

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

2SD2114K / 2SD2144S

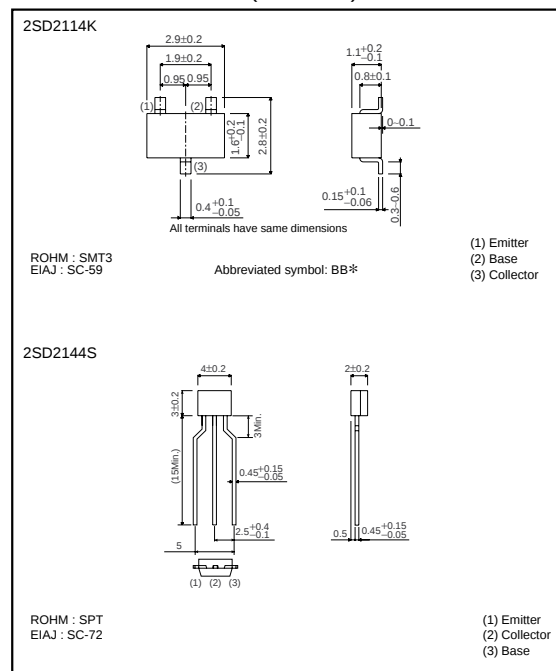
●Features

- 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	0.2	W
	2SD2144S	0.3	
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_{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	μA	$V_{CB}=20V$
Emitter cutoff current	I_{EBO}	—	—	0.5	μA	$V_{EB}=10V$
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	—	Ω	$I_B=1mA, V_i=100mV(rms), f=1kHz$

* Measured using pulse current

●Packaging specifications and h_{FE}

Type	h_{FE}	Package	Taping	
		Code	T146	TP
		Basic ordering unit (pieces)	3000	5000
2SD2114K	VW		○	—
2SD2144S	VW		—	○

 h_{FE} values are classified as follows :

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

●Electrical characteristic curves

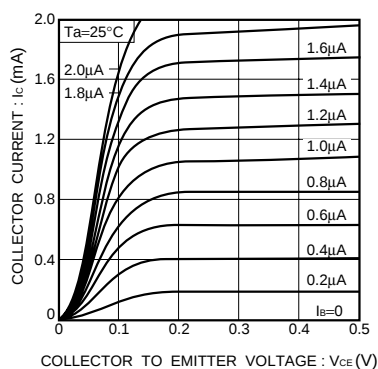


Fig.1 Grounded emitter output characteristics (I)

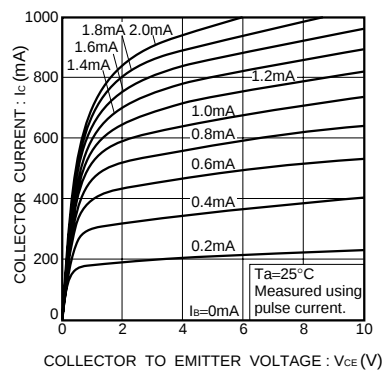


Fig.2 Grounded emitter output characteristics (II)

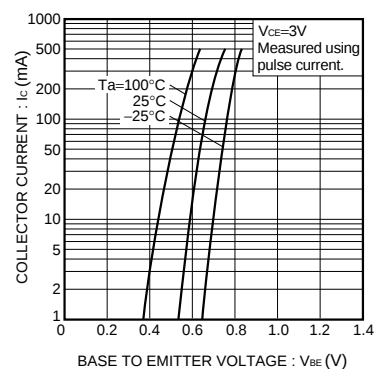


Fig.3 Grounded emitter propagation characteristics

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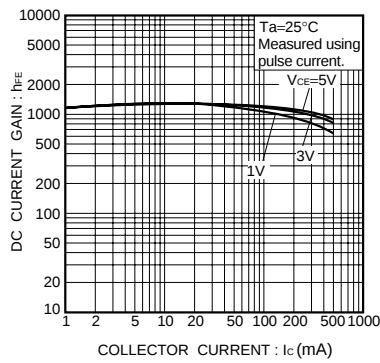


Fig.4 DC current gain vs. collector current (I)

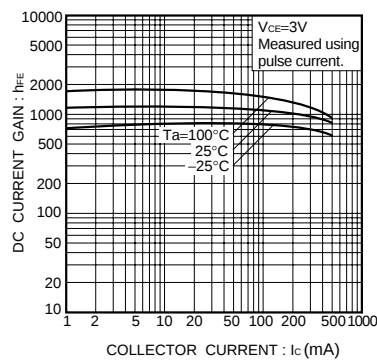


Fig.5 DC current gain vs. collector current (II)

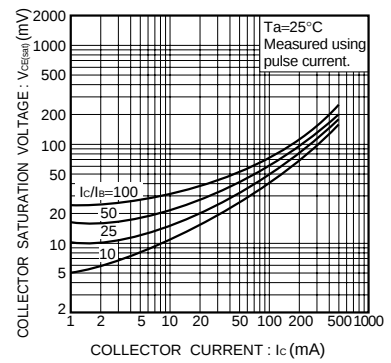


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

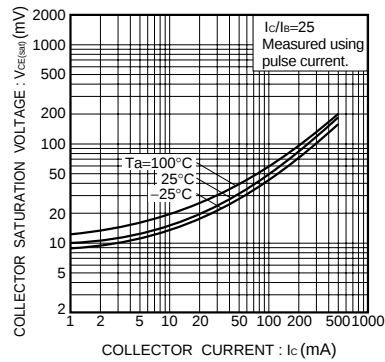


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

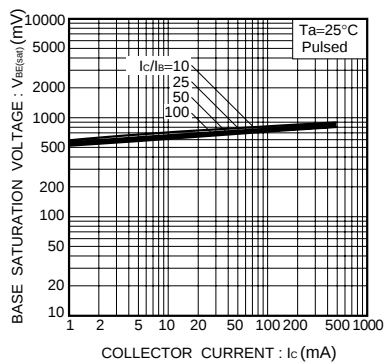


Fig.8 Base-emitter saturation voltage vs. collector current (I)

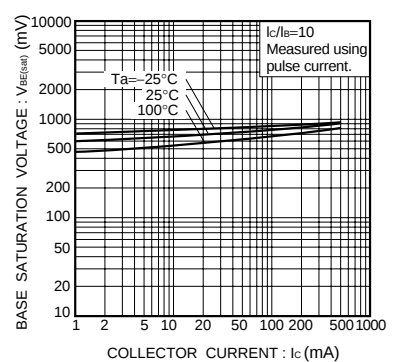


Fig.9 Base-emitter saturation voltage vs. collector current (II)

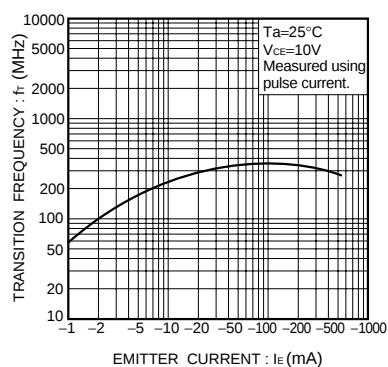


Fig.10 Gain bandwidth product vs. emitter current

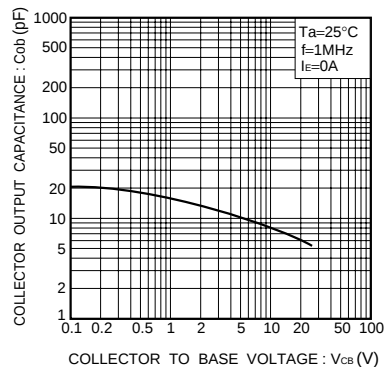


Fig.11 Collector output capacitance vs. collector-base voltage

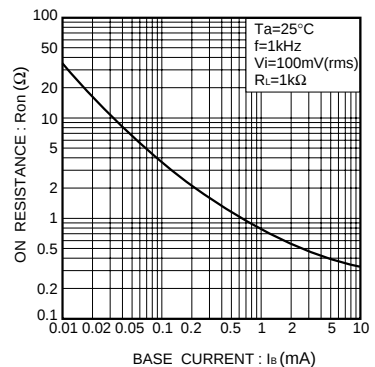
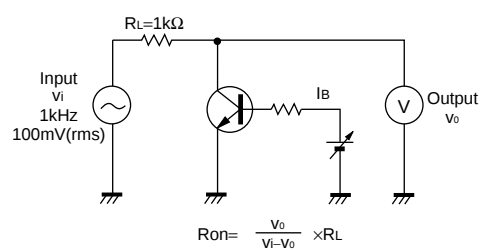


Fig.12 Output-on resistance vs. base current

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●Ron measurement circuit



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