

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

2SD2114K / 2SD2144S

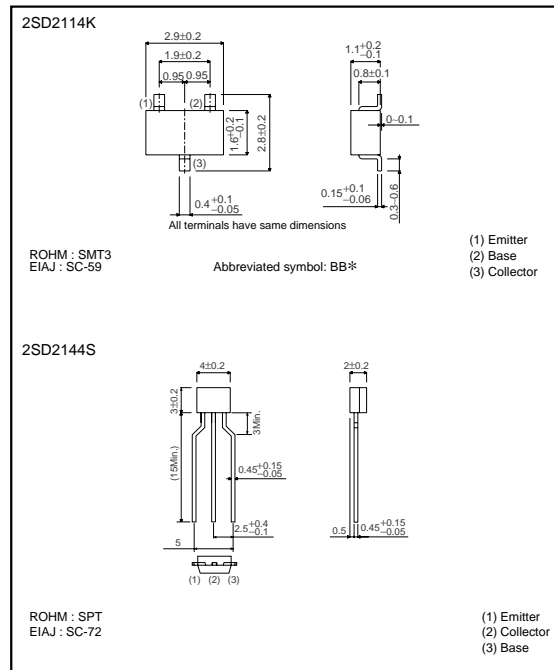
●Features

- 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 _{CB0}	25	–	–	V	I _C =10μA
Collector-emitter breakdown voltage	BV _{CEO}	20	–	–	V	I _C =1mA
Emitter-base breakdown voltage	BV _{EB0}	12	–	–	V	I _E =10μA
Collector cutoff current	I _{CB0}	–	–	0.5	μA	V _{CB} =20V
Emitter cutoff current	I _{EB0}	–	–	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

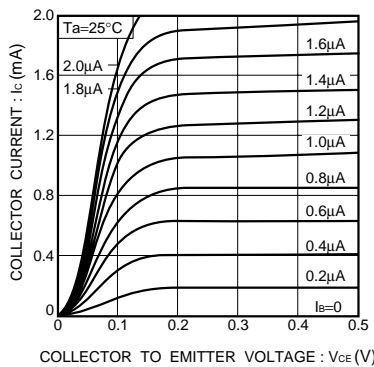


Fig.1 Grounded emitter output characteristics (I)

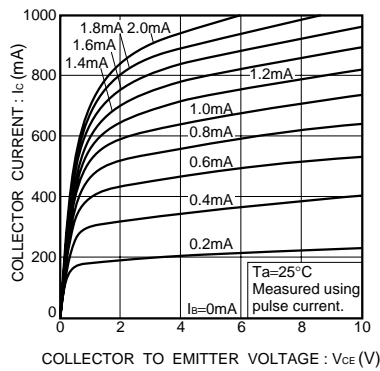


Fig.2 Grounded emitter output characteristics (II)

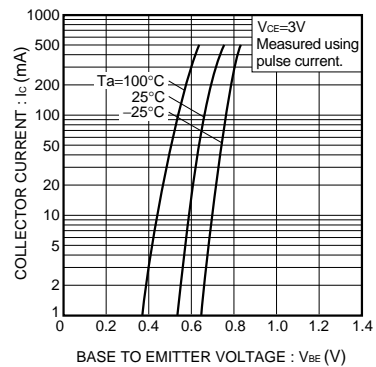


Fig.3 Grounded emitter propagation characteristics

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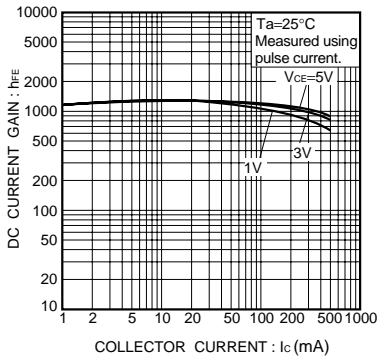


Fig.4 DC current gain vs. collector current (I)

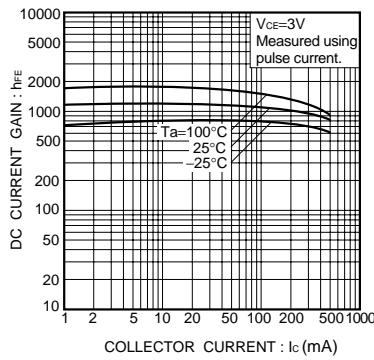


Fig.5 DC current gain vs. collector current (II)

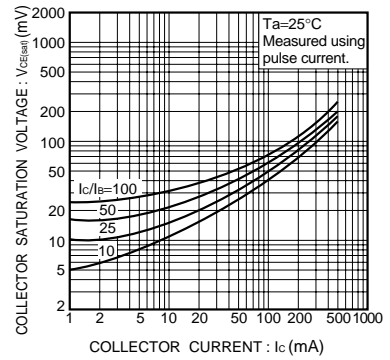


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

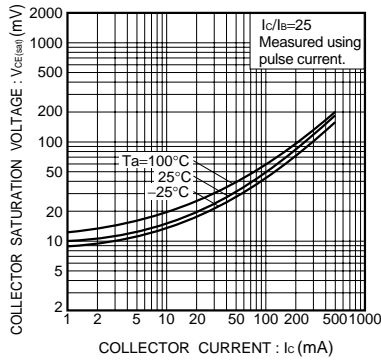


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

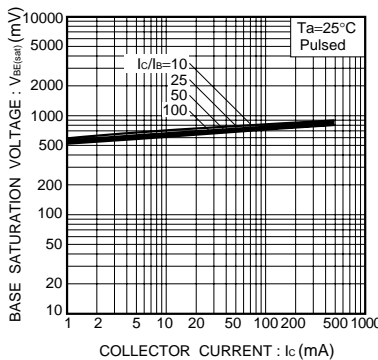


Fig.8 Base-emitter saturation voltage vs. collector current (I)

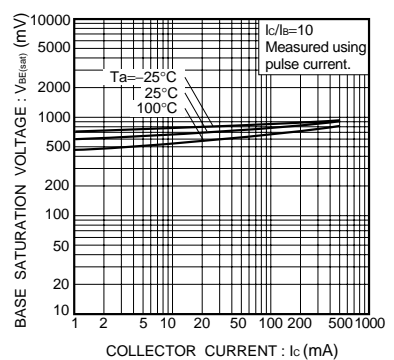


Fig.9 Base-emitter saturation voltage vs. collector current (II)

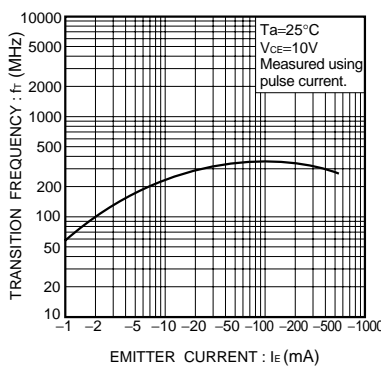


Fig.10 Gain bandwidth product vs. emitter current

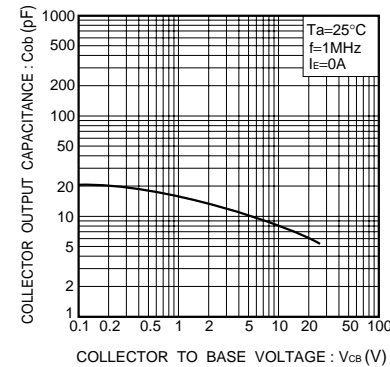


Fig.11 Collector output capacitance vs. collector-base voltage

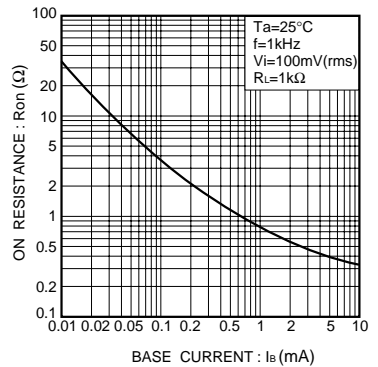
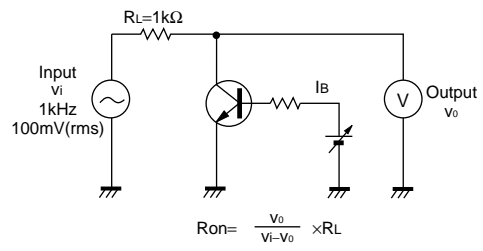


Fig.12 Output-on resistance vs. base current

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●Ron measurement circuit



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