SHINDENGEN

CAT.No.E308

# 2SC407 thru 2SC412

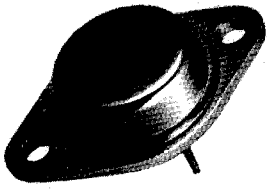
**Use**

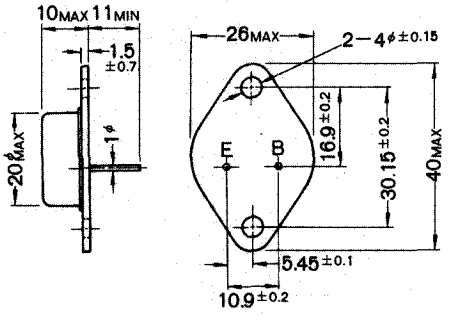
- For high-frequency power amplification
- For high-frequency power switching

**Construction**

- NPN triple diffusion type

SHINDENGEN'S silicon power transistors are all outside comparison in performance and really epoch-making to realize that even one piece of element is powerful enough to treat several kW of large power in the area of high-frequency wave.
It is expected that silicon power transistors will play an important part for the electronic equipment developing to find further utility and advantage in the future.






**Dimensions**

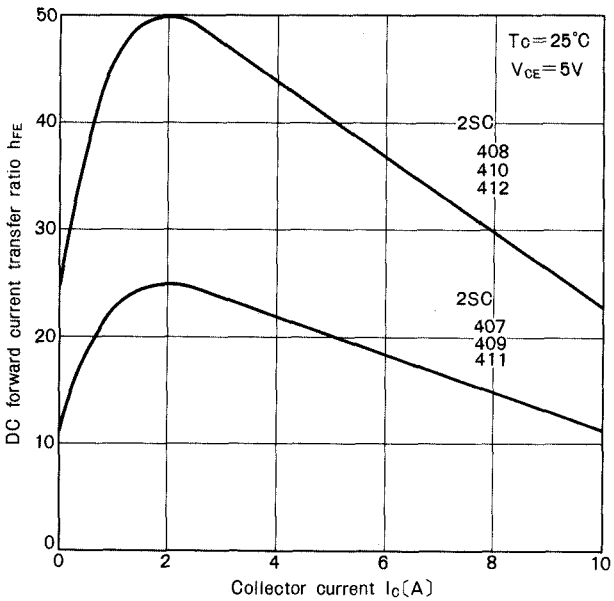
**Unit : mm**

**Ratings**

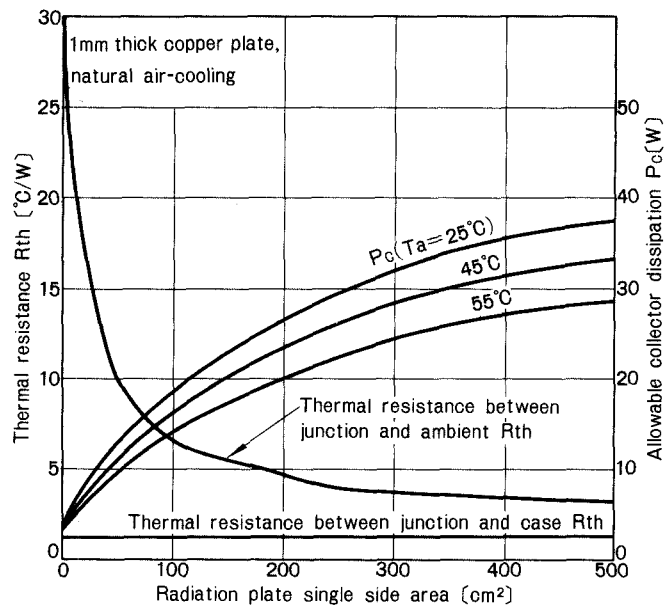
| Item | | Symbol | Unit | Conditions \ Type | 2SC 407 | 2SC 408 | 2SC 409 | 2SC 410 | 2SC 411 | 2SC 412 |
|---|---|---|---|---|---|---|---|---|---|---|
| Absolute maximum ratings | Storage temperature | Tstg | °C | | −55～+150 | | | | | |
| | Junction temperature | Tj | °C | | +150 | | | | | |
| | Emitter-base voltage | $V_{EBO}$ | V | | 4 | | | | | |
| | Collector-base voltage | $V_{CBO}$ | V | | 150 | 150 | 200 | 200 | 300 | 300 |
| | Collector-emitter voltage | $V_{CEO}$ | V | | 100 | 100 | 140 | 140 | 200 | 200 |
| | Collector current | $I_C$ | A | | 10 | | | | | |
| | Base current | $I_B$ | A | | 3 | | | | | |
| | Collector dissipation | $P_C$ | W | | 100 | | | | | |
| Electrical characteristic | Emitter cutoff current | $I_{EBO}$ | mA | At rated voltage | MAX | | 25 | | | |
| | Collector cutoff current | $I_{CBO}$ | mA | At rated voltage | MAX50 | 50 | 20 | 20 | 5 | 5 |
| | Collector cutoff current | $I_{CEO}$ | mA | At rated voltage | MAX50 | 50 | 30 | 30 | 10 | 10 |
| | DC forward current transfer ratio | $h_{FE}$ | | $V_{CE}$=5V, $I_C$=5A | MIN 10 | 20 | 10 | 20 | 10 | 20 |
| | | | | | STD 20 | 40 | 20 | 40 | 20 | 40 |
| | | | | | MAX30 | | 30 | | 30 | |
| | Collector-emitter saturation voltage | $V_{CE(SAT)}$ | V | $I_C$=5A, $I_B$=2A | STD | | 0.4 | | | |
| | | | | | MAX | | 1 | | | |
| | Base-emitter saturation voltage | $V_{BE(SAT)}$ | V | $I_C$=5A, $I_B$=2A | STD | | 1.2 | | | |
| | | | | | MAX | | 2 | | | |
| | Thermal resistance | Rth | °C/W | Between junction and case | 1.25 | | | | | |
| High-frequency characteristic | Cutoff frequency | $f_{\alpha e}$ | kHz | $V_{CE}$=10V, $I_C$=2A | STD | | 400 | | | |
| | Collector output capacitance | Cob | PF | $V_{CB}$=20V, $I_C$=0, f=1MHz | STD | | 300 | | | |
| | | | | | MAX | | 500 | | | |
| Pulse characteristic | Delay time | td | μS | $I_C$=5A | MAX | | 0.2 | | | |
| | Rise time | tr | μS | $R_L$=5Ω | MAX | | 1 | | | |
| | Storage time | ts | μS | $I_{B1}$=1A | MAX | | 4 | | | |
| | Fall time | tf | μS | $I_{B2}$=−1A | MAX | | 1 | | | |

Note : Case temperature Tc=25°C

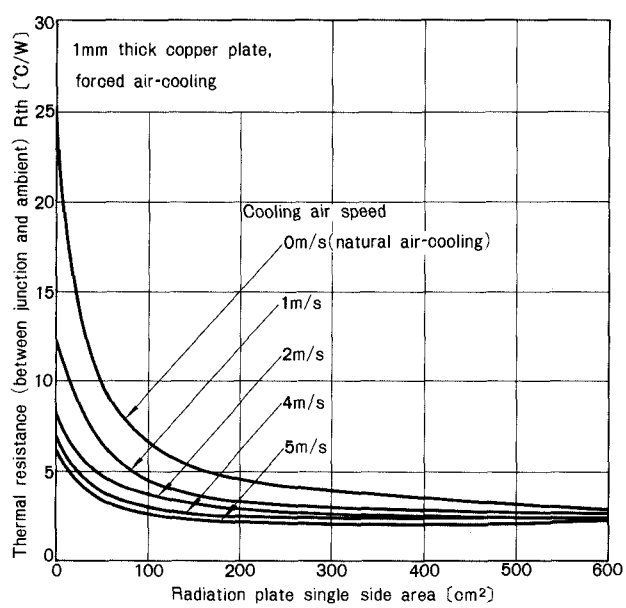
**Collector current——DC forward current transfer ratio**



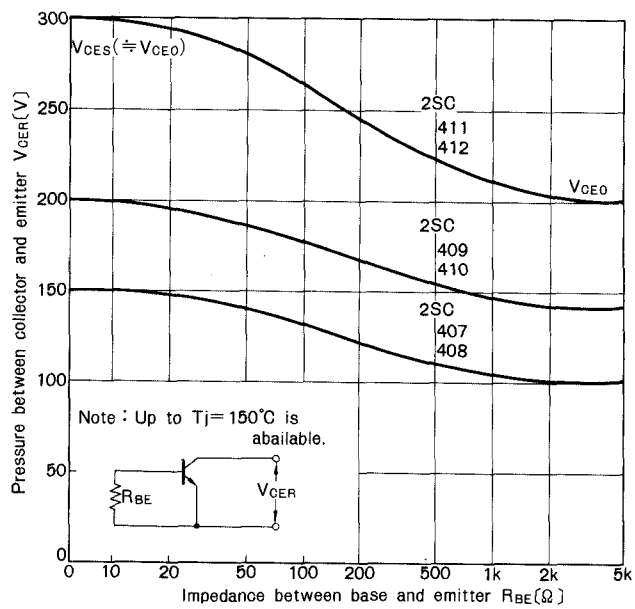

**Heat sink——thermal resistance and allowable collector dissipation**



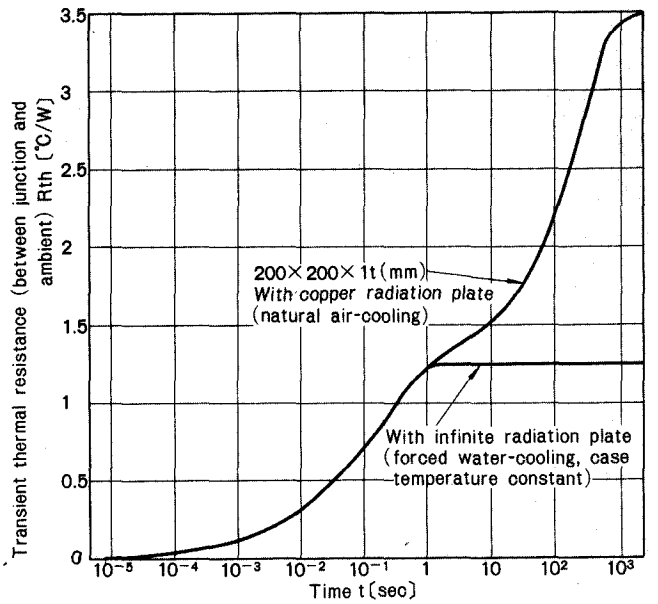

**Heat sink——forced air-cooling and thrmal resistance**



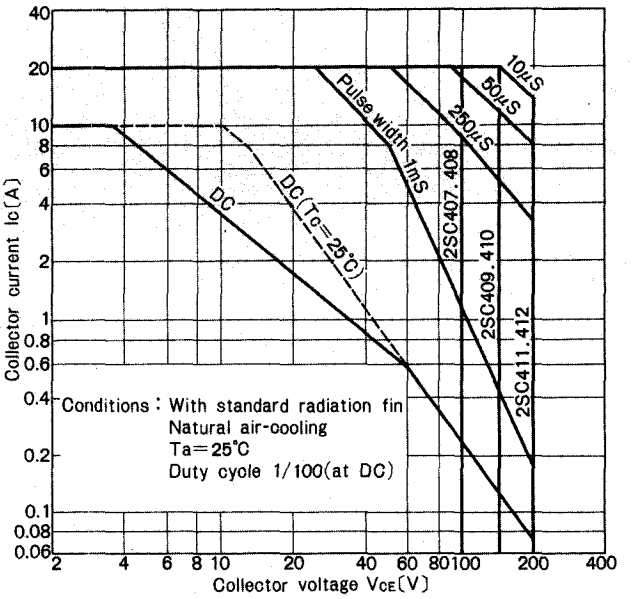

**Signal source impedance——collector and emitter voltage**



**Transient thermal resistance**




**Maximum safe operation areas**

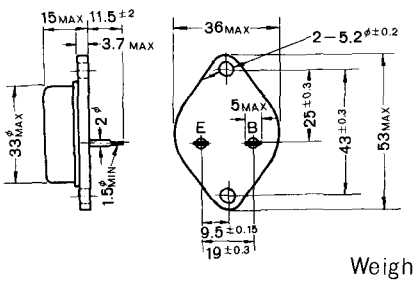


# POWER TRANSISTOR

| | Type | $P_C$ (W) | $I_C$ (A) | $I_B$ (A) | $V_{CBO}$ (V) | $V_{CEO}$ (V) | $V_{CES}$ (V) | $h_{FE}$ (STD) | $f_{ae}$ (kHz) | $T_j$ (°C) | Dimensions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Germanium transistor | 2SB205 | 80 | −20 | −3 | − 80 | — | −60 | 40 | 2.5 | 85 | Fig.26 (For low-frequency power amplification) |
| | 2SB206 | | −30 | | − 80 | | −60 | 100 | | | |
| | 2SB207 | | −20 | | −100 | | −75 | 40 | | | |
| | 2SB208 | | −30 | | −100 | | −75 | 100 | | | |
| | 2SB207A | | −20 | | −140 | | −85 | 40 | | | |
| | 2SB208A | | −30 | | −140 | | −85 | 100 | | | |
| | 2SB211 | 80 | −20 | −3 | − 80 | — | −60 | 40 | 2.5 | 85 | Fig.26 (For low-frequency power switching) |
| | 2SB212 | | −30 | | − 80 | | −60 | 100 | | | |
| | 2SB213 | | −20 | | −100 | | −75 | 40 | | | |
| | 2SB214 | | −30 | | −100 | | −75 | 100 | | | |
| | 2SB213A | | −20 | | −140 | | −85 | 40 | | | |
| | 2SB214A | | −30 | | −140 | | −85 | 100 | | | |
| Silicon transistor | 2SC407 | 100 | 10 | 3 | 150 | 100 | — | 20 | 400 | 150 | Fig.27 |
| | 2SC408 | | | | 150 | 100 | | 40 | | | |
| | 2SC409 | | | | 200 | 140 | | 20 | | | |
| | 2SC410 | | | | 200 | 140 | | 40 | | | |
| | 2SC411 | | | | 300 | 200 | | 20 | | | |
| | 2SC412 | | | | 300 | 200 | | 40 | | | |
| | 2SD206 | 150 | 10 | 4 | 50 | 30 | — | 20 | 18 | 150 | Fig.27 |
| | 2SD207 | | | | 100 | 60 | | | | | |
| | 2SD208 | | | | 150 | 90 | | | | | |
| | 2SC431 | 200 | 30 | 10 | 150 | 100 | — | 20 | 400 | 150 | Fig.28 |
| | 2SC432 | | | | 150 | 100 | | 40 | | | |
| | 2SC433 | | | | 200 | 140 | | 20 | | | |
| | 2SC434 | | | | 200 | 140 | | 40 | | | |
| | 2SC435 | | | | 300 | 200 | | 20 | | | |
| | 2SC436 | | | | 300 | 200 | | 40 | | | |
| High voltage silicon transistor | 2SC1466 | 30 | 3 | 1 | 450 | 360(sus) | — | 16 | $f_T$ 10 (MHz) | 150 | Fig.29 |
| | 2SC1467 | | | | 500 | 400(sus) | | 12 | | | |
| | 2SC1468 | 100 | 100 | 4 | 450 | 360(sus) | — | 16 | $f_T$ 10 (MHz) | 150 | Fig.27 |
| | 2SC1469 | | | | 500 | 400(sus) | | 12 | | | |
| | 2SC1470 | 200 | 200 | 10 | 450 | 360(sus) | — | 20 | $f_T$ 10 (MHz) | 150 | Fig.28 |
| | 2SC1471 | | | | 500 | 400(sus) | | 15 | | | |
| Darlington silicon transistor | 2SD384 | 30 | 7 | 0.5 | 80 | 80(sus) | — | 5000 | 20 | 150 | Fig.29 |
| | 2SD385 | | | | 100 | 100(sus) | | | | | |

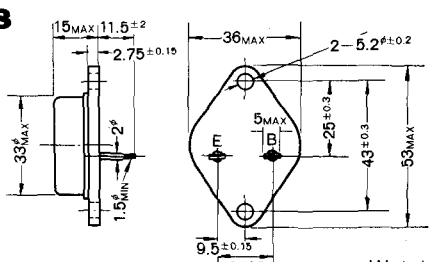
Unit : mm

**Fig.26**



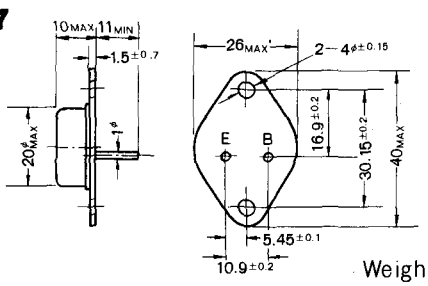

Weight: 44(g)

**Fig.28**



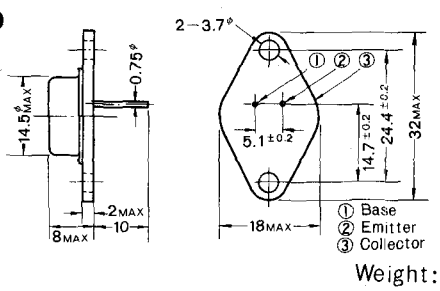

Weight: 44(g)

**Fig.27**




Weight: 17(g)

**Fig.29**




Weight: 6.3(g)