

Innovative Engineering Solutions



The Pride of TRI-MAG Power

TRI-MAG, Inc. was founded in 1980 to meet a growing need for power supplies, including:

- A.C. Line Filters
- Switching Power Supplies
- DC-DC Converters
- Industrial Computer Chassis

In 2013, the assets of TRI-MAG were acquired by Curtis Industries, a division of Powers Holdings, Inc.

At Curtis, we vow to retain the TRI-MAG commitment to:

- Solutions that enhance the functionality and increase efficiency of customers' power systems
- Service to meet changing market needs
- Processes dedicated to continuous improvement
- Superior quality products
- On-time delivery

Buy a power supply product from TRI-MAG, and you also receive a team of dedicated professionals whose sole purpose is to serve your electrical power needs.

Today, and tomorrow.

LOW POWER

Series	Watts	Description	Page
TDB1	1	Low, Profile, 16 Pin DIP	1
TDL1	1	Dual Inline	3
TSP1	1	SIP Dual Output	5
TSP2	1-2	SIP	7
TSP2W & TSP2X	2	SIP 2:1 4:1 Wide Range Input	9
TDA2	2-3	2:1 Wide Range Input High Isolation Voltage	12
TDS1 & TDS2	1-2	SMD Unregulated	14
TLV2	2	Single Inline Unregulated	16
TDB3	2	Single and Dual Output, 24 Pin DIP	18
TDB4	3	Single and Dual Output, 24 Pin DIP	20
TDB4W	3	2:1 Wide Range Input, 24 Pin DIP	22
TDB4X	3	4:1 Wide Range Input, 24 Pin DIP	24
TDH4W	3	2:1 Wide Range Input, High Isolation	26
TDH4X	3	4:1 Wide Range Input, 24 Pin DIP, High Isolation	28
TDU4W	3	2:1 Wide Range Input, High Isolation	30
TDB5W	5	2:1 Wide Range Input	32

MIDDLE POWER

Series	Watts	Description	Page
949ZW	5	2:1 Wide Range Input	34
949ZX	5	4:1 Wide Range Input	36
TDC7	7.5	2:1 Wide Range Input	38
TDC7X	7.5	4:1 Wide Range Input	40
TDC10	10	2:1 Wide Range Input	42
TDC15	15	2:1 Wide Range Input	44
TDC20 & TDC20X	20	2:1 Wide Range Input	46
962ZW	10	2:1 Wide Range Input, Low Profile	49
972ZW	15	2:1 Wide Range Input, Low Profile	51
972ZX	15	4:1 Wide Range Input, Low Profile	54
983ZW & 983ZX	30	2:1, 4:1 Wide Range Input, Low Profile	56
984ZW	40	2:1 Wide Range Input, Low Profile	60
987ZW	60	2:1 Low Profile High Efficiency	62
PL16	80	POL (Point of Load) Series	64

CUSTOM DC-DC CONVERTER

955ZW, ZX 956ZW, ZX 957ZW, ZX 958ZW, ZX metal case with screw terminal	66
Other Package Configuration	67
Custom and Special Product Quotation	68

TDB1 SERIES

1 Watt

DC-DC CONVERTER
 16 Pin DIP Low Profile

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Device
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	± 10%
Output Voltage Accuracy	± 3%
Load Regulation:	Unregulated
	Regulated
	± 10%
	± 1%
Line Regulation:	Unregulated
	Regulated
	± 10%
	± 1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short Term, (10 sec. max.)

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	70% typical
Isolation Voltage	1500VDC
Operating Frequency	25KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

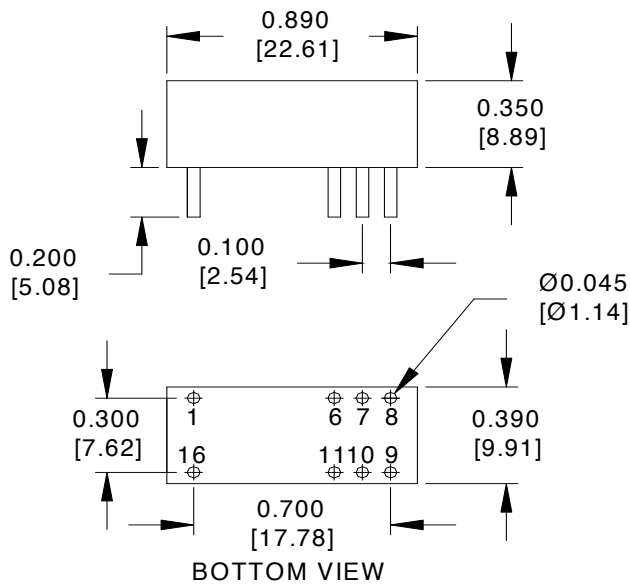
TDB1 SERIES SPECIFICATIONS

*Model-Type	Input Voltage (Vdc)	Input Current mA (typ)	Output Voltage (Vdc)	Output Current mA (max)
TDB1-0505S	5	333	5	200
TDB1-0509SU	5	276	9	111
TDB1-0512S	5	276	12	84
TDB1-0515S	5	276	15	67
TDB1-0524SU	5	276	24	42
TDB1-1205S	12	134	5	200
TDB1-1209SU	12	115	9	100
TDB1-1212S	12	115	12	84
TDB1-1215S	12	115	15	67
TDB1-2405S	24	67	5	200
TDB1-2412S	24	57	12	84
TDB1-2415S	24	57	15	67

S: Single Output

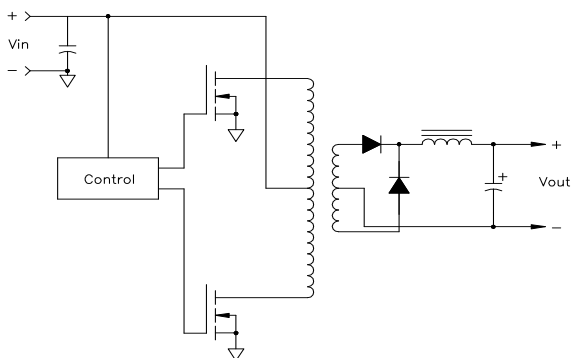
*Note: For Unregulated, Add 'U' at end of Part Number i.e. TDB1-0509SU

Specifications subject to change without notice.

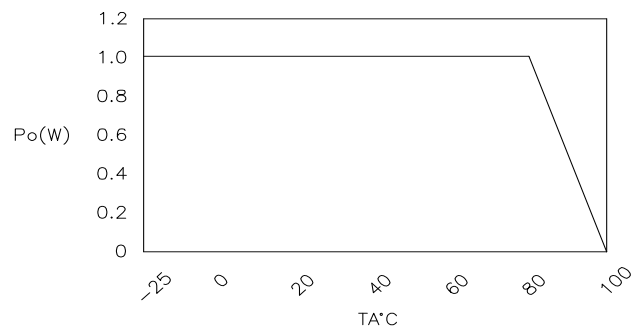


Pin Connections

Pin	Single Out
1&16	+ Input
6&11	- Output
7&10	+ Output
8&9	- Input



Power Derating Curve



TDL1 SERIES

1 Watt, 1500VDC Isolation

DC-DC CONVERTER

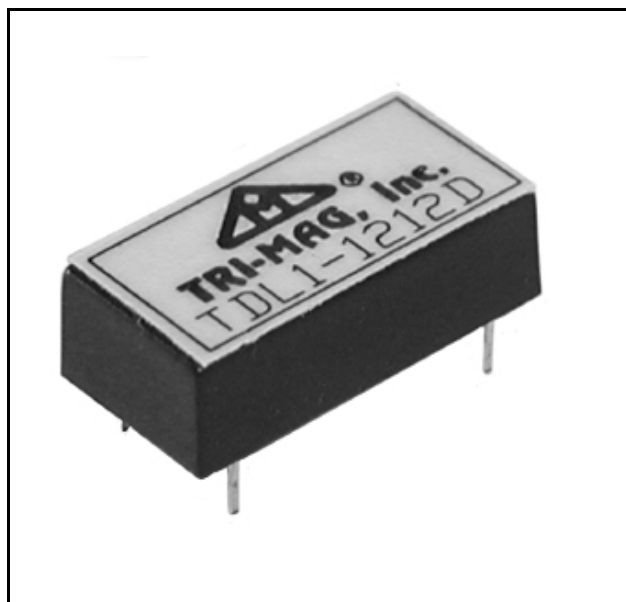
DIP Type

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	± 10%
Output Voltage Accuracy	± 5%
Load Regulation	± 8%
Line Regulation	± 1.2%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short Term, (10 sec. max.)

GENERAL SPECIFICATIONS

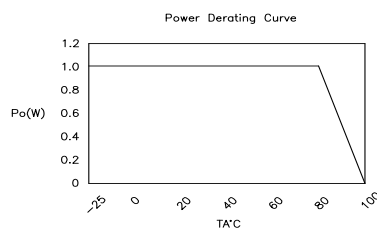
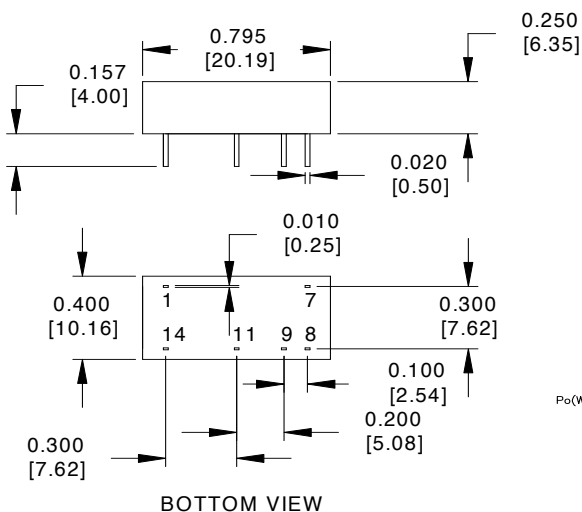
Efficiency (At Full Load)	73 to 82% typical
Isolation Voltage	1500VDC
Operating Frequency	100KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.1 Oz. (2.4 grams)
Case Material	Non-conductive Plastic

TDL1 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDL1-0505D	5	50	285	±5	±100
TDL1-0509D	5	50	265	±9	±56
TDL1-0512D	5	50	265	±12	±42
TDL1-0515D	5	50	265	±15	±34
TDL1-1205D	12	25	120	±5	±100
TDL1-1209D	12	25	110	±9	±56
TDL1-1212D	12	20	110	±12	±42
TDL1-1215D	12	20	110	±15	±34
TDL1-0505S	5	50	285	5	200
TDL1-0509S	5	50	265	9	112
TDL1-0512S	5	50	265	12	84
TDL1-0515S	5	50	265	15	67
TDL1-1205S	12	25	120	5	200
TDL1-1209S	12	25	110	9	112
TDL1-1212S	12	20	110	12	84
TDL1-1215S	12	20	110	15	67
TDL1-2405SU	24	25	70	5	200
TDL1-2409SU	24	25	70	9	112
TDL1-2412SU	24	20	70	12	84
TDL1-2415SU	24	20	70	15	67
TDL1-2405DU	24	25	70	±5	±100
TDL1-2409DU	24	25	70	±9	±56
TDL1-2412DU	24	20	70	±12	±42
TDL1-2415DU	24	20	70	±15	±34

S: Single Output D: Dual Output U: Unregulated

Specifications subject to change without notice.



Pin Connections

Pin	Single	Dual
1	- Input	- Input
7	NC	NC
8	- Output	Common
9	+ Output	+ Output
11	NC	- Output
14	+ Input	+ Input

TSP1 SERIES

1 Watt, 1500VDC Isolation (Regulated)

3000VDC Isolation (UnRegulated)

DC-DC CONVERTER

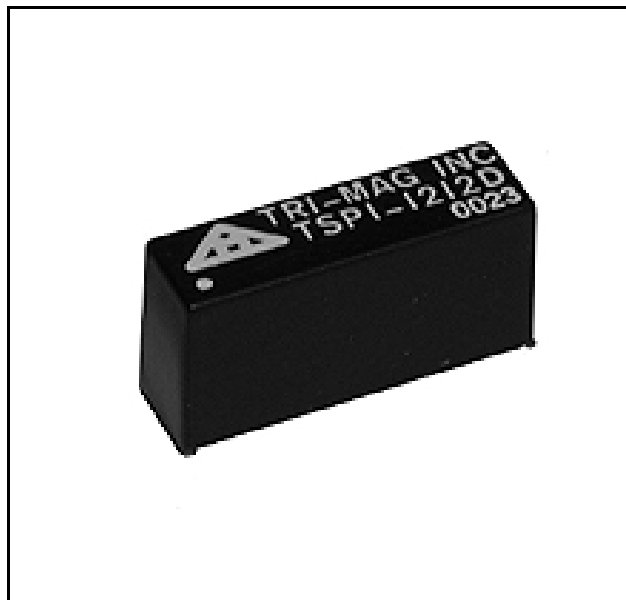
SIP Type

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	± 5%
Output Voltage Accuracy	± 5%
Load Regulation	± 10%
Line Regulation	± 10%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short Term, (10 sec. max.)

GENERAL SPECIFICATIONS

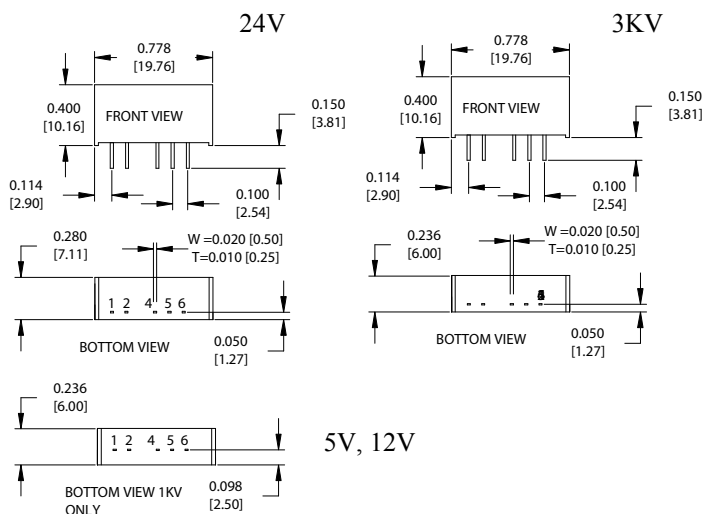
Efficiency (At Full Load)	70% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	
Operating Temperature	-25°C to 70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.1 Oz. (2.4 grams)
Case Material	Non-conductive Plastic

TSP1 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TSP1-0503S	5	30	285	3.3	300
TSP1-0505S	5	30	285	5	200
TSP1-0509S	5	30	265	9	110
TSP1-0512S	5	30	265	12	75
TSP1-0515S	5	30	265	15	60
TSP1-0505D	5	50	285	±5	±100
TSP1-0509D	5	50	265	±9	±56
TSP1-0512D	5	50	265	±12	±42
TSP1-0515D	5	60	265	±15	±34
TSP1-1203S	12	20	120	3.3	300
TSP1-1205S	12	20	120	5	200
TSP1-1209S	12	20	110	9	110
TSP1-1212S	12	20	110	12	80
TSP1-1215S	12	20	110	15	68
TSP1-1205D	12	25	120	±5	±100
TSP1-1209D	12	25	110	±9	±56
TSP1-1212D	12	20	110	±12	±42
TSP1-1215D	12	20	110	±15	±34
TSP1-2403SU	24	15	60	3.3	300
TSP1-2405SU	24	15	60	5	200
TSP1-2409SU	24	15	55	9	110
TSP1-2412SU	24	15	55	12	80
TSP1-2415SU	24	15	55	15	68
TSP1-2424SU	24	15	55	24	42
TSP1-2405D	24	15	60	±5	±100
TSP1-2412D	24	15	55	±12	±42
TSP1-2415D	24	15	58	±15	±34

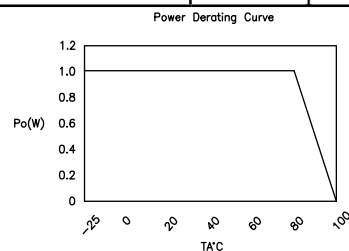
D: Dual Output S: Single Output U: Unregulated

(3000V Isolation -3K at end of P/N)



Pin Connections

Pin	(3K)	Single	Dual
1	1	+ Input	+ Input
2	2	- Input	- Input
4	5	- Output	- Output
5	6	No Pin	Common
6	7	+ Output	+ Output



TSP2 SERIES

1-2 Watt

DC-DC CONVERTER

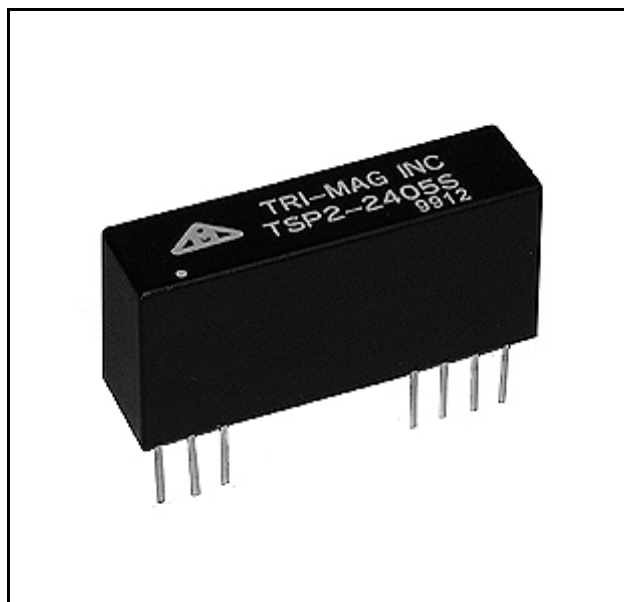
SIP Type

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	± 10%
Output Voltage Accuracy	± 5%
Load Regulation	± 5%
Line Regulation	± 1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short Term, (10 sec. max.)

GENERAL SPECIFICATIONS

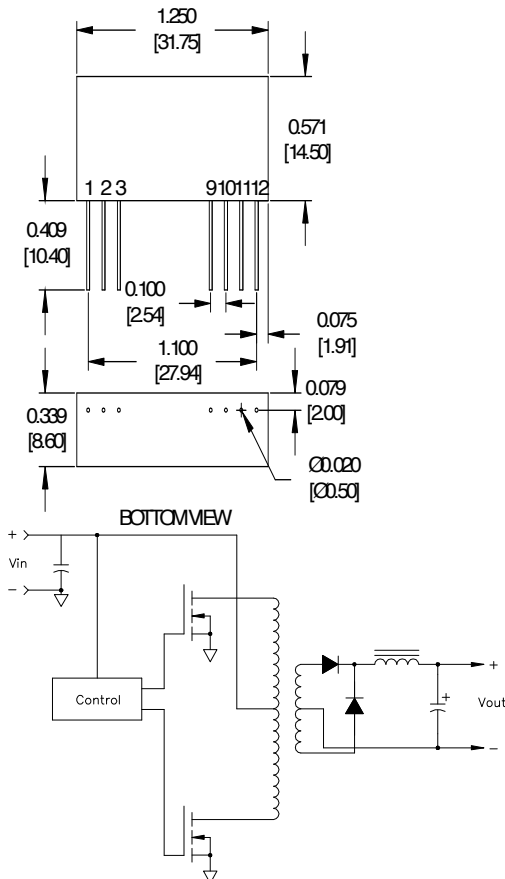
Efficiency (At Full Load)	70% typical
Isolation Voltage	1000VDC
Operating Frequency	20KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.3 Oz. (8 grams)
Case Material	Non-conductive Plastic

TSP2 SERIES SINGLE & DUAL OUTPUT SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TSP2-0505S	5	60	600	5	300
TSP2-0512S	5	60	490	12	125
TSP2-0515S	5	50	480	15	100
TSP2-0512D	5	60	525	±12	±60
TSP2-0515D	5	45	490	±15	±50
TSP2-1205S	12	30	250	5	300
TSP2-1212S	12	20	210	12	125
TSP2-1215S	12	20	205	15	100
TSP2-1212D	12	25	200	±12	±60
TSP2-1215D	12	30	210	±15	±50
TSP2-2405S	24	15	125	5	300
TSP2-2412S	24	25	115	12	125
TSP2-2415S	24	20	110	15	100
TSP2-2412D	24	20	100	±12	±60
TSP2-2415D	24	15	105	±15	±50

S: Single Output D: Dual Output

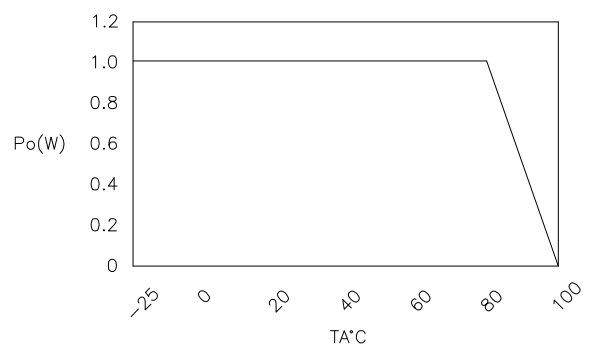
Specifications subject to change without notice.



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	NC	- Output
3	NC	Common
9	NC	NC
10	- Output	Common
11	+ Output	+ Output
12	- Input	- Input

Power Derating Curve



TSP2W & TSP2X SERIES

2 Watt

DC-DC CONVERTER

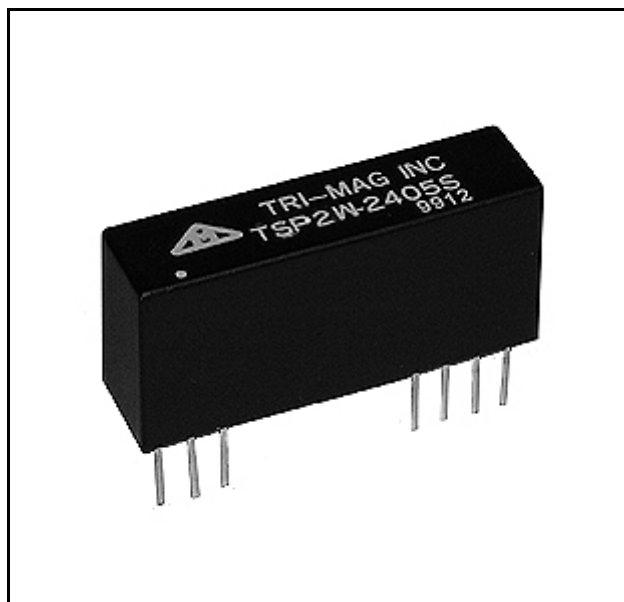
SIP Type 2:1 & 4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 900,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1 & 4:1
Output Voltage Accuracy	± 2%
Load Regulation	± 0.5%
Line Regulation	± 0.5%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short Term, (10 sec. max.)

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	72 to 82% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	100KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +105°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.3 Oz. (8 grams)
Case Material	Non-conductive Plastic

TSP2W SERIES OUTPUT SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TSP2W-0503S	4.9-9	50	516	3.3	500
TSP2W-0505S	4.9-9	50	602	5	400
TSP2W-0509S	4.9-9	50	500	9	200
TSP2W-0512S	4.9-9	50	500	12	150
TSP2W-0515S	4.9-9	50	500	15	120
TSP2W-1203S	9-18	30	205	3.3	500
TSP2W-1205S	9-18	20	220	5	400
TSP2W-1209S	9-18	20	225	9	222
TSP2W-1212S	9-18	20	213	12	168
TSP2W-1215S	9-18	20	213	15	133
TSP2W-1205D	9-18	20	225	±5	±200
TSP2W-1215D	9-18	20	225	±15	±67
TSP2W-2403S	18-36	12	98	3.3	500
TSP2W-2405S	18-36	12	112	5	400
TSP2W-2409S	18-36	13	111	9	222
TSP2W-2412S	18-36	11	107	12	168
TSP2W-2415S	18-36	11	107	15	133
TSP2W-2424S	18-36	11	107	24	83
TSP2W-2405D	18-36	12	112	±5	±200
TSP2W-2412D	18-36	12	112	±12	±83
TSP2W-2415D	18-36	12	112	±15	±67
TSP2W-4803S	36-72	8	52	3.3	500
TSP2W-4805S	36-72	8	56	5	400
TSP2W-4809S	36-72	8	55	9	222
TSP2W-4812S	36-72	8	54	12	168
TSP2W-4815S	36-72	8	54	15	133
TSP2W-4805D	36-72	8	56	±5	±200

S: Single Output D: Dual Output (3000V Isolation add -3K at end of P/N, For single output only)

Specifications subject to change without notice.

Remote ON/OFF Specifications

Parameter	Min	Max
Supply On	Under 1 VDC or Open Circuit	
Supply Off	4VDC	
Standby Input Current		0.2mA
Control Input Current (On)		-0.4mA
Control Input Current (Off)		1mA
Control Common	Referenced to -Input (Pin 1)	

Pin Connections

Pin	Single	Dual
1	- Input	- Input
2	+ Input	+ Input
3	Remote On/Off	Remote On/Off
5	NC	NC
6	+ Output	+ Output
7	- Output	Common
8	NC	- Output



Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TSP2X-2403S	9-36	12	98	3.3	500
TSP2X-2405S	9-36	12	112	5	400
TSP2X-2409S	9-36	13	111	9	222
TSP2X-2412S	9-36	11	107	12	168
TSP2X-2415S	9-36	11	107	15	133
TSP2X-4803S	20-72	8	52	3.3	500
TSP2X-4805S	20-72	8	56	5	400
TSP2X-4809S	20-72	8	55	9	222
TSP2X-4812S	20-72	8	54	12	168
TSP2X-4815S	20-72	8	54	15	133
S: Single Output	D: Dual Output	(3000V Isolation add –3K at end of P/N, For single output only)			

Technical drawing of a mechanical part with dimensions in inches and millimeters. The drawing shows a top view of a rectangular component with several features and dimensions:

- Overall width: 0.860 [21.84]
- Overall height: 0.44 [11.17]
- Top edge features:
 - Left side: 0.150 [3.81] (width of a small rectangular feature)
 - Right side: 0.020 [0.51] (width of a small rectangular feature)
- Bottom edge features:
 - Left side: 0.080 [2.03] (width of a small rectangular feature)
 - Right side: 0.360 [9.14] (width of a small rectangular feature)
- Internal features:
 - Top edge: 0.100 [2.54] (width of a small rectangular feature)
 - Bottom edge: 0.130 [3.30] (width of a small rectangular feature)
- Other dimensions:
 - 0.020 [0.51] (width of a small rectangular feature)
 - 0.020 [0.51] (width of a small rectangular feature)

Power Derating Curve

TA (°C)	Power (Po(W))
-20	2.0
70	2.0
100	0.0

TDA2 SERIES

2-3 Watt, 2500VDC Isolation

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	± 3%
Load Regulation	± 1%
Line Regulation	± 1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-Back

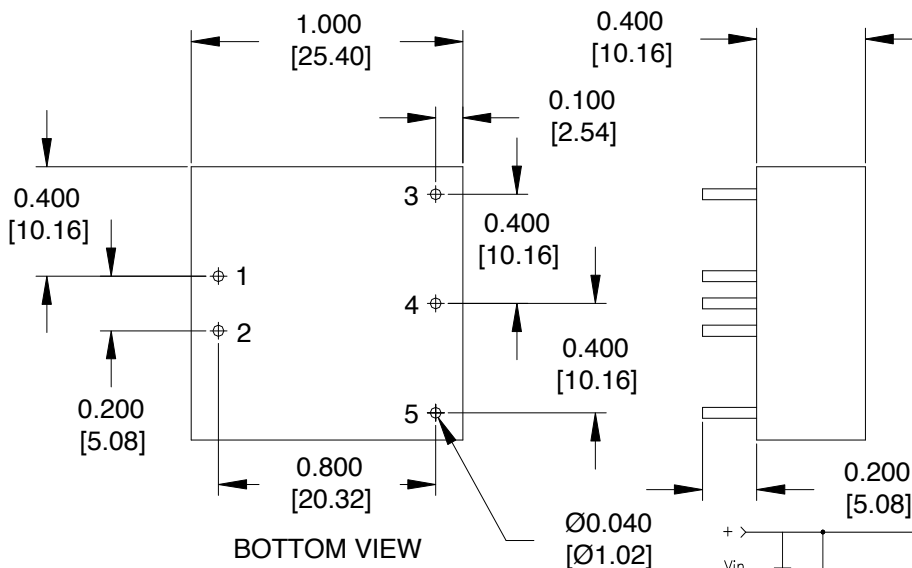
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	70% typical
Isolation Voltage	2500VDC
Operating Frequency	25KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	1.0 Oz. (28.4 grams)
Case Material	Non-conductive Plastic

TDA2 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDA2-0505S TDA2-0512S TDA2-0515S	4.5-6.0 (5)	80 85 80	565 750 460	5 12 15	360 200 100
TDA2-1205S TDA2-1209S TDA2-1212S TDA2-1215S	9-18 (12)	45 50 50 50	230 270 300 185	5 9 12 15	360 250 200 100
TDA2-2405S TDA2-2412S TDA2-2415S	18-36 (24)	25 30 30	106 133 85	5 12 15	360 200 100
TDA2-4805S TDA2-4812S TDA2-4815S	36-72 (48)	15 15 15	55 73 48	5 12 15	360 200 100

S: Single Output

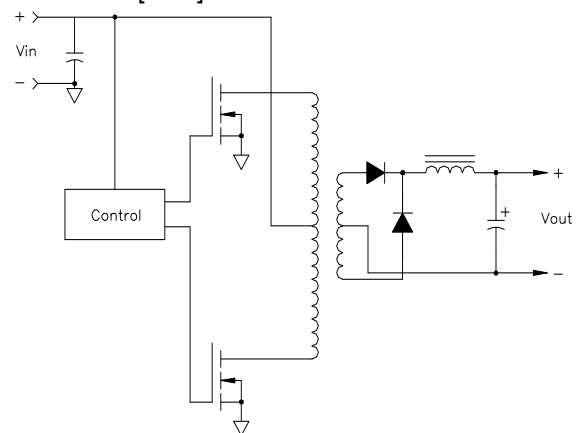
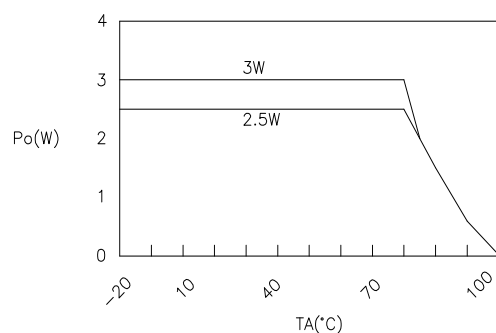


Specifications subject to change without notice.

Pin Connections

Pin	Single
1	+ Input
2	- Input
3	No Pin
4	+ Output
5	- Output

BOTTOM VIEW
Power Derating Curve



TDS1 & TDS2 SERIES UNREGULATED

1&2 Watt

DC-DC CONVERTER

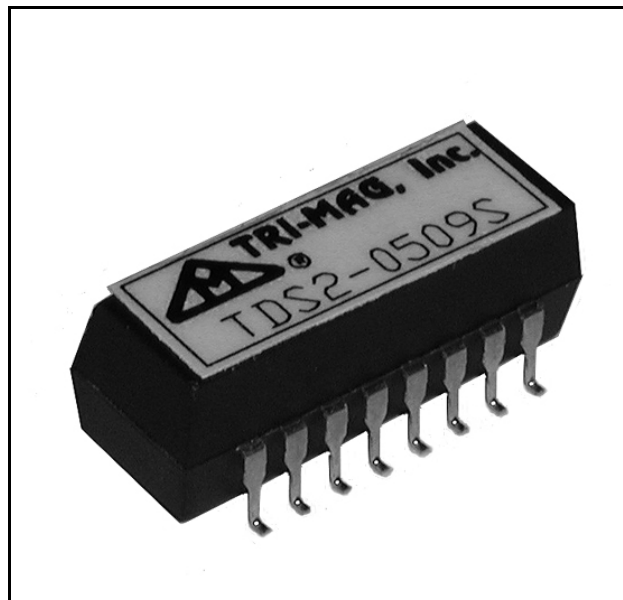
SMD Technology

FEATURES

- PCB Mountable
- Unregulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 2,000,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	±10%
Output Voltage Accuracy	±2%
Load Regulation	±8% Max.
Line Regulation	±2% Max.
Ripple & Noise	100mV p-p
Short Circuit Protection	Short Term (10 sec. max.)

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	70% typical
Isolation Voltage	1000VDC
Operating Frequency	100KHz min.
Operating Temperature	-40°C to +70°C
Storage Temperature	-55°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

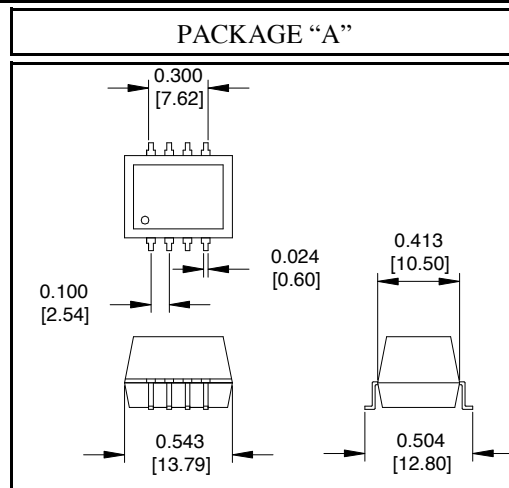
TDS1 & TDS2 SERIES SPECIFICATIONS

TDS1 SERIES 1 Watt

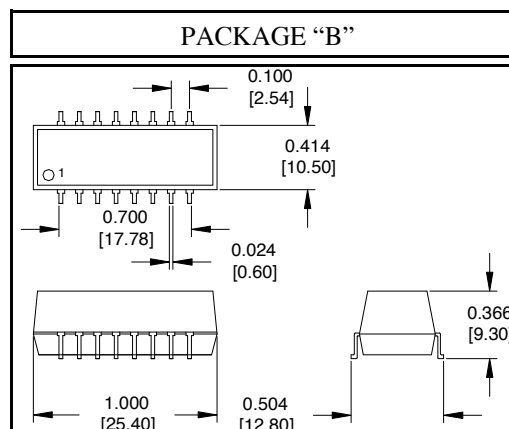
Model	Input Voltage (Vdc)	Output		Eff. (%)	Package
		Voltage (VDC)	Current (mA)		
TDS1-0505S	5	5	200	71	A
TDS1-0509S	5	9	111	78	A
TDS1-0512S	5	12	84	79	A
TDS1-0515S	5	15	67	79	A
TDS1-1205S	12	5	200	74	A
TDS1-1209S	12	9	111	78	A
TDS1-1212S	12	12	84	82	A
TDS1-1215S	12	15	67	82	A

TDS2 SERIES 2 Watt

Model	Input Voltage (Vdc)	Output		Eff. (%)	Package
		Voltage (VDC)	Current (mA)		
TDS2-0505S	5	5	400	77	B
TDS2-0509S	5	9	222	79	B
TDS2-0512S	5	12	167	80	B
TDS2-0515S	5	15	133	82	B
TDS2-1205S	12	5	400	78	B
TDS2-1212S	12	12	167	83	B
TDS2-1215S	12	15	133	85	B

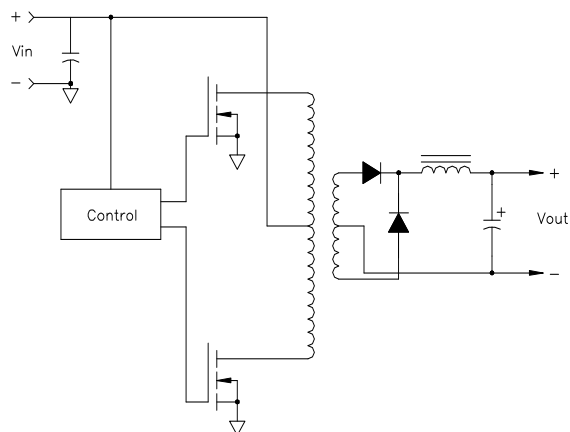
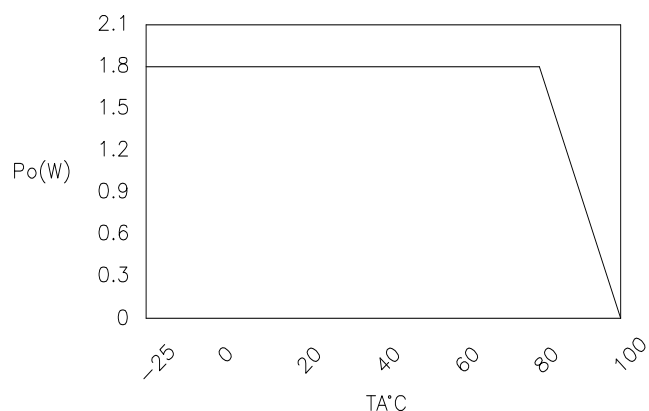


Pin	1	2	4	5
Single	-Vin	+Vin	-Vout	+Vout



Pin	1	2	7	8
Single	-Vin	+Vin	-Vout	+Vout

Power Derating Curve



TLV2 SERIES

2 Watt

DC-DC CONVERTER

Unregulated

FEATURES

- Up to 2W Unregulated Output Power
- Single In Line Package
- Low Cost
- 100% Burn-In and Triple Tested
- High Efficiency

APPLICATIONS

- Local Area Network
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	±10%
Output Voltage Accuracy	±2%
Load Regulation	±8%
Line Regulation	±1.2%
Ripple & Noise	1000mV p-p Max.
Short Circuit Protection	Momentary
Transient Response	100uS

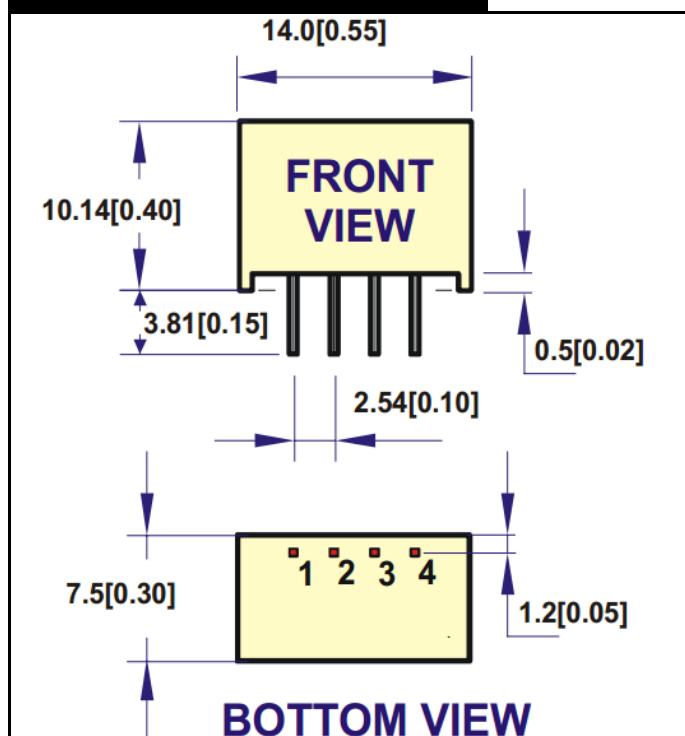
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	72 to 85% typical
Isolation Voltage	1500VDC min.
Operating Frequency	100KHz min.
Operating Temperature	-25°C to +71°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Cooling	Free-Air Convection
Case Material	Non-conductive Plastic

TLV2 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Output Voltage (VDC)	Output Current (mA)	Eff. (%)	Isolation (VDC)
TLV2-0505S	5	5	400	77	1000
TLV2-0509S	5	9	222	79	1000
TLV2-0512S	5	12	167	80	1000
TLV2-0515S	5	15	133	82	1000
TLV2-1205S	12	5	400	78	1000
TLV2-1209S	12	9	222	78	1000
TLV2-1212S	12	12	167	83	1000
TLV2-1215S	12	15	133	85	1000
TLV2-2405S	24	5	400	78	1000
TLV2-2409S	24	9	222	78	1000
TLV2-2412S	24	12	167	81	1000
TLV2-2415S	24	15	133	83	1000

MECHANICAL



Pin Connections

Pin	Single
1	-Vin
2	+Vin
3	-Vout
4	+Vout

TDB3 SERIES

2 Watt

DC-DC CONVERTER

24 Pin DIP Single & Dual Output

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	± 10%
Output Voltage Accuracy	±3%
Load Regulation	±1%
Line Regulation	±1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short Term, (10 sec. max.)

GENERAL SPECIFICATIONS

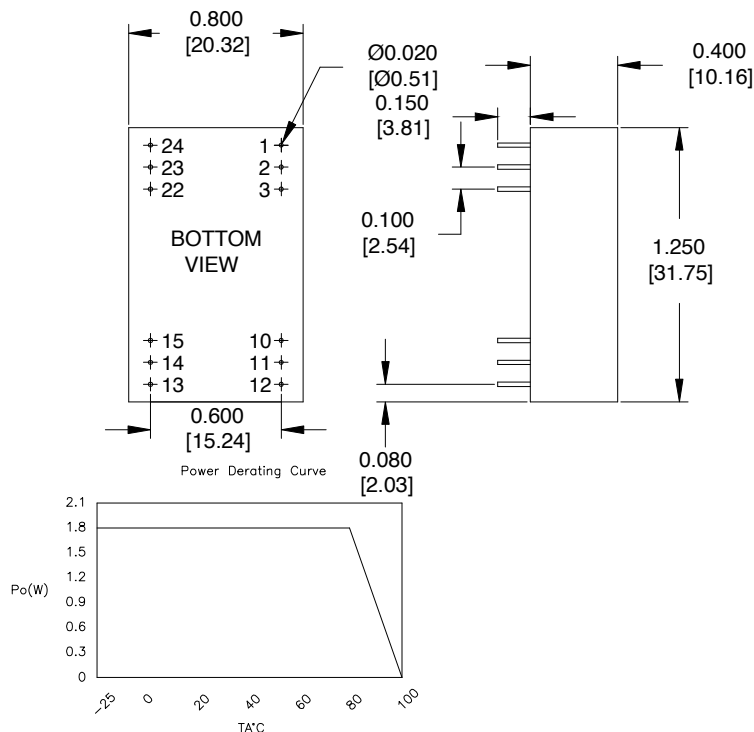
Efficiency (At Full Load)	70% typical
Isolation Voltage	1500VDC
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

TDB3 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDB3-0505S	5	100	720	5	400
TDB3-0509S	5	70	590	9	222
TDB3-0512S	5	70	630	12	167
TDB3-0515S	5	70	550	15	133
TDB3-0505D	5	70	770	±5	±200
TDB3-0512D	5	120	640	±12	±84
TDB3-0515D	5	60	620	±15	±67
TDB3-1205S	12	22	290	5	400
TDB3-1209S	12	25	290	9	222
TDB3-1212S	12	26	250	12	167
TDB3-1212D	12	20	260	±12	±84
TDB3-1215D	12	25	235	±15	±67
TDB3-2405S	24	20	150	5	400
TDB3-2412S	24	16	130	12	167
TDB3-2415S	24	25	140	15	133
TDB3-2405D	24	20	240	5	±200
TDB3-2412D	24	15	130	±12	±84
TDB3-2415D	24	15	125	±15	±67
TDB3-4805S	48	15	75	5	400
TDB3-4812S	48	15	65	12	167
TDB3-4815S	48	15	65	15	133
TDB3-4812D	48	10	70	±12	±84
TDB3-4815D	48	15	65	±15	±67

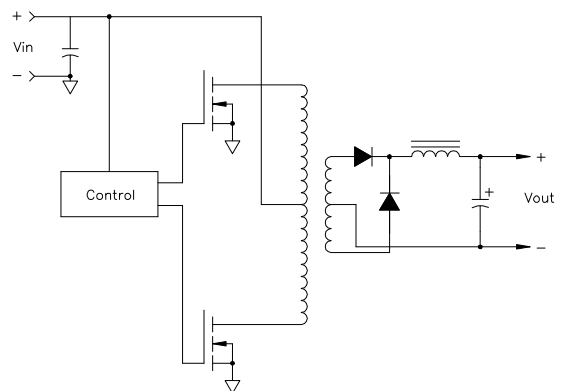
S: Single Output

D: Dual Output



Pin Connections

Pin	Single	Dual
1&24	+ Input	+ Input
2&23	NC	- Output
3&22	NC	Common
10&15	- Output	Common
11&14	+ Output	+ Output
12&13	- Input	- Input



TDB4 SERIES

3 Watt

DC-DC CONVERTER

24 Pin DIP 2:1

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	±10%
Output Voltage Accuracy	±5%
Load Regulation	±1%
Line Regulation	±1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Short term, (10 sec. Max.)

GENERAL SPECIFICATIONS

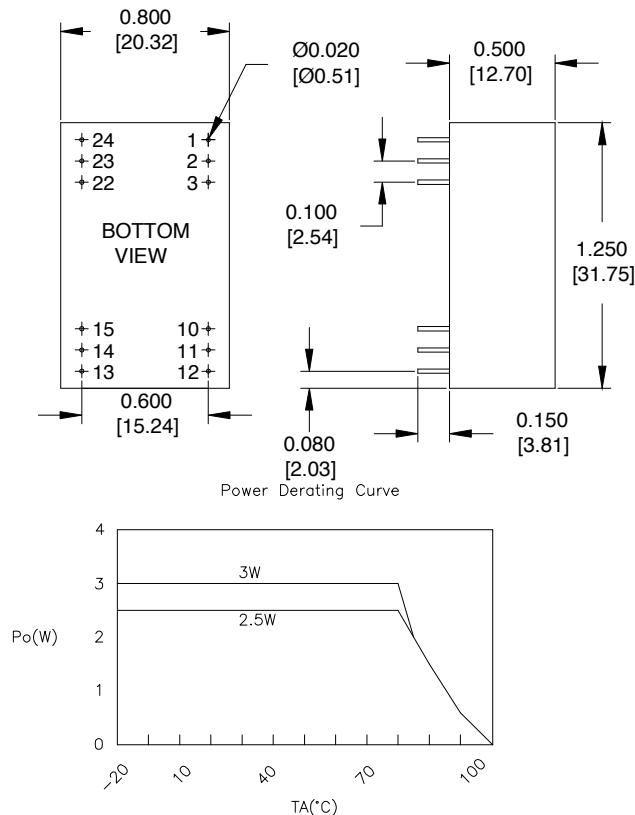
Efficiency (At Full Load)	70% typical
Isolation Voltage	1500VDC
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

TDB4 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDB4-0505S	5	110	1000	5	600
TDB4-0509S	5	80	780	9	330
TDB4-0512S	5	110	1000	12	250
TDB4-0515S	5	120	950	15	200
TDB4-0512D	5	80	930	±12	±125
TDB4-0515D	5	105	1000	±15	±100
TDB4-1205S	12	30	400	5	600
TDB4-1209S	12	40	375	9	330
TDB4-1212S	12	30	400	12	250
TDB4-1212D	12	40	400	±12	±125
TDB4-1215D	12	45	400	±15	±100
TDB4-2405S	24	20	195	5	600
TDB4-2412S	24	30	205	12	250
TDB4-2415S	24	25	210	15	200
TDB4-2412D	24	20	185	±12	±125
TDB4-2415D	24	20	195	±15	±100
TDB4-4805S	48	10	94	5	600
TDB4-4812S	48	10	92	12	250
TDB4-4815S	48	15	100	15	200
TDB4-4812D	48	15	98	±12	±125
TDB4-4815D	48	15	110	±15	±100

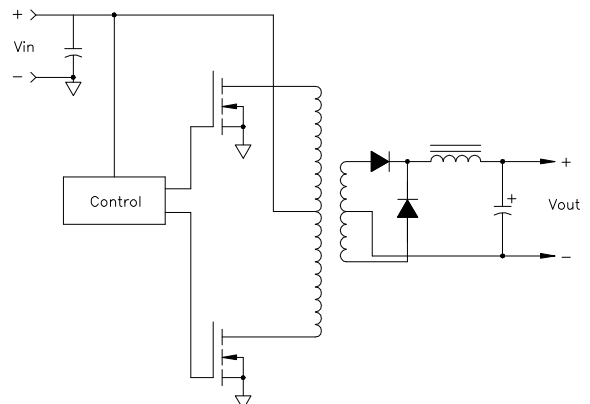
S: Single Output

D: Dual Output



Pin Connections

Pin	Single	Dual
1&24	+ Input	+ Input
2&23	NC	- Output
3&22	NC	Common
10&15	- Output	Common
11&14	+ Output	+ Output
12&13	- Input	- Input



TDB4W SERIES

3 Watt

DC-DC CONVERTER

24 Pin DIP 2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±3%
Load Regulation	±1% (Single Output), ±2.5% (Dual Output)
Line Regulation	± 1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-back

GENERAL SPECIFICATIONS

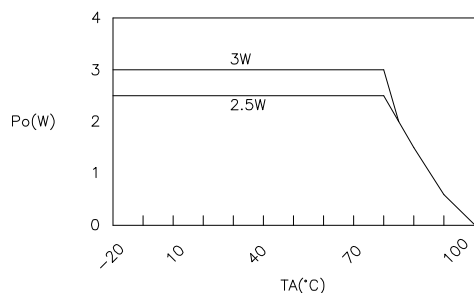
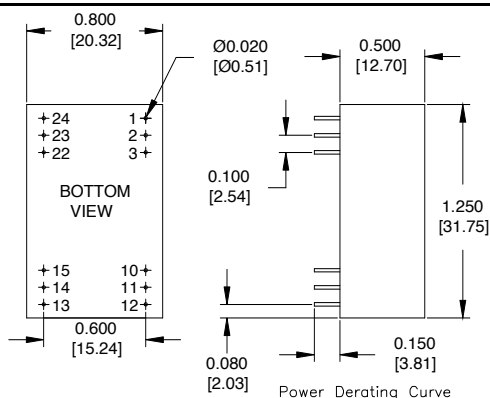
Efficiency (At Full Load)	73 to 82% typical
Isolation Voltage	1500VDC
Isolation Capacitance	80pF max.
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

TDB4W SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDB4W-0505S TDB4W-0512S TDB4W-0515S TDB4W-0505D TDB4W-0512D TDB4W-0515D	4.5-6.0 (5)	60 170 90 140 180 180	770 930 880 810 900 910	5 12 15 ±5 ±12 ±15	500 250 200 ±300 ±125 ±100
TDB4W-1205S TDB4W-1212S TDB4W-1215S TDB4W-1205D TDB4W-1212D TDB4W-1215D	9-18 (12)	35 30 40 140 75 70	320 340 340 340 360 360	5 12 15 ±5 ±12 ±15	500 250 200 ±300 ±125 ±100
TDB4W-2405S TDB4W-2412S TDB4W-2415S TDB4W-2405D TDB4W-2412D TDB4W-2415D	18-36 (24)	15 20 20 30 30 40	140 180 170 160 190 180	5 12 15 ±5 ±12 ±15	600 250 200 ±300 ±125 ±100
TDB4W-4805S TDB4W-4812S TDB4W-4815S TDB4W-4805D TDB4W-4812D TDB4W-4815D	36-72 (48)	15 20 10 20 20 20	85 90 95 80 85 90	5 12 15 ±5 ±12 ±15	600 250 200 ±300 ±125 ±100

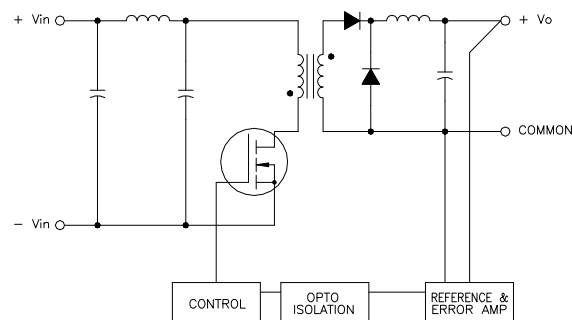
S: Single Output

D: Dual Output



Pin Connections

Pin	Single	Dual
1&24	+ Input	+ Input
2&23	NC	- Output
3&22	NC	Common
10&15	- Output	Common
11&14	+ Output	+ Output
12&13	- Input	- Input



TDB4X SERIES

3 Watt

DC-DC CONVERTER

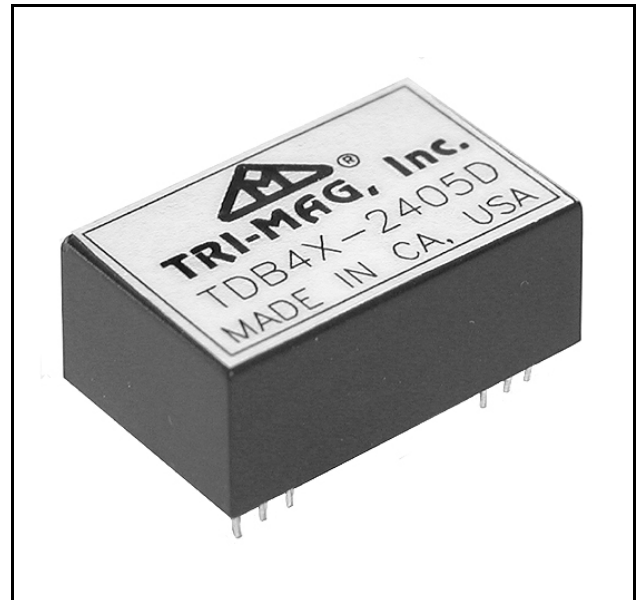
24 Pin DIP 4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	4:1
Output Voltage Accuracy	±3%
Load Regulation	±0.5%
Line Regulation	±1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-back

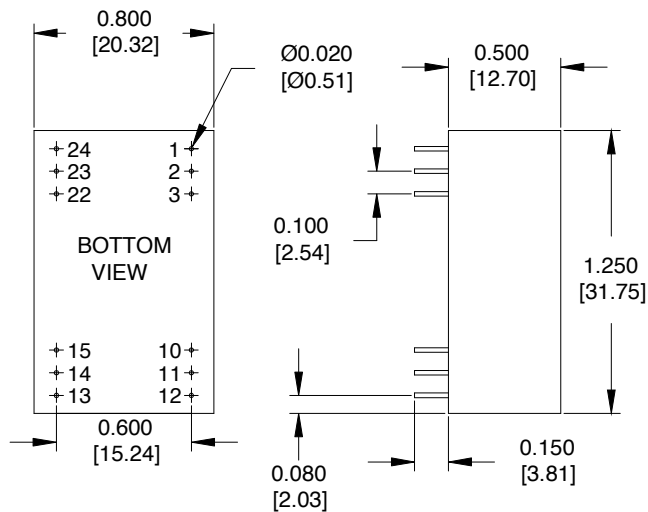
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	71 to 80% typical
Isolation Voltage	1500VDC
Isolation Capacitance	80pF max.
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

TDB4X SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDB4X-2405S TDB4X-2412S TDB4X-2415S TDB4X-2405D TDB4X-2412D TDB4X-2415D	9-36 (24)	35 40 40 35 35 50	335 385 385 330 390 390	5 12 15 ±5 ±12 ±15	600 250 200 ±300 ±125 ±100
TDB4X-4805S TDB4X-4812S TDB4X-4815S TDB4X-4805D TDB4X-4812D TDB4X-4815D	20-72 (48)	40 20 20 20 20 50	160 180 180 170 185 180	5 12 15 ±5 ±12 ±15	600 250 200 ±300 ±125 ±100

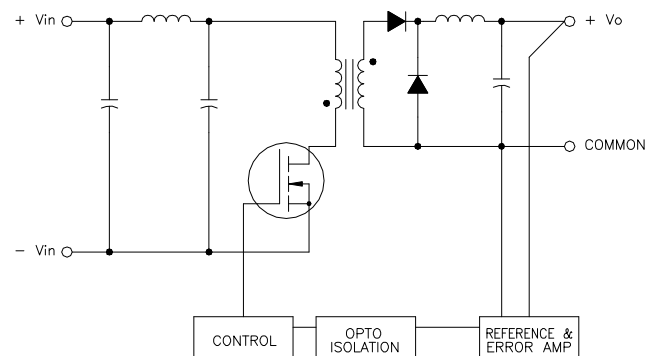
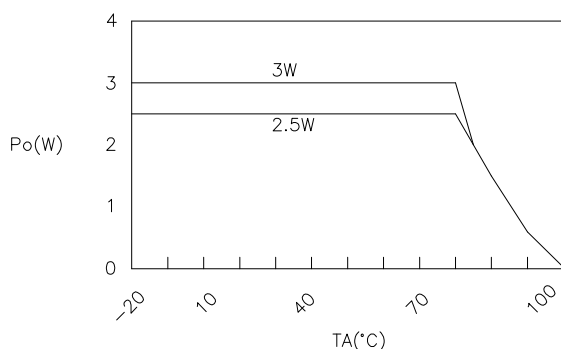
S: Single Output D: Dual Output



Pin Connections

Pin	Single	Dual
1&24	+ Input	+ Input
2&23	NC	- Output
3&22	NC	Common
10&15	- Output	Common
11&14	+ Output	+ Output
12&13	- Input	- Input

Power Derating Curve



TDH4W SERIES

3 Watt 1500VDC & 3000VDC Isolation

DC-DC CONVERTER

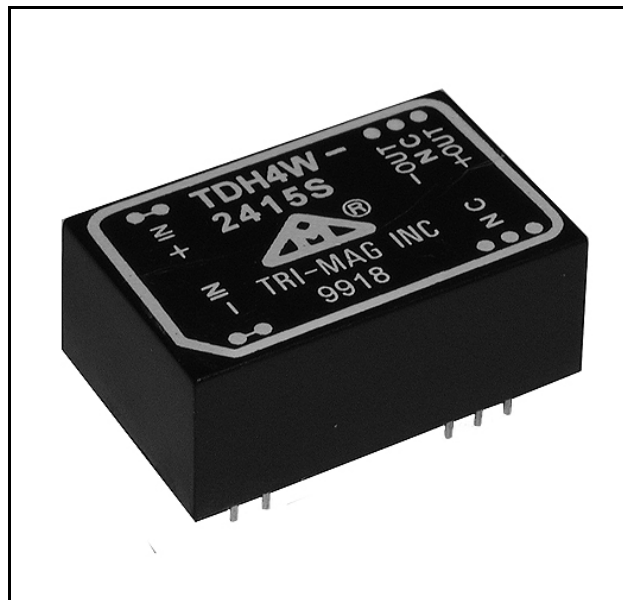
24 Pin DIP 2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±3%
Load Regulation	±1% (Single Output), ±2.5% (Dual Output)
Line Regulation	±1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-back

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	73 to 82% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +71°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

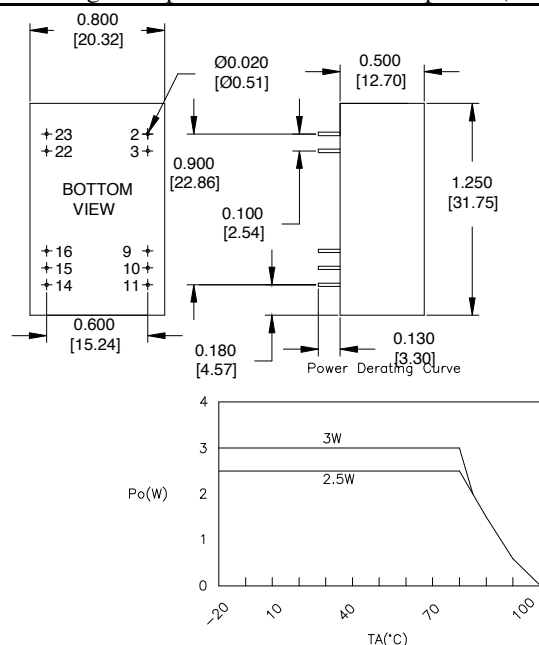
TDH4W SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDH4W-0505S	4.5-6.0 (5)	90	835	5	500
TDH4W-0512S		100	920	12	250
TDH4W-0515S		100	920	15	200
TDH4W-0505D		90	780	±5	±300
TDH4W-0512D		100	920	±12	±125
TDH4W-0515D		100	920	±15	±100
TDH4W-1203S	9-18 (12)	40	320	3.3	700
TDH4W-1205S		40	320	5	600
TDH4W-1212S		40	355	12	250
TDH4W-1215S		40	355	15	200
TDH4W-1205D		40	315	±5	±300
TDH4W-1212D		40	355	±12	±125
TDH4W-1215D		40	355	±15	±100
TDH4W-2403S	18-36 (24)	20	160	3.3	700
TDH4W-2405S		20	160	5	600
TDH4W-2412S		20	175	12	250
TDH4W-2415S		20	175	15	200
TDH4W-2405D		20	155	±5	±300
TDH4W-2412D		20	180	±12	±125
TDH4W-2415D		20	170	±15	±100
TDH4W-4803S	36-72 (48)	20	95	3.3	700
TDH4W-4805S		20	95	5	600
TDH4W-4812S		20	85	12	250
TDH4W-4815S		20	85	15	200
TDH4W-4805D		20	75	±5	±300
TDH4W-4812D		20	85	±12	±125
TDH4W-4815D		20	85	±15	±100

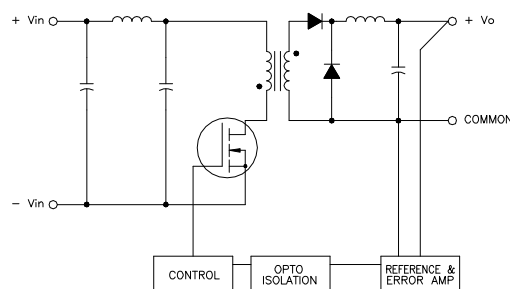
S: Single Output

D: Dual Output

(3000V Isolation add -3K at end of P/N)


Pin Connections

FUNCTION	Single	Dual
+ Input	22&23	22&23
- Input	2&3	2&3
+Output	14	14
Common	NC	9&16
- Output	16	11



TDH4X SERIES

3 Watt 1500VDC and 3000VDC Isolation

DC-DC CONVERTER

24 Pin DIP 4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	4:1
Output Voltage Accuracy	±3%
Load Regulation	±0.5%
Line Regulation	±1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-back

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	71 to 80% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

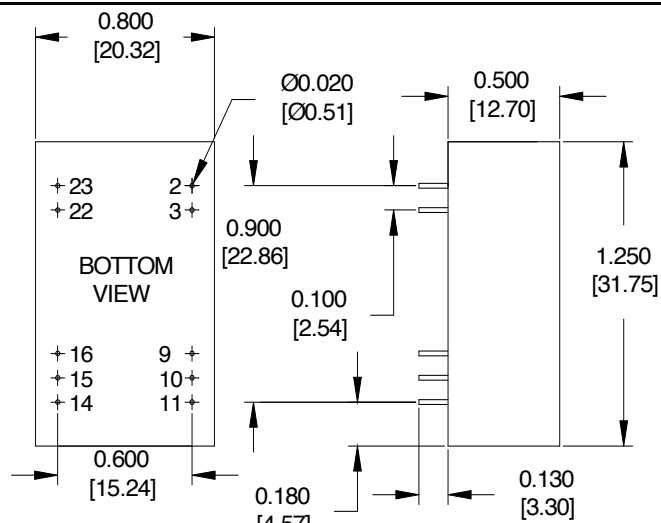
TDH4X SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDH4X-2403S	9-36 (24)	80	340	3.3	700
TDH4X-2405S		80	340	5	600
TDH4X-2412S		90	385	12	250
TDH4X-2415S		90	385	15	200
TDH4X-2405D		80	330	±5	±300
TDH4X-2412D		90	385	±12	±125
TDH4X-2415D		90	385	±15	±100
TDH4X-4803S	20-72 (48)	50	160	3.3	700
TDH4X-4805S		50	160	5	600
TDH4X-4812S		50	180	12	250
TDH4X-4815S		50	180	15	200
TDH4X-4805D		50	170	±5	±300
TDH4X-4812D		50	180	±12	±125
TDH4X-4815D		50	180	±15	±100

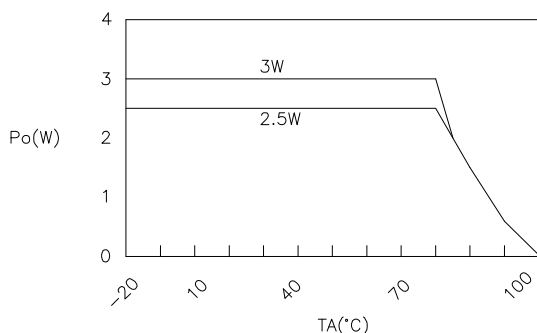
S: Single Output

D: Dual Output

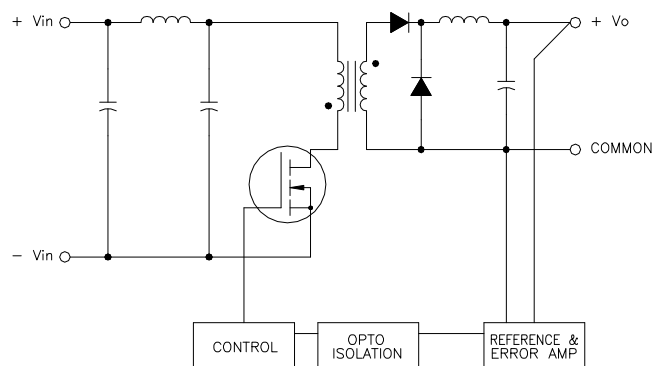
(3000V Isolation add -3K at end of P/N)



Power Derating Curve


Pin Connections

FUNCTION	Single	Dual
+ Input	22&23	22&23
- Input	2&3	2&3
+Output	14	14
Common	NC	9&16
- Output	16	11



TDU4W SERIES

3 Watt 2000 VDC Isolation

DC-DC CONVERTER

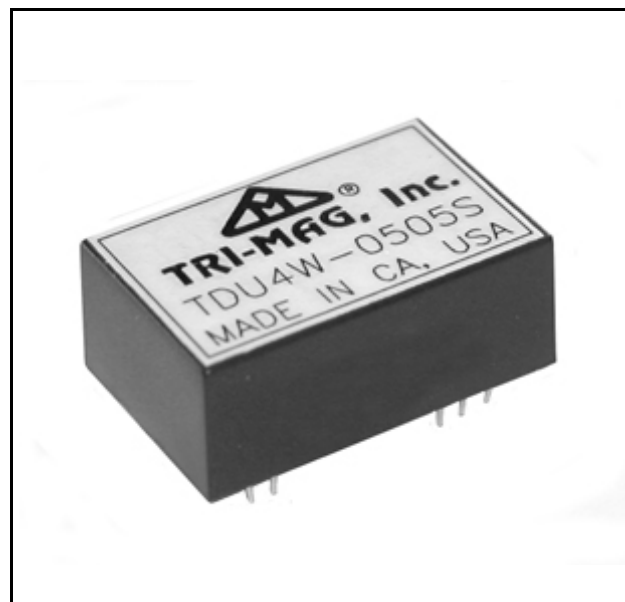
24 Pin DIP 2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±3%
Load Regulation	±0.5%
Line Regulation	±1%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-back

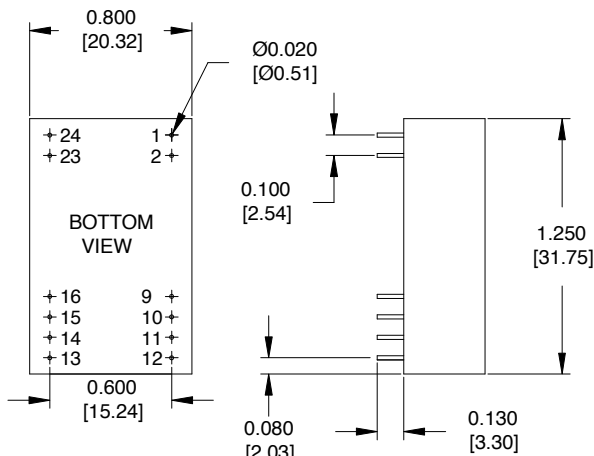
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	73 to 80% typical
Isolation Voltage	2000 VDC
Operating Frequency	25KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Non-conductive Plastic

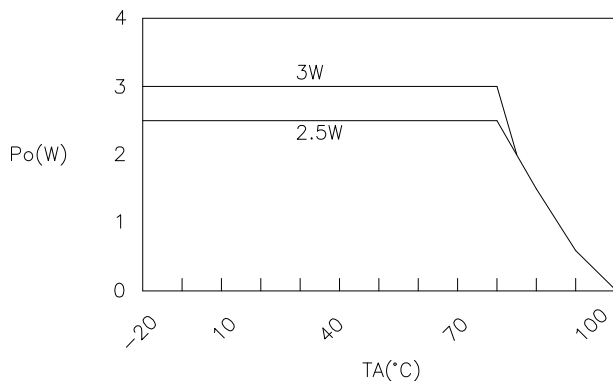
TDU4W SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDU4W-0505S TDU4W-0512S TDU4W-0515S	4.5-6.0 (5)	90 90 90	825 920 920	5 12 15	500 250 200
TDU4W-1205S TDU4W-1212S TDU4W-1215S	9-18 (12)	40 40 40	315 355 355	5 12 15	600 250 200
TDU4W-2405S TDU4W-2412S TDU4W-2415S	18-36 (24)	20 20 20	160 175 175	5 12 15	600 250 200
TDU4W-4805S TDU4W-4812S TDU4W-4815S	36-72 (48)	20 20 20	75 85 85	5 12 15	600 250 200

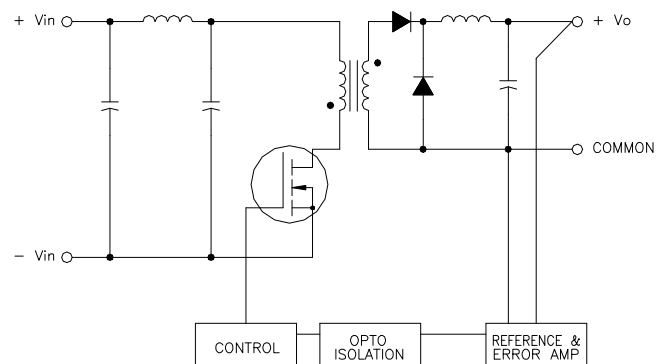
S: Single Output



Power Derating Curve


Pin Connections

Pin	Single
1&2	+ Input
23&24	- Input
11&12	+Output
9&10	- Output



TDB5W SERIES

5 Watt Metal Case, 1500V and 3000V Isolation

DC-DC CONVERTER

24 Pin DIP 2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±1% max.
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-back

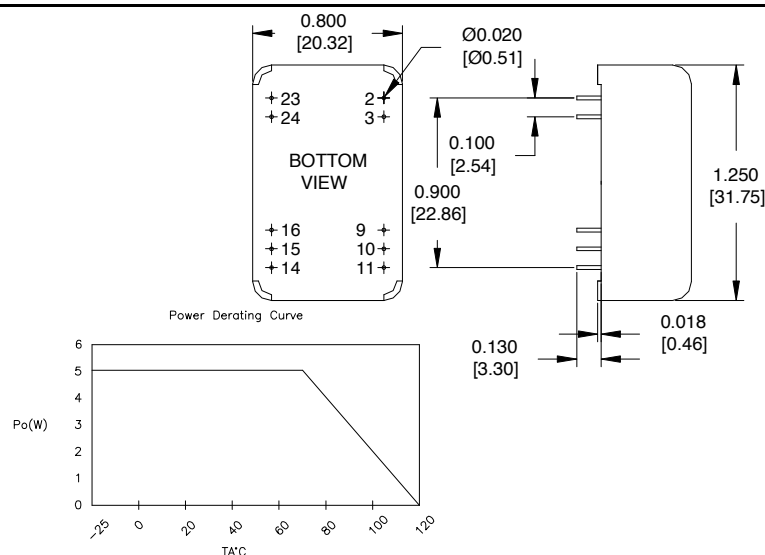
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	71 to 83% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	200KHz Typical
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	0.5 Oz. (14.2 grams)
Case Material	Metal

TDB5W SERIES SINGLE AND DUAL OUTPUT SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDB5W-0505S TDB5W-0512S TDB5W-0512D TDB5W-0515D	4.5-9 (5)	100 100 100 100	1080 1080 1080 1080	5 12 ±12 ±15	800 333 ±167 ±133
TDB5W-1203S TDB5W-1205S TDB5W-1212S TDB5W-1215S TDB5W-1205D TDB5W-1212D TDB5W-1215D	9-18 (12)	48 48 48 48 48 48 48	580 580 500 510 580 526 513	3.3 5 12 15 ±5 ±12 ±15	1200 1000 470 400 ±500 ±230 ±190
TDB5W-2403S TDB5W-2405S TDB5W-2412S TDB5W-2415S TDB5W-2405D TDB5W-2412D TDB5W-2415D	18-36 (24)	42 42 42 42 42 42 42	282 282 250 230 290 263 250	3.3 5 12 15 ±5 ±12 ±15	1200 1000 470 400 ±500 ±230 ±190
TDB5W-4803S TDB5W-4805S TDB5W-4812S TDB5W-4815S TDB5W-4805D TDB5W-4812D TDB5W-4815D	36-72 (48)	36 36 36 36 36 36 36	140 140 125 116 145 131 128	3.3 5 12 15 ±5 ±12 ±15	1200 1000 470 400 ±500 ±230 ±190

S: Single Output D: Dual Output (3000V Isolation add -3K at end of P/N)


Pin Connections

FUNCTION	Single	Dual
+ Input	22&23	22&23
- Input	2&3	2&3
+Output	14	14
Common	NC	9&16
- Output	16	11

949ZW SERIES

5 Watt

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	±1% (Single Output), ±2.5% (Dual Output)
Line Regulation	±1% .
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold back
Overload Protection	Built-in

GENERAL SPECIFICATIONS

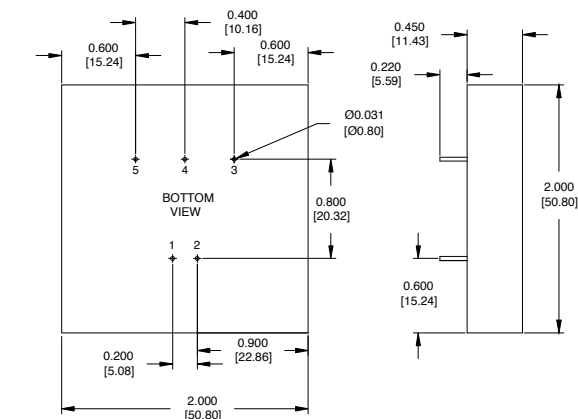
Efficiency (At Full Load)	70% typical
Isolation Voltage	500VDC
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA p-p max.
Weight	2.0 Oz. (56 grams)
Case Material	Black coated copper with non-conductive plastic base

949ZW SERIES SPECIFICATIONS

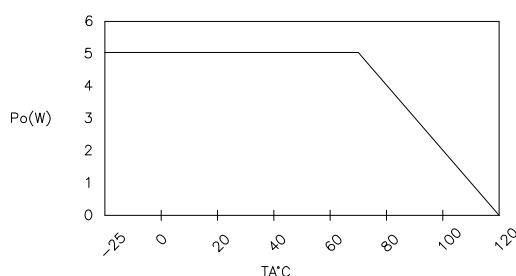
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
949ZW0505S 949ZW0512S 949ZW0515S 949ZW0512D 949ZW0515D	4.5-6.0 (5)	165 155 145 175 170	1665 1550 1425 1550 1540	5 12 15 ±12 ±15	1000 400 330 ±200 ±167
949ZW1205S 949ZW1212S 949ZW1215S 949ZW1212D 949ZW1215D	9-18 (12)	50 60 60 120 80	595 590 600 615 625	5 12 15 ±12 ±15	1000 400 333 ±200 ±167
949ZW2405S 949ZW2412S 949ZW2415S 949ZW2412D 949ZW2415D	18-36 (24)	35 30 30 40 40	310 290 290 310 320	5 12 15 ±12 ±15	1000 400 333 ±200 ±167
949ZW4805S 949ZW4812S 949ZW4815S 949ZW4812D 949ZW4815D	36-72 (48)	15 15 15 30 35	155 150 150 160 165	5 12 15 ±12 ±15	1000 400 333 ±200 ±167

S: Single Output

D: Dual Output

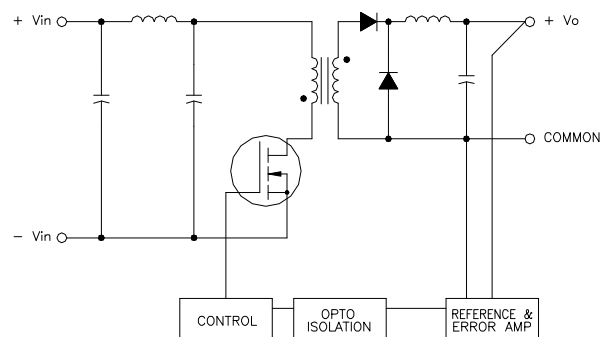


Power Derating Curve



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	- Output	- Output
4	NC	Common
5	+ Output	+ Output



949ZX SERIES

5 Watt

DC-DC CONVERTER

3:1 & 4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	3:1 & 4:1
Output Voltage Accuracy	±2%
Load Regulation	±1% (Single Output), ±2.5% (Dual Output)
Line Regulation	±1% .
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold back
Over voltage Protection	Build-in

GENERAL SPECIFICATIONS

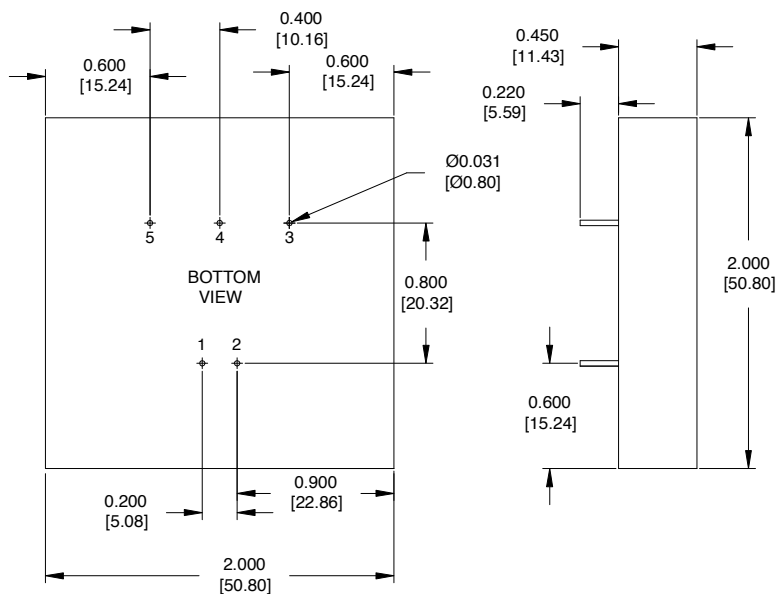
Efficiency (At Full Load)	70% typical
Isolation Voltage	500VDC
Operating Frequency	50KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA p-p max.
Weight	3.0 Oz. (90 grams)
Case Material	Black coated copper with non-conductive plastic base

949ZX SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
949ZX1205S 949ZX1212S 949ZX1215S	9-36 (24)	60 60 60	660 590 595	5 12 15	1000 400 330
949ZX1212D 949ZX1215D	9-27 (24)	90 135	635 660	±12 ±15	±200 ±167
949ZX4805S 949ZX4812S 949ZX4815S	20-72 (48)	30 30 30	300 285 300	5 12 15	1000 400 330
949ZX4812D 949ZX4815D	20-60 (48)	65 50	320 325	±12 ±15	±200 ±167

S: Single Output D: Dual Output

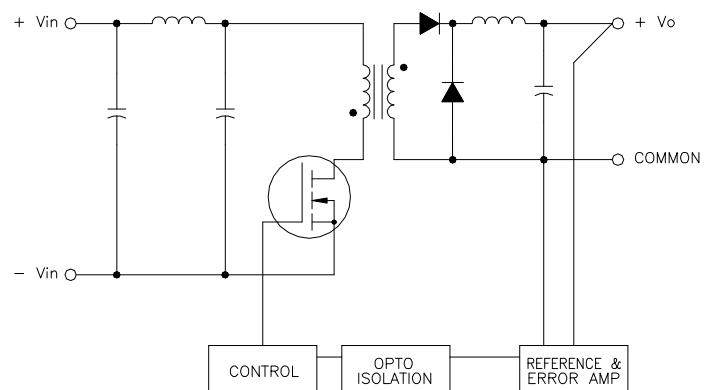
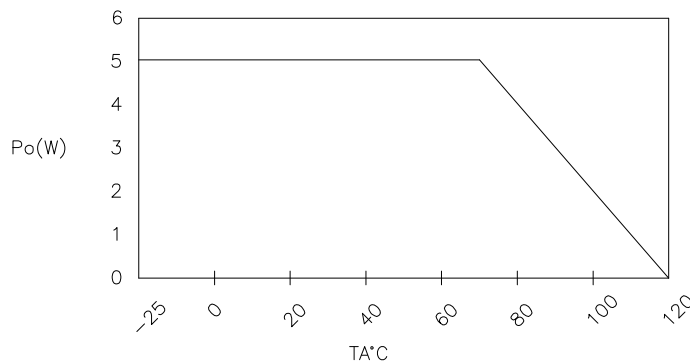
Specifications subject to change without notice.



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	- Output	- Output
4	NC	Common
5	+ Output	+ Output

Power Derating Curve



TDC7 SERIES

7.5 Watt 1500VDC & 3000VDC Isolation

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±1%
Ripple & Noise	100mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold back

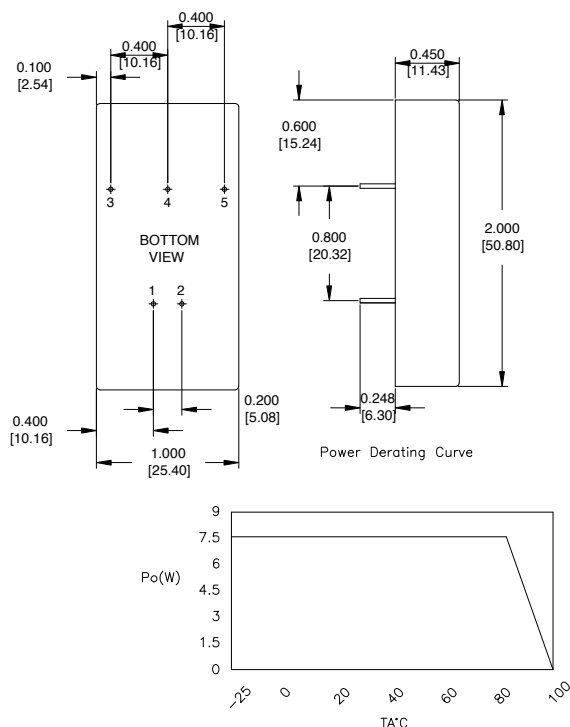
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	74 to 82% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	100KHz min.
Operating Temperature	0°C to 70°C Based Temperature
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	1.5 Oz. (42 grams)
Case Material	Black coated with non-conductive metal base

TDC7 SERIES SPECIFICATIONS

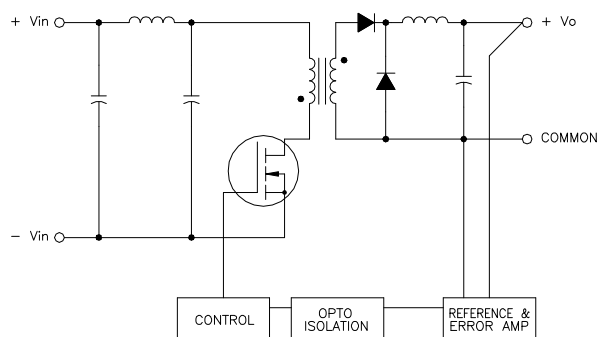
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDC7-1203S	9-18 (12)	50	830	3.3	2400
TDC7-1205S		50	830	5	2000
TDC7-1212S		50	800	12	830
TDC7-1215S		50	780	15	670
TDC7-1205D		50	830	±5	±1000
TDC7-1212D		50	800	±12	±416
TDC7-1215D		50	830	±15	±333
TDC7-2403S	18-36 (24)	30	410	3.3	2400
TDC7-2405S		30	410	5	2000
TDC7-2412S		30	390	12	830
TDC7-2415S		30	400	15	670
TDC7-2405D		30	400	±5	±1000
TDC7-2412D		30	395	±12	±416
TDC7-2415D		30	410	±15	±333
TDC7-4803S	36-72 (48)	20	200	3.3	2400
TDC7-4805S		20	200	5	2000
TDC7-4812S		20	195	12	830
TDC7-4815S		20	195	15	670
TDC7-4805D		20	200	±5	±1000
TDC7-4812D		20	215	±12	±416
TDC7-4815D		20	215	±15	±333

S: Single Output D: Dual Output (3000V Isolation add -3K at end of P/N)



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	+ Output	+ Output
4	NC	Common
5	- Output	- Output



TDC7X SERIES

7.5 Watt 1500VDC & 3000VDC Isolation

DC-DC CONVERTER

4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	4:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	100mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold back

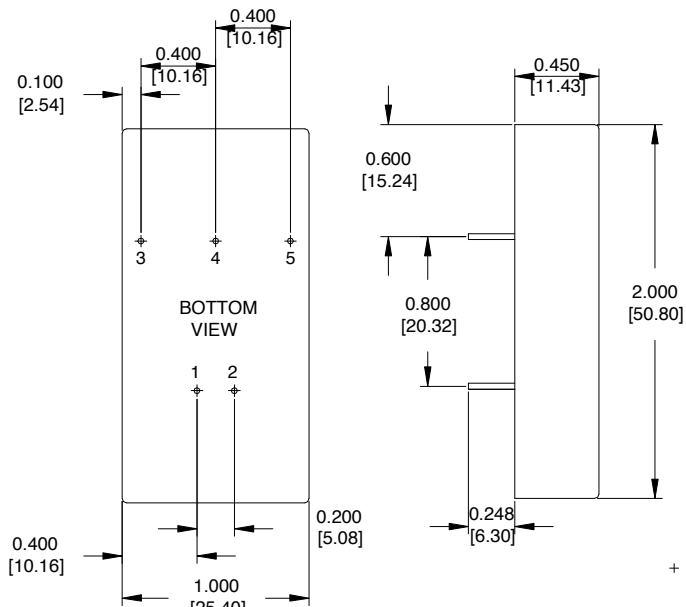
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	77 to 81% typical
Isolation Voltage	1500VDC and 3000VDC
Operating Frequency	100KHz min.
Operating Temperature	0°C to 70°C Based Temperature
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	1.5 Oz. (42 grams)
Case Material	Black coated with non-conductive metal base

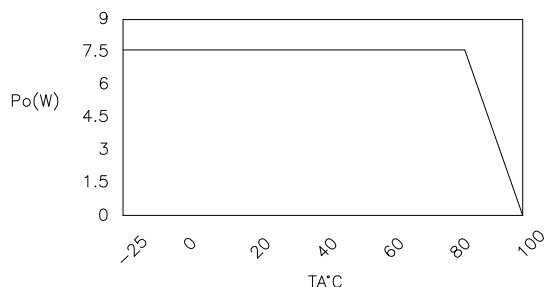
TDC7X SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDC7X-2405S	9-36 (24)	60	895	5	2000
TDC7X-2412S		60	895	12	830
TDC7X-2415S		60	895	15	670
TDC7X-2405D		60	895	±5	±1000
TDC7X-2412D		60	800	±12	±416
TDC7X-2415D		60	835	±15	±333
TDC7X-4805S	20-72 (48)	50	435	5	2000
TDC7X-4812S		50	430	12	830
TDC7X-4815S		50	430	15	670
TDC7X-4805D		50	430	±5	±1000
TDC7X-4812D		50	395	±12	±416
TDC7X-4815D		50	415	±15	±333

S: Single Output D: Dual Output (3000V Isolation add -3K at end of P/N)

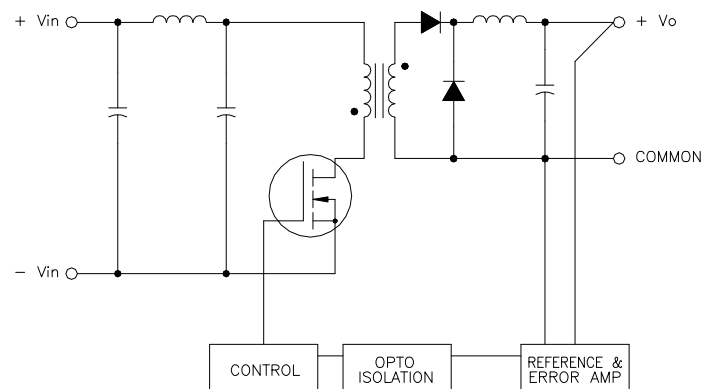


Power Derating Curve



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	+ Output	+ Output
4	No Pin	Common
5	- Output	- Output



TDC10 SERIES

10 Watt Triple Output

DC-DC CONVERTER
 2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulate
- 100% Burn-In and Triple Tested
- MTBF > 700,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

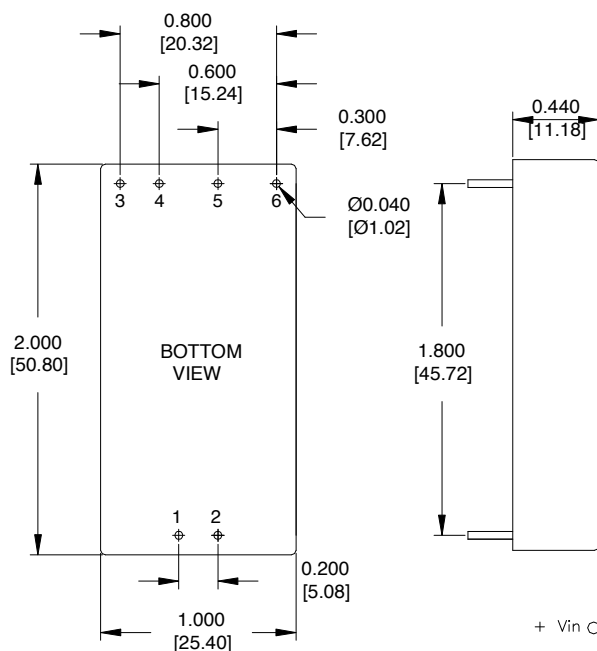
Input Voltage Range	18V-36VDC
Output Voltage Accuracy	Out1: 5V $\pm 2\%$ max., Out 2, 3: $\pm 5\%$ max.
Load Regulation	$\pm 2\%$
Line Regulation	$\pm 2\%$
Ripple & Noise	100mV p-p
Short Circuit Protection	Fold back

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	75% typical
Isolation Voltage	1000VDC
Operating Frequency	200KHz min.
Operating Temperature	-25°C to 71°C Based Temperature
Storage Temperature	-55°C to +100°C
Isolation Resistance	10^9 Ohms, min.
Weight	1.1 Oz. (32 grams)
Case Material	Black coated with non-conductive metal base

TDC10X SERIES SPECIFICATIONS

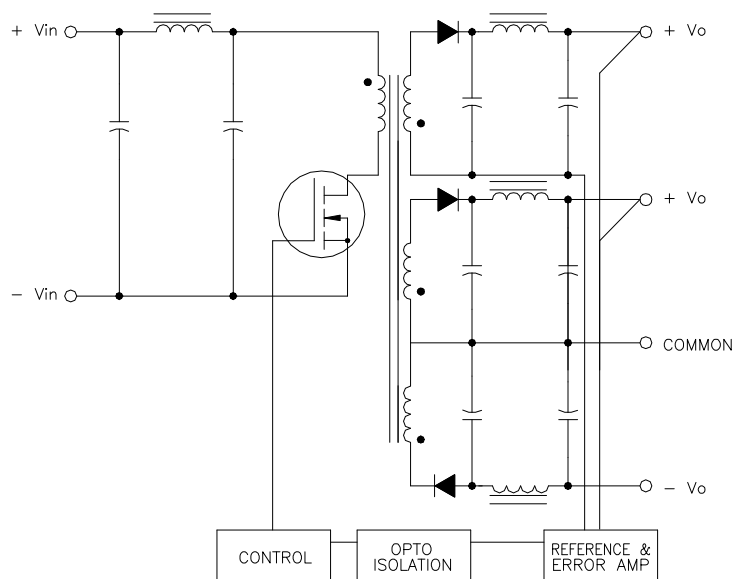
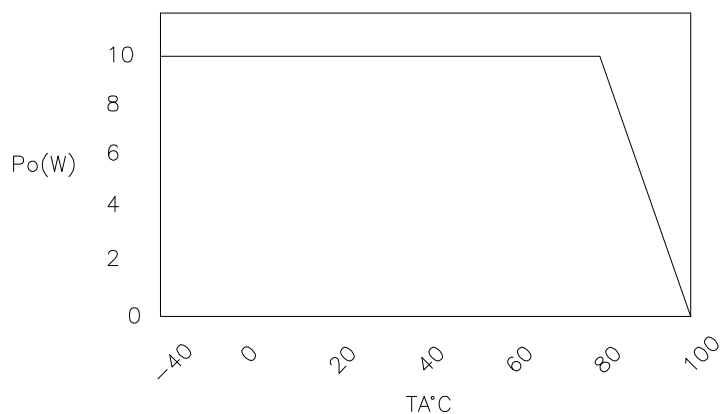
Model-Type	Input Voltage (VDC)	Output Voltage (VDC)			Output Current (mA)			Input Current (mA)		Eff. (%)	Isolation
		Out 1	Out 2	Out 3	Out 1	Out 2	Out 3	Full Load	No Load		
TDC10-24TO1	18-36	+5	+12	-12	1000	200	200	534	15	78	1000
TDC10-24TO2	18-36	+5	+15	-15	1000	160	160	534	15	78	1000
TDC10-24TO3	18-36	+5	+12	-5	1000	200	200	534	15	78	1000



Pin Connections

Pin	Triple
1	+Vin
2	-Vin
3	+Out 2
4	-Out 3
5	Common
6	+5/(1A Vout)

Power Derating Curve



TDC15 SERIES

15 Watt

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	100mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold back
Overload Protection	Build-in

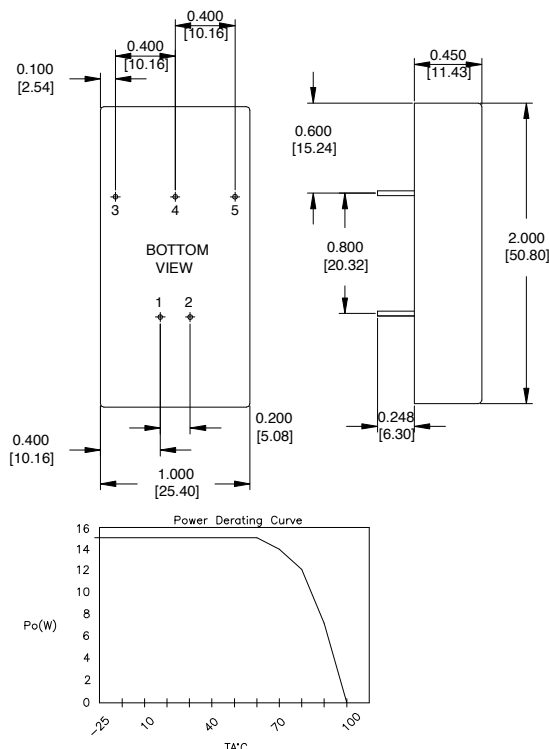
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	79 to 82% typical
Isolation Voltage	1500VDC
Operating Frequency	150KHz min.
Operating Temperature	-25°C to 70°C Based Temperature
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	1.5 Oz. (42 grams)
Case Material	Black coated with non-conductive metal base

TDC15 SERIES SPECIFICATIONS

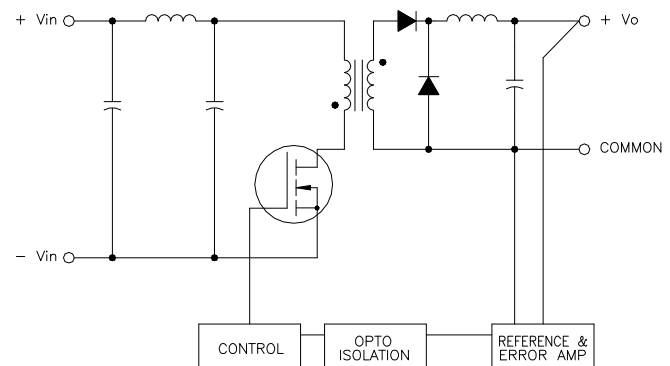
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDC15-1203S	9-18 (12)	50	1600	3.3	3000
TDC15-1205S		50	1600	5	3000
TDC15-1212S		50	1560	12	1250
TDC15-1215S		50	1560	15	1000
TDC15-1205D		50	1600	±5	±1500
TDC15-1212D		50	1560	±12	±625
TDC15-1215D		50	1560	±15	±500
TDC15-2403S	18-36 (24)	30	790	3.3	3000
TDC15-2405S		30	790	5	3000
TDC15-2412S		30	780	12	1250
TDC15-2415S		30	780	15	1000
TDC15-2405D		30	790	±5	±1500
TDC15-2412D		30	780	±12	±625
TDC15-2415D		30	780	±15	±500
TDC15-4803S	36-72 (48)	20	395	3.3	3000
TDC15-4805S		20	395	5	3000
TDC15-4812S		20	390	12	1250
TDC15-4815S		20	390	15	1000
TDC15-4805D		20	395	±5	±1500
TDC15-4812D		20	390	±12	±625
TDC15-4815D		20	390	±15	±500

S: Single Output D: Dual Output



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	+ Output	+ Output
4	No Pin	Common
5	- Output	- Output



TDC20 & TDC20X SERIES

20 Watt

DC-DC CONVERTER

2:1 and 4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulate
- 100% Burn-In and Triple Tested
- MTBF > 700,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	100mV p-p
Short Circuit Protection	Fold back

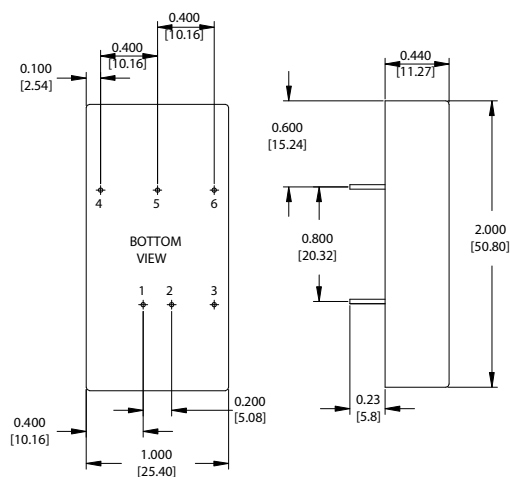
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	79 to 82% typical
Isolation Voltage	1500VDC
Operating Frequency	150KHz min.
Operating Temperature	-25°C to 71°C Based Temperature
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Weight	1.1 Oz. (32 grams)
Case Material	Black coated with non-conductive metal base

TDC20 SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDC20-1203S	9-18 (12)	35	1741	3.3	5000
TDC20-1205S		30	2110	5	4000
TDC20-1212S		30	2030	12	1660
TDC20-1215S		30	2030	15	1330
TDC20-1205D		30	2080	±5	±2000
TDC20-1212D		30	2015	±12	±830
TDC20-1215D		30	2030	±15	±660
TDC20-2403S	18-36 (24)	20	870	3.3	5000
TDC20-2405S		20	1055	5	4000
TDC20-2412S		20	1015	12	1660
TDC20-2415S		20	1015	15	1330
TDC20-2405D		20	1045	±5	±2000
TDC20-2412D		20	1015	±12	±830
TDC20-2415D		20	1015	±15	±660
TDC20-4803S	36-75 (48)	20	435	3.3	5000
TDC20-4805S		20	520	5	4000
TDC20-4812S		20	510	12	1660
TDC20-4815S		20	510	15	1330
TDC20-4805D		20	510	±5	±2000
TDC20-4812D		20	510	±12	±830
TDC20-4815D		20	570	±15	±660

S: Single Output D: Dual Output



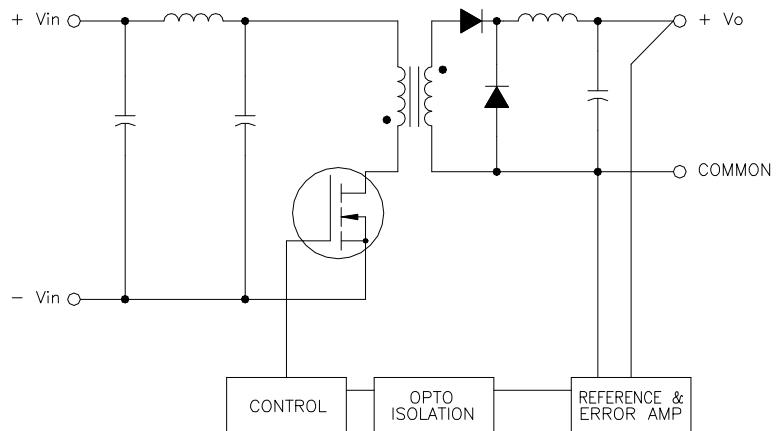
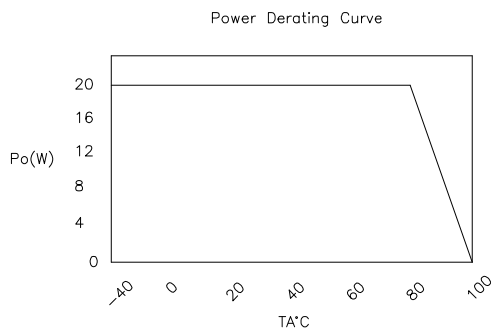
Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	Remote On/Off (On=OPEN, Off=-V _{in})	
4	+ Output	+ Output
5	Trim	Common
6	- Output	- Output

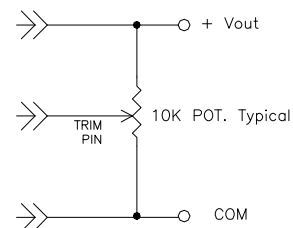
TDC20X SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
TDC20X-1203S	9-36 (12)	35	1763	3.3	5000
TDC20X-1205S		30	2130	5	4000
TDC20X-1209S		35	2109	9	2220
TDC20X-1212S		30	2075	12	1660
TDC20X-1215S		30	2075	15	1330
TDC20X-1212D		30	2075	±12	±830
TDC20X-1215D		30	2075	±15	±660
TDC20X-2403S	18-75 (24)	20	881	3.3	5000
TDC20X-2405S		20	1068	5	4000
TDC20X-2412S		20	1015	12	1660
TDC20X-2415S		20	1015	15	1330
TDC20X-2412D		20	1015	±12	±830
TDC20X-2415D		20	1015	±15	±660

S: Single Output D: Dual Output



TRIM NOTE:



962ZW SERIES

10 Watt Low Profile

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulated
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	± 1%
Load Regulation	Single ±1%, Dual ±2.5%
Line Regulation	±1%
Ripple & Noise	100mV p-p for 5V, 1% for other voltages, 50mV for 3.3V
Short Circuit Protection	Continuous
Overload Protection	All Output

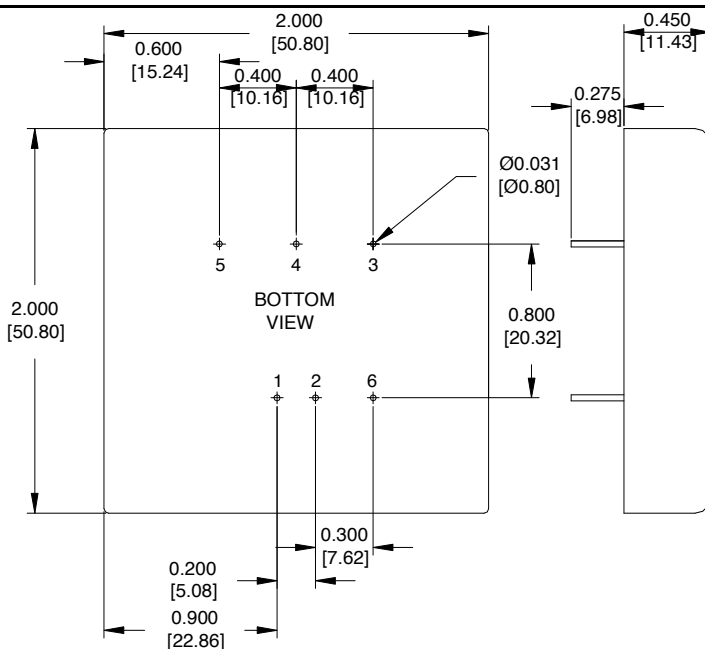
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	85% typical, 80% for 3.3V
Isolation Voltage	500VDC
Operating Frequency	100KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-40°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	2.4 Oz. (65 grams)
Case Material	Black coated with non-conductive metal base

962ZW SERIES SINGLE AND DUAL OUTPUT SPECIFICATIONS

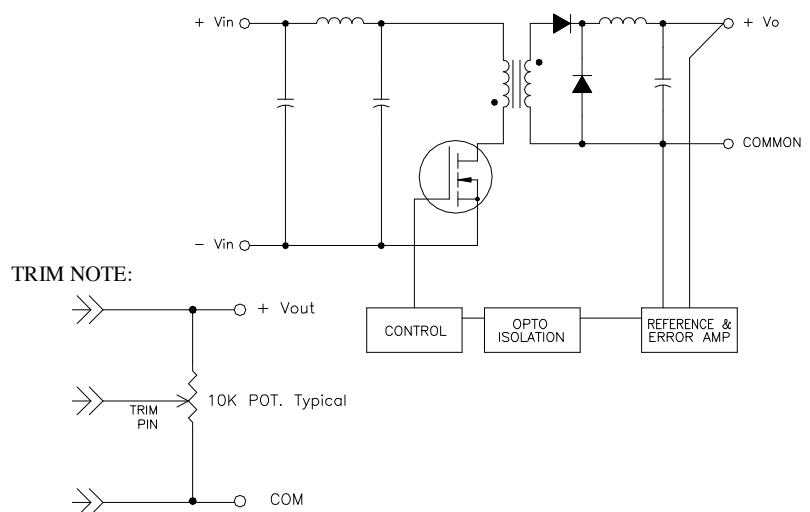
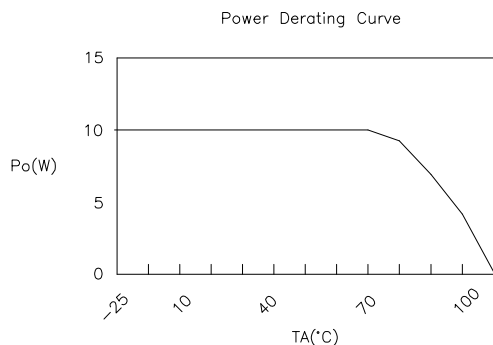
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
962ZW0503S	4.5-6.0 (5)	15	2666	3.3	3000
962ZW0505S		15	2666	5	2000
962ZW0512S		15	2562	12	800
962ZW0515S		15	2600	15	667
962ZW0505D		15	2666	±5	±1000
962ZW0512D		15	2666	±12	±400
962ZW0515D		15	2639	±15	±333
962ZW1203S	9-18 (12)	28	1031	3.3	3000
962ZW2403S	18-36 (24)	30	516	3.3	3000
962ZW4803S	36-72 (48)	32	255	3.3	3000

S: Single Output D: Dual Output



Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	- Output	- Output
4	Trim	Common
5	+ Output	+ Output
6	Remote On/Off (On=OPEN, Off=- Vin)	



972ZW SERIES

15 Watt Low Profile

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulated
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	Single & Dual $\pm 2\%$, Triple $+V_1$ & $-V_2 \pm 2\%$, $+V_3 \pm 3\%$
Load Regulation	Single & Dual $\pm 0.5\%$, Triple $\pm 2.5\%$
Line Regulation (Triple Output / Single Output)	Single & Dual $\pm 0.5\%$, Triple $\pm 1\%$
Ripple & Noise	100mV p-p for 5V, 1% for other voltages, 50mV for 3.3V
Short Circuit Protection	Fold back
Overload Protection	Build-in

GENERAL SPECIFICATIONS

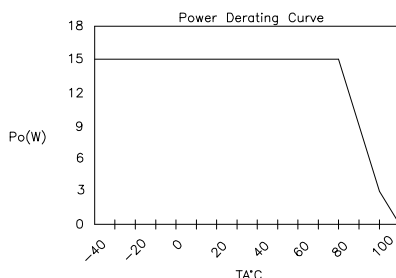
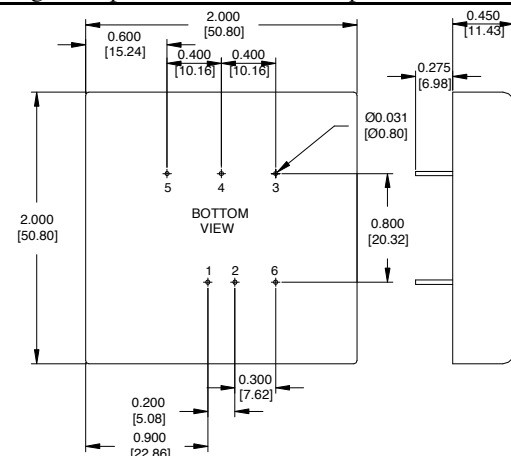
Efficiency (At Full Load)	Single & Dual 85% typical, Triple 80% typical
Isolation Voltage	1500VDC
Operating Frequency	150KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10^9 Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	Single & Dual 2.4 Oz. (65 grams), Triple 2.8 Oz. (79 grams)
Case Material	Black coated with non-conductive metal base

972ZW SERIES SPECIFICATIONS

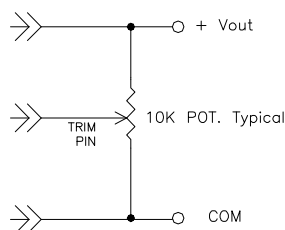
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
972ZW1203S	9-18 (12)	30	1563	3.3	3600
972ZW1205S		30	1563	5	3000
972ZW1212S		30	1563	12	1250
972ZW1215S		30	1563	15	1000
972ZW1205D		30	1563	±5	±1500
972ZW1212D		30	1563	±12	±625
972ZW1215D		30	1524	±15	±500
972ZW2403S	18-36 (24)	28	781	3.3	3600
972ZW2405S		28	781	5	3000
972ZW2412S		28	753	12	1250
972ZW2415S		28	753	15	1000
972ZW2405D		28	781	±5	±1500
972ZW2412D		28	753	±12	±625
972ZW2415D		28	753	±15	±500
972ZW4803S	36-72 (48)	25	381	3.3	3600
972ZW4805S		25	381	5	3000
972ZW4812S		25	372	12	1250
972ZW4815S		25	368	15	1000
972ZW4805D		25	381	±5	±1500
972ZW4812D		25	372	±12	±625
972ZW4815D		25	368	±15	±500

S: Single Output

D: Dual Output

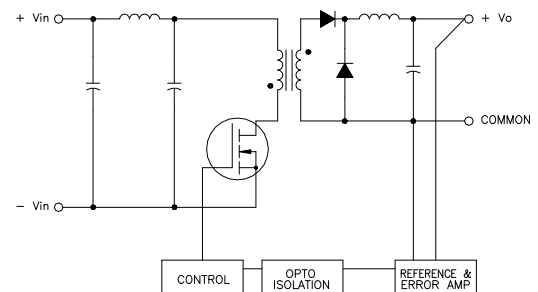


TRIM NOTE:



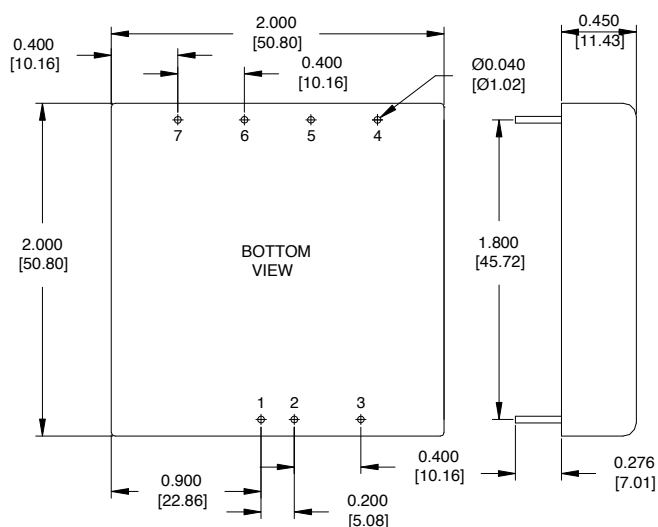
Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	- Output	- Output
4	Trim	Common
5	+ Output	+ Output
6	Remote On/Off (On=OPEN, Off=- Vin)	



972ZW SERIES SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
972ZW12T01	9-18 (12)	50	1518	+5 +12 -12	1500 310 310
972ZW12T02		50	1524	+5 +15 -12	1500 250 250
972ZW12T03		50	1394	+5 +12 -5	1500 310 500
972ZW24T01	18-36 (24)	55	750	+5 +12 -12	1500 310 310
972ZW24T02		55	753	+5 +15 -15	1500 250 250
972ZW24T03		55	699	+5 +12 -5	1500 310 500
972ZW48T01	36-72 (48)	55	375	+5 +12 -12	1500 310 310
972ZW48T02		55	375	+5 +15 -15	1500 250 250
972ZW48T03		55	344	+5 +12 -5	1500 310 500



Pin Connections

Pin	Function
1	+ Input
2	- Input
3	On/Off*
4	- Output
5	Common
6	+5V Output
7	+ Output
* (On=OPEN, Off=-Vin)	

972ZX SERIES

15 Watt Low Profile

DC-DC CONVERTER

4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulated
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	4:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	100mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold Back
Over Load Protection	Build-in

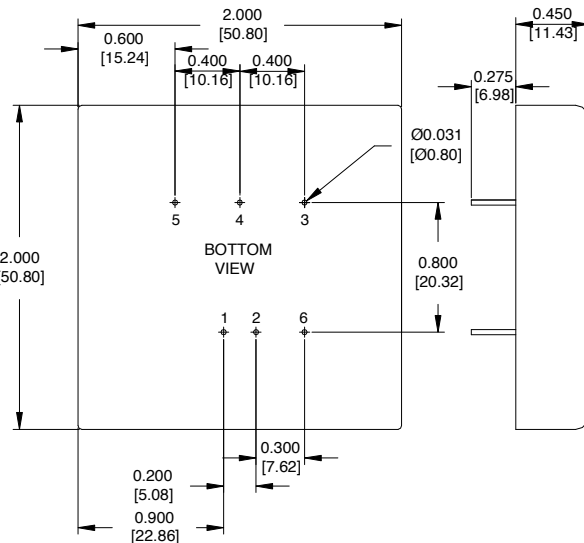
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	Single & Dual 80% typical
Isolation Voltage	1500VDC
Operating Frequency	150KHz min.
Operating Temperature	-25°C to +70°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	Single & Dual 2.4 Oz. (65 grams), Triple 2.8 Oz. (79 grams)
Case Material	Black coated with non-conductive metal base

972ZX SERIES SINGLE AND DUAL OUTPUT SPECIFICATIONS

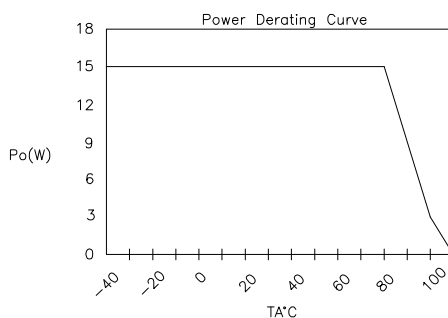
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
972ZX2405S	9-36 (24)	28	1563	5	3000
972ZX2412S		28	1563	12	1250
972ZX2415S		28	1563	15	1000
972ZX2405D		28	1524	±5	±1500
972ZX2412D		28	1563	±12	±625
972ZX2415D		28	1524	±15	±500
972ZX4805S	20-72 (48)	26	781	5	3000
972ZX4812S		26	753	12	1250
972ZX4815S		26	753	15	1000
972ZX4805D		26	781	±5	±1500
972ZX4812D		26	753	±12	±625
972ZX4815D		26	753	±15	±500

S: Single Output D: Dual Output

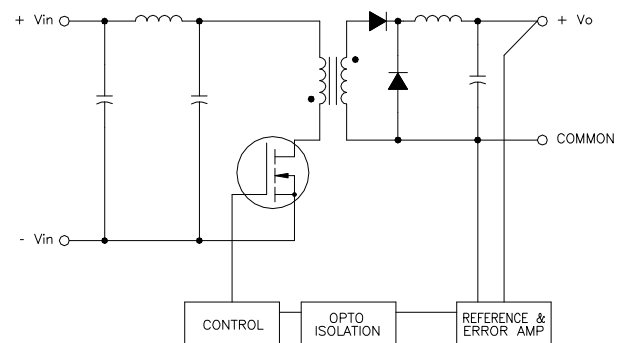
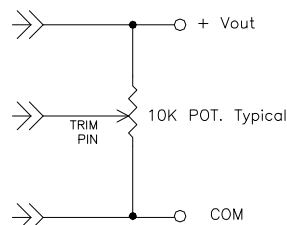


Pin Connections

Pin	Single	Dual
1	+ Input	+ Input
2	- Input	- Input
3	- Output	- Output
4	Trim	Common
5	+ Output	+ Output
6	Remote On/Off (On=OPEN, Off=- Vin)	



TRIM NOTE:



983ZW, 983ZX SERIES

25~30 Watt

DC-DC CONVERTER

2:1 & 4:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 700,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1, 4:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-Back
Overload Protection	Build-in

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	75% typical
Isolation Voltage	1500VDC
Operating Frequency	100KHz min.
Operating Temperature	-40°C to +71°C
Storage Temperature	-55°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	16 Oz. (454 grams)
Case Material	Black coated with non-conductive metal base

983ZW SERIES SINGLE AND DUAL OUTPUT SPECIFICATIONS

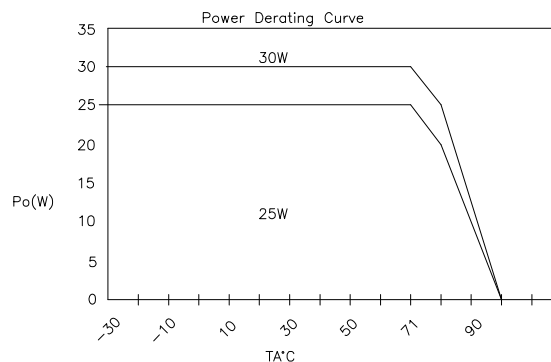
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
983ZW1205S	9-18 (12)	28	3333	5	6000
983ZW1209S		28	3333	9	3333
983ZW1212S		28	3333	12	2500
983ZW1215S		28	3333	15	2000
983ZW1224S		28	3333	24	1250
983ZW1205D		28	3333	±5	±2500
983ZW1212D		28	3333	±12	±1250
983ZW1215D		28	3333	±15	±1000
983ZW2405S	18-36 (24)	25	1667	5	6000
983ZW2409S		25	1667	9	3333
983ZW2412S		25	1667	12	2500
983ZW2415S		25	1667	15	2000
983ZW2424S		25	1667	24	1250
983ZW2405D		25	1667	±5	±2500
983ZW2412D		25	1667	±12	±1250
983ZW2415D		25	1667	±15	±1000
983ZW4805S	36-72 (48)	22	834	5	6000
983ZW4809S		22	834	9	3333
983ZW4812S		22	834	12	2500
983ZW4815S		22	834	15	2000
983ZW4824S		22	834	24	1250
983ZW4805D		22	834	±5	±2500
983ZW4812D		22	834	±12	±1250
983ZW4815D		22	834	±15	±1000

S: Single Output

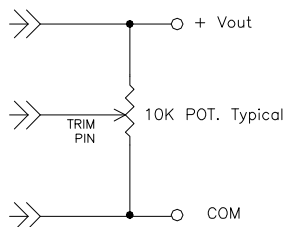
D: Dual Output

Pin Connections

Pin	Single	Dual	Triple
1	Remote On/Off (On=OPEN, Off=-Vin)		
2	N/C	N/C	N/C
3	-Vin	-Vin	-Vin
4	+Vin	+Vin	+Vin
5	N/C	+Vout	+Aux
6	+Vout	Common	+5V
7	-Vout	-Vout	Common
8	Trim	Trim	-Aux



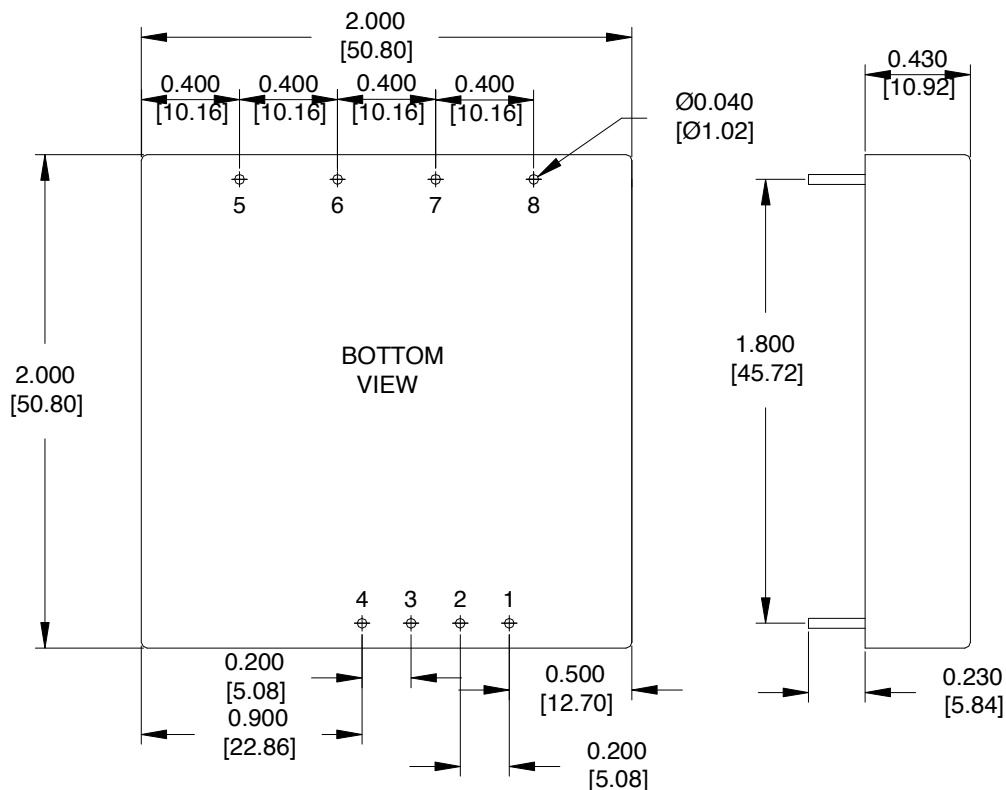
TRIM NOTE:



983ZX SERIES SINGLE AND DUAL OUTPUT SPECIFICATIONS

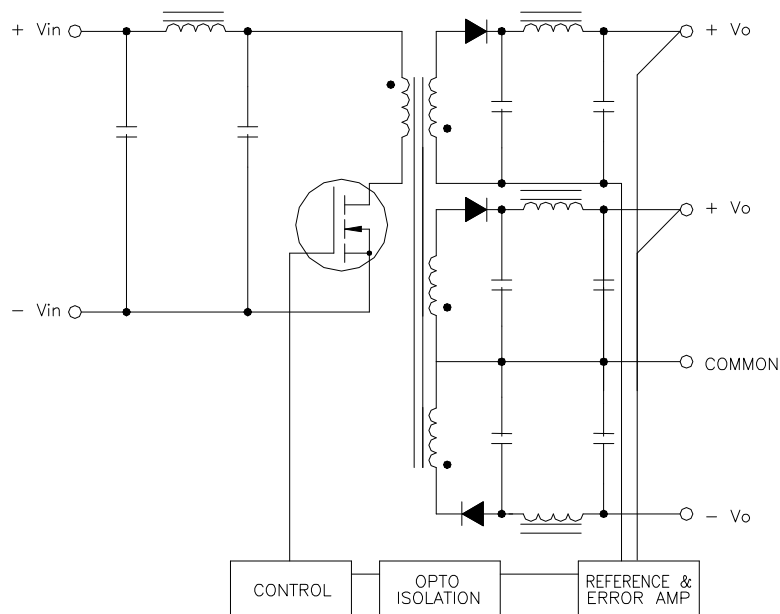
Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
983ZX2405S	9-36 (24)	25	1667	5	6000
983ZX2409S		25	1667	9	3333
983ZX2412S		25	1667	12	2500
983ZX2415S		25	1667	15	2000
983ZX2424S		25	1667	24	1250
983ZX2405D		25	1667	±5	±2500
983ZX2412D		25	1667	±12	±1250
983ZX2415D		25	1667	±15	±1000
983ZX4805S	18-72 (48)	22	834	5	6000
983ZX4809S		22	834	9	3333
983ZX4812S		22	834	12	2500
983ZX4815S		22	834	15	2000
983ZX4824S		22	834	24	1250
983ZX4805D		22	834	±5	±2500
983ZX4812D		22	834	±12	±1250
983ZX4815D		22	834	±15	±1000

S: Single Output D: Dual Output



983ZX SERIES TRIPLE OUTPUT SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
983ZX24T01	9-36 (24)	25	1667	+5 +12 -12	3500 310 310
983ZX24T02		25	1667	+5 +15 -15	3500 250 250
983ZX48T01	18-72 (48)	25	834	+5 +12 -12	3500 310 310
983ZX48T02		25	834	+5 +15 -15	3500 250 250



984ZW SERIES

40 Watt

DC-DC CONVERTER
 2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 700,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-Back
Overload Protection	Build-in

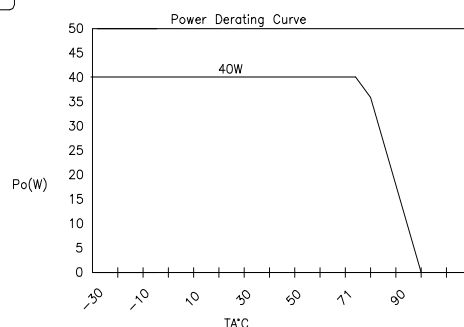
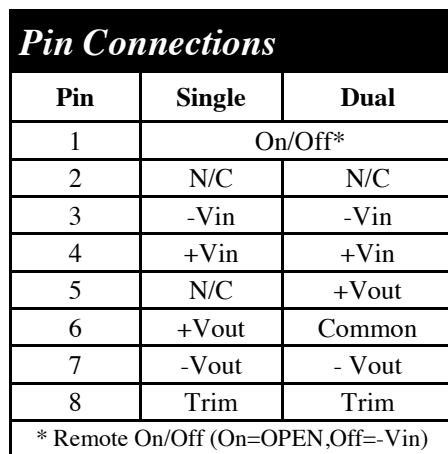
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	80% typical
Isolation Voltage	1500VDC
Operating Frequency	100KHz min.
Operating Temperature	-40°C to +71°C
Storage Temperature	-55°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	16 Oz. (454 grams)
Case Material	Black coated with non-conductive metal base



Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
984ZW1212S	9-18 (12)	28	3750	12	3000
984ZW1215S		28	3750	15	2400
984ZW1224S		28	3750	24	1500
984ZW1212D		28	3750	±12	±1500
984ZW1215D		28	3750	±15	±1200
984ZW2412S	18-36 (24)	25	1875	12	3000
984ZW2415S		25	1875	15	2400
984ZW2424S		25	1875	24	1667
984ZW2412D		25	1875	±12	±1650
984ZW2415D		25	1875	±15	±1300
984ZW4812S	36-72 (48)	22	938	12	3000
984ZW4815S		22	938	15	2400
984ZW4824S		22	938	24	1667
984ZW4812D		22	938	±12	±1650
984ZW4815D		22	938	±15	±1300

S: Single Output D: Dual Output



987ZW SERIES

60 Watt

DC-DC CONVERTER

2:1 Wide Range Input

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 700,000 Hours

APPLICATIONS

- Local Area Network
- Isolation Devices
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	2:1
Output Voltage Accuracy	±2%
Load Regulation	Single ±1%,
Line Regulation	±0.5%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-Back
Overload Protection	Build-in

GENERAL SPECIFICATIONS

Efficiency (At Full Load)	90% typical
Isolation Voltage	1500VDC
Operating Frequency	250KHz typ.
Operating Temperature	-40°C to +60°C (with derating)
Storage Temperature	-55°C to +100°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	16 Oz. (454 grams)
Case Material	Black coated with non-conductive metal base

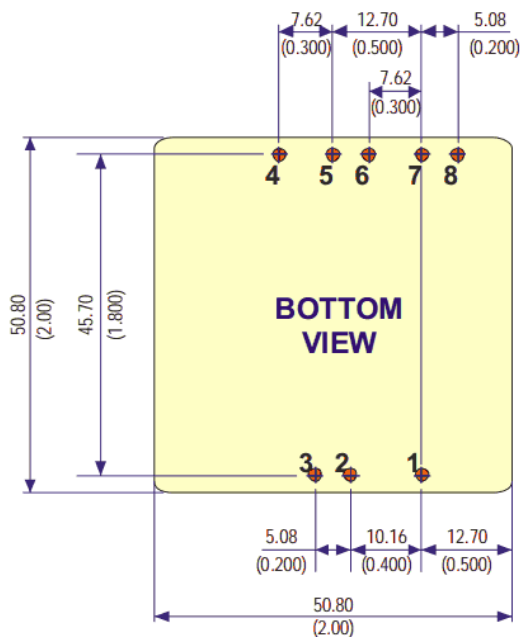
987ZW SERIES OUTPUT SPECIFICATIONS

Model-Type	Input Voltage (Vdc)	Input Current mA (typ)		Output Voltage (Vdc)	Output Current mA (max)
		No Load	Full Load		
987ZW1205S 987ZW1212S 987ZW1215S	9-18 (12)	- - -	6250 6250 6250	5 12 15	12000 5000 4000
987ZW2403S 987ZW2405S 987ZW2412S 987ZW2415S	18-36 (24)	- - - -	3125 3125 3125 3125	3.3 5 12 15	12000 12000 5000 4000
987ZW4803S 987ZW4805S 987ZW4812S 987ZW4815S	36-72 (48)	- - - -	1250 1250 1250 1250	3.3 5 12 15	12000 12000 5000 4000

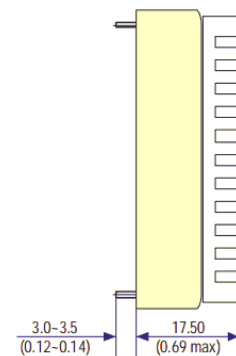
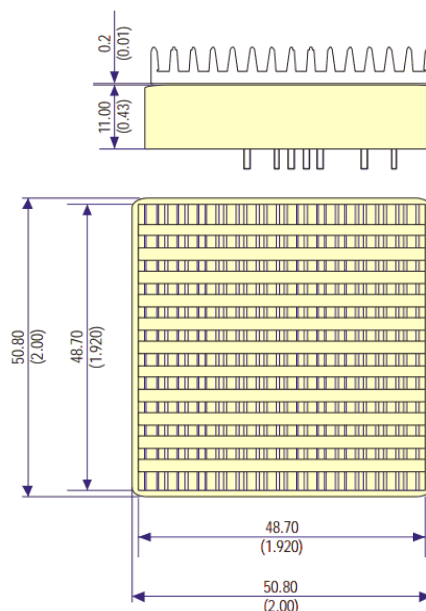
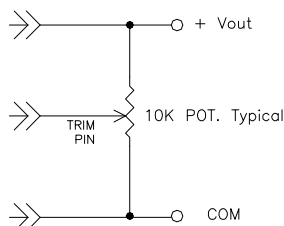
Pin Connections

Pin	Single
1	Remote On/Off*
2	-Vin
3	+Vin
4	-Sense
5	+Sense
6	+Vout
7	-Vout
8	Trim

* Remote On/Off (On=OPEN, Off=-Vin)



TRIM NOTE:



PL16 SERIES (Point Of Load)

16A Output 0.75-5.0VDC

DC-DC CONVERTER

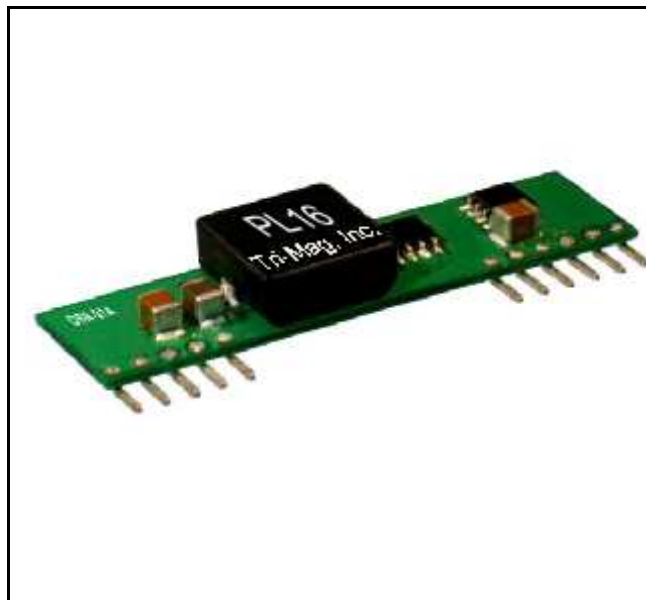
Non Isolated

FEATURES

- PCB Mountable
- High Stable Regulated Output
- Thermally Conductive Encapsulant
- 100% Burn-In and Triple Tested
- MTBF > 400,000 Hours

APPLICATIONS

- Local Area Network
- Telecommunications
- Industrial and Testing Equipment
- Battery-Powered Equipment
- Medical Equipment
- Distributed Power Equipment



ELECTRICAL SPECIFICATIONS

Input Voltage Range	8-14VDC
Output Voltage Accuracy	±2%
Load Regulation	±0.5%
Line Regulation	±0.5%
Ripple & Noise	50mV p-p for 5V, 1% for other voltages
Short Circuit Protection	Fold-Back
Overload Protection	Build-in

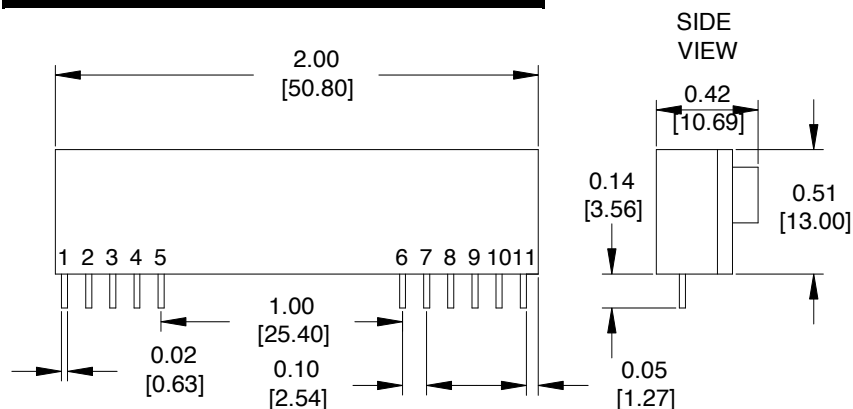
GENERAL SPECIFICATIONS

Efficiency (At Full Load)	80% min.
Isolation Voltage	Non-Isolated
Operating Frequency	300KHz
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +125°C
Isolation Resistance	10 ⁹ Ohms, min.
Reflected Ripple Current	20mA, typical
Weight	3.7 Oz. (105 grams)
Case Material	PCB

PL16 SERIES SPECIFICATIONS

Model-Type	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (A)	Input Current (mA)		Eff. (%)
				Full Load	No Load	
PL16	8-14	0.7525	16A	1210	40	80
	8-14	1.2	16A	1882	40	85
	8-14	1.5	16A	2270	49	88
	8-14	1.8	16A	2699	60	89
	8-14	2.0	16A	2965	60	90
	8-14	2.5	16A	2665	65	91
	8-14	3.3	16A	4730	75	93
	8-14	5.0	16A	7095	95	94

MECHANICAL



Pin Connections

Pin	Single
1	+Vout
2	+Vout
3	+Sense
4	+Vout
5	Common
6	Common
7	+Vin
8	+Vin
9	N/C
10	Trim
11	Remote on/off

Resistor Value for Output

Vout(V)	Rtrim(K Ω)
0.7525	Open
1.2	22.46
1.5	13.05
1.8	9.024
2.0	7.417
2.5	5.009
3.3	3.122
5.0	1.472

Remote On/Off Control Voltage

Output Power ON	Vin or Open
Output Power OFF	<0.4V

955ZW, ZX SERIES

15 Watt

956ZW, ZX SERIES

30 Watt

957ZW, ZW SERIES

30 Watt

958ZW, ZX SERIES

60 Watt

DC-DC CONVERTER

Metal Enclosed Type



DESCRIPTION

The 955ZW, 955ZX, 956ZW, 956ZX Series DC-DC multiple output converters operate over a wide range of input voltages while maintaining excellent output regulation. The power supplies are capable of withstanding simultaneous and continuous short-circuits across their output.

APPLICATIONS

- *Telecommunications*
- *Industrial and Testing Equipment*
- *Battery-Powered Equipment*
- *Medical Equipment*
- *Computer and Peripheral Equipment*
- *Distributed Power Systems*

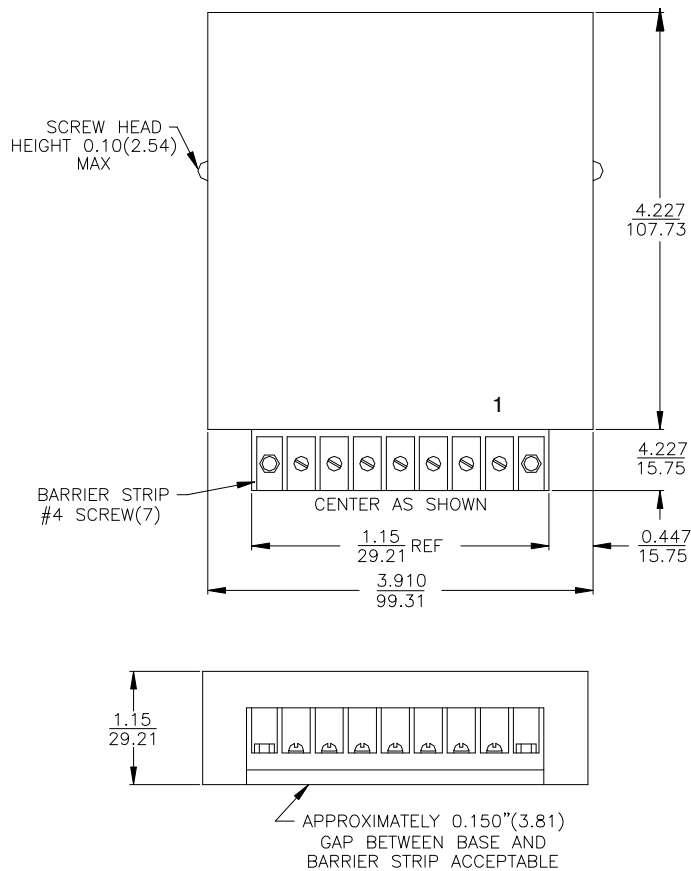
Electrical specification and general specification, please refer to specifications of the following series respectively.

955ZW (see 975ZW series) 956ZW (see 980ZW series) 957ZX (see 984ZX series) 958ZX (see 986ZX series)

Example

955ZW 1205S (Input 12V, Output 5V, 15 Watt)

956ZW 1205S (Input 12V, Output 5V, 30 Watt)

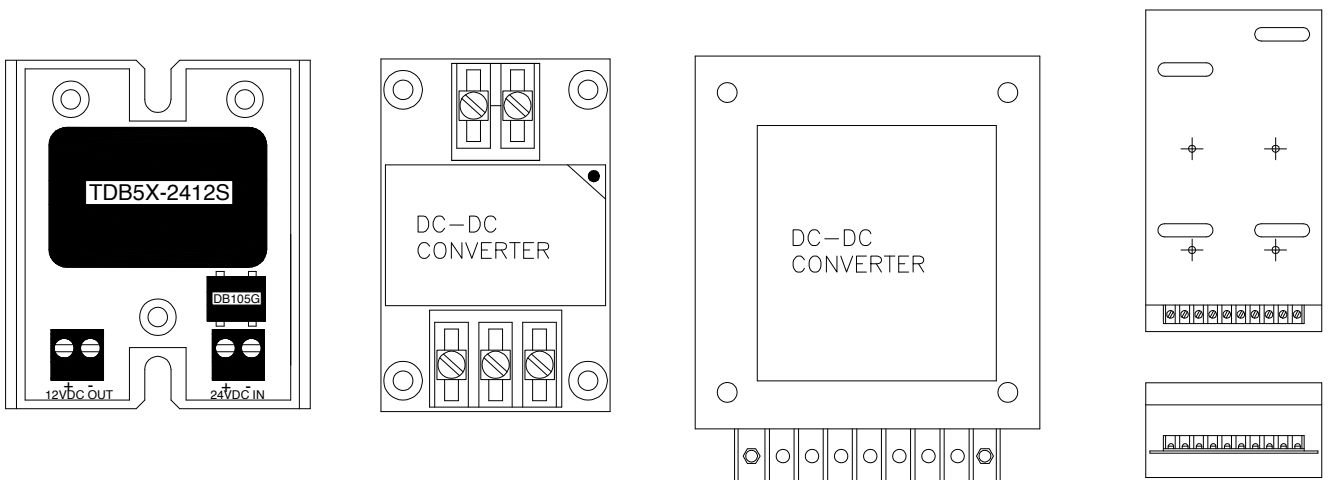


Pin Connections

Pin	Single	Dual	Triple
1	+Input	+Input	+Input
2	-Input	-Input	-Input
3	N/C	+Output	+Output
4	Trim	Common	Common
5	+Output	-Output	-Output
6	-Output	N/C	+5V Output
7	Remote On/Off control		

OTHER PACKAGE CONFIGURATION

All DC-DC Converters can be assembled in PC Board or Metal Enclosure with screw terminal.
 Please consult factory for part number and dimension.



CUSTOM AND SPECIAL PRODUCT QUOTATION

Date _____ Date Quotation Req'd _____

Name _____ Title _____

Company _____ Telephone _____

Address _____

City _____ State _____ Zip _____

PRODUCT TYPE:

☐ Mil Spec ☐ Switching Power Module ☐ Open-Frame Switcher ☐ Metal-Cased Switcher ☐ DC/DC Converter

ELECTRICAL SPECIFICATION:

<u>OUTPUT</u>	<u>TOL.</u>	<u>CURRENT</u>	<u>LOAD REG</u>	<u>RIPPLE</u>
1. _____ VDC	± _____ %	_____ Amps	_____ %	_____ mV P-P
2. _____ VDC	± _____ %	_____ Amps	_____ %	_____ mV P-P
3. _____ VDC	± _____ %	_____ Amps	_____ %	_____ mV P-P
4. _____ VDC	± _____ %	_____ Amps	_____ %	_____ mV P-P

Input Voltage/Frequency _____ Input Voltage Range _____

Efficiency %, F.L. _____ Input/Output Isolation _____

Back Ripple Current _____ Transient Response _____

 Output Protection: ☐ OVP ☐ Current Limit ☐ None ☐ Other _____

Operating Temp. Range (°C) _____ Storage Temp. Range (°C) _____

GENERAL SPECIFICATIONS:

 Dimension: L _____ W _____ H _____ ☐ Shielded ☐ Unshielded

Target price in Production Quantity _____ Production Quantity Required _____

Date First Prototype Required _____ Date First Production Qty. Req'd _____

End Product/Application _____ Other Information (Technical Requirements, Specifics, Competitive Models under Consideration, etc.) _____

Power Supply Testing Method and Conditions

Power Supply Testing Methods and Conditions

1. **+5V output is adjusted to +1% at rated load at factory.**
2. **Output Voltage Tolerance.** With nominal input voltage and 60% rated load for all output, the DC output voltage is measured with an accurate, calibrated DC Voltmeter. Output Voltage tolerance is the difference between the measured output voltage and specified nominal value in percent (%).
3. **Line Regulation.** Make and record the following measurements with rated output load at 25°C:
 1. Output voltage at nominal input line voltage.
 2. Output voltage at high line (input) voltage.
 3. Output voltage at low line (input) voltage.The line regulation is the maximum of the two deviations of output from the value at nominal input.
4. **Load Regulation.** Make and record the following measurements at nominal line voltage at 25°C:
 1. Output voltage with 60% rated load on the output to be measured. All other output set at rated load.
 2. Output voltage with +40% load change from 60% rated load. The load regulation is the difference between the two measured output voltage as a percent of output voltage at 60% rated load.
5. **Temperature Coefficient.** With the power supply in a temperature test chamber with rated output load, record the following measurements:
 1. Output voltage at 25°C ambient temperature.
 2. Adjust chamber for maximum operating temperature and allow the power supply to stabilize for 15 to 30 minutes, measure and record the output voltage.
 3. Adjust chamber for minimum operating temperature and allow the power supply to stabilize for 15 to 30 minutes, measure and record the output voltage.
 4. Divide each percentage voltage deviation from the 25°C ambient value by the corresponding temperature change from 25°C ambient.
6. **Output Ripple and Noise.** Output ripple and noise spike are measured with a 30MHz Bandwidth oscilloscope at the test point as follows:
 1. Directly at the output pins of the power supply without the use of the probe ground clip (See Fig. A).
 2. By using a 12 inch twisted pair of 16AWG copper wired and terminated with a 47 μ F capacitor of proper polarity and voltage rating. The oscilloscope probe ground lead should connect right to the ground ring on the probe and be as short as possible (See Fig. B).

Fig. A

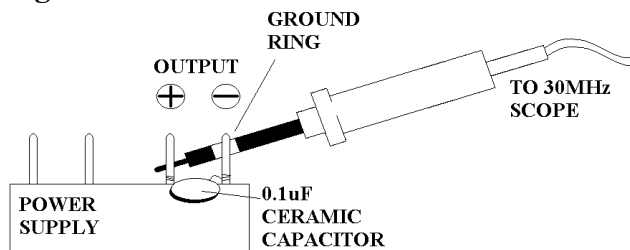
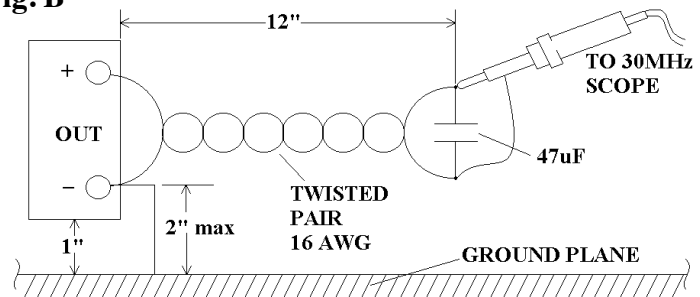
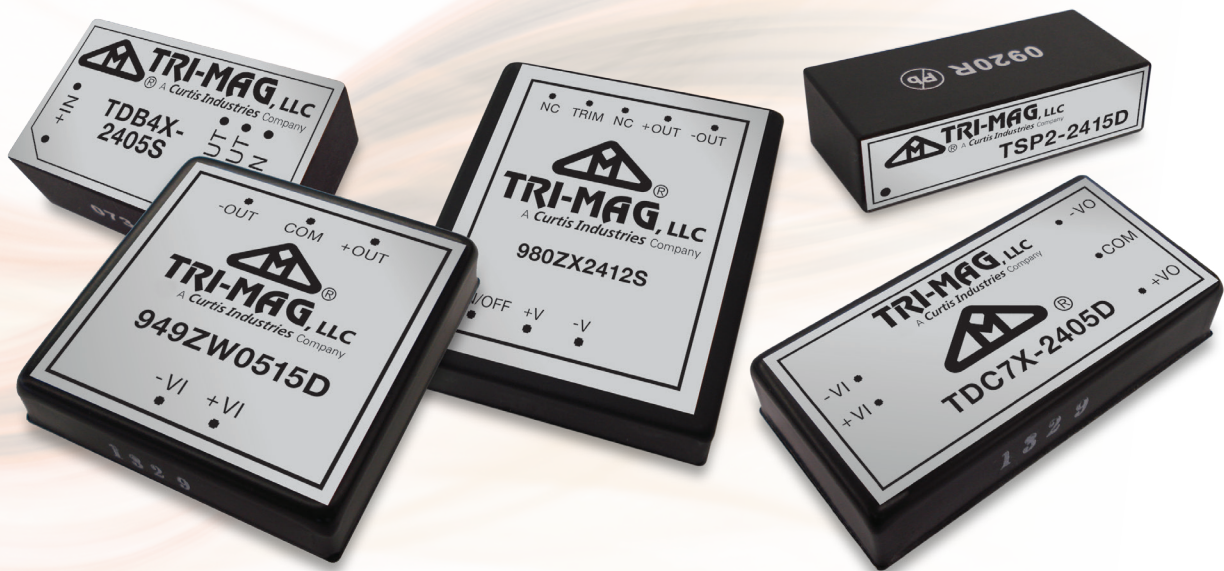


Fig. B



Innovative Engineering Solutions

- > Power Supplies
- > DC-DC Converters
- > EMI/RFI Filters
- > Filtered Power Entry Modules
- > Custom Filters
- > Terminal Blocks
- > Custom Terminal Blocks
- > Liquid Level Controllers



Your POWER Specialists



Tri-Mag, LLC
1601 N Clancy Court
Visalia, CA 93291
559-651-2222
www.tri-mag.com

Curtis Industries
2400 S 43rd Street
Milwaukee, WI 53219
800-657-0853
www.curtisind.com