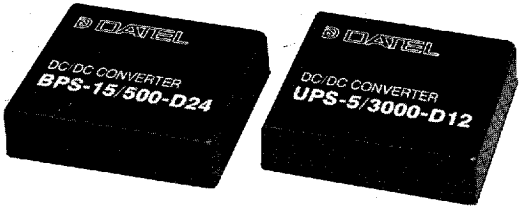
Wide Input Range,
15/25/30 Watt, Single, Dual, Triple Output DC-DC Power Converters

T-57-11

FEATURES

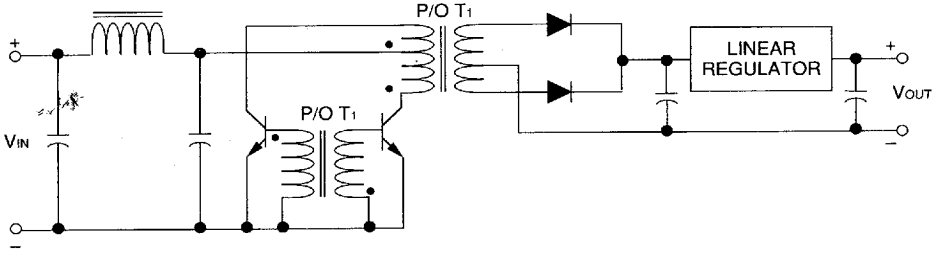
- Wide input ranges; 9 - 18V dc, 18 - 36V dc
- State-of-the-Art Thermal Management Technologies
- Internal input/output filtering
- Short circuit protection
- 100 KHz switching frequencies
- Six-sided shield for EMI/RFI protection
- Remote ON/OFF control
- Available in +5V, ±12V, ±15V outputs
- Delivery from stock



GENERAL DESCRIPTION

These mid and high power dc-to-dc power converters feature wide ranging inputs for general applicability across a board spectrum of applications. Featuring switching frequencies to 100 KHz and operating efficiencies of 84% (typical), their very low thermal rise and temperature coefficient of ±0.02% per °C (maximum) results in trouble-free operation for prolonged periods. Their very wide input ranges are ideal for battery powered applications found in automotive, aerospace, marine, and telecommunication applications.

All models feature remote ON/OFF control capability, input to output isolation of 500V dc (minimum), short circuit protection, and six-sided continuous shielding for EMI/RFI protection. A Pi network input filter, reverse voltage protection (via shunt diode), overvoltage protection on all ranges, and external trimming capability (±10%) are ideal for sensitive circuitry requiring a semi-custom output voltage. Output ripple is a low 10 mV (RMS, maximum) with output voltage accuracy of ±1% (depending upon model). Remote ON/OFF logic compatibility is CMOS (or Open Controller TTL) with "ON" levels of +5.5V dc or OPEN circuit) and "OFF" level of 1.8V dc. Shutdown idle current is 5 mA and input resistance of ON/OFF control pin is 100 Kohms (0 to 9V dc). The 15 Watt converter modules measure 2.56" x 3.0" x 0.83" while the 25 and 30 Watt converters are 4.56" x 2.56" x 0.83". All converters are easily PC board mountable.



APPLICATIONS

- Telecommunications Equipment
- Local Power Distribution Systems
- PC Board Subsystems
- Portable/Mobile/Battery Operated Instrumentation
- Field Use Equipment
- Portable Computer and Computer Controlled Equipment
- Automotive/Avionics/Marine Systems and Equipment

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SPECIFICATIONS

	SINGLE OUTPUT MODELS			
	UPS-5/3000-D12	UPS-5/3000-D24	UPS-5/5000-D12	UPS-5/5000-D24
Output Voltage	+5V	+5V	+5V	+5V
Output Current	+3000 mA	+3000 mA	+5000 mA	+5000 mA
Input Voltage (Nominal)	12V	24V	12V	24V
Input Voltage Tolerance	9 — 18V	18 — 36V	9 — 18V	18 — 36V
No Load Input Current, max.	30 mA	20 mA	30 mA	20 mA
Full Load Input Current, max.	1700 mA	810 mA	2800 mA	1350 mA
Line Regulation, max.	±0.2%	±0.2%	±0.2%	±0.2%
Load Regulation, max.	±1%	±1%	±1%	±1%
Temperature Coefficient	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C
Case Configuration	X	X	Z	Z

	SINGLE OUTPUT MODELS			
	UPS-12/1250-D12	UPS-12/1250-D24	UPS-12/2500-D12	UPS-12/2500-D24
Output Voltage	+12V	+12V	+12V	+12V
Output Current	+1250 mA	+1250 mA	+2500 mA	+2500 mA
Input Voltage (Nominal)	12V	24V	12V	24V
Input Voltage Tolerance	9 - 18V	18 - 36V	9 - 18V	18 - 36V
No Load Input Current, max.	30 mA	20 mA	30 mA	20 mA
Full Load Input Current, max.	1600 mA	780 mA	3200 mA	1550 mA
Line Regulation, max.	±0.2%	±0.2%	±0.2%	±0.2%
Load Regulation, max.	±1%	±1%	±1%	±1%
Temperature Coefficient	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C
Case Configuration	X	X	Z	Z

SPECIFICATIONS (Single Outputs)

All specifications typical at nominal line, full load, and 25 °C unless otherwise noted.

INPUT SPECIFICATIONS

Input Range ..... 12V (9 — 18V)
24V (18 — 36V)
Input Filter ..... PI Type
Reverse Voltage Protection ..... Internal Shunt Diode

OUTPUT SPECIFICATIONS

Voltage Accuracy
Single Output, maximum ..... ±1%
External Trim Adjustment Range ..... ±10%
Ripple and Noise (20 MHz BW) ..... 10 mV RMS
(75 mV pk-pk, maximum)
Temperature Coefficient, maximum ..... ±0.02% per °C
Short Circuit Protection ..... Indefinite
Overvoltage Protection
5V, typical 6.8V
12V, typical 15V
Line Regulation
Single, maximum ..... ±0.2%
Load Regulation
Single, maximum ..... ±1%

GENERAL SPECIFICATIONS

Efficiency
Minimum 75%
Typical 84%
Isolation Voltage, minimum ..... 500V dc
Isolation Resistance ..... 10 Megohms
Switching Frequency ..... 100 KHz
Case Grounding ..... Capacitively coupled to input
Operating Temperature ..... -25 °C to +71 °C
Storage Temperature ..... -40 °C to +100 °C
EMI/RFI ..... Six-sided continuous shield
Case Material ..... Black coated copper with non-conductive base

REMOTE ON/OFF CONTROL

Logic Compatibility ..... CMOS or open collector TTL
Ec - ON ..... +5.5V dc or open collector
Ec - OFF ..... 1.8V dc
Shutdown Idle Current ..... 5 mA
Input Resistance ..... (E_{IN} 0 to 9V dc), 100 Kohms
Control Common ..... Referenced to Input Minus

SPECIFICATIONS

	SINGLE OUTPUT MODELS			
	UPS-15/1000-D12	UPS-15/1000-D24	UPS-15/2000-D12	UPS-15/2000-D24
Output Voltage	+15V	+15V	+15V	+15V
Output Current	+1000 mA	+1000 mA	+2000 mA	+2000 mA
Input Voltage (Nominal)	12V	24V	12V	24V
Input Voltage Tolerance	9 - 18V	18 - 36V	9 - 18V	18 - 36V
No Load Input Current, max.	30 mA	20 mA	30 mA	20 mA
Full Load Input Current, max.	1600 mA	780 mA	3200 mA	1550 mA
Line Regulation, max.	±0.2%	±0.2%	±0.2%	±0.2%
Load Regulation, max.	±1%	±1%	±1%	±1%
Temperature Coefficient	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C
Case Configuration	X	X	Z	Z

SPECIFICATIONS (Single Outputs)

All specifications typical at nominal line, full load, and 25 °C unless otherwise noted.

INPUT SPECIFICATIONS

Input Range ..... 12V (9 — 18V)
24V (18 — 36V)
Input Filter ..... PI Type
Reverse Voltage Protection ..... Internal Shunt Diode

OUTPUT SPECIFICATIONS

Voltage Accuracy
Single Output, maximum ..... ±1%
External Trim Adjustment Range ..... ±10%
Ripple and Noise (20 MHz BW) ..... 10 mV RMS
(75 mV pk-pk, maximum)
Temperature Coefficient, maximum ..... ±0.02% per °C
Short Circuit Protection ..... Indefinite
Overvoltage Protection
15V, typical 18V
Line Regulation
Single, maximum ..... ±0.2%
Load Regulation
Single, maximum ..... ±1%

GENERAL SPECIFICATIONS

Efficiency
Minimum 75%
Typical 84%
Isolation Voltage, minimum ..... 500V dc
Isolation Resistance ..... 10 Megohms
Switching Frequency ..... 100 KHz
Case Grounding ..... Capacitively coupled to input
Operating Temperature ..... -25 °C to +71 °C
Storage Temperature ..... -40 °C to +100 °C
EMI/RFI ..... Six-sided continuous shield
Case Material ..... Black coated copper with non-conductive base

REMOTE ON/OFF CONTROL

Logic Compatibility ..... CMOS or open collector TTL
Ec - ON ..... +5.5V dc or open collector
Ec - OFF ..... 1.8V dc
Shutdown Idle Current ..... 5 mA
Input Resistance ..... (E_{IN} 0 to 9V dc), 100 Kohms
Control Common ..... Referenced to Input Minus

SPECIFICATIONS

	DUAL OUTPUT MODELS			
	BPS-12/625-D12	BPS-12/625-D24	BPS-12/1250-D12	BPS-12/1250-D24
Output Voltage	±12V	±12V	±12V	±12V
Output Current	±625 mA	±625 mA	±1250 mA	±1250 mA
Input Voltage (Nominal)	12V	24V	12V	24V
Input Voltage Tolerance	9 — 18V	18 — 36V	9 — 18V	18 — 36V
No Load Input Current, max.	25 mA	25 mA	25 mA	25 mA
Full Load Input Current, max.	1520 mA	750 mA	3050 mA	1500 mA
Line Regulation, max.	±0.2%	±0.2%	±0.2%	±0.2%
Load Regulation, max.	±1%	±1%	±1%	±1%
Temperature Coefficient	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C
Case Configuration	X1	X1	Z1	Z1

	DUAL OUTPUT MODELS			
	BPS-15/500-D12	BPS-15/500-D24	BPS-15/1000-D12	BPS-15/1000-D24
Output Voltage	±15V	±15V	±15V	±15V
Output Current	±500 mA	±500 mA	±1000 mA	±1000 mA
Input Voltage (Nominal)	12V	24V	12V	24V
Input Voltage Tolerance	9 - 18V	18 - 36V	9 - 18V	18 - 36V
No Load Input Current, max.	25 mA	25 mA	25 mA	25 mA
Full Load Input Current, max.	1520 mA	750 mA	3050 mA	1500 mA
Line Regulation, max.	±0.2%	±0.2%	±0.2%	±0.2%
Load Regulation, max.	±1%	±1%	±1%	±1%
Temperature Coefficient	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C
Case Configuration	X1	X1	Z1	Z1

SPECIFICATIONS (Dual Outputs)

All specifications typical at nominal line, full load, and 25 °C unless otherwise noted.

INPUT SPECIFICATIONS

- **Input Range** ..... 12V (9 — 18V), 24V (18 — 36V)
- **Input Filter** ..... PI Type
- **Reverse Voltage Protection** ..... Internal Shunt Diode

OUTPUT SPECIFICATIONS

- **Voltage Accuracy**
  - **Dual Output, maximum**
    - **+ Output** ..... ±1%
    - **- Output** ..... ±3%
- **External Trim Adjustment Range** ..... ±10%
- **Ripple and Noise (20 MHz BW)** ..... 10 mV RMS (75 mV pk-pk, max.)
- **Temperature Coefficient, maximum** ..... ±0.02% per °C
- **Short Circuit Protection** ..... Indefinite
- **Overvoltage Protection**
  - **12V, typical** 15V
  - **15V, typical** 18V
- **Line Regulation**
  - **Dual, maximum** ..... ±0.2%
- **Load Regulation**
  - **Dual, maximum** ..... ±1%

GENERAL SPECIFICATIONS

- **Efficiency**
  - **Minimum** 75%
  - **Typical** 84%
- **Isolation Voltage, minimum** ..... 500V dc
- **Isolation Resistance** ..... 10 Megohms
- **Switching Frequency** ..... 100 KHz
- **Case Grounding** ..... Capacitively coupled to input
- **Operating Temperature** ..... -25 °C to +71 °C
- **Storage Temperature** ..... -40 °C to +100 °C
- **EMI/RFI** ..... Six-sided continuous shield
- **Case Material** ..... Black coated copper with non-conductive base

REMOTE ON/OFF CONTROL

- **Logic Compatibility** ..... CMOS or open collector TTL
- **Ec - ON** ..... +5.5V dc or open collector
- **Ec - OFF** ..... 1.8V dc
- **Shutdown Idle Current** ..... 5 mA
- **Input Resistance** ..... (EIN 0 to 9V dc), 100 Kohms
- **Control Common** ..... Referenced to Input Minus

SPECIFICATIONS

	TRIPLE OUTPUT MODELS			
	TPS-5/1500-12/310-D12	TPS-5/1500-12/310-D24	TPS-5/1500-15/250-D12	TPS-5/1500-15/250-D24
Output Voltage	+5/±12V	+5/±12V	+5/±15V	+5/±15V
Output Current	+1500/±310 mA	+1500/±310 mA	+1500/±250 mA	+1500/±250 mA
Input Voltage (Nominal)	12V	24V	12V	24V
Input Voltage Tolerance	9 - 18V	18 - 36V	9 - 18V	18 - 36V
No Load Input Current, max.	50 mA	40 mA	50 mA	40 mA
Full Load Input Current, max.	1600 mA	780 mA	1600 mA	780 mA
Line Regulation, max.	±1%	±1%	±1%	±1%
Load Regulation, max.	±5%	±5%	±5%	±5%
Temperature Coefficient	0.05%/°C	0.05%/°C	0.05%/°C	0.05%/°C
Case Configuration	T	T	T	T

SPECIFICATIONS (Triple Outputs)

All specifications typical at nominal line, full load, and 25 °C unless otherwise noted.

INPUT SPECIFICATIONS

Input Range ..... 12V (9 — 18V)
24V (18 — 36V)
Input Filter ..... PI Type
Reverse Voltage Protection ..... Internal Shunt Diode

OUTPUT SPECIFICATIONS

Voltage Accuracy
Triple Output, maximum
5V ..... ±2%
12V/15V ..... ±3%
External Trim Adjustment Range ..... ±10%
Ripple and Noise (20 MHz BW) ..... 10 mV RMS (75 mV pk-pk, max.)
Temperature Coefficient, maximum ..... ±0.02% per °C
Short Circuit Protection ..... Indefinite
Overvoltage Protection
5V, typical 6.8V
12V, typical 15V
15V, typical 18V
Line Regulation
Triple, maximum ..... ±1%
Load Regulation
Triple, maximum ..... ±5%

GENERAL SPECIFICATIONS

Efficiency
Minimum 75%
Typical 84%
Isolation Voltage, minimum ..... 500V dc
Isolation Resistance ..... 10 Megohms
Switching Frequency ..... 100 KHz
Case Grounding ..... Capacitively coupled to input
Operating Temperature ..... -25 °C to +71 °C
Storage Temperature ..... -40 °C to +100 °C
EMI/RFI ..... Six-sided continuous shield
Case Material ..... Black coated copper with non-conductive base

REMOTE ON/OFF CONTROL

Logic Compatibility ..... CMOS or open collector TTL
Ec - ON ..... +5.5V dc or open collector
Ec - OFF ..... 1.8V dc
Shutdown Idle Current ..... 5 mA
Input Resistance ..... (EIN 0 to 9V dc), 100 Kohms
Control Common ..... Referenced to Input Minus

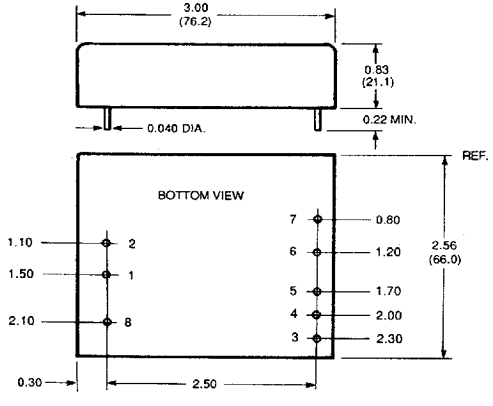
MECHANICAL AND INPUT/OUTPUT CONNECTIONS

	PIN FUNCTIONS		
Pin Number	Single (UPS)	Dual (BPS)	Triple (TPS)
1	+ Input	+ Input	+ Input
2	- Input	- Input	- Input
3	No Pin	+ Output	+ Output
4	Output Trim	Common	Common
5	No Pin	- Output	- Output
6	+ Output	No Pin	+5V dc Output
7	No Pin	No Pin	No Pin
8	Remote ON/OFF	Remote ON/OFF	Remote ON/OFF

CASE PIN CONNECTIONS

	PIN CONNECTIONS				
Pin Number	X	X1	T	Z	Z1
1	+ Input	+ Input	+ Input	+ Input	+ Input
2	- Input	- Input	- Input	- Input	- Input
3	No Pin	+ Output	+ Output	+ Sense	+ Output
4	Output Trim	Common	Common	Output Trim	Common
5	No Pin	- Output	- Output	- Sense	- Output
6	+ Output	No Pin	+5V dc Output	+ Output	No Pin
7	Output	No Pin	No Pin	- Output	No Pin
8	ON/OFF	ON/OFF	ON/OFF	ON/OFF	ON/OFF

CASE X/T



CASE Z