

M57904L

HYBRID IC FOR DRIVING TRANSISTOR MODULES

DESCRIPTION

M57904L is a hybrid integrated circuit designed for driving transistor modules QM30DY, QM50DY, etc., in an inverter application. This device operates as an isolation amplifier for transistor modules due to the electrical isolation between the input and output, and includes three independent circuits which are applicable to the 3 phase application.

FEATURES

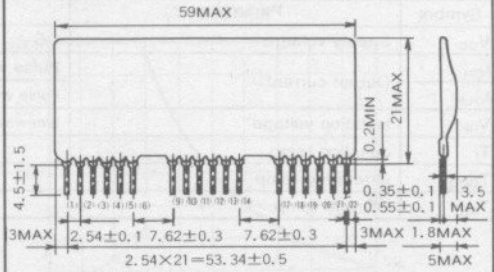
- Three independent circuits are included. Isolation voltage : $V_{ISO}=2500V_{rms}$
- Each circuit can be driven by single power supply.

APPLICATION

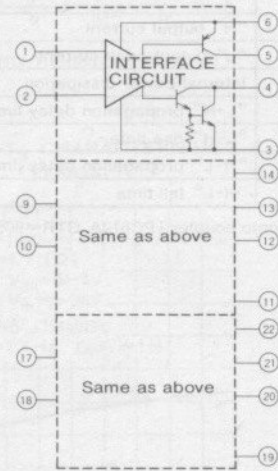
To drive transistor modules for inverter applications

OUTLINE DRAWING

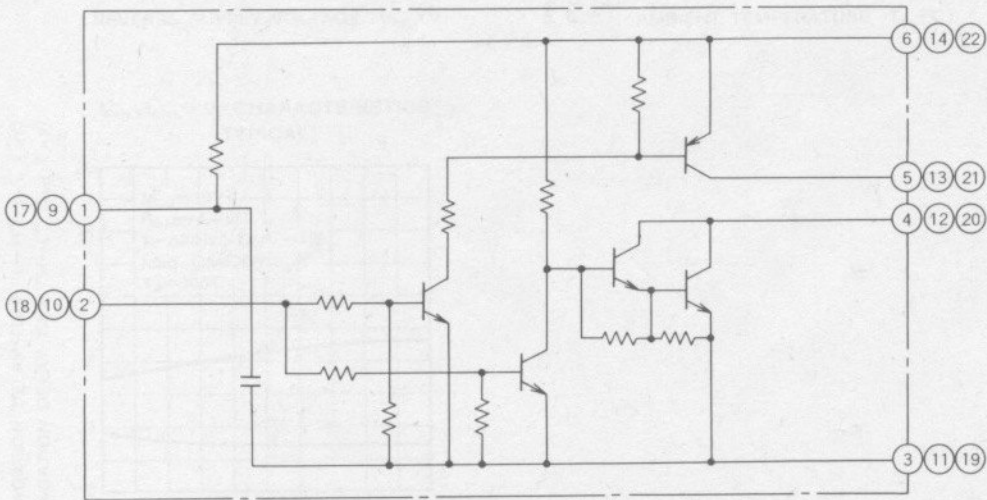
Dimensions in mm



BLOCK DIAGRAM



INTERNAL CIRCUIT DIAGRAM



HYBRID IC FOR DRIVING TRANSISTOR MODULES

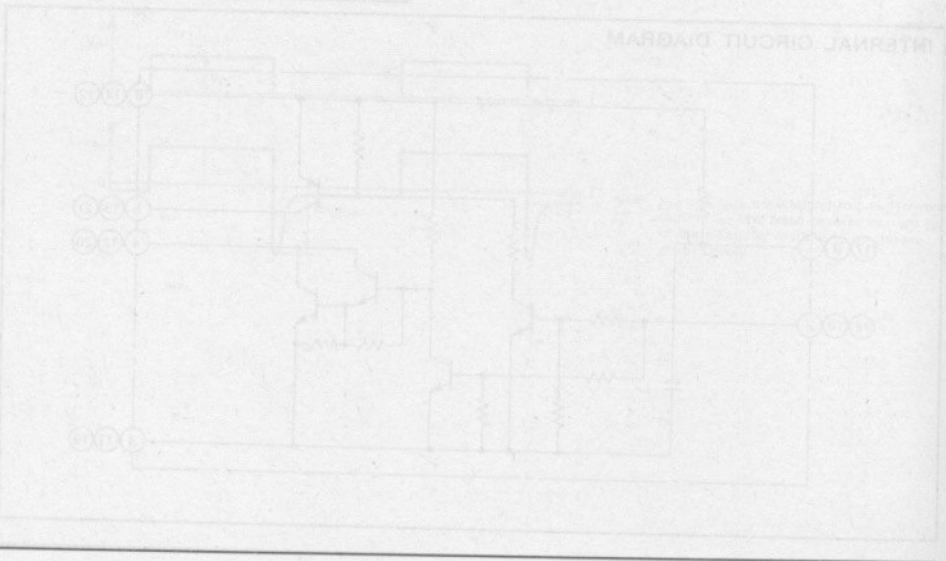
ABSOLUTE MAXIMUM RATINGS ($T_a = -20 \sim +70^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|-------------------|--|-----------------|------------------|
| V_{CC} | Supply voltage | DC | 14 | V |
| I_{OH} | Output current | Pulse width $10\mu\text{s}$, $f=2\text{kHz}$ | -0.8 | A |
| I_{OLP} | | Pulse width $10\mu\text{s}$, Freq. 2kHz , peak value | 3 | A |
| V_{ISO} | Isolation voltage | Sinewave voltage $60\text{Hz}/\text{min}$, $T_a=25^\circ\text{C}$ | 2500 | Vrms |
| T_j | Junction temp. | | 125 | $^\circ\text{C}$ |
| T_{opg} | Operating temp. | | $-20 \sim +70$ | $^\circ\text{C}$ |
| T_{stg} | Storage temp. | | $-25 \sim +125$ | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V_{CC}=10\text{V}$, $V_{EE}=3\text{V}$, unless otherwise specified)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-----------|------------------------------|--|--------|-------|--------|---------------|
| | | | Min | Typ | Max | |
| I_{OH} | "H" output current | $R_{ext}=9\Omega$ | — | -0.65 | — | A |
| I_{OLP} | "L" output peak current | $C_{ext}=47\mu\text{F}$ | — | 2 | — | A |
| P_d | Internal power dissipation | $I_{OH}=-0.65\text{A}$, $I_{OLP}=2\text{A}$, $f=2\text{kHz}$, $D.F.=50\%$ | — | 2.1 | — | W |
| t_{PLH} | "L-H" propagation delay time | $V_i=0$ to 4V , $T_j=100^\circ\text{C}$ | — | 5 | 10^* | μs |
| t_r | "L-H" rise time | $V_i=0$ to 4V , $T_j=100^\circ\text{C}$ | — | — | 1^* | μs |
| t_{PHL} | "H-L" propagation delay time | $V_i=5$ to 0V , $T_j=100^\circ\text{C}$ | — | 8 | 15^* | μs |
| t_f | "H-L" fall time | $V_i=5$ to 0V , $T_j=100^\circ\text{C}$ | — | — | 1^* | μs |

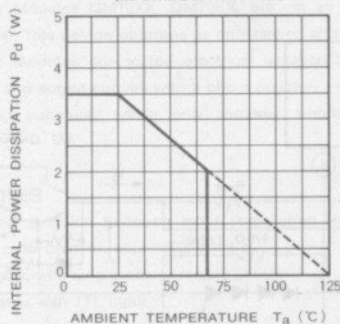
* with opto coupler (PC812A CTR=80%)



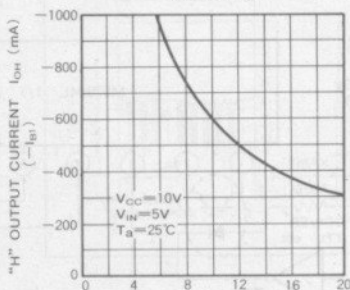
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PERFORMANCE CURVES

INTERNAL POWER DISSIPATION VS. T_a
(MAXIMUM RATING)

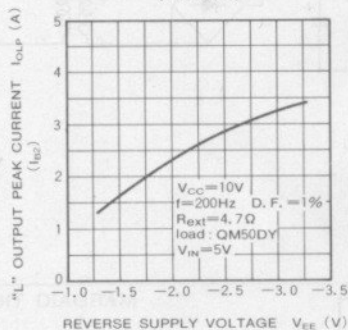


I_{OH} - R_{Ext} CHARACTERISTICS
(TYPICAL)

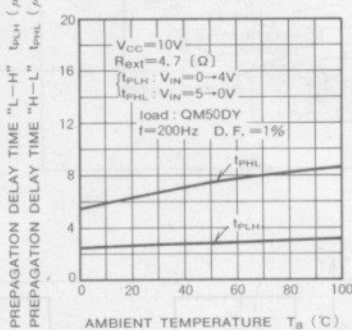


"H" LIMITING RESISTOR R_{Ext} (Ω)

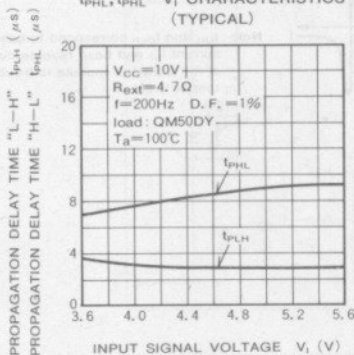
I_{OLP} - V_{EE} CHARACTERISTICS
(TYPICAL)



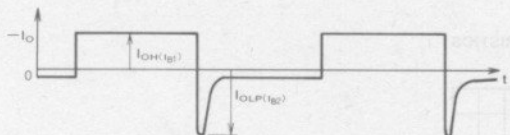
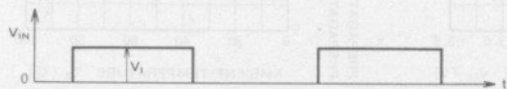
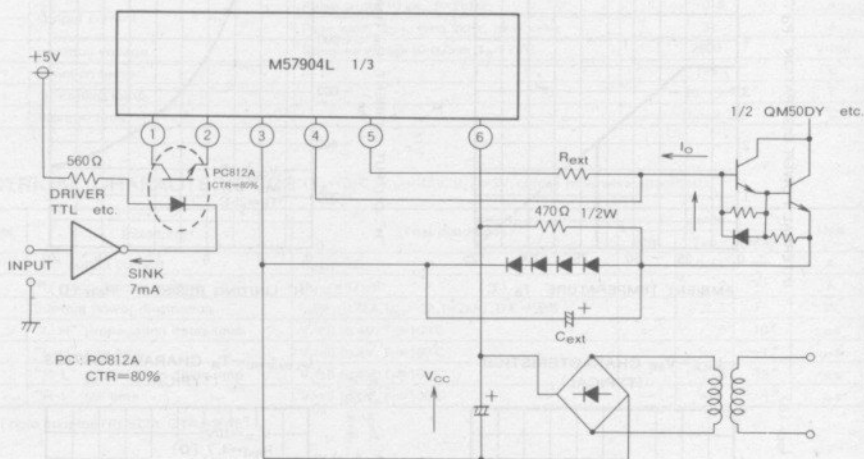
t_{PLH} , t_{PHL} - T_a CHARACTERISTICS
(TYPICAL)



t_{PLH} , t_{PHL} - V_i CHARACTERISTICS
(TYPICAL)



TEST CURCUIT AND APPLICATION CURCUIT EXAMPLE



Note: I_{OH} and I_{OLP} correspond to base forward current I_{B1} and base reverse current I_{B2} of the transistor module to be driven respectively.