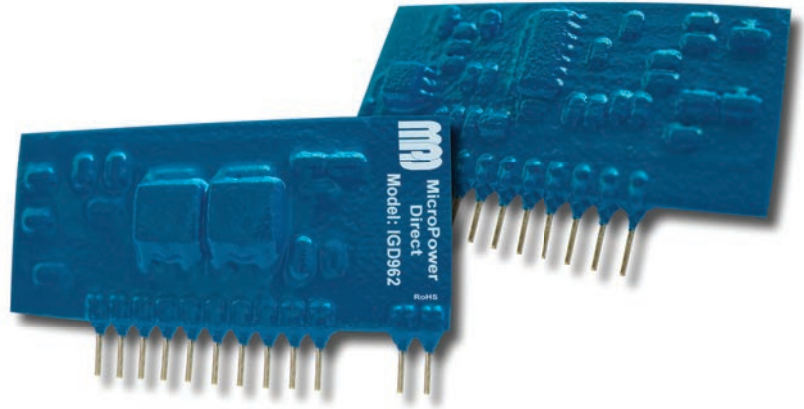


IGD962

Hybrid Integrated Isolated N-Channel IGBT Driver



Key Features:

- Internal OptoCoupler
- 30 kV/ μ S CMR
- VISO = 3,750V
- Two Supply Drive Topology
- TTL Compatible Input
- Short Circuit Protected
- Fault Signal Output
- Switching Freq. to 20 kHz
- Compatible With M57962AL

Recommended For:

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

RoHS



Operates With
IG100 Series
DC/DC Converters

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Electrical Specifications

Absolute Maximum Ratings, $T_A = 25^\circ\text{C}$ unless otherwise noted.

Parameter	Conditions		Min.	Typ.	Max.	Units
Supply Voltage	VCC	DC			18	VDC
	VEE				-15	
Input Voltage	VIN	See Note 3			50	VDC
Input Current	IIN	See Note 4			25	mA
Output Voltage	VO	When Output is "H"			VCC	VDC
Output Current	IGON	Pulse Width $2\mu\text{s}$, Frequency $\leq 20\text{ kHz}$			+5.0	A
	IGOFF				-5.0	
Isolation Voltage	VISO	Sine Wave Voltage 50 Hz/ 60 Hz, 1 Min			3,750	VAC
Junction Temperature	TJ				150	$^\circ\text{C}$
Operating Temperature	TOP		-20		+70	$^\circ\text{C}$
Storage Temperature	TST		-40		+125	$^\circ\text{C}$
Fault Output Current	IFO	See Note 5			20	mA

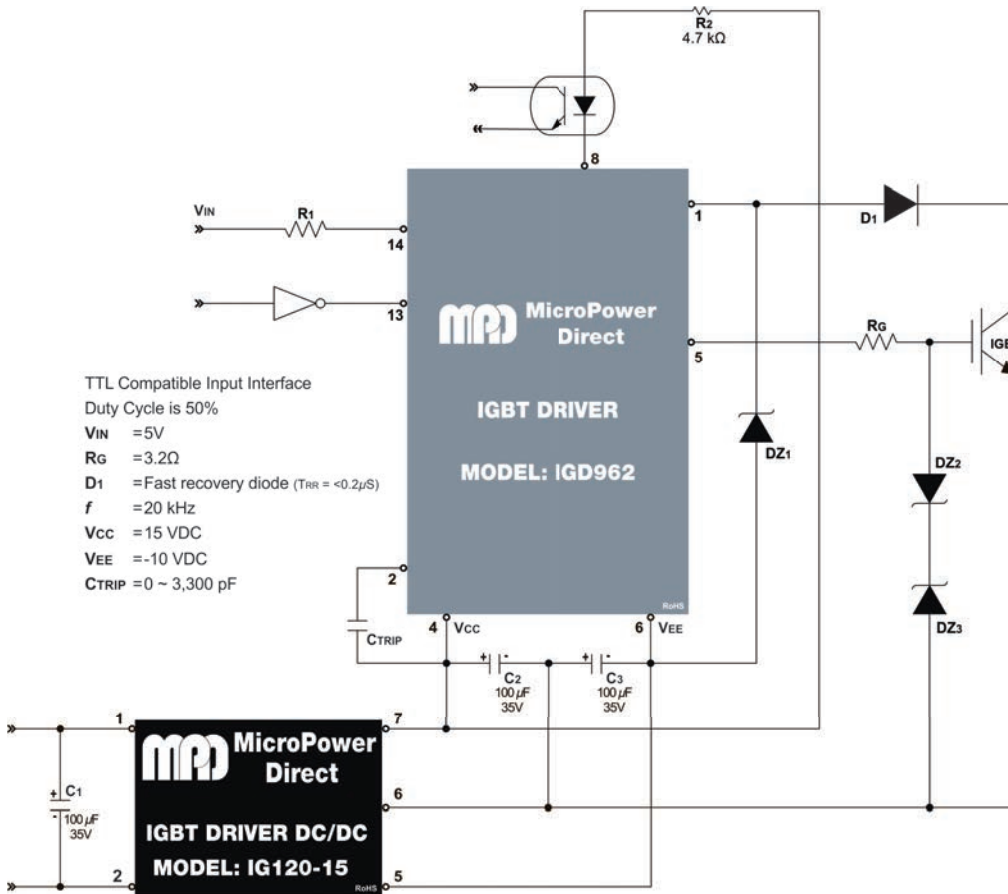
Electrical Characteristics, $T_A = 25^\circ\text{C}$, VCC = 15 VDC, VEE = -10 VDC unless otherwise noted.

Parameter	Conditions		Min.	Typ.	Max.	Units
Supply Voltage	VCC	Recommended Range	14	15		VDC
	VEE		-7		-10	
Switching Frequency	f	Recommended Range	0		20	kHz
Gate Resistor	RG		2			Ω
Input CMR			15	30		kV/ μ S
"H" Input Current	IiH	Recommended Range	10	16	20	mA
"H" Output Voltage	VOH		13	14		VDC
"L" Output Voltage	VOL		-6		-9	VDC
"L-H" Propagation	TPLH	IiH = 16 mA		0.5	1.0	μs
"L-H" Rise Time	TR	IiH = 16 mA		0.6	1.0	μs
"H-L" Propagation	TPHL	IiH = 16 mA		1.0	1.3	μs
"H-L" Fall Time	TF	IiH = 16 mA		0.4	1.0	μs
Protection Reset Time	TTIMER		1.0	1.3	2.0	mS
Fault Output Current	IFO	See Note 6		5.0		mA
Controlled Time Detect	TTRIP1	Short Circuit 1, See Note 7		2.6		μs
	TTRIP2	Short Circuit 2, See Note 8		3.0		μs
Soft Turn-On Time	TOFF2	See Note 9		5.0		μs
SC Detect Voltage	VSC	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 1.
4. The voltage measured between pins 13 and 14.
5. The input current at pin 8.
6. The input current at pin 8. $R_2 = 4.7\text{ k}\Omega$.
7. Pin 1 $\geq 15\text{ VDC}$. Pin 2 open.
8. Pin 1 $\geq 15\text{ VDC}$. A 1,000 pF connected from pin 2 to pin 4.
9. Pin 1 $\geq 15\text{ VDC}$.

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TTL Compatible Input Interface

Duty Cycle is 50%

VIN = 5V

RG = 3.2Ω

D1 = Fast recovery diode (T_{RR} = <0.2μS)

f = 20 kHz

VCC = 15 VDC

VEE = -10 VDC

CTRIP = 0 ~ 3,300 pF

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:

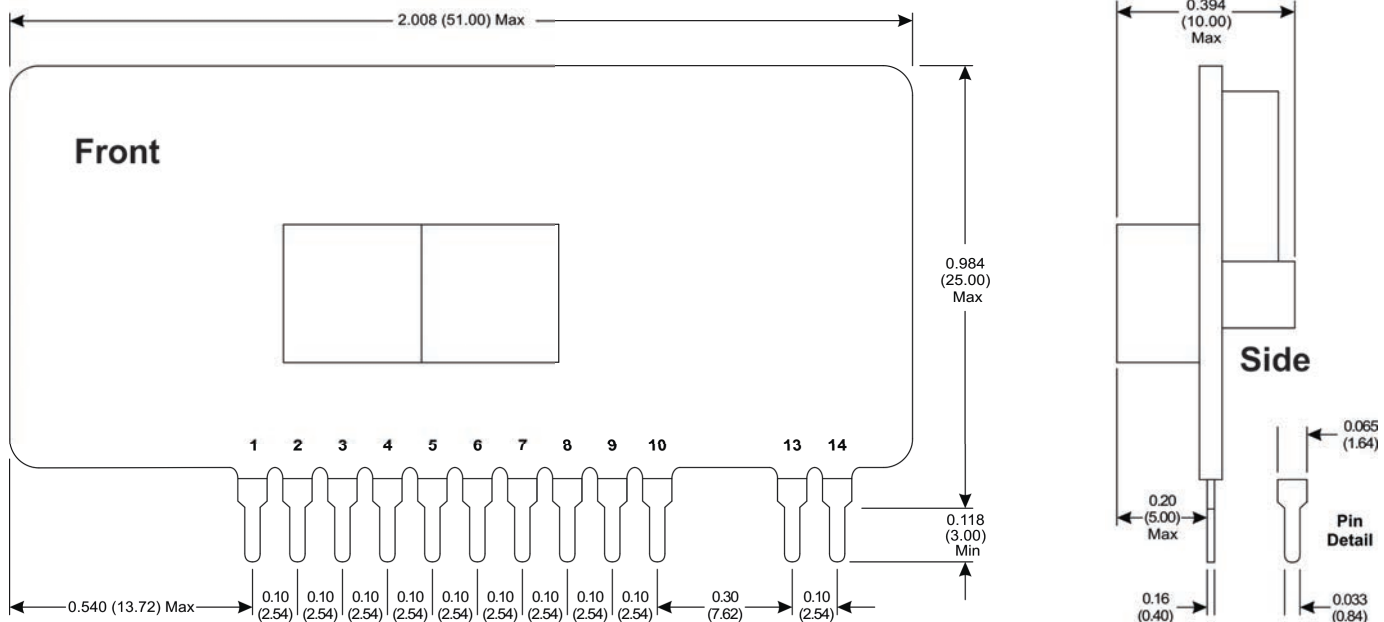
1. The input signal voltage (pin 14) cannot exceed 5.25V. The internal dissipation caused by the resultant increase in input current could damage the input optocoupler. A current limiting resistor (R₁) is used to help prevent this. The resistor value is calculated by the formula:

$$R_1 = \frac{V_{IN} - 1.7V}{16 mA} - 150\Omega$$
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 3, 7, 9 and 10 (not shown in the connection diagram) of the IGD962 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. Capacitors C₂ and C₃ should be mounted as close to the driver as possible.
7. The peak reverse voltage rating of D₁ must be higher than the peak value of the IGBT collector voltage.
8. The voltage level at pin 1 could go "High" depending on the reverse recovery characteristics of D₁. A 30V zener diode DZ₁ is connected between pin 1 and Pin 6 to prevent any problems caused by this.
9. If CTRIP is used, it be mounted as close to the driver as possible. The distance between CTRIP and pins 4 & 2 should be less than 5 cm.
10. The traces (or wires) between the DC/DC and the driver circuit should be as short as possible.

Pin Connections

Pin	Function	Pin	Function	Pin	Function
1	Fault Detect	5	Drive Output	13	Drive Signal Input (-)
2	Control Pin (For CTRIP)	6	VEE (- Power Supply)	14	Drive Signal Input (+)
4	VCC (+ Power Supply)	8	Fault Signal Output	3,7,9,10	No Connection

Mechanical Dimensions



Notes:

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



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