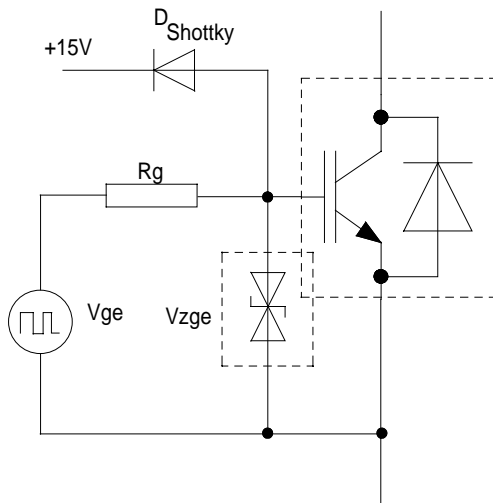


Clamping of V_{GE}

1) Suppressor zener diode clamping:



V_{zge} has to be chosen, so that following equations are fulfilled:

$$V_{zge} = V_z * (1 + \alpha_T * \Delta\vartheta_j) * (1 + T_V) \leq V_{GE, peak}$$

$$V_{ge, max} \leq V_z * (1 - T_V)$$

with:

V_z : nom. value for voltage of zener diode

$V_{GE, peak}$: recommendation for short – circuit appr. $\leq 17.5V$

$V_{ge, max}$: must be checked with respect to lower tolerance – band of V_{zge}

α_T : normalized temperature coefficient of zener diode

$\Delta\vartheta_j$: diode temperature rise from nom. temperature $25^\circ C$

T_V : tolerance of zener diode

recommended: Pr otek device 15KE16CA or 1N6044A

(both are bi – directional types)

$$\alpha_T: 8 * 10^{-4} K^{-1} \quad (12mV / K)$$

$$\Delta\vartheta_j: 50 K \quad (assumption)$$

$$T_V: 5\% \quad (type "A")$$

→

$$V_z (@ 75^\circ C, +5\%) = 17.53V \approx V_{GE, peak}$$

$$V_z (@ -25^\circ C, -5\%) = V_{zge, min} = 14.53V$$

V_z will be heated up, until $V_{zge} \geq V_{ge, max}$ e. g.:

$$V_z (@ 25^\circ C, -5\%) = 15.2V \geq V_{ge, max}$$

2) Shottky diode feedback:

A feedback to the 15V supply capacitor will clamp the gate voltage too. The effectiveness will depend on the stray inductance between gate and clamping capacitor.

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