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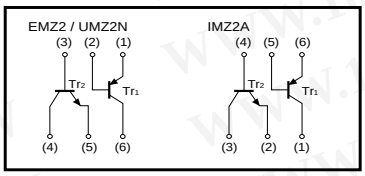
Power management (dual transistors)

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 Tr1	Limits Tr2	Unit	
Collector-base voltage		V_{CBO}	−60	60	V	
Collector-emitter voltage		V_{CEO}	−50	50	V	
Emitter-base voltage		V_{EBO}	−6	7	V	
Collector current		I_C	−150	150	mA	
Collector power dissipation	EMZ2, UMZ2N	P_C	150 (TOTAL)		mW	※1
	IMZ2A		300 (TOTAL)			※2
Junction temperature		Tj	150		°C	
Storage temperature		Tstg	−55 to +150		°C	

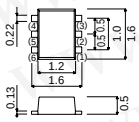
※1 120mW per element must not be exceeded.
※2 200mW per element must not be exceeded.

●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)

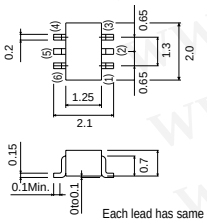
EMZ2



ROHM : EMT6

Each lead has same dimensions

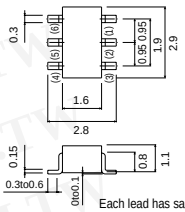
UMZ2N



ROHM : UMT6
EIAJ : SC-88

Each lead has same dimensions

IMZ2A



ROHM : SMT6
EIAJ : SC-74

Each lead has same dimensions

●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

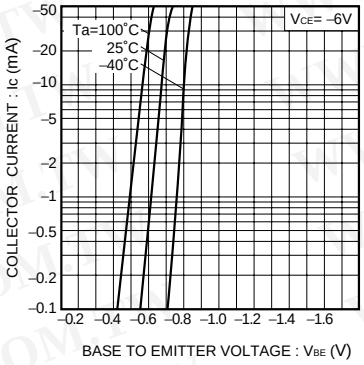


Fig.1 Grounded emitter propagation characteristics

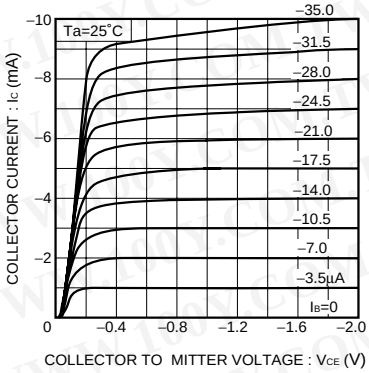


Fig.2 Grounded emitter output characteristics (I)

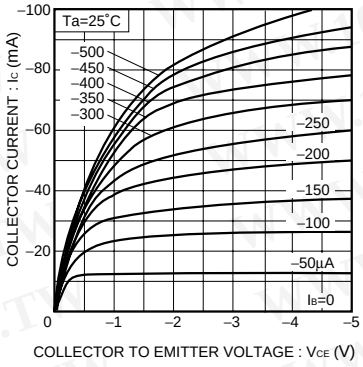


Fig.3 Grounded emitter output characteristics (II)

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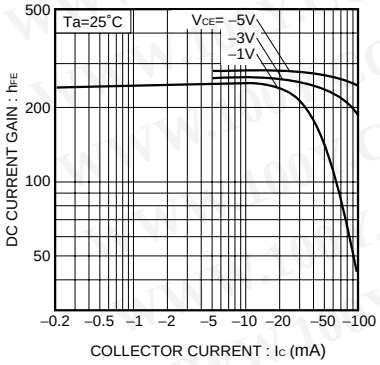

Fig.4 DC current gain vs. collector current (I)

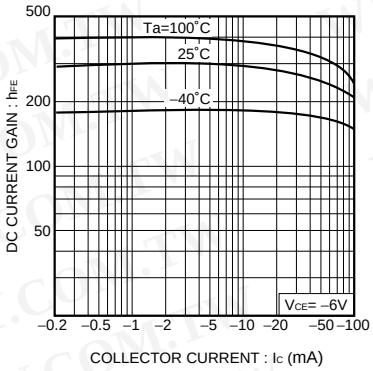

Fig.5 DC current gain vs. collector current (II)

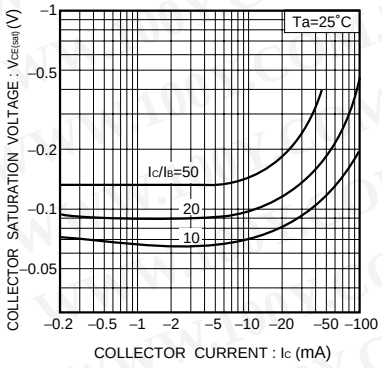

Fig.6 Collector-emitter saturation voltage vs. collector current (I)

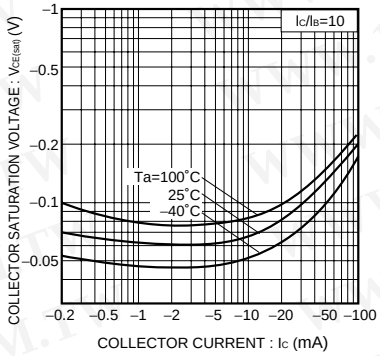

Fig.7 Collector-emitter saturation voltage vs. collector current (II)

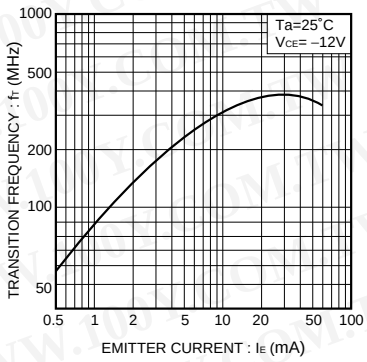

Fig.8 Gain bandwidth product vs. emitter current

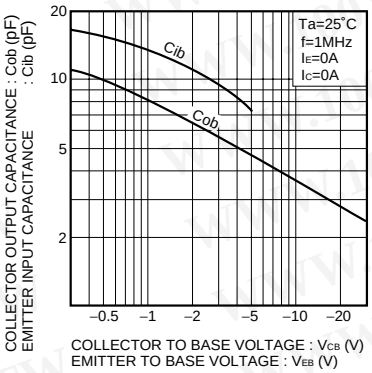

Fig.9 Collector output capacitance vs. collector-base voltage
Emitter inputcapacitance vs. emitter-base voltage

NPN Tr

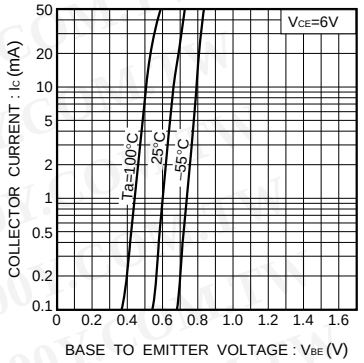

Fig.10 Grounded emitter propagation characteristics

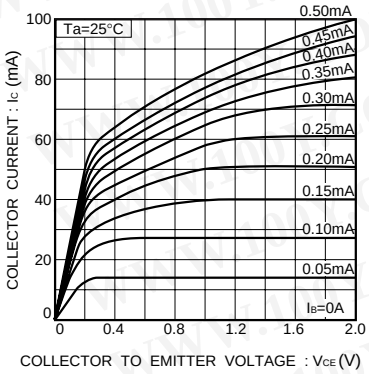

Fig.11 Grounded emitter output characteristics (I)

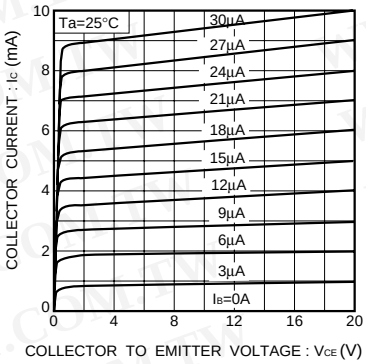

Fig.12 Grounded emitter output characteristics (II)

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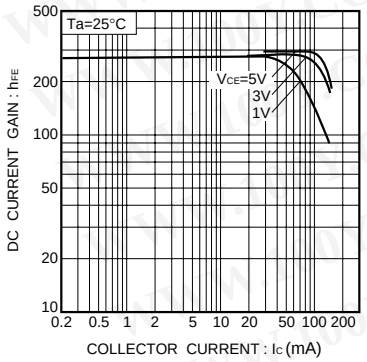

Fig.13 DC current gain vs. collector current (I)

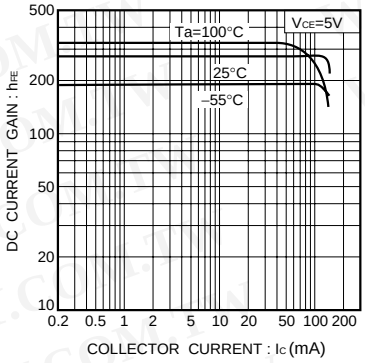

Fig.14 DC current gain vs. collector current (II)

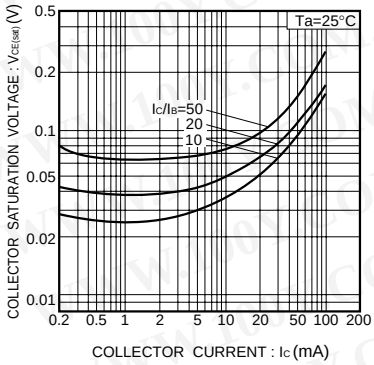

Fig.15 Collector-emitter saturation voltage vs. collector current

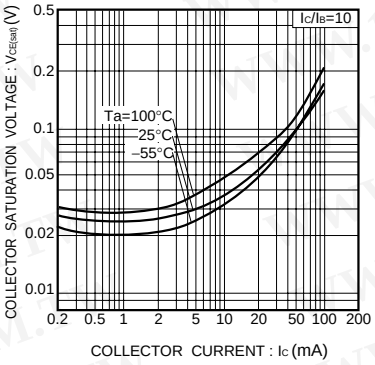

Fig.16 Collector-emitter saturation voltage vs. collector current (I)

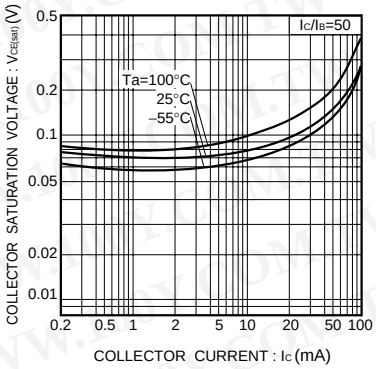

Fig.17 Collector-emitter saturation voltage vs. collector current (II)

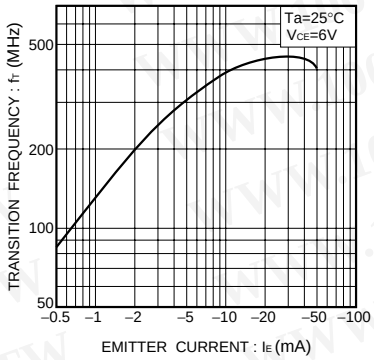

Fig.18 Gain bandwidth product vs. emitter current

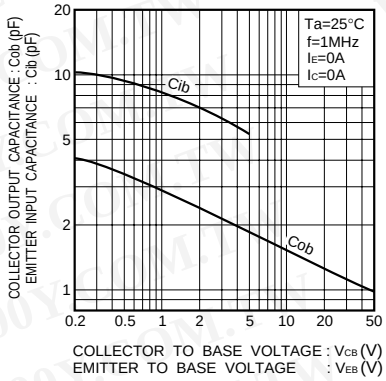

Fig.19 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

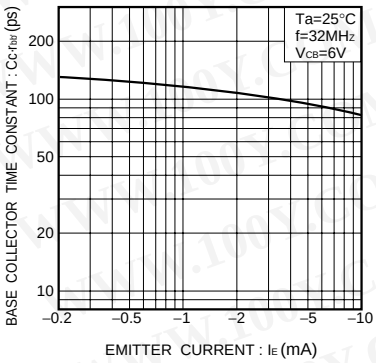

Fig.20 Base-collector time constant vs. emitter current

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