

# General purpose transistor (dual transistors)

## EMZ7/UMZ7N

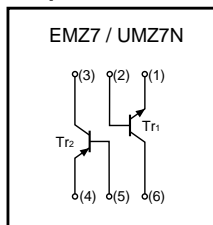
### ● Features

- 1) Both a 2SA2018 chip and 2SC5585 chip in a EMT or UMT package.
- 2) Mounting possible with EMT3 or UMT3 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.
- 5) Low  $V_{CE(sat)}$

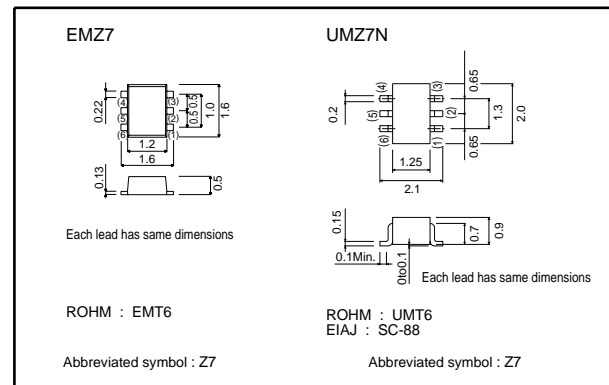
### ● Structure

NPN / PNP epitaxial planar silicon transistor

### ● Equivalent Circuit



### ● External dimensions (Unit : mm)



### ● Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Limits		Unit
		Tr1	Tr2	
Collector-base voltage	$V_{CBO}$	15	-15	V
Collector-emitter voltage	$V_{CEO}$	12	-12	V
Emitter-base voltage	$V_{EBO}$	6	-6	V
Collector current	$I_C$	500	-500	mA
	$I_{CP}$	1	-1	A
Collector power dissipation	$P_C$	150(TOTAL)		mW *1
Junction temperature	$T_J$	150		$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150		$^\circ\text{C}$

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

## Transistors

## ● Electrical characteristics (Ta=25°C)

## Tr1 (NPN)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	15	–	–	V	I <sub>C</sub> =10μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	12	–	–	V	I <sub>C</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EB0</sub>	6	–	–	V	I <sub>E</sub> =10μA
Collector cutoff current	I <sub>CB0</sub>	–	–	0.1	μA	V <sub>CB</sub> =15V
Emitter cutoff current	I <sub>EB0</sub>	–	–	0.1	μA	V <sub>EB</sub> =6V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	90	250	mV	I <sub>C</sub> /I <sub>B</sub> =200mA/10mA
DC current transfer ratio	h <sub>FE</sub>	270	–	680	–	V <sub>CE</sub> /I <sub>C</sub> =2V/10mA
Transition frequency	f <sub>T</sub>	–	320	–	MHz	V <sub>CE</sub> =2V, I <sub>C</sub> =–10mA, f=100MHz
Output capacitance	C <sub>ob</sub>	–	7.5	–	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz

## Tr2 (PNP)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	–15	–	–	V	I <sub>C</sub> =–10μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	–12	–	–	V	I <sub>C</sub> =–1mA
Emitter-base breakdown voltage	BV <sub>EB0</sub>	–6	–	–	V	I <sub>E</sub> =–10μA
Collector cutoff current	I <sub>CB0</sub>	–	–	–0.1	μA	V <sub>CB</sub> =–15V
Emitter cutoff current	I <sub>EB0</sub>	–	–	–0.1	μA	V <sub>EB</sub> =–6V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	–100	–250	mV	I <sub>C</sub> /I <sub>B</sub> =–200mA/–10mA
DC current transfer ratio	h <sub>FE</sub>	270	–	680	–	V <sub>CE</sub> /I <sub>C</sub> =–2V/–10mA
Transition frequency	f <sub>T</sub>	–	260	–	MHz	V <sub>CE</sub> =–2V, I <sub>C</sub> =10mA, f=100MHz
Output capacitance	C <sub>ob</sub>	–	6.5	–	pF	V <sub>CB</sub> =–10V, I <sub>E</sub> =0A, f=1MHz

## ● Packaging specifications

Part No.	Packaging type	Taping	
	Code	TR	T2R
	Basic ordering unit (pieces)	3000	8000
UMZ7N		○	–
EMZ7		–	○

Transistors

● Electrical characteristic curves

Tr1 (NPN)

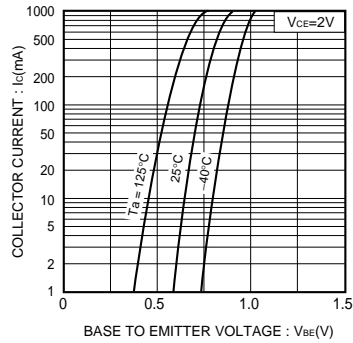


Fig.1 Grounded emitter propagation characteristics

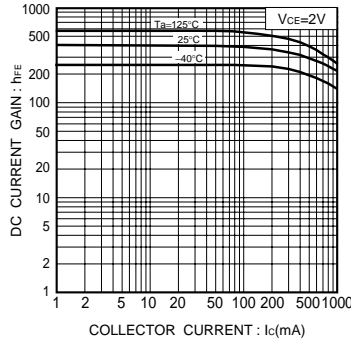


Fig.2 DC current gain vs. collector current

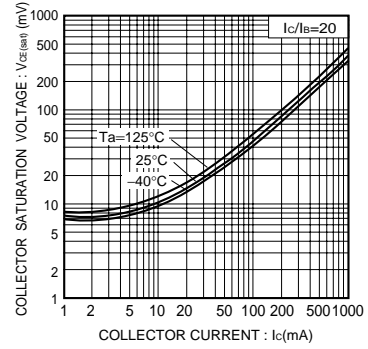


Fig.3 Collector-emitter saturation voltage vs. collector current ( I )

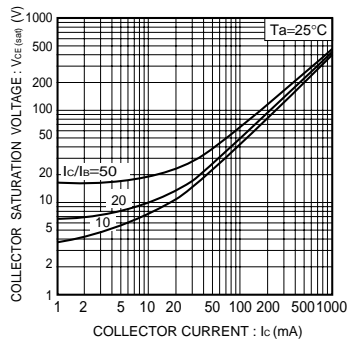


Fig.4 Collector-emitter saturation voltage vs. collector current ( II )

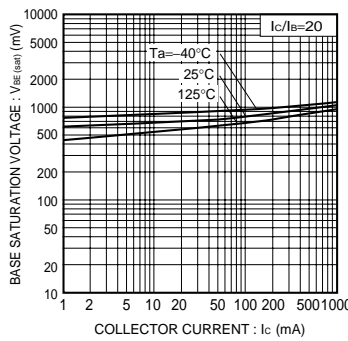


Fig.5 Base-emitter saturation voltage vs. collector current

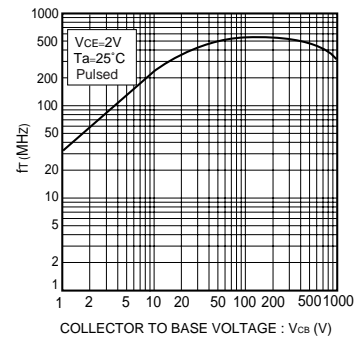


Fig.6 Collector output capacitance Emitter input capacitance vs. base voltage

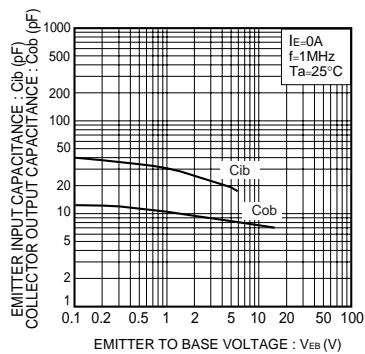


Fig.7 Collector output capacitance vs collector-base voltage Emitter input capacitance vs emitter-base voltage

Transistors

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

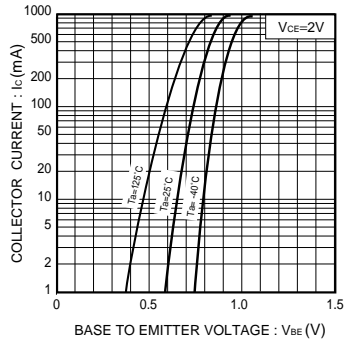


Fig.8 Grounded emitter propagation characteristics

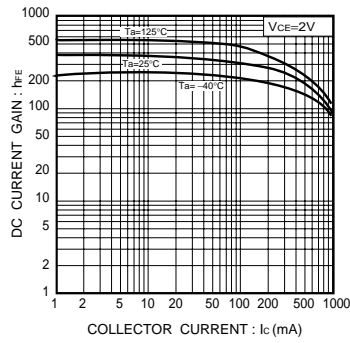


Fig.9 DC current gain vs. collector current

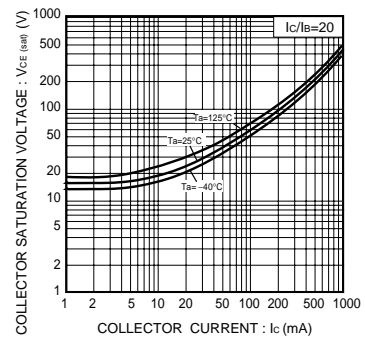


Fig.10 Collector-emitter saturation voltage vs. collector current (I)

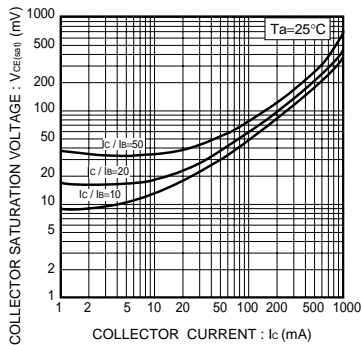


Fig.11 Collector-emitter saturation voltage vs. collector current

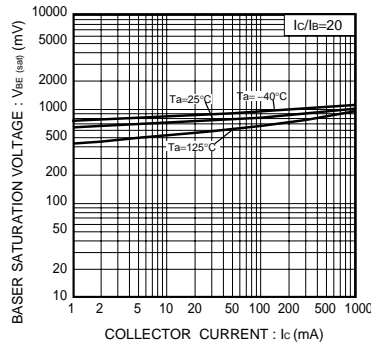


Fig.12 Base-emitter saturation voltage vs. collector current

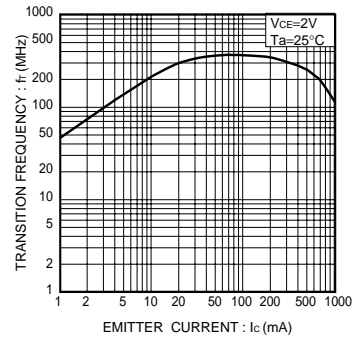


Fig.13 Gain bandwidth product vs. emitter current

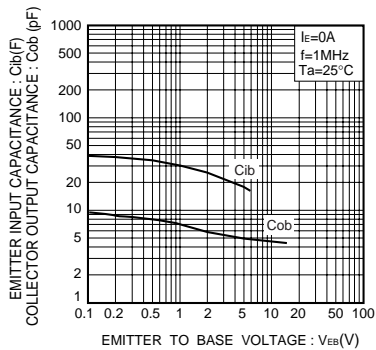


Fig.14 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

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