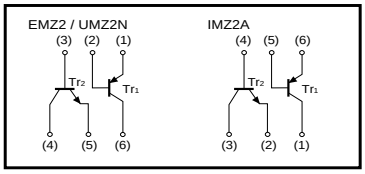
Power management (dual transistors)

EMZ2 / UMZ2N / IMZ2A

●Feature

1) Both a 2SA1037AK chip and 2SC2412K chip in a EMT or UMT or SMT package.

●Equivalent circuits



●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits		Unit	
			Tr1	Tr2		
Collector-base voltage		VCBO	−60	60	V	
Collector-emitter voltage		VCEO	−50	50	V	
Emitter-base voltage		VEBO	−6	7	V	
Collector current		IC	−150	150	mA	
Collector power dissipation	EMZ2, UMZ2N	PC	150 (TOTAL)		mW	※1
	IMZ2A		300 (TOTAL)			※2
Junction temperature		Tj	150		°C	
Storage temperature		Tstg	−55 to +150		°C	

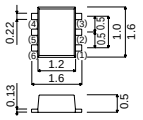
※1 120mW per element must not be exceeded.
※2 200mW per element must not be exceeded.

●Package, marking, and packaging specifications

Part No.	EMZ2	UMZ2N	IMZ2A
Package	EMT6	UMT6	SMT6
Marking	Z2	Z2	Z2
Code	T2R	TR	T108
Basic ordering unit (pieces)	8000	3000	3000

●External dimensions (Unit : mm)

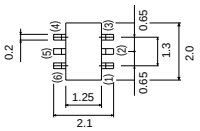
EMZ2

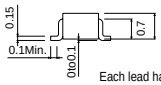


ROHM : EMT6

Each lead has same dimensions

UMZ2N

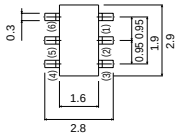


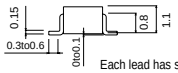


Each lead has same dimensions

ROHM : UMT6
EIAJ : SC-88

IMZ2A





Each lead has same dimensions

ROHM : SMT6
EIAJ : SC-74

●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	Cob	–	4	5	pF	V_{CB} = –12V , I_E = 0A , f = 1MHz

✻ Transition frequency of the device.

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

✻ Transition frequency of the device.

●Electrical characteristics curves

PNP Tr

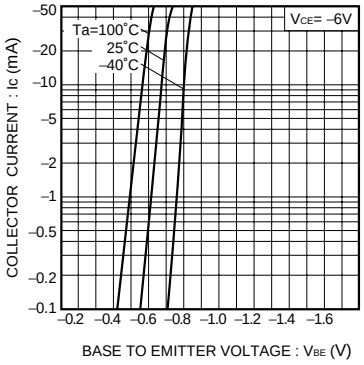


Fig.1 Grounded emitter propagation characteristics

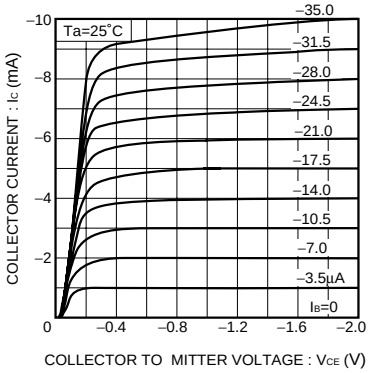


Fig.2 Grounded emitter output characteristics (I)

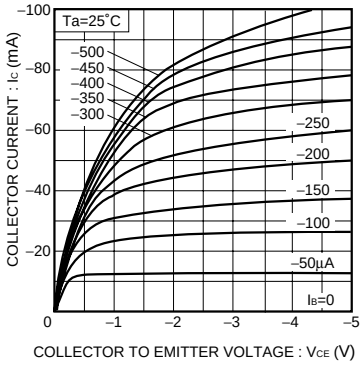


Fig.3 Grounded emitter output characteristics (II)

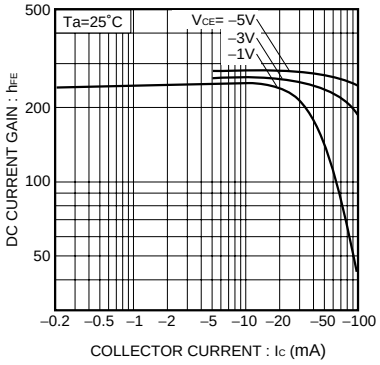


Fig.4 DC current gain vs. collector current (I)

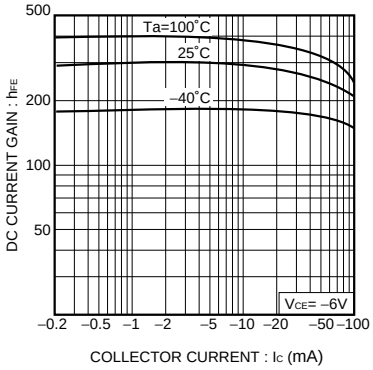


Fig.5 DC current gain vs. collector current (II)

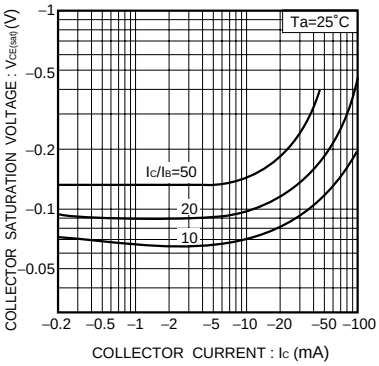


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

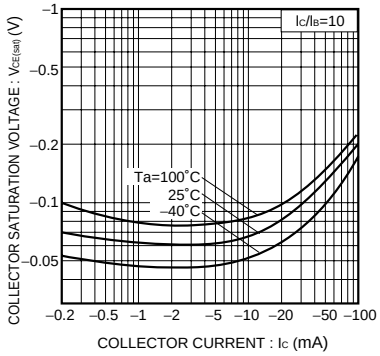


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

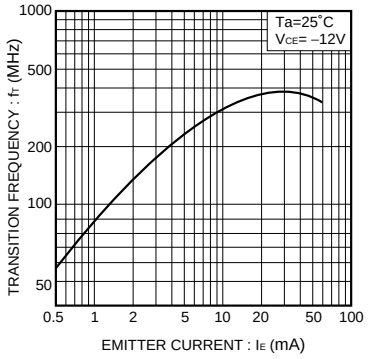


Fig.8 Gain bandwidth product vs. emitter current

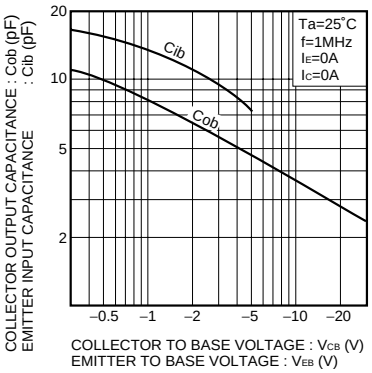


Fig.9 Collector output capacitance vs. collector-base voltage
Emitter inputcapacitance vs. emitter-base voltage

NPN Tr

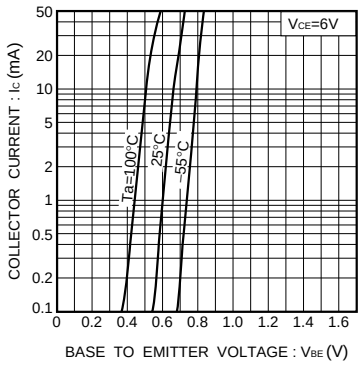


Fig.10 Grounded emitter propagation characteristics

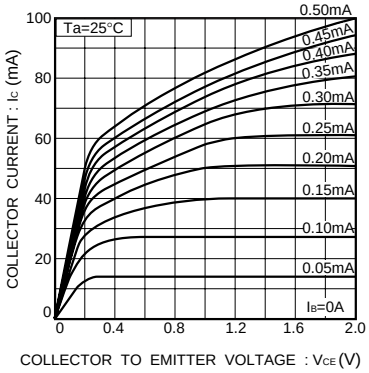


Fig.11 Grounded emitter output characteristics (I)

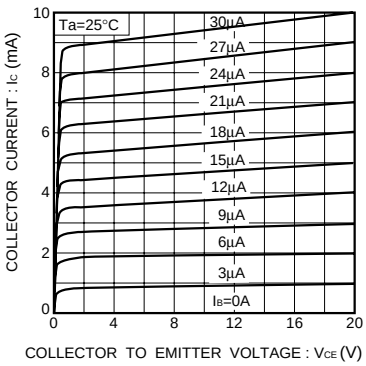


Fig.12 Grounded emitter output characteristics (II)

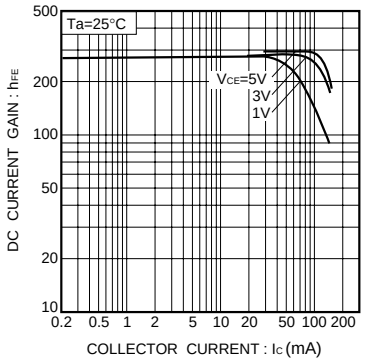


Fig.13 DC current gain vs. collector current (I)

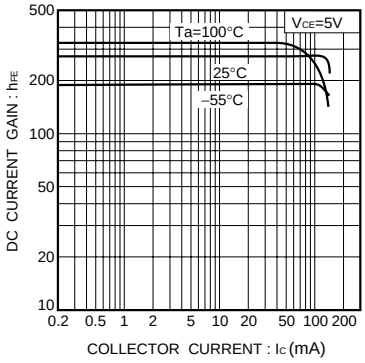


Fig.14 DC current gain vs. collector current (II)

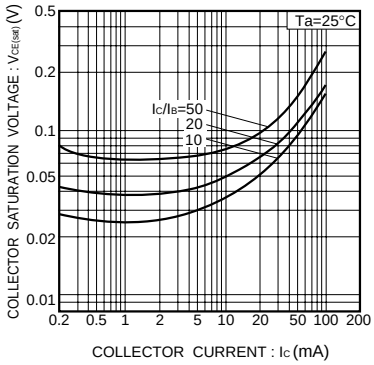


Fig.15 Collector-emitter saturation voltage vs. collector current

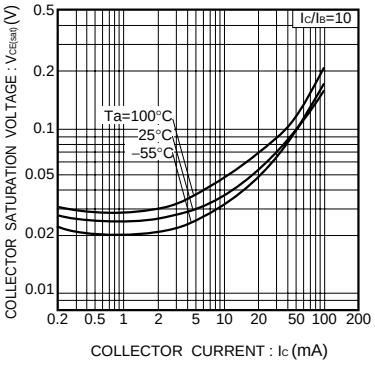


Fig.16 Collector-emitter saturation voltage vs. collector current (I)

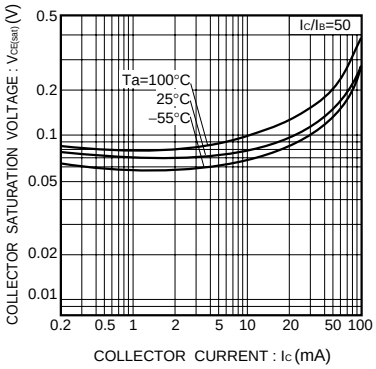


Fig.17 Collector-emitter saturation voltage vs. collector current (II)

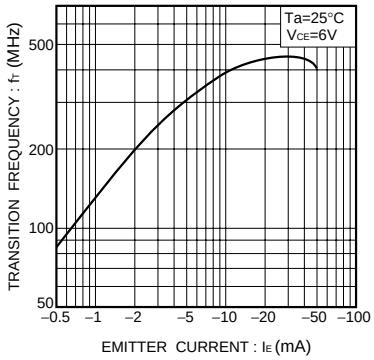


Fig.18 Gain bandwidth product vs. emitter current

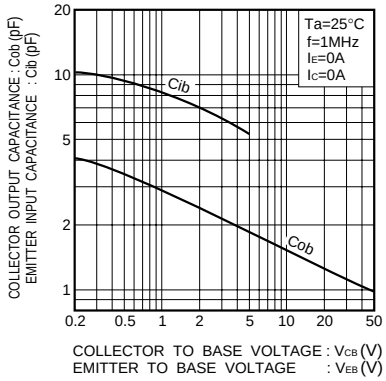


Fig.19 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

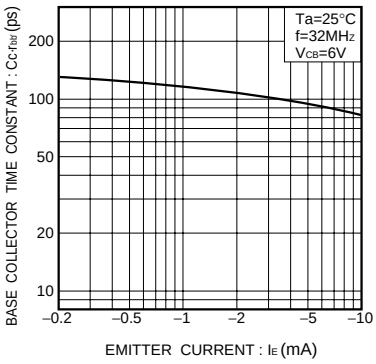


Fig.20 Base-collector time constant vs. emitter current

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