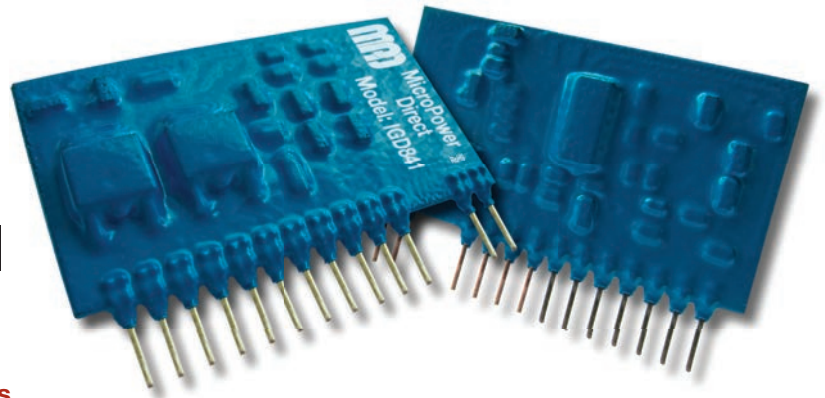# IGD841

Hybrid Integrated Isolated N-Channel IGBT Driver

Key Features:

- Internal OptoCoupler
- 30 kV/μS CMR
- V_{ISO} = 3,750V
- One Supply Drive Topology
- Compact SIP Package
- Short Circuit Protected
- Fault Signal Output
- Switching Freq. to 20 kHz
- Compatible With EXB841

Recommended For:

- 600V Series IGBT (up to 600A)
- 1200V Series IGBT (up to 400A)
- 1700V Series IGBT (up to 200A)

RoHS

Electrical Specifications

Absolute Maximum Ratings, T_A = 25 ºC unless otherwise noted.

Parameter		Conditions	Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}	DC			25	VDC
Input Voltage	V_{IN}	See Note 3			50	VDC
Input Current	I_{IN}	See Note 4			25	mA
Output Current	I_{GON}	Pulse Width 2μS, Frequency $\leqq$ 20 kHz			+5.0	A
	I_{GOFF}				-5.0	
Isolation Voltage	V_{ISO}	Sine Wave Voltage 50 Hz/ 60 Hz , 1 Min			3,750	VAC
Junction Temperature	T_J				150	ºC
Operating Temperature	T_{OP}		-20		+70	ºC
Storage Temperature	T_{ST}		-40		+125	ºC
Fault Output Current	I_{FO}	See Note 5			20	mA

Electrical Characteristics, T_A = 25 ºC, V_{CC} = 15 VDC unless otherwise noted.

Parameter		Conditions	Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}	Recommended Range	14	15		VDC
Reverse Bias Supply Voltage	V_{RB}	Recommended Range		-5		VDC
Switching Frequency	f	Recommended Range	0		20	kHz
Gate Resistor	R_G		2			Ω
Input CMR			15	30		kV/μS
"H" Input Current	I_{IH}	Recommended Range	10	16	20	mA
"H" Output Voltage	V_{OH}	V_{CC} = 20V		14		VDC
"L" Output Voltage	V_{OL}	V_{CC} = 20V		-5		VDC
"L-H" Propagation	T_{PLH}	I_{IH} = 16 mA		0.5	1.0	μS
"L-H" Rise Time	T_R	I_{IH} = 16 mA		0.6	1.0	μS
"H-L" Propagation	T_{PHL}	I_{IH} = 16 mA		1.0	1.3	μS
"H-L" Fall Time	T_F	I_{IH} = 16 mA		0.4	1.0	μS
Protection Threshold Voltage	V_{OCP}	V_{CC} = 20V		8.5		VDC
Protection Reset Time	T_{TIMER}		1.0	1.4	2.0	mS
Fault Output Current	I_{FO}	See Note 6			5.0	mA
Controlled Time Detect	T_{TRIP1}	Short Circuit 1, See Note 7		2.6		μS
Soft Turn-Off Time	T_{OFF2}	See Note 8		5.0		μS
SC Detect Voltage	V_{SC}	Collector Voltage of Module	15			VDC

Notes:
1. Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.
2. "H" = high level signal. "L" = low level signal.
3. The voltage applied to pin 15.
4. The current measured between pins 15 and 14.
5. The current at pin 5.
6. The current at pin 5. R_2 = 4.7 kΩ.
7. Pin 6 $\geqq$ 15 VDC.
8. Pin 6 $\geqq$ 15 VDC.

MicroPower Direct

IGBT DRIVER

MODEL: IGD841

RoHS

Input

R₁

Fault Signal Output

TTL Compatible Input Interface
Duty Cycle is 50%
D₁ = Fast recovery diode (T$_{RR}$ = <0.2μS)

V_{IN} = 5V
R_G = 3.1Ω
f = 20 kHz
V_{CC} = 20V

R₂
4.7 kΩ

20 VDC
Floating
Supply

D₁

R$_G$
3.1Ω

IGBT

0V

-5V

15V

C₃

C₂

V$_{CC}$
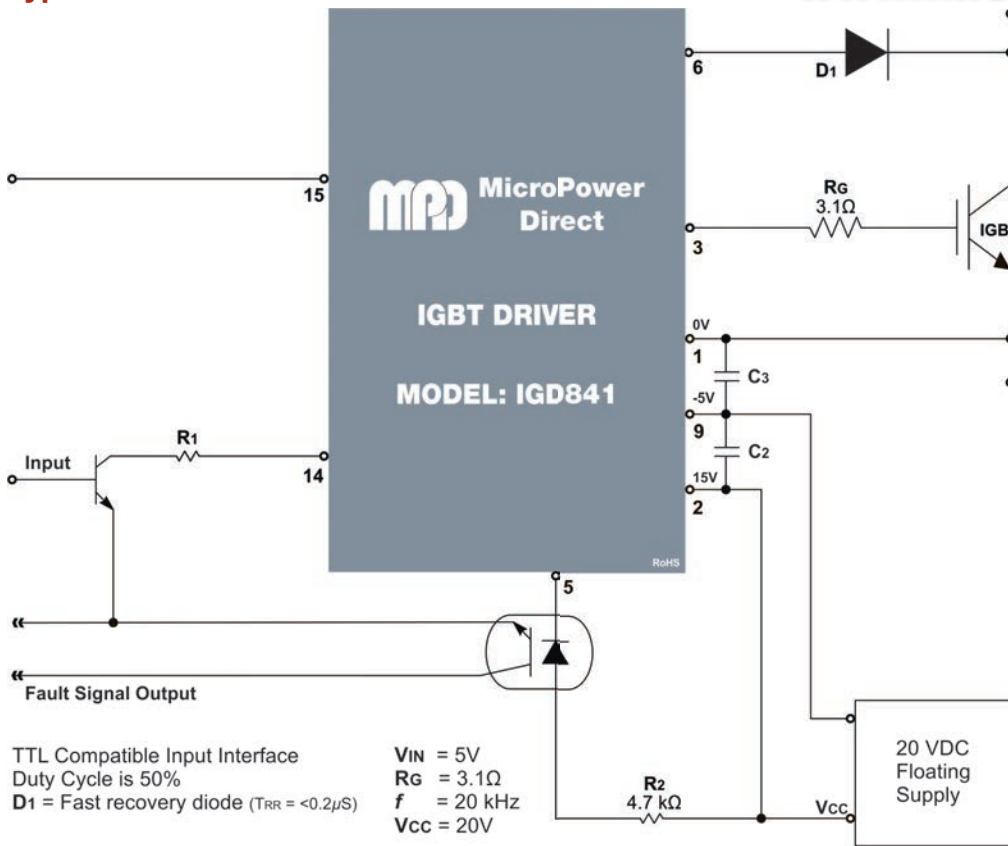
Connection Notes:
To minimize the potential for problems (and/or failures) caused by induced noise, EMI interference and/or oscillation, the connection of the gate driver must be done with great care. Some recommendations would include:

1. The input signal voltage (pin 14) cannot exceed 5.25V. The internal dissipation caused by the resultant increase in input current could damage the input optocoupler. A current limiting resistor (R₁) is used to help prevent this. The resistor value is calculated by the formula:

$$R_1 = \frac{V_{IN} - 1.7V}{16 \text{ mA}} - 150\Omega$$

2. The gate wiring of the IGBT gate-emitter drive loop must be shorter than 1 meter.
3. Twisted pair wiring is recommended for the gate-emitter drive loop to minimize mutual induction.
4. Pins 4, 7, 8, 10 and 11 (not shown in the connection diagram) of the IGD841 are only used for testing. They should not be used as a connection in any application circuit.
5. If a large voltage spike is generated at the IGBT collector, the value of the gate resistor (R$_G$) should be increased.
6. Smoothing capacitors C₂ and C₃ should be mounted as close to the driver as possible.
7. An internal circuit sets up a -5V off-gate voltage at pin 9 to protect against faults in the off state. Do not apply an external voltage to pin 1.
8. The peak reverse voltage rating of D₁ must be higher than the peak value of the IGBT collector voltage.
9. The traces (or wires) between the power source (V$_{CC}$) and the driver circuit should be as short as possible.
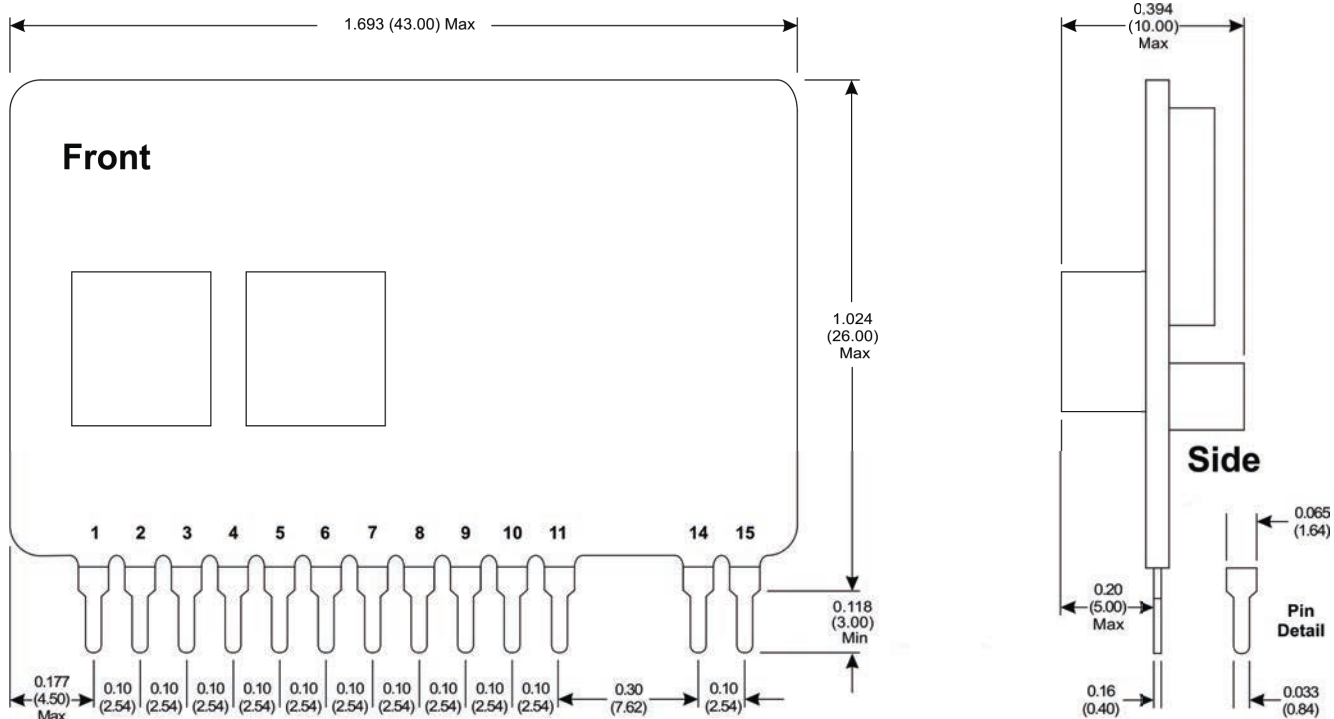
Pin Connections

Pin	Function	Pin	Function	Pin	Function
1	Smoothing Capacitor	5	Fault Signal Output	14	Drive Signal Input (-)
2	Power Supply (+)	6	Fault Detect	15	Drive Signal Input (+)
3	Drive Output	9	Gnd	4,7,8,10,11	No Connection

Mechanical Dimensions

Front

1.693 (43.00) Max

1.024 (26.00) Max

0.118 (3.00) Min

0.177 (4.50) Max

0.10 (2.54)

0.30 (7.62)

0.10 (2.54)

Pins: 1 2 3 4 5 6 7 8 9 10 11 14 15

0.394 (10.00) Max

Side

0.20 (5.00) Max

0.16 (0.40)

0.065 (1.64)

Pin Detail

0.033 (0.84)

Notes:
• All dimensions are typical in inches (mm)
• Tolerance x.xx = ±0.01 (±0.25)