

# High-current Gain Medium Power Transistor (20V, 0.5A)

## 2SD2114K

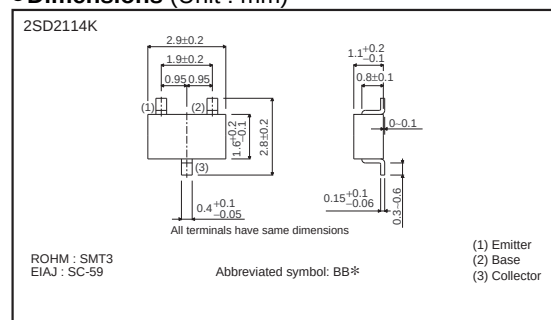
### ●Features

- 1) High DC current gain.  
 $h_{FE} = 1200$  (Typ.)
- 2) High emitter-base voltage.  
 $V_{EBO} = 12V$  (Min.)
- 3) LOW  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = 0.18V$  (Typ.)  
 $(I_C / I_B = 500mA / 20mA)$

### ●Structure

Epitaxial planar type  
 NPN silicon transistor

### ●Dimensions (Unit : mm)



### ●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           | $I_C$     | 0.5         | A(DC)      |
|                             |           | 1           | A(Pulse) * |
| Collector power dissipation | $P_C$     | 0.2         | W          |
| Junction temperature        | $T_j$     | 150         | °C         |
| Storage temperature         | $T_{stg}$ | -55 to +150 | °C         |

\* Single pulse  $P_w=100ms$

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

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit     | Conditions                        |
|--------------------------------------|---------------|------|------|------|----------|-----------------------------------|
| Collector-base breakdown voltage     | $BV_{CBO}$    | 25   | —    | —    | V        | $I_C=10\mu A$                     |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 20   | —    | —    | V        | $I_C=1mA$                         |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 12   | —    | —    | V        | $I_E=10\mu A$                     |
| Collector cutoff current             | $I_{CBO}$     | —    | —    | 0.5  | $\mu A$  | $V_{CB}=20V$                      |
| Emitter cutoff current               | $I_{EBO}$     | —    | —    | 0.5  | $\mu A$  | $V_{EB}=10V$                      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —    | 0.18 | 0.4  | V        | $I_C/I_B=500mA/20mA$              |
| DC current transfer ratio            | $h_{FE}$      | 820  | —    | 2700 | —        | $V_{CE}=3V, I_C=10mA$             |
| Transition frequency                 | $f_T^*$       | —    | 350  | —    | MHz      | $V_{CE}=10V, I_E=-50mA, f=100MHz$ |
| Output capacitance                   | $C_{ob}$      | —    | 8.0  | —    | pF       | $V_{CB}=10V, I_E=0A, f=1MHz$      |
| Output On-resistance                 | $R_{on}$      | —    | 0.8  | —    | $\Omega$ | $I_B=1mA, V_i=100mV(rms), f=1kHz$ |

\* Measured using pulse current

●Packaging specifications and  $h_{FE}$ 

|          |          |                              |        |
|----------|----------|------------------------------|--------|
| Type     | $h_{FE}$ | Package                      | Taping |
|          |          | Code                         | T146   |
|          |          | Basic ordering unit (pieces) | 3000   |
| 2SD2114K | VW       |                              | ○      |

$h_{FE}$  values are classified as follows :

| Item     | V           | W            |
|----------|-------------|--------------|
| $h_{FE}$ | 820 to 1800 | 1200 to 2700 |

## ●Electrical characteristic curves

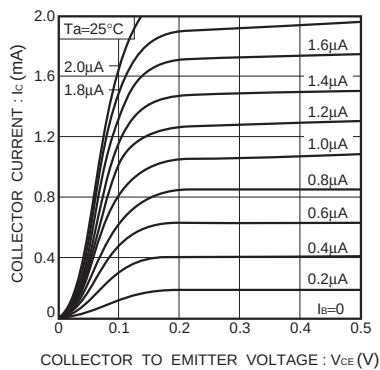


Fig.1 Grounded emitter output characteristics (I)

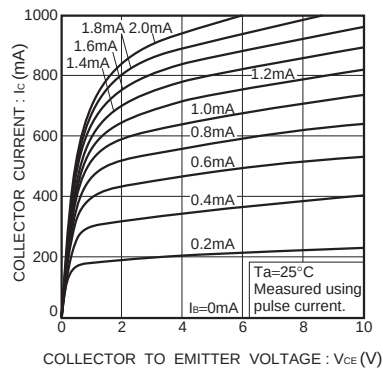


Fig.2 Grounded emitter output characteristics (II)

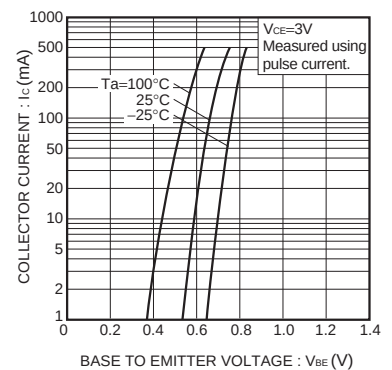


Fig.3 Grounded emitter propagation characteristics

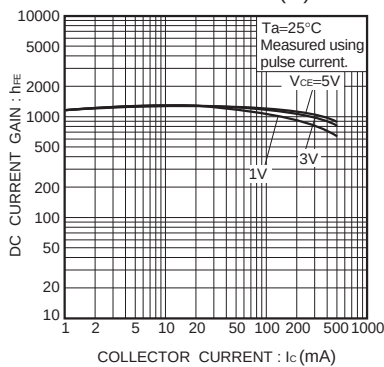


Fig.4 DC current gain vs. collector current (I)

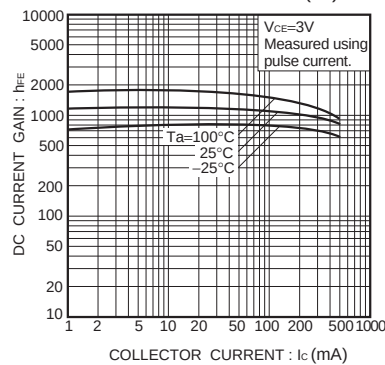


Fig.5 DC current gain vs. collector current (II)

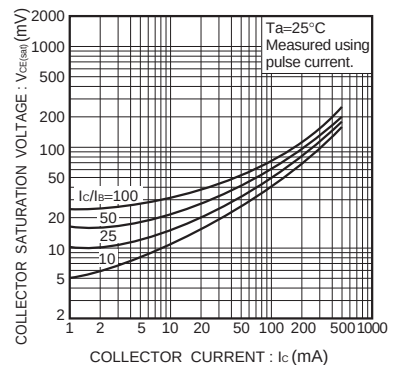


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

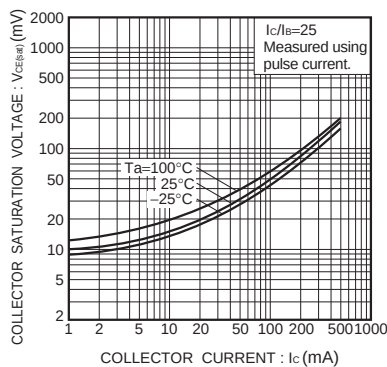


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

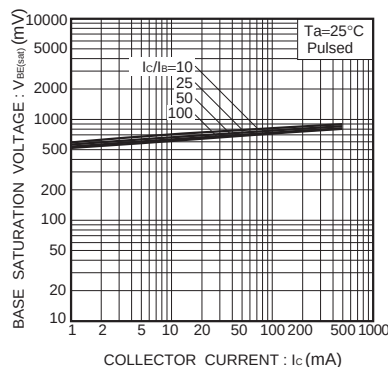


Fig.8 Base-emitter saturation voltage vs. collector current (I)

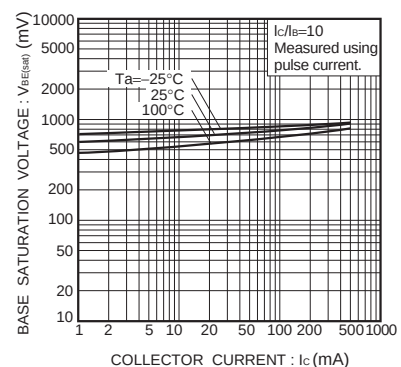
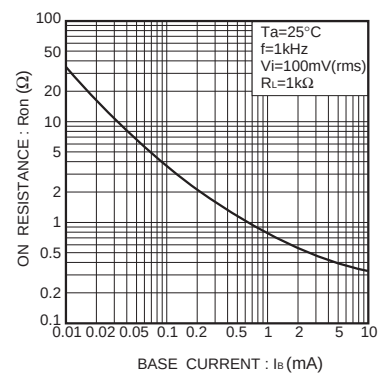
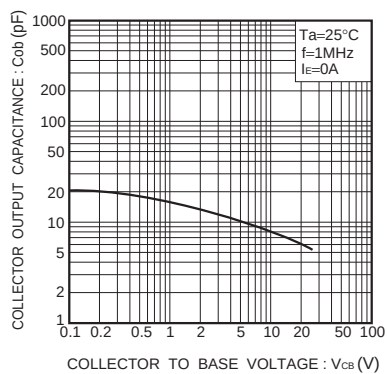
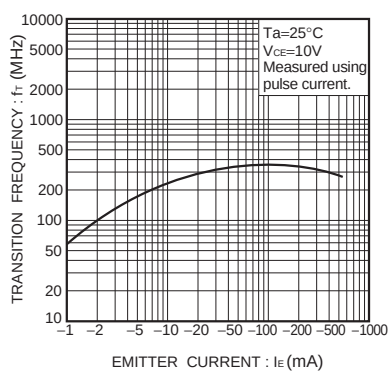
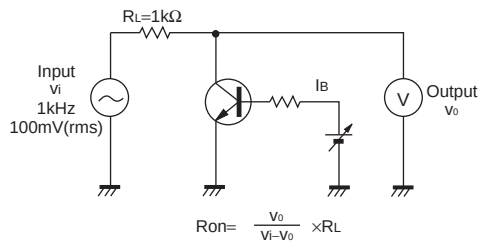


Fig.9 Base-emitter saturation voltage vs. collector current (II)



#### ●Ron measurement circuit



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