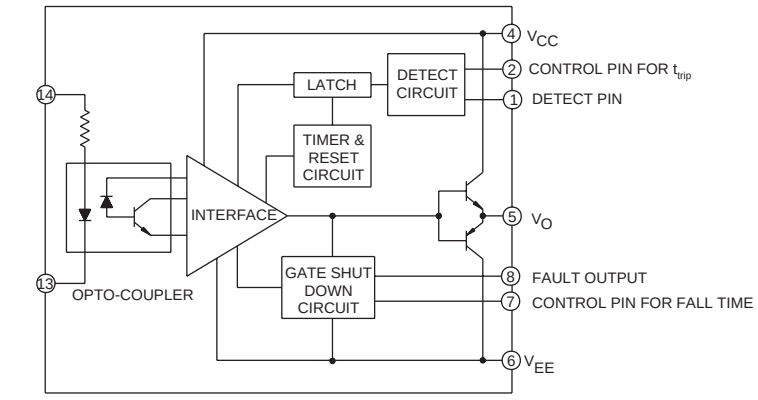
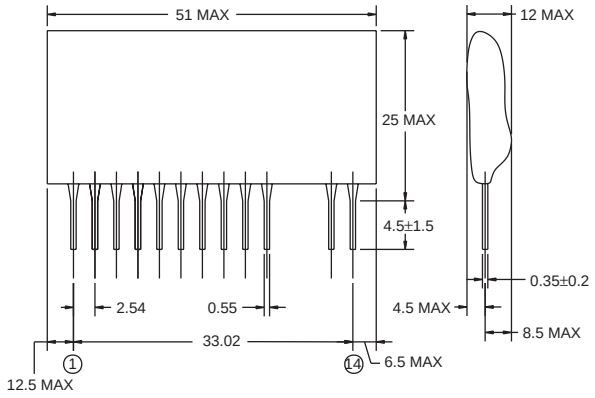
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

Gate Driver

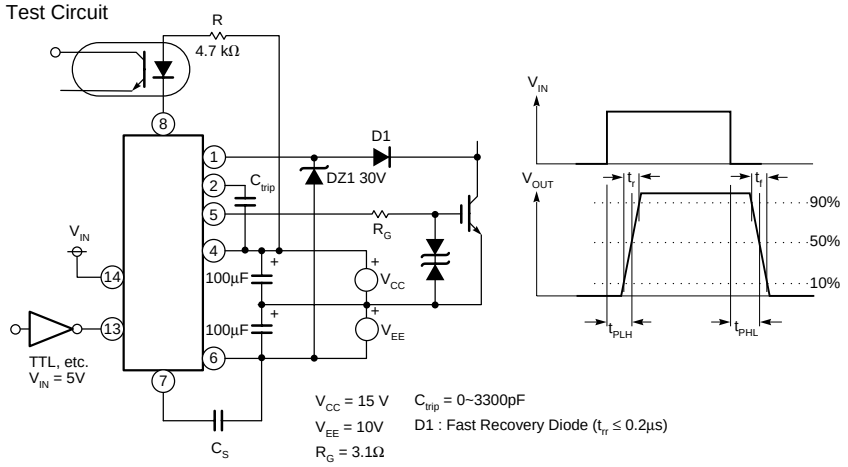
Block Diagram



Outline Drawing



Test Circuit



V_{CC} = 15 V C_{trip} = 0~3300pF
V_{EE} = 10V D1 : Fast Recovery Diode (t_{rr} ≤ 0.2µs)
R_G = 3.1Ω

Hybrid Integrated Circuit For Driving IGBT Modules

Description:
M57962CL-01 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:
- ☐ Electrical Isolation between input and output with opto-couplers. (V_{iso} = 2500V_{RMS} for 1 min.)
- ☐ Two supply drive topology
- ☐ Built in short circuit protection circuit with a pin for fault output
- ☐ Variable fall time on activity of short circuit protection
- ☐ TTL compatible input interface

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

Recommended Modules:
V_{CES} = 600V Series
(up to 800A Class)

V_{CES} = 1200V Series
(up to 400A Class)

Absolute Maximum Ratings, T_a =25°C unless otherwise specified

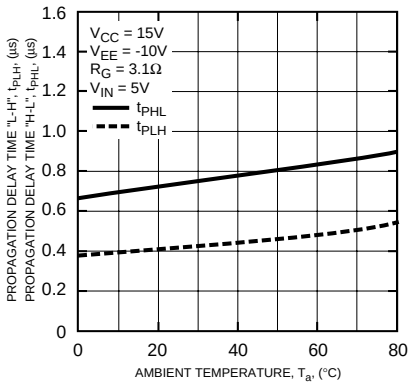
Item	Symbol	Test Conditions	Limit	Units
Supply Voltage	V_{CC}	DC	18	Volts
	V_{EE}	DC	-15	Volts
Input Voltage	V_I	Applied between: (13) – (14)	-1 ~ 7	Volts
Output Voltage	V_O	Output Voltage "H"	V_{CC}	Volts
Output Current	I_{OHP}	Pulse Width 2µs, f ≤ 20kHz	-5	Amperes
	I_{OLP}	Pulse Width 2µs, f ≤ 20kHz	5	Amperes
Isolation Voltage	V_{RMS}	Sinewave Voltage 60Hz, 1 min.	2500	Volts
Case Temperature	T_c		85	°C
Operating Temperature	T_{opg}		-20 ~ 60	°C
Storage Temperature	t_{stg}		-25 ~ 100	°C
Fault Output Current	I_{FO}	Applied (8) pin	20	mA
Input Voltage	V_{R1}	Applied (1) pin	50	Volts

Electrical Characteristics, T_a = 25°C, V_{CC} = 15V, V_{EE} = -10V unless otherwise specified

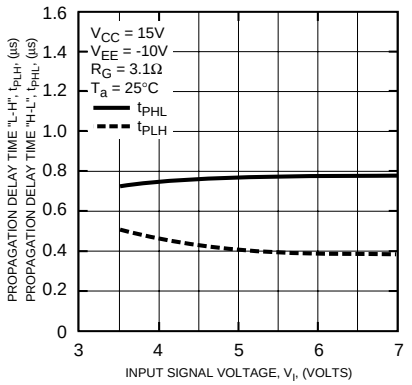
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}	Recommended Range	14	15	—	Volts
	V_{EE}	Recommended Range	-7	—	-10	Volts
Pull-up Voltage on Input Side	V_{IN}	Recommended Range	4.75	5.00	5.25	Volts
"H" Input Current	I_{IH}	Recommended Range	15.2	16	19	mA
Switching Frequency	f	Recommended Range	—	—	20	kHz
Gate Resistor	R_G	Recommended Range	2	—	—	Ω
"H" Input Current	I_{IH}	V_{IN} = 5V	—	16	—	mA
"H" Output Voltage	V_{OH}		13	14	—	Volts
"L" Output Voltage	V_{OL}		-8	-9	—	Volts
"L-H" Propagation Time	t_{PLH}	I_{IH} = 16mA	—	0.5	1.0	µs
"L-H" Rise Time	t_r	I_{IH} = 16mA	—	0.6	1.0	µs
"H-L" Propagation Time	t_{PHL}	I_{IH} = 16mA	—	0.8	1.3	µs
"H-L" Fall Time	t_f	I_{IH} = 16mA	—	0.4	1.0	µs
Timer	t_{timer}	Between start and cancel (under input sign "L")	1.0	—	2.0	ms
Fault Output Current	I_{FO}	Applied ⑧ pin, R = 4.7kΩ	—	5.0	—	mA
Controlled Time Detect Short Circuit 1	t_{trip1}	Pin ①: 15V and more, Pin ②: Open	—	2.6	—	µs
Controlled Time Detect Short Circuit 2*	t_{trip2}	Pin ①: 15V and more, Pin ② – ④: 1000pF (Connective Capacitance)	—	3.0	—	µs
SC Voltage	V_{SC}	SC Detect Voltage	15	—	—	Volts

*Length of wiring of condenser controlled time detect short circuit is within 5cm from ② and ④ pin coming and going.

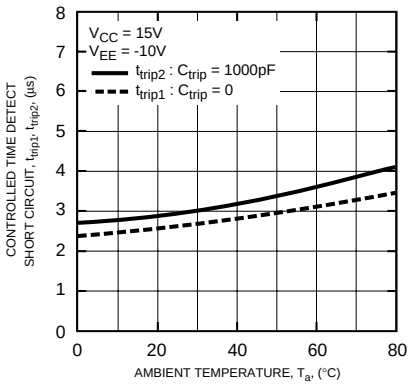
PROPAGATION DELAY TIME VS. AMBIENT TEMPERATURE CHARACTERISTICS (TYPICAL)



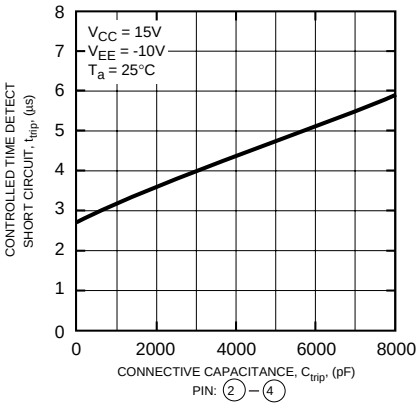
PROPAGATION DELAY TIME VS. SIGNAL VOLTAGE CHARACTERISTICS (TYPICAL)



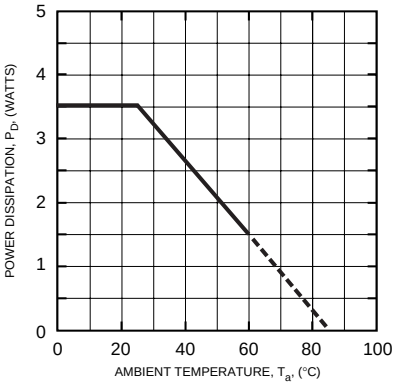
CONTROLLED TIME DETECT VS. AMBIENT TEMPERATURE CHARACTERISTICS (TYPICAL)



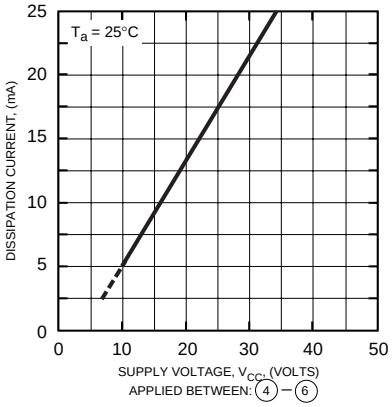
CONTROLLED TIME DETECT VS. CONNECTIVE CAPACITANCE CHARACTERISTICS (TYPICAL)



POWER DISSIPATION VS. AMBIENT TEMPERATURE (MAXIMUM RATING)



DISSIPATION CURRENT VS. SUPPLY VOLTAGE INPUT SIGNAL "L" (TYPICAL)



SLOW SHUTDOWN SPEED (t_1, t_2) VS. C_S