General purpose transistor (dual transistors)

EMZ1 / UMZ1N / IMZ1A

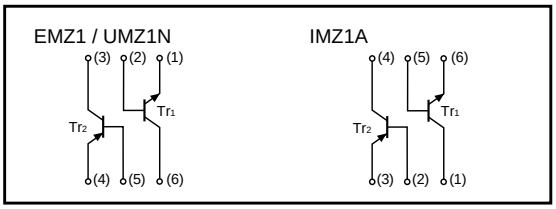
●Features

1) Both a 2SA1037AK chip and 2SC2412K chip in a EMT or UMT or SMT package.
2) Mounting possible with EMT3 or UMT3 or SMT3 automatic mounting machines.
3) Transistor elements are independent, eliminating interference.
4) Mounting cost and area can be cut in half.

●Structure

NPN / PNP epitaxial planar silicon transistor

●Equivalent circuit



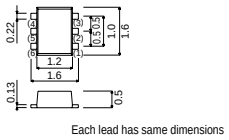
●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits		Unit
			Tr_1	Tr_2	
Collector-base voltage		V_{CBO}	60	–60	V
Collector-emitter voltage		V_{CEO}	50	–50	V
Emitter-base voltage		V_{EBO}	7	–6	V
Collector current		I_C	150	–150	mA
Power dissipation	EMZ1, UMZ1N	P_C	150 (TOTAL)		mW *1
	IMZ1A		300 (TOTAL)		mW *2
Junction temperature		Tj	150		˚C
Storage temperature		Tstg	–55 to +150		˚C

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

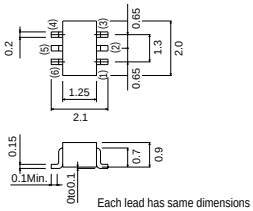
●External dimensions (Unit : mm)

EMZ1



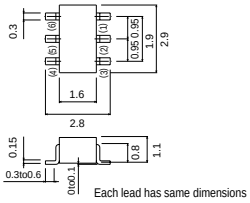
ROHM : EMT6
Abbreviated symbol : Z1

UMZ1N



ROHM : UMT6
EIAJ : SC-88
Abbreviated symbol : Z1

IMZ1A



ROHM : SMT6
EIAJ : SC-74

Abbreviated symbol : Z1

●Electrical characteristics (Ta = 25°C)

Tr1 (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	Cob	–	2	3.5	PF	V_{CB}=12V, I_E=0A, f=1MHz

Tr2 (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	Cob	–	4	5	PF	V_{CB}=–12V, I_E=0A, f=1MHz

●Packaging specifications

Type	Package	Taping		
	Code	T2R	TR	T108
	Basic ordering unit (pieces)	8000	3000	3000
EMZ1		○	—	—
UMZ1N		—	○	—
IMZ1A		—	—	○

●Electrical characteristic curves

Tr1 (NPN)

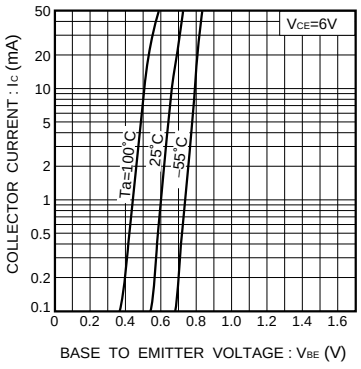


Fig.1 Grounded emitter propagation characteristics

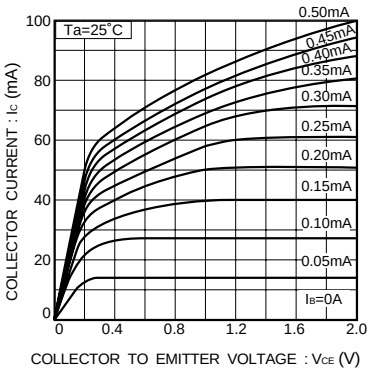


Fig.2 Grounded emitter output characteristics (I)

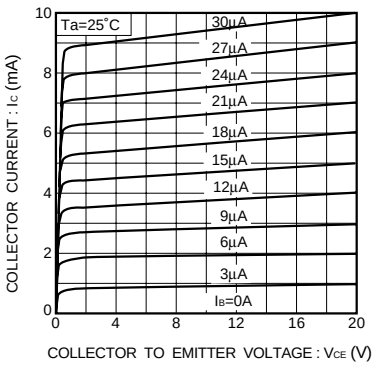


Fig.3 Grounded emitter output characteristics (II)

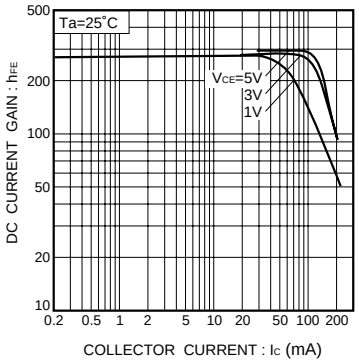


Fig.4 DC current gain vs. collector current (I)

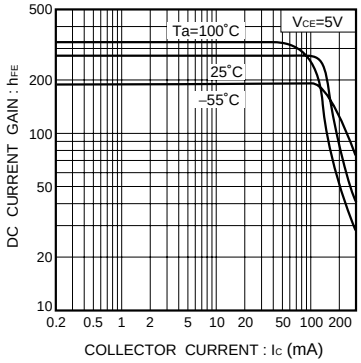


Fig.5 DC current gain vs. collector current (II)

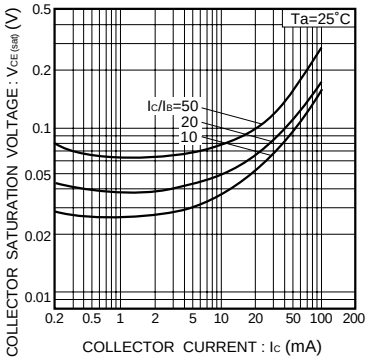


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

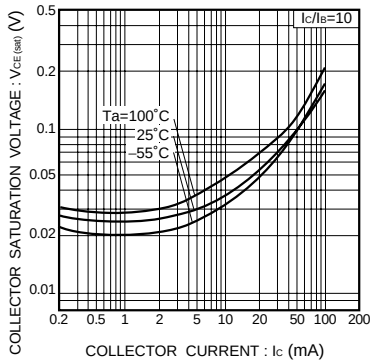


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

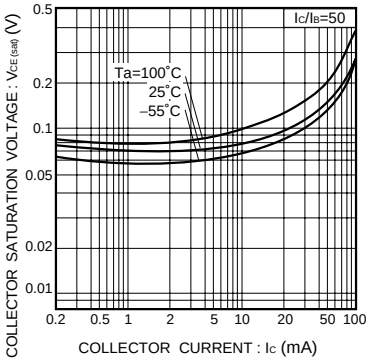


Fig.8 Collector-emitter saturation voltage vs. collector current (III)

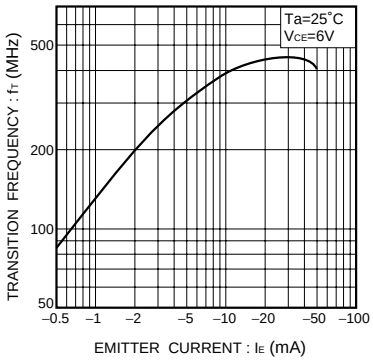


Fig.9 Gain bandwidth product vs. emitter current

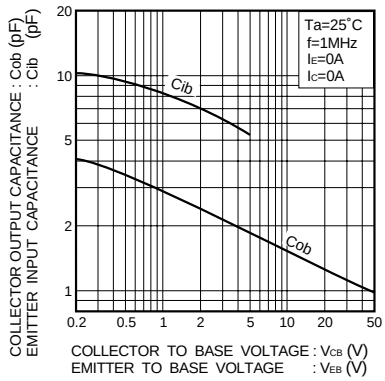


Fig.10 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

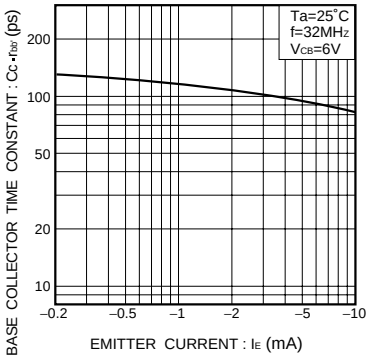


Fig.11 Base-collector time constant vs. emitter current

Tr2 (PNP)

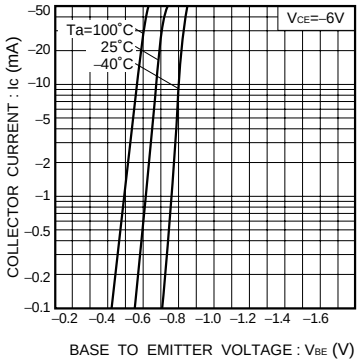


Fig.12 Grounded emitter propagation characteristics

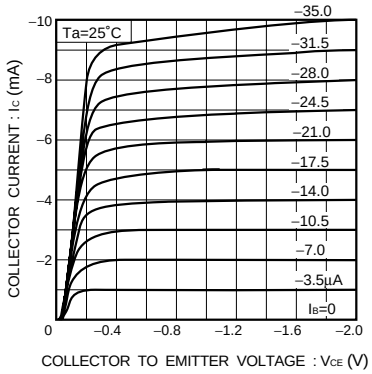


Fig.13 Grounded emitter output characteristics (I)

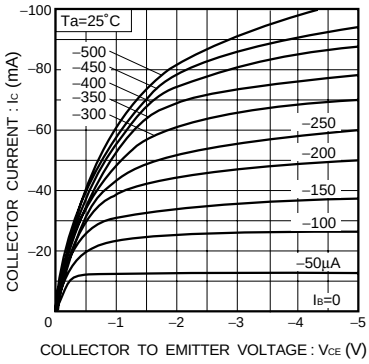


Fig.14 Grounded emitter output characteristics (II)

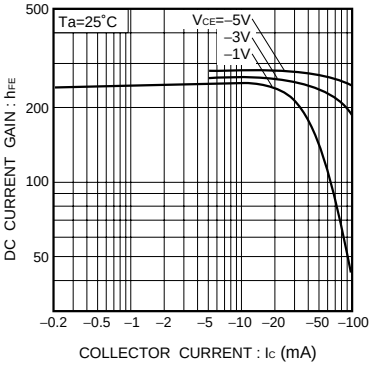


Fig.15 DC current gain vs. collector current (I)

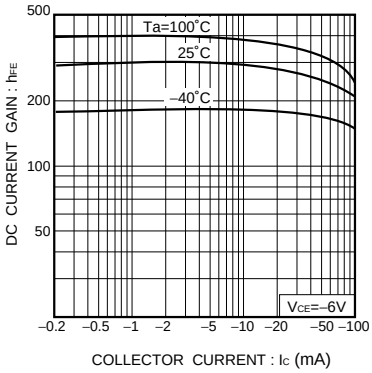


Fig.16 DC current gain vs. collector current (II)

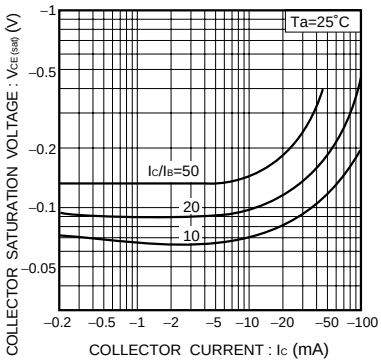


Fig.17 Collector-emitter saturation voltage vs. collector current (I)

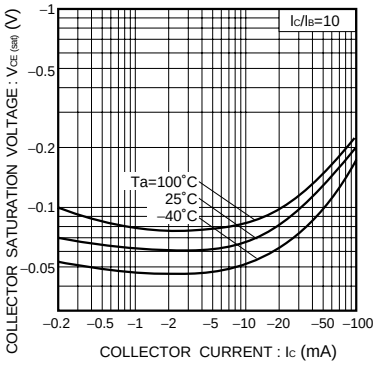


Fig.18 Collector-emitter saturation voltage vs. collector current (II)

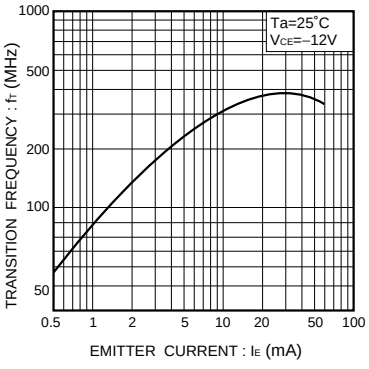


Fig.19 Gain bandwidth product vs. emitter current

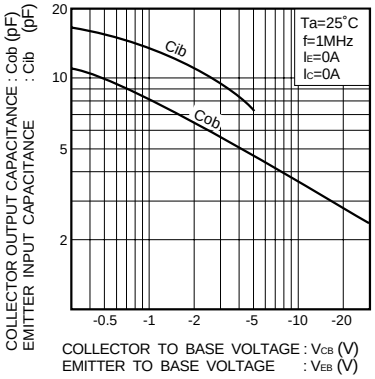


Fig.20 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

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