

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

## 2SD2114K / 2SD2144S

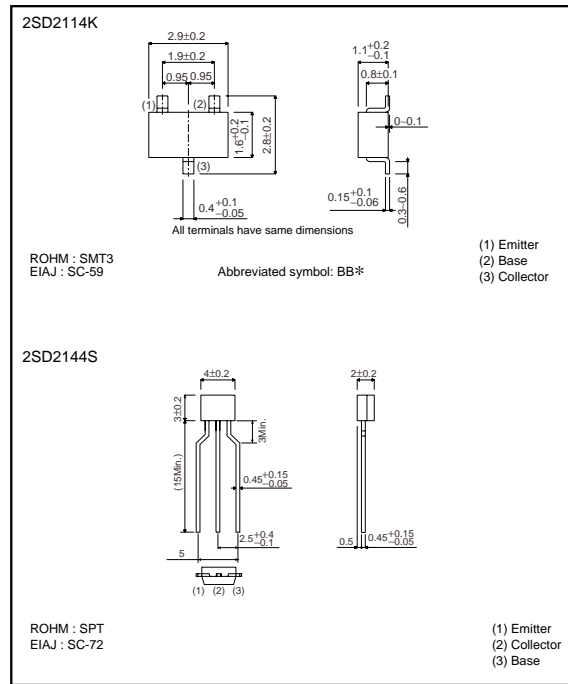
●Features

- 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

●External dimensions (Units : mm)



\* Denotes  $h_{FE}$

●Absolute maximum ratings ( $T_a=25^{\circ}C$ )

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
		0.3	
Junction temperature	$T_j$	150	$^{\circ}C$
Storage temperature	$T_{stg}$	-55-+150	$^{\circ}C$

\* Single pulse  $P_w=100ms$

Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
Collector-base breakdown voltage	BV <sub>CB0</sub>	25	–	–	V	I <sub>C</sub> =10μA	
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	20	–	–	V	I <sub>C</sub> =1mA	
Emitter-base breakdown voltage	BV <sub>EBO</sub>	12	–	–	V	I <sub>E</sub> =10μA	
Collector cutoff current	I <sub>CBO</sub>	–	–	0.5	μA	V <sub>CB</sub> =20V	
Emitter cutoff current	I <sub>EBO</sub>	–	–	0.5	μA	V <sub>EB</sub> =10V	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	0.18	0.4	V	I <sub>C</sub> /I <sub>B</sub> =500mA/20mA	
DC current transfer ratio	2SD2114K	h <sub>FE</sub>	820	–	2700	–	V <sub>CE</sub> =3V, I <sub>C</sub> =10mA
	2SD2144S	h <sub>FE</sub>	560	–	2700	–	
Transition frequency	f <sub>T</sub> *	–	350	–	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =–50mA, f=100MHz	
Output capacitance	C <sub>ob</sub>	–	8.0	–	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz	
Output On-resistance	R <sub>on</sub>	–	0.8	–	pF	I <sub>B</sub> =1mA, V <sub>I</sub> =100mV(rms), f=1kHz	

\* Measured using pulse current

●Packaging specifications and h<sub>FE</sub>

Type	h <sub>FE</sub>	Package	Taping	
		Code	T146	TP
		Basic ordering unit (pieces)	3000	5000
2SD2114K	VW	○	–	–
2SD2144S	UVW	–	–	○

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

Item	U	V	W
h <sub>FE</sub>	560~1200	820~1800	1200~2700

●Electrical characteristic curves

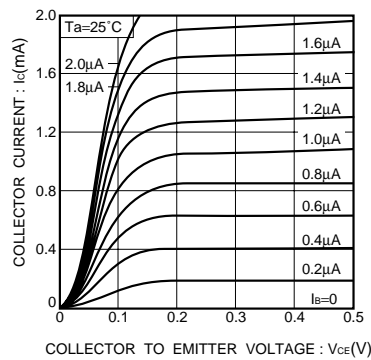


Fig.1 Grounded emitter output characteristics(I)

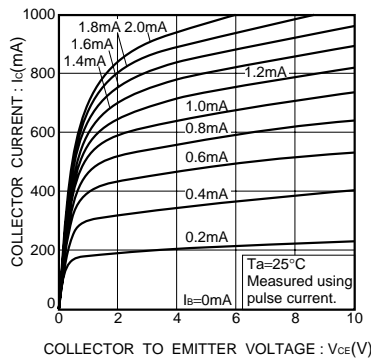


Fig.2 Grounded emitter output characteristics(II)

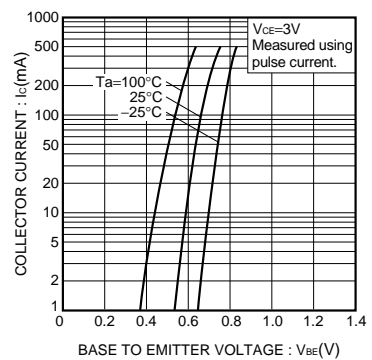


Fig.3 Grounded emitter propagation characteristics

Transistors

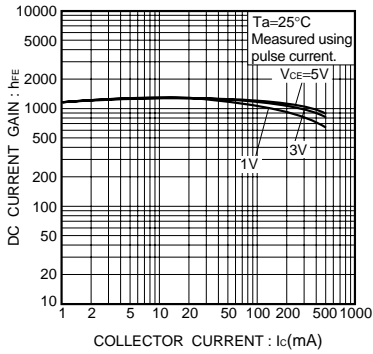


Fig.4 DC current gain vs. collector current(I)

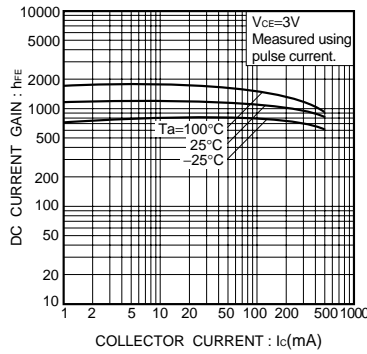


Fig.5 DC current gain vs. collector current(II)

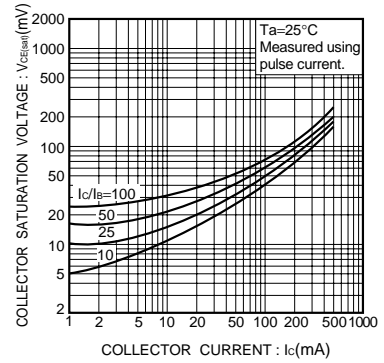


Fig.6 Collector-emitter saturation voltage vs. collector current(I)

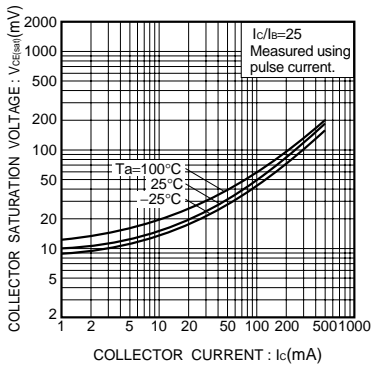


Fig.7 Collector-emitter saturation voltage vs. collector current(II)

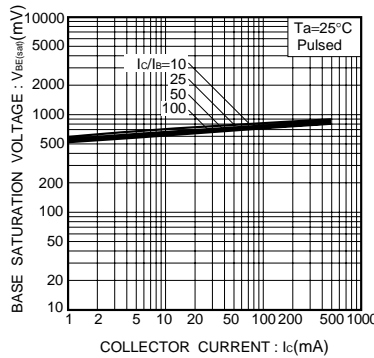


Fig.8 Base-emitter saturation voltage vs. collector current(I)

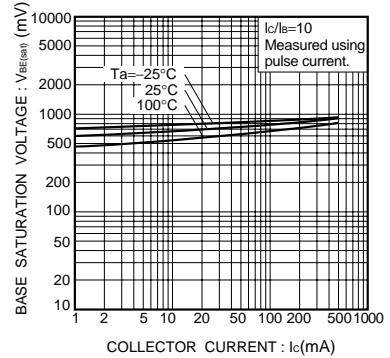


Fig.9 Base-emitter saturation voltage vs. collector current(II)

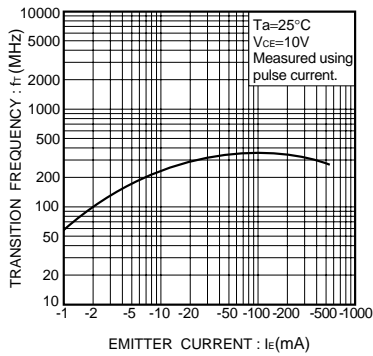


Fig.10 Gain bandwidth product vs. emitter current

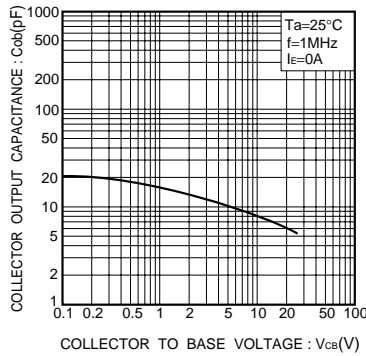


Fig.11 Collector output capacitance vs. collector-base voltage

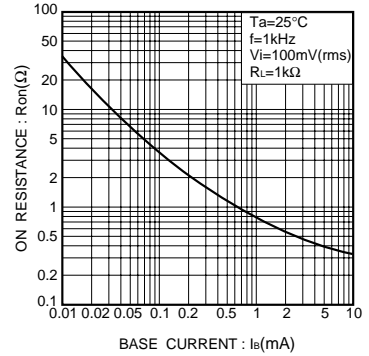


Fig.12 Output-on resistance vs. base current

## Transistors

---

### ● Ron measurement circuit

