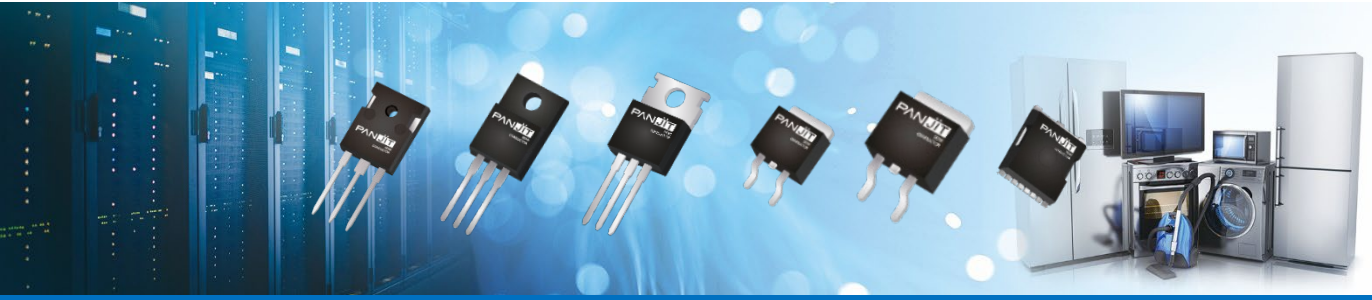


Power Supply Unit (PSU)

Super Junction MOSFETs:
Optimal Efficiency and Reliability for High-Power Systems



Power Supply Units (PSU) are power conversion systems widely used in commercial and industrial applications, including AC-DC and DC-DC converters. PANJIT's Super Junction (SJ) MOSFETs offer an exceptional option for PSU systems, various DC-DC converter topologies, and Power Factor Correction (PFC) circuits due to their features that facilitate easy and efficient design solutions. Additionally, a key feature of PANJIT SJ MOSFETs is their excellent di/dt ruggedness of the body diode and optimized switching performance, which together enhance EMI performance. Beyond their outstanding performance, PANJIT SJ MOSFETs provide engineers and R&D developers with benefits such as extended lifespan and simplified design.

► Features

- Robustness of body diode
- Good EMI performance
- High efficiency
- High quality
- Low FOM

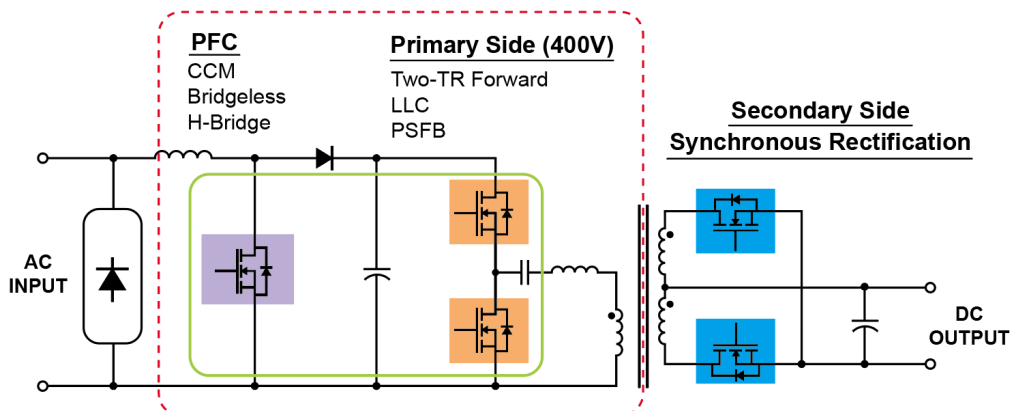
► Applications

- Telecommunications
- Server data centers
- PC power supplies
- Home appliances
- Gaming adapters
- PD chargers

► Super Junction MOSFETs for PSU Block Circuit

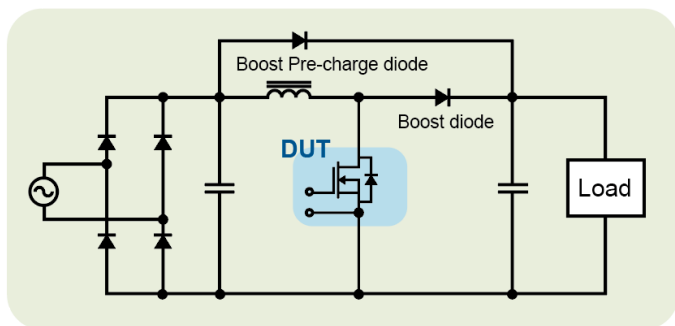
- PFC circuit for AC/DC converter
- Primary side switching for DC/DC converter

► PSU Block Diagram

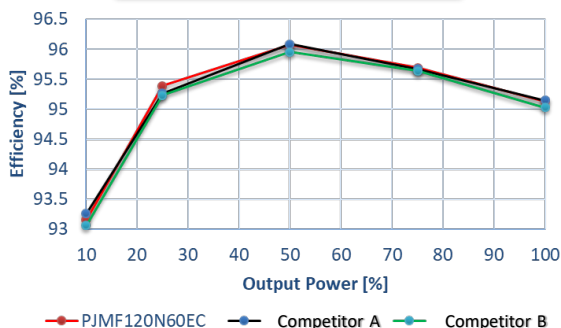


System Evaluation

(600 W CCM PFC, $V_{IN} = 110 \text{ Vac}/60 \text{ Hz}$, $V_{OUT} = 400 \text{ V}$, $F_{SW} = 65 \text{ kHz}$ with voltage spike $< (BV \cdot 80\%)$)



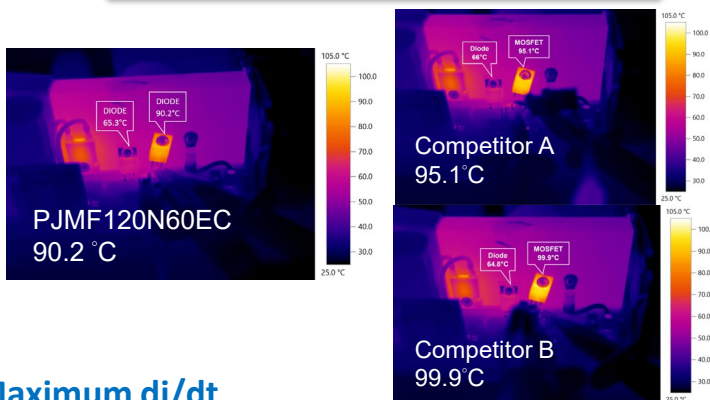
Efficiency @ Output Power



Test Parameters

| Parameters | Specification |
|----------------------|-----------------------------|
| Input Voltage | 110 VAC / 60 Hz |
| Output Voltage | 400 VDC |
| Max. Power | 750 W |
| Switching Frequency | 65 kHz |
| Heatsink Temperature | 45°C (Cooling & Heating) |
| Ambient Temperature | 25°C |

Junction Temperature @ Full Load Operation



Robustness Capability of Body Diode Maximum di/dt

Body diode di/dt test @ $I_F = 10 \text{ A}$

| Part Numbers | 500 A/us | 600 A/us | 700 A/us | 800 A/us | 900 A/us | 1000 A/us |
|--------------|----------|----------|----------|----------|----------|-----------|
| PJMF120N60EC | PASS | PASS | PASS | PASS | PASS | PASS |
| Competitor A | PASS | Fail | - | - | - | - |
| Competitor B | PASS | PASS | PASS | PASS | PASS | PASS |

Products

* Under Development

| Series | BV | $R_{DS(on)}$ | | | | | | |
|-------------------|-----|--------------|----------------|---------------|---------------|---------------|----------------|----------------|
| | (V) | (mΩ) | TO-247 | ITO-220AB-F | TO-220AB-L | TO-252AA | TO-263 | TOLLK |
| SJ MOSFET 600V | 600 | 42 | PJMH042N60FRC | | | | | |
| | | 74 | PJMH074N60FRCH | | | | | |
| | | 99 | PJMH099N60EC | PJMF099N60EC | PJMP099N60EC | | | |
| | | 105 | PJMH105N60FRC | PJMF105N60FRC | PJMP105N60FRC | | PJMB105N60FRC | |
| | | 120 | PJMH120N60EC | PJMF120N60EC | PJMP120N60EC | | | |
| | | 125 | PJMH125N60FRC | PJMF125N60FRC | PJMP125N60FRC | | PJMB125N60FRC | |
| SJ MOSFET 650V | 650 | 60 | PJMH060N65FR2 | PJMF060N65FR2 | PJMP060N65FR2 | | PJMB060N65FR2* | PJMN060N65FR2* |
| | | 75 | PJMH080N65FR2 | PJMF080N65FR2 | PJMP080N65FR2 | | PJMB080N65FR2* | PJMN080N65FR2* |
| | | 130 | | PJMF130N65EC | PJMP130N65EC | | PJMB130N65EC | |
| | | 180 | PJMH190N65FR2 | PJMF190N65FR2 | PJMP190N65FR2 | PJMD190N65FR2 | PJMB190N65FR2* | PJMN190N65FR2* |
| | | 210 | | PJMF210N65EC | PJMP210N65EC | | PJMB210N65EC | |
| | | 390 | | PJMF390N65EC | PJMP390N65EC | PJMD390N65EC | PJMB390N65EC | |
| | | 990 | | PJMF990N65EC | PJMP990N65EC | PJMD990N65EC | | |