

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

2SD2114K / 2SD2144S

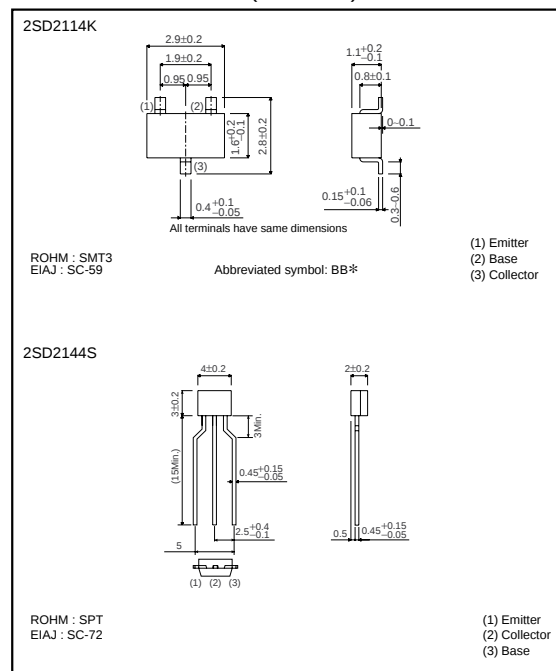
●Features

- 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 $P_w=100ms$

Transistors

●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

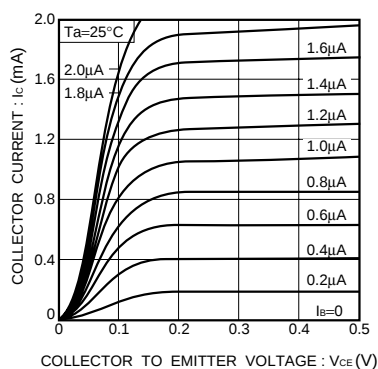


Fig.1 Grounded emitter output characteristics (I)

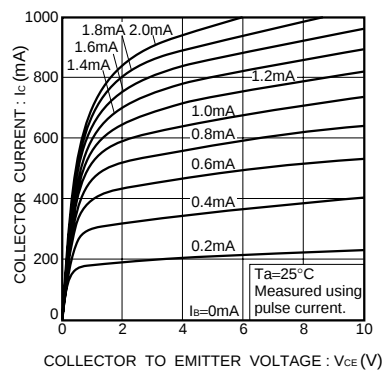


Fig.2 Grounded emitter output characteristics (II)

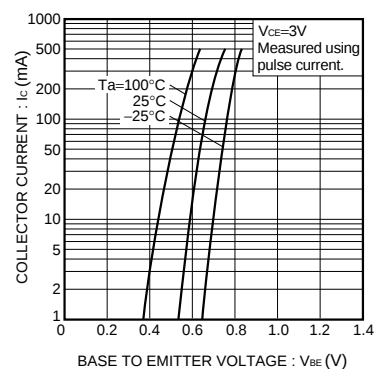


Fig.3 Grounded emitter propagation characteristics

Transistors

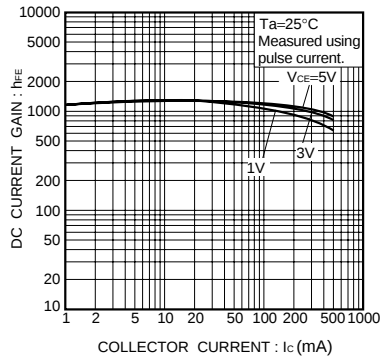


Fig.4 DC current gain vs. collector current (I)

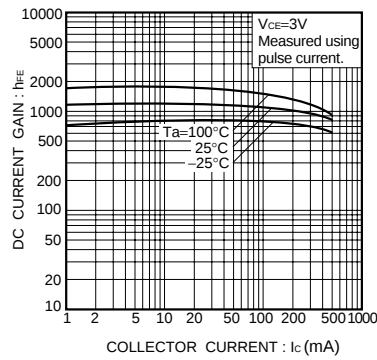


Fig.5 DC current gain vs. collector current (II)

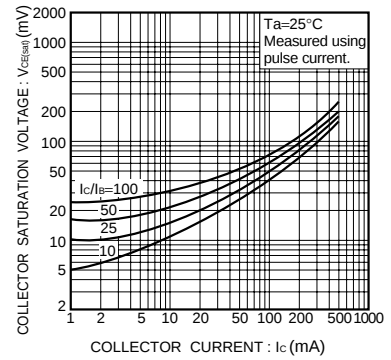


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

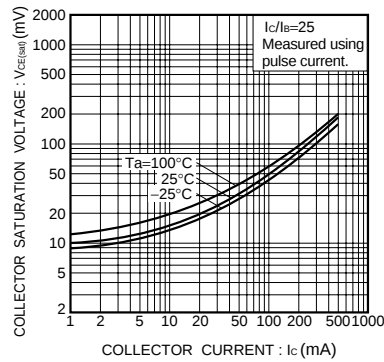


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

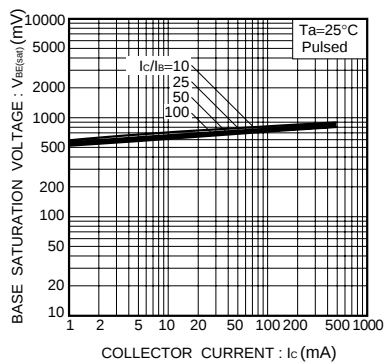


Fig.8 Base-emitter saturation voltage vs. collector current (I)

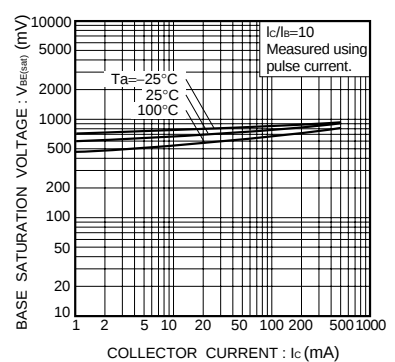


Fig.9 Base-emitter saturation voltage vs. collector current (II)

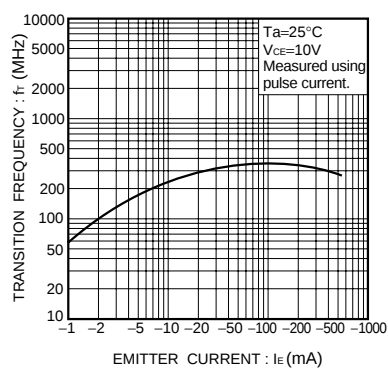


Fig.10 Gain bandwidth product vs. emitter current

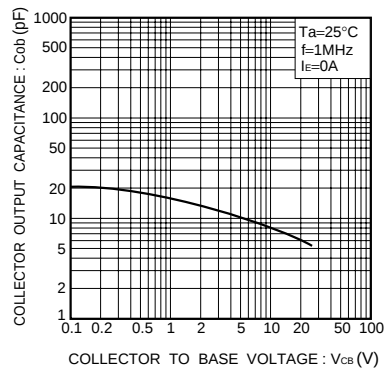


Fig.11 Collector output capacitance vs. collector-base voltage

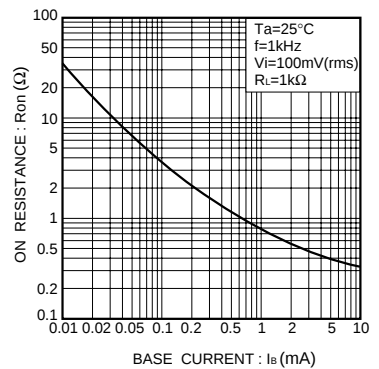
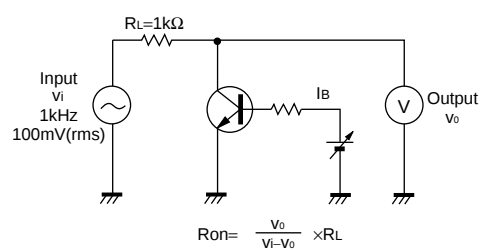


Fig.12 Output-on resistance vs. base current

Transistors

●Ron measurement circuit



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