Ordering number : ENN6918A

NPN Epitaxial Planar Silicon Transistor

# CPH5503

## DC / DC Converter Applications

## Applications

- Relay drivers, lamp drivers, motor drivers, strobes.

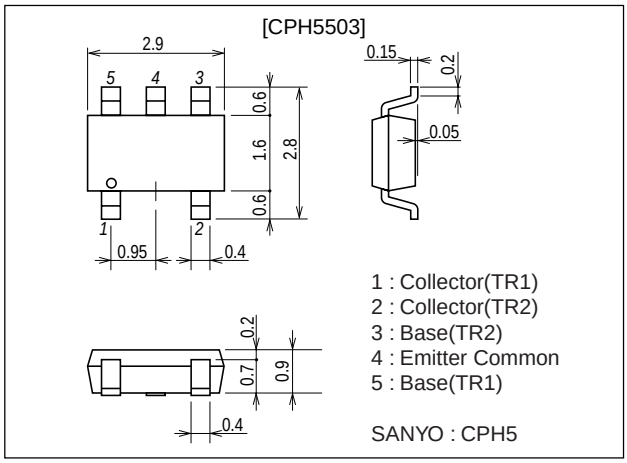
## Features

- Composite type with two NPN transistors contained in one package facilitating high-density mounting.
- The two chips contained are equivalent to the CPH3209.
- Ultrasmall package permitting applied sets to be made small and slim.(0.9mm)

## Package Dimensions

unit : mm

2162




## Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | 40 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | 30 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | 5 | V |
| Collector Current | $I_C$ | | 3 | A |
| Collector Current (Pulse) | $I_{CP}$ | | 5 | A |
| Collector Dissipation | $P_C$ | Mounted on a ceramic board (600mm²×0.8mm) | 0.9 | W |
| Total Dissipation | $P_T$ | Mounted on a ceramic board (600mm²×0.8mm) | 1.2 | 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 | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=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, $I_C$=500mA | 200 | | 560 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=10V, $I_C$=500mA | | 450 | | MHz |
| Output Capacitance | Cob | $V_{CB}$=10V, f=1MHz | | 20 | | pF |

Marking : EC

Continued on next page.



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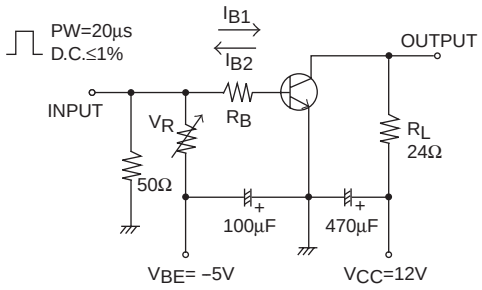
Continued from preceding page.

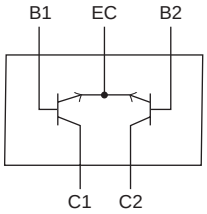
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE}(sat)$ | $I_C$=1.5A, $I_B$=30mA | | 120 | 180 | mV |
| | | $I_C$=3A, $I_B$=60mA | | 220 | 330 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE}(sat)$ | $I_C$=1.5A, $I_B$=30mA | | 0.85 | 1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=10μA, $I_E$=0 | 40 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=1mA, $R_{BE}$=∞ | 30 | | | 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 | | 300 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit | | 15 | | ns |

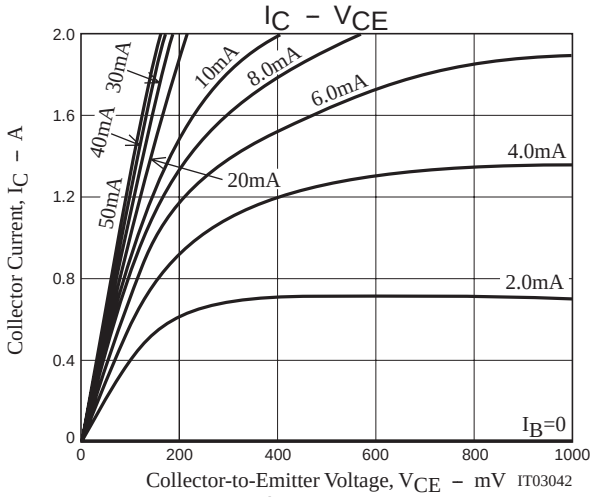
## Switching Time Test Circuit

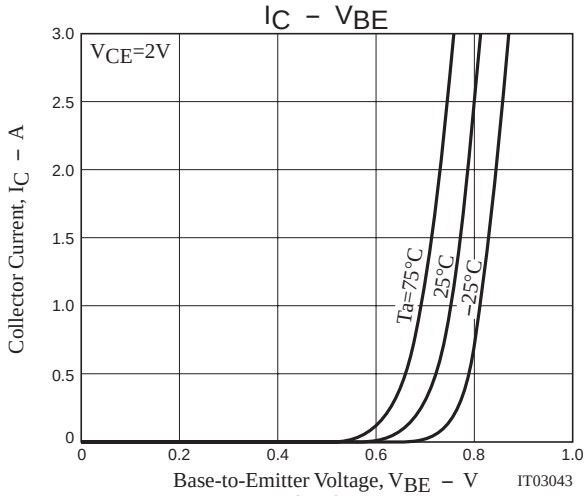


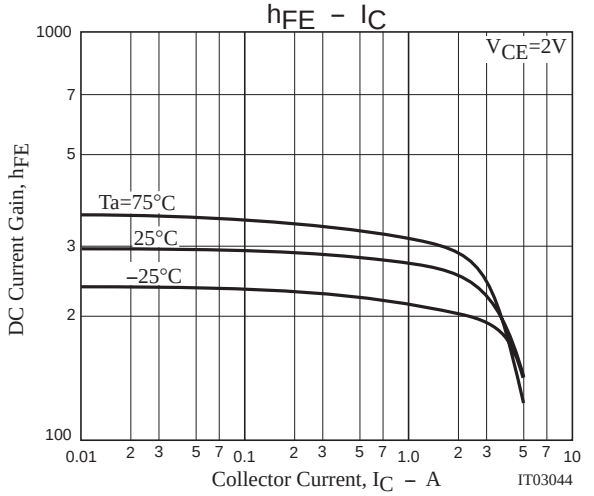

$I_C$=20$I_{B1}$= −20$I_{B2}$=500mA

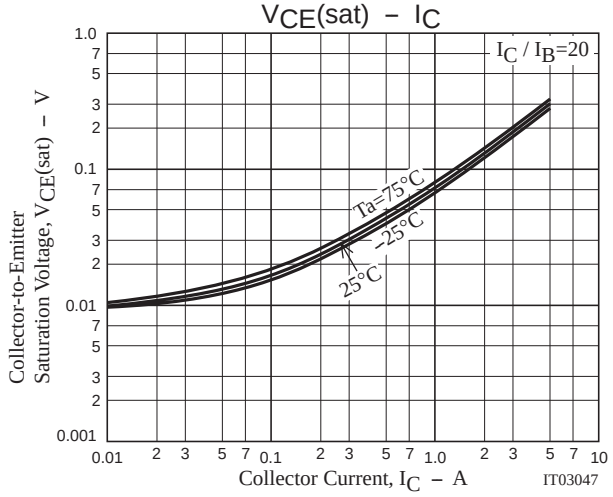
## Electrical Connection

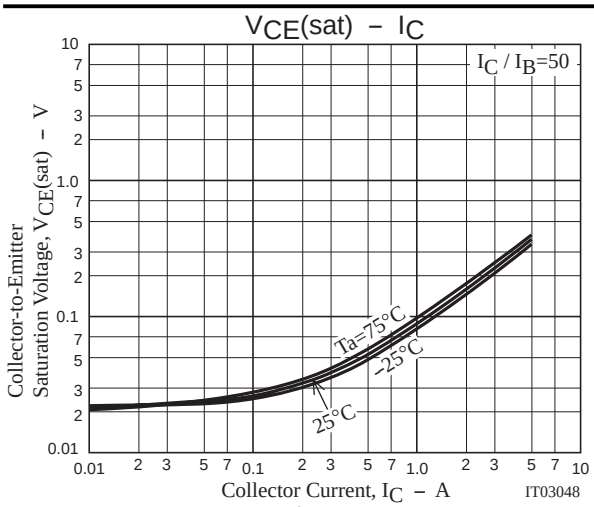


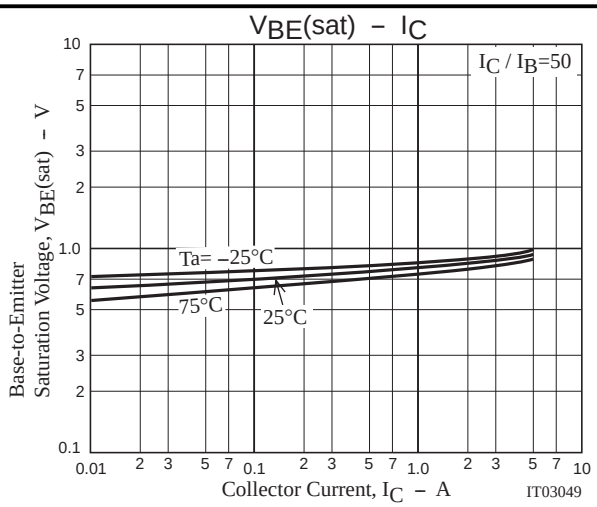



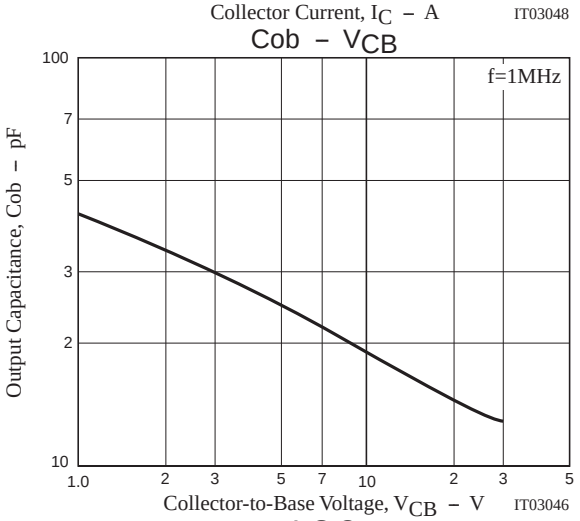



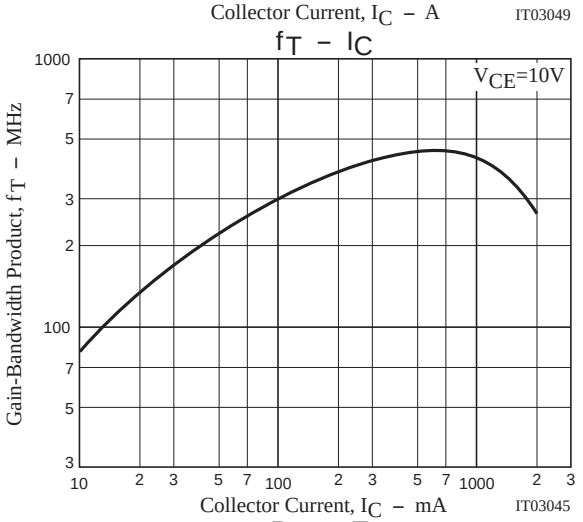



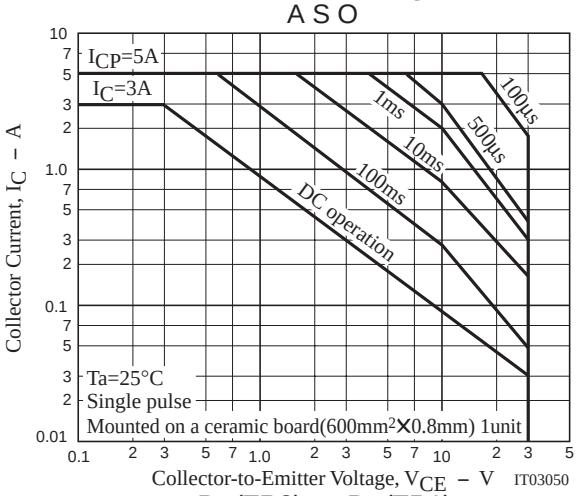



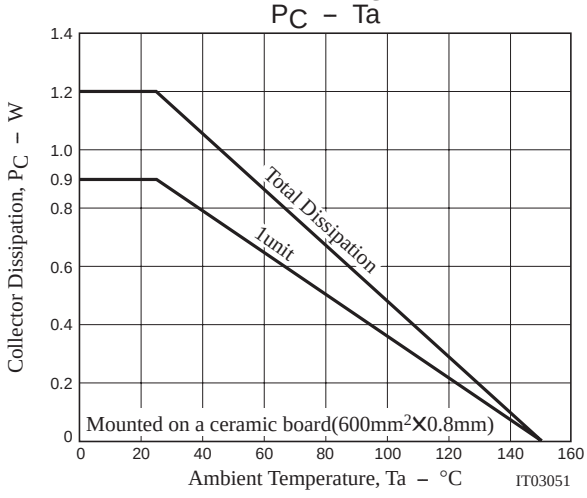

VCE(sat) – IC
IC / IB=50
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
IT03048

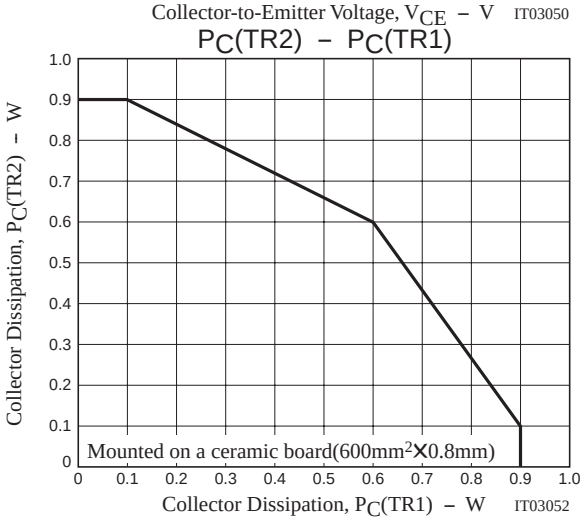

VBE(sat) – IC
IC / IB=50
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Ta= –25°C
75°C
25°C
Collector Current, IC – A
IT03049


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT03046


fT – IC
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
IT03045


A S O
ICP=5A
IC=3A
1ms
10ms
100ms
DC operation
100µs
500µs
Ta=25°C
Single pulse
Mounted on a ceramic board(600mm2×0.8mm) 1unit
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT03050


PC – Ta
Total Dissipation
1unit
Mounted on a ceramic board(600mm2×0.8mm)
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT03051


PC(TR2) – PC(TR1)
Mounted on a ceramic board(600mm2×0.8mm)
Collector Dissipation, PC(TR2) – W
Collector Dissipation, PC(TR1) – W
IT03052

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