

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

2SD2114K / 2SD2144S

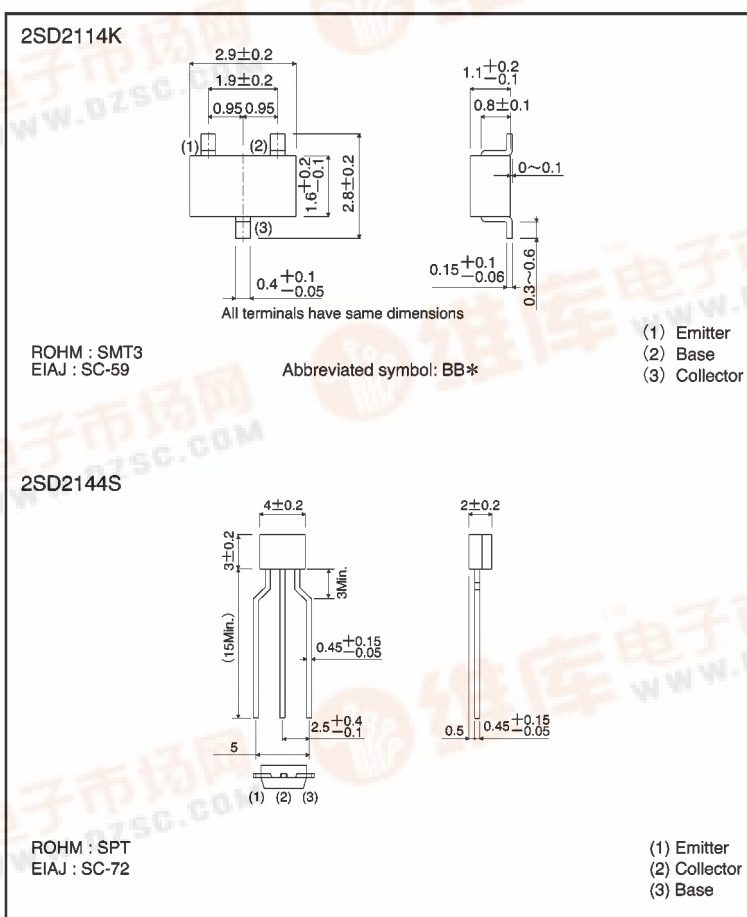
●Features

- 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}

Transistors

2SD2114K / 2SD2144S

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V _{CB0}	25	V
Collector-emitter voltage		V _{CEO}	20	V
Emitter-base voltage		V _{EB0}	12	V
Collector current		I _c	0.5	A (DC)
			1	A (Pulse) *
Collector power dissipation	2SD2114K	P _c	0.2	W
	2SD2144S		0.3	
Junction temperature		T _j	150	℃
Storage temperature		T _{stg}	−55~+150	℃

* Single pulse Pw=100ms

● Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CB0}	25	—	—	V	I _c =10 μA
Collector-emitter breakdown voltage	BV _{CE0}	20	—	—	V	I _c =1mA
Emitter-base breakdown voltage	BV _{EB0}	12	—	—	V	I _E =10 μA
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	2SD2114K	h _{FE}	820	—	2700	V _{CE} =3V, I _c =10mA
	2SD2144S		560	—	2700	
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	—	pF	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	UVW		—	○

h_{FE} values are classified as follows :

Item	U	V	W
h _{FE}	560~1200	820~1800	1200~2700

● Electrical characteristic curves

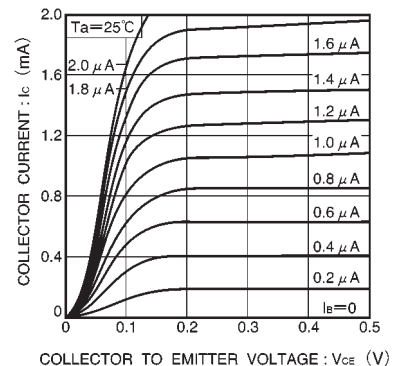


Fig.1 Grounded emitter output characteristics (I)

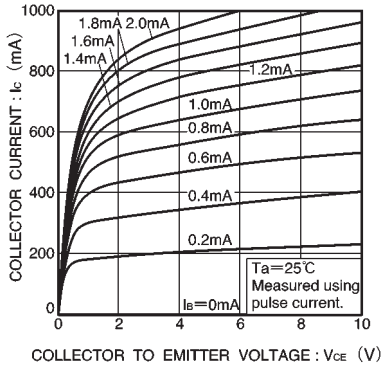


Fig.2 Grounded emitter output characteristics (I)

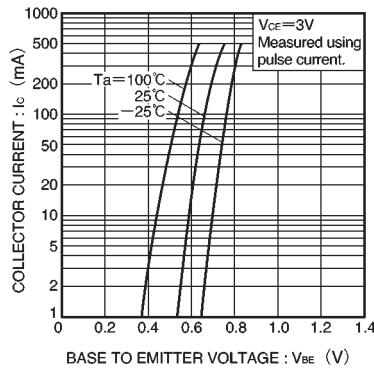


Fig.3 Grounded emitter propagation characteristics

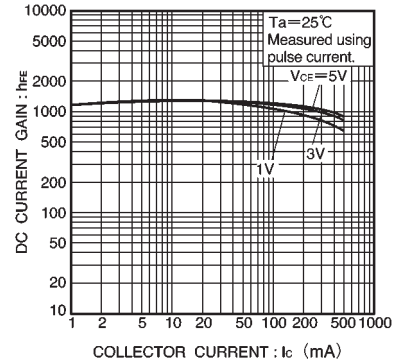


Fig.4 DC current gain vs. collector current (I)

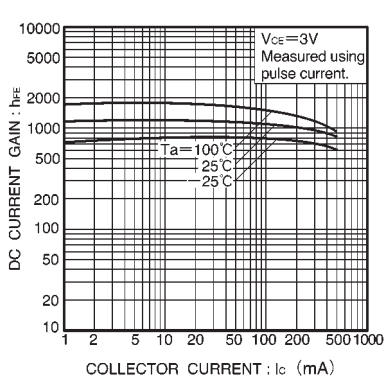


Fig.5 DC current gain vs. collector current (II)

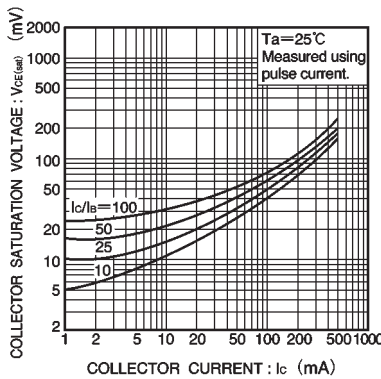


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

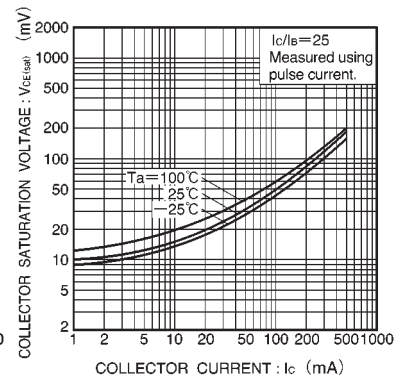


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

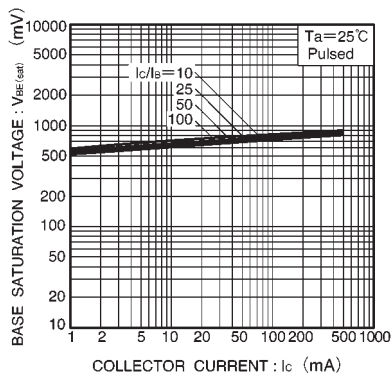


Fig.8 Base-emitter saturation voltage vs. collector current (I)

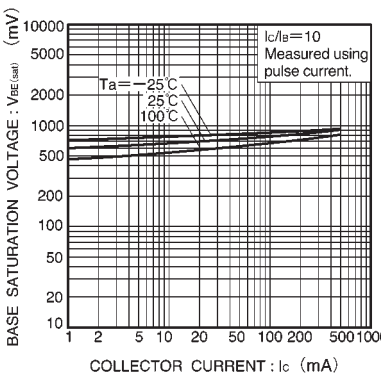


Fig.9 Base-emitter saturation voltage vs. collector current (II)

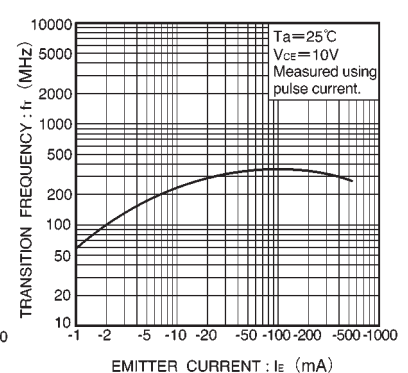


Fig.10 Gain bandwidth product vs. emitter current

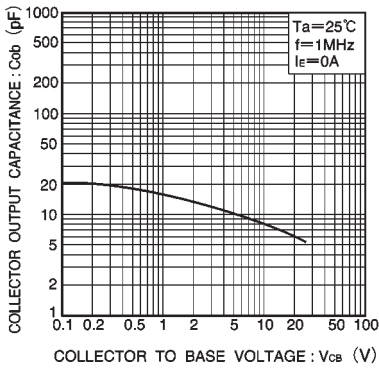


Fig.11 Collector output capacitance vs. collector-base voltage

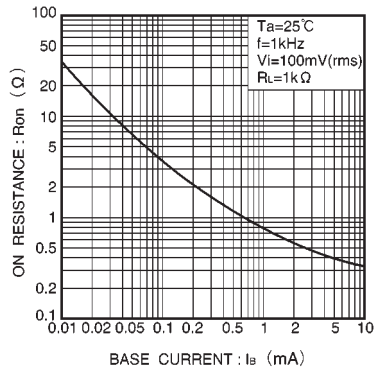


Fig.12 Output-on resistance vs. base current

● R_{on} measurement circuit

