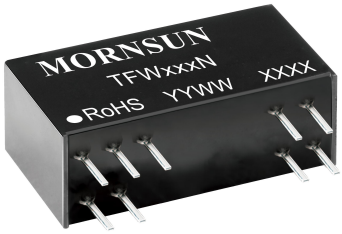
Signal Conditioning Modules
TFWxxxN Series

MORNSUN®

Active high precision output signal conditioning module



CE Report EN62368-1 RoHS

3 years Warranty

FEATURES

- Two-port isolation (signal input to signal output)
- High linearity of 0.1% Full Scale
- Isolation test voltage 2kVAC (60s)
- Low ripple & noise (30mVpp, 20MHz)
- Compact DIP18 size measures 26 x 9.5 x 12.5mm

The TFWxxxN series signal conditioning modules (also called isolated transmitter), are transforming the incoming digital PWM signal on the input directly into representative isolated analog voltage and current signals at the output. The adopted electromagnetic isolation technology has a much higher accuracy and a lower temperature drift in comparison with photo/opto-coupler isolators. This module has a two-port isolation (input and output).

Selection Guide

Certification	Model	Power Supply input Typ. (VDC)	Input Signal(%)	Linearity Output Range	Isolated Power Output (VDC)
EN	TFW260N	5	0-100	0-20mA	None
	TFW560N	5	0-100	0-10V	None
	TFW660N	5	0-100	0-5V	None

Input Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Power Input	Input Voltage		Typ.-5%	Typ.	Typ.+5%	VDC
	Input Power	Signal full load, isolated power supply full load	--	--	1.0	W
	Power Supply Protection		None			
Signal Input	Frequency	Operating temperature range from -40℃ to +85℃, ViH-ViL=3.3V	100	--	1000	Hz
	Duty Cycle	Operating temperature range from -40℃ to +85℃, ViH-ViL=3.3V	0	--	100%	--
	Edge Time	500Hz, Ta=25℃	--	--	100	ns
	PWM Amplitude	ViH-ViL	3	--	5	V

Output Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Signal Output	Output Signal		See selection guide			
	Load Capacity	Current output	--	--	500	Ω
		Voltage output	2	--	--	kΩ
	Ripple & Noise	20MHz bandwidth	--	30	--	mVpp

Transmission Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
linearity	Ta=25℃	-0.1%FS	--	+0.1%FS	--
Temperature Coefficient	Operating temperature range from -40℃ to +85℃	--	50	100	PPM/℃
Response Time		--	500	1000	ms

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General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Electric Isolation		Isolated between signal input/power supply and signal output.			
Isolation Test	Electric strength test for 1 minute with a leakage current <1mA, humidity <70%RH	2	--	--	kVAC
Insulation Resistance	At 500VDC	100	--	--	MΩ
Operating Temperature		-40	--	+85	℃
Transportation and Storage Temperature		-40	--	+85	℃
Safety Standard		EN62368-1 (Report)			
Safety Class		CLASS III			
Application Environment		The presence of dust, severe vibration, shock and corrosive gas may cause damage to the product			

Mechanical Specifications

Case Material	Black plastic, flame-retardant heat- resistant
Package	DIP18
Weight	5.5g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Immunity	ESD	IEC/EN61000-4-4	HBM ±4kV	
	EFT	IEC/EN61000-4-4	Signal output port ±1kV (see Fig. 4 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	Signal output port ±1kV (line to ground) (see Fig. 4 for recommended circuit)	perf. Criteria B

Application Precautions

1. Carefully read and follow the instructions before use; contact our technical support if you have any question;
2. Do not use the product in hazardous areas;
3. Use only DC power supply source for this product. 220VAC power supply is prohibited;
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction;

After-sales service

1. Factory inspection and quality control are strictly enforced before shipping any product; please contact your local representative or our technical support if you experience any abnormal operation or possible failure of the module;
2. The products have a 3-year warranty period, from the date of shipment. The product will be repaired or exchanged free of charge within the warranty period for any quality problem that occurs under normal use.

Applied circuit

Please refer to Isolated Transmitter application notes.

Design Reference

1. Typical application

1) Schematic diagram

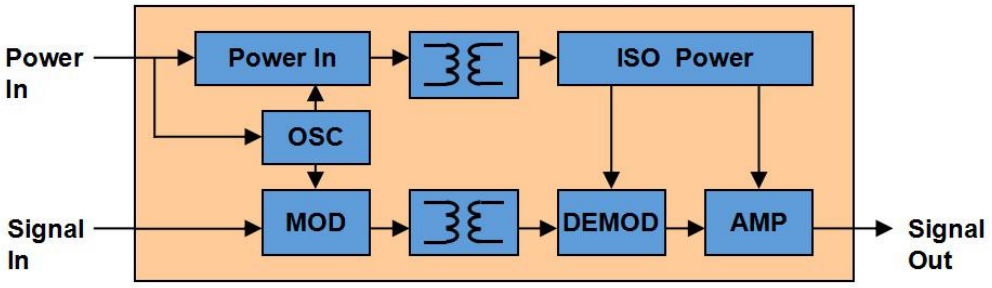

Fig. 1

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2) Typical application circuit

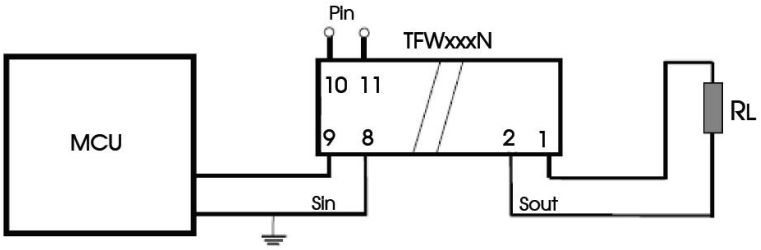

Fig. 2 Schematic diagram of TFW_N application

Functional Description

In figure 2, Sin is a digital control signal provided by the MCU control circuit. The TFW-N module realizes the conversion of this input into an isolated output signal at the Sout terminals. The Pin terminals are the input ports for the module's power supply.

How it Works

The MCU circuit's output is a PWM signal feeding into Sin terminals. The PWM signal is subsequently converted by the TFW-N module into an analog signal that is isolated from the input and ready for the back end load RL. The whole process results in a converted and isolated analog outputs signal of the MCU's digital signal input. The power supply to the TFW_N module is provided by the MCU control circuit.

3)The relationship between dutycycle of the input signal and output voltage (For reference only)

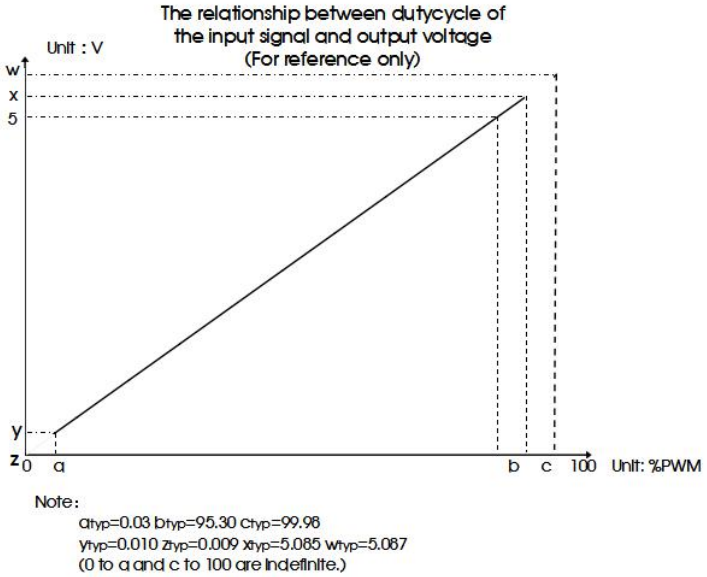

Fig. 3 The relationship between dutycycle of the input signal and output voltage (For reference only)

2. EMC compliance circuit

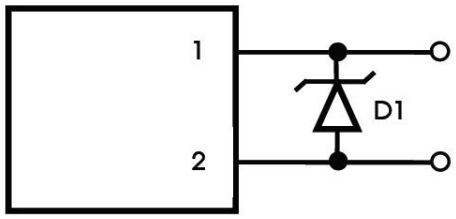

Fig. 4

Component	Recommended part, value	Recommended brand
D1	SMBJ15A	AVX

3.For additional information please find the application notes on www.mornsun-power.com

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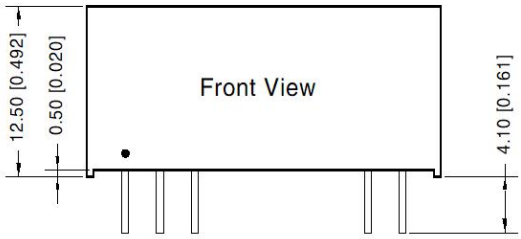
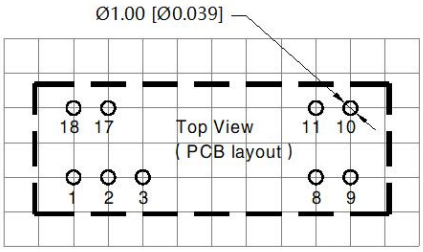
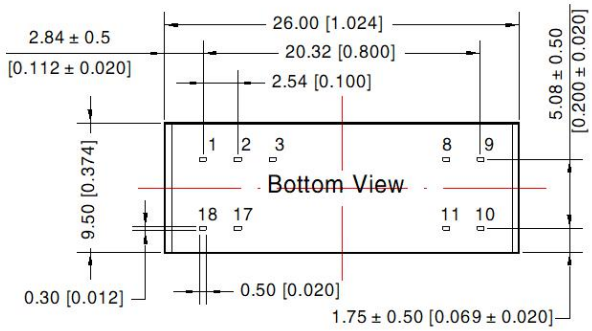
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note: Grid 2.54*2.54mm



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

Pin-Out					
1	Sout+	Signal output(+)	10	Pin+	Power input(+)
2	Sout-	Signal output(-)	11	Pin-	Power input(-)
3	NC	No Connection	17	NC	No Connection
8	Sin-	Signal input(-)	18	NC	No Connection
9	Sin+	Signal input(+)			

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58240002;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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