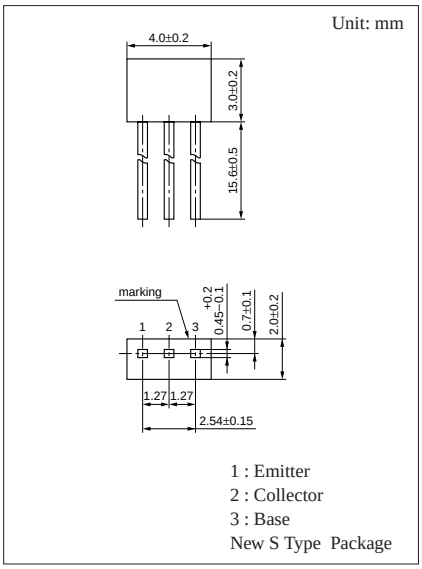
# UN4211/4212/4213/4214/4215/4216/4217/4218/4219/4210/421D/421E/421F/421K/421L

## Silicon NPN epitaxial planer transistor

For digital circuits



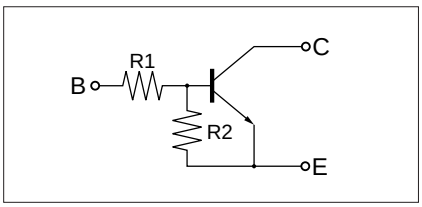

### Features

- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- New S type package, allowing supply with the radial taping.

### Resistance by Part Number

| | ($R_1$) | ($R_2$) |
|---|---|---|
| UN4211 | 10kΩ | 10kΩ |
| UN4212 | 22kΩ | 22kΩ |
| UN4213 | 47kΩ | 47kΩ |
| UN4214 | 10kΩ | 47kΩ |
| UN4215 | 10kΩ | — |
| UN4216 | 4.7kΩ | — |
| UN4217 | 22kΩ | — |
| UN4218 | 0.51kΩ | 5.1kΩ |
| UN4219 | 1kΩ | 10kΩ |
| UN4210 | 47kΩ | — |
| UN421D | 47kΩ | 10kΩ |
| UN421E | 47kΩ | 22kΩ |
| UN421F | 4.7kΩ | 10kΩ |
| UN421K | 10kΩ | 4.7kΩ |
| UN421L | 4.7kΩ | 4.7kΩ |

Internal Connection




### Absolute Maximum Ratings (Ta=25˚C)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to base voltage | $V_{CBO}$ | 50 | V |
| Collector to emitter voltage | $V_{CEO}$ | 50 | V |
| Collector current | $I_C$ | 100 | mA |
| Total power dissipation | $P_T$ | 300 | mW |
| Junction temperature | $T_j$ | 150 | ˚C |
| Storage temperature | $T_{stg}$ | –55 to +150 | ˚C |

## Electrical Characteristics (Ta=25˚C)

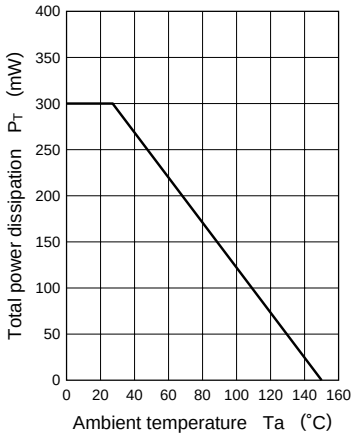
| Parameter | | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cutoff current | | $I_{CBO}$ | $V_{CB}$ = 50V, $I_E$ = 0 | | | 0.1 | μA |
| | | $I_{CEO}$ | $V_{CE}$ = 50V, $I_B$ = 0 | | | 0.5 | μA |
| Emitter cutoff current | UN4211 | $I_{EBO}$ | $V_{EB}$ = 6V, $I_C$ = 0 | | | 0.5 | mA |
| | UN4212/4214/421E/421D | | | | | 0.2 | |
| | UN4213 | | | | | 0.1 | |
| | UN4215/4216/4217/4210 | | | | | 0.01 | |
| | UN421F/421K | | | | | 1.0 | |
| | UN4219 | | | | | 1.5 | |
| | UN4218/421L | | | | | 2.0 | |
| Collector to base voltage | | $V_{CBO}$ | $I_C$ = 10μA, $I_E$ = 0 | 50 | | | V |
| Collector to emitter voltage | | $V_{CEO}$ | $I_C$ = 2mA, $I_B$ = 0 | 50 | | | V |
| Forward current transfer ratio | UN4211 | $h_{FE}$ | $V_{CE}$ = 10V, $I_C$ = 5mA | 35 | | | |
| | UN4212/421E | | | 60 | | | |
| | UN4213/4214 | | | 80 | | | |
| | UN4215*/4216*/4217*/4210* | | | 160 | | 460 | |
| | UN421F/421D/4219 | | | 30 | | | |
| | UN4218/421K/421L | | | 20 | | | |
| Collector to emitter saturation voltage | | $V_{CE(sat)}$ | $I_C$ = 10mA, $I_B$ = 0.3mA | | | 0.25 | V |
| Output voltage high level | | $V_{OH}$ | $V_{CC}$ = 5V, $V_B$ = 0.5V, $R_L$ = 1kΩ | 4.9 | | | V |
| Output voltage low level | | $V_{OL}$ | $V_{CC}$ = 5V, $V_B$ = 2.5V, $R_L$ = 1kΩ | | | 0.2 | V |
| | UN4213/421K | | $V_{CC}$ = 5V, $V_B$ = 3.5V, $R_L$ = 1kΩ | | | 0.2 | |
| | UN421D | | $V_{CC}$ = 5V, $V_B$ = 10V, $R_L$ = 1kΩ | | | 0.2 | |
| | UN421E | | $V_{CC}$ = 5V, $V_B$ = 6V, $R_L$ = 1kΩ | | | 0.2 | |
| Transition frequency | | $f_T$ | $V_{CB}$ = 10V, $I_E$ = –2mA, f = 200MHz | | 150 | | MHz |
| Input resistance | UN4211/4214/4215/421K | $R_1$ | | (–30%) | 10 | (+30%) | kΩ |
| | UN4212/4217 | | | | 22 | | |
| | UN4213/421D/421E/4210 | | | | 47 | | |
| | UN4216/421F/421L | | | | 4.7 | | |
| | UN4218 | | | | 0.51 | | |
| | UN4219 | | | | 1 | | |
| Resistance ratio | UN4211/4212/4213/421L | $R_1/R_2$ | | 0.8 | 1.0 | 1.2 | |
| | UN4214 | | | 0.17 | 0.21 | 0.25 | |
| | UN4218/4219 | | | 0.08 | 0.1 | 0.12 | |
| | UN421D | | | 3.7 | 4.7 | 5.7 | |
| | UN421E | | | 1.7 | 2.14 | 2.6 | |
| | UN421F | | | 0.37 | 0.47 | 0.57 | |
| | UN421K | | | 1.7 | 2.13 | 2.6 | |

* $h_{FE}$ rank classification (UN4215/4216/4217/4210)

| Rank | Q | R | S |
|---|---|---|---|
| $h_{FE}$ | 160 to 260 | 210 to 340 | 290 to 460 |

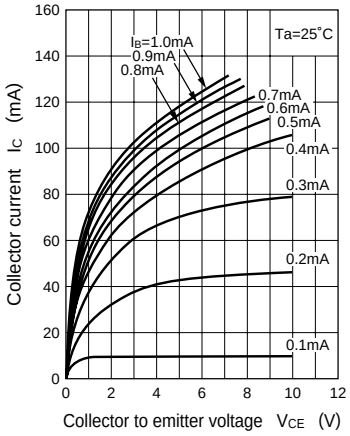
## Common characteristics chart

$P_T$ — Ta

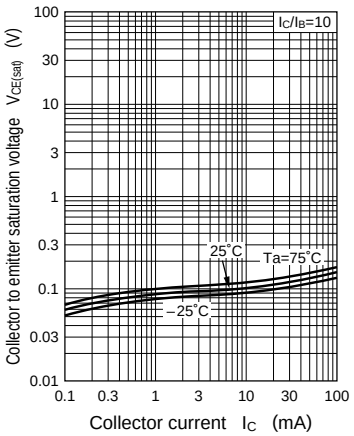



## Characteristics charts of UN4211

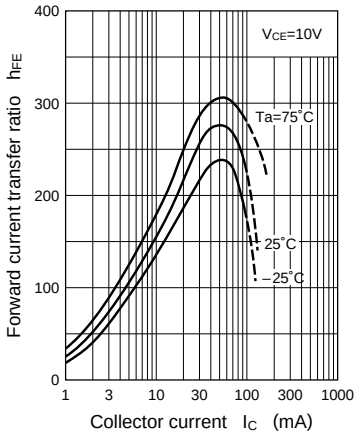
$I_C$ — $V_{CE}$



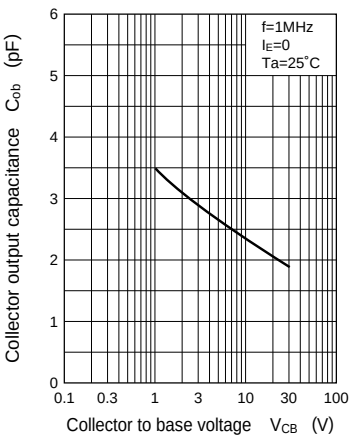

$V_{CE(sat)}$ — $I_C$



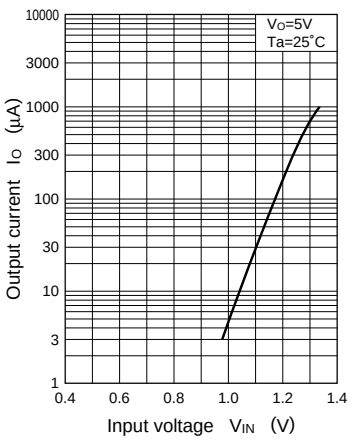

$h_{FE}$ — $I_C$



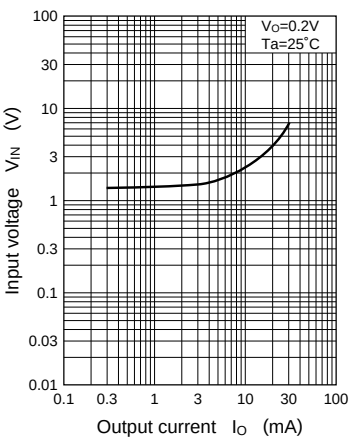

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

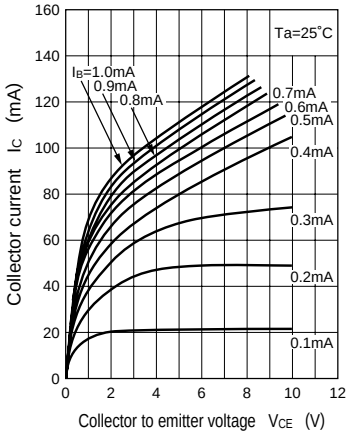



$V_{IN}$ — $I_O$

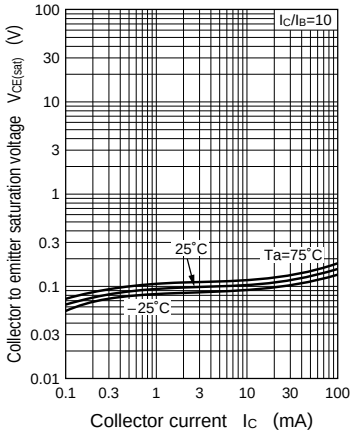


## Characteristics charts of UN4212

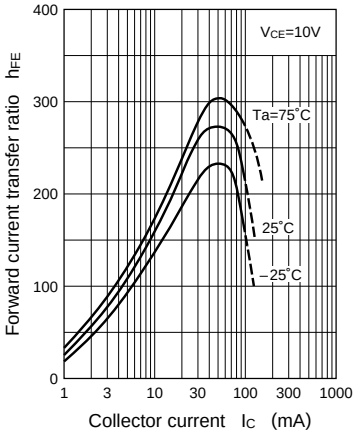
$I_C$ — $V_{CE}$



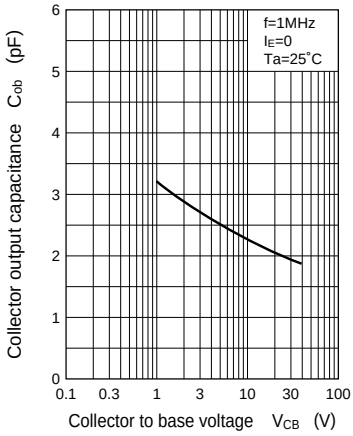

$V_{CE(sat)}$ — $I_C$



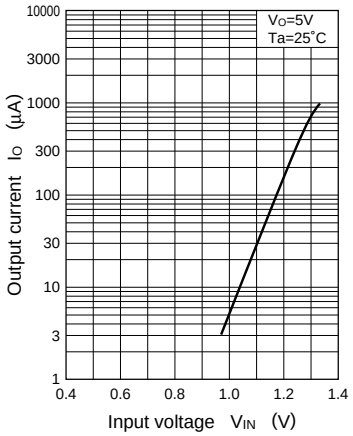

$h_{FE}$ — $I_C$



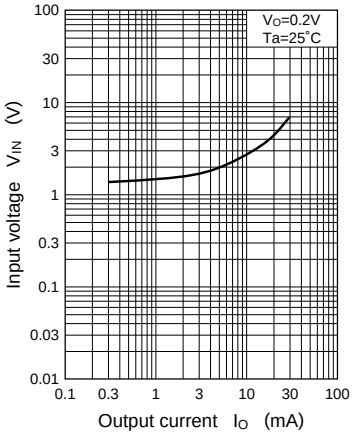

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

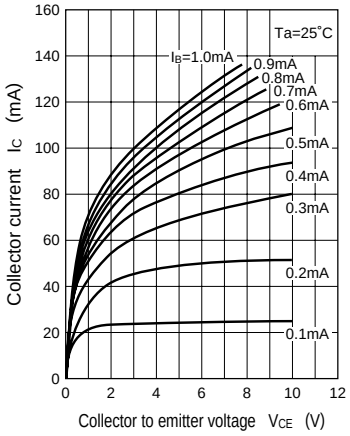



$V_{IN}$ — $I_O$

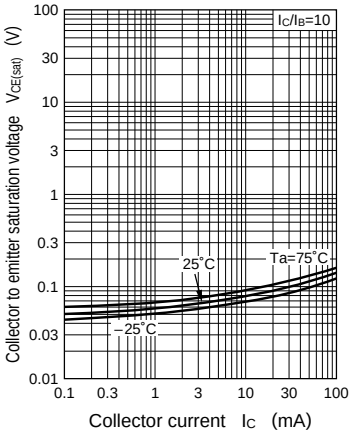



## Characteristics charts of UN4213

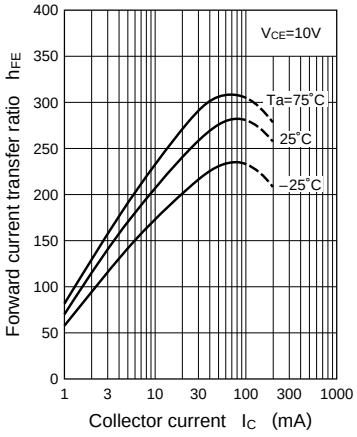
$I_C$ — $V_{CE}$



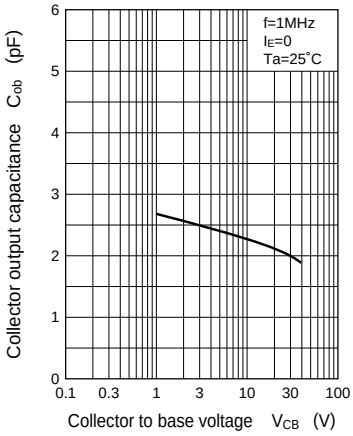

$V_{CE(sat)}$ — $I_C$



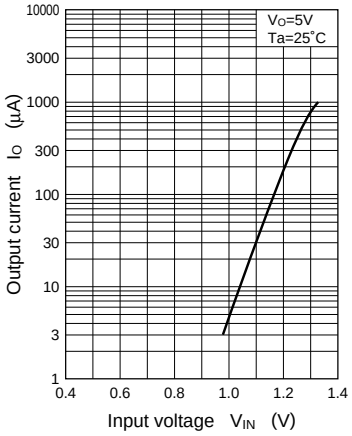

$h_{FE}$ — $I_C$



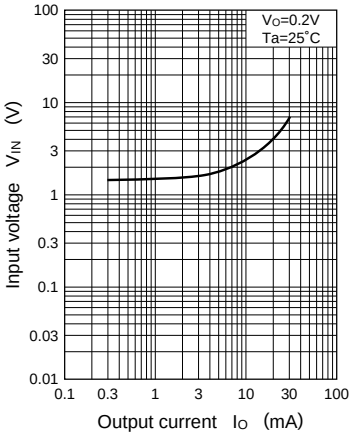
$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

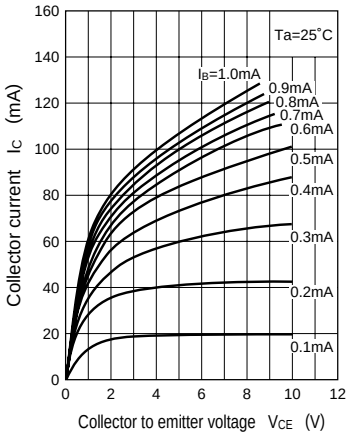



$V_{IN}$ — $I_O$

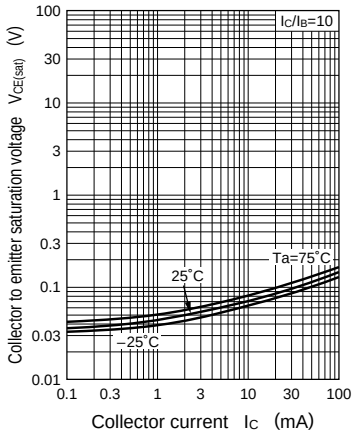



Characteristics charts of UN4214

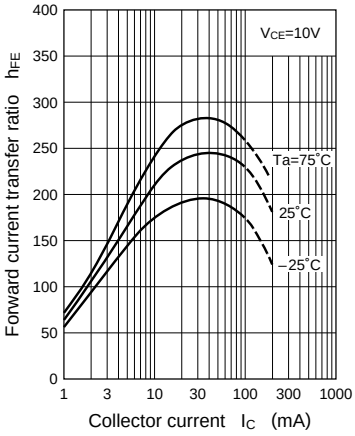
$I_C$ — $V_{CE}$



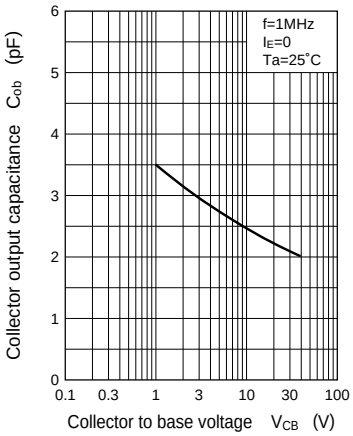

$V_{CE(sat)}$ — $I_C$



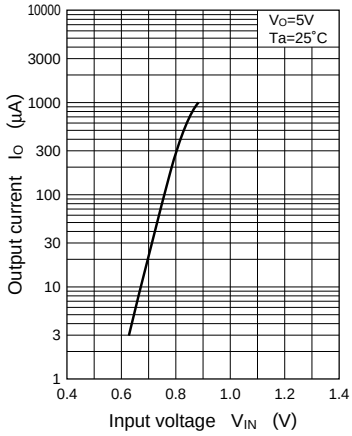

$h_{FE}$ — $I_C$



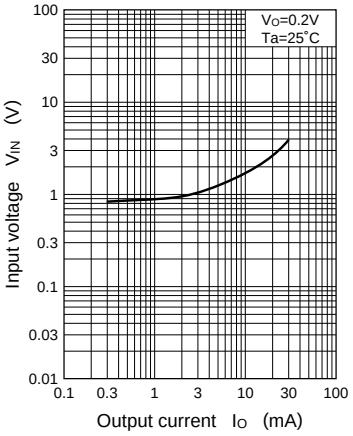

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

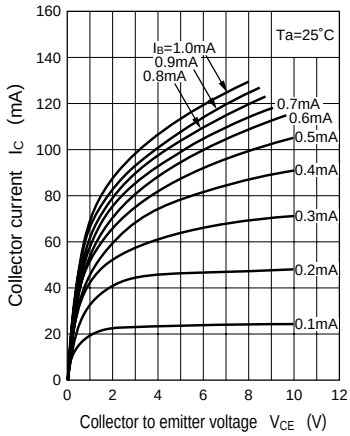



$V_{IN}$ — $I_O$

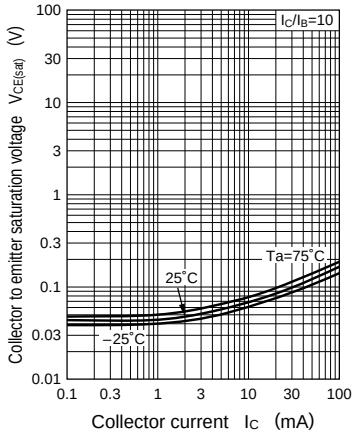


## Characteristics charts of UN4215

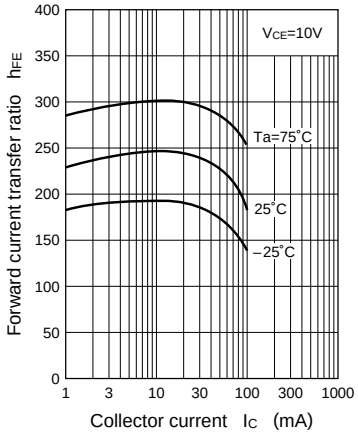
$I_C$ — $V_{CE}$



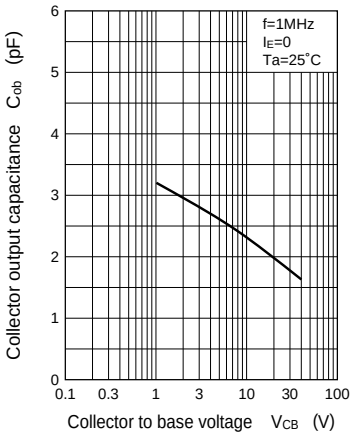

$V_{CE(sat)}$ — $I_C$



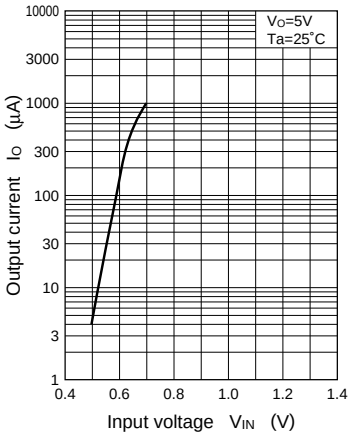

$h_{FE}$ — $I_C$



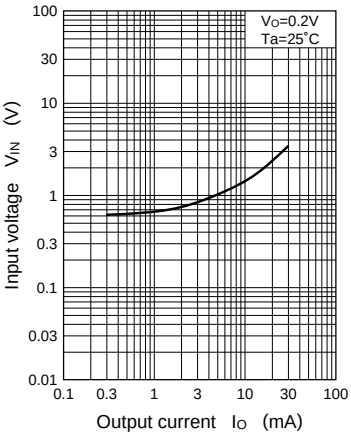

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

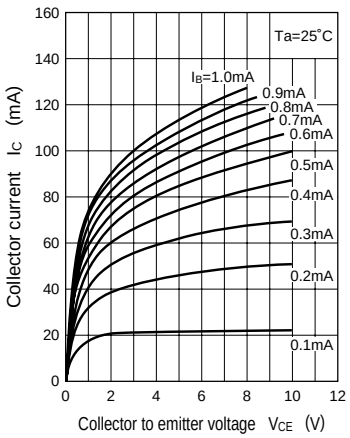



$V_{IN}$ — $I_O$

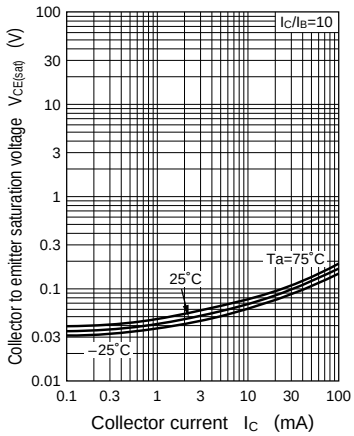



## Characteristics charts of UN4216

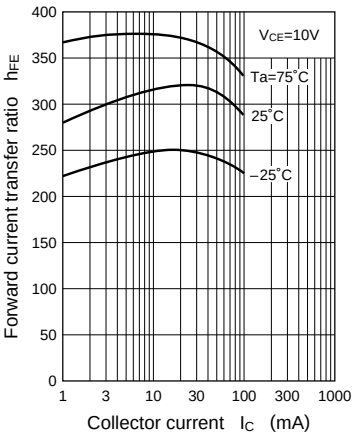
$I_C$ — $V_{CE}$



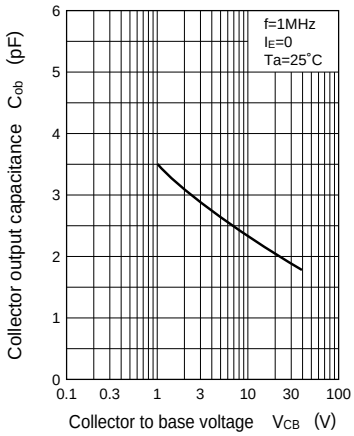

$V_{CE(sat)}$ — $I_C$



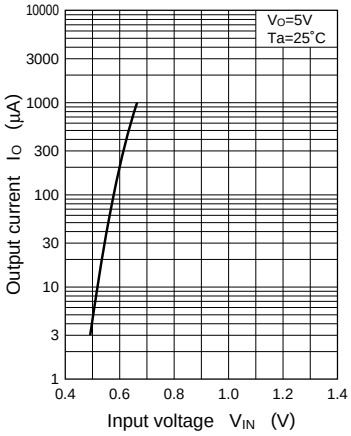

$h_{FE}$ — $I_C$



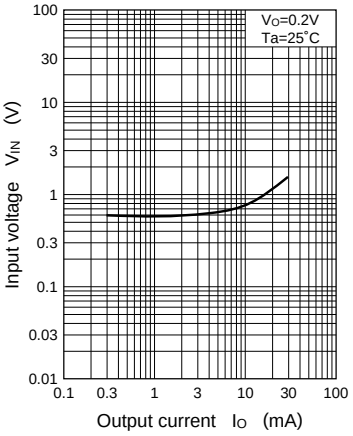
$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

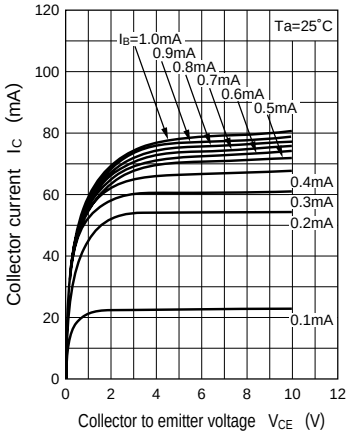



$V_{IN}$ — $I_O$

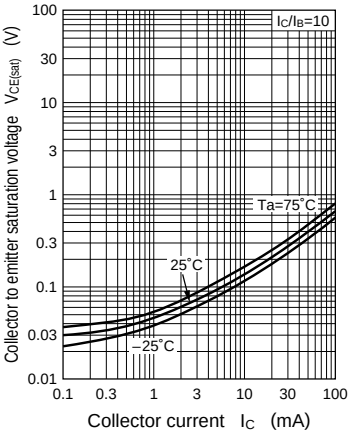



Characteristics charts of UN4217

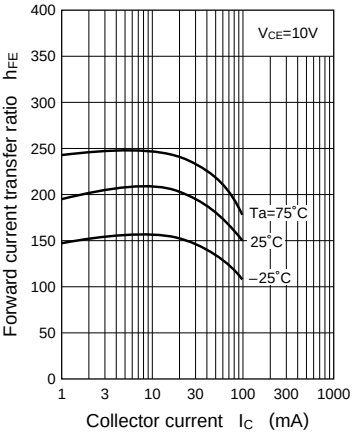
$I_C$ — $V_{CE}$



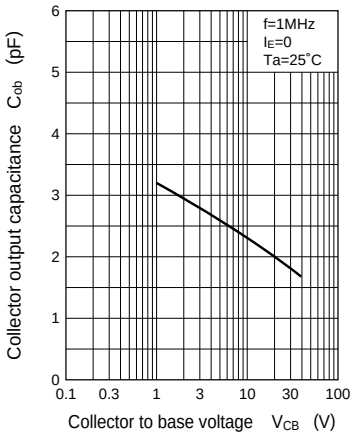

$V_{CE(sat)}$ — $I_C$



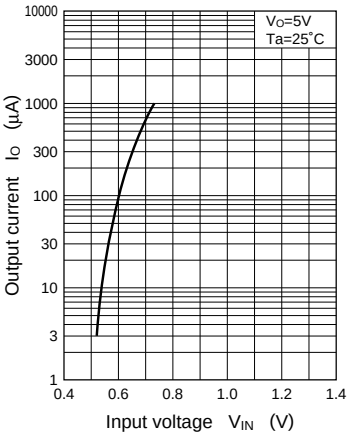

$h_{FE}$ — $I_C$



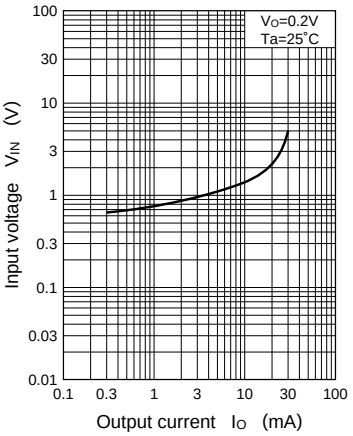

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

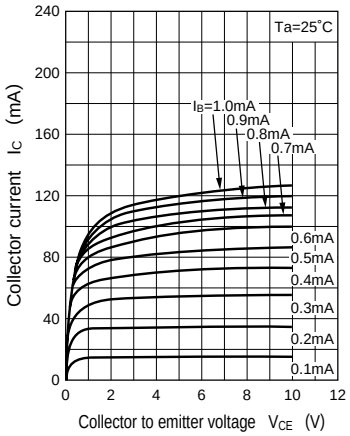



$V_{IN}$ — $I_O$

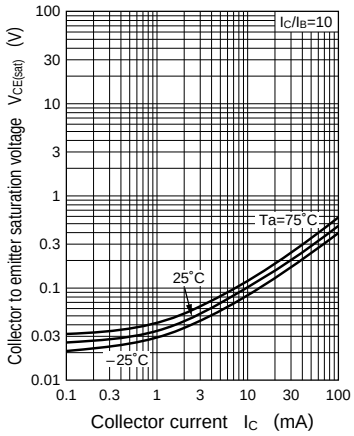


## Characteristics charts of UN4218

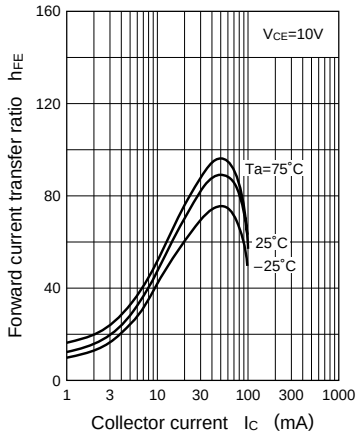
$I_C$ — $V_{CE}$



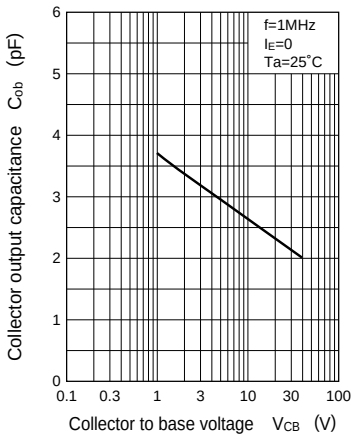

$V_{CE(sat)}$ — $I_C$



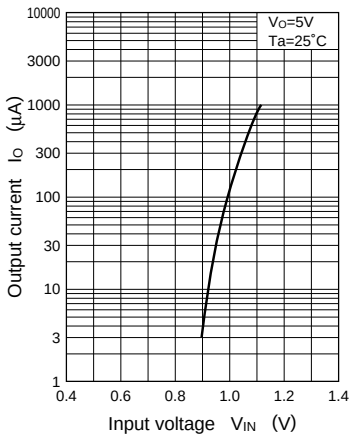

$h_{FE}$ — $I_C$



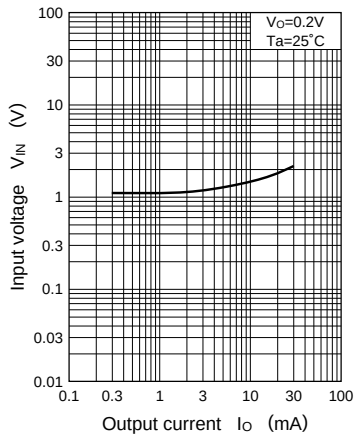

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

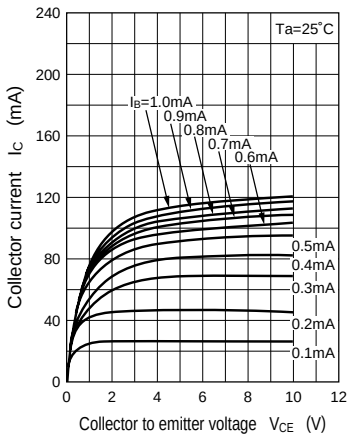



$V_{IN}$ — $I_O$

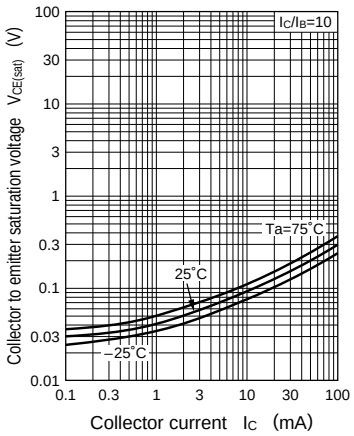



## Characteristics charts of UN4219

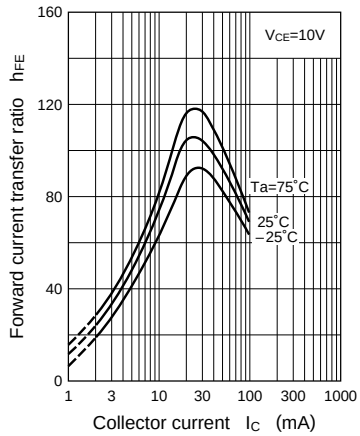
$I_C$ — $V_{CE}$



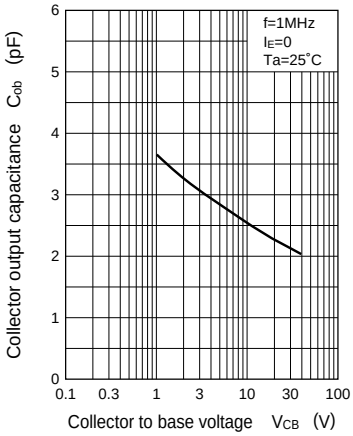

$V_{CE(sat)}$ — $I_C$



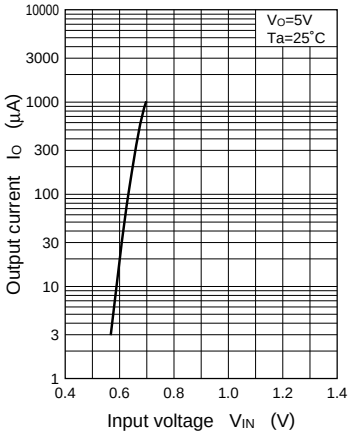

$h_{FE}$ — $I_C$



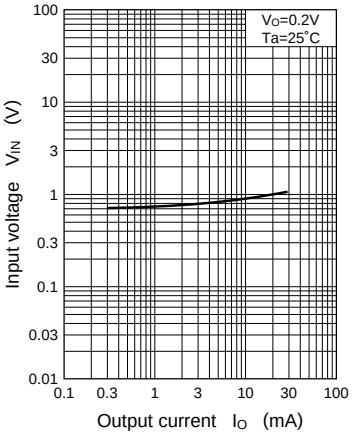
$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

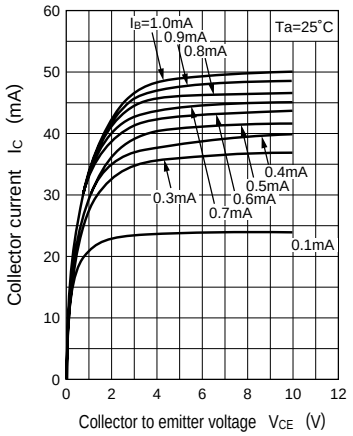



$V_{IN}$ — $I_O$

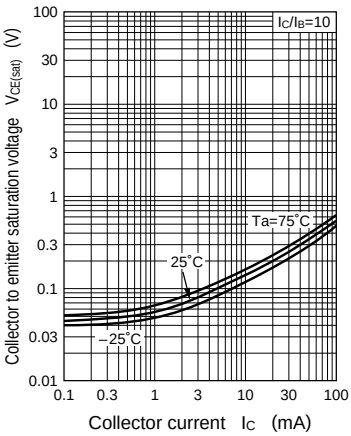



Characteristics charts of UN4210

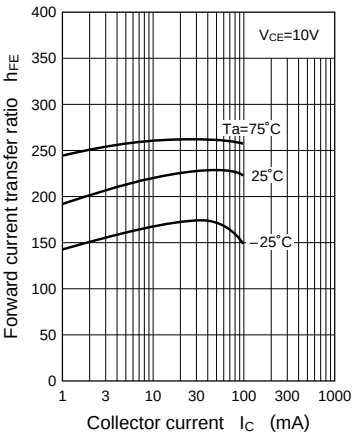
$I_C$ — $V_{CE}$



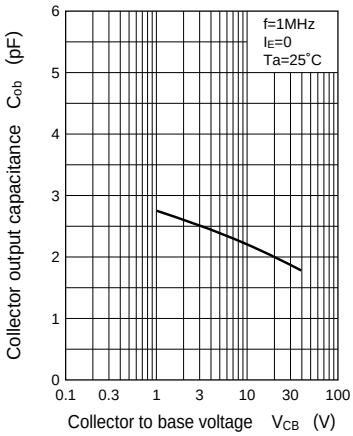

$V_{CE(sat)}$ — $I_C$



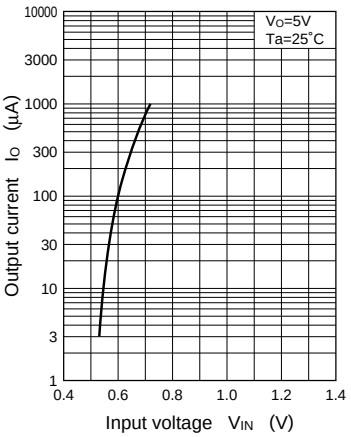

$h_{FE}$ — $I_C$



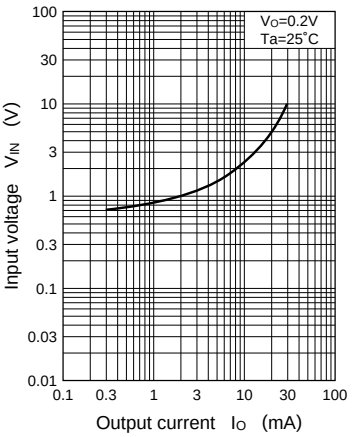

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

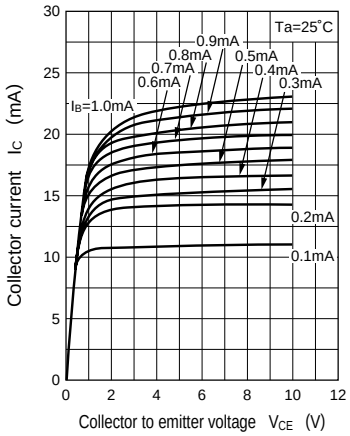



$V_{IN}$ — $I_O$

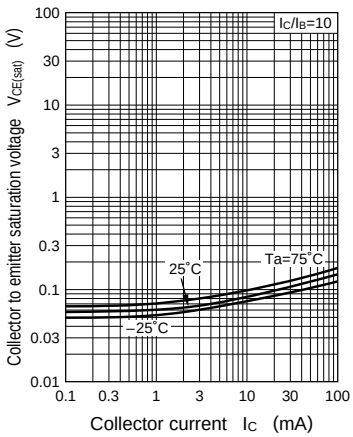


## Characteristics charts of UN421D

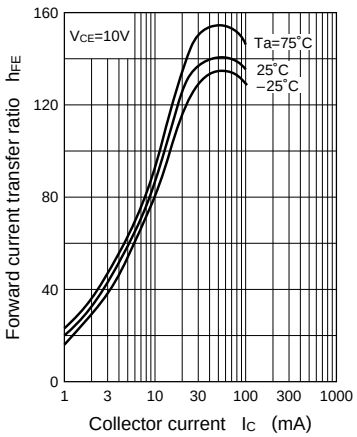
$I_C$ — $V_{CE}$



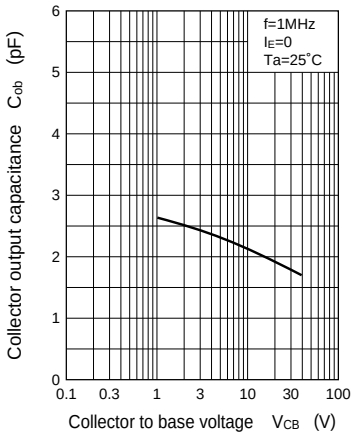

$V_{CE(sat)}$ — $I_C$



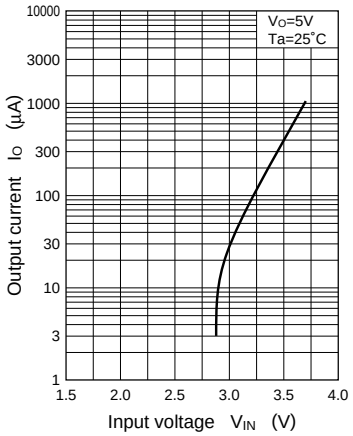

$h_{FE}$ — $I_C$



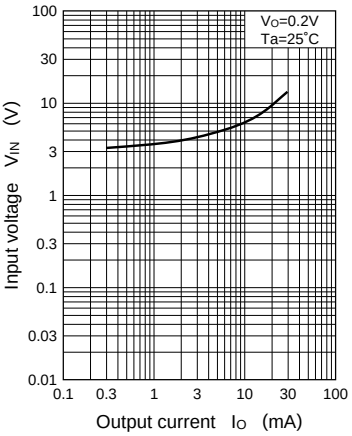

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

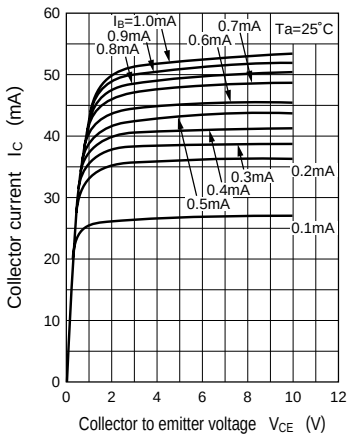



$V_{IN}$ — $I_O$

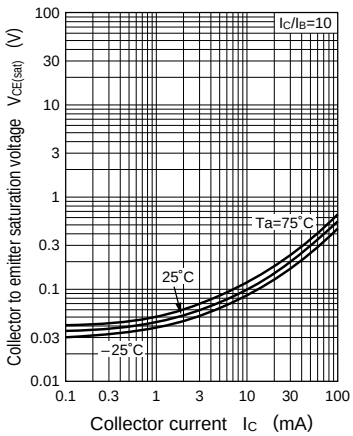



## Characteristics charts of UN421E

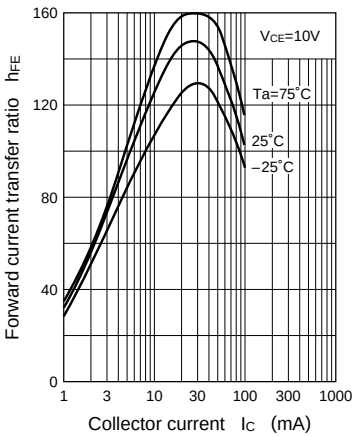
$I_C$ — $V_{CE}$



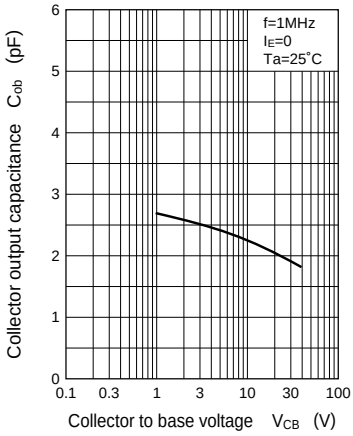

$V_{CE(sat)}$ — $I_C$



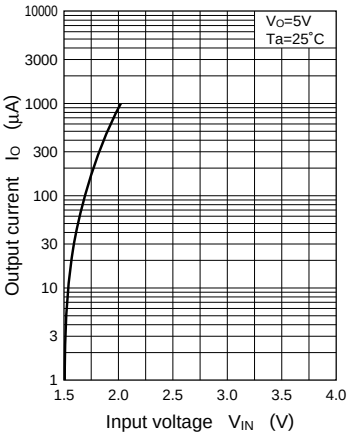

$h_{FE}$ — $I_C$



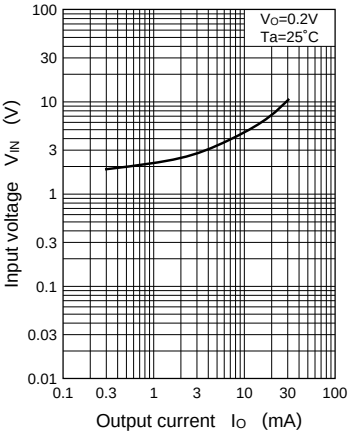
$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

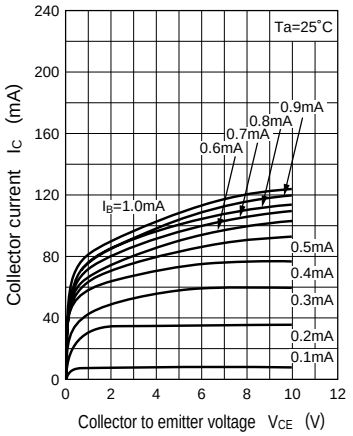



$V_{IN}$ — $I_O$

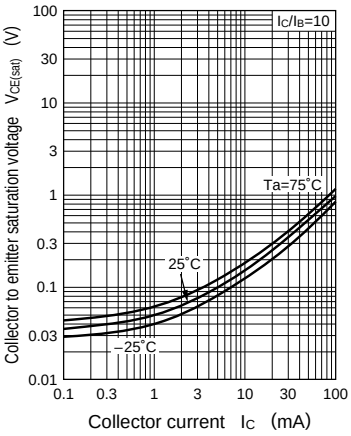



Characteristics charts of UN421F

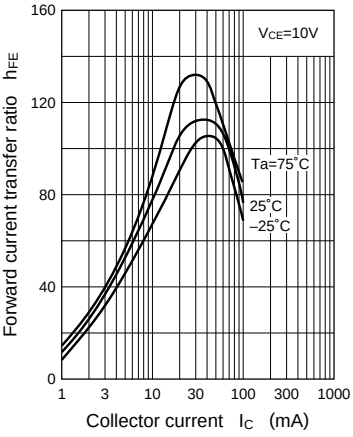
$I_C$ — $V_{CE}$



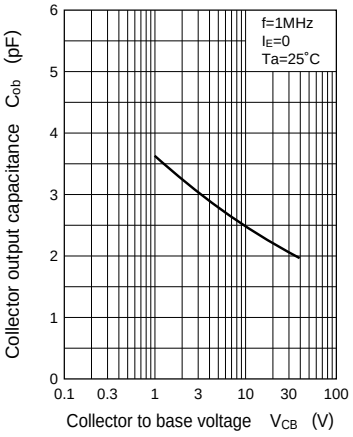

$V_{CE(sat)}$ — $I_C$



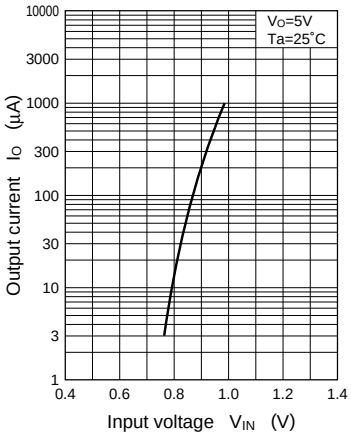

$h_{FE}$ — $I_C$



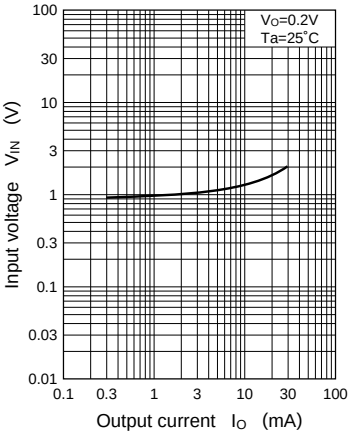

$C_{ob}$ — $V_{CB}$




$I_O$ — $V_{IN}$

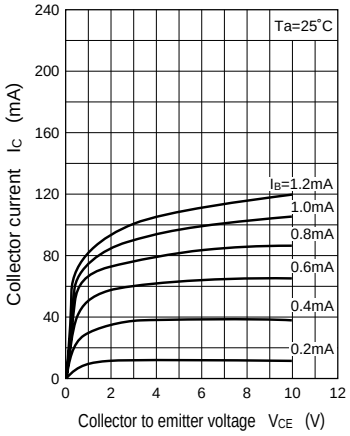



$V_{IN}$ — $I_O$

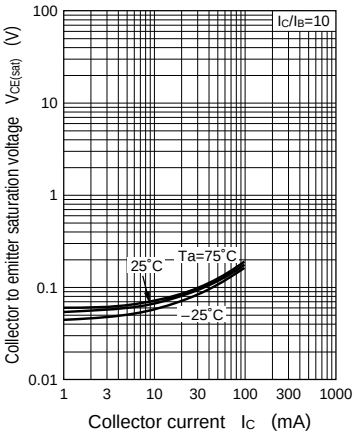


## Characteristics charts of UN421K

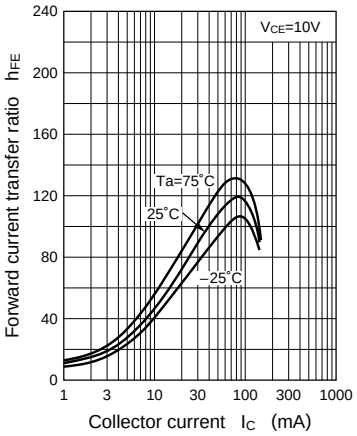
$I_C$ — $V_{CE}$



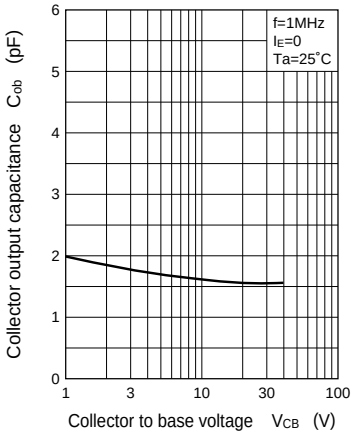

$V_{CE(sat)}$ — $I_C$



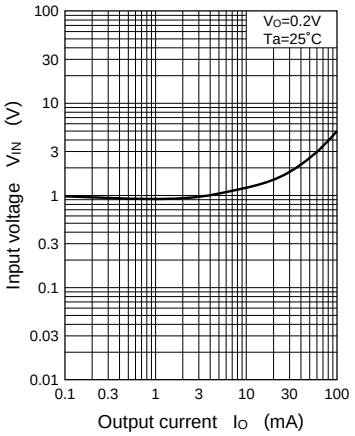

$h_{FE}$ — $I_C$




$C_{ob}$ — $V_{CB}$

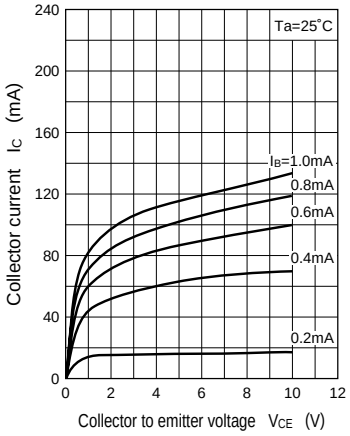



$V_{IN}$ — $I_O$

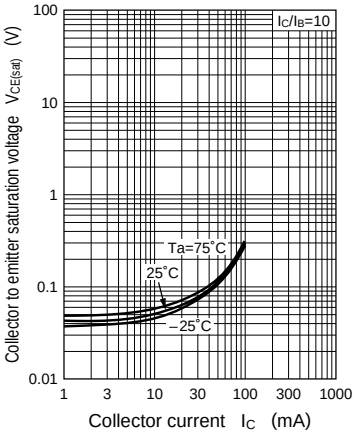



## Characteristics charts of UN421L

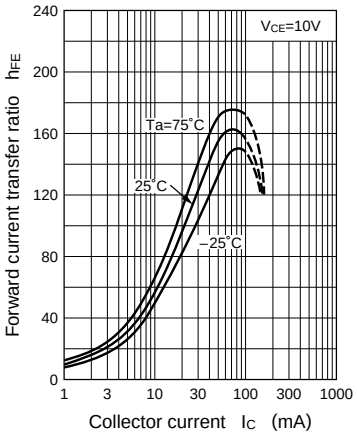
$I_C$ — $V_{CE}$



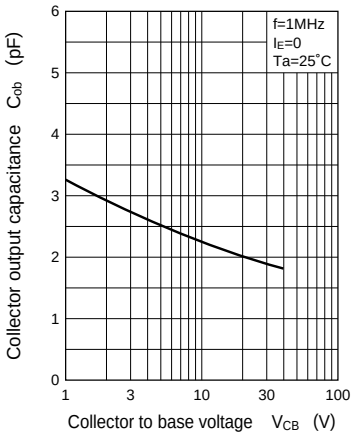

$V_{CE(sat)}$ — $I_C$




$h_{FE}$ — $I_C$



$C_{ob} — V_{CB}$




$I_O — V_{IN}$

