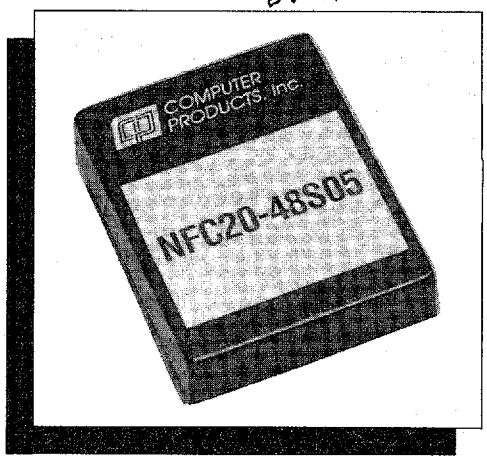
NFC20 SERIES 20 Watt Hybrid DC/DC Converters

- Wide 2:1 input range
- High efficiency
- Low profile case
- Overvoltage protection
- Overcurrent protection
- Inhibit/sync input
- Two year warranty
- Recommended for new designs



The NFC20 series are economical 20 watt, high efficiency hybrid DC/DC converters that are ideal for space-critical applications in telecommunications, data communications, distributed power networks, field test and battery-powered products.

This series accepts input voltages ranging from 18 to 36VDC or 36 to 72VDC. They maintain a nearly-constant 80% efficiency over the entire input voltage ranges, and can provide full output power up to 60°C without derating or additional heatsinking. Single output versions have floating outputs, which can be referenced as either positive or negative, or "stacked" in series for higher output voltages.

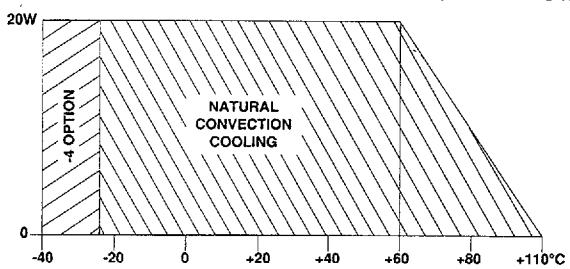
The NFC20 series includes current limited outputs, overvoltage protection and CMOS/TTL compatible remote inhibit/sync input. The small 1.6" × 2.0" × 0.46" package conserves usable PCB area and makes compact systems possible.

This series also incorporates useful features such as external output trim for user voltage adjustment and provision to synchronize the converter's switching frequency to an external clock. Guaranteed operation down to −40°C is available. Both single and dual output versions are available.

Model Number(1)	Input Voltage	Input(2) Current (max)	Output Voltage	Output Current (min)	Output Current (max)	OVP(4) (typ)	Efficiency (typ)	Error Band(5)
NFC20-24S05	24V	1.05A	5V	0	4A	6.2V	81%	±2% max
NFC20-24S12	24V	1.03A	12V	0	1.67A	15V	83%	±2% max
NFC20-24S15	24V	1.03A	15V	0	1.33A	18V	83%	±2% max
NFC20-24D12	24V	1.04A	+12V	0	.833A	30V	83%	±4% max
			−12V	0	.833A	(total)		±4% max
NFC20-24D15	24V	1.03A	+15V	0	.666A	36V	84%	±4% max
			−15V	0	.666A	(total)		±4% max
NFC20-48S05	48V	0.52A	5V	0	4A	6.2V	82%	±2% max
NFC20-48S12	48V	0.515A	12V	0	1.67A	15V	83%	±2% max
NFC20-48S15	48V	0.515A	15V	0	1.33A	18V	83%	±2% max
NFC20-48D12	48V	0.51A	+12V	0	.833A	30V	85%	±4% max
			−12V	0	.833A	(total)		±4% max
NFC20-48D15	48V	0.505A	+15V	0	.666A	36V	86%	±4% max
			−15V	0	.666A	(total)		±4% max

Notes:
(1) For guaranteed operation at −40°C, please add "-4" to any of these model numbers. Please contact the factory for availability.
(2) Maximum input current at 24VDC or 48VDC input voltage.
(3) The NFC20 can operate at full output current without heatsinking or forced air cooling as long as the maximum case temperature is not exceeded. Please consult the Product Specifications table.
(4) OverVoltage Protection threshold. Any output overvoltage clamps the output to a very low output voltage.
(5) Error band is defined as the static output regulation at 25°C, including initial setting accuracy, line voltage within stated limits and load current within stated limits.

OPERATING TEMPERATURE LIMITS AND OUTPUT POWER RANGE



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PRODUCT SPECIFICATIONS(6)

T-57-11

Parameter	Conditions	Limits
Input Voltage	24V nominal 48V nominal	18 to 36VDC 36 to 72VDC
Input Voltage Surge Protection	24V input 48V input	50V for 100 mS 75V continuously 100V for 100 mS
Input Filter		See note 7
Reflected Ripple Current		Determined by external filter circuit
Input Current	Converter inhibited	20 mA
Output Voltage Setting Accuracy		±0.5%
Line Regulation	Full input range	±0.1%
Load Regulation	 100% to 25% 100% to 0%	Singles Duals ±0.25% ±2% ±0.5% ±3%
Output Voltage Trim Adjustment Range		±10%
Temperature Coefficient		±0.02%/°C
Voltage Stability	24 hours	±0.05% max
Transient Response	25% load step	150 mV peak transient settling within 1% in 1 mS
Output PARD	20 MHz bandwidth Single output Dual outputs	 75 mV P-P, 20mV RMS 100mV P-P, 20mV RMS
Output Overshoot	Turn-on	None
Short Circuit Protection	Automatic recovery	Continuous
Total Output Power		20 watts maximum
Isolation Voltage		500VAC, 710 VDC min
Isolation Resistance		10^8 ohms min
Inhibit Function	Referenced to input (-) On Off	 >1.8V or open < 0.4V
Switching Freqency	Normal operation Frequency range with sync Sync signal requirements	200kHz ±5% ±10% negative (sink) pulse 25% duty cycle maximum CMOS/TTL compatible
Altitude	Operating Non-operating	10,000 feet max 40,000 feet max
Temperature	Operating ambient temperature Standard models "-4" models (8) Case temperature Non-operating	 −25°C to +60°C −40°C to +60°C +110°C maximum −55°C to +125°C
Relative Humidity	Non-condensing	5% to 95%
Vibration	Three orthagonal axes, random vibration 10 minute test for each axis	2.4G rms (appx) 5 Hz to 500 Hz
MTBF	MIL-HDBK 217E, 25 C	260,000 hrs min
Weight		2 oz. (57 grams)
Case Material		Black coated metal with non-conductive base
Flammability		UL 94V-0 materials

Notes:
(6) All specifications are typical at nominal input, 25°C unless otherwise noted.
(7) An external input capacitor is required for normal operation. For 24V input, the cap should be capable of 1000mA ripple current. 100uF - 50V, Sprague type 672D107F050D1 or equivalent suggested. For 48V input, the cap should be capable of 600mA ripple current. 33uF - 100V, Sprague type 672D336F100DM4D or equivalent suggested.
(8) For guaranteed operation at −40°C, please add "-4" to any of the model numbers shown on the first page. These are special order products; contact the factory for availability details.

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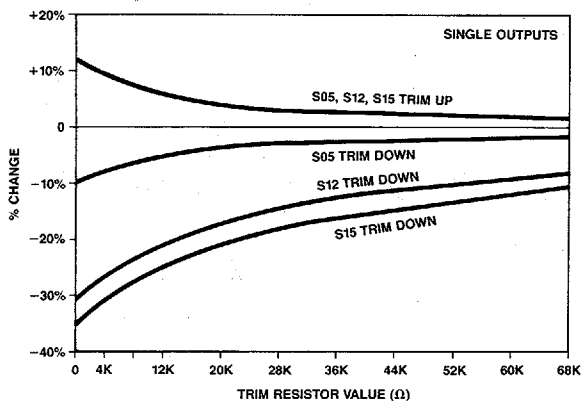
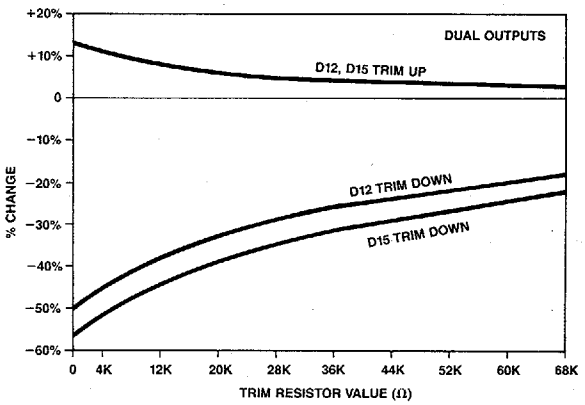
T-57-11

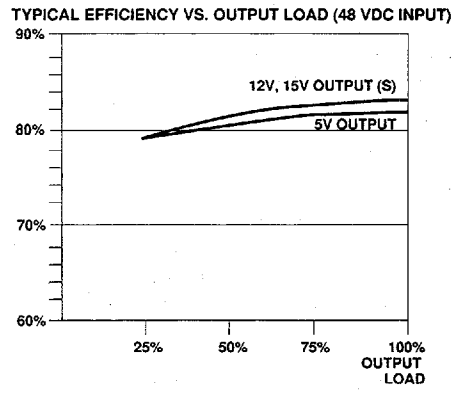
Output Voltage Trim Procedure

The output voltage(s) can be trimmed up or down using either a fixed value resistor or a potentiometer. The trim up resistor should be connected between Pin 7 and "Trim". The trim down resistor should be connected between "$+V_{out}$" and "Trim". Alternatively, the output voltage(s) can be made continuously adjustable by connecting a 10K pot between "$+V_{out}$" and "$-V_{out}$", with the pot's wiper arm connected to "Trim".

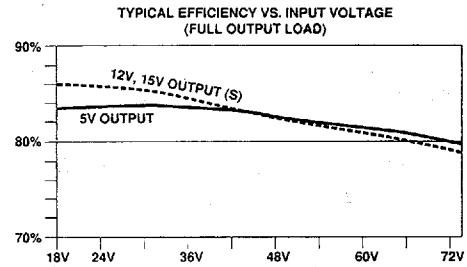




TYPICAL EFFICIENCY VS. OUTPUT LOAD (48VDC INPUT)



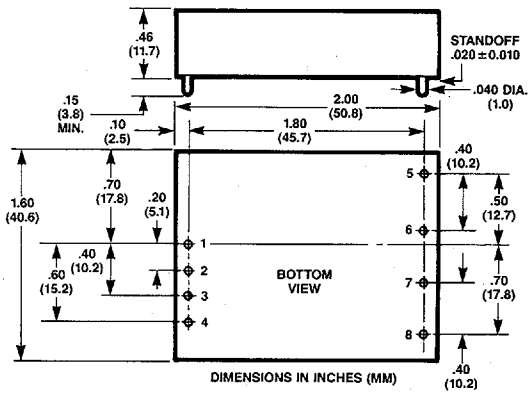
TYPICAL EFFICIENCY VS. INPUT VOLTAGE (FULL OUTPUT LOAD)



MECHANICAL SPECIFICATIONS

PIN CHART

	NFC20-XXS05	*NFC20-XXS12*	*NFC20-XXS15*	*NFC20-XXD12*	*NFC20-XXD15*
Pin 1	Input (+)	Input (+)	Input (+)	Input (+)	Input (+)
Pin 2	Input (−)	Input (−)	Input (−)	Input (−)	Input (−)
Pin 3	(no pin)	(no pin)	(no pin)	(no pin)	(no pin)
Pin 4	Control/Sync	Control/Sync	Control/Sync	Control/Sync	Control/Sync
Pin 5	(no pin)	(no pin)	(no pin)	+12V	+15V
Pin 6	+5V	+12V	+15V	Output Return	Output Return
Pin 7	Output Return	Output Return	Output Return	−12V	−15V
Pin 8	Trim	Trim	Trim	Trim	Trim



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