Reference Design RD-325

Fairchild PFM Controller FAN7621 - 384W Design

Featured Device	Application	Input Voltage Range	Output Voltage (Rated Current)	Rated Output Power	Topology
FAN7621 FEP16FT/FET16FTA FEP16BT/FET16BTA FCPF11N60	PDP TV	340~400V_{DC}	210V /1.4A 60V / 1.5A	384W	LLC Resonant Half-Bridge Converter

Key Features

FAN7621

- Variable Frequency Control with 50% Duty Cycle for Half-Bridge Resonant Converter Topology
- High Efficiency through Zero Voltage Switching (ZVS)
- Fixed Dead Time: 350ns
- Up to 300kHz Operating Frequency
- Pulse Skipping for Frequency Limit (Programmable) at Light-Load Condition
- Remote On/Off Control Using Control Pin
- Various Protection Functions: Over-Voltage Protection (OVP), Overload Protection (OLP), Over-Current Protection (OCP), Abnormal Over-Current Protection (AOCP), and Internal Thermal Shutdown (TSD)

FEP16FT

- 300V/16A Ultra-Fast Recovery Rectifier, Common Cathode
- Low Forward-Voltage Drop: 1.3V at T_A = 25°C, 8A

FEP16FTA

- 300V/16A Ultra-Fast Recovery Rectifier, Common Anode
- Low Forward-Voltage Drop: 1.3V at T_A = 25°C, 8A

FEP16BT

- 100V/16A Ultra-Fast Recovery Rectifier, Common Cathode
- Low Forward-Voltage Drop: 0.95V at T_A = 25°C, 8A

FEP16BTA

- 100V/16A Ultra-Fast Recovery Rectifier, Common Anode
- Low Forward-Voltage Drop: 0.95V at T_A = 25°C, 8A

FCPF11N60

- 600V/11A SuperFET™
- Low Gate Charge: Typical: 40°C
- Low $R_{DS,ON}$: 0.38Ω Max. at T_A 25°C

1. Schematic

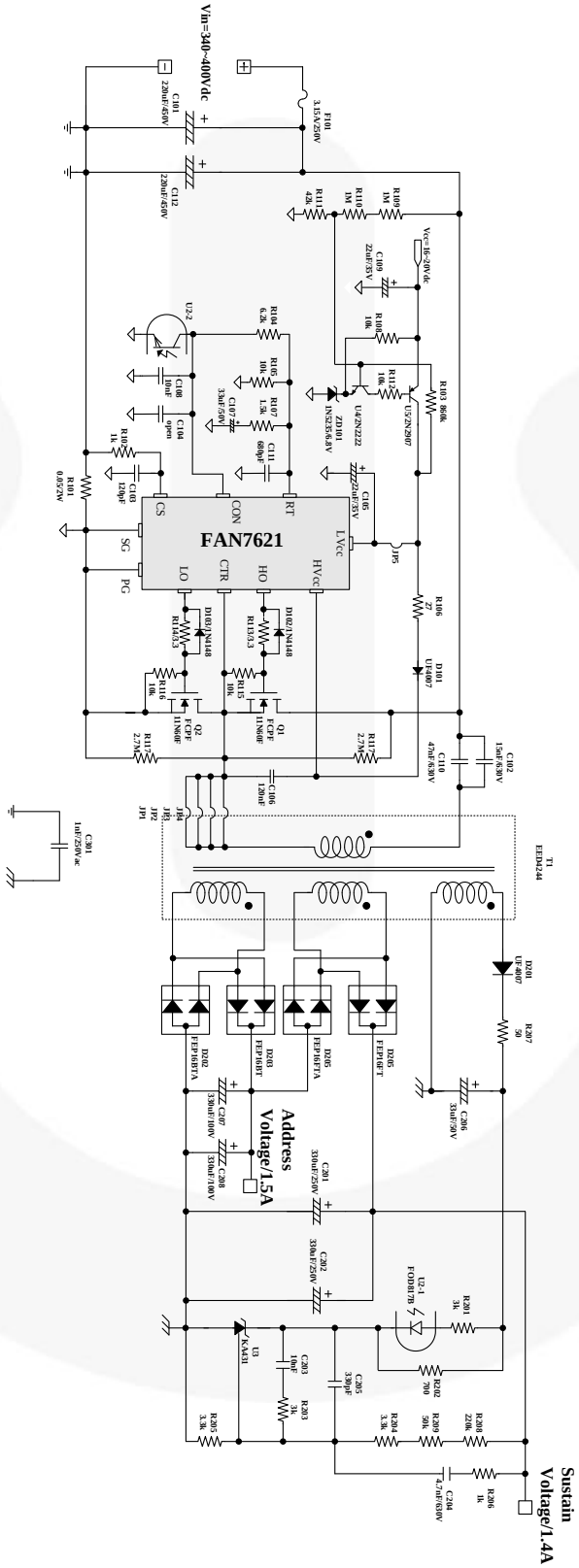
Vin=340~400Vdc
FAN7621
CS
CON
RT
SG
LVCC
PG
LO
CTR
HO
HVCC
Address Voltage/1.5A
Sustain Voltage/1.4A
T1
EER4244

Figure 1. Schematic

2. Transformer

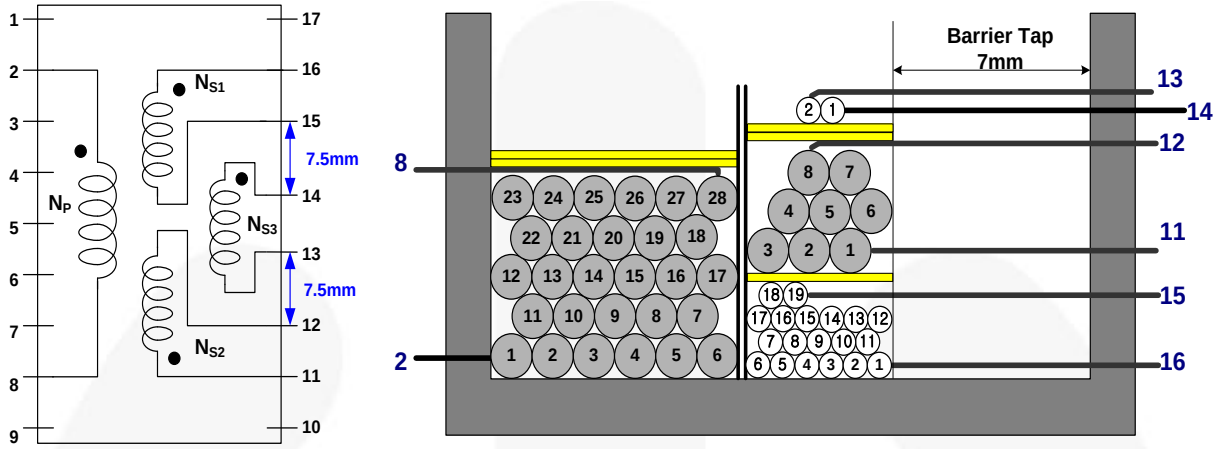

Figure 2. Transformer Schematic Diagram

2.1. Winding Specification

	Pin (S → F)	Wire	Turns	Winding Method
N_{S3}	14 → 13	0.12φ×25 (Litz Wire)	2	Solenoid
N_{s2}	11 → 12	0.08φ×126 (Litz Wire)	8	Solenoid
N_{s1}	16 → 15	0.12φ×25 (Litz Wire)	19	Solenoid
N_P	2 → 8	0.08φ×126 (Litz Wire)	28	Solenoid

Core: EED4244D (Ae=158 mm2)
Bobbin: EED4244D (Horizontal, 17Pins, 9/8 pins at each side)

2.2. Electrical Characteristics

	Pin	Specification	Remark
Primary-Side Inductance (L_p)	2 – 8	240μH ± 5%	100kHz, 1V, All Other Pins Open
Primary-Side Effective Leakage Inductance (L_r)	2 – 8	40μH ± 10%	All Other Pins Shorted

3. Typical Characteristics

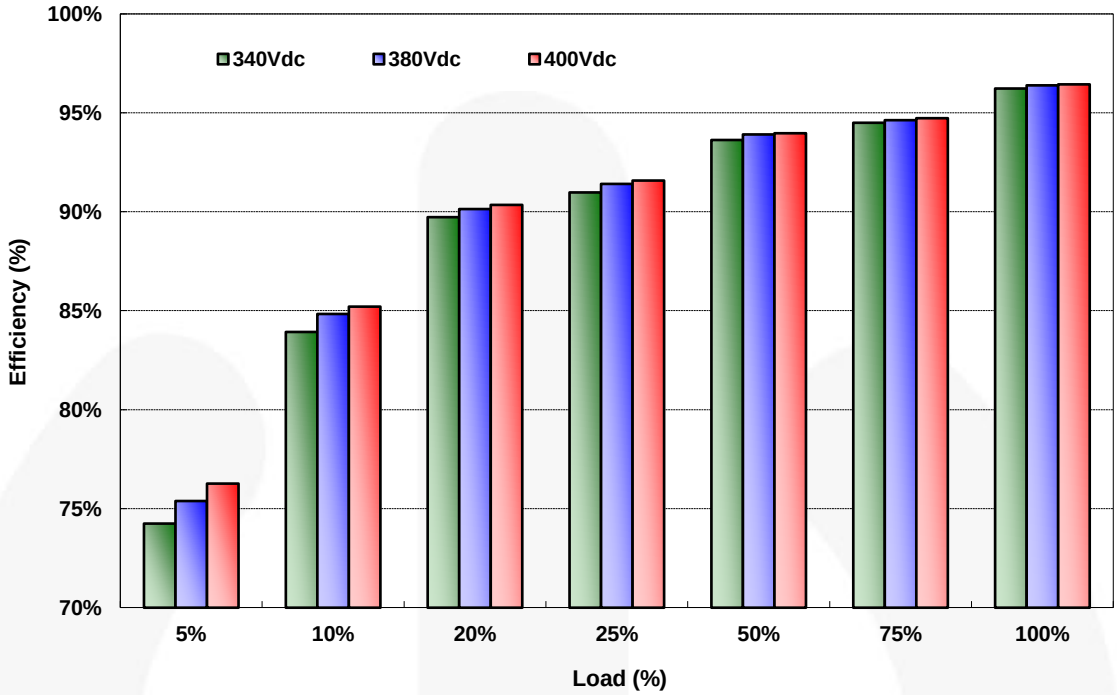

Figure 3. Efficiency

4. Related Resources

FAN7621 — PFM Controller for Half-Bridge Resonant Converters

AN-4151 — Half-Bridge LLC Replacement Converter Design Using FSFR-Series Fairchild Power Switches (FPS™)