

## Quasi-Resonant Switching Power Supply using FA5541

Table of component models use in the DesignKit

| Code       | Classification                    | Part No.      | Manufacturer  | SPEC                        |
|------------|-----------------------------------|---------------|---------------|-----------------------------|
| IC1        | Switching power supply control IC | FA5541/42     | Fuji Electric |                             |
| PC1        | Photocoupler                      | TLP281        | TOSHIBA       |                             |
| SR1        | Shunt regulator                   | TA76432F      | TOSHIBA       | VREF = 1.26 V               |
| M1         | Power MOSFET                      | 2SK3681-01    | Fuji Electric | $V_{DSS}=600V, I_D=43A$     |
| DBR1       | Bridge Diode                      | D3SB80        | SHINDENGEN    | 800V, 4A,<br>$I_{FSM}=120A$ |
| D1         | Diode                             | ERA38-06      | Fuji Electric | 600V, 0.5A                  |
| D2         |                                   | ERA22-02      | Fuji Electric | 200V, 0.5A                  |
| D3,D4      |                                   | D1NL20U       | SHINDENGEN    | 200V, 1A                    |
| D21,D22    | Schottky barrier diode            | YG865C15R     | Fuji Electric | 150V, 20A                   |
| C7         | Aluminum Electrolytic Capacitor   | PEG124HG410AQ | ELFA          | 1000uF ,25V                 |
| C4, C5, C6 |                                   | PEG124HJ433BQ | ELFA          | 3300uF ,25V                 |

Simulation files are stored in folders, as shown in list below.

**Simulations**

**Folder name**

- |   |           |
|---|-----------|
| 1. Start-up sequence simulation.....                    | Startup   |
| 2. Quasi-Resonant Switching Power Supply Waveforms..... | Waveforms |
| 3. Step-load response.....                              | Stepload  |
| 4. Power switch devices (M1 and SBD losses).....        | Losses    |
| 5. Variable design parameters ( $L_{leak}$ and C2)..... | Params    |

※ Please copy the folder named “Simulations” to your PC. Library files (.lib) are added already.

**Design document: Quasi-Resonant Switching Power Supply using FA5541**

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1. Quasi-Resonant Switching Power Supply 19V/5A
  - 1.1 Output voltage
  - 1.2 Output current
  - 1.3 Output ripple voltage
  - 1.4 Step-load response
2. Basic operation of switching power supply using FA5541
3. Start-up sequence simulation
4. Bridge diode peak current at start-up
5. Transformer
6. Transformer leakage inductance
7. RCD Clamping network
8. Power MOSFET switching device
9. Schottky barrier diode D21 and D22 waveforms
10. Photocoupler