TU425

425W Single Output
Test and Measurement/Industrial Series



Features

- 3.3” x 6.2” x 1.62” Package
- Up to 425W of Air-Cooled Power, 300W Convection
- Universal Input 90-264Vac Input Range
- 5V at 2A Isolated Standby Output
- Isolated 12V Fan Output
- Inhibit, Power Fail, DC OK Signals, Remote Sense
- Approved to CSA/EN/IEC/UL60950-1, 2nd Edition
- Compliant to high levels of EMC per EN61000-4
- Meets Class B Conducted EMI with 6db margin, Class A Radiated EMI with 3db margin
- Efficiency 90% typical
- 3 Year Warranty

Description

A Superior performance 425 Watts AC to DC power supply designed for Test and Measurement and Industrial applications. Feature rich and highly efficient TU425 product family with active current share for redundant applications can easily fit in 1U chassis and provides 300 Watts for convection or 425 Watts with moving air. Input & output monitoring alarms plus isolated 12V/1A fan output and 5V/2A standby voltage are among other standard offering of TU425 family. All models are CE marked to low voltage directive and approved to ITE standards of IEC/UL/EN60950 and CSA C22.2, 2nd edition.

Model Selection

Model Number	Volts	Output Current w/200LFM air[1]	Output Current Convection[2]	Efficiency[3] (Main Output)	Ripple & Noise[4] (mV pk-pk)	Total Regulation	OVP Threshold	MTBF[7]
TU425S12E	12V 5Vsb 12V Fan[5]	32.2A 2.0A 1.0A	22.0A 2.0A 0.5A	88%	120mV 100mV 360mV	±3% ±5% ±10%	14.0 ± 1.1V 5.5V – 8.0V N/A	389,750
TU425S18E	18V 5Vsb 12V Fan[5]	21.4A 2.0A 1.0A	14.6A 2.0A 0.5A	88%	180mV 100mV 360mV	±3% ±5% ±10%	21.0 ± 2.0V 5.5V – 8.0V N/A	356,330
TU425S24E	24V 5Vsb 12V Fan[5]	16.8A 2.0A 1.0A	11.9A 2.0A 0.5A	90%	240mV 100mV 360mV	±3% ±5% ±10%	28.0 ± 2.5V 5.5V – 8.0V N/A	355,520
TU425S48E	48V 5Vsb 12V Fan[5]	8.4A 2.0A 1.0A	5.9A 2.0A 0.5A	90%	480mV 100mV 360mV	±3% ±5% ±10%	55.0 ± 4.0V 5.5V – 8.0V N/A	354,722
TU425S56E	56V[3] 5Vsb 12V Fan[5]	7.2A 2.0A 1.0A	5.1A 2.0A 0.5A	90%	560mV 100mV 360mV	±3% ±5% ±10%	63.0 ± 4.0V 5.5V – 8.0V N/A	354,560

Notes:

1. Total power with 200lfm of forced air cooling is 425W (385W for 12V model) including 12V/1A for Fan output and 5V/2A standby.
2. Maximum convection cooled power is limited to 280W for 12V model and 300W for other models. This includes 12V/0.5A fan output and 5V/2A standby output.
3. Efficiency values listed are typical and are measured at 115Vac input, full load output current, at an ambient temperature of 25°C.
4. Measured at 25°C ambient with noise probe directly at end of 6” twisted pair terminated with 0.1µF ceramic and 10µF low ESR capacitors. Values will be higher at ambient temperatures below 0°C.
5. Fan Output: If the load on this output is other than a fan, a short circuit condition on this output can only be remedied by removing both the cause of the short circuit and the load. This will allow the output to resume normal operation.
6. No output adjustment for 56V model.
7. MTBF values are in hours, per Telcordia 332, Issue 6, 25°C, full rated load (w/airflow) at 110Vac input.

General Specifications

AC Input	100-240Vac, ±10%, 47-63Hz, 1∅ 120–300Vdc (external fuse required for DC input)	**Turn On Time** (Main Output)	Main output: <1 sec. max @115Vac, rise time 30mS max. 5Vsb turn-on time is 500mS max., rise time 50mS max. Output Voltage rise is monotonic.
Input Current	115Vac: 5.2A, 230Vac: 2.5A	**Hold-up Time**	Main Output: >20ms for 300W @ 120Vac/60 Hz, >16ms for 383W (90% of 425W) @ 120v/60Hz. 5Vsb Output: >500mS
Inrush Current	264Vac, cold start: will not exceed 40Arms within ½ cycle. $I^2T = 25A^2/Sec$ maximum	**Overtemperature Protection**	Sensing transformer temperature, 135°C (55°C ambient temperature at full load), auto recovery.
Input Fuses	F1, F2: 6.3A, 250Vac	**Overload Protection**	130 to 170% of rating, Hiccup Mode, auto recovery.
Earth Leakage Current	<750µA@264Vac, 60Hz, NC <1.5mA@264Vac, 60Hz, SFC	**Short Circuit Protection**	Main Output & 5Vsb: Cycling type, auto recovery. Fan Output: recovery only after removal of short and load. See note 5 on page 1.
Power Factor	>0.99 @ 115Vac, Full Load >0.95 @ 230Vac, Full Load	**Overvoltage Protection**	OVP latch, see chart for trip ranges. 5V standby output (latch), see chart for trip range.
Efficiency	See Model Selection Chart on page 1.	**Switching Frequency**	75kHz, typical
Output Power	425W continuous, with 200 lfm airflow 300W convection cooled – See chart for specific voltage model ratings.	**Isolation**	Input-Output: 4000Vac Input-Ground: 1800Vac Output-Ground: 1500Vdc
Transient Response	50% load step, $\Delta i/\Delta t$: <0.2A/µS. Max Voltage Deviation = 5%. Recover to within 1% of nominal within 500µS	**Operating Temperature**	-10 to 70°C. Starts up at -40°C. The unit will meet all published specifications after a warm-up period. See Application Note for operating conditions during start-up.
Ripple and Noise	0.5%rms, 1% pk-pk, see Model Selection Chart on page 1.	**Temperature Derating**	Derate output power linearly above 50°C to 50% at 70°C
Common Mode Noise	Line Frequency: <2.5Vrms @115Vac, <5Vrms@ 230Vac, 50/60Hz. See App Note for test set-up and typical graphs. For high frequency noise, consult the factory.	**Storage Temperature**	-40°C to +85°C
Output Voltage	See chart on page 1. Initial setpoint within 0.5% of nominal. Adjustable +/-5% from nominal (except 56V)	**Altitude**	Operating: up to 5000m (derating may be required above 3000m, consult factory) Non-operating: -500 to 40,000 ft.
Minimum Load	Not required for main output or 5Vsb. Fan Output: 0.5A min required on the main output in order for the 12V Fan output to be within regulation.	**Relative Humidity**	5% to 95%, non-condensing
Total Regulation	See Model Selection Chart on page 1.	**Shock**	Operating: Half-sine, 20gpk, 10ms, 3 axes, 6 shocks total Non-Operating: Half-sine, 40 gpk, 10 ms, 3 axes, 6 shocks total
Vibration	Operating: 0.003g/Hz, 1.5grms overall, 3 axes, 10 min/axis Non-Operating: 0.026g2/Hz, 5.0grms overall, 3 axes, 1 hr/axis	**Safety Standards**	EN/CSA/UL/IEC 60950-1, 2nd Edition
Dimensions	W: 3.3" x L: 6.2" x H: 1.62" W: 84mm x L: 157.5mm x H: 41mm	**MTBF**	See Model Selection Chart on page 1.
Weight	670g	**E-Cap Life**	7 years, based on typical operation of 12 hours/day, 261 days/year at 40°C ambient temp.

Auxiliary Signals

DC OK:	Goes HIGH when main DC output is above 90% of nominal voltage and goes LOW when the output is below 90% of rated main output DC voltage	**Power Good/ Power Fail:**	Signal is high within 500mS after the main output is within regulation band upon AC turn on. Goes low with 4 mS min. before the main DC output drops below 90% of nominal value when AC turns off.
Inhibit:	Logic HIGH or open = ON Logic LOW or short to ground = OFF	**Fan Output:**	12V @ 1 A (air cooled) or 0.5A (convection), +/-10% regulation for load change of 0.5A to FL on the main output.
Remote Sense:	Compensates for up to 0.5V voltage drop for 48V & 56V models, and 0.16V voltage drop for 12V & 24V models. Maximum deviation of 5% (main output) any 50% step above 5% load.	**Current Share[1]:**	Active single wire, up to 4 supplies in parallel. Paralleled output voltages must be set to within 0.5% of each other. Contact Factory for details on the required set-up for proper operation.
5V Standby Output:	5V @ 2A, +/-5% regulation over all changes in main output load current.	**Current Share Accuracy[1]:**	5% when the load current is ≥50% of the total available load current, 10% when the load current is between 25% - 49% of the total available load current. Remote sense lines must be connected to ensure accuracy.

Notes: 1. Consult Factory for proper set-up for current sharing operation.

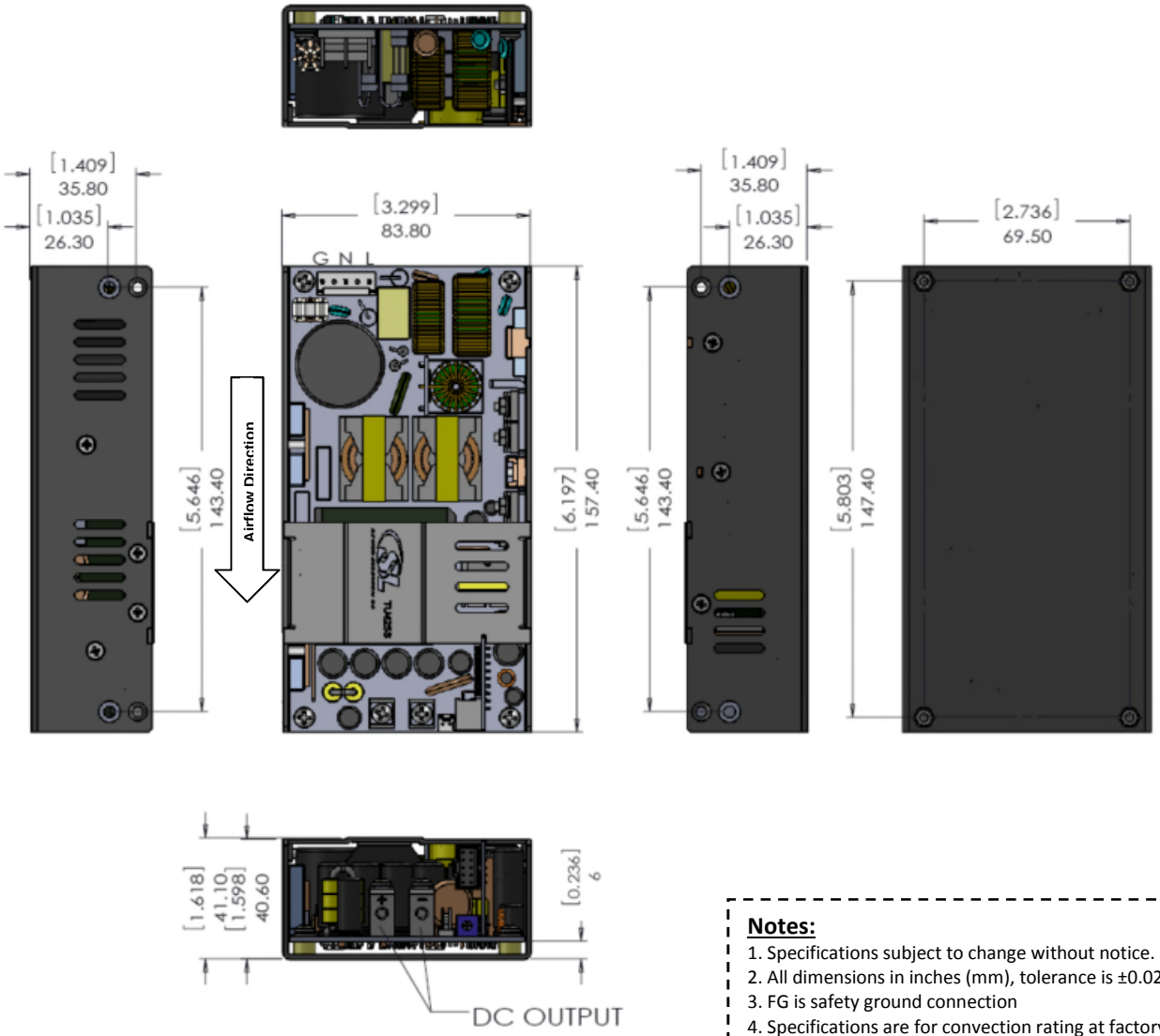
EMI/EMC Compliance

Conducted Emissions	EN55011/CISPR22 Class B, FCC Part 15.107, Class B, 6db margin, typical.
Radiated Emissions	EN55011/CISPR22 Class A, FCC Part 15.109, Class A, 3db margin, typical.
Static Discharge Immunity	EN55024/IEC61000-4-2, Level 4, 8kV Contact Discharge, 15kV air discharge, Criteria A
Radiated RF Immunity	EN55022/IEC61000-4-3, Level 2, 3V/m, Criteria A
EFT/Burst Immunity	EN55024/IEC61000-4-4, Level 3, 2kV (PS Output), 1kV (signal outputs), Criteria A
Line Surge Immunity	EN55024/IEC61000-4-5, Level 3, 1kV diff., 2kV common-mode, Criteria A Level 4, 2kV diff., 4kV Common-mode, Criteria C
Conducted RF Immunity	EN55022/IEC61000-4-6, Level 3, 10V/m, Criteria A
Power Frequency Magnetic Field Immunity	EN55024/IEC61000-4-8, Level 3, 10A/m, Criteria A
Voltage Dip Immunity	EN55024/IEC61000-4-11, Dips: 100%, 10ms; 30%, 500ms; 60%, 100ms; Interruptions: 100%, 5000mS; Performance Criteria A, A, B & B
Line Harmonic Emissions	EN55024/IEC61000-3-2, Class A, C & D at full load (425W output).
Flicker Test	EN55024/IEC61000-3-3, Section 5

Connector Information

Input Connector J101	Main DC Output J302, J303	Fan Output J301	Signal Connector J401
PIN 1) FG PIN 2) NC PIN 3) AC Neutral PIN 4) NC PIN 5) AC Line	Term 1 – J302: (+V) Term 2 – J303: (–V)	PIN 1) 12V Fan (+) PIN 2) 12V Fan (–)	PIN 1) Remote Sense (+) Pin 6) Power Good PIN 2) Common Pin 7) +5Vsb Output PIN 3) Remote Sense (–) Pin 8) +5Vsb Output PIN 4) Current Sharing Pin 9) DC OK PIN 5) Remote Inhibit Pin 10) Common
Mating Connector: Tyco/AMP 640250-5 Pins: 3-770476-1	Mating Connector: Molex 19141-0058 19141-0063 19141-0083	Mating Connector: Tyco AMP 1375820-2 Pins: 1375819-1	Mating Connector: Molex 90142-0010 Pins: 90119-2110

Mechanical Drawing



Notes:

1. Specifications subject to change without notice.
2. All dimensions in inches (mm), tolerance is ±0.02”.(±0.5).
3. FG is safety ground connection
4. Specifications are for convection rating at factory settings at 115 Vac input 25 °C unless otherwise stated.
5. Warranty: 3 years.

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