

# Emitter common (dual transistors)

## EMY1 / UMY1N / FMY1A

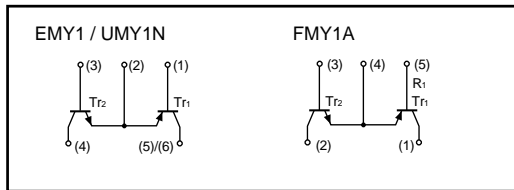
**●Features**

- 1) Includes a 2SA1037AK and a 2SC2412K transistor in a EMT or UMT or SMT package.
- 2) PNP and NPN transistors have common emitters.
- 3) Mounting cost and area can be cut in half.

**●Structure**

Epitaxial planar type  
PNP / NPN silicon transistor

**●Equivalent circuit**

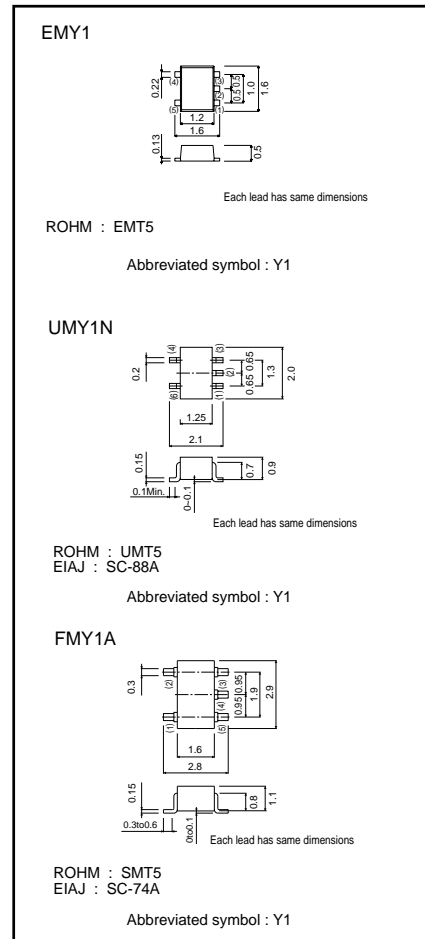


**●Absolute maximum ratings (Ta = 25°C)**

Parameter	Symbol	Limits		Unit
		Tr1	Tr2	
Collector-base voltage	V <sub>CB0</sub>	-60	60	V
Collector-emitter voltage	V <sub>CE0</sub>	-50	50	V
Emitter-base voltage	V <sub>EBO</sub>	-6	7	V
Collector current	I <sub>C</sub>	-150	150	mA
Power dissipation	EMY1, UMY1N	150 (TOTAL) <sup>*1</sup>		mW
	FMY1A	300 (TOTAL) <sup>*2</sup>		
Junction temperature	T <sub>J</sub>	150		°C
Storage temperature	T <sub>stg</sub>	-55~+150		°C

\*1 120mW per element must not be exceeded.  
\*2 200mW per element must not be exceeded.

**●External dimensions (Units : mm)**



Transistors

●Electrical characteristics (Ta = 25°C)

Tr1 (PNP)

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

Tr2 (NPN)

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

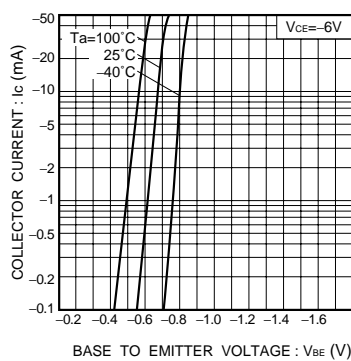


Fig.1 Grounded emitter propagation characteristics

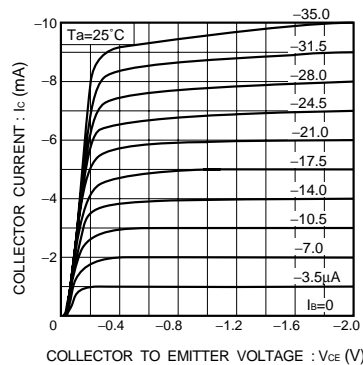


Fig.2 Grounded emitter output characteristics ( I )

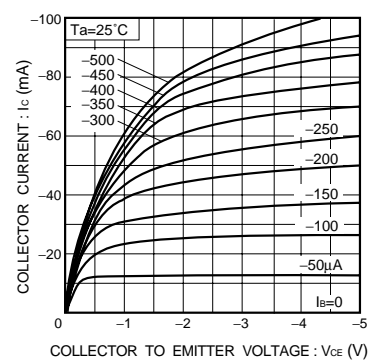


Fig.3 Grounded emitter output characteristics ( II )

Transistors

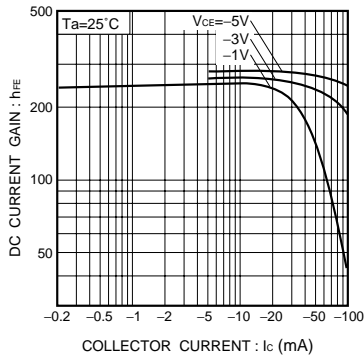


Fig.4 DC current gain vs. collector current ( I )

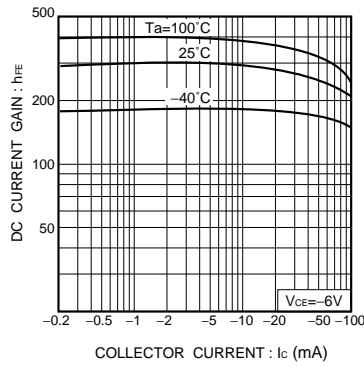


Fig.5 DC current gain vs. collector current ( II )

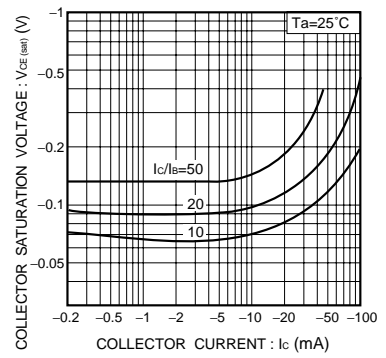


Fig.6 Collector-emitter saturation voltage vs. collector current ( I )

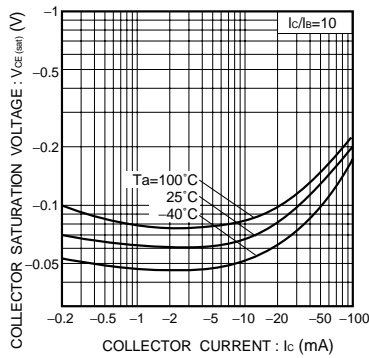


Fig.7 Collector-emitter saturation voltage vs. collector current ( II )

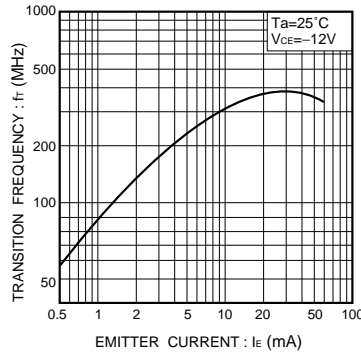


Fig.8 Gain bandwidth product vs. emitter current

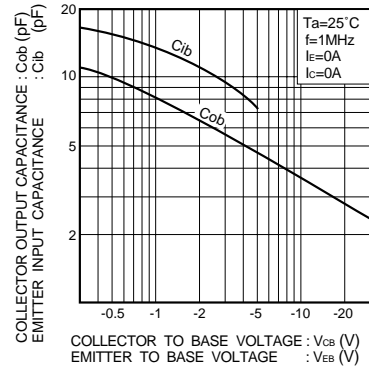


Fig.9 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

Tr<sub>2</sub> (NPN)

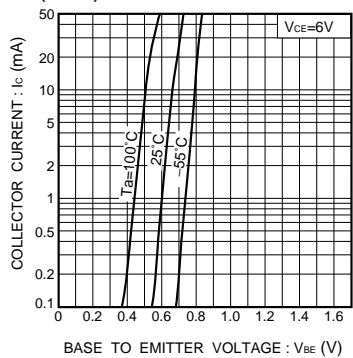


Fig.10 Grounded emitter propagation characteristics

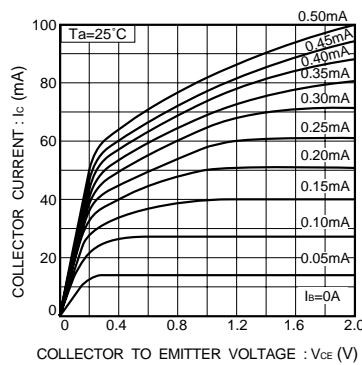


Fig.11 Grounded emitter output characteristics ( I )

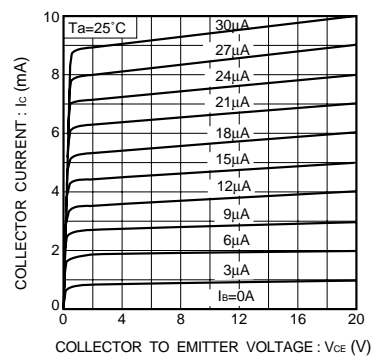


Fig.12 Grounded emitter output characteristics ( II )

Transistors

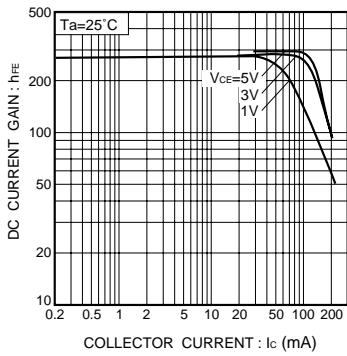


Fig.13 DC current gain vs. collector current ( I )

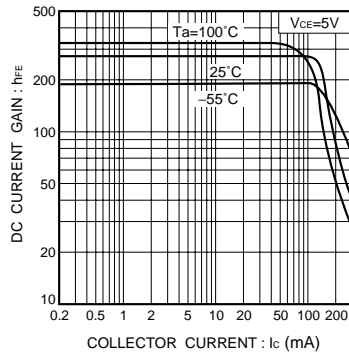


Fig.14 DC current gain vs. collector current ( II )

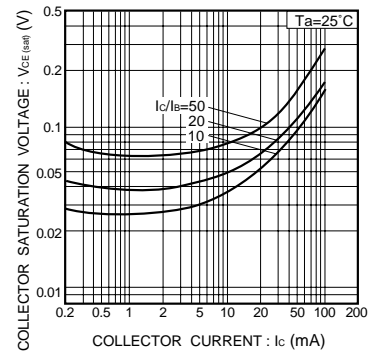


Fig.15 Collector-emitter saturation voltage vs. collector current ( I )

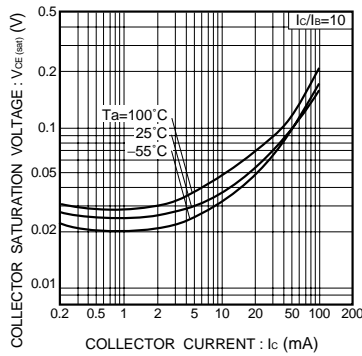


Fig.16 Collector-emitter saturation voltage vs. collector current ( II )

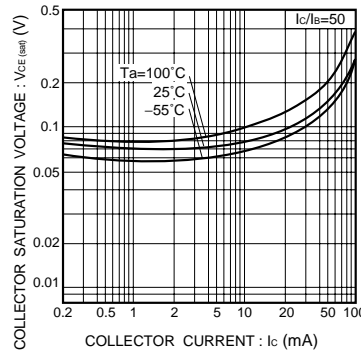


Fig.17 Collector-emitter saturation voltage vs. collector current ( III )

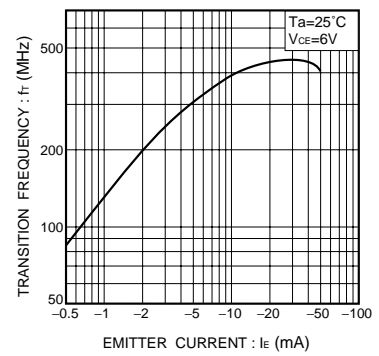


Fig.18 Gain bandwidth product vs. emitter current

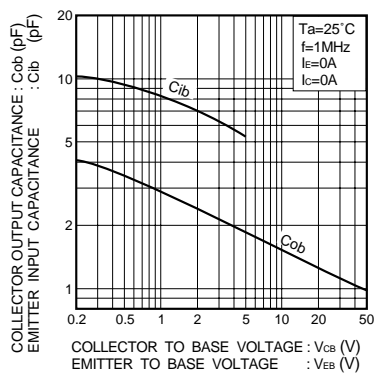


Fig.19 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

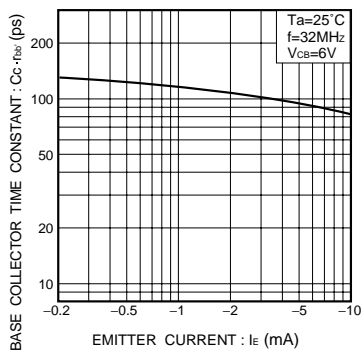


Fig.20 Base-collector time constant vs. emitter current