



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

50C02MH — Low-Frequency General-Purpose Amplifier Applications

NPN Epitaxial Planar Silicon Transistor

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=175m Ω [$I_C=0.5A$, $I_B=50mA$]
- Ultrasmall package facilitates miniaturization in end products
- Small ON-resistance (R_{on})

Specifications

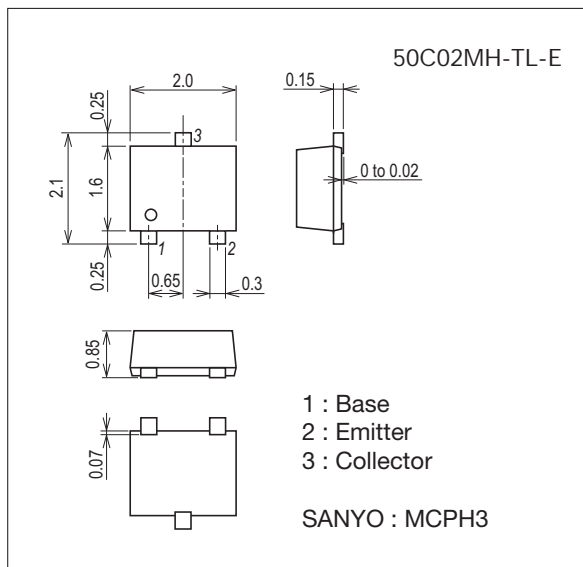
Absolute Maximum Ratings at $T_a=25^\circ C$

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|---|-------------|------|
| Collector-to-Base Voltage | V_{CBO} | | 60 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | 50 | V |
| Emitter-to-Base Voltage | V_{EBO} | | 5 | V |
| Collector Current | I_C | | 500 | mA |
| Collector Current (Pulse) | I_{CP} | | 1.0 | A |
| Collector Dissipation | P_C | When mounted on ceramic substrate (600mm ² ×0.8mm) | 600 | mW |
| Junction Temperature | T_j | | 150 | °C |
| Storage Temperature | T_{stg} | | -55 to +150 | °C |

Package Dimensions

unit : mm (typ)

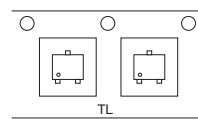
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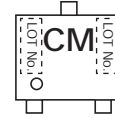
Product & Package Information

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

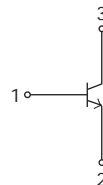
Packing Type : TL



Marking



Electrical Connection

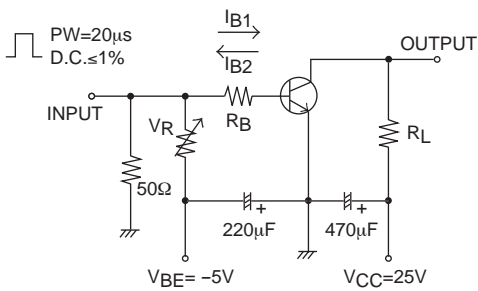


50C02MH

Electrical Characteristics at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|--------------------------------------|---------|-----|-----|------|
| | | | min | typ | max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB}=40\text{V}, I_E=0\text{A}$ | | | 100 | nA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=4\text{V}, I_C=0\text{A}$ | | | 100 | nA |
| DC Current Gain | h_{FE} | $V_{CE}=2\text{V}, I_C=10\text{mA}$ | 300 | | 800 | |
| Gain-Bandwidth Product | f_T | $V_{CE}=10\text{V}, I_C=50\text{mA}$ | | 500 | | MHz |
| Output Capacitance | C_{ob} | $V_{CB}=10\text{V}, f=1\text{MHz}$ | | 2.8 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=100\text{mA}, I_B=10\text{mA}$ | | 50 | 100 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=100\text{mA}, I_B=10\text{mA}$ | | 0.9 | 1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=10\mu\text{A}, I_E=0\text{A}$ | 60 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=1\text{mA}, R_{BE}=\infty$ | 50 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=10\mu\text{A}, I_C=0\text{A}$ | 5 | | | V |
| Turn-ON Time | t_{on} | See specified Test Circuit. | | 30 | | ns |
| Storage Time | t_{stg} | | | 340 | | ns |
| Fall Time | t_f | | | 55 | | ns |

Switching Time Test Circuit

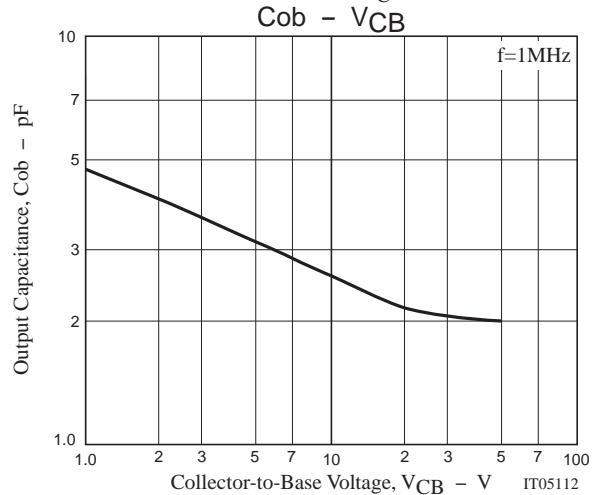
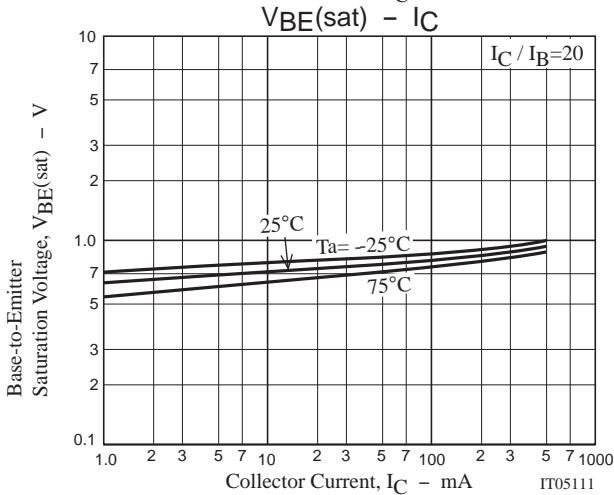
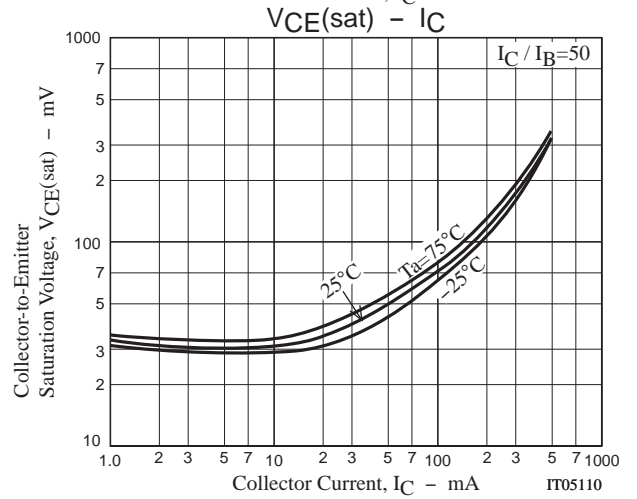
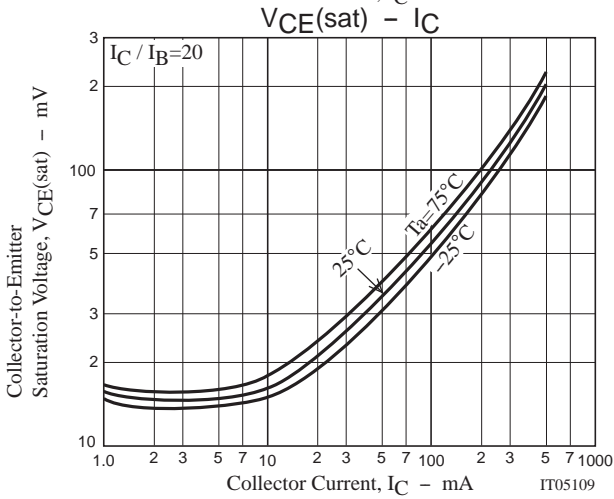
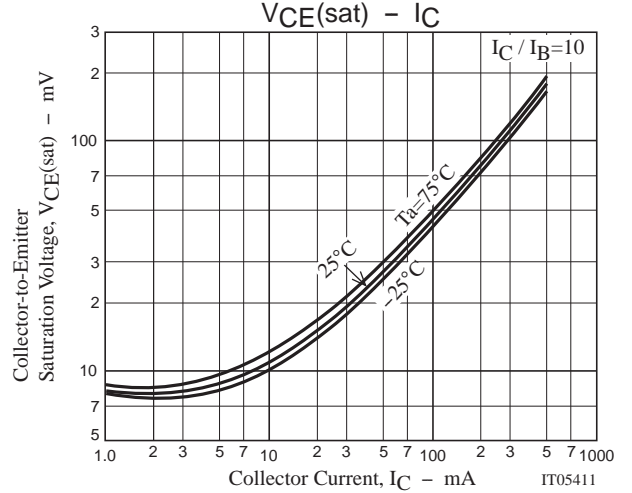
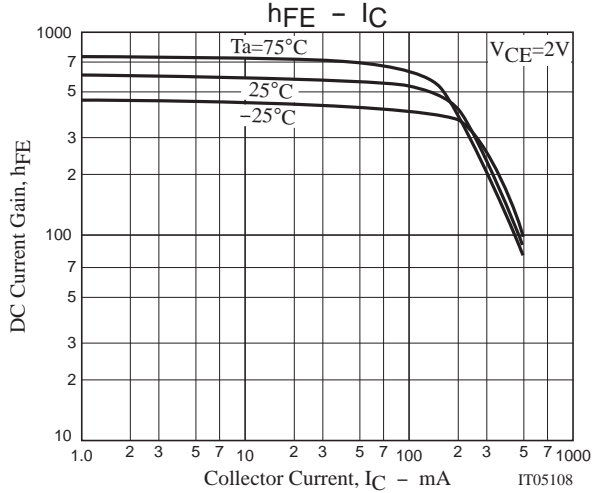
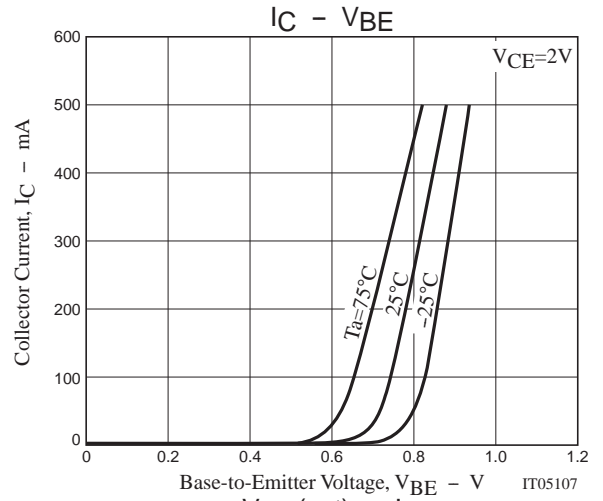
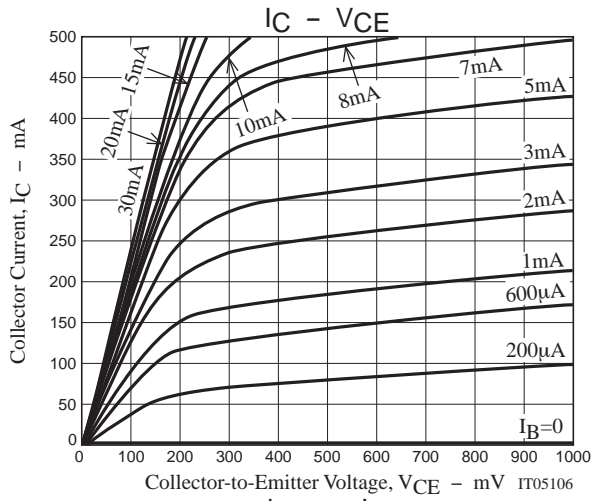


$$I_C=20I_{B1} = -20I_{B2}=200\text{mA}$$

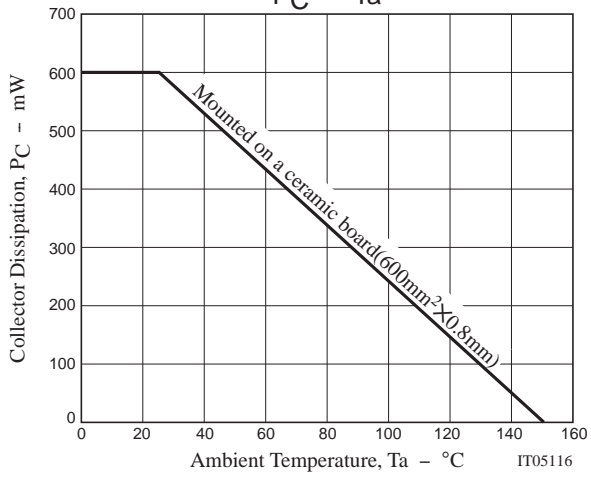
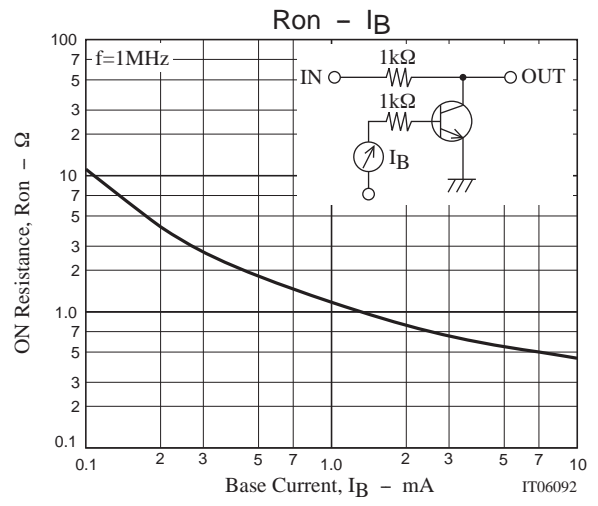
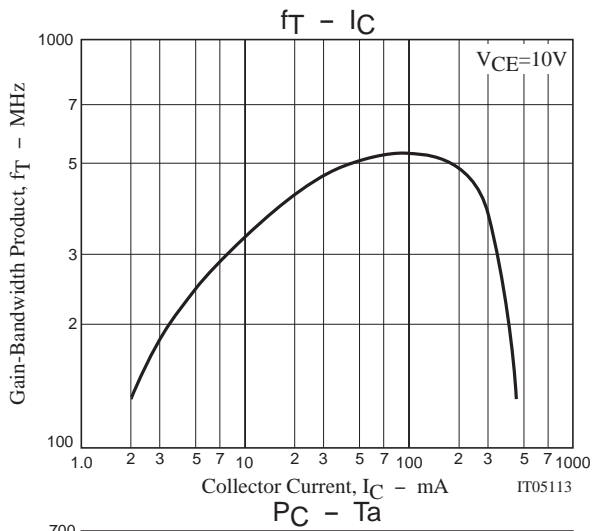
Ordering Information

| Device | Package | Shipping | memo |
|--------------|---------|----------------|---------|
| 50C02MH-TL-E | MCPH3 | 3,000pcs./reel | Pb Free |

50C02MH



50C02MH



Embossed Taping Specification

50C02MH-TL-E

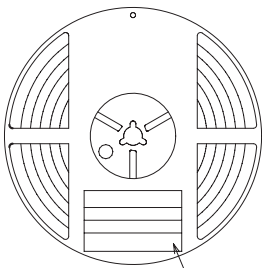
1. Packing Format

| Package Name | Carrier Tape Type | Maximum Number of devices contained (pcs) | | | Packing format | |
|--------------|-------------------|---|-----------|-----------|---|--|
| | | Reel | Inner box | Outer box | Inner BOX (C-1) | Outer BOX (A-7) |
| MCPH3 | MCPH3 | 3,000 | 15,000 | 90,000 | 5 reels contained Dimensions:mm (external) 183×72×185 | 6 inner boxes contained Dimensions:mm (external) 440×195×210 |

Reel label, Inner box label
(unit: mm)

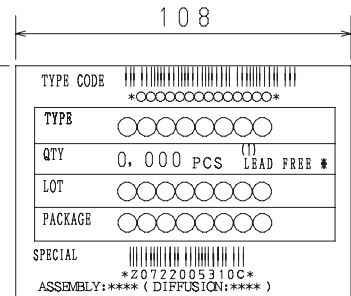
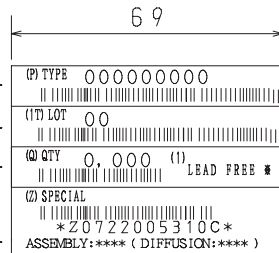
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



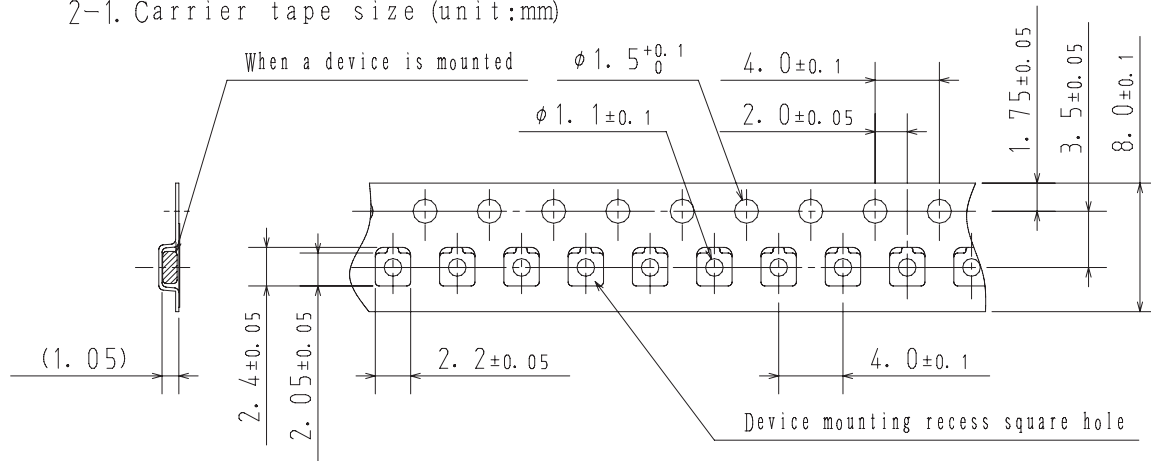
NOTE (1)

The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

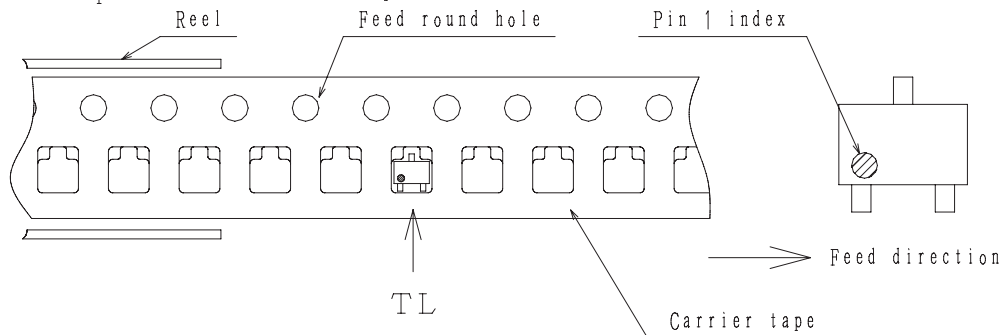
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

2. Taping configuration

2-1. Carrier tape size (unit:mm)



2-2. Device placement direction



Those with pin 1 index on the feed hole side.....TL

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