



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

PNP Epitaxial Planar Silicon Transistor

# 12A02MH — Low-Frequency General-Purpose Amplifier Applications

## Applications

- Low-frequency Amplifier, high-speed switching, small motor drive, muting circuit

## Features

- Large current capacity
- Low collector-to-emitter saturation voltage (resistance)  $R_{CE(sat)}$  typ.=285m $\Omega$  [ $I_C=1A$ ,  $I_B=50mA$ ]
- Small ON-resistance ( $R_{on}$ )

## Specifications

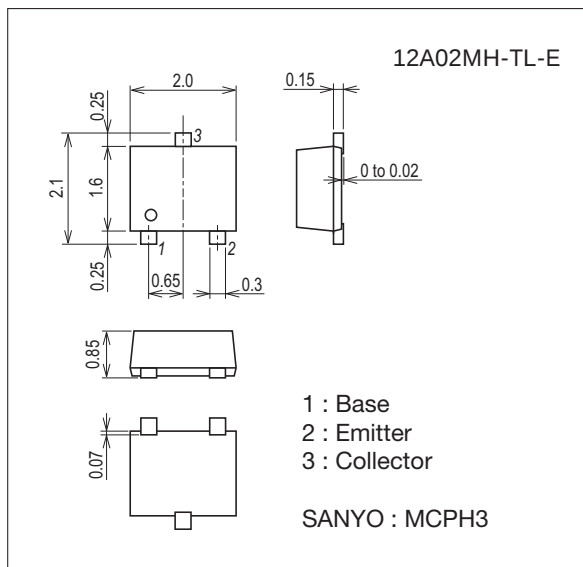
Absolute Maximum Ratings at  $T_a=25^\circ C$ 

| Parameter                    | Symbol    | Conditions                                                    | Ratings     | Unit |
|------------------------------|-----------|---------------------------------------------------------------|-------------|------|
| Collector-to-Base Voltage    | $V_{CBO}$ |                                                               | -15         | V    |
| Collector-to-Emitter Voltage | $V_{CEO}$ |                                                               | -12         | V    |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                                                               | -5          | V    |
| Collector Current            | $I_C$     |                                                               | -1          | A    |
| Collector Current (Pulse)    | $I_{CP}$  |                                                               | -2          | A    |
| Collector Dissipation        | $P_C$     | When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm) | 600         | mW   |
| Junction Temperature         | $T_j$     |                                                               | 150         | °C   |
| Storage Temperature          | $T_{stg}$ |                                                               | -55 to +150 | °C   |

## Package Dimensions

unit : mm (typ)

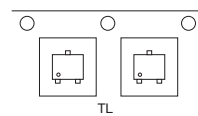
7019A-004



## Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

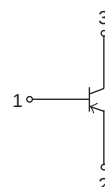
## Packing Type : TL



## Marking



## Electrical Connection

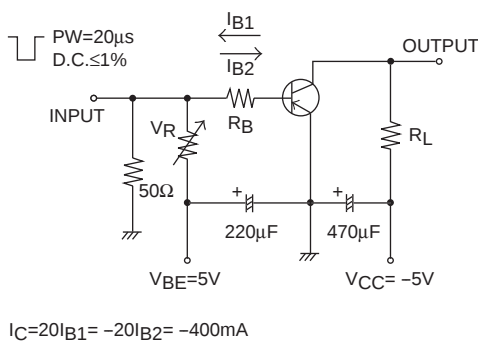


12A02MH

Electrical Characteristics at Ta=25°C

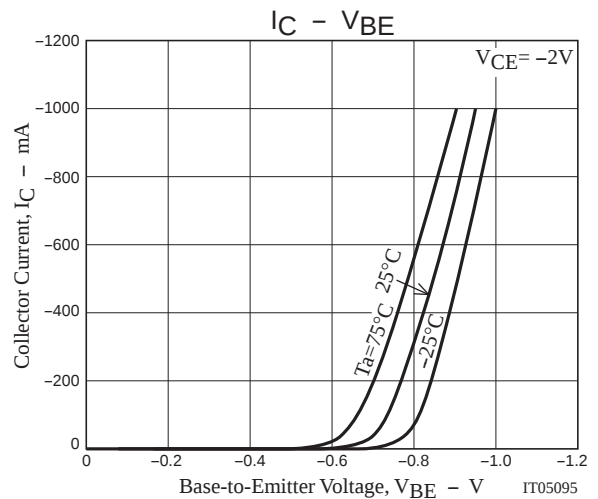
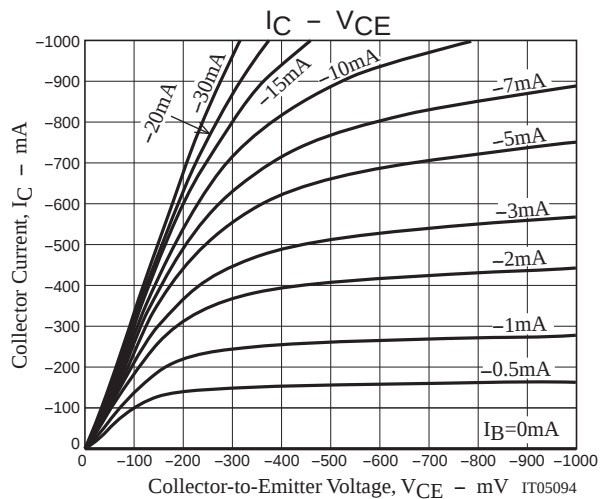
| Parameter                               | Symbol   | Conditions                  | Ratings |      |      | Unit |
|-----------------------------------------|----------|-----------------------------|---------|------|------|------|
|                                         |          |                             | min     | typ  | max  |      |
| Collector Cutoff Current                | ICBO     | VCE= -12V, IE=0A            |         |      | -100 | nA   |
| Emitter Cutoff Current                  | IEBO     | VEB= -4V, IC=0A             |         |      | -100 | nA   |
| DC Current Gain                         | hFE      | VCE= -2V, IC= -10mA         | 300     |      | 700  |      |
| Gain-Bandwidth Product                  | fT       | VCE= -2V, IC= -50mA         |         | 450  |      | MHz  |
| Output Capacitance                      | Cob      | VCE= -10V, f=1MHz           |         | 6    |      | pF   |
| Collector-to-Emitter Saturation Voltage | VCE(sat) | IC= -400mA, IB= -20mA       |         | -120 | -240 | mV   |
| Base-to-Emitter Saturation Voltage      | VBE(sat) | IC= -400mA, IB= -20mA       |         | -0.9 | -1.2 | V    |
| Collector-to-Base Breakdown Voltage     | V(BR)CBO | IC= -10μA, IE=0A            | -15     |      |      | V    |
| Collector-to-Emitter Breakdown Voltage  | V(BR)CEO | IC= -1mA, RBE=∞             | -12     |      |      | V    |
| Emitter-to-Base Breakdown Voltage       | V(BR)EBO | IE= -10μA, IC=0A            | -5      |      |      | V    |
| Turn-ON Time                            | ton      | See specified Test Circuit. |         | 30   |      | ns   |
| Storage Time                            | tstg     |                             |         | 75   |      | ns   |
| Fall Time                               | tf       |                             |         | 15   |      | ns   |

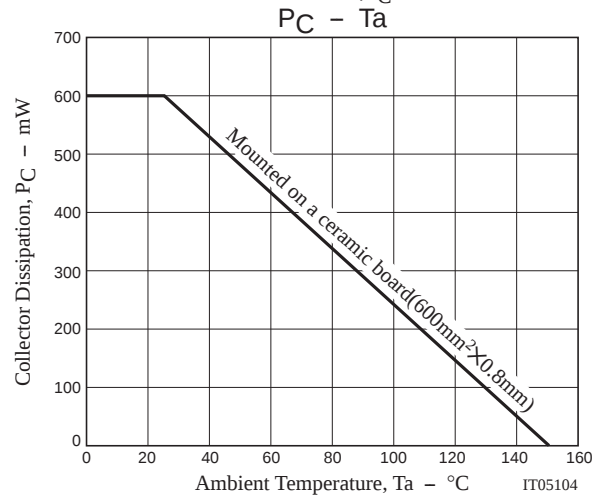
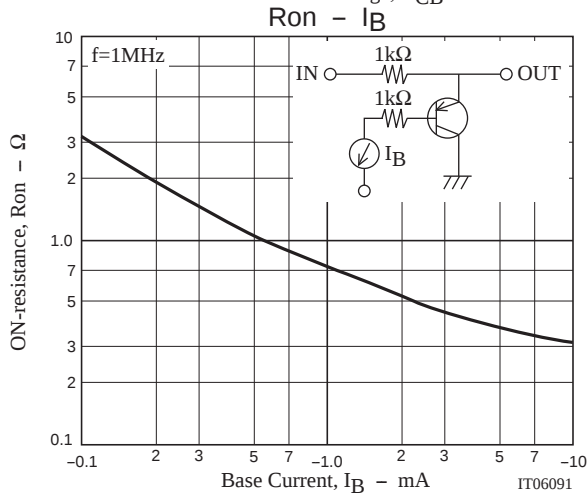
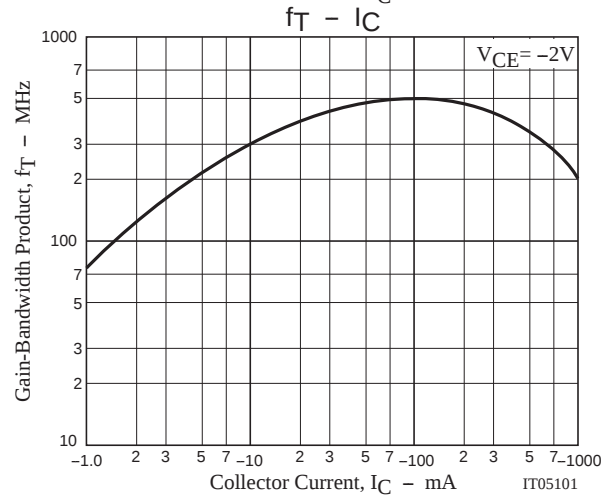
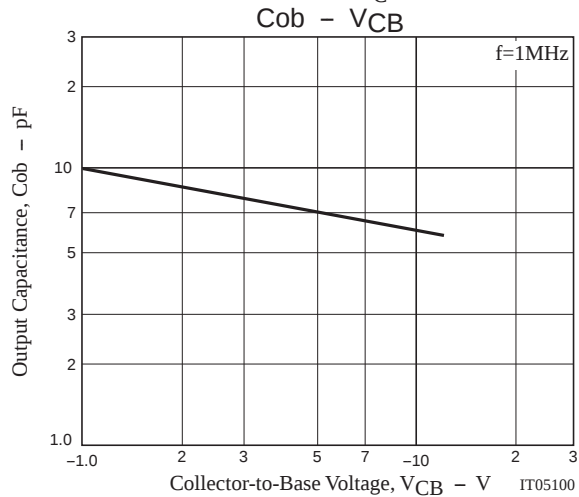
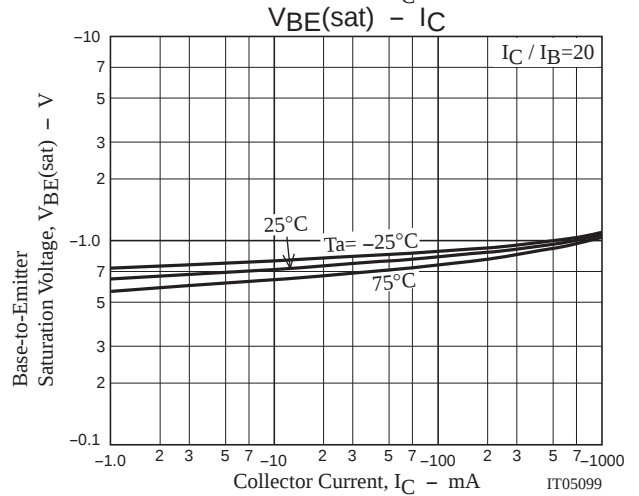
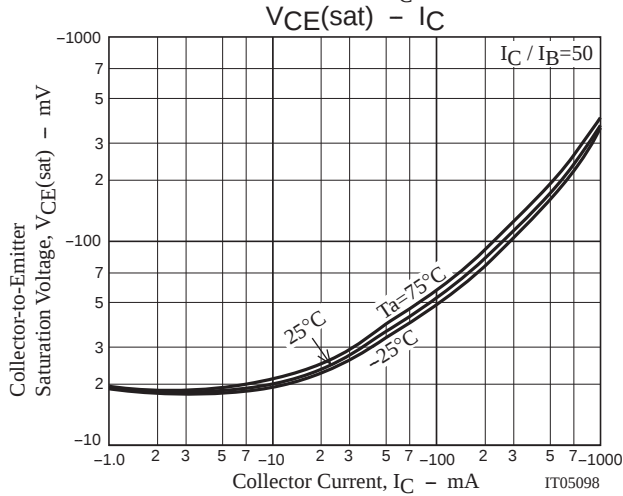
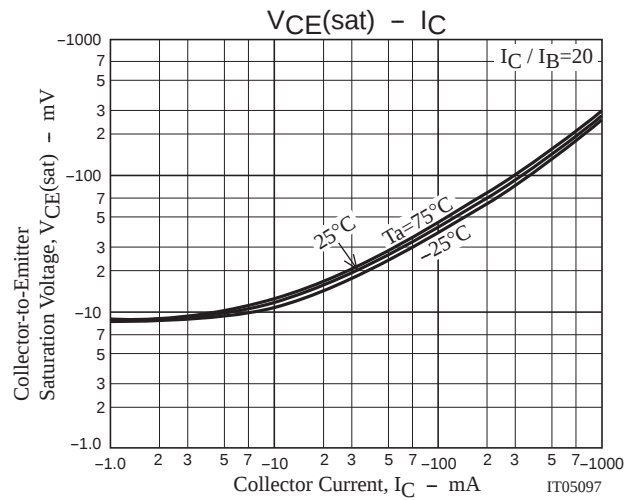
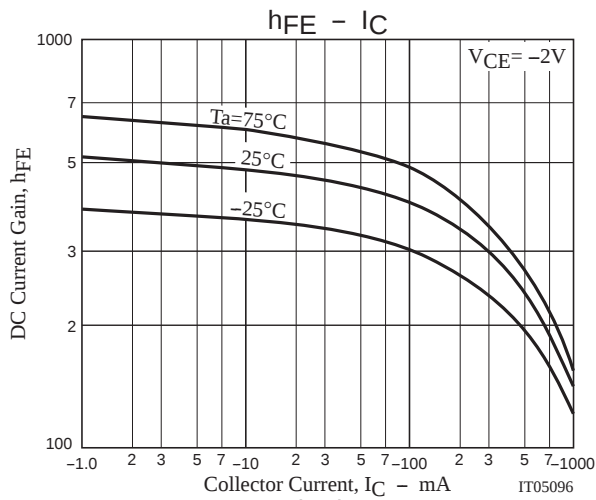
Switching Time Test Circuit



Ordering Information

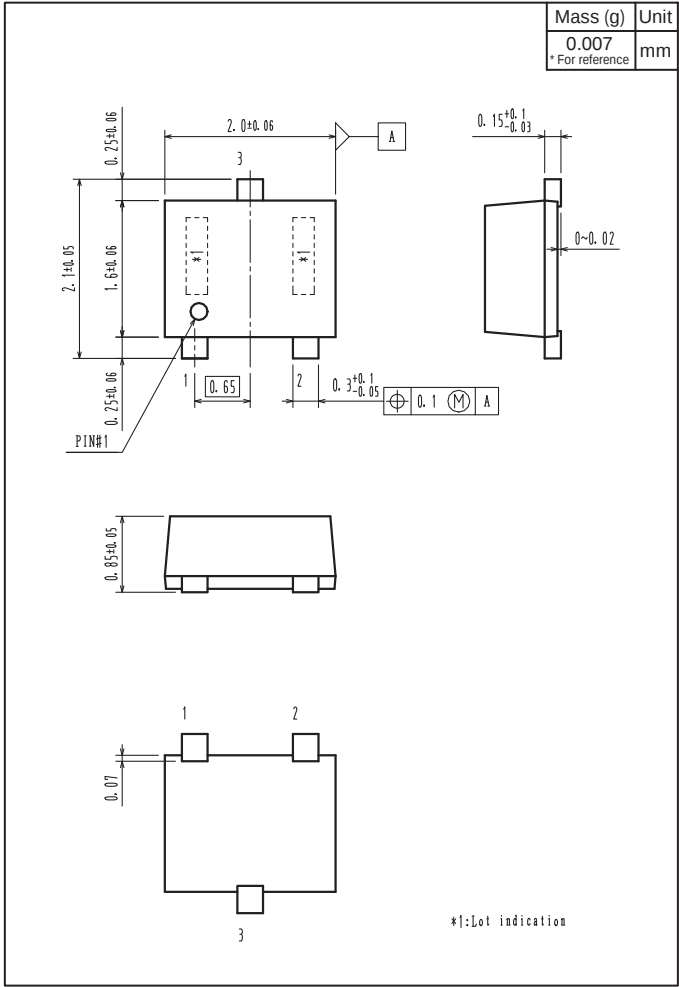
| Device       | Package | Shipping       | memo    |
|--------------|---------|----------------|---------|
| 12A02MH-TL-E | MCPH3   | 3,000pcs./reel | Pb Free |



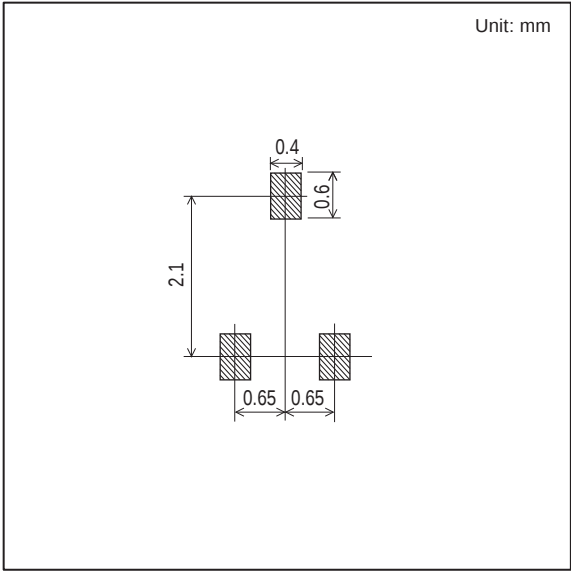




Outline Drawing  
12A02MH-TL-E



Land Pattern Example



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