



DVFL2800S Series

HIGH RELIABILITY HYBRID DC-DC CONVERTERS

DESCRIPTION

The DVFL series of high reliability DC-DC converters is operable over the full military (-55 °C to +125 °C) temperature range with no power derating. Unique to the DVFL series is a magnetic feedback circuit that is radiation immune. Operating at a nominal fixed frequency of 500 kHz, these regulated, isolated units utilize well-controlled undervoltage lockout circuitry to eliminate slow start-up problems. The current sharing function allows a maximum of five units to be connected in parallel to boost the total output power to 5 times. The output voltage is trimmable up to +10% or down -20%.

These converters are designed and manufactured in a facility qualified to ISO9001 and certified to MIL-PRF-38534 and MIL-STD-883.

This product may incorporate one or more of the following U.S. patents:

5,784,266
5,790,389
5,963,438
5,999,433
6,005,780
6,084,792
6,118,673

FEATURES

- High Reliability
- Parallel Up to 5 Units With Current Sharing
- Output Voltage Trim Up +10% or Down -20%
- Wide Input Voltage Range: 16 to 40 Volts per MIL-STD-704
- Up to 120 Watts Output Power
- Radiation Immune Magnetic Feedback Circuit
- NO Use of Optoisolators
- Undervoltage Lockout
- Indefinite Short Circuit Protection
- Current Limit Protection
- Industry Standard Pinout
- Input Transient Voltage: 50 Volts for 1 second
- Radiation Hardened Version Available
- Precision Seam Welded Hermetic Package
- High Power Density: > 80 W/in³
- Custom Versions Available
- Additional Environmental Screening Available
- Meets MIL-STD-461C and MIL-STD-461D EMC Requirements When Used With a DVME28 EMI Filter
- MIL-PRF-38534 Element Evaluated Components

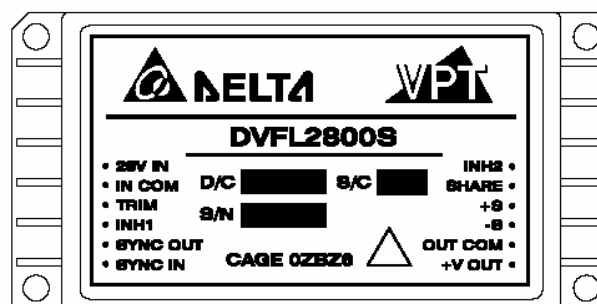


Figure 1 – DVFL2800S DC-DC Converter
(Not To Scale)

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|-------------|--------------------------------------|-----------------|
| Input Voltage (Continuous) | 40 V_{DC} | Junction Temperature Rise to Case | +15°C |
| Input Voltage (Transient, 1 second) | 50 Volts | Storage Temperature | -65°C to +150°C |
| Output Power ¹ | 120 Watts | Lead Solder Temperature (10 seconds) | 270°C |
| Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$) | 41 Watts | Weight (Maximum) (No Pin Extensions) | 86 Grams |

| Parameter | Conditions | DVFL283R3S | | | DVFL2805S | | | Units |
|--|--|------------|------|-------|-----------|------|-------|-------------------|
| | | Min | Typ | Max | Min | Typ | Max | |
| STATIC | | | | | | | | |
| INPUT Voltage ⁴ | Continuous | 16 | 28 | 40 | 16 | 28 | 40 | V |
| | Transient, 1 sec | - | - | 50 | - | - | 50 | V |
| Current | Inhibited 1 | - | - | 6 | - | - | 6 | mA |
| | Inhibited 2 | - | - | 70 | - | - | 70 | mA |
| | No Load | - | - | 120 | - | - | 120 | mA |
| Ripple Current | Full Load, 20Hz to 10MHz | - | - | 80 | - | - | 80 | mA _{p-p} |
| INH1 Pin Input ⁴ | | 0 | - | 1.5 | 0 | - | 1.5 | V |
| INH2 Pin Input ⁴ | | 0 | - | 1.0 | 0 | - | 1.0 | V |
| INH1 Pin Open Circuit Voltage ⁴ | | 10.5 | - | 13.5 | 10.5 | - | 13.5 | V |
| INH2 Pin Open Circuit Voltage ⁴ | | 5.0 | - | 8.0 | 5.0 | - | 8.0 | V |
| UVLO Turn On | | 14.5 | - | 16.0 | 14.5 | - | 16.0 | V |
| UVLO Turn Off ⁴ | | 14.0 | - | 15.5 | 14.0 | - | 15.5 | V |
| OUTPUT Voltage | V_{OUT} $T_{CASE} = 25^{\circ}\text{C}$ | 3.267 | 3.30 | 3.333 | 4.95 | 5.00 | 5.05 | V |
| | V_{OUT} $T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ | 3.25 | 3.30 | 3.35 | 4.925 | 5.00 | 5.075 | V |
| Power | | 0 | - | 66 | 0 | - | 100 | W |
| Current | V_{OUT} | - | - | 20 | - | - | 20 | A |
| Ripple Voltage | V_{OUT} Full Load, 20Hz to 10MHz | - | - | 80 | - | - | 80 | mV _{p-p} |
| Line Regulation | V_{OUT} $V_{IN} = 16\text{V}$ to 40V | - | - | 20 | - | - | 20 | mV |
| Load Regulation | V_{OUT} No Load to Full Load | - | - | 80 | - | - | 100 | mV |
| Voltage Trim ⁴ | V_{OUT} Full Load | -10 | - | 10 | -20 | - | 10 | % |
| Share Pin Voltage ⁴ | | 2.0 | - | 3.0 | 2.0 | - | 3.0 | V |
| EFFICIENCY | | 68 | - | - | 72 | - | - | % |
| LOAD FAULT POWER DISSIPATION | Overload ⁴ | - | - | 80 | - | - | 80 | W |
| | Short Circuit | - | - | 80 | - | - | 80 | W |
| CAPACITIVE LOAD ⁴ | | - | - | 1000 | - | - | 1000 | μF |
| SWITCHING FREQUENCY | | 425 | 500 | 600 | 425 | 500 | 600 | kHz |
| SYNC FREQUENCY RANGE | $V_H - V_L = 5\text{V}$ Duty Cycle = 20% - 80% | 500 | - | 600 | 500 | - | 600 | kHz |
| ISOLATION | 500 V_{DC} | 100 | - | - | 100 | - | - | M Ω |
| MTBF (MIL-HDBK-217F) | AIF @ $T_C = 55^{\circ}\text{C}$ | - | 400 | - | - | 400 | - | kHrs |

Notes: 1. Dependant on output voltage. 2. Time for output voltage to settle within 1% of its nominal value.
3. Derate linearly to 0 at 135°C. 4. Verified by qualification testing.

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|-------------|--------------------------------------|-----------------|
| Input Voltage (Continuous) | 40 V_{DC} | Junction Temperature Rise to Case | +15°C |
| Input Voltage (Transient, 1 second) | 50 Volts | Storage Temperature | -65°C to +150°C |
| Output Power ¹ | 120 Watts | Lead Solder Temperature (10 seconds) | 270°C |
| Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$) | 41 Watts | Weight (Maximum) (No Pin Extensions) | 86 Grams |

| Parameter | Conditions | DVFL283R3S | | | DVFL2805S | | | Units | |
|---|------------|---------------------------------------|-----|-----|-----------|-----|-----|-------|------------------|
| | | Min | Typ | Max | Min | Typ | Max | | |
| DYNAMIC | | | | | | | | | |
| Load Step Output Transient | V_{OUT} | Half Load to Full Load | - | - | 400 | - | - | 400 | mV _{PK} |
| Load Step Recovery ² | | | - | - | 500 | - | - | 500 | μSec |
| Line Step Output Transient ⁴ | V_{OUT} | $V_{IN} = 16\text{V}$ to 40V | - | 300 | 600 | - | 300 | 600 | mV _{PK} |
| Line Step Recovery ^{2, 4} | | | - | 300 | 500 | - | 300 | 500 | μSec |
| Turn On Delay | V_{OUT} | $V_{IN} = 0\text{V}$ to 28V | - | - | 20 | - | - | 20 | mSec |
| Turn On Overshoot | | | - | - | 15 | - | - | 25 | mV _{PK} |

- Notes: 1. Dependant on output voltage. 2. Time for output voltage to settle within 1% of its nominal value.
 3. Derate linearly to 0 at 135°C. 4. Verified by qualification testing.

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|-------------|--------------------------------------|-----------------|
| Input Voltage (Continuous) | 40 V_{DC} | Junction Temperature Rise to Case | +15°C |
| Input Voltage (Transient, 1 second) | 50 Volts | Storage Temperature | -65°C to +150°C |
| Output Power ¹ | 120 Watts | Lead Solder Temperature (10 seconds) | 270°C |
| Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$) | 41 Watts | Weight (Maximum) (No Pin Extensions) | 86 Grams |

| Parameter | Conditions | DVFL2812S | | | DVFL2815S | | | Units |
|--|--|-----------|-------|-------|-----------|-------|--------|-------------------|
| | | Min | Typ | Max | Min | Typ | Max | |
| STATIC | | | | | | | | |
| INPUT Voltage ⁴ | Continuous | 16 | 28 | 40 | 16 | 28 | 40 | V |
| | Transient, 1 sec | - | - | 50 | - | - | 50 | V |
| Current | Inhibited 1 | - | - | 6 | - | - | 6 | mA |
| | Inhibited 2 | - | - | 70 | - | - | 70 | mA |
| | No Load | - | - | 120 | - | - | 120 | mA |
| Ripple Current | Full Load, 20Hz to 10MHz | - | - | 80 | - | - | 80 | mA _{p-p} |
| INH1 Pin Input ⁴ | | 0 | - | 1.5 | 0 | - | 1.5 | V |
| INH2 Pin Input ⁴ | | 0 | - | 1.0 | 0 | - | 1.0 | V |
| INH1 Pin Open Circuit Voltage ⁴ | | 10.5 | - | 13.5 | 10.5 | - | 13.5 | V |
| INH2 Pin Open Circuit Voltage ⁴ | | 5.0 | - | 8.0 | 5.0 | - | 8.0 | V |
| UVLO Turn On | | 14.5 | - | 16.0 | 14.5 | - | 16.0 | V |
| UVLO Turn Off ⁴ | | 14.0 | - | 15.5 | 14.0 | - | 15.5 | V |
| OUTPUT Voltage | V_{OUT} $T_{CASE} = 25^{\circ}\text{C}$ | 11.88 | 12.00 | 12.12 | 14.85 | 15.00 | 15.15 | V |
| | V_{OUT} $T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ | 11.82 | 12.00 | 12.18 | 14.775 | 15.00 | 15.225 | V |
| Power | | - | - | 110 | - | - | 120 | W |
| Current | V_{OUT} | - | - | 9.2 | - | - | 8.0 | A |
| Ripple Voltage | V_{OUT} Full Load, 20Hz to 10MHz | - | - | 80 | - | - | 80 | mV _{p-p} |
| Line Regulation | V_{OUT} $V_{IN} = 16\text{V}$ to 40V | - | - | 20 | - | - | 20 | mV |
| Load Regulation | V_{OUT} No Load to Full Load | - | - | 120 | - | - | 120 | mV |
| Voltage Trim ⁴ | V_{OUT} Full Load | -20 | - | 10 | -20 | - | 10 | % |
| Share Pin Voltage ⁴ | | 2.0 | - | 3.0 | 2.0 | - | 3.0 | V |
| EFFICIENCY | | 79 | - | - | 80 | - | - | % |
| LOAD FAULT POWER DISSIPATION | Overload ⁴ | - | - | 80 | - | - | 80 | W |
| | Short Circuit | - | - | 80 | - | - | 80 | W |
| CAPACITIVE LOAD ⁴ | | - | - | 500 | - | - | 500 | μF |
| SWITCHING FREQUENCY | | 425 | 500 | 600 | 425 | 500 | 600 | kHz |
| SYNC FREQUENCY RANGE | $V_H - V_L = 5\text{V}$ Duty Cycle = 20% - 80% | 500 | - | 600 | 500 | - | 600 | kHz |
| ISOLATION | 500 V_{DC} | 100 | - | - | 100 | - | - | M Ω |
| MTBF (MIL-HDBK-217F) | AIF @ $T_C = 55^{\circ}\text{C}$ | - | 400 | - | - | 400 | - | kHrs |

Notes: 1. Dependant on output voltage. 2. Time for output voltage to settle within 1% of its nominal value.
3. Derate linearly to 0 at 135°C. 4. Verified by qualification testing.

SPECIFICATIONS ($T_{CASE} = -55^{\circ}C$ to $+125^{\circ}C$, $V_{IN} = +28V \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

| | | | |
|--|-------------|--------------------------------------|-----------------|
| Input Voltage (Continuous) | 40 V_{DC} | Junction Temperature Rise to Case | +15°C |
| Input Voltage (Transient, 1 second) | 50 Volts | Storage Temperature | -65°C to +150°C |
| Output Power ¹ | 120 Watts | Lead Solder Temperature (10 seconds) | 270°C |
| Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}C$) | 41 Watts | Weight (Maximum) (No Pin Extensions) | 86 Grams |

| Parameter | Conditions | DVFL2812S | | | DVFL2815S | | | Units | |
|---|------------|-------------------------|-----|-----|-----------|-----|-----|-------|------------------|
| | | Min | Typ | Max | Min | Typ | Max | | |
| DYNAMIC | | | | | | | | | |
| Load Step Output Transient | V_{OUT} | Half Load to Full Load | - | - | 800 | - | - | 800 | mV _{PK} |
| Load Step Recovery ² | | | - | - | 500 | - | - | 500 | μSec |
| Line Step Output Transient ⁴ | V_{OUT} | $V_{IN} = 16V$ to $40V$ | - | 600 | 1200 | - | 600 | 1200 | mV _{PK} |
| Line Step Recovery ^{2, 4} | | | - | 300 | 500 | - | 300 | 500 | μSec |
| Turn On Delay | V_{OUT} | $V_{IN} = 0V$ to $28V$ | - | - | 20 | - | - | 20 | mSec |
| Turn On Overshoot | | | - | - | 50 | - | - | 50 | mV _{PK} |

- Notes: 1. Dependant on output voltage. 2. Time for output voltage to settle within 1% of its nominal value.
 3. Derate linearly to 0 at 135°C. 4. Verified by qualification testing.

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|-------------|--------------------------------------|-----------------|
| Input Voltage (Continuous) | 40 V_{DC} | Junction Temperature Rise to Case | +15°C |
| Input Voltage (Transient, 1 second) | 50 Volts | Storage Temperature | -65°C to +150°C |
| Output Power ¹ | 120 Watts | Lead Solder Temperature (10 seconds) | 270°C |
| Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$) | 41 Watts | Weight (Maximum) (No Pin Extensions) | 86 Grams |

| Parameter | Conditions | DVFL285R2S | | | Units |
|--|--|------------|------|-------|-------------------|
| | | Min | Typ | Max | |
| STATIC | | | | | |
| INPUT Voltage ⁴ | Continuous | 16 | 28 | 40 | V |
| | Transient, 1 sec | - | - | 50 | V |
| Current | Inhibited 1 | - | - | 6 | mA |
| | Inhibited 2 | - | - | 70 | mA |
| | No Load | - | - | 120 | mA |
| Ripple Current | Full Load, 20Hz to 10MHz | - | - | 80 | mA _{p-p} |
| INH1 Pin Input ⁴ | | 0 | - | 1.5 | V |
| INH2 Pin Input ⁴ | | 0 | - | 1.0 | V |
| INH1 Pin Open Circuit Voltage ⁴ | | 10.5 | - | 13.5 | V |
| INH2 Pin Open Circuit Voltage ⁴ | | 5.0 | - | 8.0 | V |
| UVLO Turn On | | 14.5 | - | 16.0 | V |
| UVLO Turn Off ⁴ | | 14.0 | - | 15.5 | V |
| OUTPUT Voltage | V_{OUT} $T_{CASE} = 25^{\circ}\text{C}$ | 5.148 | 5.20 | 5.252 | V |
| | V_{OUT} $T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ | 5.122 | 5.20 | 5.278 | V |
| Power | | - | - | 100 | W |
| Current | V_{OUT} | - | - | 19.2 | A |
| Ripple Voltage | V_{OUT} Full Load, 20Hz to 10MHz | - | - | 80 | mV _{p-p} |
| Line Regulation | V_{OUT} $V_{IN} = 16\text{V}$ to 40V | - | - | 20 | mV |
| Load Regulation | V_{OUT} No Load to Full Load | - | - | 100 | mV |
| Voltage Trim ⁴ | V_{OUT} Full Load | -20 | - | 10 | % |
| Share Pin Voltage ⁴ | | 2.0 | - | 3.0 | V |
| EFFICIENCY | | 72 | - | - | % |
| LOAD FAULT POWER DISSIPATION | Overload ⁴ | - | - | 80 | W |
| | Short Circuit | - | - | 80 | W |
| CAPACITIVE LOAD ⁴ | | - | - | 1000 | μF |
| SWITCHING FREQUENCY | | 425 | 500 | 600 | kHz |
| SYNC FREQUENCY RANGE | $V_H - V_L = 5\text{V}$ Duty Cycle = 20% - 80% | 500 | - | 600 | kHz |
| ISOLATION | 500 V_{DC} | 100 | - | - | M Ω |
| MTBF (MIL-HDBK-217F) | AIF @ $T_c = 55^{\circ}\text{C}$ | - | 400 | - | kHrs |

Notes: 1. Dependant on output voltage. 2. Time for output voltage to settle within 1% of its nominal value.
3. Derate linearly to 0 at 135°C. 4. Verified by qualification testing.

SPECIFICATIONS ($T_{CASE} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $V_{IN} = +28\text{V} \pm 5\%$, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|-------------|--------------------------------------|-----------------|
| Input Voltage (Continuous) | 40 V_{DC} | Junction Temperature Rise to Case | +15°C |
| Input Voltage (Transient, 1 second) | 50 Volts | Storage Temperature | -65°C to +150°C |
| Output Power ¹ | 120 Watts | Lead Solder Temperature (10 seconds) | 270°C |
| Power Dissipation (Full Load, $T_{CASE} = +125^{\circ}\text{C}$) | 41 Watts | Weight (Maximum) (No Pin Extensions) | 86 Grams |

| Parameter | Conditions | DVFL285R2S | | | Units | |
|---|------------|---------------------------------------|-----|-----|-------|------------------|
| | | Min | Typ | Max | | |
| DYNAMIC | | | | | | |
| Load Step Output Transient | V_{OUT} | Half Load to Full Load | - | - | 400 | mV_{PK} |
| Load Step Recovery ² | | | - | - | 500 | μSec |
| Line Step Output Transient ⁴ | V_{OUT} | $V_{IN} = 16\text{V}$ to 40V | - | 300 | 600 | mV_{PK} |
| Line Step Recovery ^{2, 4} | | | - | 300 | 500 | μSec |
| Turn On Delay | V_{OUT} | $V_{IN} = 0\text{V}$ to 28V | - | - | 20 | mSec |
| Turn On Overshoot | | | - | - | 25 | mV_{PK} |

Notes: 1. Dependant on output voltage. 2. Time for output voltage to settle within 1% of its nominal value.
 3. Derate linearly to 0 at 135°C. 4. Verified by qualification testing.

BLOCK DIAGRAM

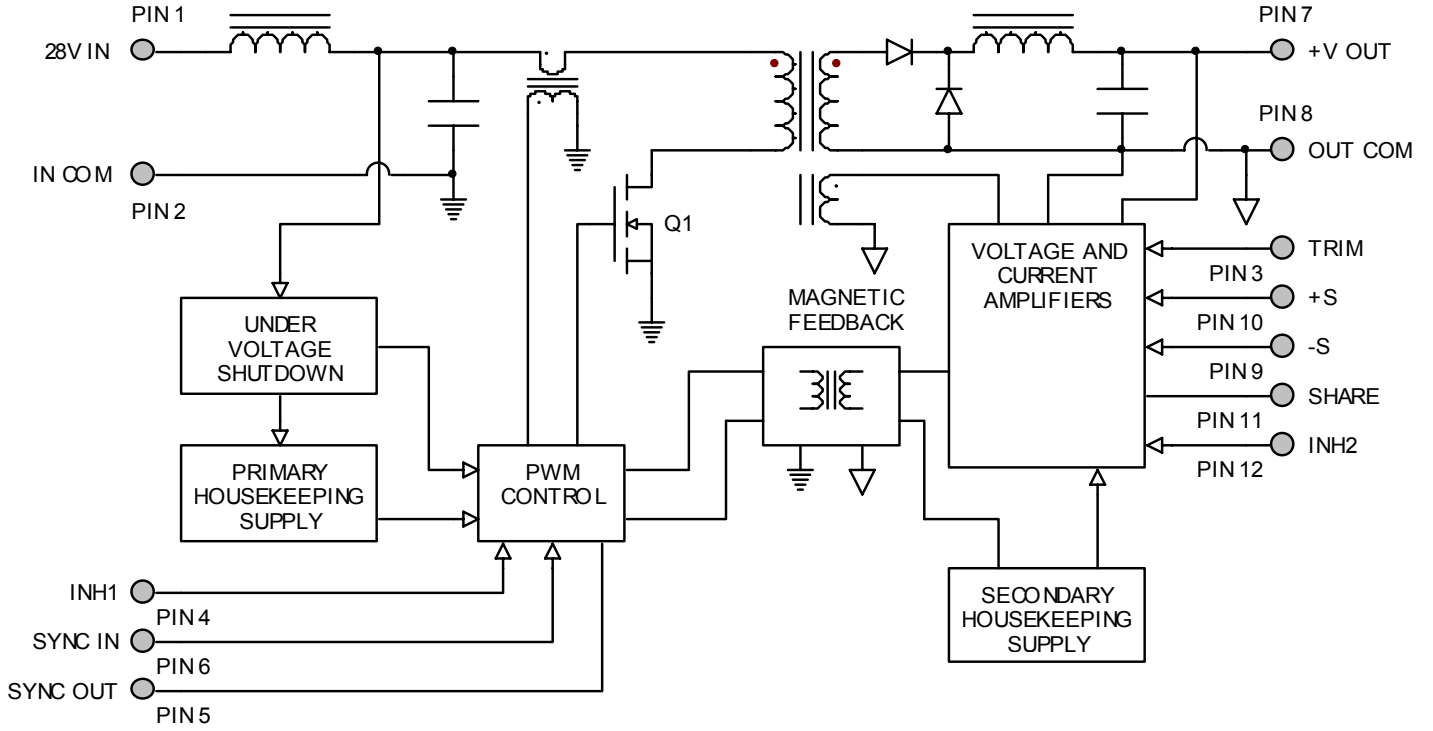


Figure 2

CONNECTION DIAGRAM

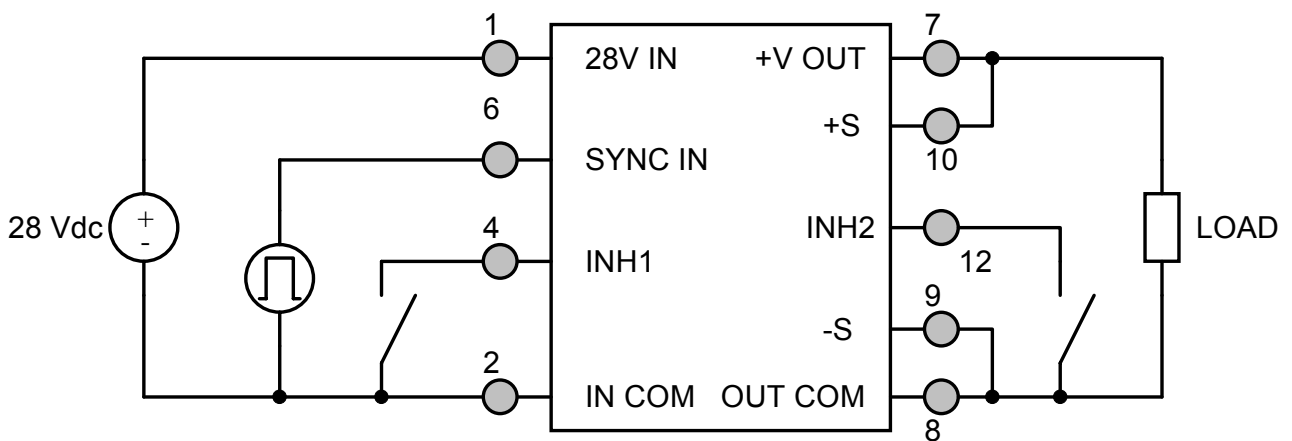


Figure 3

INHIBIT DRIVE CONNECTION DIAGRAM

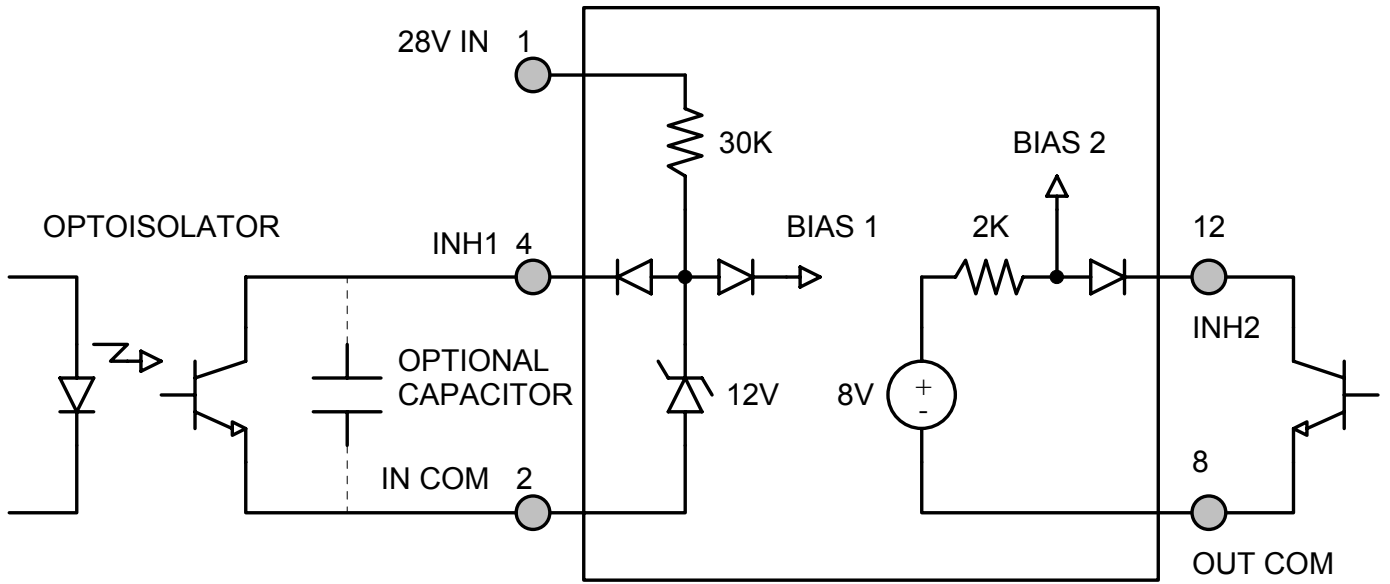


Figure 4 – Isolated Inhibit Drive and Internal Equivalent Circuit
(Shown with optional capacitor for turn-on delay)

EMI FILTER HOOKUP DIAGRAM

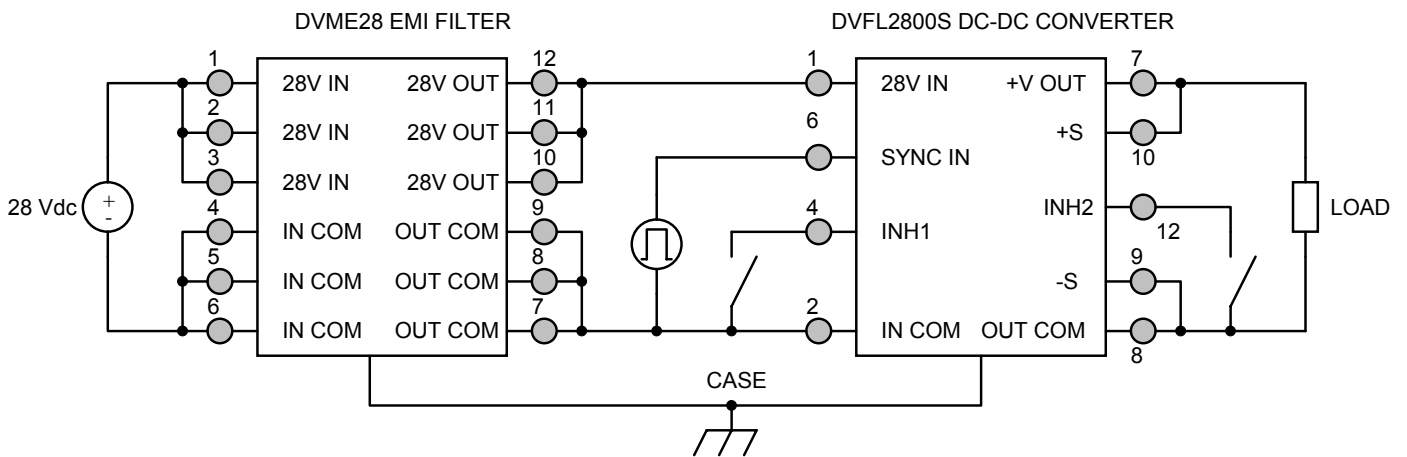


Figure 5 – Converter with EMI Filter

PARALLEL CONNECTION DIAGRAMS

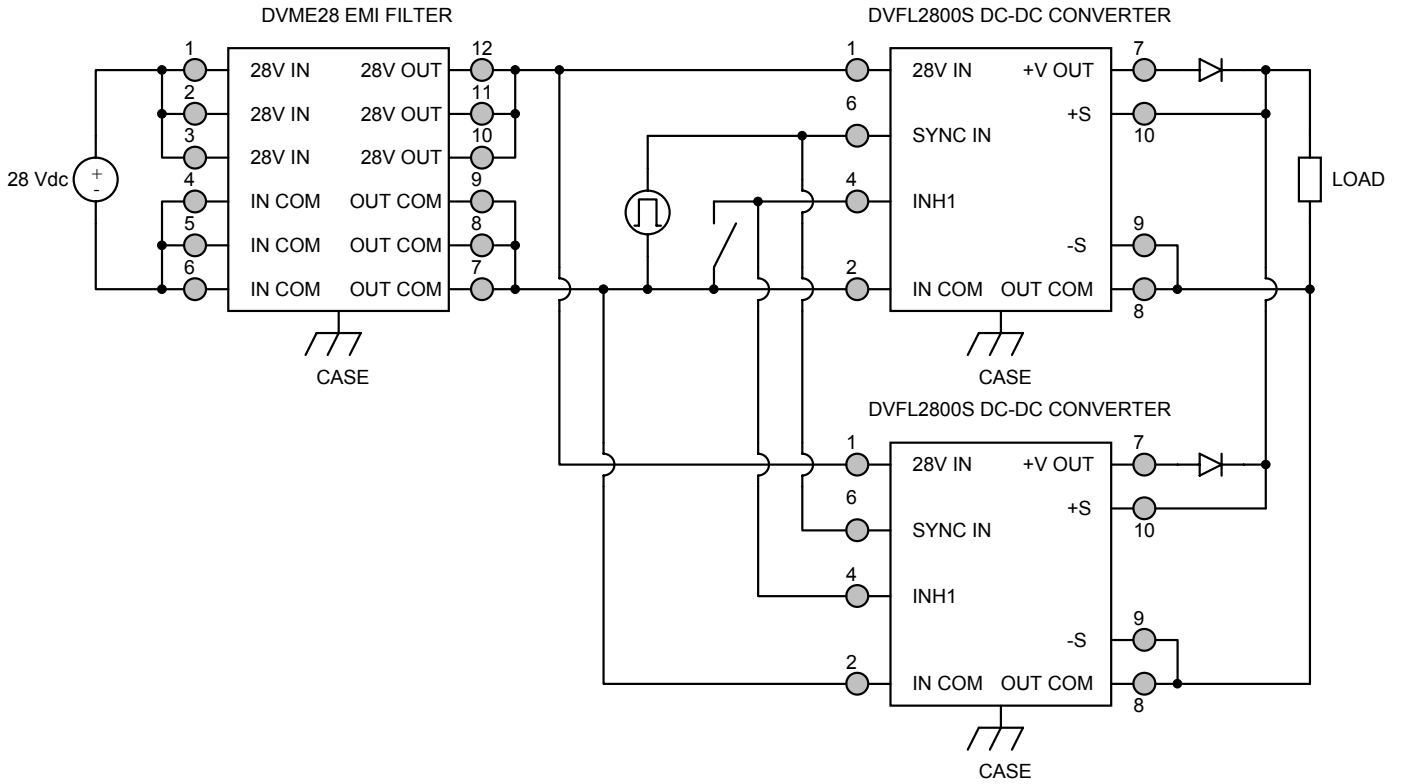


Figure 6 – Parallel Connection without Current Sharing

PARALLEL CONNECTION DIAGRAMS

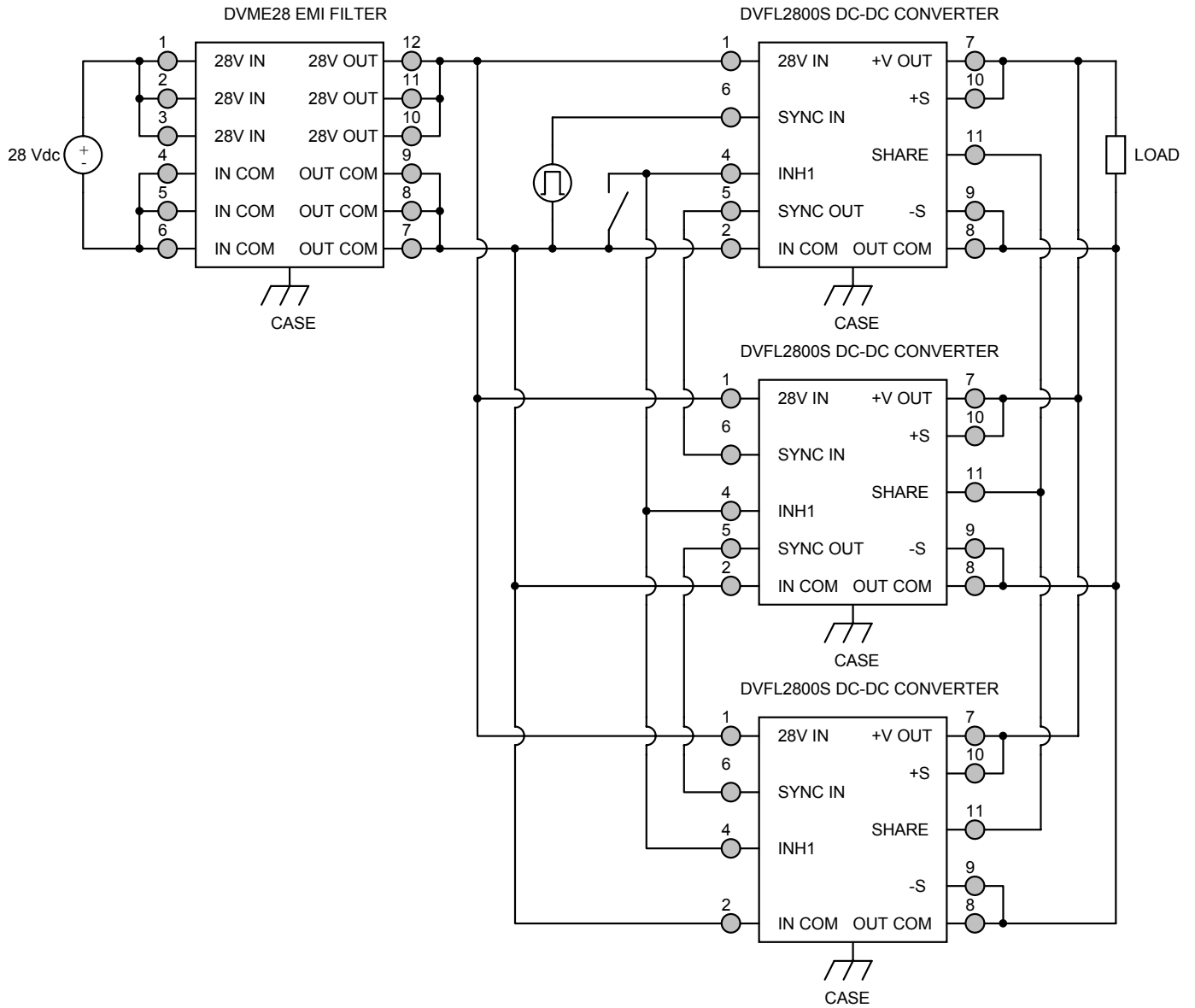
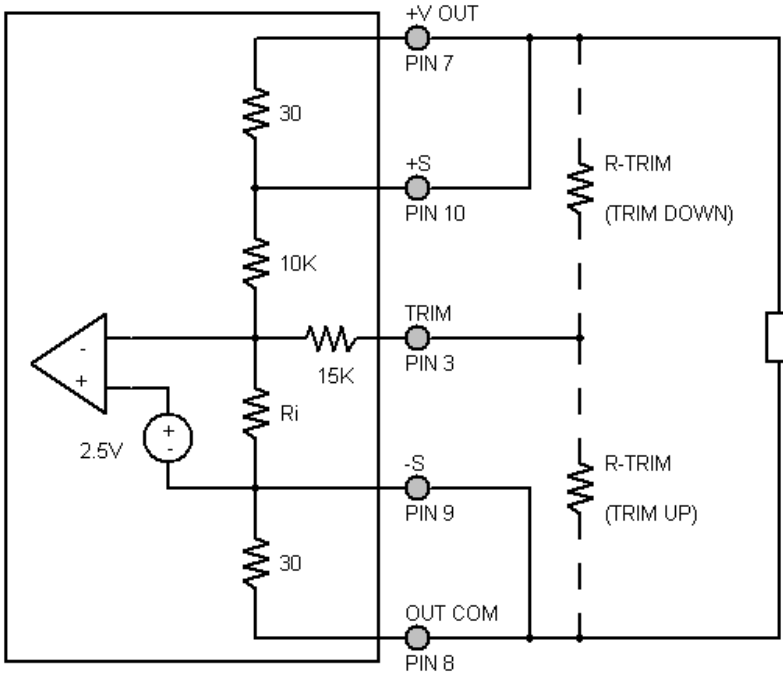


Figure 7 – Current Sharing Parallel Connection for Multiple Converters

OUTPUT VOLTAGE TRIM



The output voltage can be trimmed down by connecting a resistor between the TRIM pin (PIN 3) and the +V OUT pin (PIN 7), or can be trimmed up by connecting a resistor between the TRIM pin (PIN 3) and the OUT COM pin (PIN 8). The maximum trim range is +10% up and -20% down. The appropriate resistor values versus the output voltage are given in the trim table below.

Figure 8 – Output Voltage Trim

| DVFL283R3S | | DVFL2805S | | DVFL285R2S | | DVFL2812S | | DVFL2815S | |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| +V _{OUT} (V) | R _{TRIM} (Ω) | +V _{OUT} (V) | R _{TRIM} (Ω) | +V _{OUT} (V) | R _{TRIM} (Ω) | +V _{OUT} (V) | R _{TRIM} (Ω) | +V _{OUT} (V) | R _{TRIM} (Ω) |
| 3.60 | 68.3k | 5.5 | 35k | 5.7 | 35k | 13.2 | 5.8k | 16.50 | 1.7k |
| 3.55 | 85k | 5.4 | 47.5k | 5.6 | 47.5k | 13.0 | 10k | 16.25 | 5k |
| 3.50 | 110k | 5.3 | 68.3k | 5.5 | 68.3k | 12.8 | 16.2k | 16.00 | 10k |
| 3.45 | 151.7k | 5.2 | 110k | 5.4 | 110k | 12.6 | 26.6k | 15.75 | 18.3k |
| 3.40 | 235k | 5.1 | 235k | 5.3 | 235k | 12.4 | 47.3k | 15.50 | 35k |
| 3.35 | 485k | 5.0 | - | 5.2 | - | 12.2 | 109k | 15.25 | 85k |
| 3.30 | - | 4.9 | 225k | 5.1 | 245k | 12.0 | - | 15.00 | - |
| 3.25 | 135k | 4.8 | 100k | 5.0 | 110k | 11.8 | 454k | 14.75 | 475k |
| 3.20 | 55k | 4.7 | 58.3k | 4.9 | 65k | 11.6 | 213k | 14.50 | 225k |
| 3.15 | 28.3k | 4.6 | 37.5k | 4.8 | 42.5k | 11.4 | 134k | 14.25 | 142k |
| 3.10 | 15k | 4.5 | 25k | 4.7 | 29k | 11.2 | 94k | 14.00 | 100k |
| 3.05 | 7k | 4.4 | 16.7k | 4.6 | 20k | 11.0 | 70.1k | 13.75 | 75k |
| 3.00 | 1.7k | 4.3 | 10.7k | 4.5 | 13.6k | 10.8 | 54.3k | 13.50 | 58.3k |
| | | 4.2 | 6.3k | 4.4 | 8.8k | 10.6 | 42.9k | 13.25 | 46.4k |
| | | 4.1 | 2.8k | 4.3 | 5k | 10.4 | 34.4k | 13.00 | 37.5k |
| | | 4.0 | 0 | 4.2 | 2k | 10.2 | 27.8k | 12.75 | 30.6k |
| | | | | | | 10.0 | 22.5k | 12.50 | 25k |
| | | | | | | 9.8 | 18.2k | 12.25 | 20.5k |
| | | | | | | 9.6 | 14.6k | 12.00 | 16.7k |

EFFICIENCY PERFORMANCE CURVES ($T_{CASE} = 25^{\circ}C$, Full Load, Unless Otherwise Specified)

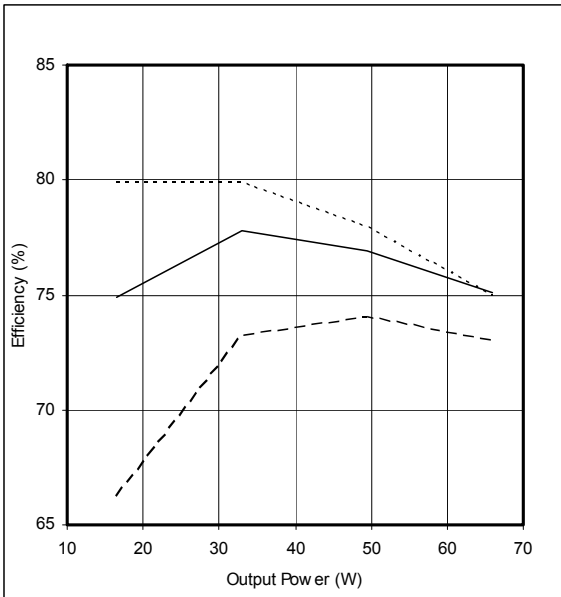


Figure 9 – DVFL283R3S
Efficiency (%) vs. Output Power (W)

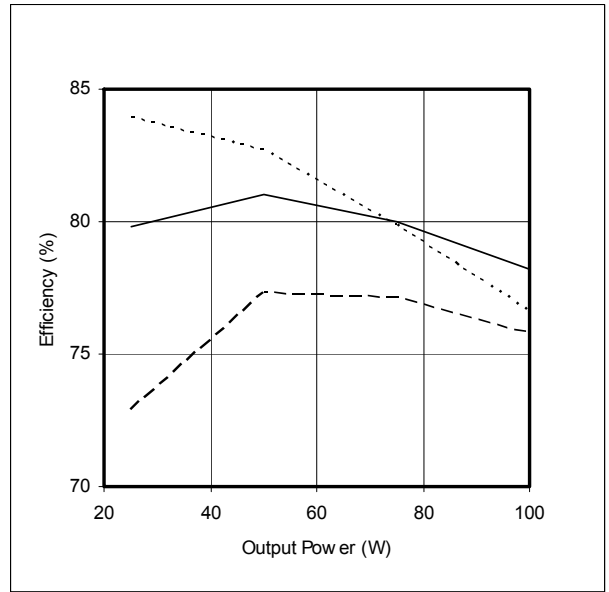


Figure 10 – DVFL2805S / DVFL285R2S
Efficiency (%) vs. Output Power (W)

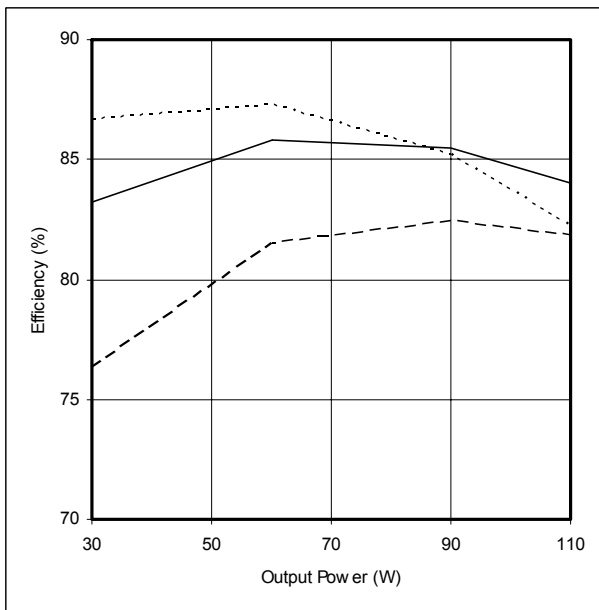


Figure 11 – DVFL2812S
Efficiency (%) vs. Output Power (W)

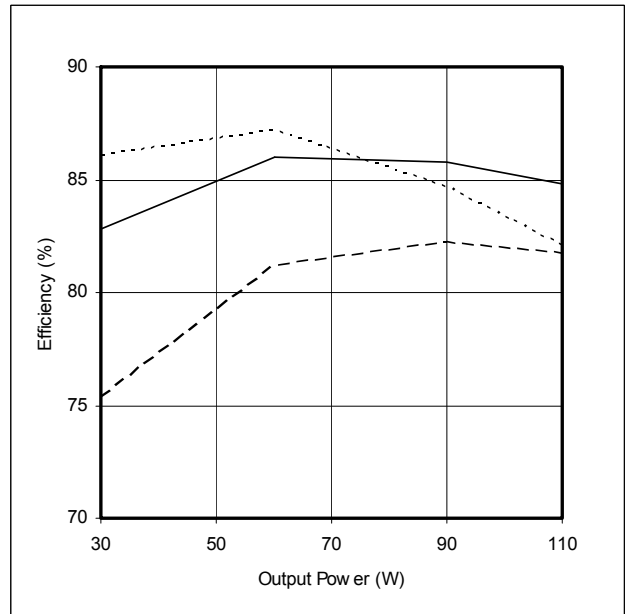


Figure 12 – DVFL2815S
Efficiency (%) vs. Output Power (W)

EMI PERFORMANCE CURVES

($T_{CASE} = 25^{\circ}C$, $V_{IN} = +28V \pm 5\%$, Full Load, Unless Otherwise Specified)

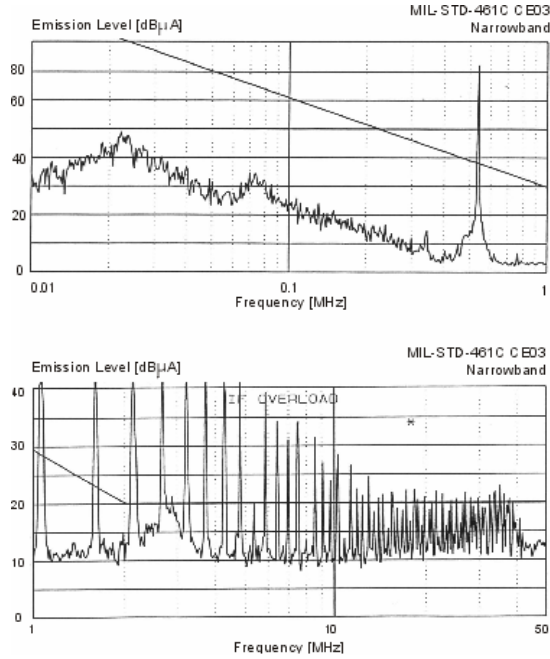


Figure 13 – DVFL2800S without EMI Filter

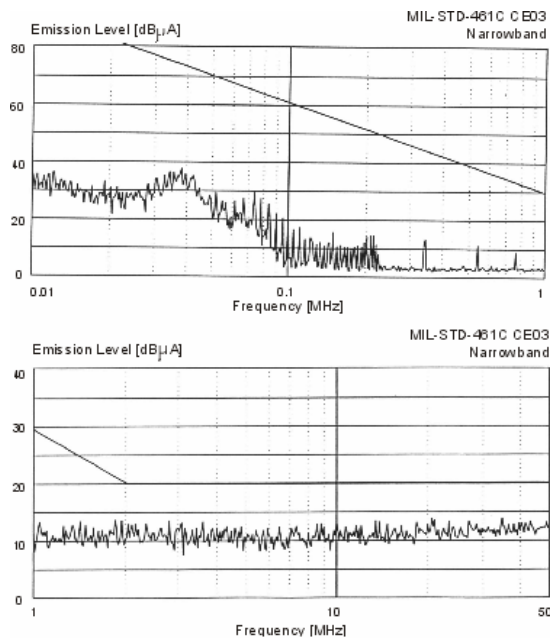
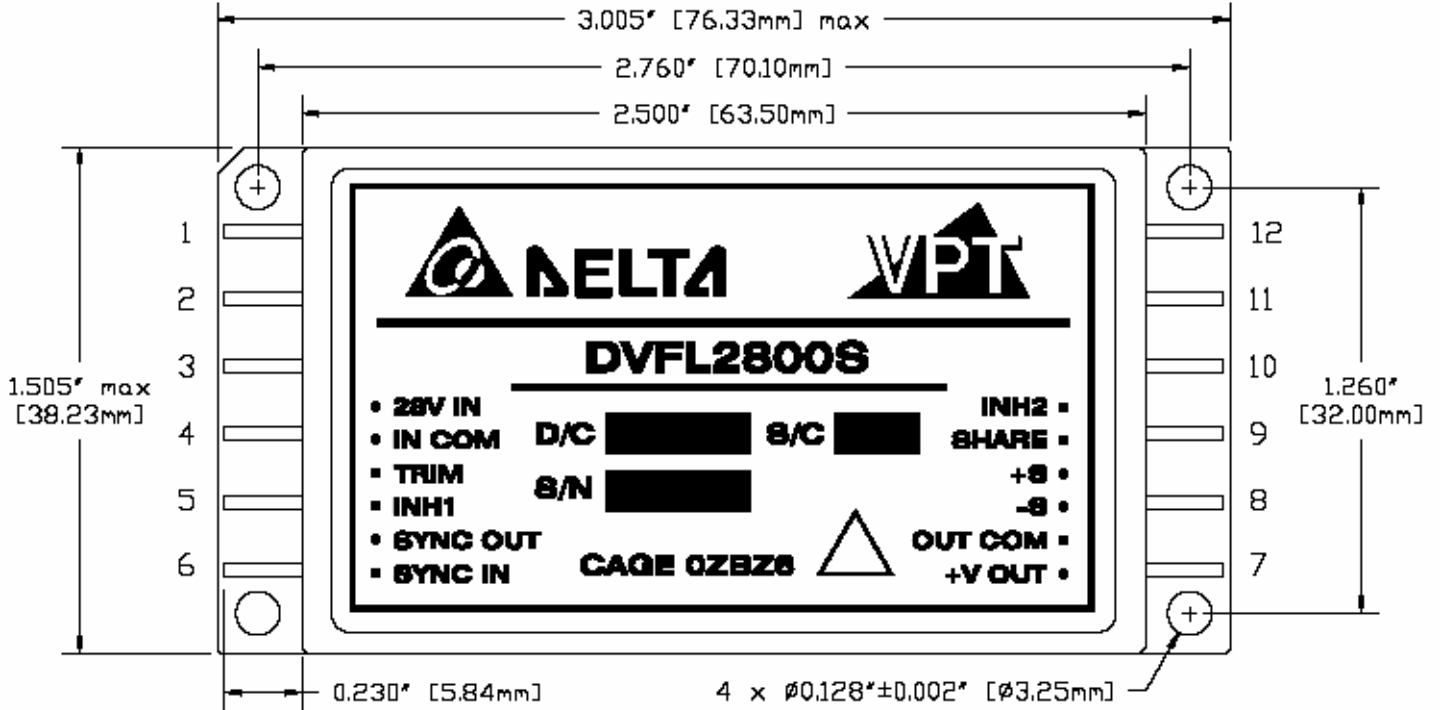
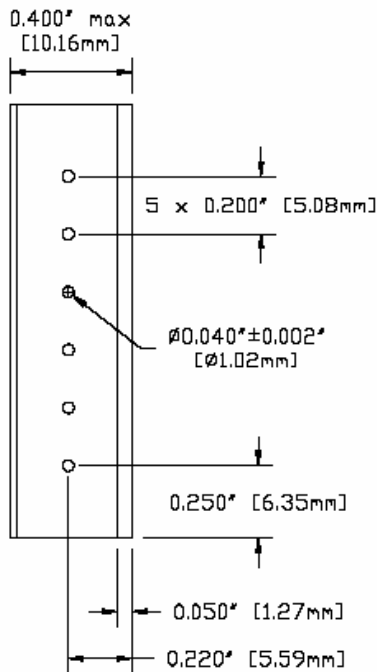


Figure 14 – DVFL2800S with EMI Filter

PACKAGE SPECIFICATIONS



TOP VIEW

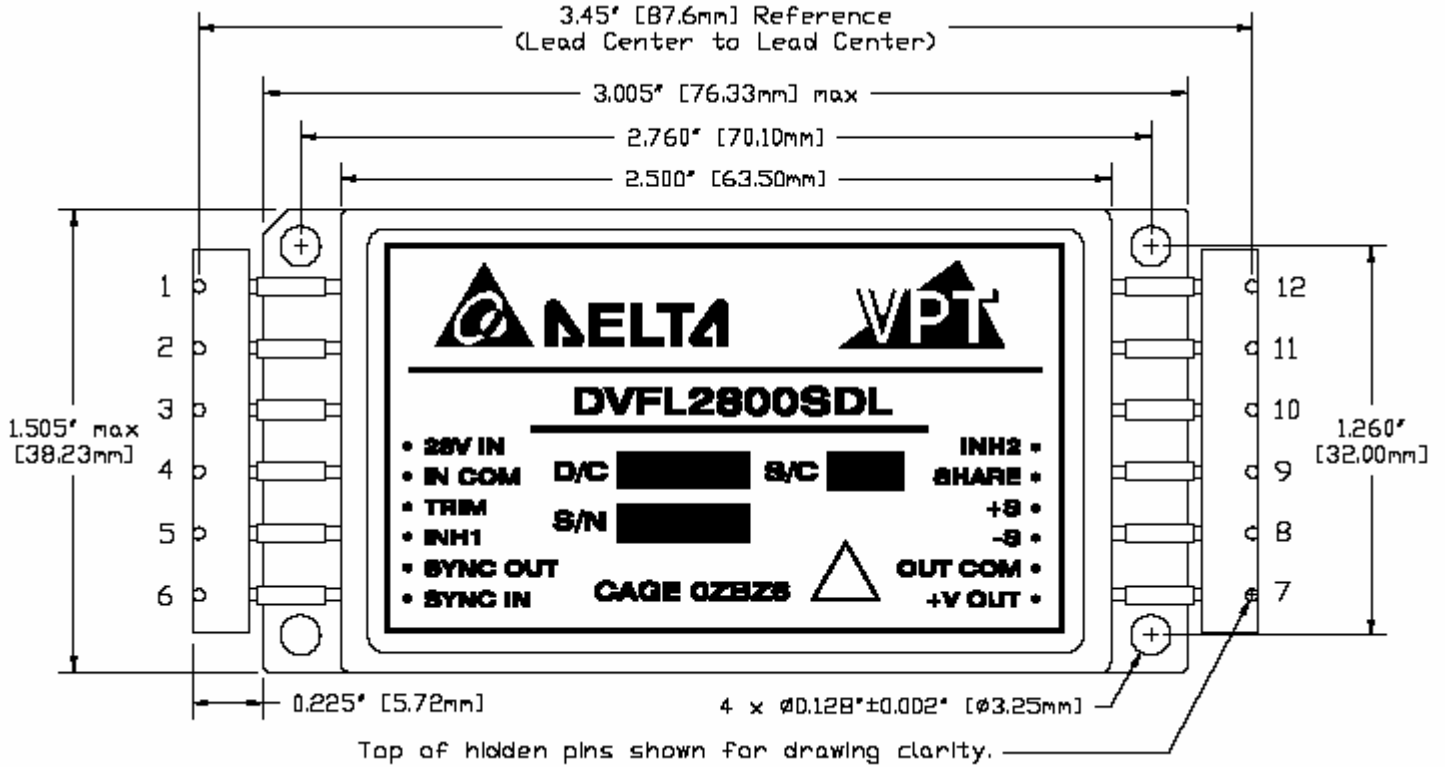


SIDE VIEW

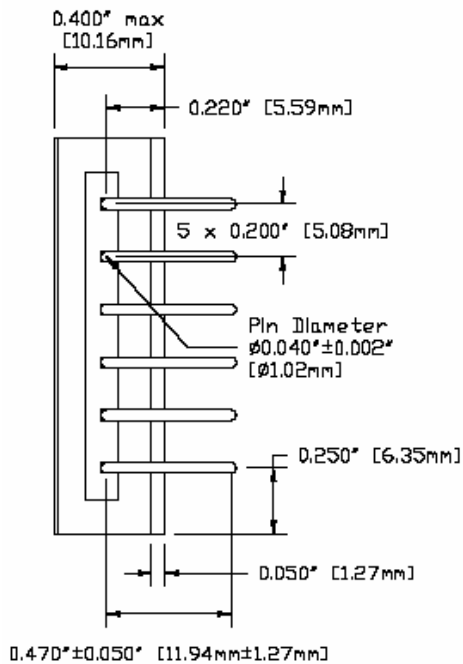
| PIN | FUNCTION |
|-----|----------|
| 1 | 28V IN |
| 2 | IN COM |
| 3 | TRIM |
| 4 | INH1 |
| 5 | SYNC OUT |
| 6 | SYNC IN |
| 7 | +V OUT |
| 8 | OUT COM |
| 9 | -S |
| 10 | +S |
| 11 | SHARE |
| 12 | INH2 |

Figure 15 – Package and Pinout
(Pin Length is ± 0.01 ", Other Dimensional Limits are ± 0.005 " Unless Otherwise Stated)

PACKAGE SPECIFICATIONS (DOWN-LEADED)



TOP VIEW

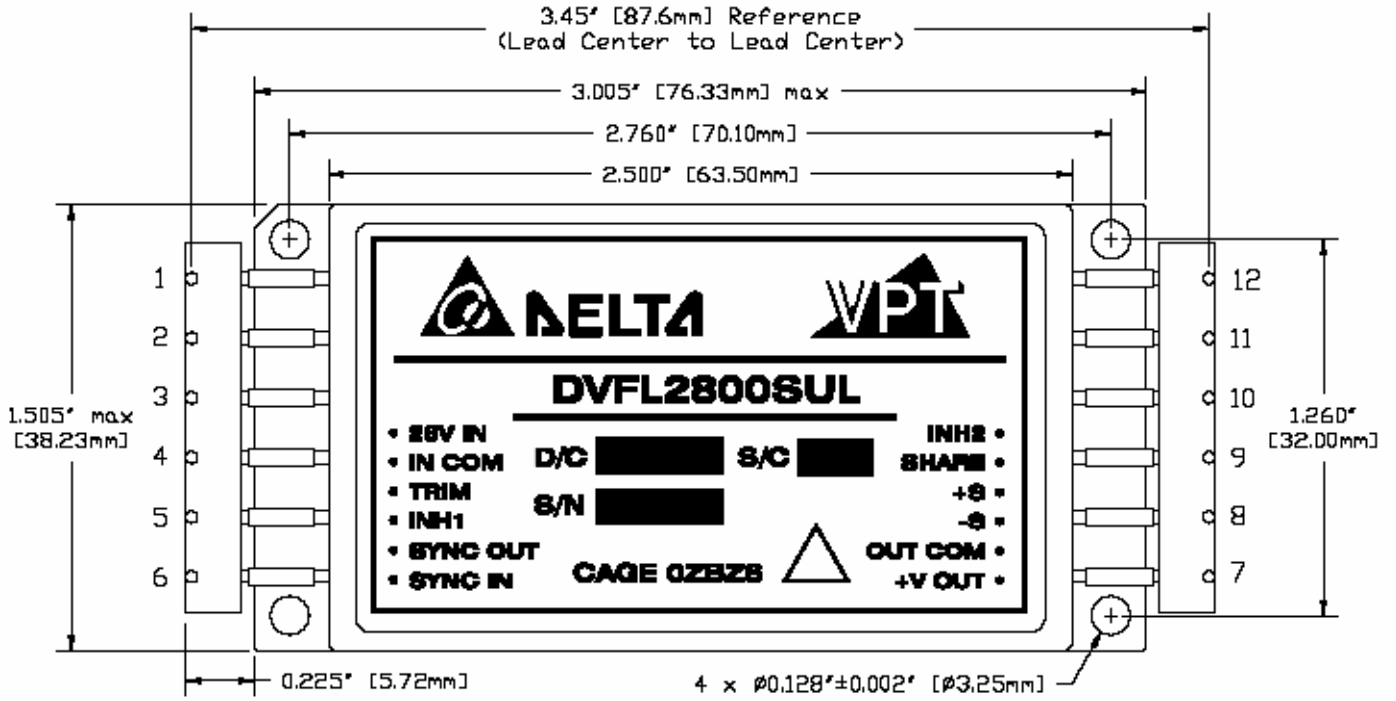


SIDE VIEW

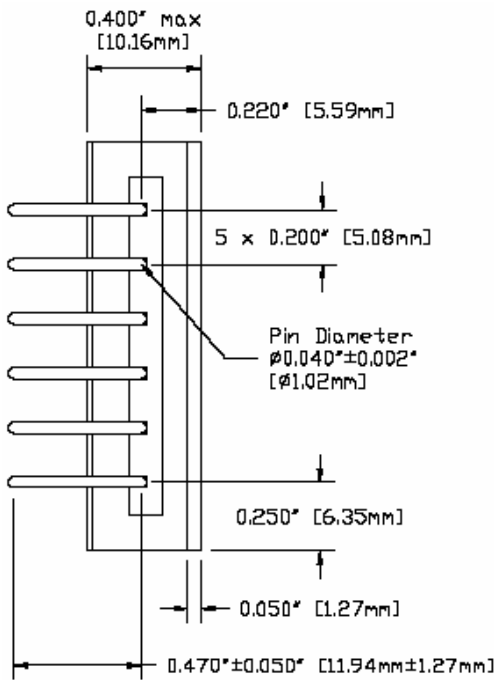
| PIN | FUNCTION |
|-----|----------|
| 1 | 28V IN |
| 2 | IN COM |
| 3 | TRIM |
| 4 | INH1 |
| 5 | SYNC OUT |
| 6 | SYNC IN |
| 7 | +V OUT |
| 8 | OUT COM |
| 9 | -S |
| 10 | +S |
| 11 | SHARE |
| 12 | INH2 |

Figure 16 – Package and Pinout (With Down-Leaded Pin Extensions Added)
(Pin Length is ± 0.01 ", Other Dimensional Limits are ± 0.005 " Unless Otherwise Stated)

PACKAGE SPECIFICATIONS (UP-LEADED)



TOP VIEW



SIDE VIEW

| PIN | FUNCTION |
|-----|----------|
| 1 | 28V IN |
| 2 | IN COM |
| 3 | TRIM |
| 4 | INH1 |
| 5 | SYNC OUT |
| 6 | SYNC IN |
| 7 | +V OUT |
| 8 | OUT COM |
| 9 | -S |
| 10 | +S |
| 11 | SHARE |
| 12 | INH2 |

Figure 17 – Package and Pinout (With Up-Leaded Pin Extensions Added)
(Pin Length is ±0.01", Other Dimensional Limits are ±0.005" Unless Otherwise Stated)

PACKAGE PIN DESCRIPTION

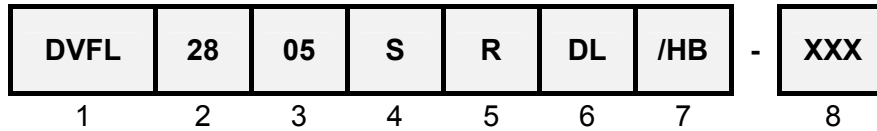
| Pin | Function | Description |
|-----|----------|---|
| 1 | 28V IN | Positive Input Voltage Connection |
| 2 | IN COM | Input Common Connection |
| 3 | TRIM | Trim Output Voltage to +10%, -20% of Nominal Value |
| 4 | INH1 | Logic Low = Disabled Output. Connecting the inhibit(1) pin to input common causes converter shutdown. Logic High = Enabled Output. Unconnected or open collector TTL. |
| 5 | SYNC OUT | Output Synchronization Signal |
| 6 | SYNC IN | Input Synchronization Signal |
| 7 | +V OUT | Positive Output Voltage Connection |
| 8 | OUT COM | Output Common Connection |
| 9 | -S | Return Sense |
| 10 | +S | Positive Sense |
| 11 | SHARE | Current Share |
| 12 | INH2 | Logic Low = Disabled Output. Connecting the inhibit(2) pin to output common causes converter shutdown. Logic High = Enabled Output. Unconnected or open collector TTL. |

ENVIRONMENTAL SCREENING (100% Tested Per MIL-STD-883 as referenced to MIL-PRF-38534)

| Screening | MIL-STD-883 | Standard (No Suffix) | Extended /ES | HB /HB | Class H /H | Class K /K |
|---------------------------|--|-------------------------|-----------------|-----------|---------------|---------------|
| Non-Destructive Bond Pull | Method 2023 | • | • | • | • | • |
| Internal Visual | Method 2017, 2032 Internal Procedure | • | • | • | • | • |
| Temperature Cycling | Method 1010, Condition C Method 1010, -55°C to 125°C | | • | • | • | • |
| Constant Acceleration | Method 2001, 3000g, Y1 Direction Method 2001, 500g, Y1 Direction | | • | • | • | • |
| PIND | Method 2020, Condition A ² | | | | | • |
| Pre Burn-In Electrical | 100% at 25°C | | | | | • |
| Burn-In | Method 1015, 320 hours at +125°C Method 1015, 160 hours at +125°C 96 hours at +125°C 24 hours at +125°C | • | • | • | • | • |
| Final Electrical | MIL-PRF-38534, Group A ¹ 100% at 25°C | • | • | • | • | • |
| Hermeticity | Method 1014, Fine Leak, Condition A Method 1014, Gross Leak, Condition C Dip (1 x 10 ⁻³) | • | • | • | • | • |
| Radiography | Method 2012 ³ | | | | | • |
| External Visual | Method 2009 | • | • | • | • | • |

- Notes:
1. 100% R&R testing at -55°C, +25°C, and +125°C with all test data included in product shipment.
 2. PIND test Certificate of Compliance included in product shipment.
 3. Radiographic test Certificate of Compliance and film(s) included in product shipment.

ORDERING INFORMATION



(1)

(2)

(3)

(4)

| Product Series | Nominal Input Voltage | | Output Voltage | | Number of Outputs | |
|----------------|-----------------------|----------|---|---|-------------------|--------|
| DVFL | 28 | 28 Volts | 3R3 05 5R2 12 15 | 3.3 Volts 5 Volts 5.2 Volts 12 Volts 15 Volts | S | Single |

(5)

(6)

(7)

(8)

| Rad-Hard Option ² | | Package Option | | Screening Code ^{1,3} | | Additional Screening Code |
|------------------------------|----------------------|---------------------------------------|----------------------------------|---|--|---------------------------|
| None R | Standard 100 kRad | None DL UL | Standard Down-Lead Up-Lead | None /ES /HB /H /K | Standard Extended HB Class H Class K | Contact Sales |

- Notes:
1. Contact the VPT Inc. Sales Department for availability of Class H (/H) or Class K (/K) qualified products.
 2. VPT Inc. is not currently qualified to a DSCC certified radiation hardness assurance program.
 3. VPT Inc. reserves the right to ship higher screened or SMD products to meet lower screened orders at our sole discretion unless specifically forbidden by customer contract.

Please contact your sales representative or the VPT Inc. Sales Department for more information concerning additional environmental screening and testing, different input voltage, output voltage, power requirement, source inspection, and/or special element evaluation for space or other higher quality applications.

SMD (STANDARD MICROCIRCUIT DRAWING) NUMBERS

| Standard Microcircuit Drawing (SMD) | DVFL2800S Series Similar Part Number |
|-------------------------------------|--------------------------------------|
| *T.B.D. | DVFL283R3S/H |
| *T.B.D. | DVFL2805S/H |
| *T.B.D. | DVFL285R2S/H |
| *T.B.D. | DVFL2812S/H |
| *T.B.D. | DVFL2815S/H |

Do not use the DVFL2800S Series similar part number for SMD product acquisition. It is listed for reference only. For exact specifications for the SMD product, refer to the SMD drawing. SMD's can be downloaded from the DSCC website at <http://www.dscclia.mil/programs/smcr/>. The SMD number listed above is for MIL-PRF-38534 Class H screening, standard gold plated lead finish, and no RHA (Radiation Hardness Assurance) level. Please reference the SMD for other screening levels, lead finishes, and radiation levels.

CONTACT INFORMATION

To request a quotation or place orders please contact your sales representative or the VPT Inc. Sales Department at:

Phone: (425) 353-3010
Fax: (425) 353-4030
E-mail: vptsales@vpt-inc.com

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