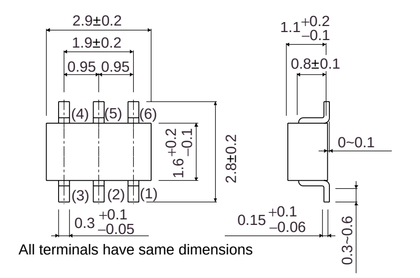
# General purpose transistor (isolated dual transistors)

## IMX9

### ●Features
1) Two 2SD2114K chips in a SMT package.
2) Mounting possible with SMT3 automatic mounting machine.
3) Transistor elements are independent, eliminating interference.
4) Mounting cost and area can be cut in half.

### ●External dimensions (Units : mm)




### ●Structure
Epitaxial planar type
NPN silicon transistor

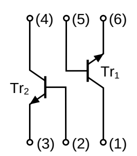
The following characteristics apply to both $Tr_1$ and $Tr_2$.

### ●Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 25 | V |
| Collector-emitter voltage | $V_{CEO}$ | 20 | V |
| Emitter-base voltage | $V_{EBO}$ | 12 | V |
| Collector current | $I_C$ | 500 | mA |
| Power dissipation | Pd | 300(TOTAL) | mW ∗ |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | −55~+150 | °C |

∗ 200mW per element must not be exceeded.

### ●Equivalent circuit




### ●Electrical characteristics (Ta = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | 25 | – | – | V | $I_C$=10µA |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | 20 | – | – | V | $I_C$=1mA |
| Emitter-base breakdown voltage | $BV_{EBO}$ | 12 | – | – | V | $I_E$=10µA |
| Collector cutoff current | $I_{CBO}$ | – | – | 0.5 | µA | $V_{CB}$=20V |
| Emitter cutoff current | $I_{EBO}$ | – | – | 0.5 | µA | $V_{EB}$=10V |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | – | 0.18 | 0.4 | V | $I_C/I_B$=500mA/20mA |
| DC current transfer ratio | $h_{FE}$ | 560 | – | 2700 | – | $V_{CE}$=3V, $I_C$=10mA |
| Transition frequency | $f_T$ | – | 350 | – | MHz | $V_{CE}$=10V, $I_E$=−50mA, f=100MHz |
| Output capacitance | Cob | – | 8 | – | pF | $V_{CB}$=10V, $I_E$=0A, f=1MHz |
| Output On-resistance | Ron | – | 0.8 | – | Ω | $I_B$=1mA, $V_i$=100mVrms, f=1kHz |

## ●Packaging specifications

| Part No. | Packaging type | Taping |
|---|---|---|
| | Code | T110 |
| | Basic ordering unit (pieces) | 3000 |
| IMX9 | | ○ |

## ●Electrical characteristic curves

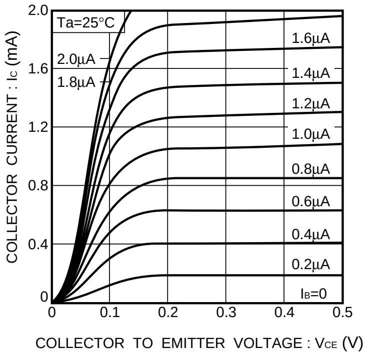



Fig.1 Grounded emitter output characteristics(I)

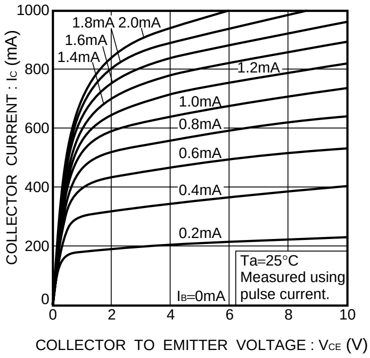



Fig.2 Grounded emitter output characteristics (II)

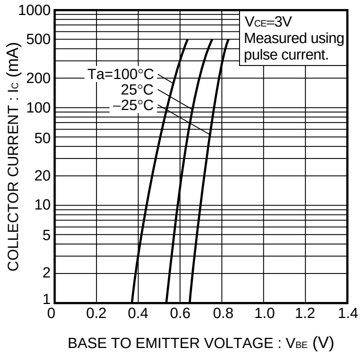



Fig.3 Grounded emitter propagation characteristics

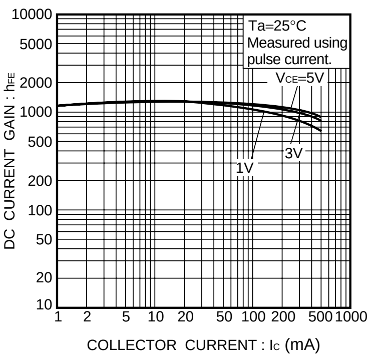



Fig.4 DC current gain vs. collector current (I)

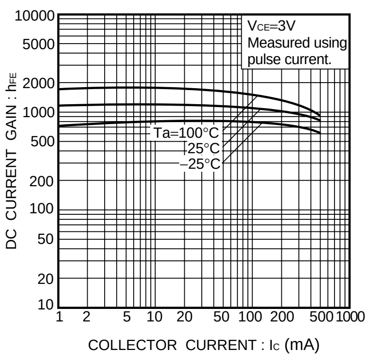



Fig.5 DC current gain vs. collector current (II)

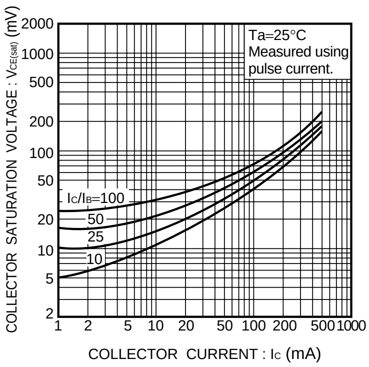



Fig.6 Collector-emitter saturation voltage vs. collector current (I)

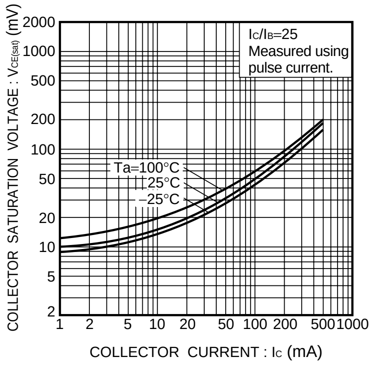



Fig.7 Collector-emitter saturation voltage vs. collector current (II)

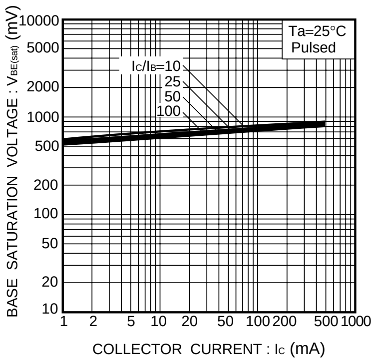



Fig.8 Base-emitter saturation voltage vs. collector current (I)

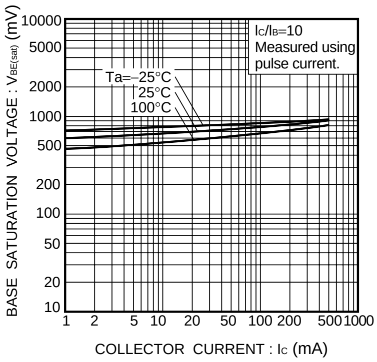



Fig.9 Base-emitter saturation voltage vs. collector current (II)

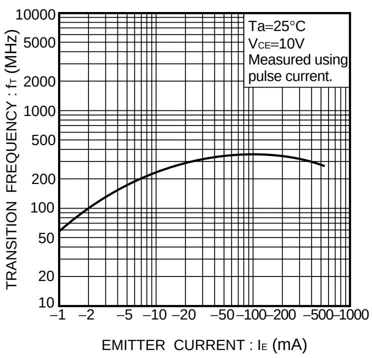



Fig.10 Gain bandwidth product vs. emitter current

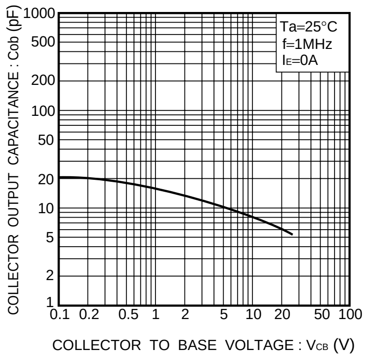



Fig.11 Collector output capacitance vs. collector-base voltage

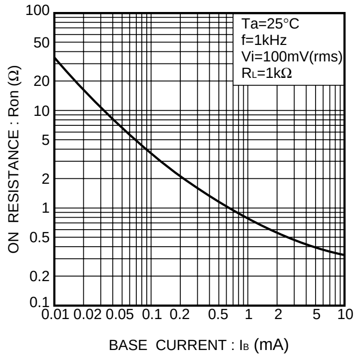
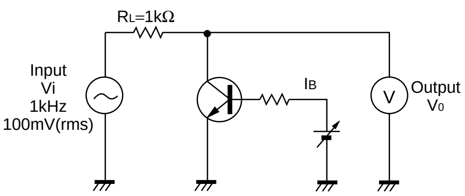



Fig.12 Output-on resistance vs. base current

**●Ron measurement circuit**




$$Ron = \frac{V_0}{V_i - V_0} \times R_L$$