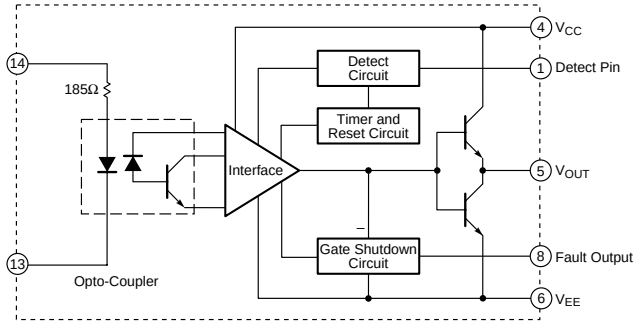
M57959L

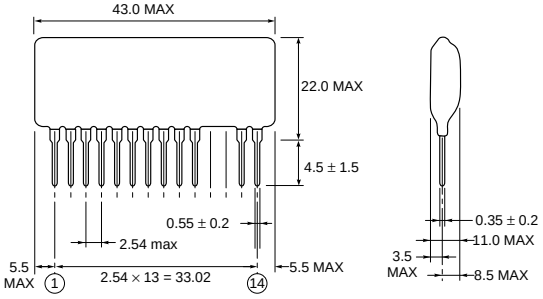
HYBRID IC FOR DRIVING IGBT MODULES

Block Diagram

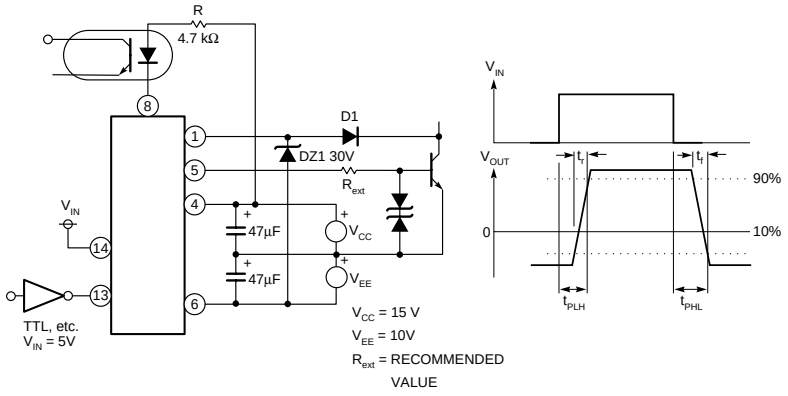


Outline Drawing

Dimensions in mm



Test Circuit



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 opto-coupler (V_{CMR} : Typical 30kV/μs, Min. 15kV/μs)
- ☐ Electrical Isolation between input and output with opto-couplers (V_{iso} = 2500, V_{RMS} 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_{CES} = 600V Series
(up to 200A Class)

V_{CES} = 1200V Series
(up to 100A Class)

V_{CES} = 1400V Series
(up to 100A Class)

MITSUBISHI ELECTRIC

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		-1 ~ 7	Volts
Output Voltage	V_O	Output Voltage "H"	V_{CC}	Volts
Output Current	I_{OHP}	Pulse Width 2µs, f = 20kHz	-2	Amperes
	I_{OLP}	Pulse Width 2µs, f = 20kHz	2	Amperes
Output Current	I_{OH}	f = 20kHz, 50% Duty Cycle	0.2	Amperes
Isolation Voltage	V_{RMS}	Sinewave Voltage 60Hz, 1 min.	2500	Volts
Junction Temperature	T_j		85	°C
Operating Temperature	T_{opr}	(Differs from H/C Condition)	-20 ~ 60	°C
Storage Temperature	T_{stg}		-25 ~ 100	°C
Fault Output Current	I_{FO}		20	mA
Input Voltage	V_{R1}		50	Volts

*20 Volts ≤ V_{CC} + V_{EE} ≤ 28 Volts

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
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}	V_{IN} = 5V, R = 185Ω	—	16	—	mA
"H" Output Voltage	V_{OH}		13	14	—	Volts
"L" Output Voltage	V_{OL}		-8	-9	—	Volts
Internal Power Dissipation	P_D	f = 20kHz, Module 200A, 600V IGBT	—	0.86	—	Watts
"L-H" Propagation Time	t_{PLH}	V_I = 0 to 4V, T_j = 85°C	—	0.8	1.5	µs
"L-H" Rise Time	t_r	V_I = 0 to 4V, T_j = 85°C	—	0.5	1.0	µs
"H-L" Propagation Time	t_{PHL}	V_I = 0 to 4V, T_j = 85°C	—	1.0	1.5	µs
"H-L" Rise Time	t_r	V_I = 0 to 4V, T_j = 85°C	—	0.3	0.6	µs
Reset Time of Protection	t_{RESET}		1	—	2	ms
Fault Output Current	I_{FO}		—	5	—	mA
SC Voltage	V_{SC}		15	—	—	Volts