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

## 2SD2114K / 2SD2144S

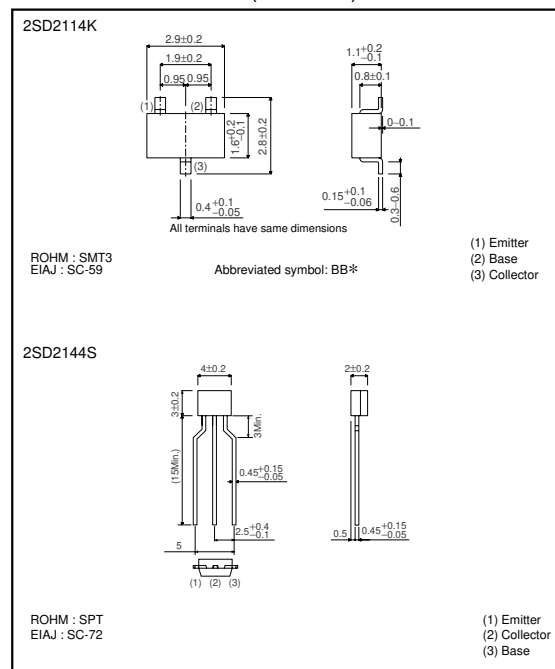
### ●Features

- 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 (Unit : 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	2SD2114K	$P_C$	W
	2SD2144S		
Junction temperature	$T_j$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

\* Single pulse  $P_w=100ms$

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CBO</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	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

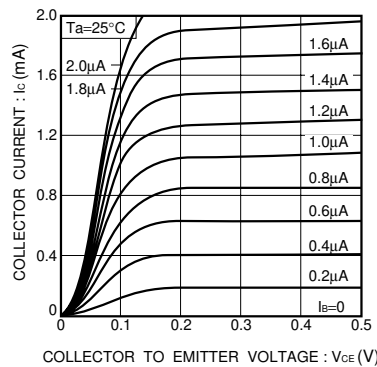


Fig.1 Grounded emitter output characteristics ( I )

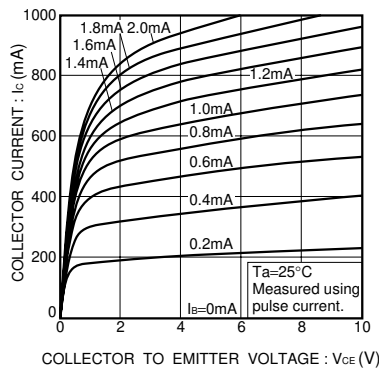


Fig.2 Grounded emitter output characteristics ( II )

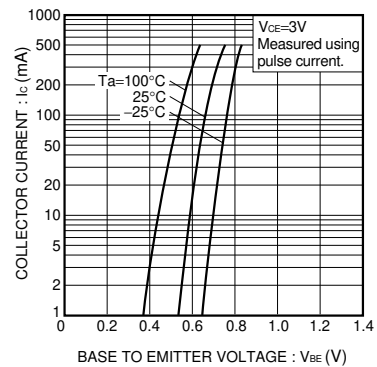


Fig.3 Grounded emitter propagation characteristics

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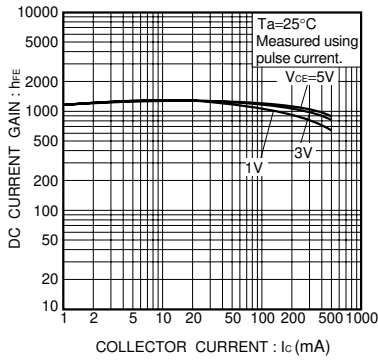


Fig.4 DC current gain vs. collector current (I)

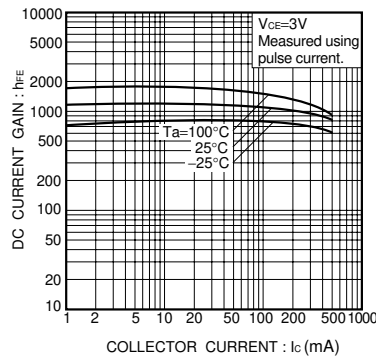


Fig.5 DC current gain vs. collector current (II)

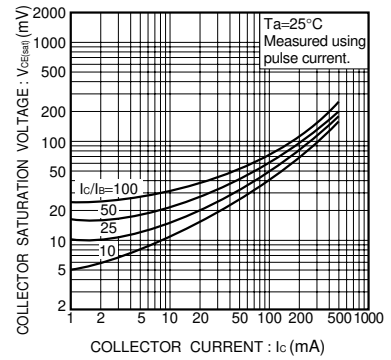


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

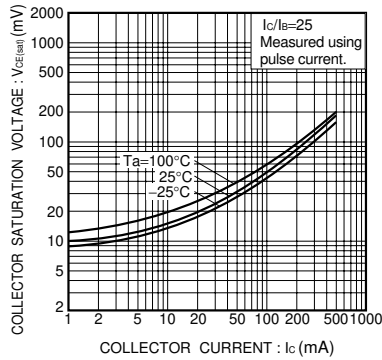


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

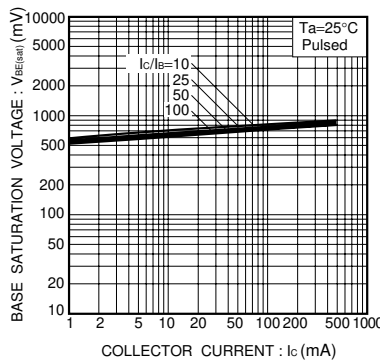


Fig.8 Base-emitter saturation voltage vs. collector current (I)

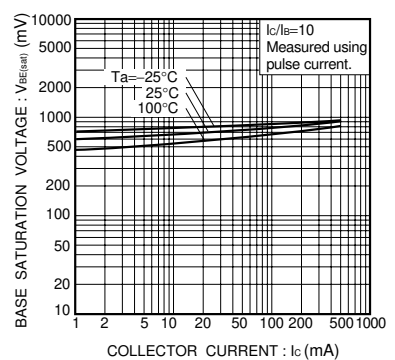


Fig.9 Base-emitter saturation voltage vs. collector current (II)

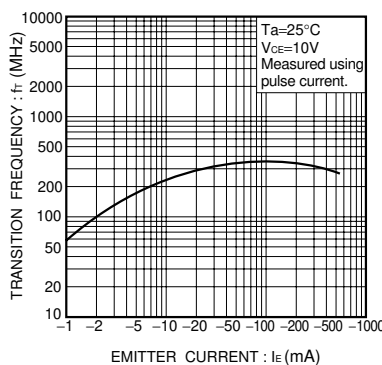


Fig.10 Gain bandwidth product vs. emitter current

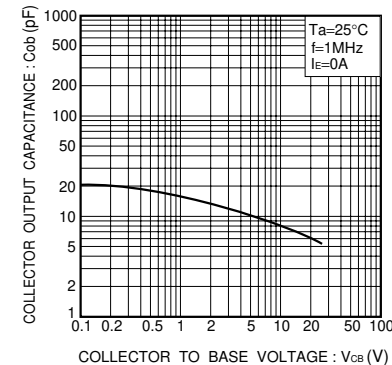


Fig.11 Collector output capacitance vs. collector-base voltage

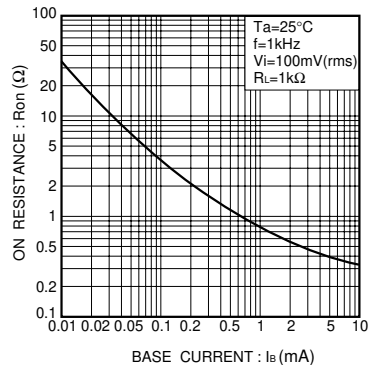
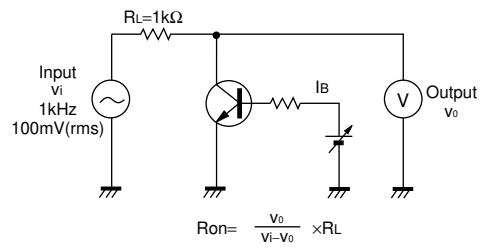


Fig.12 Output-on resistance vs. base current

## Transistors

## ● Ron measurement circuit



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