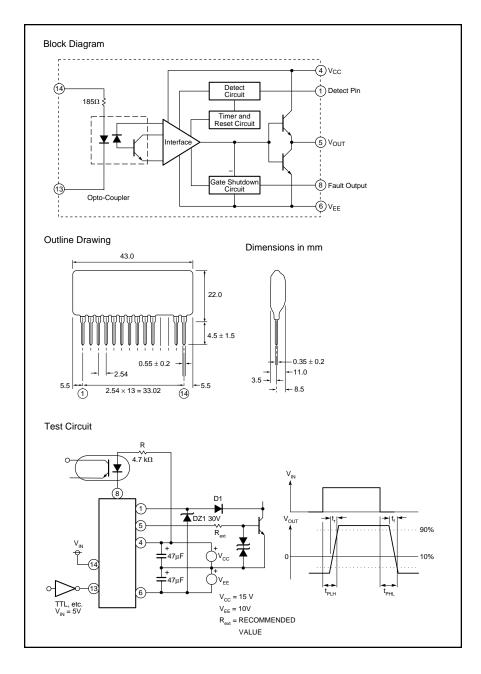
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

#### Gate Driver



# **Hybrid Integrated Circuit For Driving IGBT Modules**

#### **Description:**

M57959L is a hybrid integrated circuit designed for driving n-channel IGBT modules in any gate amplifier application. This device operates as an isolation amplifier for these modules and provides the required electrical isolation between the input and output with an opto-coupler. Short circuit protection is provided by a built in desaturation detector. A fault signal is provided if the short circuit protection is activated.

#### Features:

- Built in high CMRR optocoupler (V<sub>CMR</sub>: Typical 30kV/μs, Min. 15kV/μs)
- ☐ Electrical Isolation between input and output with optocouplers (V<sub>iso</sub> = 2500, V<sub>RMS</sub> for 1 min.)
- ☐ TTL compatible input interface
- ☐ Two supply drive topology
- Built in short circuit protection circuit with a pin for fault output

#### Application:

To drive IGBT modules for inverter, AC Servo systems, UPS, CVCF inverter, and welding applications.

#### **Recommended Modules:**

V<sub>CES</sub> = 600V Series (up to 200A Class)

V<sub>CES</sub> = 1200V Series (up to 100A Class)

V<sub>CES</sub> = 1400V Series (up to 100A Class)



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M57959L Hybrid IC for IGBT Gate Driver

## Absolute Maximum Ratings, $\rm T_a \sim 20^{\circ} C$ to $\rm 70^{\circ} C$ unless otherwise specified

Item	Symbol	Test Conditions	Limit	Units
Supply Voltage*	V <sub>CC</sub>	DC	18	Volts
	V <sub>EE</sub>	DC	-15	Volts
Input Voltage	VI		-1 ~ 7	Volts
Output Voltage	Vo	Output Voltage "H"	V <sub>CC</sub>	Volts
Output Current	I <sub>OHP</sub>	Pulse Width 2μs, f = 20kHz	-2	Amperes
	I <sub>OLP</sub>	Pulse Width 2μs, f = 20kHz	2	Amperes
Output Current	ІОН	f = 20kHz, 50% Duty Cycle	0.2	Amperes
Isolation Voltage	V <sub>RMS</sub>	Sinewave Voltage 60kHz, 1 min.	2500	Volts
Junction Temperature	T <sub>j</sub>		85	°C
Operating Temperature	T <sub>opg</sub>	(Differs from H/C Condition)	-20 ~ 60	°C
Storage Temperature	T <sub>stg</sub>		-25 ~ 100	°C
Fault Output Current	I <sub>FO</sub>		20	mA
Input Voltage	V <sub>R1</sub>		50	Volts

<sup>\*20</sup> Volts ≤ V<sub>CC</sub> + V<sub>EE</sub> ≤ 28 Volts

### Electrical Characteristics, $T_a = 25^{\circ}C$ , $V_{CC} = 15V$ , $-V_{EE} = 10V$ unless otherwise specified

Characteristics	Symbol	Test conditions	Min.	Тур.	Max.	Unit
Supply Voltage	V <sub>CC</sub>	Recommended Range	14	15	_	Volts
	V <sub>EE</sub>	Recommended Range	-7	_	-10	Volts
Pull-up Voltage on Input Side	V <sub>IN</sub>	Recommended Range	4.75	5.00	5.25	Volts
"H" Input Current	l <sub>IH</sub>	$V_{IN} = 5V, R = 185\Omega$	_	16	_	mA
"H" Output Voltage	V <sub>OH</sub>		13	14	_	Volts
"L" Output Voltage	V <sub>OL</sub>		-8	-9	_	Volts
Internal Power Dissipation	P <sub>D</sub>	f = 20kHz,	_	0.86	_	Watts
		Module 200A, 600V IGBT				
"L-H" Propagation Time	t <sub>PLH</sub>	$V_I = 0 \text{ to } 4V, T_j \pm 85^{\circ}C$	_	0.8	1.5	μs
"L-H" Rise Time	t <sub>r</sub>	$V_I = 0 \text{ to } 4V, T_j \pm 85^{\circ}C$	_	0.5	1.0	μs
"H-L" Propagation Time	t <sub>PHL</sub>	$V_{I} = 0 \text{ to } 4V, T_{j} \pm 85^{\circ}C$	_	1.0	1.5	μs
"H-L" Rise Time	t <sub>r</sub>	$V_I = 0 \text{ to } 4V, T_j \pm 85^{\circ}C$	_	0.3	0.6	μs
Reset Time of Protection	t <sub>RESET</sub>		1	_	2	ms
Fault Output Current	I <sub>FO</sub>		_	5	_	mA
SC Voltage	V <sub>SC</sub>		15	_	_	Volts

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