



DVHF2800S Series

HIGH RELIABILITY HYBRID DC-DC CONVERTERS

DESCRIPTION

The DVHF 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 DVHF series are robust and effective input and output filters which provide dramatically reduced input and output noise performance when compared to other manufacturers competing devices. Operating at a nominal fixed frequency of 450 kHz, these regulated, isolated units utilize a high speed magnetic feedback design and well controlled undervoltage lockout circuitry to eliminate slow start-up problems.

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
- Very Low Output Noise
- Wide Input Voltage Range: 15 to 50 Volts per MIL-STD-704
- Up to 20 Watts Output Power
- Fault Tolerant Magnetic Feedback Circuit
- NO Use of Optoisolators
- Undervoltage Lockout
- Indefinite Short Circuit Protection
- Current Limit Protection
- Industry Standard Pinout
- High Input Transient Voltage: 80 Volts for 1 sec per MIL-STD-704A
- Precision Projection Welded Hermetic Package
- High Power Density: > 37 W/in³
- Custom Versions Available
- Additional Environmental Screening Available
- Meets MIL-STD-461 Revisions C, D, E and F EMC Requirements When Used With VPT's EMI Filters.
- Flanged and Non-flanged Versions Available.
- MIL-PRF-38534 Element Evaluated Components
- Space Applications should consider VPT's "S" Series of Radiation Tolerant Power Conversion Devices. Contact VPT for details.

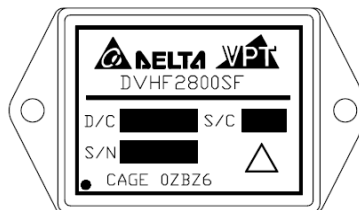


Figure 1 – DVHF2800S / DVHF2800SF DC-DC Converter
 (Exact marking may differ from that shown)

SPECIFICATIONS (T_{CASE} = -55°C to +125°C, V_{IN} = +28V ± 5%, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V _{DC}	Junction Temperature Rise to Case	+12°C
Input Voltage (Transient, 1 second)	80 Volts	Storage Temperature	-65°C to +150°C
Output Power ¹	20 Watts	Lead Solder Temperature (10 seconds)	270°C
Power Dissipation (Full Load, T _{CASE} = +125°C)	6 Watts	Weight (Maximum) (Un-Flanged / Flanged)	(24 / 28) Grams
ESD Rating per MIL-PRF-38534	2		

Parameter	Conditions	DVHF281R9S			DVHF283R3S			Units
		Min	Typ	Max	Min	Typ	Max	
STATIC								
INPUT Voltage ⁴	Continuous	15	28	50	15	28	50	V
	Transient, 1 sec	-	-	80	-	-	80	V
Current	Inhibited	-	4	6	-	4	6	mA
	No Load	-	45	65	-	45	65	mA
Ripple Current	Full Load, 20Hz to 10MHz	-	20	80	-	25	80	mA _{p-p}
Inhibit Pin Input ⁴		0	-	1.5	0	-	1.5	V
Inhibit Pin Open Circuit Voltage ⁴		9	11	13	9	11	13	V
UVLO Turn On		12	-	14.8	12	-	14.8	V
UVLO Turn Off ⁴		11	-	14.5	11	-	14.5	V
OUTPUT Voltage	V _{OUT} T _{CASE} = 25°C	1.87	1.9	1.93	3.267	3.3	3.333	V
	V _{OUT} T _{CASE} = -55°C to +125°C	1.86	1.9	1.94	3.25	3.3	3.35	V
Power ³		0	-	8	0	-	10	W
Current ³	V _{OUT}	0	-	4	0	-	3	A
Ripple Voltage	V _{OUT} Full Load, 20Hz to 10MHz	-	10	40	-	10	40	mV _{p-p}
Line Regulation	V _{OUT} V _{IN} = 15V to 50V	-	2	20	-	2	20	mV
Load Regulation	V _{OUT} No Load to Full Load	-	25	75	-	20	50	mV
EFFICIENCY		57	61	-	65	71	-	%
LOAD FAULT POWER DISSIPATION	Overload ⁴	-	-	8	-	-	8	W
	Short Circuit	-	-	8	-	-	8	W
CAPACITIVE LOAD ⁴		-	-	1000	-	-	1000	μF
SWITCHING FREQUENCY		350	450	500	350	450	500	kHz
ISOLATION	500 V _{DC}	100	-	-	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T _C = 55°C	-	427	-	-	427	-	kHrs
DYNAMIC								
Load Step Output Transient	V _{OUT} Half Load to Full Load	-	100	250	-	160	400	mV _{PK}
Load Step Recovery ²		-	450	800	-	350	500	μSec
Line Step Output Transient ⁴	V _{OUT} V _{IN} = 16V to 40V	-	100	400	-	400	700	mV _{PK}
Line Step Recovery ^{2, 4}		-	200	700	-	300	500	μSec
Turn On Delay	V _{OUT} V _{IN} = 0V to 28V	-	10	20	-	10	20	mSec
Turn On Overshoot		-	0	15	-	0	15	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°C to +125°C, V_{IN} = +28V ± 5%, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V _{DC}	Junction Temperature Rise to Case	+12°C
Input Voltage (Transient, 1 second)	80 Volts	Storage Temperature	-65°C to +150°C
Output Power ¹	20 Watts	Lead Solder Temperature (10 seconds)	270°C
Power Dissipation (Full Load, T _{CASE} = +125°C)	6 Watts	Weight (Maximum) (Un-Flanged / Flanged)	(24 / 28) Grams
ESD Rating per MIL-PRF-38534	2		

Parameter	Conditions	DVHF2805S			DVHF285R2S			Units
		Min	Typ	Max	Min	Typ	Max	
STATIC								
INPUT Voltage ⁴	Continuous	15	28	50	15	28	50	V
	Transient, 1 sec	-	-	80	-	-	80	V
Current	Inhibited	-	4	6	-	4	6	mA
	No Load	-	45	65	-	45	65	mA
Ripple Current	Full Load, 20Hz to 10MHz	-	30	80	-	30	80	mA _{p-p}
Inhibit Pin Input ⁴		0	-	1.5	0	-	1.5	V
Inhibit Pin Open Circuit Voltage ⁴		9	11	13	9	11	13	V
UVLO Turn On		12	-	14.8	12	-	14.8	V
UVLO Turn Off ⁴		11	-	14.5	11	-	14.5	V
OUTPUT Voltage	V _{OUT} T _{CASE} = 25°C	4.95	5	5.05	5.148	5.2	5.252	V
	V _{OUT} T _{CASE} = -55°C to +125°C	4.925	5	5.075	5.122	5.2	5.278	V
Power ³		0	-	15	0	-	15	W
Current ³	V _{OUT}	0	-	3	0	-	3	A
Ripple Voltage	V _{OUT} Full Load, 20Hz to 10MHz	-	15	40	-	15	40	mV _{p-p}
Line Regulation	V _{OUT} V _{IN} = 15V to 50V	-	2	20	-	2	20	mV
Load Regulation	V _{OUT} No Load to Full Load	-	25	50	-	25	50	mV
EFFICIENCY		72	77	-	72	77	-	%
LOAD FAULT POWER DISSIPATION	Overload ⁴	-	-	8	-	-	8	W
	Short Circuit	-	-	8	-	-	8	W
CAPACITIVE LOAD ⁴		-	-	1000	-	-	1000	μF
SWITCHING FREQUENCY		350	450	500	350	450	500	kHz
ISOLATION	500 V _{DC}	100	-	-	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T _C = 55°C	-	427	-	-	427	-	kHrs
DYNAMIC								
Load Step Output Transient	V _{OUT} Half Load to Full Load	-	250	600	-	250	600	mV _{PK}
Load Step Recovery ²		-	450	600	-	450	600	μSec
Line Step Output Transient ⁴	V _{OUT} V _{IN} = 16V to 40V	-	400	800	-	400	800	mV _{PK}
Line Step Recovery ^{2, 4}		-	300	700	-	300	700	μSec
Turn On Delay	V _{OUT} V _{IN} = 0V to 28V	-	10	20	-	10	20	mSec
Turn On Overshoot		-	0	25	-	0	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°C to +125°C, V_{IN} = +28V ± 5%, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V _{DC}	Junction Temperature Rise to Case	+12°C
Input Voltage (Transient, 1 second)	80 Volts	Storage Temperature	-65°C to +150°C
Output Power ¹	20 Watts	Lead Solder Temperature (10 seconds)	270°C
Power Dissipation (Full Load, T _{CASE} = +125°C)	6 Watts	Weight (Maximum) (Un-Flanged / Flanged)	(24 / 28) Grams
ESD Rating per MIL-PRF-38534	2		

Parameter	Conditions	DVHF285R7S			DVHF2812S			Units
		Min	Typ	Max	Min	Typ	Max	
STATIC								
INPUT Voltage ⁴	Continuous	15	28	50	15	28	50	V
	Transient, 1 sec	-	-	80	-	-	80	V
Current	Inhibited	-	4	6	-	4	6	mA
	No Load	-	45	65	-	45	65	mA
Ripple Current	Full Load, 20Hz to 10MHz	-	30	80	-	40	80	mA _{p-p}
Inhibit Pin Input ⁴		0	-	1.5	0	-	1.5	V
Inhibit Pin Open Circuit Voltage ⁴		9	11	13	9	11	13	V
UVLO Turn On		12	-	14.8	12	-	14.8	V
UVLO Turn Off ⁴		11	-	14.5	11	-	14.5	V
OUTPUT Voltage	V _{OUT} T _{CASE} = 25°C	5.643	5.7	5.757	11.88	12	12.12	V
	V _{OUT} T _{CASE} = -55°C to +125°C	5.615	5.7	5.786	11.82	12	12.18	V
Power ³		0	-	15	0	-	20	W
Current ³	V _{OUT}	0	-	2.63	0	-	1.67	A
Ripple Voltage	V _{OUT} Full Load, 20Hz to 10MHz	-	15	40	-	10	40	mV _{p-p}
Line Regulation	V _{OUT} V _{IN} = 15V to 50V	-	2	20	-	2	20	mV
Load Regulation	V _{OUT} No Load to Full Load	-	25	50	-	10	50	mV
EFFICIENCY		72	77	-	77	84	-	%
LOAD FAULT POWER DISSIPATION	Overload ⁴	-	-	8	-	-	8	W
	Short Circuit	-	-	8	-	-	8	W
CAPACITIVE LOAD ⁴		-	-	1000	-	-	500	μF
SWITCHING FREQUENCY		350	450	500	350	450	500	kHz
ISOLATION	500 V _{DC}	100	-	-	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T _C = 55°C	-	427	-	-	427	-	kHrs
DYNAMIC								
Load Step Output Transient	V _{OUT} Half Load to Full Load	-	150	400	-	350	500	mV _{PK}
Load Step Recovery ²		-	150	400	-	250	500	μSec
Line Step Output Transient ⁴	V _{OUT} V _{IN} = 16V to 40V	-	250	450	-	500	900	mV _{PK}
Line Step Recovery ^{2, 4}		-	300	700	-	300	500	μSec
Turn On Delay	V _{OUT} V _{IN} = 0V to 28V	-	10	20	-	10	20	mSec
Turn On Overshoot		-	0	25	-	0	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°C to +125°C, V_{IN} = +28V ± 5%, Full Load, Unless Otherwise Specified)

ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V _{DC}	Junction Temperature Rise to Case	+12°C
Input Voltage (Transient, 1 second)	80 Volts	Storage Temperature	-65°C to +150°C
Output Power ¹	20 Watts	Lead Solder Temperature (10 seconds)	270°C
Power Dissipation (Full Load, T _{CASE} = +125°C)	6 Watts	Weight (Maximum) (Un-Flanged / Flanged)	(24 / 28) Grams
ESD Rating per MIL-PRF-38534	2		

Parameter	Conditions	DVHF2815S			DVHF2818S			Units
		Min	Typ	Max	Min	Typ	Max	
STATIC								
INPUT Voltage ⁴	Continuous	15	28	50	15	28	50	V
	Transient, 1 sec	-	-	80	-	-	80	V
Current	Inhibited	-	4	6	-	4	6	mA
	No Load	-	45	65	-	45	65	mA
Ripple Current	Full Load, 20Hz to 10MHz	-	40	80	-	40	80	mA _{p-p}
Inhibit Pin Input ⁴		0	-	1.5	0	-	1.5	V
Inhibit Pin Open Circuit Voltage ⁴		9	11	13	9	11	13	V
UVLO Turn On		12	-	14.8	12	-	14.8	V
UVLO Turn Off ⁴		11	-	14.5	11	-	14.5	V
OUTPUT Voltage	V _{OUT} T _{CASE} = 25°C	14.85	15	15.15	17.82	18	18.18	V
	V _{OUT} T _{CASE} = -55°C to +125°C	14.775	15	15.225	17.73	18	18.27	V
Power ³		0	-	20	0	-	20	W
Current ³	V _{OUT}	0	-	1.34	0	-	1.11	A
Ripple Voltage	V _{OUT} Full Load, 20Hz to 10MHz	-	10	40	-	10	40	mV _{p-p}
Line Regulation	V _{OUT} V _{IN} = 15V to 50V	-	2	20	-	2	20	mV
Load Regulation	V _{OUT} No Load to Full Load	-	10	50	-	10	50	mV
EFFICIENCY		78	85	-	78	84	-	%
LOAD FAULT POWER DISSIPATION	Overload ⁴	-	-	8	-	-	8	W
	Short Circuit	-	-	8	-	-	8	W
CAPACITIVE LOAD ⁴		-	-	500	-	-	500	μF
SWITCHING FREQUENCY		350	450	500	350	450	500	kHz
ISOLATION	500 V _{DC}	100	-	-	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T _C = 55°C	-	427	-	-	427	-	kHrs
DYNAMIC								
Load Step Output Transient	V _{OUT} Half Load to Full Load	-	350	500	-	500	700	mV _{PK}
Load Step Recovery ²		-	250	500	-	200	500	μSec
Line Step Output Transient ⁴	V _{OUT} V _{IN} = 16V to 40V	-	500	900	-	800	1200	mV _{PK}
Line Step Recovery ^{2, 4}		-	300	500	-	500	700	μSec
Turn On Delay	V _{OUT} V _{IN} = 0V to 28V	-	10	20	-	10	20	mSec
Turn On Overshoot		-	0	50	-	0	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°C to +125°C, V_{IN} = +28V ± 5%, Full Load, Unless Otherwise Specified)

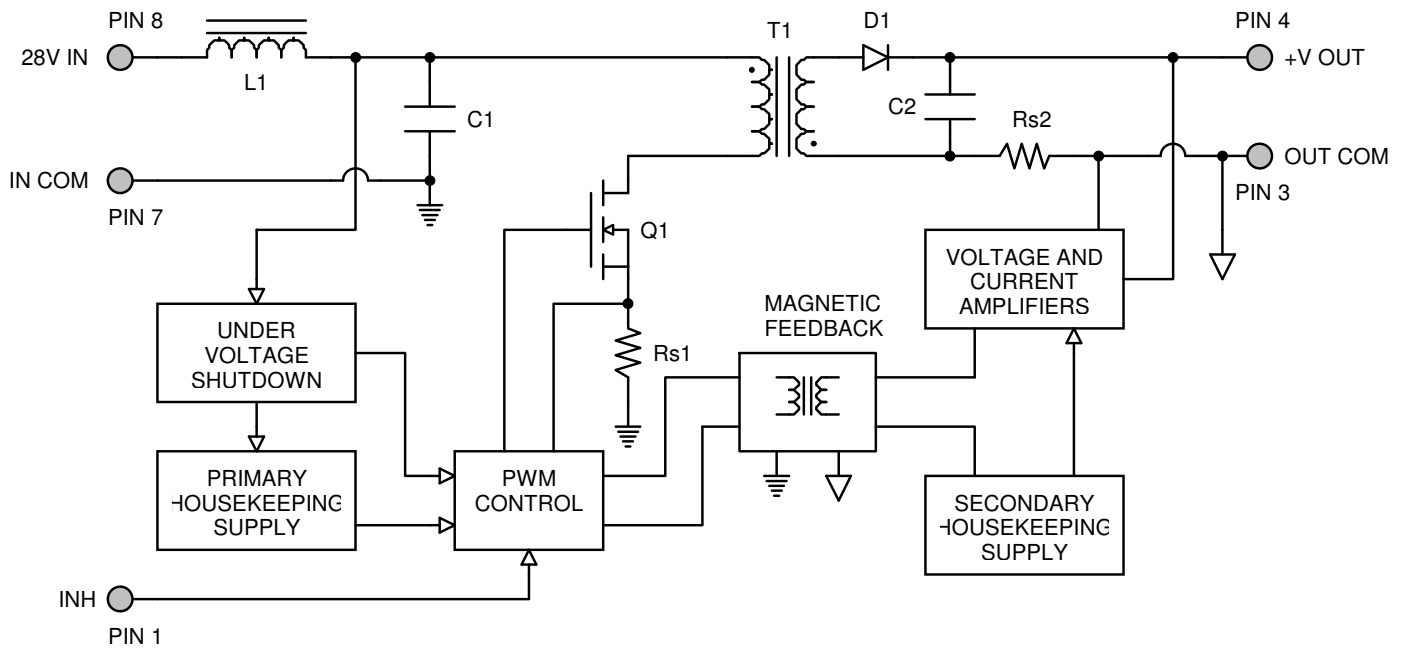
ABSOLUTE MAXIMUM RATINGS

Input Voltage (Continuous)	50 V _{DC}	Junction Temperature Rise to Case	+12°C
Input Voltage (Transient, 1 second)	80 Volts	Storage Temperature	-65°C to +150°C
Output Power ¹	20 Watts	Lead Solder Temperature (10 seconds)	270°C
Power Dissipation (Full Load, T _{CASE} = +125°C)	6 Watts	Weight (Maximum) (Un-Flanged / Flanged)	(24 / 28) Grams
ESD Rating per MIL-PRF-38534	2		

Parameter	Conditions	DVHF2828S			Units
		Min	Typ	Max	
STATIC					
INPUT Voltage ⁴	Continuous	15	28	50	V
	Transient, 1 sec	-	-	80	V
Current	Inhibited	-	4	6	mA
	No Load	-	45	65	mA
Ripple Current	Full Load, 20Hz to 10MHz	-	40	100	mA _{p-p}
Inhibit Pin Input ⁴		0	-	1.5	V
Inhibit Pin Open Circuit Voltage ⁴		9	11	13	V
UVLO Turn On		12	-	14.8	V
UVLO Turn Off ⁴		11	-	14.5	V
OUTPUT Voltage	V _{OUT} T _{CASE} = 25°C	27.70	28.00	28.30	V
	V _{OUT} T _{CASE} = -55°C to +125°C	27.25	28.00	28.75	V
Power ³		0	-	20	W
Current ³	V _{OUT}	0	-	0.714	A
Ripple Voltage	V _{OUT} Full Load, 20Hz to 10MHz	-	45	120	mV _{p-p}
Line Regulation	V _{OUT} V _{IN} = 15V to 50V	-	45	150	mV
Load Regulation	V _{OUT} No Load to Full Load	-	25	150	mV
EFFICIENCY		79	85	-	%
LOAD FAULT POWER DISSIPATION	Overload ⁴	-	-	8	W
	Short Circuit	-	-	8	W
CAPACITIVE LOAD ⁴		-	-	500	μF
SWITCHING FREQUENCY		350	450	500	kHz
ISOLATION	500 V _{DC}	100	-	-	MΩ
MTBF (MIL-HDBK-217F)	AIF @ T _C = 55°C	-	427	-	kHrs
DYNAMIC					
Load Step Output Transient	V _{OUT} Half Load to Full Load	-	630	900	mV _{PK}
Load Step Recovery ²		-	250	400	μSec
Line Step Output Transient ⁴	V _{OUT} V _{IN} = 16V to 40V	-	900	1300	mV _{PK}
Line Step Recovery ^{2, 4}		-	400	700	μSec
Turn On Delay	V _{OUT} V _{IN} = 0V to 28V	-	10	20	mSec
Turn On Overshoot		-	0	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.

BLOCK DIAGRAM



Note: Not applicable to DVHF2828S.

Figure 2

CONNECTION DIAGRAM

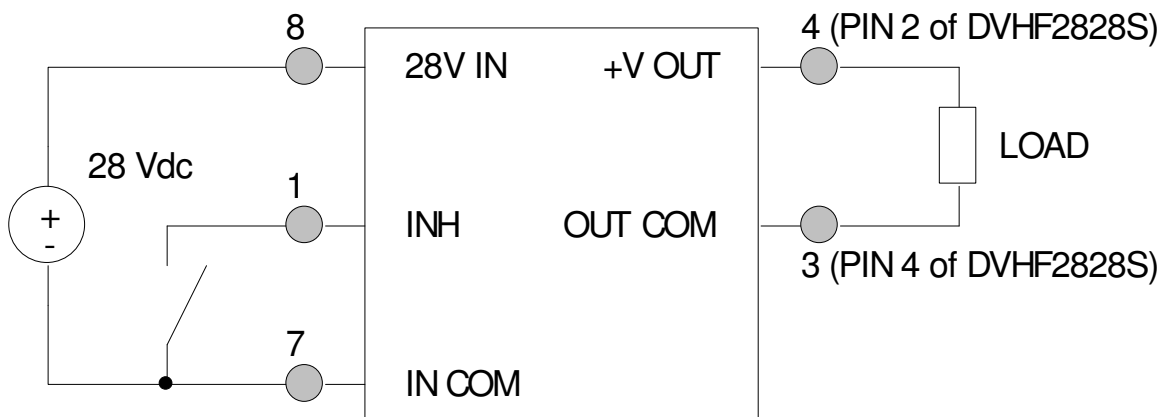


Figure 3

INHIBIT DRIVE CONNECTION DIAGRAMS

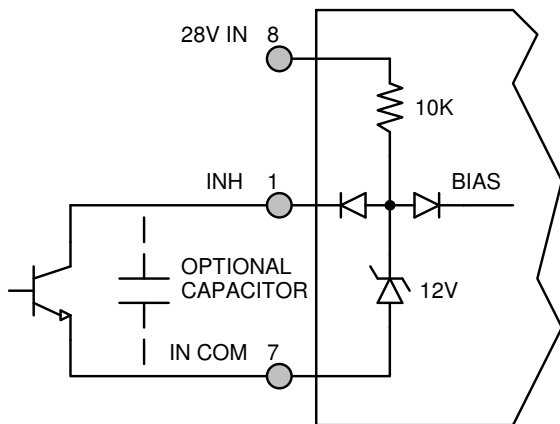


Figure 4 – Internal Inhibit Circuit and Recommended Drive
(Shown with optional capacitor for turn-on delay)

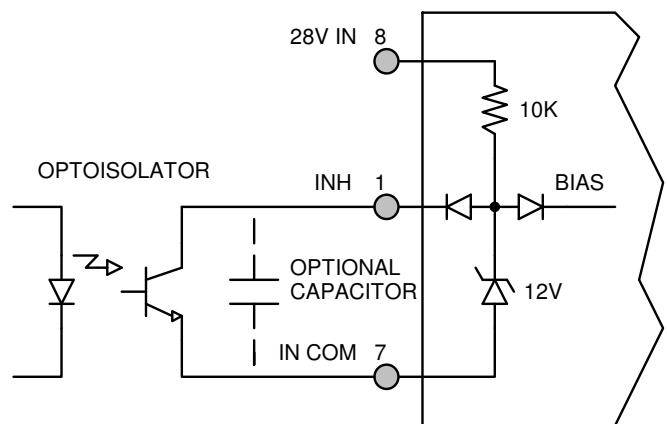


Figure 5 – Isolated Inhibit Drive
(Shown with optional capacitor for turn-on delay)

EMI FILTER HOOKUP DIAGRAM

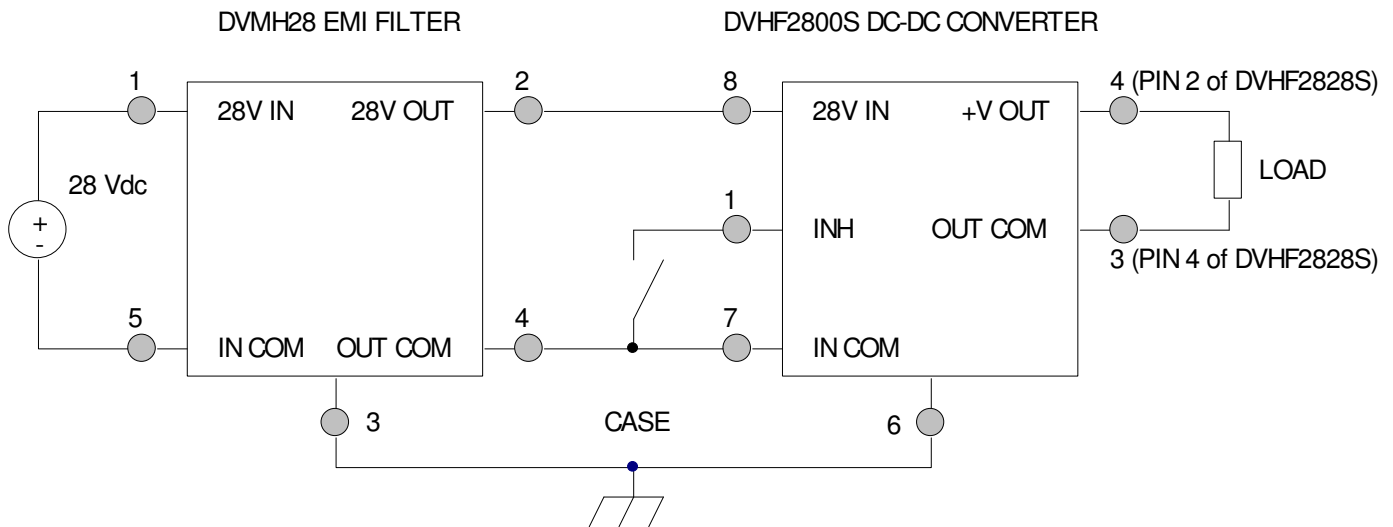


Figure 6 – Converter with EMI Filter

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

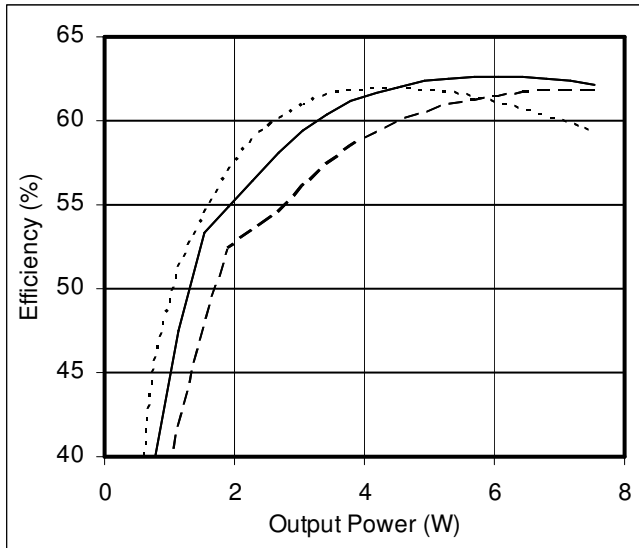


Figure 7 – DVHF281R9S
Efficiency (%) vs. Output Power (W)

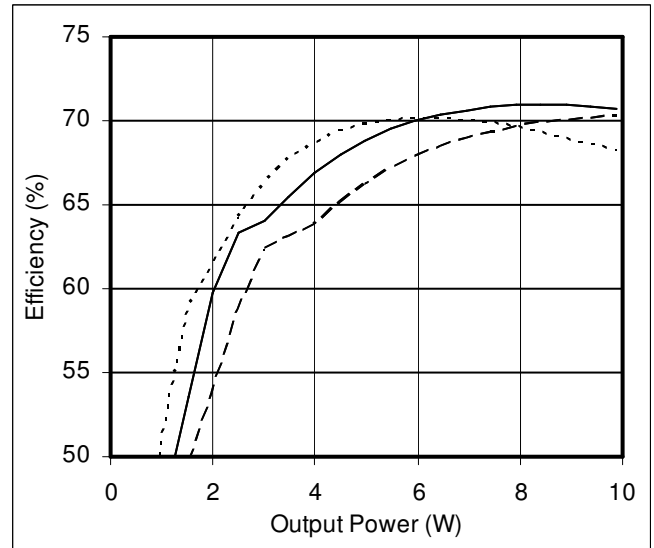


Figure 8 – DVHF283R3S
Efficiency (%) vs. Output Power (W)

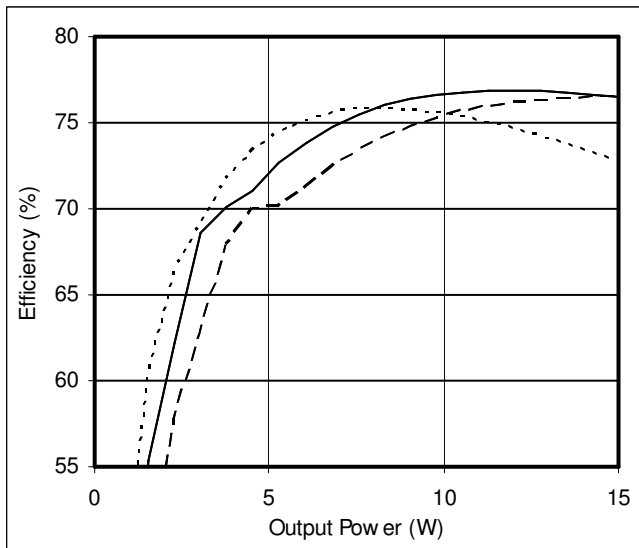


Figure 9 – DVHF2805S / DVHF285R2S
Efficiency (%) vs. Output Power (W)

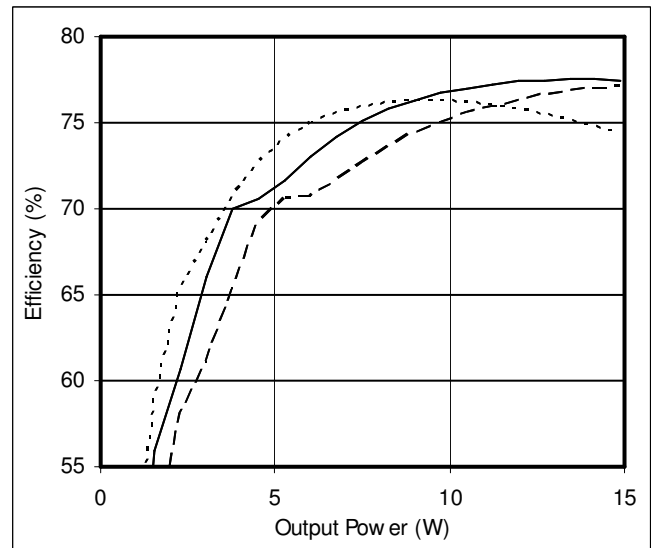


Figure 10 – DVHF285R7S
Efficiency (%) vs. Output Power (W)

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

- - - - - $V_{IN} = 16V$
— $V_{IN} = 28V$
- - - - - $V_{IN} = 40V$

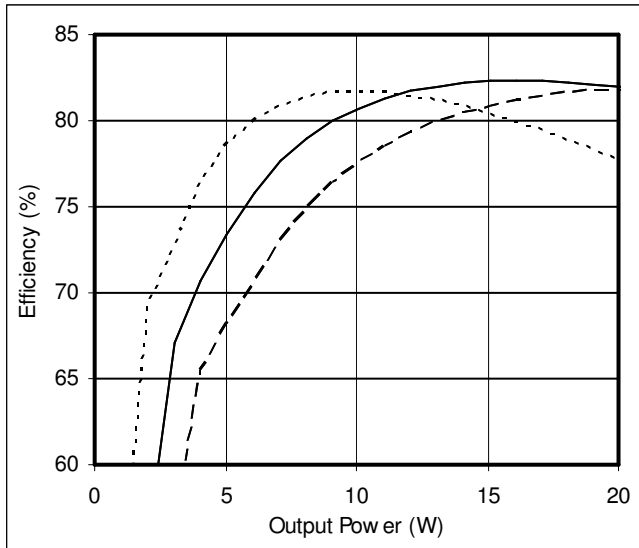


Figure 11 – DVHF2812S
Efficiency (%) vs. Output Power (W)

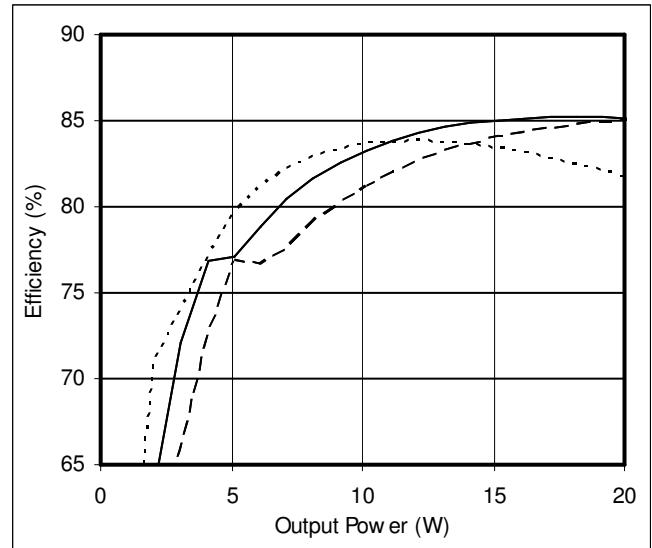


Figure 12 – DVHF2815S
Efficiency (%) vs. Output Power (W)

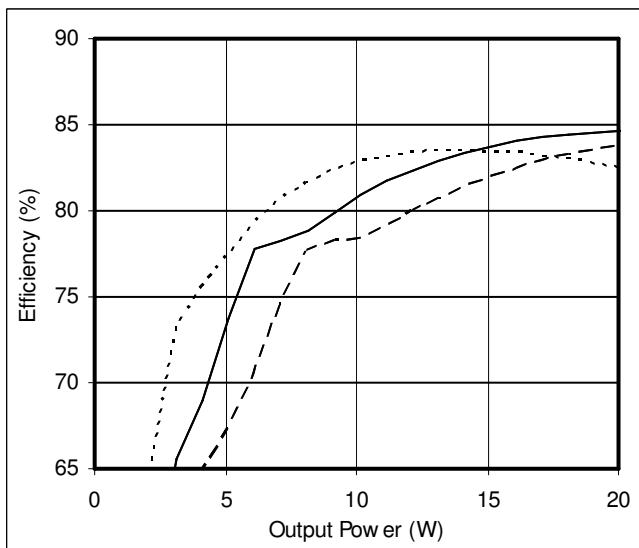


Figure 13 – DVHF2818S
Efficiency (%) vs. Output Power (W)

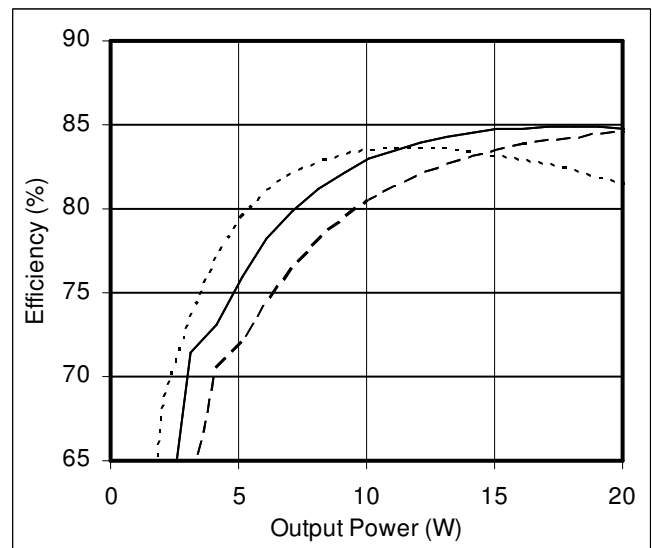


Figure 14 – DVHF2828S
Efficiency (%) vs. Output Power (W)

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

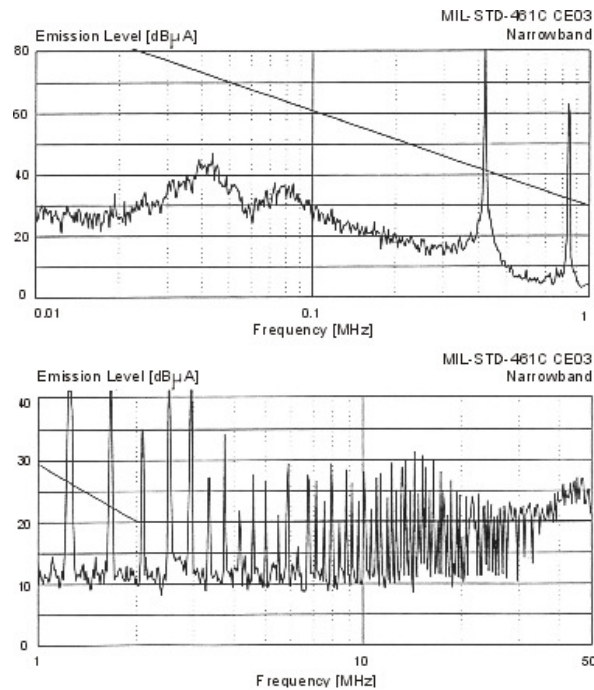


Figure 15 – DVHF2800S without EMI Filter

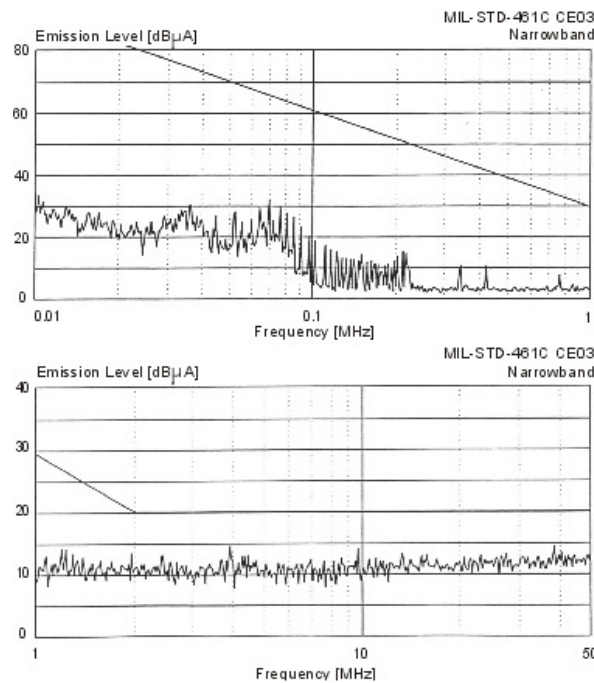
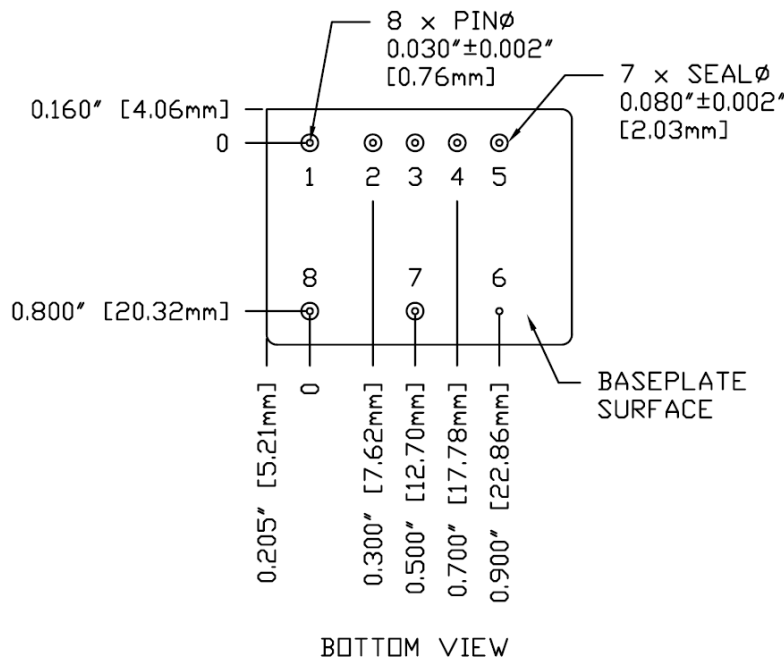
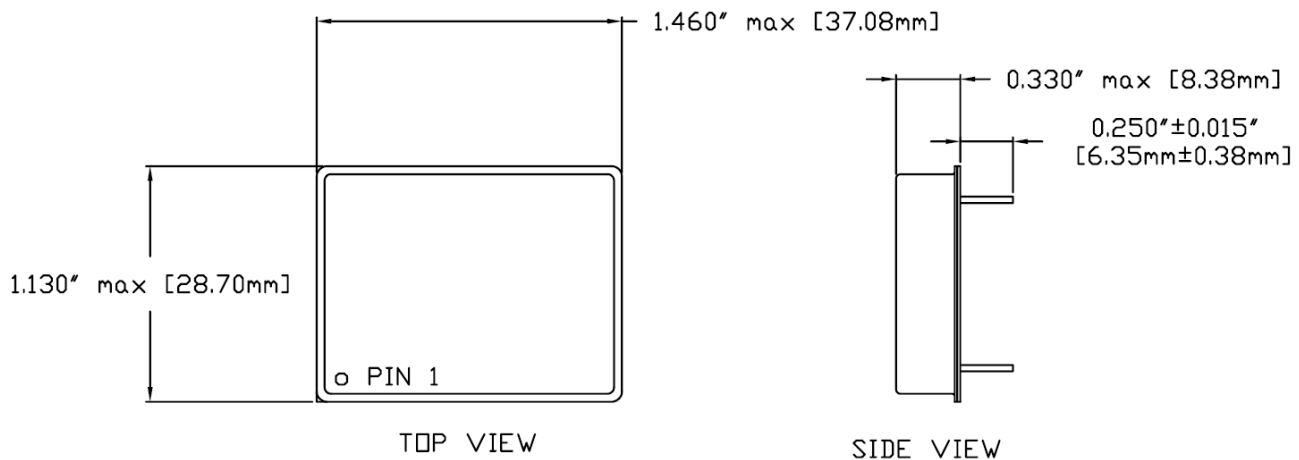


Figure 16 – DVHF2800S with EMI Filter

PACKAGE SPECIFICATIONS (NON-FLANGED)



- NOTES:
1. DIMENSIONAL LIMITS ARE $\pm 0.005"$ UNLESS OTHERWISE STATED.
 2. CASE TEMPERATURE IS MEASURED ON THE CENTER OF THE BASEPLATE.
 3. MATERIALS:
CASE: STEEL, GOLD OVER NICKEL PLATED.
COVER: STEEL, NICKEL PLATED.
PINS: ALLOY 52, GOLD OVER NICKEL PLATED.
PIN SEALS: GLASS

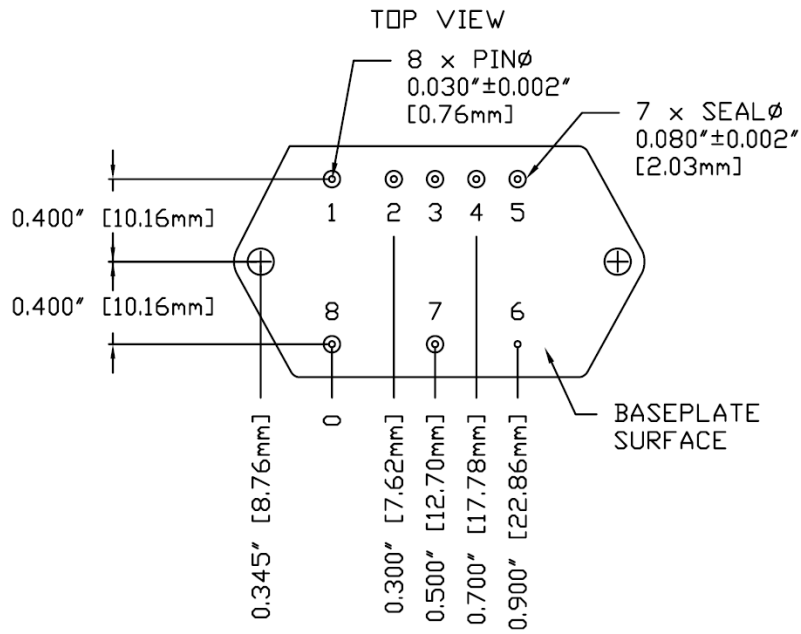
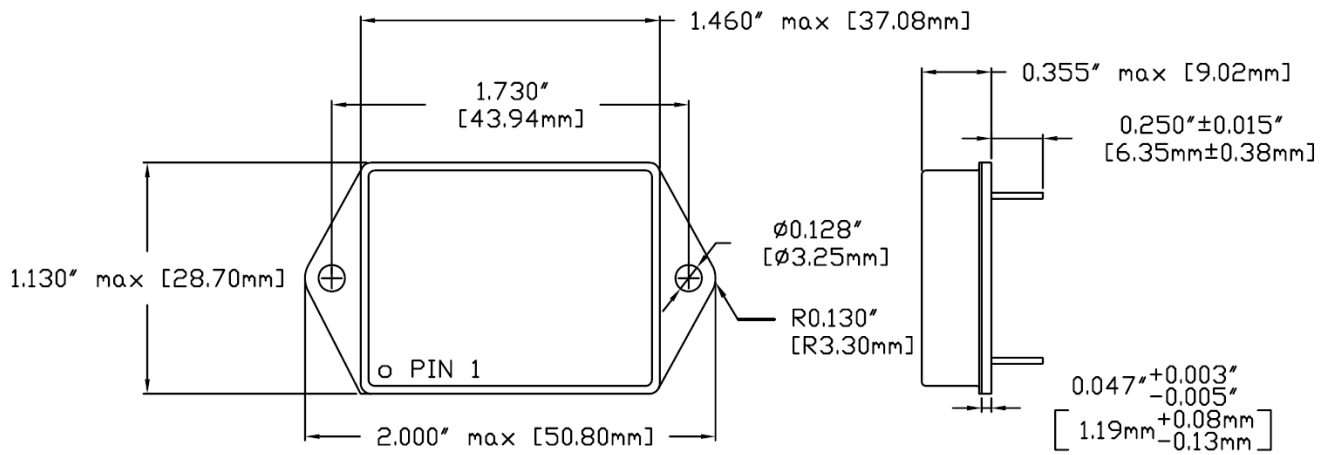
All Outputs Except DVHF2828S			
Pin	Function	Pin	Function
1	INHIBIT	5	N/C
2	N/C	6	CASE
3	OUT COM	7	IN COM
4	+V OUT	8	28V IN

DVHF2828S			
Pin	Function	Pin	Function
1	INHIBIT	5	N/C
2	+V OUT	6	CASE
3	*	7	IN COM
4	OUT COM	8	28V IN

*Pin 3 of DVHF2828S provides a +14V output referenced to OUT COM.

Figure 17 – Non-Flanged Package and Pinout

PACKAGE SPECIFICATIONS (FLANGED)



- NOTES:
1. DIMENSIONAL LIMITS ARE $\pm 0.005"$ UNLESS OTHERWISE STATED.
 2. CASE TEMPERATURE IS MEASURED ON THE CENTER OF THE BASEPLATE.
 3. MOUNTING HOLES ARE NOT THREADED. RECOMMENDED FASTENER IS #4-40 SCREW.
 4. MATERIALS:
 CASE: STEEL, GOLD OVER NICKEL PLATED.
 COVER: STEEL, NICKEL PLATED.
 PINS: ALLOY 52, GOLD OVER NICKEL PLATED.
 PIN SEALS: GLASS

All Outputs Except DVHF2828S			
Pin	Function	Pin	Function
1	INHIBIT	5	N/C
2	N/C	6	CASE
3	OUT COM	7	IN COM
4	+V OUT	8	28V IN

DVHF2828S			
Pin	Function	Pin	Function
1	INHIBIT	5	N/C
2	+V OUT	6	CASE
3	*	7	IN COM
4	OUT COM	8	28V IN

*Pin 3 of DVHF2828S provides a +14V output referenced to OUT COM.

Figure 18 – Flanged Package and Pinout

PACKAGE PIN DESCRIPTION

All Outputs Except DVHF2828S:

Pin	Function	Description
1	INHIBIT	Logic Low = Disabled Output. Connecting the inhibit pin to input common causes converter shutdown. Logic High = Enabled Output. Unconnected or open collector TTL.
2	N/C	No Connection
3	OUT COM	Output Common Connection
4	+V OUT	Positive Output Voltage Connection
5	N/C	No Connection
6	CASE	Case Connection
7	IN COM	Input Common Connection
8	28V IN	Positive Input Voltage Connection

DVHF2828S:

Pin	Function	Description
1	INHIBIT	Logic Low = Disabled Output. Connecting the inhibit pin to input common causes converter shutdown. Logic High = Enabled Output. Unconnected or open collector TTL.
2	+V OUT	Positive Output Voltage Connection
3	*	Provides +14V output referenced to OUT COM.
4	OUT COM	Output Common Connection
5	N/C	No Connection
6	CASE	Case Connection
7	IN COM	Input Common Connection
8	28V IN	Positive Input Voltage Connection

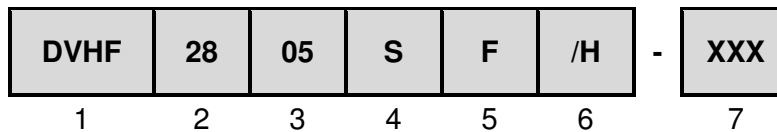
ENVIRONMENTAL SCREENING (100% Tested Per MIL-STD-883 as referenced to MIL-PRF-38534)

Test	MIL-STD-883 Test Method, Condition	No Suffix (Standard) Non-QML ⑤	/ES (Extended) Non-QML ⑤	/H (Class H)	/K (Class K)
Non-Destructive Bond Pull	TM2023	• ④	• ④	• ④	•
Internal Visual	TM2010, TM2017, TM2032 (MIL-STD-750, TM2072, TM2073)	•	•	•	•
Temperature Cycling	TM1010, Condition C -65°C to 150°C, Ambient			•	•
	TM1010, Condition B -55°C to 125°C, Ambient		•		
Constant Acceleration	TM2001, 3000g, Y1 Direction			•	•
	TM2001, 500g, Y1 Direction		•		
PIND ⑦	TM2020, Condition A				•
Pre Burn-In Electrical	25°C				•
Burn-In	TM1015, 320 hrs, 125°C, Case Typ				•
	TM1015, 160 hrs, 125°C, Case Typ			•	
	96 hrs, 125°C, Case Typ		•		
	24 hrs, 125°C, Case Typ	•			
Final Electrical	MIL-PRF-38534, Group A Subgroups 1-6 -55°C, 25°C, 125°C ③			•	•
	MIL-PRF-38534, Group A Subgroups 1 and 4 25°C	•	•		
Hermeticity (Seal)	TM1014, Fine Leak, Condition A2		•	•	•
	TM1014, Gross Leak, Condition C		•	•	•
	Gross Leak, Dip (1 x 10 ⁻³)	•			
Radiography ⑧	TM2012				•
External Visual	TM2009	•	•	•	•

Notes:

- ① Contact Sales for more information concerning additional environmental screening and testing options desired.
- ② 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.
- ③ 100% R&R testing with all test data included in product shipment.
- ④ Not required per MIL-PRF-38534. Test is performed for additional product quality assurance.
- ⑤ Non-QML products may not meet all requirements of MIL-PRF-38534.
- ⑥ Note intentionally not used.
- ⑦ PIND test Certificate of Compliance included in product shipment.
- ⑧ Radiographic test Certificate of Compliance and film(s) or data CD included in product shipment.

ORDERING INFORMATION



(1) Product Series	(2) Nominal Input Voltage		(3) Output Voltage		(4) Number of Outputs	
DVHF	28	28 Volts	1R9 3R3 05 5R2 5R7 12 15 18 28	1.9 Volts 3.3 Volts 5 Volts 5.2 Volts 5.7 Volts 12 Volts 15 Volts 18 Volts 28 Volts	S	Single

(5) Package Option		(6) Screening Code ¹		(7) Additional Screening Code
None F	Non-Flanged Flanged	None /ES /H /K	Standard Extended Class H Class K	Contact Sales

Notes: 1. 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)	DVHF2800S Series Similar Part Number	Standard Microcircuit Drawing (SMD)	DVHF2800S Series Similar Part Number
5962-0324306HXC	DVHF281R9S/H	5962-0324304HXC	DVHF2812S/H
5962-0324306HXA	DVHF281R9S/H-E	5962-0324304HXA	DVHF2812S/H-E
5962-0324306HYC	DVHF281R9SF/H	5962-0324304HYC	DVHF2812SF/H
5962-0324306HYA	DVHF281R9SF/H-E	5962-0324304HYA	DVHF2812SF/H-E
5962-0324306KXC	DVHF281R9S/K	5962-0324304KXC	DVHF2812S/K
5962-0324306KXA	DVHF281R9S/K-E	5962-0324304KXA	DVHF2812S/K-E
5962-0324306KYC	DVHF281R9SF/K	5962-0324304KYC	DVHF2812SF/K
5962-0324306KYA	DVHF281R9SF/K-E	5962-0324304KYA	DVHF2812SF/K-E
5962-0324301HXC	DVHF283R3S/H	5962-0324305HXC	DVHF2815S/H
5962-0324301HXA	DVHF283R3S/H-E	5962-0324305HXA	DVHF2815S/H-E
5962-0324301HYC	DVHF283R3SF/H	5962-0324305HYC	DVHF2815SF/H
5962-0324301HYA	DVHF283R3SF/H-E	5962-0324305HYA	DVHF2815SF/H-E
5962-0324301KXC	DVHF283R3S/K	5962-0324305KXC	DVHF2815S/K
5962-0324301KXA	DVHF283R3S/K-E	5962-0324305KXA	DVHF2815S/K-E
5962-0324301KYC	DVHF283R3SF/K	5962-0324305KYC	DVHF2815SF/K
5962-0324301KYA	DVHF283R3SF/K-E	5962-0324305KYA	DVHF2815SF/K-E
5962-0324302HXC	DVHF2805S/H	5962-0324309HXC	DVHF2818S/H
5962-0324302HXA	DVHF2805S/H-E	5962-0324309HXA	DVHF2818S/H-E
5962-0324302HYC	DVHF2805SF/H	5962-0324309HYC	DVHF2818SF/H
5962-0324302HYA	DVHF2805SF/H-E	5962-0324309HYA	DVHF2818SF/H-E
5962-0324302KXC	DVHF2805S/K	5962-0324309KXC	DVHF2818S/K
5962-0324302KXA	DVHF2805S/K-E	5962-0324309KXA	DVHF2818S/K-E
5962-0324302KYC	DVHF2805SF/K	5962-0324309KYC	DVHF2818SF/K
5962-0324302KYA	DVHF2805SF/K-E	5962-0324309KYA	DVHF2818SF/K-E
5962-0324303HXC	DVHF285R2S/H	5962-0324307HXC	DVHF2828S/H
5962-0324303HXA	DVHF285R2S/H-E	5962-0324307HXA	DVHF2828S/H-E
5962-0324303HYC	DVHF285R2SF/H	5962-0324307HYC	DVHF2828SF/H
5962-0324303HYA	DVHF285R2SF/H-E	5962-0324307HYA	DVHF2828SF/H-E
5962-0324303KXC	DVHF285R2S/K	5962-0324307KXC	DVHF2828S/K
5962-0324303KXA	DVHF285R2S/K-E	5962-0324307KXA	DVHF2828S/K-E
5962-0324303KYC	DVHF285R2SF/K	5962-0324307KYC	DVHF2828SF/K
5962-0324303KYA	DVHF285R2SF/K-E	5962-0324307KYA	DVHF2828SF/K-E
5962-0324308HXC	DVHF285R7S/H		
5962-0324308HXA	DVHF285R7S/H-E		
5962-0324308HYC	DVHF285R7SF/H		
5962-0324308HYA	DVHF285R7SF/H-E		
5962-0324308KXC	DVHF285R7S/K		
5962-0324308KXA	DVHF285R7S/K-E		
5962-0324308KYC	DVHF285R7SF/K		
5962-0324308KYA	DVHF285R7SF/K-E		

Do not use the DVHF2800S 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 DLA Land and Maritime (Previously known as DSCC) website at <https://landandmaritimeapps.dla.mil/programs/defaultapps.asp>. The SMD number listed above is for 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. All SMD products are marked with a "Q" on the cover as specified by the QML certification mark requirement of MIL-PRF-38534.

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

All information contained in this datasheet is believed to be accurate, however, no responsibility is assumed for possible errors or omissions. The products or specifications contained herein are subject to change without notice.