

Power Supply Unit (PSU)

Super Junction MOSFETs:

Optimal Efficiency and Reliability for High-Power Systems



Power Supply Units (PSUs) are power conversion systems widely used in commercial and industrial applications, including AC-DC and DC-DC converters. PANJIT's Super Junction (SJ) MOSFETs are an excellent choice for PSU systems, various DC-DC converter topologies, and Power Factor Correction (PFC) circuits, thanks to features that enable easy and efficient design. In addition, PANJIT SJ MOSFETs feature excellent body-diode di/dt ruggedness and optimized switching performance, which together help improve EMI performance. Beyond their strong electrical characteristics, PANJIT SJ MOSFETs offer engineers and R&D teams benefits such as extended product lifespan and simplified system design.

► Key Features

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

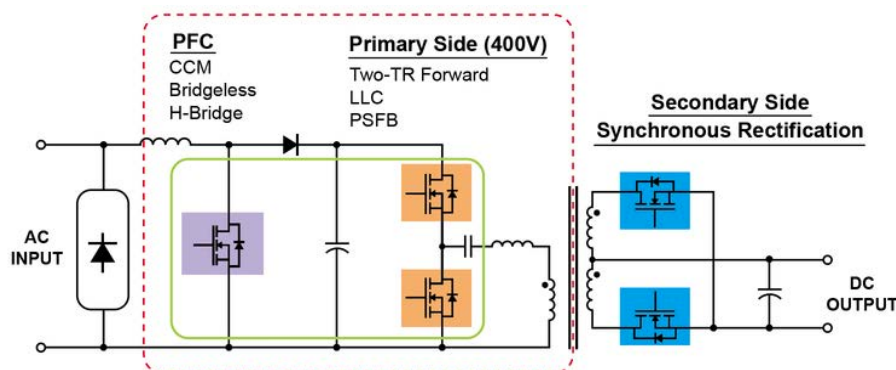
► Target Applications

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

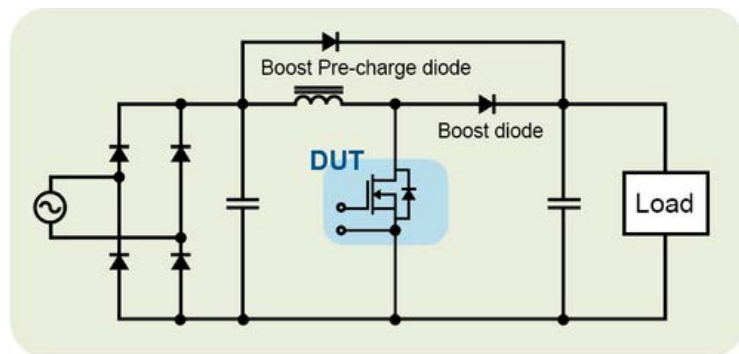
► Super Junction MOSFETs for PSU Block Circuit

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

► PSU Block Diagram



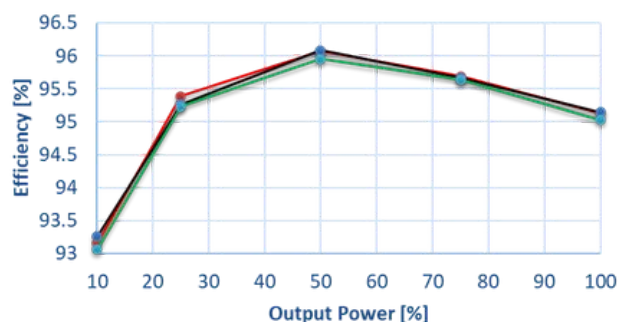
System Evaluation (600 W CCM PFC, $V_{IN} = 110 \text{ Vac}/60 \text{ Hz}$, $V_{OUT} = 400 \text{ V}$, $FSW = 65 \text{ kHz}$ with voltage spike $< (BV \cdot 80\%)$)



Test Parameters

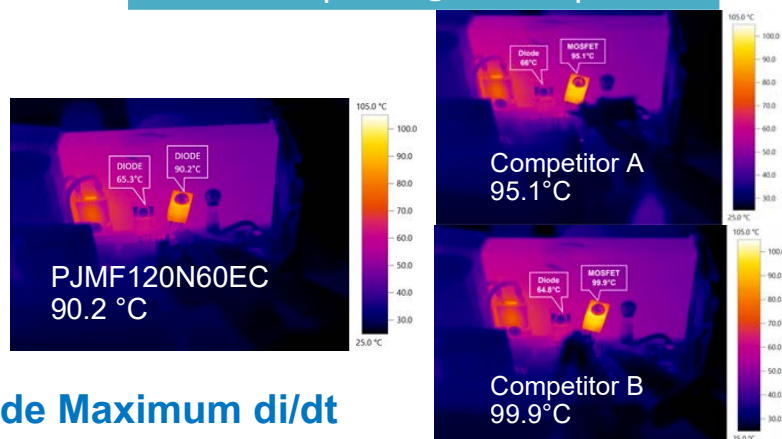
Parameters	Specification
Input Voltage	110 VAC / 60 Hz
Output Voltage	400 VDC
Max. Power	750 W
Switching Frequency	65 kHz
Heatsink Temperature	45°C (Cooling & Heating)
Ambient Temperature	25°C

Efficiency @ Output Power



— PJMF120N60EC — Competitor A — Competitor B

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

Series	BV	$R_{DS(ON)}$ Max.	TO-247AD-3LD	ITO-220AB-F	TO-220AB-L	TO-252AA	TOLLK
	V	mΩ					
SJ MOSFET 600 V	600	42	PJMH042N60FRC				
		74	PJMH074N60FRCH				
		99	PJMH099N60EC	PJMF099N60EC	PJMP099N60EC		
		105	PJMH105N60FRC	PJMF105N60FRC	PJMP105N60FRC		
		120	PJMH120N60EC	PJMF120N60EC	PJMP120N60EC		
		125	PJMH125N60FRC	PJMF125N60FRC	PJMP125N60FRC		
SJ MOSFET 650 V	650	60	PJMH060N65FR2	PJMF060N65FR2	PJMP060N65FR2		PJMN060N65FR2
		75	PJMH080N65FR2	PJMF080N65FR2	PJMP080N65FR2		PJMN080N65FR2
		130		PJMF130N65EC	PJMP130N65EC		
		180	PJMH190N65FR2	PJMF190N65FR2	PJMP190N65FR2	PJMD190N65FR2	
		210		PJMF210N65EC	PJMP210N65EC		
		390		PJMF390N65EC	PJMP390N65EC	PJMD390N65EC	
		990		PJMF990N65EC	PJMP990N65EC	PJMD990N65EC	