

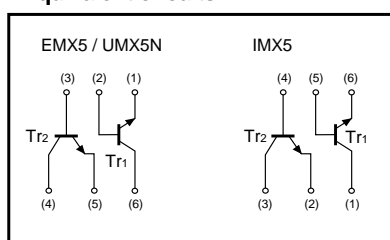
# High transition frequency (dual transistors)

## EMX5 / UMX5N / IMX5

### ●Features

- 1) Two 2SC3838K chips in a EMT or UMT or SMT package.
- 2) High transition frequency. ( $f_T=3.2\text{GHz}$ )
- 3) Low output capacitance. ( $C_{ob}=0.9\text{pF}$ )

### ●Equivalent circuits



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

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	20	V
Collector-emitter voltage	$V_{CE0}$	11	V
Emitter-base voltage	$V_{EB0}$	3	V
Collector current	$I_c$	50	mA
Collector power dissipation	EMX5 / UMX5N	150(TOTAL)	mW *1
	IMX5	300(TOTAL)	mW *2
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

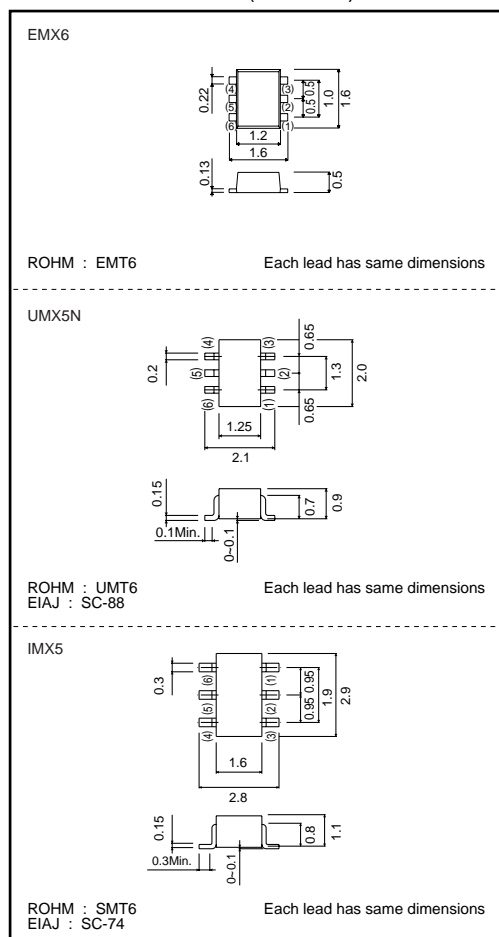
\*1 120mW per element must not be exceeded.

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

### ●Package, marking, and packaging specifications

Type	EMX5	UMX5N	IMX5
Package	EMT5	UMT6	SMT6
Marking	X5	X5	X5
Code	T2R	TR	T108
Basic ordering unit (pieces)	8000	3000	3000

### ●External dimensions (Unit : mm)



Transistors

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CB0</sub>	20	–	–	V	I <sub>C</sub> =10μA
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	11	–	–	V	I <sub>C</sub> =1mA
Emitter-base breakdown voltage	BV <sub>EB0</sub>	3	–	–	V	I <sub>E</sub> =10μA
Collector cutoff current	I <sub>CBO</sub>	–	–	0.5	μA	V <sub>CB</sub> =10V
Emitter cutoff current	I <sub>EBO</sub>	–	–	0.5	μA	V <sub>EB</sub> =2V
DC current transfer ratio	h <sub>FE</sub>	56	–	120	–	V <sub>CE</sub> /I <sub>C</sub> =10V/5mA
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	–	0.5	V	I <sub>C</sub> /I <sub>B</sub> =10mA/5mA
Transition frequency	f <sub>T</sub>	1.4	3.2	–	GHz	V <sub>CE</sub> /I <sub>E</sub> =10V/-10mA, f=500MHz *
Output capacitance	C <sub>ob</sub>	–	0.9	1.55	pF	V <sub>CB</sub> /f=10V/1MHz, I <sub>E</sub> =0A

\*Transition frequency of the device.

●Electrical characteristics curves

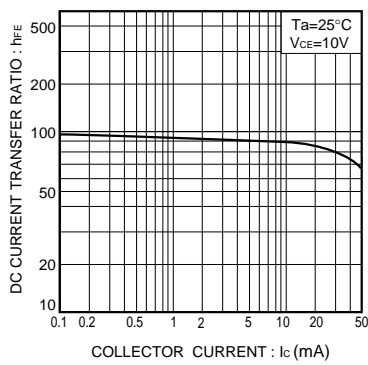


Fig.1 DC current gain vs. collector current

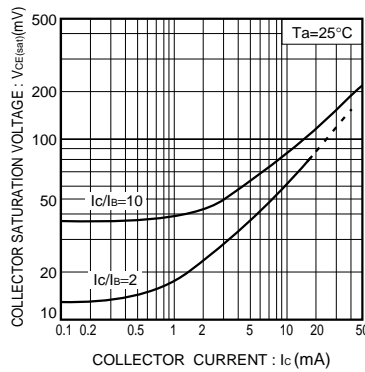


Fig.2 Collector-emitter saturation voltage vs. collector current

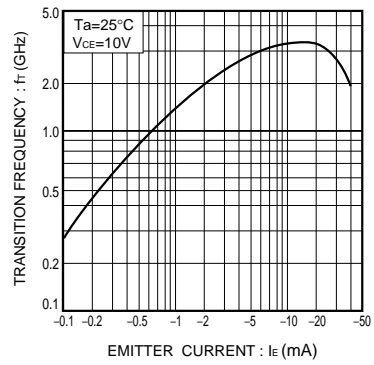


Fig.3 Gain bandwidth product vs. emitter current

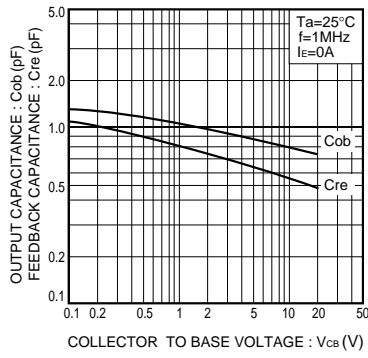


Fig.4 Capacitance vs. reverse bias voltage

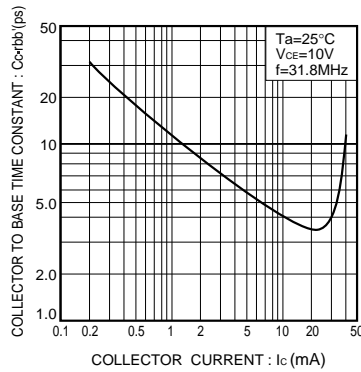


Fig.5 Collector to base time constant vs. collector current characteristics

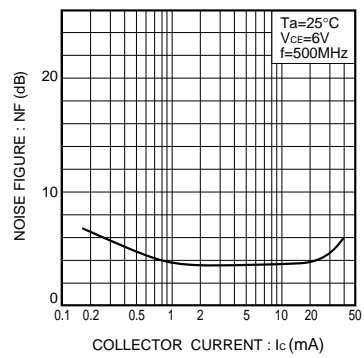


Fig.6 Noise factor vs. collector current characteristics

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