

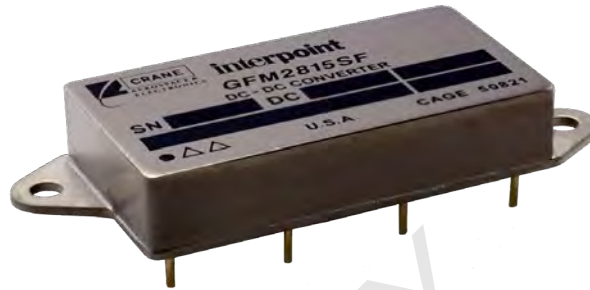
## GFM DC-DC Converter

### PRELIMINARY 8 TO 50 VOLT INPUT – 30 WATT – HIGH EFFICIENCY

*MIL-STD Pedigree. Exceptional Value.*

#### FEATURES

- High reliability
- Typical efficiency 90% or greater
- Up to 30 watts
- -55°C to +105°C operation
- Wide 8 to 50 volt input
- Inhibit and sync functions
- Assembled in a MIL-PRF-38534 certified facility



#### PERFORMANCE QUALIFICATION

Qualified to MIL-PRF-38534, Group C

- Temperature cycle -55 to +105°C 10 times
- Constant Acceleration to 3000 g
- Burn-in, 96 hours
- Final electrical
- Gross and fine leak hermeticity test
- Final visual

MODELS
OUTPUT VOLTAGE (V)
SINGLE
15

#### PACKAGING

- Hermetically sealed, nickel plated, steel case
- Compact footprint
- Typical case dimensions (see Figure 4 on page 5):  
-2.09 x 1.110 x 0.394 inches (53.09 x 28.2 x 10.16 mm)
- Weight: 55 grams max.

#### DESCRIPTION

Now, you don't need to compromise reliability to keep costs down. The GFM's innovative design combines the performance and efficiency you're looking for with Crane's legendary reliability and support. The GFM offers a high density footprint and is assembled in the same facility where Crane builds its ultra-reliable Class H and Class K products used on major space programs around the world. You can be confident that it provides the same documented quality and reliability of traditional converters costing more than double the price.

The Interpoint® GFM Series™ is hermetically sealed in a steel case and is ideal for use in military jets, helicopters, commercial air, ground vehicles and low orbit satellites. The converters are screened to perform over the temperature range of -55°C to +105°C assuring reliable operation in the most demanding of environments.

They are ideal for use in programs requiring high reliability, small size, and high efficiency. The series offers a wide input voltage range of 8 to 50 volts with 80 volt transient for 50 ms.

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## PRELIMINARY 8 TO 50 VOLT INPUT – 30 WATT – HIGH EFFICIENCY

PIN OUT	
Pin	Single Output
1	Sync
2	Inhibit
3	Output Common
4	Positive Output
5	Positive Sense
6	Trim
7	Negative Sense
8	Case Ground
9	Input Common
10	Positive Input

TABLE 1: PIN OUT

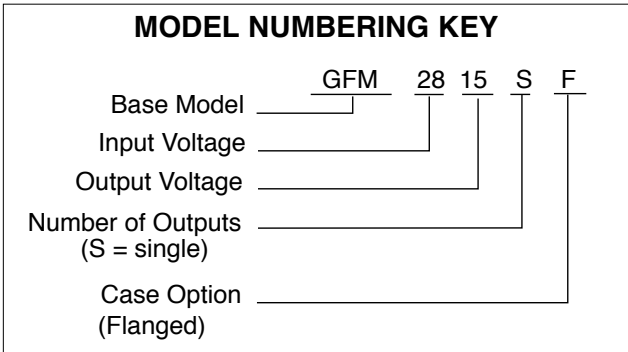


FIGURE 1: MODEL NUMBERING KEY

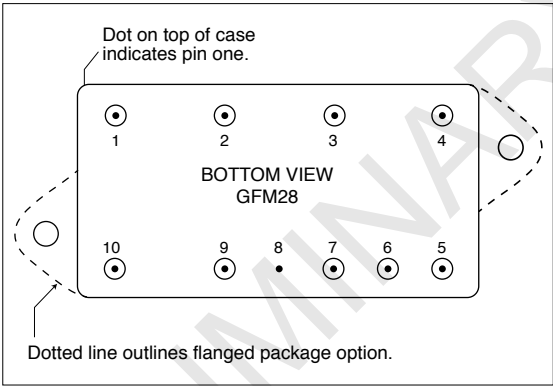
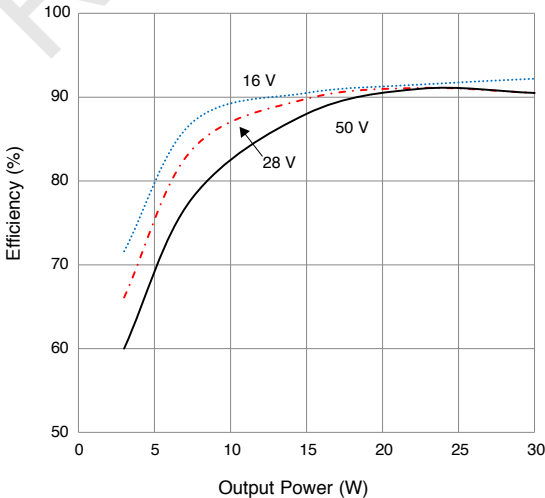


FIGURE 2: GFM SINGLE PIN OUT



GFM2815S Efficiency  
FIGURE 3

# GFM DC-DC Converter

## PRELIMINARY 8 TO 50 VOLT INPUT – 30 WATT – HIGH EFFICIENCY

TABLE 2: OPERATING CONDITIONS, 25°C CASE, 28 VIN, 100% LOAD, UNLESS OTHERWISE SPECIFIED.

GFM SERIES		ALL MODELS			UNITS
PARAMETER	CONDITIONS	MIN	TYP	MAX	
LEAD SOLDERING TEMPERATURE <sup>1</sup>	10 SECONDS MAX.	–	–	300	°C
STORAGE TEMPERATURE <sup>1</sup>		-65	–	+150	°C
CASE OPERATING TEMPERATURE	FULL POWER	-55	–	+105	°C
DERATING OUTPUT POWER/CURRENT <sup>1</sup>	LINEARLY	From 100% at 105°C to 0% at 125°C			
ISOLATION: INPUT TO OUTPUT OR ANY PIN TO CASE EXCEPT CASE PIN	500 VDC AT 25°C	100	–	–	Megohms
CURRENT LIMIT <sup>3</sup>	% OF FULL LOAD	–	130	–	%
AUDIO REJECTION <sup>1</sup>		–	50	–	dB
SWITCHING FREQUENCY	-55°C TO +105°C	380	–	420	kHz
SYNCHRONIZATION	INPUT FREQUENCY	360	–	480	kHz
	DUTY CYCLE <sup>1</sup>	40	–	60	%
	ACTIVE LOW	–	–	0.8	V
	ACTIVE HIGH <sup>1</sup>	4.5	–	5.0	
	REFERENCED TO	INPUT COMMON			
IF NOT USED	LEAVE UNCONNECTED				
INHIBIT ACTIVE LOW (OUTPUT DISABLED) Do not apply a voltage to the inhibit pin <sup>3</sup>	INHIBIT PIN PULLED LOW <sup>2</sup>	–	–	0.8	V
	INHIBIT PIN SOURCE CURRENT <sup>1</sup>	–	–	4	mA
	REFERENCED TO	INPUT COMMON			
INHIBIT ACTIVE HIGH (OUTPUT ENABLED) Do not apply a voltage to the inhibit pin <sup>3</sup>	INHIBIT PIN CONDITION	OPEN COLLECTOR OR UNCONNECTED			
	OPEN PIN VOLTAGE <sup>1</sup>	4.6	–	5.8	V

**Notes**

1. Guaranteed by characterization test and/or analysis. Not a production test.
2. Tested with inhibit pin connected to input common.
3. An external inhibit interface should be used to pull the inhibit low or leave it floating. The inhibit pin can be left unconnected if not used.

# GFM DC-DC Converter

## PRELIMINARY 8 TO 50 VOLT INPUT – 30 WATT – HIGH EFFICIENCY

TABLE 3: PRELIMINARY ELECTRICAL CHARACTERISTICS 25°C CASE, 28 VIN, 100% LOAD, UNLESS OTHERWISE SPECIFIED.

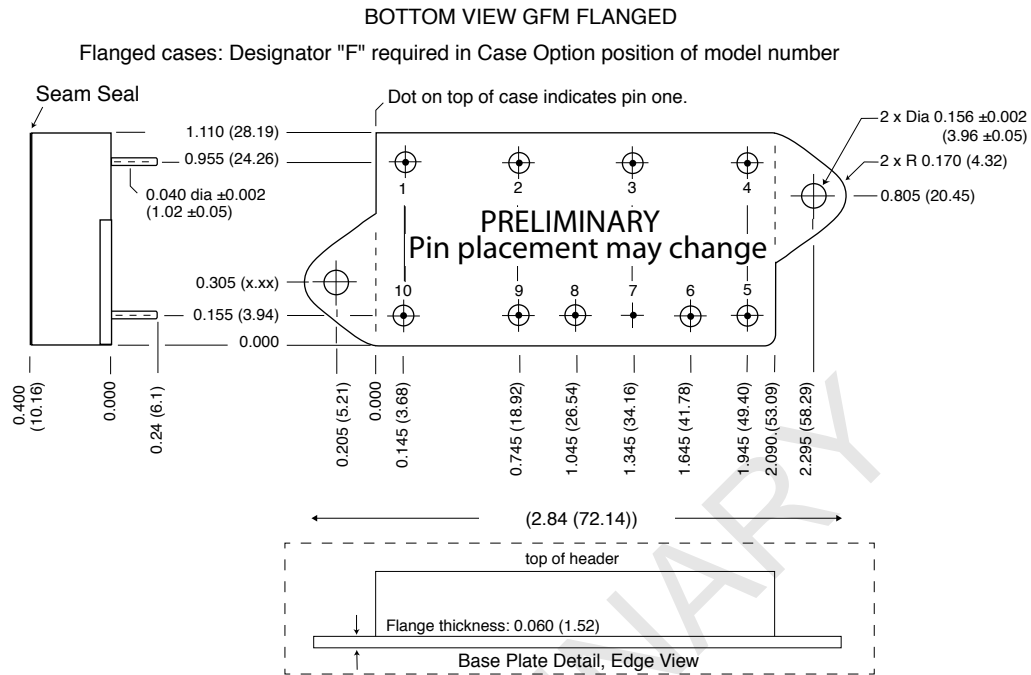
SINGLE OUTPUT MODEL		GFM2815SF			UNITS
PARAMETER	CONDITIONS	MIN	TYP	MAX	
OUTPUT VOLTAGE	$T_C = 25^\circ\text{C}$	14.85	15.00	15.15	V
OUTPUT CURRENT	$V_{IN} = 8 \text{ TO } 50 \text{ V}$	—	—	2	A
OUTPUT POWER	$V_{IN} = 8 \text{ TO } 50 \text{ V}$	—	—	30	W
OUTPUT RIPPLE	10 kHz - 2 MHz	—	20	—	mV p-p
	20 kHz to 20 MHz	—	40	—	
LINE REGULATION	$V_{IN} = 8 \text{ TO } 50$	—	50	—	mV
LOAD REGULATION	NO LOAD TO FULL	—	50	—	mV
INPUT VOLTAGE	CONTINUOUS	8	28	50	V
	NO LOAD TO FULL	—	—	80	V
UNDERVOLTAGE LOCKOUT		—	8	—	V
INPUT CURRENT	NO LOAD	—	60	—	mA
	INHIBITED	—	2	—	
INPUT RIPPLE CURRENT	10 kHz - 2 MHz	—	30	—	mA p-p
	20 kHz to 20 MHz	—	60	—	
EFFICIENCY		—	90	—	%
LOAD FAULT <sup>3</sup>	POWER DISSIPATION	—	2	—	W
SHORT CIRCUIT	RECOVERY <sup>1</sup>	—	30	—	ms
STEP LOAD RESPONSE <sup>3</sup> 50% - 100% - 50%	TRANSIENT	—	±1500	—	mV pk
	RECOVERY	—	3500	—	us
STEP LINE RESPONSE <sup>1,3</sup> 16 - 50 - 16 V	TRANSIENT	—	±800	—	mV pk
	RECOVERY	—	1300	—	μs
START-UP <sup>3,4</sup>	DELAY	—	30	—	ms
FULL LOAD	OVERSHOOT <sup>1</sup>	—	500	—	mV pk
CAPACITIVE LOAD <sup>5</sup>		—	500	—	uF

**Notes**

1. Guaranteed by characterization test and/or analysis. Not a production test.
2. Up to 80 volt transient for up to 50 ms.
3. Recovery and startup times are measured from application of the transient or change in condition to the point at which  $V_{OUT}$  is within 1% of final value.
4. Tested on release from inhibit.
5. No effect on dc performance.

# GFM DC-DC Converter

## PRELIMINARY 8 TO 50 VOLT INPUT – 30 WATT – HIGH EFFICIENCY



**Weight:** 55 grams maximum

**Case dimensions in inches (mm)**

Tolerance  $\pm$ 0.005 (0.13) for three decimal places  
 $\pm$ 0.01 (0.3) for two decimal places  
 unless otherwise specified

**CAUTION**

Heat from reflow or wave soldering may damage the device.  
 Solder pins individually with heat application not exceeding 300°C for 10 seconds per pin.

**Materials**

Header Cold Rolled Steel/Nickel/Gold  
 Cover Kovar/Nickel  
 Pins #52 alloy/Gold glass compression seal  
 Gold plating of 50 - 150 microinches included in pin diameter  
 Seal hole 0.092  $\pm$ 0.002 (3.05  $\pm$  0.05)

Please refer to the numerical dimensions for accuracy.

FIGURE 4: GFM FLANGED

# GFM DC-DC Converter

**PRELIMINARY 8 TO 50 VOLT INPUT – 30 WATT – HIGH EFFICIENCY**

## ENVIRONMENTAL SCREENING

### TEST PERFORMED

<b>Temperature Cycle (10 times)</b> Method 1010, Cond. B, -55°C to +105°C, ambient	■
<b>Burn-in Method 1015 <sup>1</sup></b> 96 hours	■
<b>Final Electrical Test MIL-PRF-38534,</b> -55°C, +25°C, +105°C case	■
<b>Hermeticity Test</b> Fine Leak, Cond. A <sub>2</sub> , helium	■
<b>Final visual inspection Method 2009</b>	■

Test methods are referenced to MIL-STD-883 as determined by MIL-PRF-38534.

#### Note

1. Burn-in temperature designed to bring the case temperature to +105°C minimum. Burn-in is a powered test.