HC55181, HC55182, HC55183, HC55184 Automatic Battery Switch

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Introduction

The RSLIC18 family of ringing SLICs provides a feature set previously not available in this type of line interface circuit. Included in this feature set is an externally controlled integrated battery switching circuit which is intended for power management in dual battery line card designs. In applications where software overheads are critical or where battery switching requires timely intervention, an external automatic battery switch can be implemented as a solution.

Description

The Automatic Battery Switch, as shown in Figure 1, shows that the external battery switch consists of an adjustable current source connected between the high battery supply and the low battery supply pin of the RSLIC18.

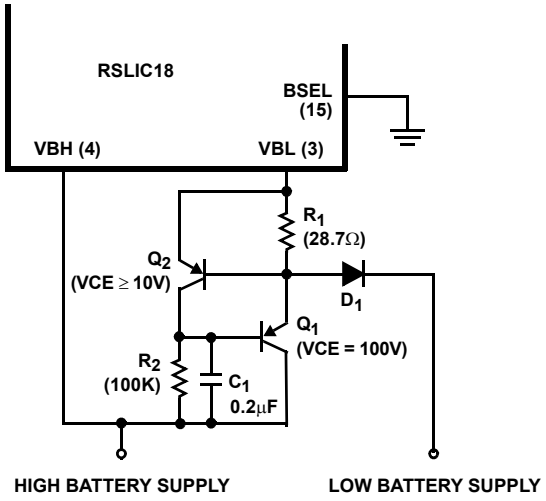

FIGURE 1. AUTOMATIC BATTERY SWITCH

The low battery supply is connected to the base of Q_2 through “stopper” diode D_1. With this configuration, the battery supply switching sequence is as follows:

ON HOOK: With the phone in the on hook condition, all current is supplied by the high battery supply through Q_1, R_1.

ON HOOK TO OFF HOOK: During this transition, the high voltage supply continues to supply all current until switch hook is detected. Once the phone is off hook, loop current plus some current to the SLIC is supplied by the low battery supply while the high battery supplies bias current for the switch. Should the loop resistance increase at this time due to feature rich customer premise equipment, the loop current will begin to decrease which will cause additional current to flow through Q_1 from the high battery supply. This action ensures that the predetermined loop current requirement will always be maintained.

DETERMINING R_1 and R_2: The current to the loop and the SLIC is set by R_1 with respect to the low battery supply. Therefore: REQUIRED LOOP CURRENT = Q_2 (VBE)/R_1. R_2 is a bias setting resistor and should be selected to limit the base current of Q_1 to less than 1mA. NOTE: Capacitor C_1 is used to prevent the possibility of oscillation. The current limit value of the automatic battery switch must always be set to a value less than the loop current limit of the RSLIC18.

The component values given in Figure 1 were determined (not limited to) using the following conditions: High Battery Voltage = -72V, Low Battery Voltage = -24V, ILIM = 20mA.

Conclusion

This external automatic battery switch provides a useful solution to the HC5518X integrated battery switch in applications where customer premise equipment features demand additional current during the on hook to off hook transition condition.

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