Datasheet

General purpose transistor (dual transistors)

Parameter	Tr1 and Tr2
$V_{\sf CEO}$	-50V
I _C	-150mA

Features

- 1) Two 2SA1037AK chips in a EMT, UMT or SMT package.
- 2) Mounting possible with EMT3, UMT3 or SMT3 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

Outline



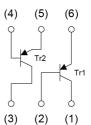
•Inner circuit

EMT2 / UMT2N

- (1) Tr1 Emitter
- (2) Tr2 Emitter
- (3) Tr2 Base
- (4) Tr2 Collector
- (5) Tr1 Base
- (6) Tr1 Collector

IMT2A

- (1) Tr1 Collector
- (2) Tr1 Base
- (3) Tr2 Collector
- (4) Tr2 Base
- (5) Tr2 Emitter
- (6) Tr1 Emitter



Application

GENERAL PURPOSE SMALL SIGNAL AMPLIFIER

Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
EMT2	EMT6	1616	T2R	180	8	8000	T2
UMT2N	UMT6	2021	TR	180	8	3000	T2
IMT2A	SMT6	2928	T108	180	8	3000	T2

● **Absolute maximum ratings** (T_a = 25°C)

<For Tr1 and Tr2 in common>

Parameter			Values	Unit
Collector-base voltage			-60	V
Collector-emitter voltage		V _{CEO}	-50	V
Emitter-base voltage			-6	V
Collector current		I _C	-150	mA
Davis dissination	EMT2/ UMT2N	P _D *1*2	150	mW/Total
Power dissipation	IMT2A	P _D *1*3	300	mW/Total
Junction temperature		T _j	150	°C
Range of storage temperature		T _{stg}	-55 to +150	°C

● Electrical characteristics (T_a = 25°C)

<For Tr1 and Tr2 in common>

Downwater	Cymahal	Conditions	Values			I limit
Parameter	Symbol Conditions —		Min.	Тур.	Max.	Unit
Collector-base breakdown voltage	BV _{CBO}	I _C = -50μA	-60	1	1	V
Collector-emitter breakdown voltage	BV _{CEO}	I _C = -1mA	-50	1	1	V
Emitter-base breakdown voltage	BV _{EBO}	I _E = -50μA	-6	1	1	V
Collector cut-off current	I _{CBO}	V _{CB} = -60V	1	1	-100	nA
Emitter cut-off current	I _{EBO}	V _{EB} = -6V	-	1	-100	nA
Collector-emitter saturation voltage	V _{CE(sat)}	$I_C = -50 \text{mA}, I_B = -5 \text{mA}$	-	1	-500	mV
DC current gain	h _{FE}	$V_{CE} = -6V, I_{C} = -1mA$	120	1	560	-
Transition frequency	f _T	$V_{CE} = -12V, I_{E} = 2mA,$ f = 100MHz	-	140	-	MHz
Output capacitance	C _{ob}	V _{CB} = -12V, I _E = 0A, f = 1MHz	-	4.0	5.0	pF

^{*1} Each terminal mounted on a reference land.

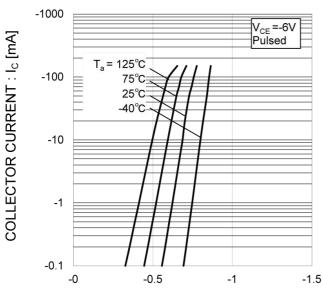
^{*2 120}mW per element must not be exceeded.

^{*3 200}mW per element must not be exceeded.

● Electrical characteristic curves (T_a = 25°C)

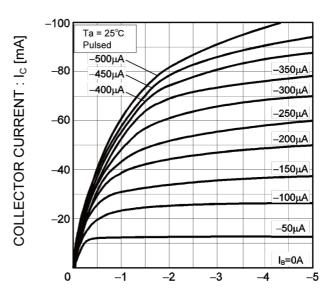
<For Tr1 and Tr2 in common>

Fig.1 Ground Emitter Propagation Characteristics



BASE TO EMITTER VOLTAGE : $V_{BE}\left[V\right]$

Fig.2 Grounded Emitter Output Characteristics



COLLECTOR TO EMITTER VOLTAGE: V_{CE} [V]

Fig.3 DC Current Gain vs. Collector Current (I)

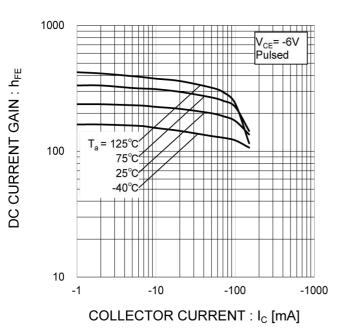
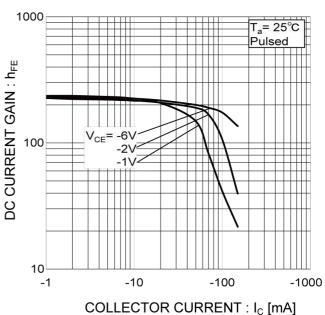


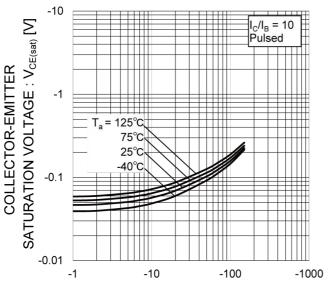
Fig.4 DC Current Gain vs. Collector Current (II)



● Electrical characteristic curves (T_a = 25°C)

<For Tr1 and Tr2 in common>

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current(I)



COLLECTOR CURRENT: Ic [mA]

Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current(II)

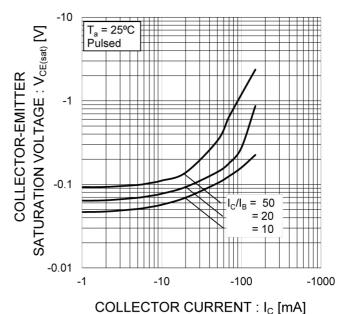


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current (I)

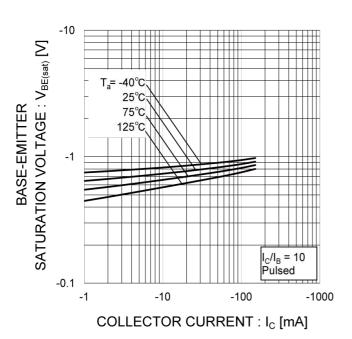
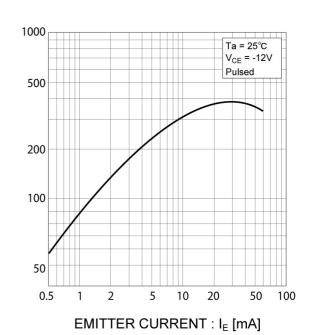


Fig.8 Gain Bandwith Product vs.
Emitter Current



TRANSITION FREQUENCY : fr [MHz]

● Electrical characteristic curves (T_a =25°C)

<For Tr1 and Tr2 in common>

Fig.9 Collector Output Capacitance vs.
Collector-Base Voltage
Emitter Input Capacitance vs.
Emitter-Base Voltage

COLLECTOR OUTPUT CAPACITANCE : C_{ob} [pF] EMITTER INPUT CAPACITANCE: Cip [pF] 20 Ta= 25°C f=1MHz I_E=0A I_C=0A 10 Cob 2 -0.5 -2 -5 -10 -20 COLLECTOR-BASE VOLTAGE: V_{CB} [V]

EMITTER-BASE VOLTAGE: VEB [V]

Fig.10 Safe Operating Area

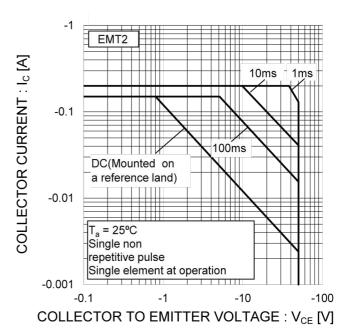


Fig.11 Safe Operating Area

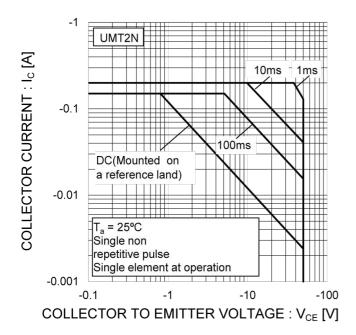
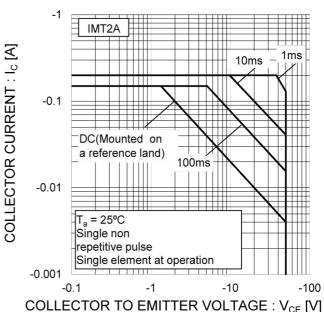
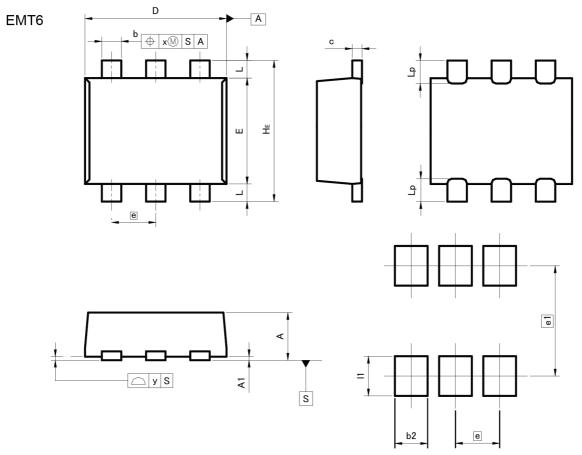


Fig.12 Safe Operating Area



Dimensions



Pattern of terminal position areas [Not a recommended pattern of soldering pads]

			I		
DIM	MILIM	MILIMETERS		HES	
DIM	MIN	MAX	MIN	MAX	
Α	0.45	0.55	0.018	0.022	
A1	0.00	0.10	0.000	0.004	
b	0.17	0.27	0.007	0.011	
С	0.08	0.18	0.003	0.007	
D	1.50	1.70	0.059	0.067	
E	1.10	1.30	0.043	0.051	
е	0.	50	0.020		
HE	1.50	1.70	0.059	0.067	
L	0.10	0.30	0.004	0.012	
Lp	=	0.35	-	0.014	
х	_	0.10	-	0.004	
У	_	0.10	:-	0.004	

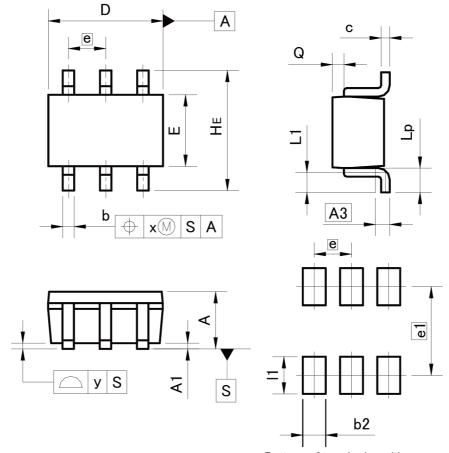
	DIM	MILIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX		
	b2	1	0.37	Ü	0.015	
	e1	1.25		0.0	49	
	11	- 0.45		I	0.018	

Dimension in mm/inches



Dimensions

UMT6



Pattern of terminal position areas [Not a recommended pattern of soldering pads]

DIM	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.:	25	0.0	10
b	0.15	0.30	0.006	0.012
С	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.	65	0.026	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
х	_	0.10	_	0.004
у	_	0.10	_	0.004

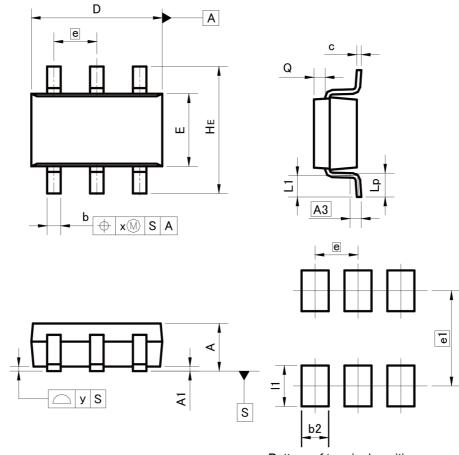
	DIM	MILIMETERS		INCHES		
DIM		MIN	MAX	MIN	MAX	
	b2	-	0.40	_	0.016	
	e1	1.9	55	0.0	61	
	11	- 0.65		_	0.026	

Dimension in mm/inches



Dimensions

SMT6



Pattern of terminal position areas [Not a recommended pattern of soldering pads]

DIM	MILIMI	ETERS	INC	HES
ואונט	MIN	MAX	MIN	MAX
Α	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.3	25	0.0	10
b	0.25	0.40	0.010	0.016
С	0.09	0.25	0.004	0.010
D	2.80	3.00	0.110	0.118
E	1.50	1.80	0.059	0.071
е	0.9	95	0.037	
HE	2.60	3.00	0.102	0.118
L1	0.30	0.60	0.012	0.024
Lp	0.40	0.70	0.016	0.028
Q	0.20	0.30	0.008	0.012
х	1	0.20	1	0.008
У	=	0.10	-	0.004
			I	
DIM -	MILIMI		INC	and and the second second second
	MIN	MAX	MIN	MAX
b2		0.60	_	0.024
e1	2.10		0.083	
11	-	0.90	-	0.035

Dimension in mm/inches



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