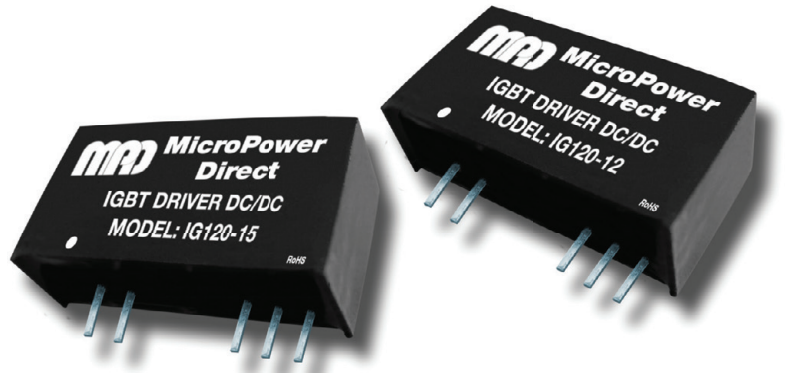


# IG120 Series

## High Isolation IGBT Driver DC/DC Converters



### Key Features:

- Operates With xx962 Drivers
- Independent Outputs
- EN 60950 Approved
- 3,000 VAC Isolation
- Miniature SIP Case
- >3.5 MHour MTBF
- Seven Standard Models

RoHS



### Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Supply Voltage Range	See Model Selection Guide					
Input Filter	Internal Capacitor					
Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Line Regulation	For VIN Change of 1%		±1.2	±1.5	%/%	
Load Regulation	See Note 1		6.3	15	%	
Ripple & Noise (20 MHz)			100	200	mV P - P	
Efficiency			80		%	
Temperature Coefficient				±0.03	%/°C	
Output Short Circuit	Continuous (Autorecovery)					
General						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage	60 Seconds	3,000			VAC	
Isolation Resistance		1,000			MΩ	
Isolation Capacitance, 1 kHz/0.1V			6.6		pF	
Switching Frequency			100	300	kHz	
EMI Characteristics						
Parameter	Standard	Criteria		Level		
Radiated Emissions, See Note 3, Pg 3	EN 55022			Class B		
Conducted Emissions, See Note 3, Pg 3	EN 55022			Class B		
ESD	EN 61000-4-2	B			±8 kV Contact	
Environmental						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Operating Temperature Range	Ambient	-40	+25	+105	°C	
Storage Temperature Range		-55		+125	°C	
Cooling	Free Air Convection					
Humidity	RH, Non-condensing			95	%	
Physical						
Case Size	See Mechanical Diagram (Page 4)					
Case Material	Non-Conductive Black Plastic (UL94-V0)					
Weight	0.152 Oz (4.3g)					
Reliability Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours	
Absolute Maximum Ratings						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Max Supply Voltage (1 Sec)	IG120-12			13	VDC	
	IG120-12W			15		
	IG100-9, IG100-9D			16		
	IG120-15, IG136-15			16		
	IG120-24			26		
Lead Temperature	1.5 mm From Case For 10 Sec			300	°C	

**Caution:** Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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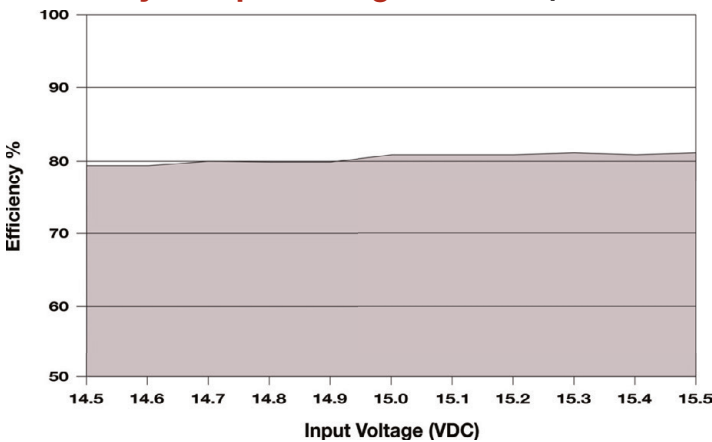
Model Number	Input (Supply)		Output 1					Output 2					Load Regulation (%)		Maximum Capacitive Load (µF)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Voltage (VDC)			Current (mA Max)	Current (mA, Min)	Voltage (VDC)			Current (mA Max)	Current (mA, Min)	Min.	Max.		
	Nom.	Range	Min.	Nom.	Max.			Min.	Nom.	Max.						
IG100-09	15	14.5 - 15.5	8.0	9.0	10.0	111.0	0.0						8.3	15	220	200
IG100-09D	15	14.5 - 15.5	8.0	9.0	10.0	55.0	0.0	-8.0	-9.0	-10.0	55.0	0.0	8.3	15	220	200
IG120-12	12	11.6 - 12.4	14.0	15.0	16.0	80.0	0.0	-7.0	-8.7	-10.0	40.0	0.0	6.3	15	220	400
IG120-12W	12	9.0 - 15.0	14.0	15.0	16.0	100.0	0.0	-7.0	-8.0	-9.0	80.0	0.0	6.3	15	220	500
IG120-15	15	14.5 - 15.5	14.0	15.0	16.0	80.0	0.0	-7.0	-8.7	-10.0	40.0	0.0	6.3	15	220	300
IG136-15	15	14.5 - 15.5	16.5	17.0	18.0	80.0	0.0	-7.0	-8.7	-10.0	40.0	0.0	6.3	15	220	400
IG120-24	24	23.3 - 24.7	14.0	15.0	16.0	80.0	0.0	-7.0	-8.7	-10.0	40.0	0.0	6.3	15	220	200

**Notes:**

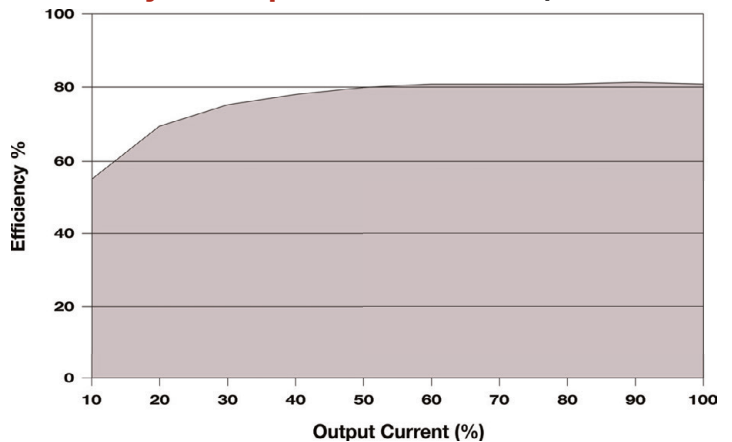
1. Load regulation is measured from 10% load to full load. Load regulation is specified for the primary output (output 1). The load regulation of output 2 may vary slightly. The typical load regulation for IG100-9 and IG100-9D is 8.3%.
2. Operation at no-load will not damage these units. However, they may not meet all specifications.
3. If output 2 is not used, it should be left open.
4. It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

The IG100 series is designed to operate with the IGD962 IGBT driver. Contact the factory for more information

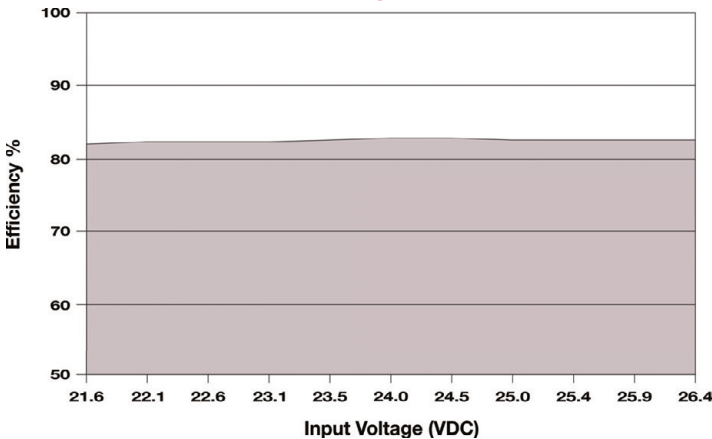
**Efficiency vs Input Voltage 15 VDC Input**



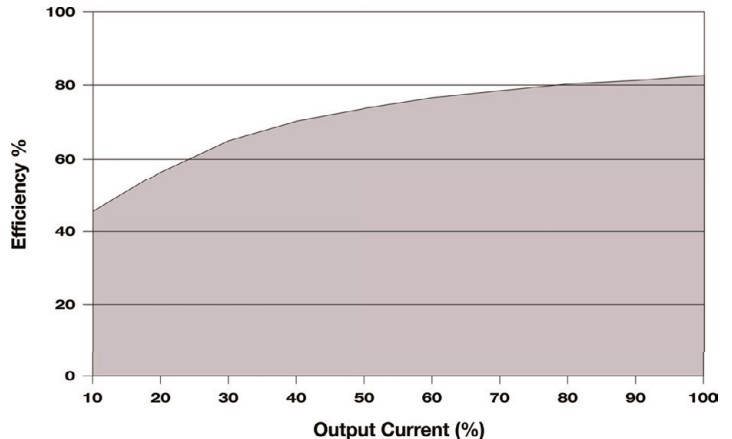
**Efficiency vs Output Load 15 VDC Input**



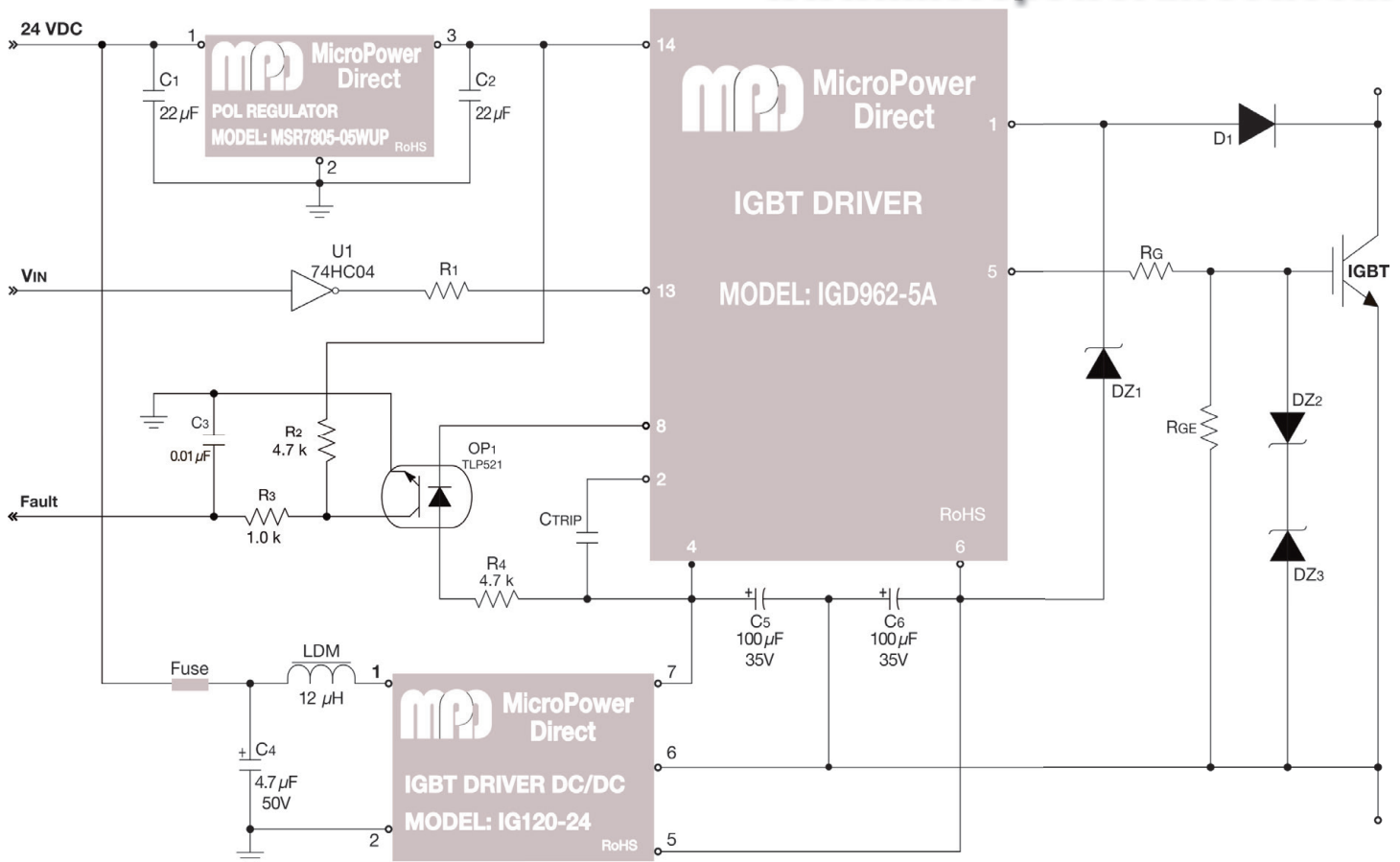
**Efficiency vs Input Voltage 24 VDC Input**



**Efficiency vs Output Load 24 VDC Input**



Typical Connection



The **IG120** series is a good match for the **IGD962** type IGBT driver. When combined, the **IGD962** & **IG120** provide the isolated gate drive required for controlling high power IGBT modules. The **IGD962** features an internal high speed optocoupler, high transient immunity, short circuit protection and a fault signal output. It is packaged in a compact single-in-line (SIP) package that minimizes the required printed circuit board space.

The **IGD962-5A** converts logic level control signals into a fully isolated gate drive of +15V/-8.5V. Gate drive current is 5A peak. Gate drive power isolation is provided by the **IG120** series DC/DC converters (see connection diagram above with the **IG120-24**). Control signal isolation is provided by an internal high speed optocoupler. Desaturation detection is used for short circuit protection.

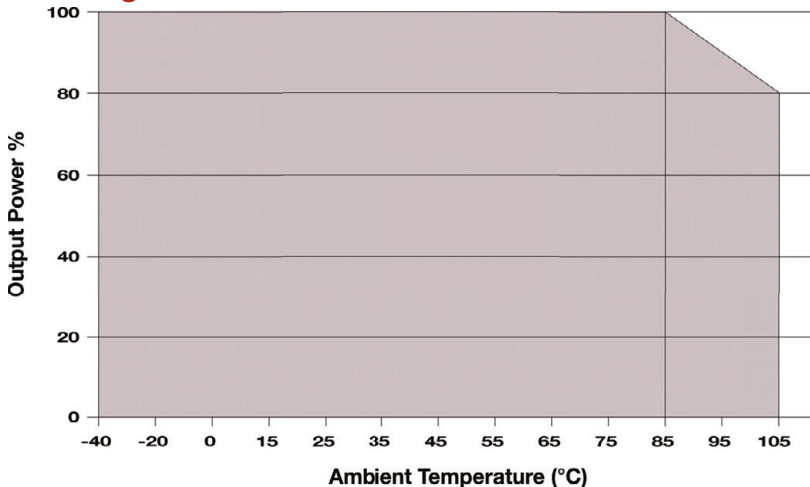
The **IG120** series may be used in a wide variety of on-board power distribution applications. However, with asymmetrical outputs, an isolation barrier specified at 3 kVAC very low isolation capacitance and a wide operating temperature range; they are an ideal choice for IGBT drive & control circuits. They are specifically designed for use with 962 type IGBT drivers. A typical connection to the **MicroPower Direct IGD962** is shown in the diagram above.

Some notes on this circuit (starting with the **IG120-24** input) are:

1. The **IG120-24** DC/DC should be mounted as close to the IGBT driver as possible, to minimize the length of connecting board traces or wires.
2. The **IG120** series does not include overload protection (typical of most low power DC/DC's). It is recommended that an external fuse be used. The recommended fuse is shown in the model chart on page 2.
3. The addition of the input filter components (C1 and LDM) will typically bring the circuit to within the limits of EN 55022 Class B. The recommended values for these components are shown in the table below.  
If meeting EN 55022 class B is not a concern, the inductor (LDM) can be eliminated. In this case, the recommended value for C4 is 100  $\mu$ F/35V.
4. The recommended values for the decoupling capacitors C5 and C6 are shown in the table below. These low ESR capacitors should be mounted as close to the **IGD962** driver as possible.
5. Input filtering components (C4 and LDM) should be mounted as close to the unit as possible. The trace (or wire) between the DC/DC and the driver circuit should be as short as possible.
6. The  $\mu$ C of the IGBT module should be 2 or less. For IGBT modules with a  $\mu$ C greater than 2, we recommend our **IG480** series.
7. Recommended values for components are:

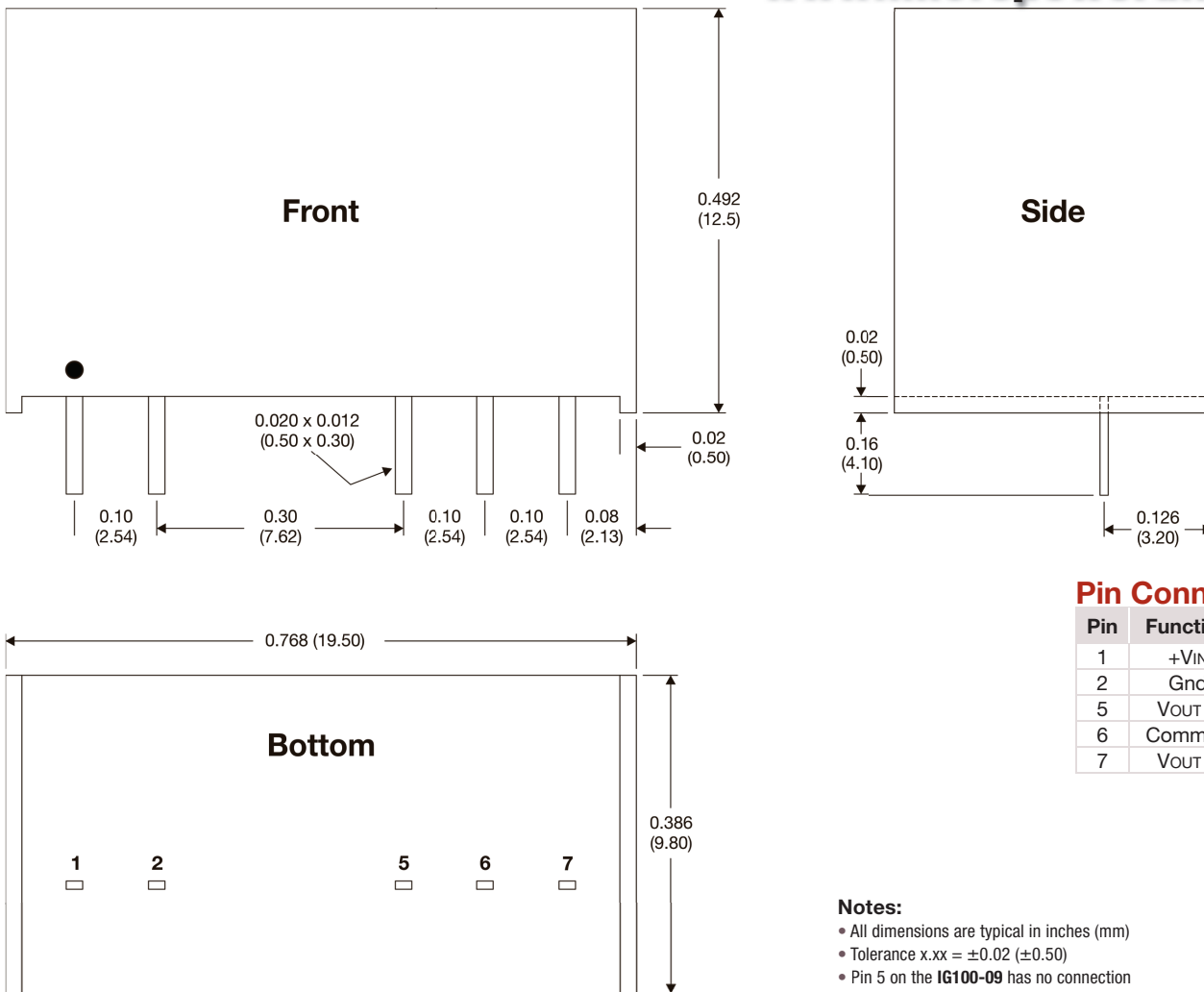
Component	12 V <sub>IN</sub>	15 V <sub>IN</sub>	24 V <sub>IN</sub>
C4	4.7 $\mu$ F/50V	4.7 $\mu$ F/50V	4.7 $\mu$ F/50V
LDM	12 $\mu$ H	12 $\mu$ H	12 $\mu$ H
C5	100 $\mu$ F/35V	100 $\mu$ F/35V	100 $\mu$ F/35V
C6	100 $\mu$ F/35V	100 $\mu$ F/35V	100 $\mu$ F/35V

Derating Curve



## Mechanical Dimensions

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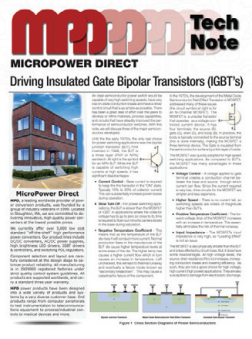
## Pin Connections

Pin	Function
1	+VIN
2	Gnd
5	VOUT 2
6	Common
7	VOUT 1

### Notes:

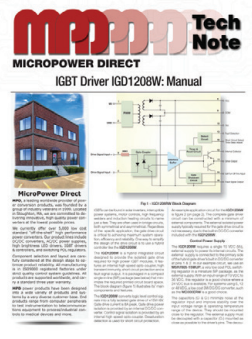
- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.50)
- Pin 5 on the IG100-09 has no connection

# More Literature:



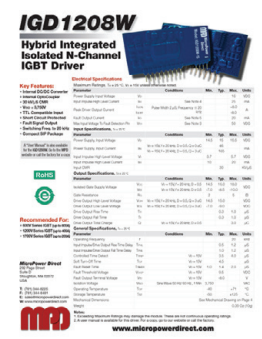
### Application Note

An in depth look at IGBT's, including their development, advantages & disadvantages, and usage.



### Product Manual

In depth information on the use and performance of the IGD1205W IGBT Drivers.



### Product Datasheets

In depth specifications on the connection and performance of a full line of IGBT drivers and isolated DC/DC converters.



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