

### 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:

$V_{CES} = 600\text{V}$  Series  
(up to 800A Class)

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

**M57962CL-01**

Hybrid IC for IGBT Gate Driver

**Absolute Maximum Ratings,  $T_a = 25^\circ\text{C}$  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 2 $\mu\text{s}$ , $f \leq 20\text{kHz}$	-5	Amperes
	$I_{OLP}$	Pulse Width 2 $\mu\text{s}$ , $f \leq 20\text{kHz}$	5	Amperes
Isolation Voltage	$V_{RMS}$	Sinewave Voltage 60Hz, 1 min.	2500	Volts
Case Temperature	$T_c$		85	$^\circ\text{C}$
Operating Temperature	$T_{opg}$		-20 ~ 60	$^\circ\text{C}$
Storage Temperature	$t_{stg}$		-25 ~ 100	$^\circ\text{C}$
Fault Output Current	$I_{FO}$	Applied (8) pin	20	mA
Input Voltage	$V_{R1}$	Applied (1) pin	50	Volts

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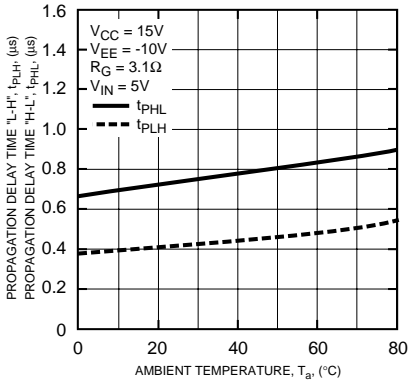
**Electrical Characteristics,  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 15\text{V}$ ,  $V_{EE} = -10\text{V}$  unless otherwise specified**

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	—	—	$\Omega$
"H" Input Current	$I_{IH}$	$V_{IN} = 5\text{V}$	—	16	—	mA
"H" Output Voltage	$V_{OH}$		13	14	—	Volts
"L" Output Voltage	$V_{OL}$		-8	-9	—	Volts
"L-H" Propagation Time	$t_{PLH}$	$I_{IH} = 16\text{mA}$	—	0.5	1.0	$\mu\text{s}$
"L-H" Rise Time	$t_r$	$I_{IH} = 16\text{mA}$	—	0.6	1.0	$\mu\text{s}$
"H-L" Propagation Time	$t_{PHL}$	$I_{IH} = 16\text{mA}$	—	0.8	1.3	$\mu\text{s}$
"H-L" Fall Time	$t_f$	$I_{IH} = 16\text{mA}$	—	0.4	1.0	$\mu\text{s}$
Timer	$t_{timer}$	Between start and cancel (under input sign "L")	1.0	—	2.0	ms
Fault Output Current	$I_{FO}$	Applied ⑧ pin, $R = 4.7\text{k}\Omega$	—	5.0	—	mA
Controlled Time Detect Short Circuit 1	$t_{trip1}$	Pin ①: 15V and more, Pin ②: Open	—	2.6	—	$\mu\text{s}$
Controlled Time Detect Short Circuit 2*	$t_{trip2}$	Pin ①: 15V and more, Pin ②-④: 1000pF (Connective Capacitance)	—	3.0	—	$\mu\text{s}$
SC Voltage	$V_{SC}$	SC Detect Voltage	15	—	—	Volts

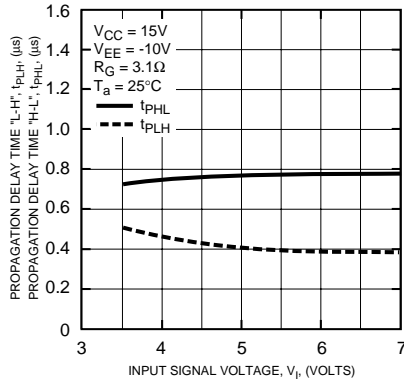
\*Length of wiring of condenser controlled time detect short circuit is within 5cm from ② and ④ pin coming and going.

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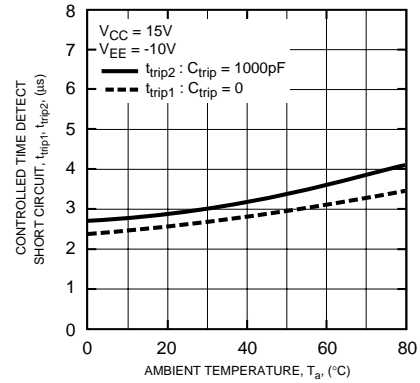
**PROPAGATION DELAY TIME VS. AMBIENT TEMPERATURE CHARACTERISTICS (TYPICAL)**



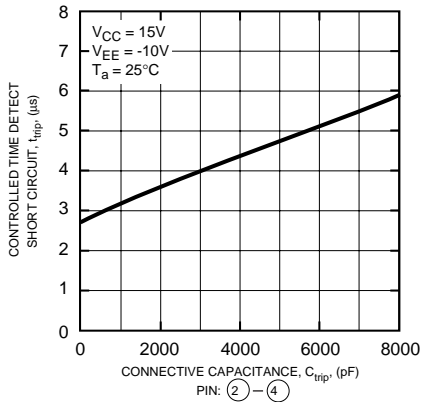
**PROPAGATION DELAY TIME VS. SIGNAL VOLTAGE CHARACTERISTICS (TYPICAL)**



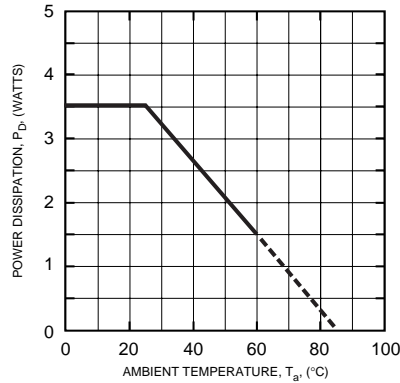
**CONTROLLED TIME DETECT SHORT CIRCUIT VS. AMBIENT TEMPERATURE CHARACTERISTICS (TYPICAL)**



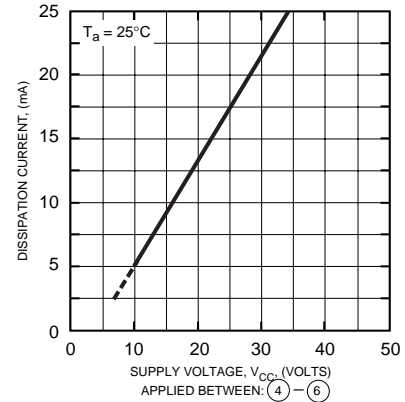
**CONTROLLED TIME DETECT SHORT CIRCUIT VS. CONNECTIVE CAPACITANCE CHARACTERISTICS (TYPICAL)**



**POWER DISSIPATION VS. AMBIENT TEMPERATURE (MAXIMUM RATING)**



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



**SLOW SHUTDOWN SPEED (t1, t2) VS. CS**

