Ordering number:ENN6387

PNP/NPN Epitaxial Planar Silicon Transistors

# MCH6101/MCH6201

## DC/DC Converter Applications

## Applications

· Relay drivers, lamp drivers, motor drivers.

## Features

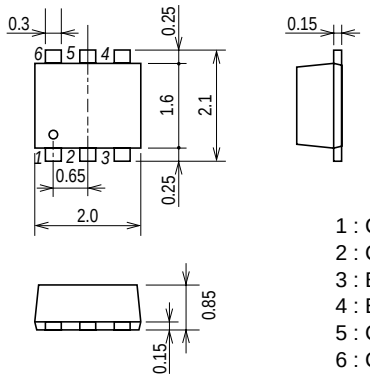
· Adoption of MBIT processes.
· Large current capacitance.
· Low collector-to-emitter saturation voltage.
· High-speed switching.
· Ultrasmall package facilitates miniaturization in end products (mounting height : 0.85mm).
· High allowable power dissipation.

## Package Dimensions

unit:mm

2170

[MCH6101/MCH6201]




1 : Collector
2 : Collector
3 : Base
4 : Emitter
5 : Collector
6 : Collector
SANYO : MCPH6

## Specifications

( ) : MCH6101

### Absolute Maximum Ratings at Ta = 25˚C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | (–)15 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (–)15 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (–)5 | V |
| Collector Current | $I_C$ | | (–)1.5 | A |
| Collector Current (Pulse) | $I_{CP}$ | | (–)3 | A |
| Base Current | $I_B$ | | (–)300 | mA |
| Collector Dissipation | $P_C$ | Mounted on a ceramic board (600mm²×0.8mm) | 1.0 | W |
| Junction Temperature | Tj | | 150 | ˚C |
| Storage Temperature | Tstg | | –55 to +150 | ˚C |

### Electrical Characteristics at Ta = 25˚C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$=(–)12V, $I_E$=0 | | | (–)0.1 | μA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=(–)4V, $I_C$=0 | | | (–)0.1 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=(–)2V, $I_C$=(–)100mA | 200 | | 560 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)2V, $I_C$=(–)300mA | | 430 | | MHz |
| Output Capacitance | Cob | $V_{CB}$=(–)10V, f=1MHz | | (15)8 | | pF |

Marking : MCH6101 : AA, MCH6201 : CA

Continued on next page.



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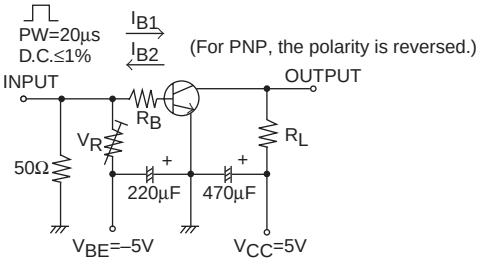
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

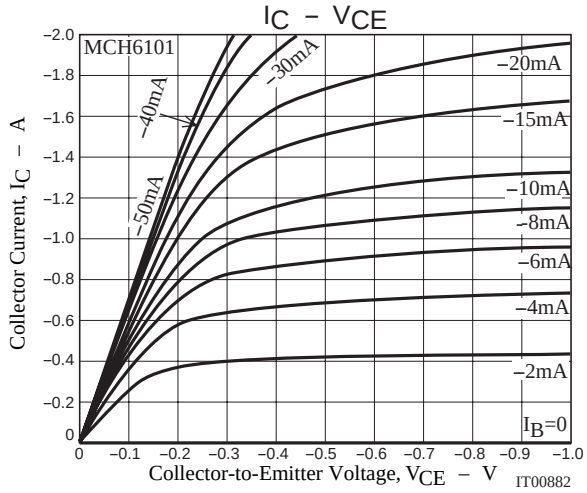
Continued from preceding page.

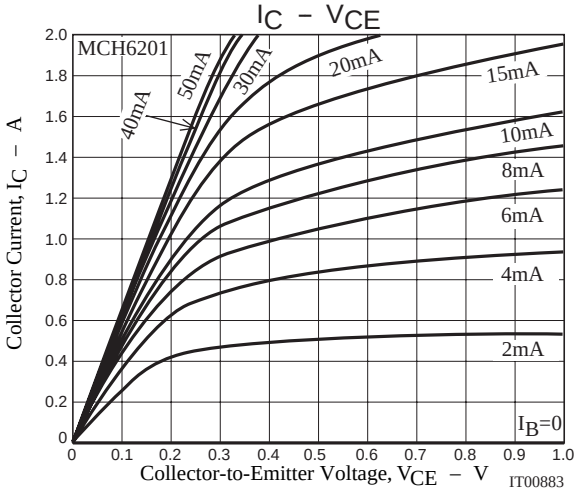
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$=(–)750mA, $I_B$=(–)15mA | | (–110) | (–180) | mV |
| | | | | 120 | 200 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$=(–)750mA, $I_B$=(–)15mA | | (–)0.85 | (–)1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=(–)10μA, $I_E$=0 | (–)15 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=(–)1mA, $R_{BE}$=∞ | (–)15 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$=(–)10μA, $I_C$=0 | (–)5 | | | V |
| Turn-ON Time | $t_{on}$ | See specified test circuit. | | 30 | | ns |
| Storage Time | $t_{stg}$ | See specified test circuit. | | (90) | | ns |
| | | | | 160 | | ns |
| Fall Time | $t_f$ | See specified test circuit. | | (12)15 | | ns |

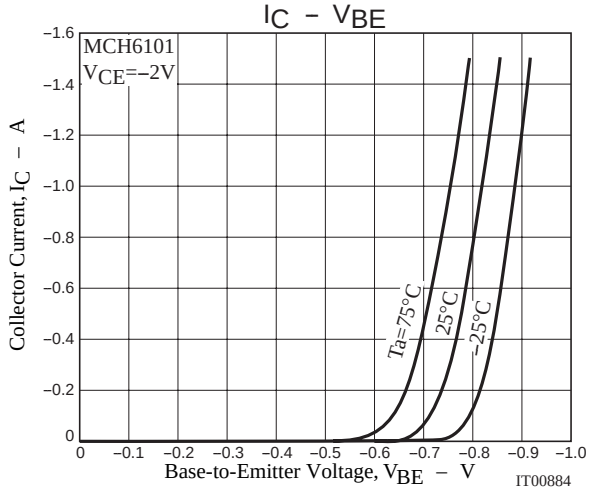
## Switching Time Test Circuit

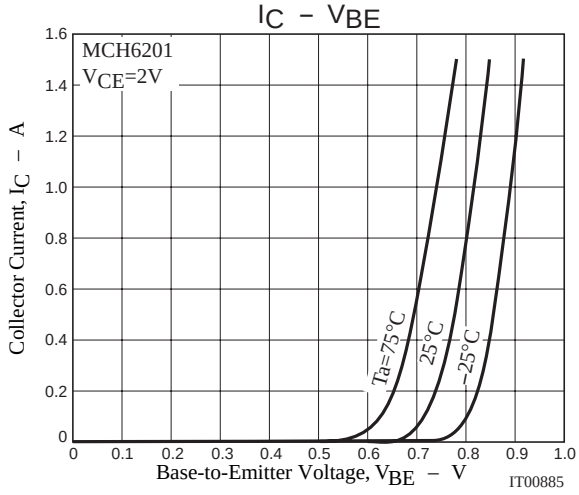


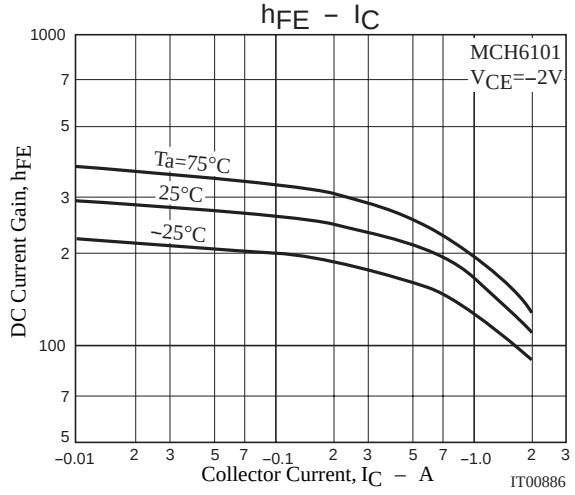

$20I_{B1}$= $-20I_{B2}$= $I_C$=750mA

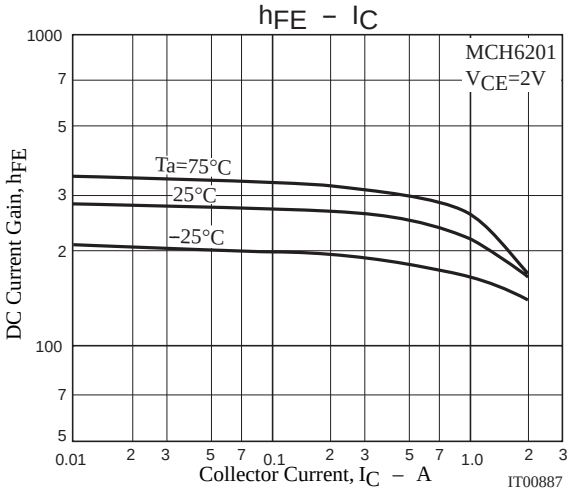


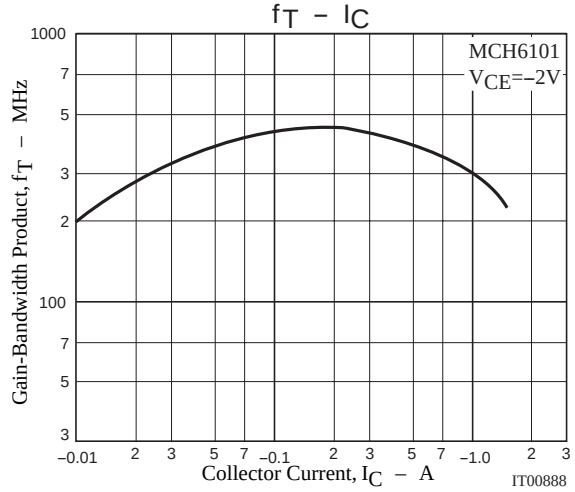



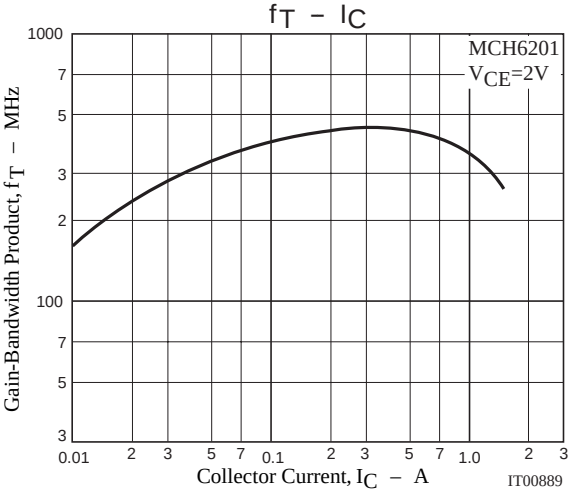



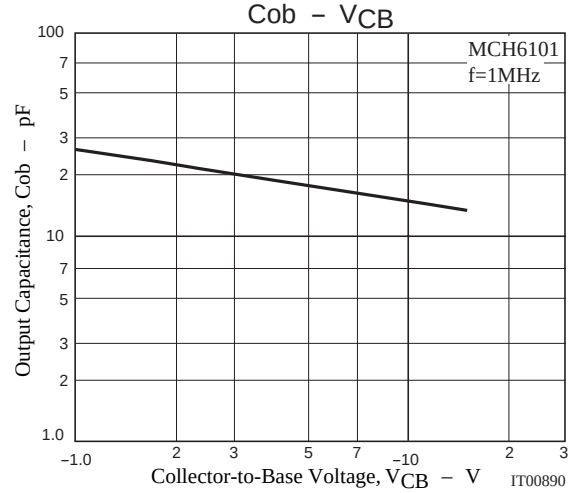



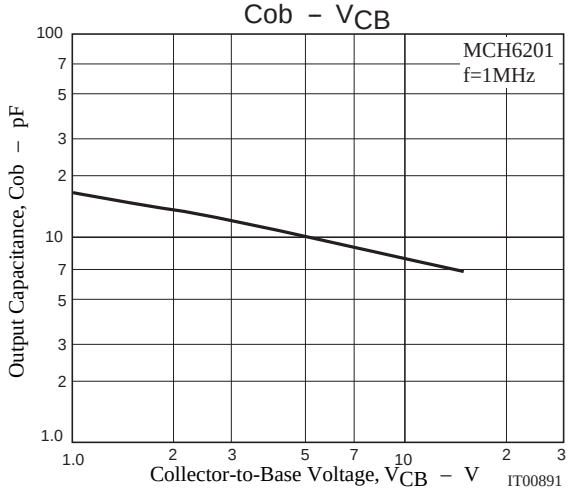

hFE – IC
MCH6101
VCE=–2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00886

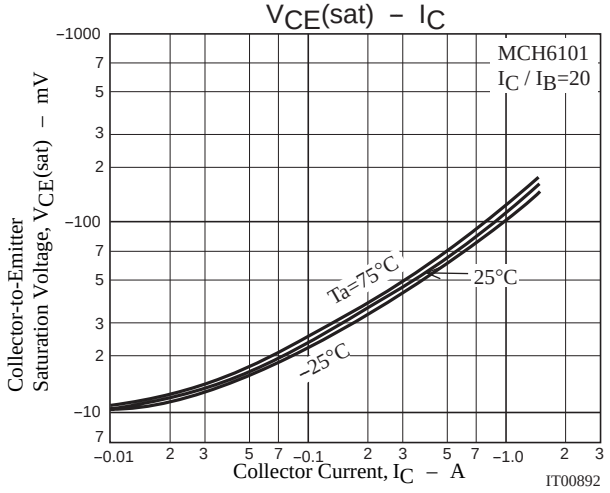

hFE – IC
MCH6201
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00887

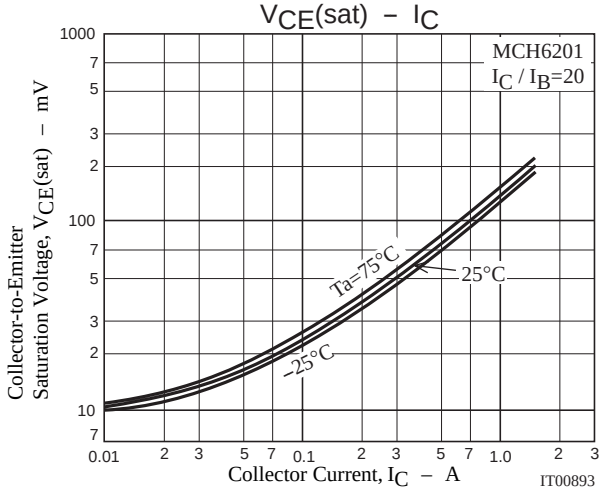

fT – IC
MCH6101
VCE=–2V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT00888


fT – IC
MCH6201
VCE=2V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT00889

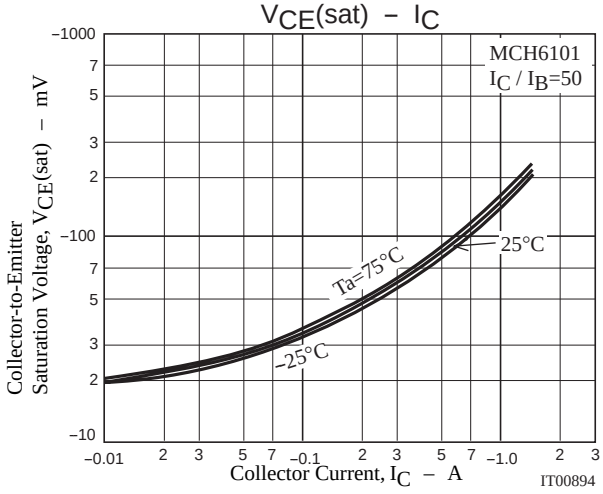

Cob – VCB
MCH6101
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT00890


Cob – VCB
MCH6201
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT00891

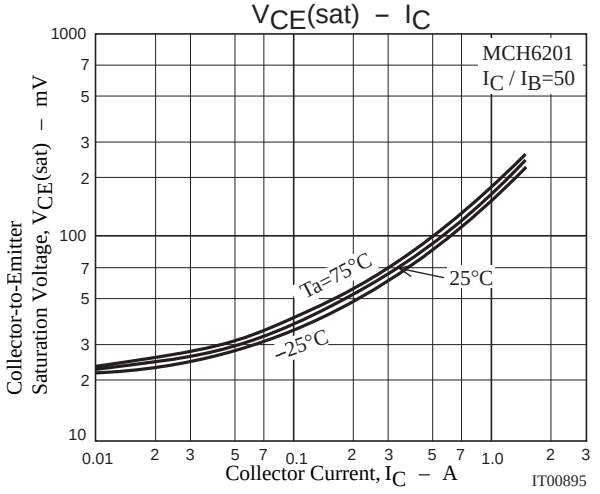

VCE(sat) – IC
MCH6101
IC / IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00892


VCE(sat) – IC
MCH6201
IC / IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00893

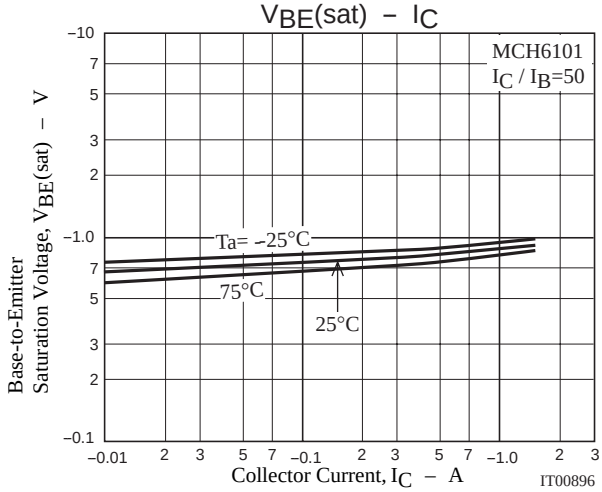
$V_{CE}(sat)$ – $I_C$



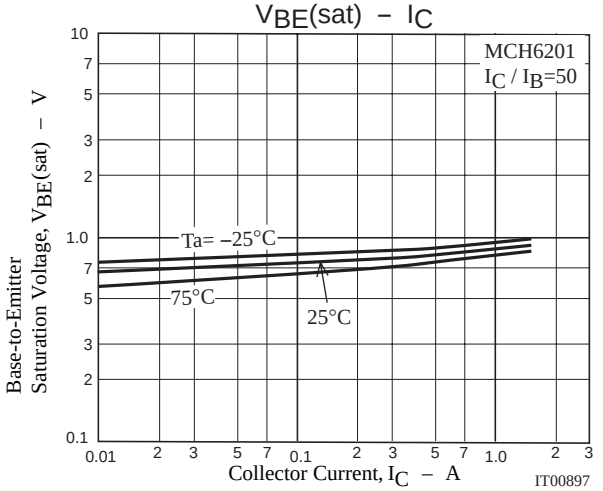

$V_{CE}(sat)$ – $I_C$



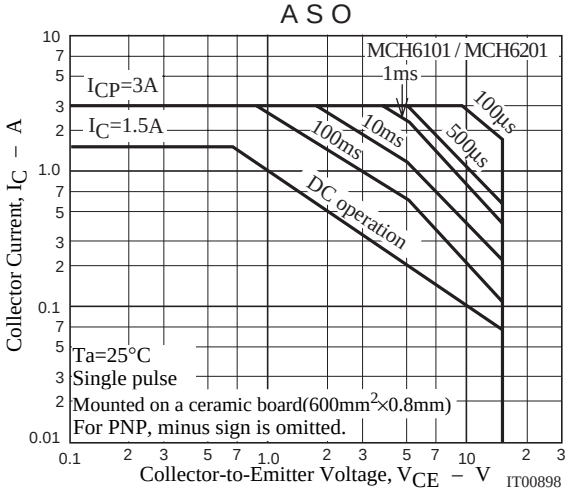

$V_{BE}(sat)$ – $I_C$




$V_{BE}(sat)$ – $I_C$




A S O




$P_C$ – Ta