

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

## 2SD2114K / 2SD2144S

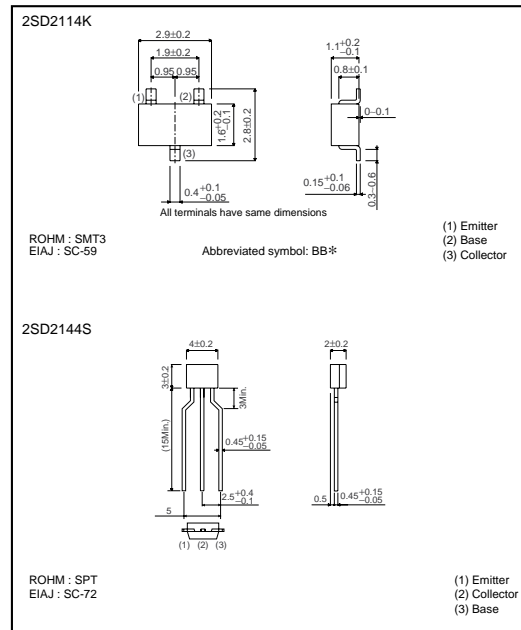
●Features

- 1) High DC current gain.  
h<sub>FE</sub> = 1200 (Typ.)
- 2) High emitter-base voltage.  
V<sub>EBO</sub> = 12V (Min.)
- 3) Low V<sub>CE</sub> (sat).  
V<sub>CE</sub> (sat) = 0.18V (Typ.)  
(I<sub>c</sub> / I<sub>B</sub> = 500mA / 20mA)

●Structure

Epitaxial planar type  
NPN silicon transistor

●External dimensions (Unit : mm)



\* Denotes h<sub>FE</sub>

●Absolute maximum ratings (T<sub>a</sub>=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	25	V
Collector-emitter voltage	V <sub>CE0</sub>	20	V
Emitter-base voltage	V <sub>EBO</sub>	12	V
Collector current	I <sub>c</sub>	0.5	A(DC)
		1	A(Pulse) *
Collector power dissipation	2SD2114K	P <sub>c</sub>	0.2
	2SD2144S		0.3
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\* Single pulse P<sub>w</sub>=100ms

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●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>CE0</sub>	20	-	-	V	I <sub>c</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EB0</sub>	12	-	-	V	I <sub>E</sub> =10μA
Collector cutoff current	I <sub>CB0</sub>	-	-	0.5	μA	V <sub>CB</sub> =20V
Emitter cutoff current	I <sub>EB0</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	h <sub>FE</sub>	820	-	2700	-	V <sub>CE</sub> =3V, I <sub>c</sub> =10mA
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	-	Ω	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	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

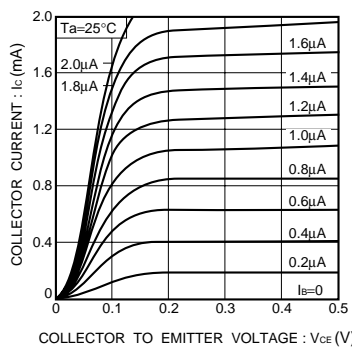


Fig.1 Grounded emitter output characteristics ( I )

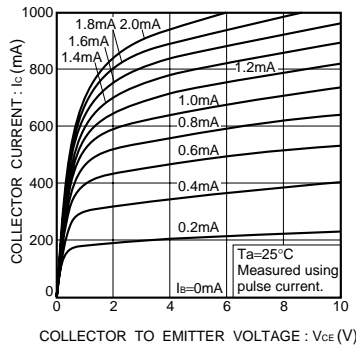


Fig.2 Grounded emitter output characteristics ( II )

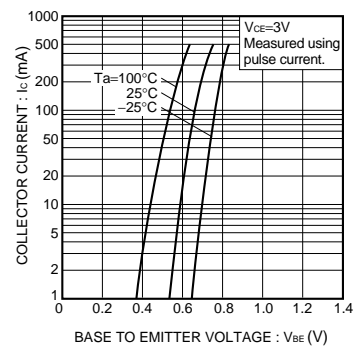


Fig.3 Grounded emitter propagation characteristics

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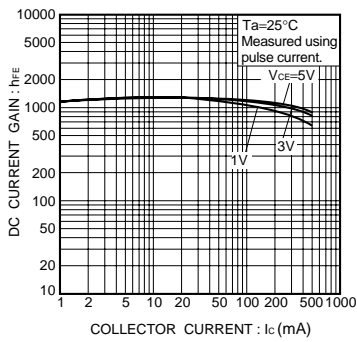


Fig.4 DC current gain vs. collector current (I)

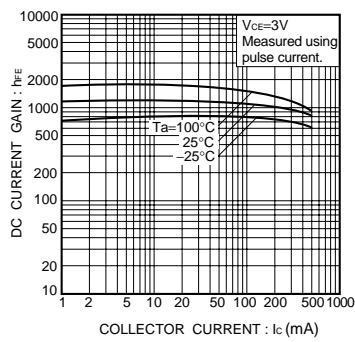


Fig.5 DC current gain vs. collector current (II)

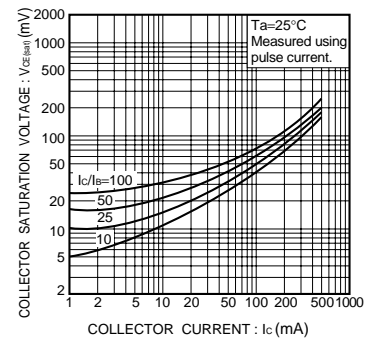


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

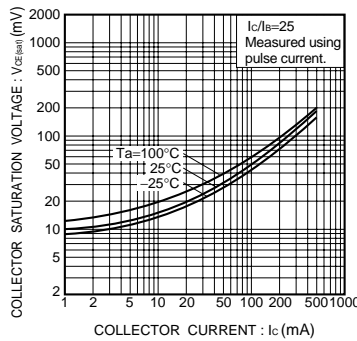


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

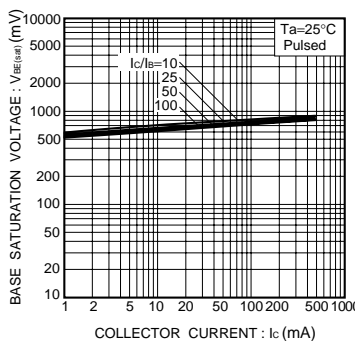


Fig.8 Base-emitter saturation voltage vs. collector current (I)

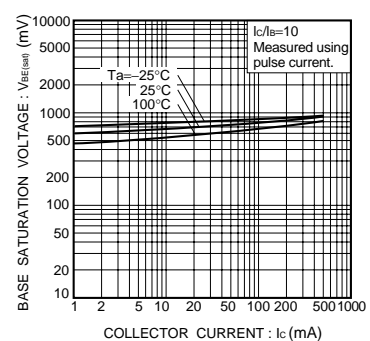


Fig.9 Base-emitter saturation voltage vs. collector current (II)

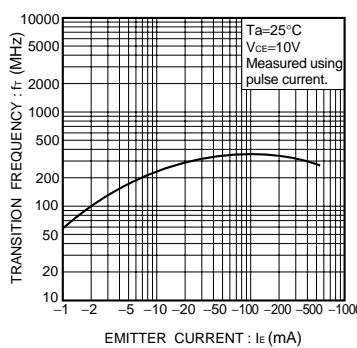


Fig.10 Gain bandwidth product vs. emitter current

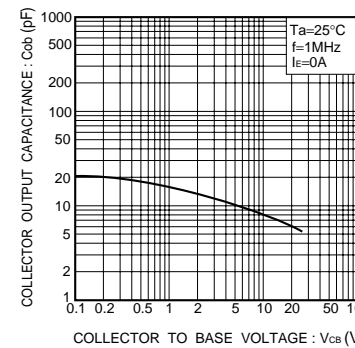


Fig.11 Collector output capacitance vs. collector-base voltage

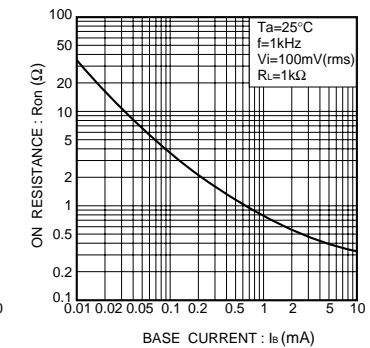
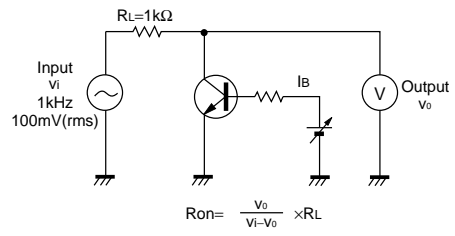


Fig.12 Output-on resistance vs. base current

## Transistors

## ●Ron measurement circuit



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