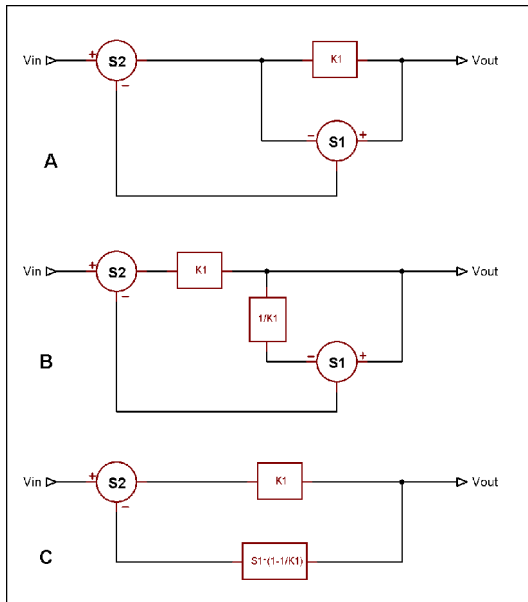


Allowed Hec summer gain at DC for loop gain < 1 (no DC latch-up).

The writer states that the summer gain(s) S1, S2 will never be exactly 1, and that, if either one (or their product) exceeds 1, the loop gain exceeds +1 and DC latch-up will result.



It appears that the summer gain $S1 \cdot S2$ can be as large as the reciprocal of $1 - K1$ before the loop gain gets to '1'.

As an example, if $K1 = 0.8$ (a relatively low gain ef), the summer gain can be $S1 \cdot S2 = 5$ before latch-up occurs.

In the limiting case where $K1$ would be 1, $S1 \cdot S2$ could even become infinite.

Let's get back to the basics. At the left we see the original Hec basic circuit and its transformation to a single feedback loop.

If we now calculate the loop gain for DC, we get, after some manipulation, $G_{loop} = S1 \cdot S2 \cdot (1 - K1)$.

To avoid DC latch-up we need to ensure that G_{loop} remains less than 1, that $S1 \cdot S2 \cdot (1 - K1) < 1$, or, $S1 \cdot S2 < 1 / (1 - K1)$ where $K1 \leq 1$.

So, what is the allowed magnitude of the summers gain versus $K1$ before reaching the critical '1' point? Let's draw a curve of $S1 \cdot S2 = 1 / (1 - K1)$ versus $K1$:

