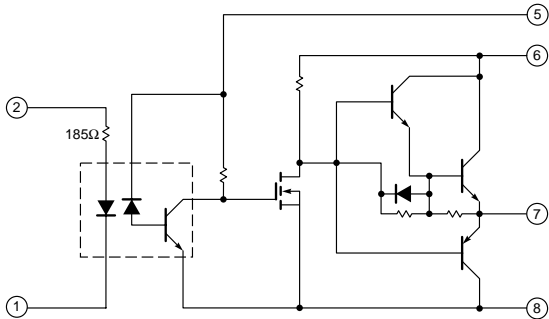


# M57957L

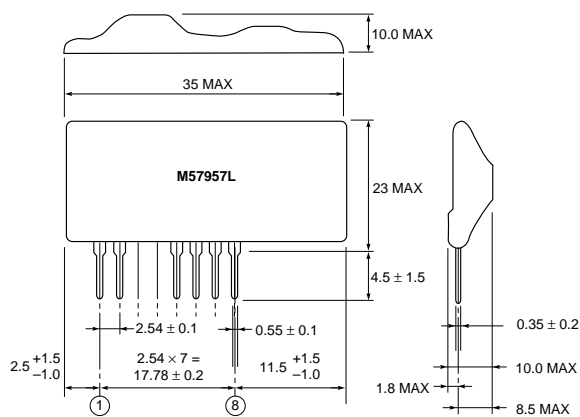
HYBRID IC FOR DRIVING IGBT MODULES

Block Diagram

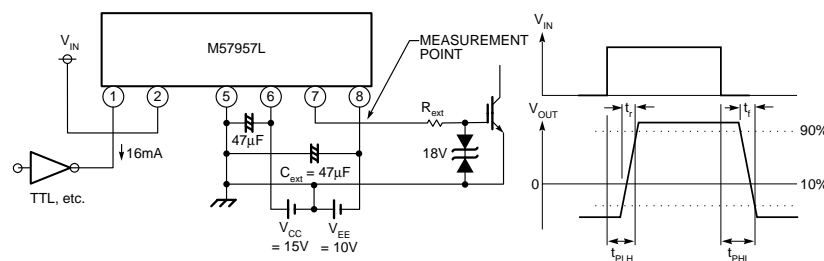


Outline Drawing

Dimensions in mm



Test Circuit



### Precaution:

The value of "R<sub>ext</sub>" should be selected according to the guidelines in Section 4.6.2 of Application Notes.

Also, the value of "R<sub>ext</sub>" should be selected so that maximum limits, I<sub>OHP</sub> and I<sub>OLP</sub> are not exceeded.

### Hybrid Integrated Circuit For Driving IGBT Modules

#### Description:

M57957L 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 optocoupler.

#### Features:

- Built in high CMRR optocoupler ( $V_{CMR}$  : Typical 30kV/μs, Min. 15kV/μs)
- Electrical Isolation between input and output with optocouplers ( $V_{iso} = 2500$ ,  $V_{RMS}$  for 1 min.)
- TTL compatible input interface
- Two supply drive topology
- Short differential of propagation time ( $t_{PLH}$ ,  $t_{PHL}$  to Max. 1.5μs, Typical 1.0μs)

#### 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)

HYBRID IC FOR DRIVING IGBT MODULES

**Absolute Maximum Ratings,  $T_a = 25^\circ\text{C}$  unless otherwise specified**

Item	Symbol	$T_a$ ( $^\circ\text{C}$ )	Test Conditions	Limit	Units
Supply Voltage	$V_{CC}$	25	DC	18	Volts
	$V_{EE}$	25	DC	-12	Volts
Input Voltage	$V_I$	25	Between Terminal 1 and 2	-1 ~ 7	Volts
Output Voltage	$V_O$	25	Output Voltage "H"	$V_{CC}$	Volts
Output Current	$I_{OHP}$	25	Pulse Width 2 $\mu\text{s}$ , $f = 30\text{kHz}$	-2	Amperes
	$I_{OLP}$	25	Pulse Width 2 $\mu\text{s}$ , $f = 30\text{kHz}$	2	Amperes
Output Current	$I_{OH}$	25	$f = 30\text{kHz}$ , $\text{DF} = 50\%$	0.2	Amperes
Isolation Voltage	$V_{iso}$	25	Sinewave Voltage 60Hz, 1 min.	2500	$V_{rms}$
Junction Temperature	$T_j$	—		100	$^\circ\text{C}$
Operating Temperature	$T_{opr}$	—	No Condensation	-20 ~ 60	$^\circ\text{C}$
Storage Temperature	$t_{stg}$	—	No Condensation	*-25 ~ 100	$^\circ\text{C}$

\*But differs from H/C condition.

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

Characteristics	Symbol	$V_{CC}/V_{EE}$ ( $^\circ\text{C}$ )	$T_a$ ( $^\circ\text{C}$ )	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	$V_{CC}$	—	25	Recommended Range	14	15	—	Volts
	$V_{EE}$	—	25	Recommended Range	-9	-10	—	Volts
Pull-up Voltage on Input Side	$V_{IN}$	—	25	Recommended Range	4.75	5.00	5.25	Volts
"H" Input Current	$I_{IH}$	15/-10	25	$V_{IN} = 5\text{V}$	—	16	—	mA
"H" Output Voltage	$V_{OH}$	15/-10	25		13	14	—	Volts
"L" Output Voltage	$V_{OL}$	15/-10	25		-8	-9	—	Volts
Internal Power Dissipation	$P_D$	15/-10	25	$f = 30\text{kHz}$ , $\text{DF} = 50\%$ , Module 200A, 600V IGBT	—	1.2	—	Watts
"L-H" Propagation Time	$t_{PLH}$	15/-10	—	$V_I = 0$ to 4V, $T_j = 100^\circ\text{C}$	—	1.0	1.5	$\mu\text{s}$
"L-H" Rise Time	$t_r$	15/-10	—	$V_I = 0$ to 4V, $T_j = 100^\circ\text{C}$	—	0.6	1.0	$\mu\text{s}$
"H-L" Propagation Time	$t_{PHL}$	15/-10	—	$V_I = 5$ to 0V, $T_j = 100^\circ\text{C}$	—	1.0	1.5	$\mu\text{s}$
Fall Time	$t_f$	15/-10	—	$V_I = 5$ to 0V, $T_j = 100^\circ\text{C}$	—	0.4	1.0	$\mu\text{s}$