2022/06/24

Dummy load for DC-DC converter

$0 \sim 1\omega\,\Omega$ resistance changable

$10 \rightarrow \quad \frac{1}{10} + \frac{1}{x} = \frac{10+x}{10x} \Rightarrow \frac{10x}{10+x} \qquad x > 10$

$\qquad\qquad\qquad \frac{1w}{20} = 5\Omega \qquad$ when $x = 10$

$\qquad\qquad\qquad \frac{2w}{30} = 6.6\Omega \qquad$ when $x = 20$

$1 \rightarrow \quad \frac{1}{1} + \frac{1}{60} = \frac{61}{60} = \frac{60}{61} \approx 1$

① Parallel with resistor (very small) ✗ → only can achieve < smaller resistance

Digital ~~tes~~ potentiometer ✗ 　　　　　　　　 Non-linear

　wiper resistance $\sim 60\,\Omega$

　& Cannot support such high power (high current $\sim 0 \sim 5A$)

　　　　　　　　　　　　　　(voltage $1 \sim 7V$)

② rheostat → can operate by a screw thread
(linear)

③ switching a ~~bank~~ bank of fixed resistors (ladder)

$1\Omega, 2\Omega, 3\Omega \quad 4\Omega \quad 5\Omega \quad 6\Omega \quad 7\Omega \quad 8\Omega \quad f\Omega \quad 10\Omega$

$15\Omega \quad 20\Omega \quad 25\Omega \quad 30\Omega \quad 40\Omega \quad 50\Omega \quad 60\Omega$

, 1.6 , 2 , 2.2 , 3.

But pure resistors — 0.25W max power go through. (problem)

Switch — MOSFET — V_{ds} — Consume some voltage along the circuit.

MPF100 TO-247 Power Film Resistor

$0.05\,\Omega$	100W Continuous power at 25°C temp	$\frac{3}{80}$
$0.1\,\Omega$	With heat sink	$4\frac{1}{5}$
$0.12\,\Omega$		$\frac{150}{6^{\prime\prime}}$
$0.15\,\Omega$		
$\vdots$		