



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

12A02MH — PNP Epitaxial Planar Silicon Transistor

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 Ω [$I_C=1A$, $I_B=50mA$]
- Small ON-resistance (R_{on})

Specifications

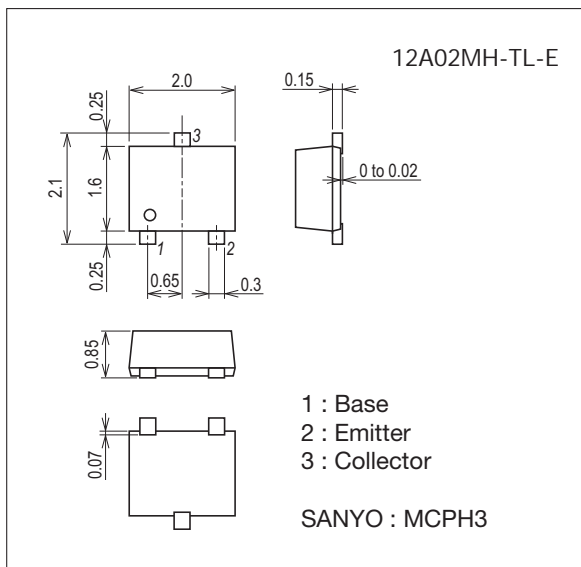
Absolute Maximum Ratings at $T_a=25^\circ C$

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 ² ×0.8mm)	600	mW
Junction Temperature	T_j		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C

Package Dimensions

unit : mm (typ)

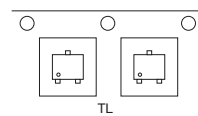
7019A-004



Product & Package Information

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

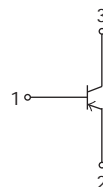
Packing Type : TL



Marking



Electrical Connection

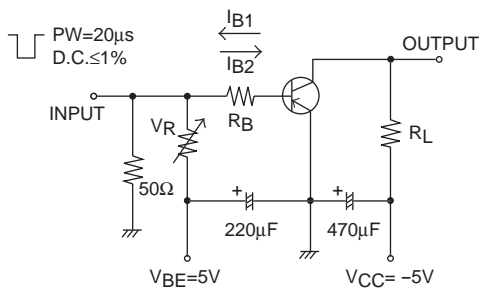


12A02MH

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

Parameter	Symbol	Conditions	Ratings			Unit	
			min	typ	max		
Collector Cutoff Current	I_{CBO}	$V_{CB} = -12\text{V}, I_E = 0\text{A}$			-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		700		
Gain-Bandwidth Product	f_T	$V_{CE} = -2\text{V}, I_C = -50\text{mA}$		450		MHz	
Output Capacitance	C_{ob}	$V_{CB} = -10\text{V}, f = 1\text{MHz}$		6		pF	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -400\text{mA}, I_B = -20\text{mA}$		-120	-240	mV	
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -400\text{mA}, I_B = -20\text{mA}$		-0.9	-1.2	V	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0\text{A}$	-15			V	
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1\text{mA}, R_{BE} = \infty$	-12			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}				75		ns
Fall Time	t_f				15		ns

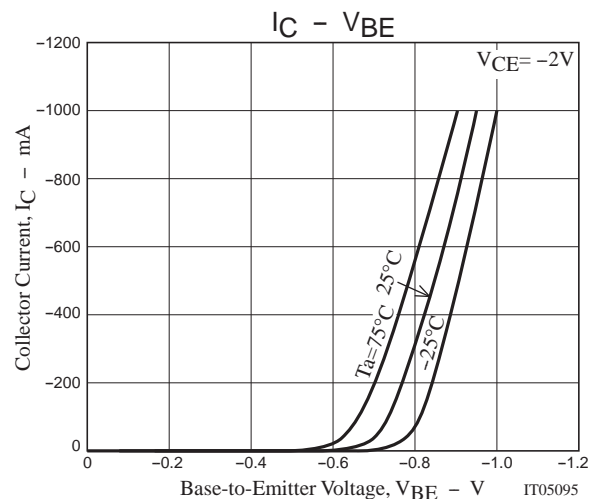
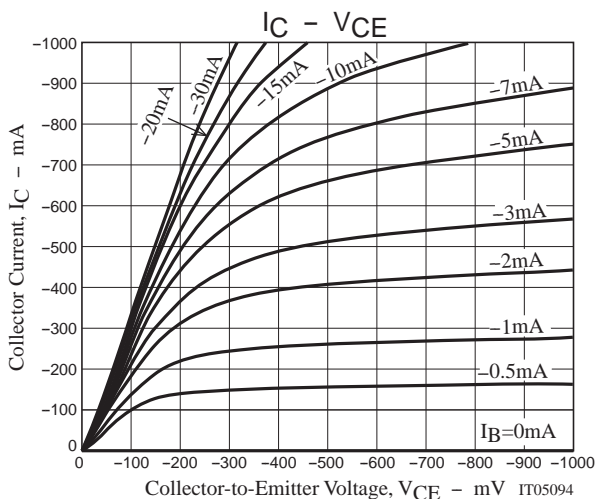
Switching Time Test Circuit



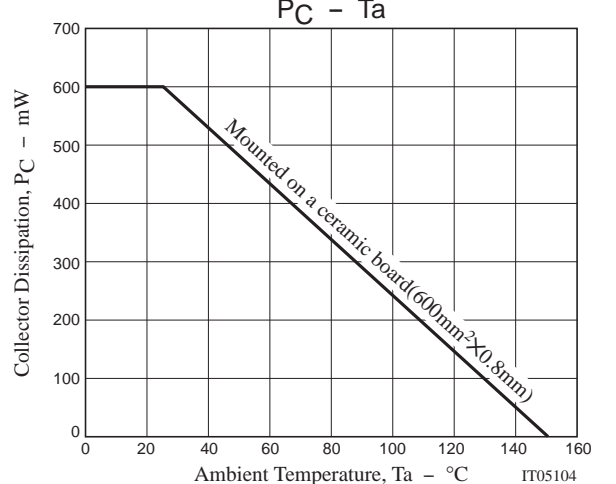
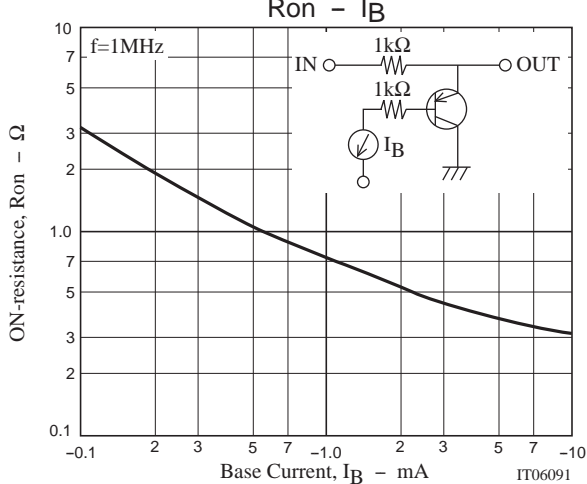
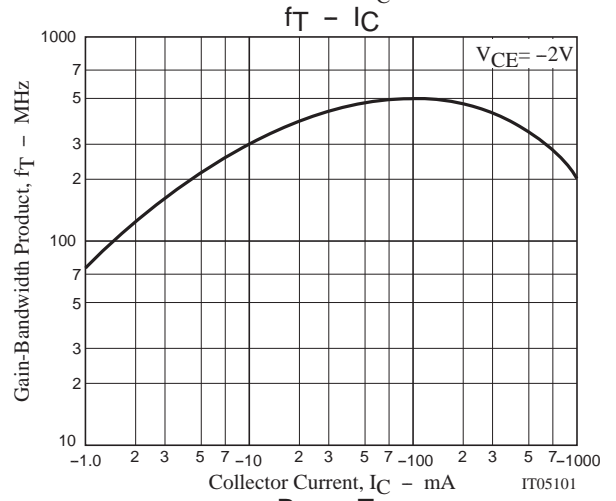
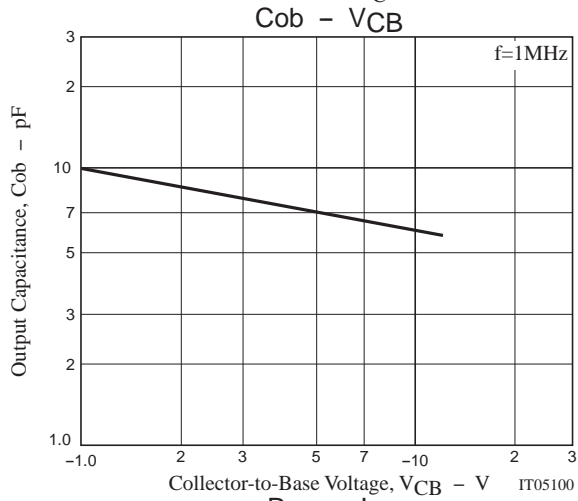
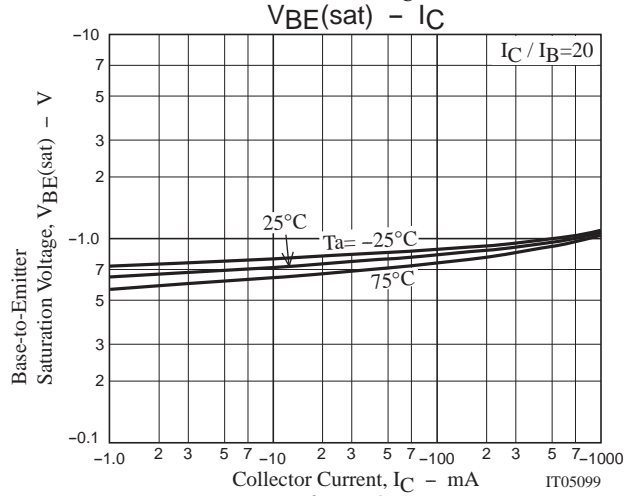
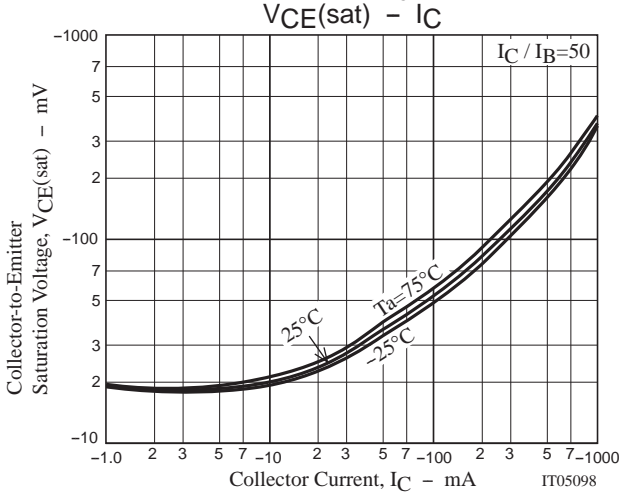
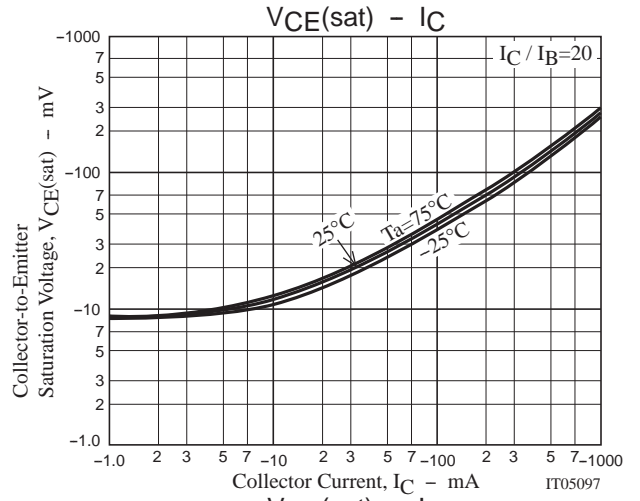
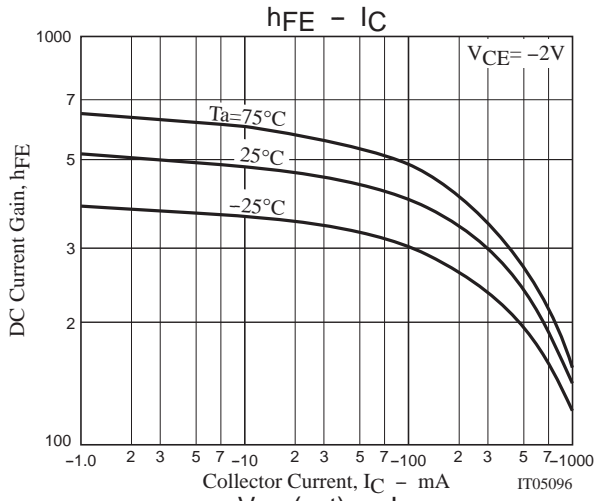
$$I_C = 20I_{B1} = -20I_{B2} = -400\text{mA}$$

Ordering Information

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



12A02MH



Embossed Taping Specification

12A02MH-TL-E

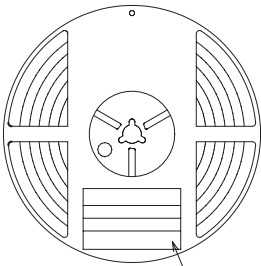
1. Packing Format

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

Packing method

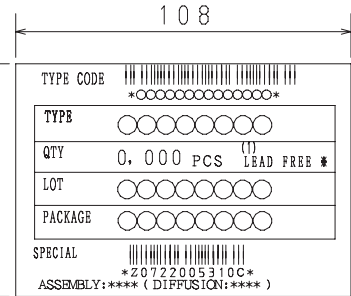
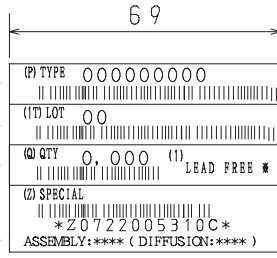
Reel label, Inner box label
(unit: mm)

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



Reel label

Type No.
LOT No.
Quantity
Origin



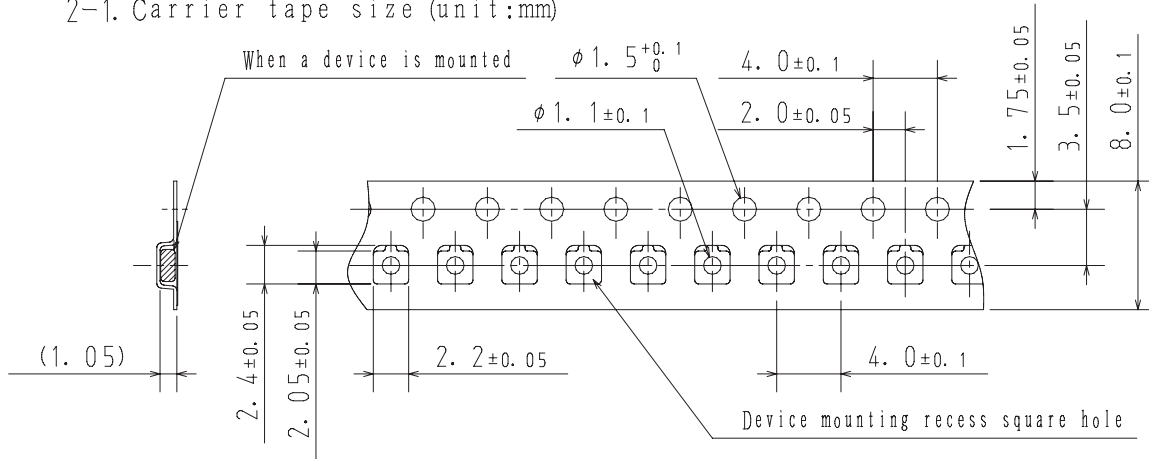
NOTE (1)

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

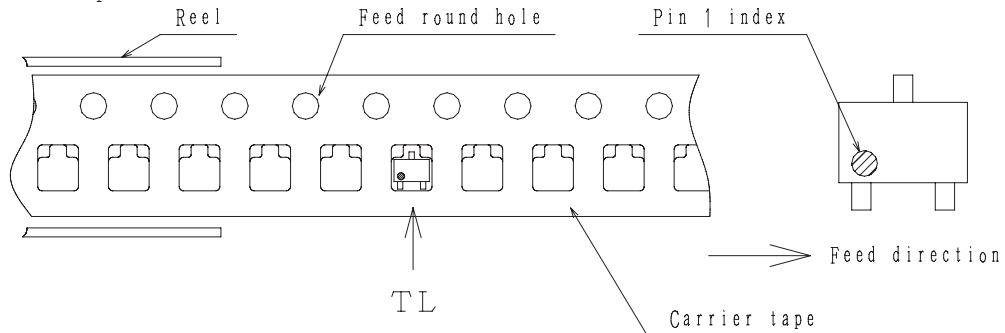
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



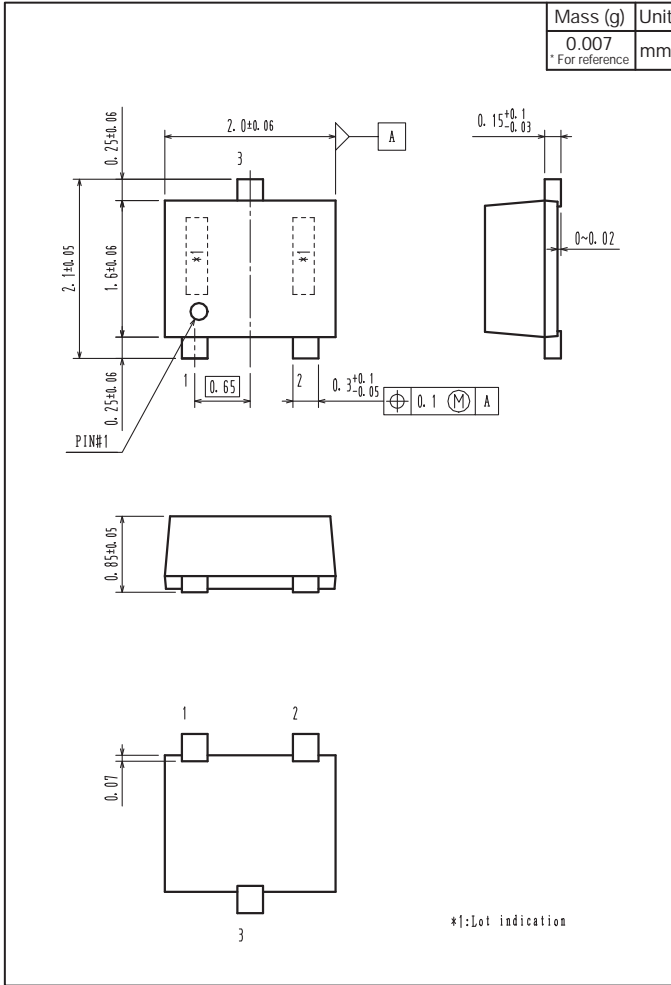
2-2. Device placement direction



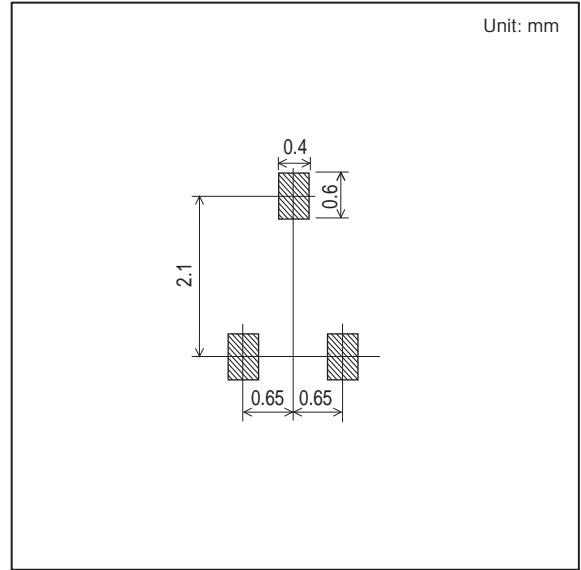
Those with pin 1 index on the feed hole side.....TL

12A02MH

Outline Drawing 12A02MH-TL-E



Land Pattern Example



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