

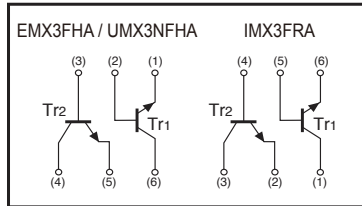
# General purpose (dual transistors)

## EMX3FHA / UMX3NFHA / IMX3FRA

### ●Features

Two 2SC2412AK chips in a EMT or UMT or SMT package.

### ●Inner circuits



### ●Package, marking, and packaging specifications

Type	EMX3FHA	UMX3NFHA	IMX3FRA
Package	EMT6	UMT6	SMT6
Marking	X3	X3	X3
Code	T2R	TR	T108
Basic ordering unit (pieces)	8000	3000	3000

### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	60	V
Collector-emitter voltage	$V_{CE0}$	50	V
Emitter-base voltage	$V_{EB0}$	7	V
Collector current	$I_C$	150	mA
Collector power dissipation	EMX3FHA / UMX3NFHA	150(TOTAL)	mW *1
	IMX3FRA	300(TOTAL)	mW *2
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

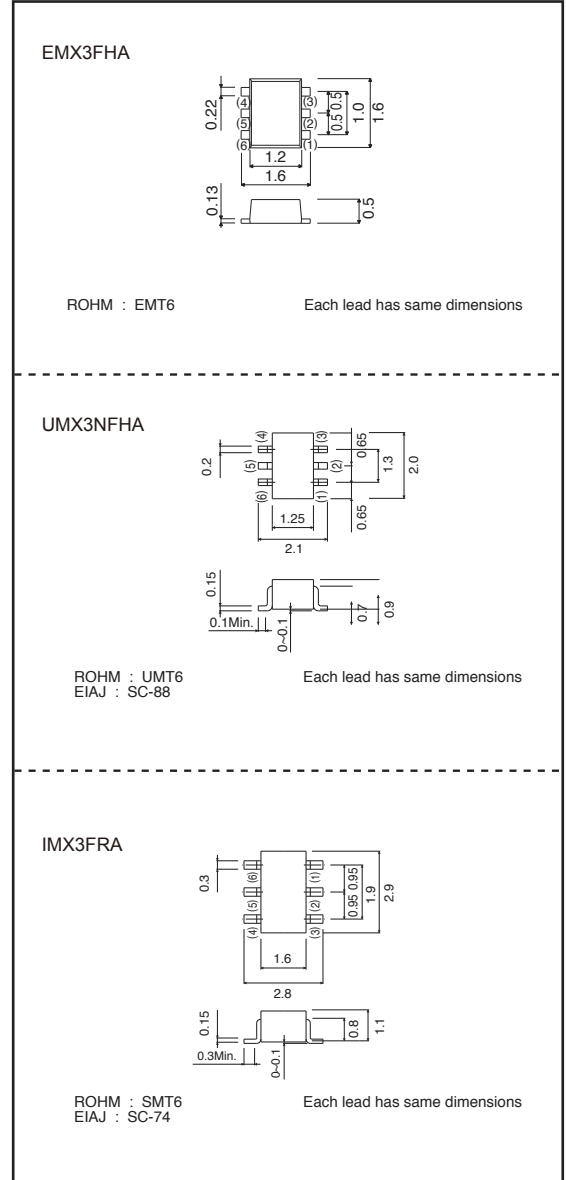
\*1 120mW per element must not be exceeded.  
\*2 200mW per element must not be exceeded.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	60	-	-	V	$I_C=50\mu A$
Collector-emitter breakdown voltage	$BV_{CE0}$	50	-	-	V	$I_C=1mA$
Emitter-base breakdown voltage	$BV_{EB0}$	7	-	-	V	$I_E=50\mu A$
Collector cutoff current	$I_{CB0}$	-	-	0.1	$\mu A$	$V_{CB}=60V$
Emitter cutoff current	$I_{EB0}$	-	-	0.1	$\mu A$	$V_{EB}=7V$
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	$C_{ob}$	-	2	3.5	pF	$V_{CB}=12V, I_E=0mA, f=1MHz$

\*Transition frequency of the device.

### ●Dimensions (Unit : mm)



●Electrical characteristics curves

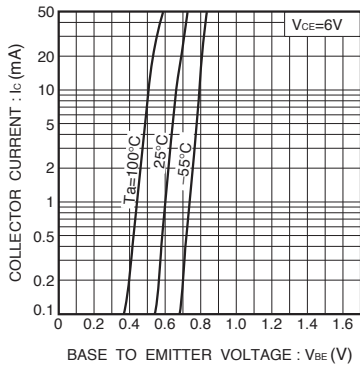


Fig.1 Grounded emitter propagation characteristics

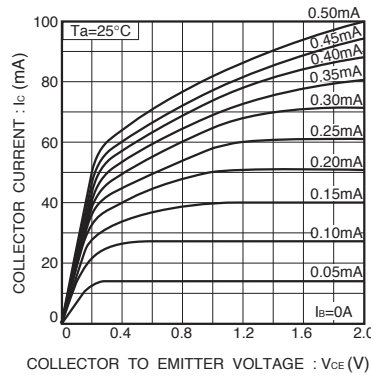


Fig.2 Grounded emitter output characteristics ( I )

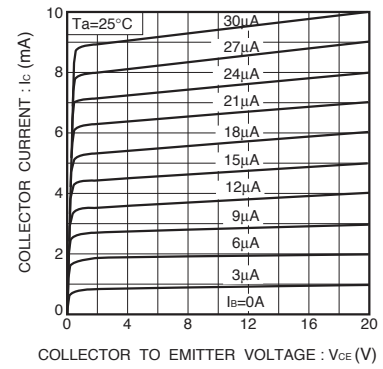


Fig.3 Grounded emitter output characteristics ( II )

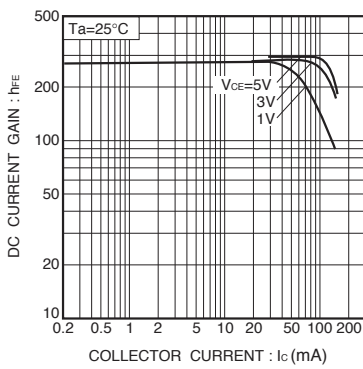


Fig.4 DC current gain vs. collector current ( I )

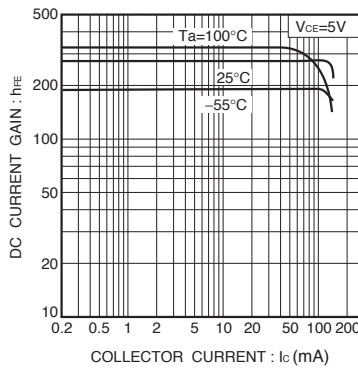


Fig.5 DC current gain vs. collector current ( II )

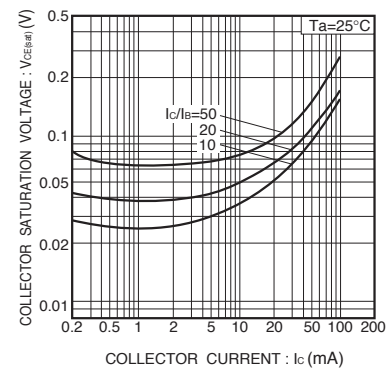


Fig. 6 Collector-emitter saturation voltage vs. collector current

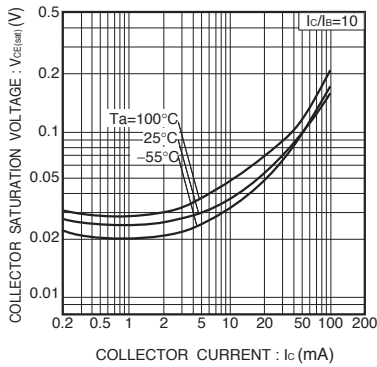


Fig.7 Collector-emitter saturation voltage vs. collector current ( I )

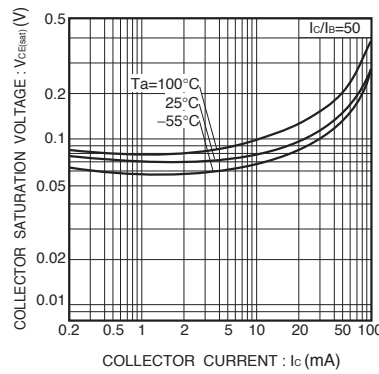


Fig.8 Collector-emitter saturation voltage vs. collector current ( II )

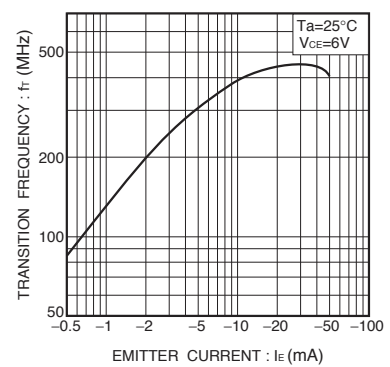


Fig.9 Gain bandwidth product vs. emitter current

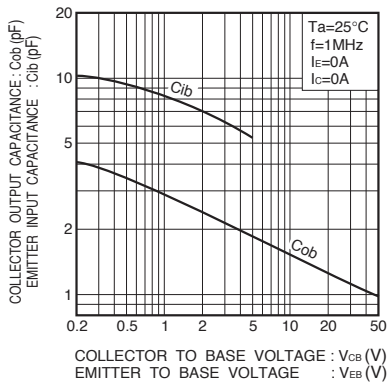


Fig.10 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

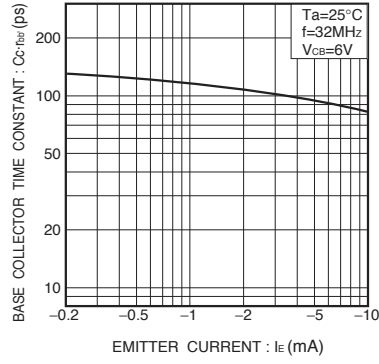


Fig.11 Base-collector time constant vs. emitter current

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