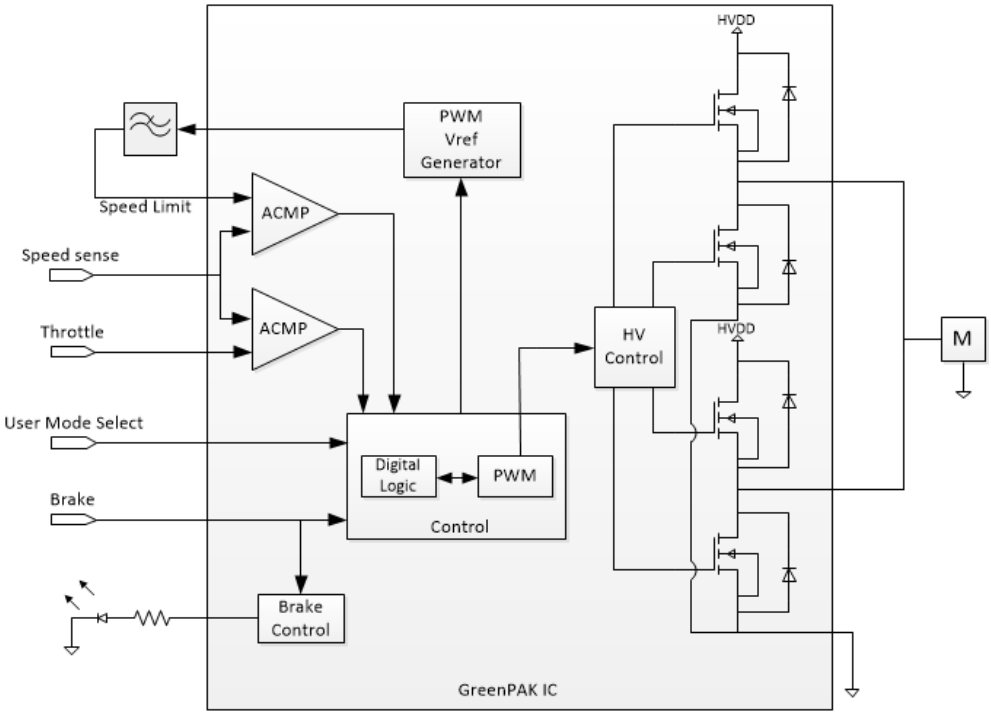
The app note consists of using a GreenPAK HVPAK Device as the main controller for an electric scooter. The IC will control the motor speed, the electric brake action, and the speed limit established by the driving mode selected by the user via the user command. They are the typical characteristics of any of the commercial scooters such as the Mi Essential Scooter from Xiaomi, Electric Scooter from Sharp or similar.

Therefore, it will show many different aspects of the IC, including motor control, PWM, external sensors, analog comparators, digital logic, etc.

The expected inputs and outputs of the GreenPAK design: throttle input, brake input, user button input, motor output and brake light output.

GreenPAK HVPAK IC is a well suited, low-cost solution for implementing the entire controller. The IC can handle all the application requirements being also a low-cost solution and with a small footprint.

The System Design has been planned:



The file scooter_controller.hvp is included.
The functional components that need to be created using discrete GreenPAK internal components: Speed Monitoring with ACMPs, Logic control with counters and LUTs, Speed regulation with PWM Modules, Speed reference with PWM and Digital GPIOs, Motor interface with HV GPIOs.

Simulated conditions can be injected into the IC to analyze the functionalities. Different speed conditions and brake usage situations can be emulated to analyze the output control signals.

It will demonstrate how the IC can be applied to a big and growing market such as the electric mobility one. It can be used for urban mobility and for industrial mobility or robotic applications.