

Transistors

●Electrical characteristics (Ta = 25°C)

Tr1 (PNP)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	-60	—	—	V	I _C =-50μA
Collector-emitter breakdown voltage	BV _{CEO}	-50	—	—	V	I _C =-1mA
Emitter-base breakdown voltage	BV _{EBO}	-6	—	—	V	I _E =-50μA
Collector cutoff current	I _{CBO}	—	—	-0.1	μA	V _{CB} =-60V
Emitter cutoff current	I _{EBO}	—	—	-0.1	μA	V _{EB} =-6V
Collector-emitter saturation voltage	V _{CE(sat)}	—	—	-0.5	V	I _C /I _B =-50mA/-5mA
DC current transfer ratio	h _{FE}	120	—	560	—	V _{CE} =-6V, I _C =-1mA
Transition frequency	f _T	—	140	—	MHz	V _{CE} =-12V, I _E =2mA, f=100MHz
Output capacitance	C _{ob}	—	4	5	PF	V _{CB} =-12V, I _E =0A, f=1MHz

Tr2 (NPN)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	60	—	—	V	I _C =50μA
Collector-emitter breakdown voltage	BV _{CEO}	50	—	—	V	I _C =1mA
Emitter-base breakdown voltage	BV _{EBO}	7	—	—	V	I _E =50μA
Collector cutoff current	I _{CBO}	—	—	0.1	μA	V _{CB} =60V
Emitter cutoff current	I _{EBO}	—	—	0.1	μA	V _{EB} =7V
Collector-emitter saturation voltage	V _{CE(sat)}	—	—	0.4	V	I _C /I _B =50mA/5mA
DC current transfer ratio	h _{FE}	120	—	560	—	V _{CE} =6V, I _C =1mA
Transition frequency	f _T	—	180	—	MHz	V _{CE} =12V, I _E =-2mA, f=100MHz
Output capacitance	C _{ob}	—	2	3.5	PF	V _{CB} =12V, I _E =0A, f=1MHz

●Packaging specifications

Type	Packaging type	Taping		
	Code	T2R	TR	T148
	Basic ordering unit (pieces)	8000	3000	3000
EMY1	○	—	—	—
UMY1N	—	○	—	—
FMY1	—	—	—	○

●Electrical characteristic curves

Tr1 (PNP)

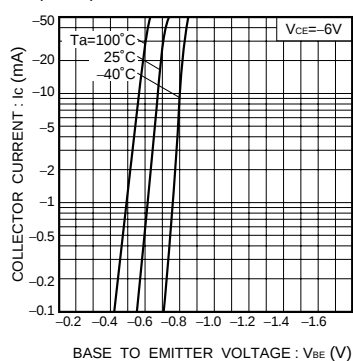


Fig.1 Grounded emitter propagation characteristics

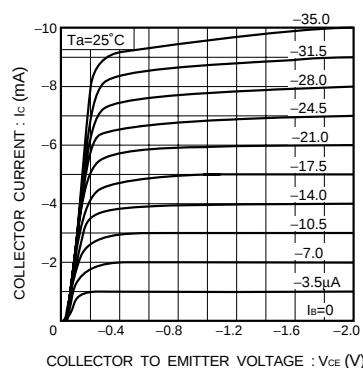


Fig.2 Grounded emitter output characteristics (I)

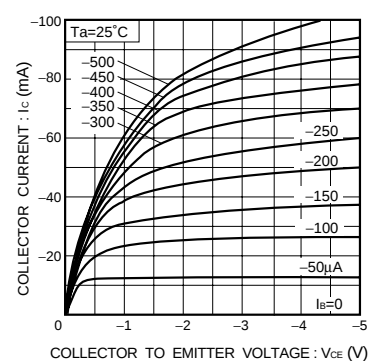


Fig.3 Grounded emitter output characteristics (II)

Transistors

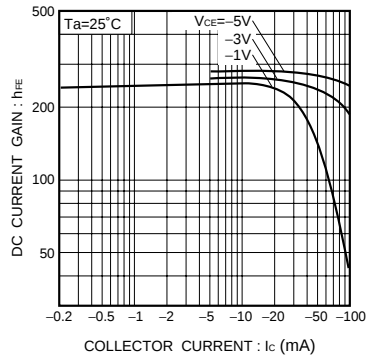


Fig.4 DC current gain vs. collector current (I)

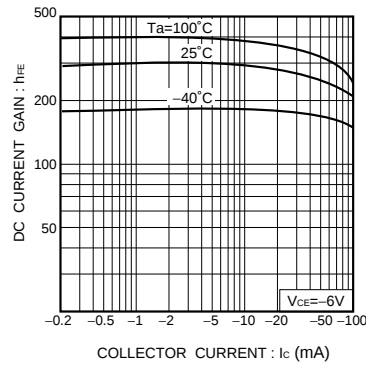


Fig.5 DC current gain vs. collector current (II)

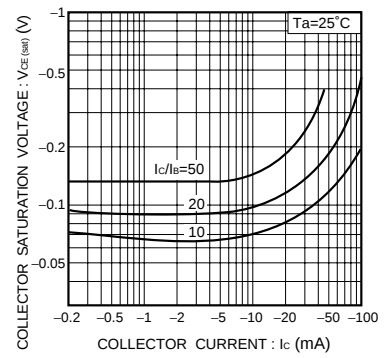


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

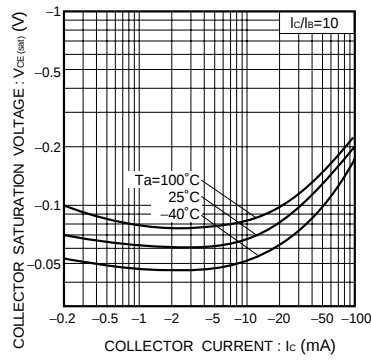


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

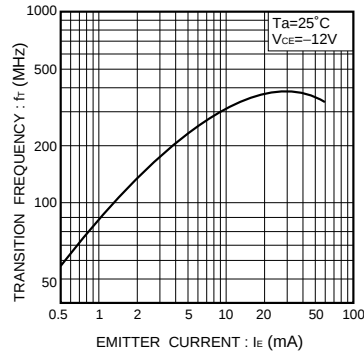


Fig.8 Gain bandwidth product vs. emitter current

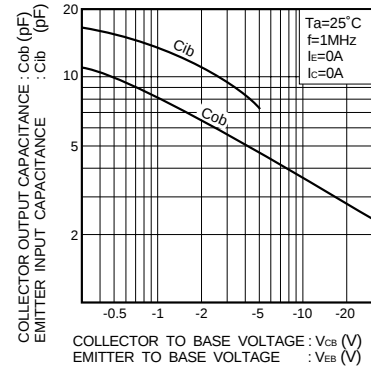


Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

T_{R2} (NPN)

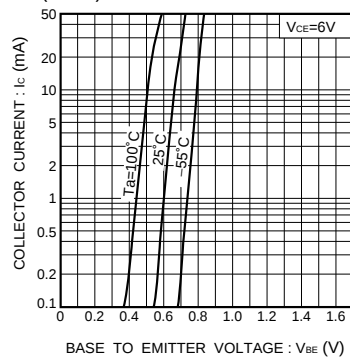


Fig.10 Grounded emitter propagation characteristics

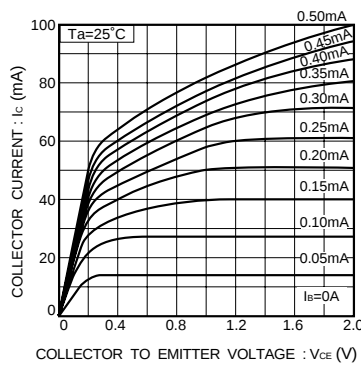


Fig.11 Grounded emitter output characteristics (I)

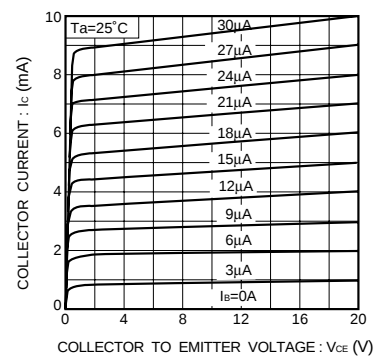


Fig.12 Grounded emitter output characteristics (II)

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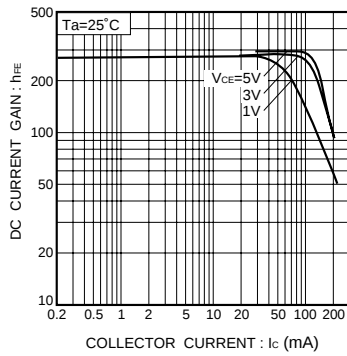


Fig.13 DC current gain vs. collector current (I)

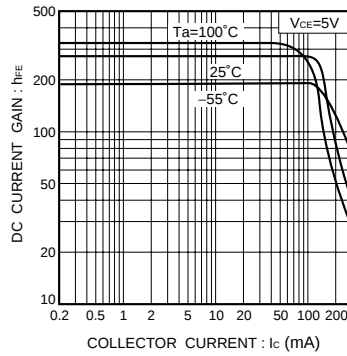


Fig.14 DC current gain vs. collector current (II)

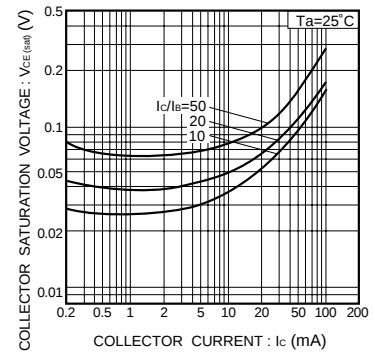


Fig.15 Collector-emitter saturation voltage vs. collector current (I)

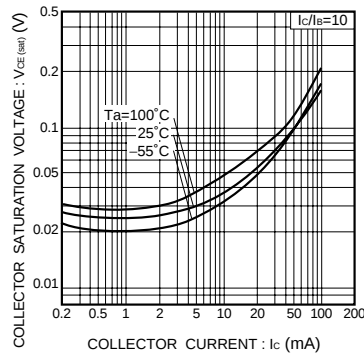


Fig.16 Collector-emitter saturation voltage vs. collector current (II)

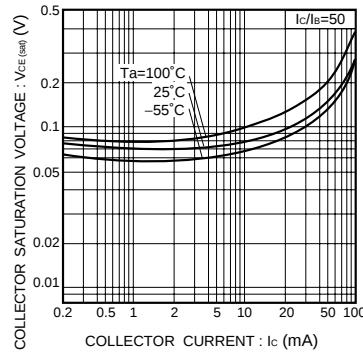


Fig.17 Collector-emitter saturation voltage vs. collector current (III)

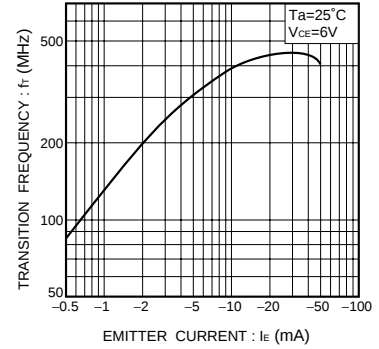


Fig.18 Gain bandwidth product vs. emitter current

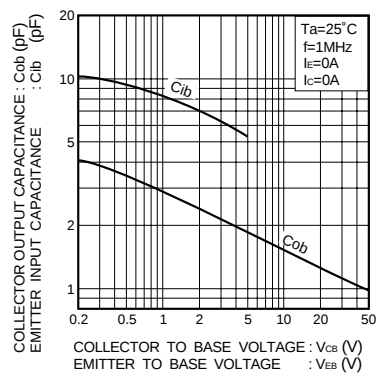


Fig.19 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

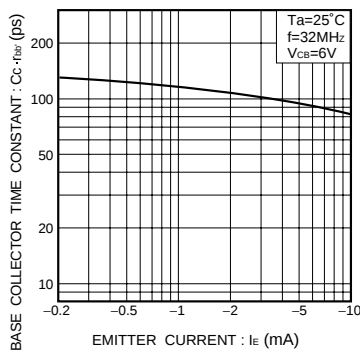


Fig.20 Base-collector time constant vs. emitter current