

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

## 2SD2114K

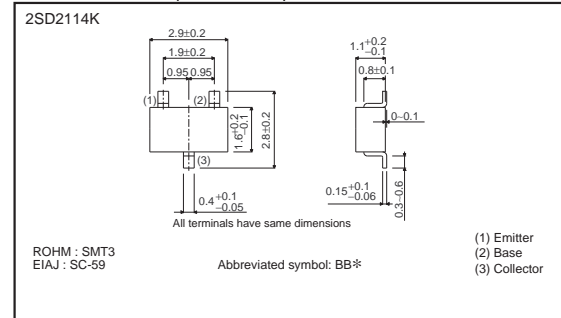
### ●Features

- 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 hFE

Type	h <sub>FE</sub>	Package	Taping
		Code	T146
		Basic ordering unit (pieces)	3000
2SD2114K	VW		○

h<sub>FE</sub> values are classified as follows :

Item	V	W
h <sub>FE</sub>	820 to 1800	1200 to 2700

●Electrical characteristic curves

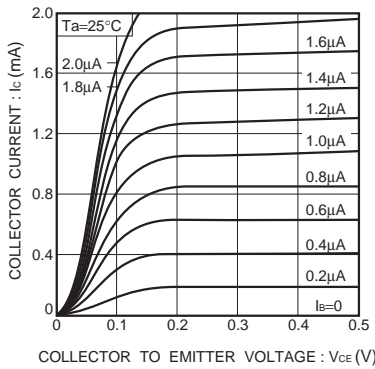


Fig.1 Grounded emitter output characteristics ( I )

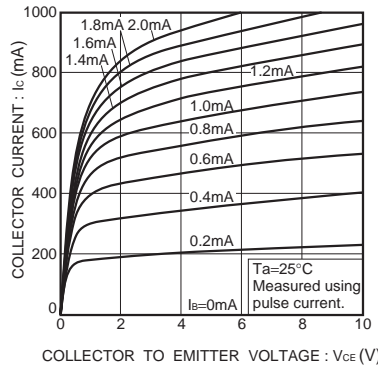


Fig.2 Grounded emitter output characteristics ( II )

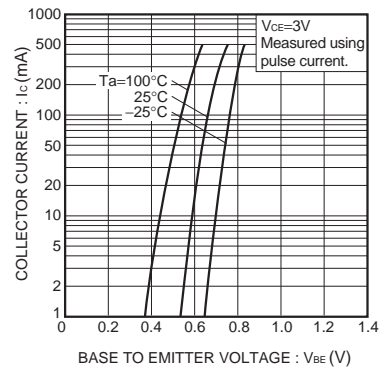


Fig.3 Grounded emitter propagation characteristics

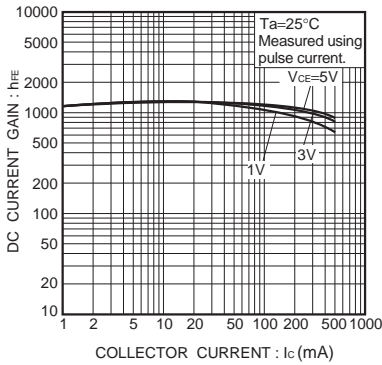


Fig.4 DC current gain vs. collector current ( I )

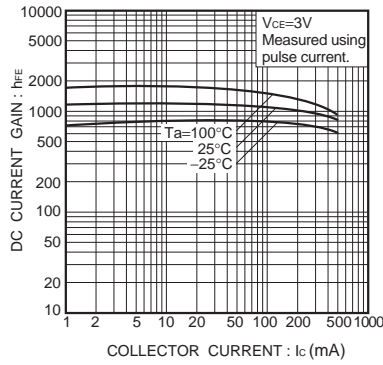


Fig.5 DC current gain vs. collector current ( II )

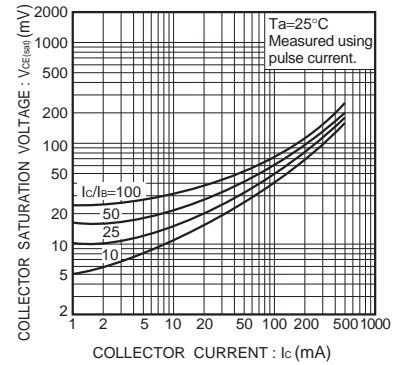


Fig.6 Collector-emitter saturation voltage vs. collector current ( I )

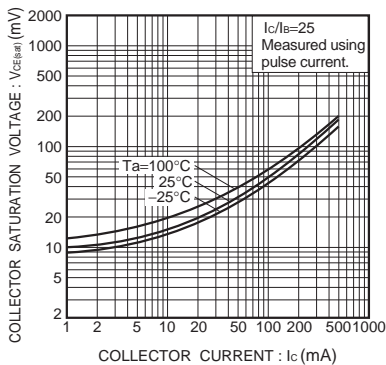


Fig.7 Collector-emitter saturation voltage vs. collector current ( II )

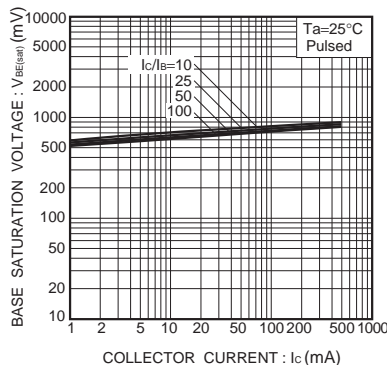


Fig.8 Base-emitter saturation voltage vs. collector current ( I )

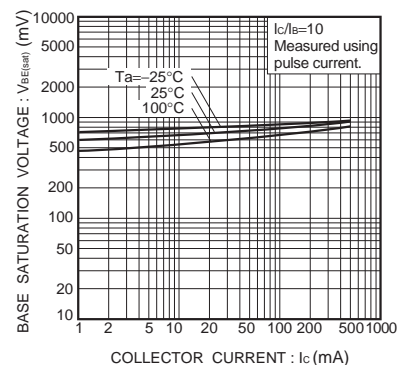


Fig.9 Base-emitter saturation voltage vs. collector current ( II )

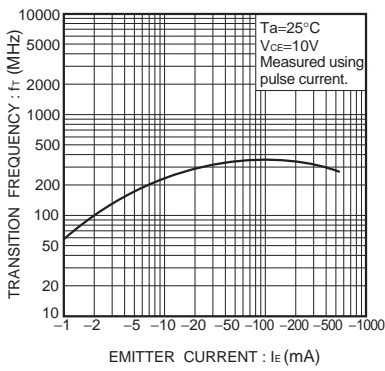


Fig.10 Gain bandwidth product vs. emitter current

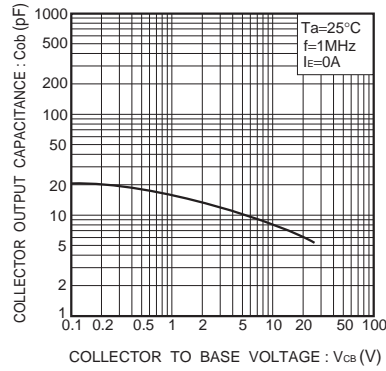


Fig.11 Collector output capacitance vs. collector-base voltage

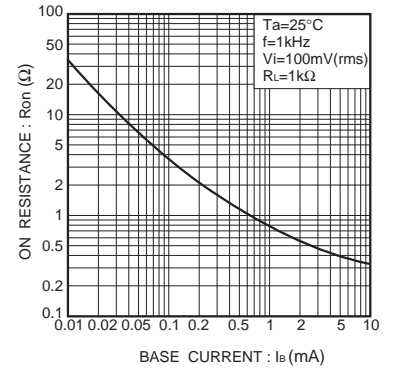
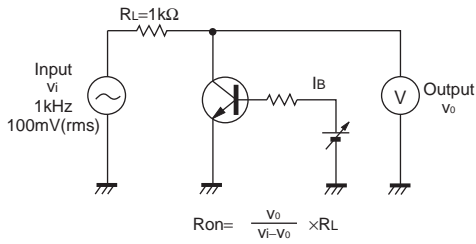


Fig.12 Output-on resistance vs. base current

● Ron measurement circuit



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