General Purpose Transistor (Dual Transistor)

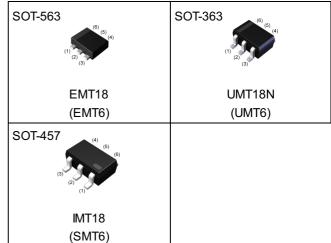
Datasheet

Parameter	Tr1 and Tr2
$V_{\sf CEO}$	-12V
I _C	-500mA

Features

- 1)Two 2SA2018 chips in a EMT or UMT or SMT package.
- 2)Mounting possible with EMT3 or UMT3 or SMT3 automatic mounting machines.
- 3)Transistor elements are independent, eliminating interference.

Outline



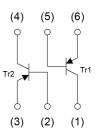
•Inner circuit

EMT18 / UMT18N

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

IMT18

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



Application

LOW FREQUENCY AMPLIFIER, DRIVER

Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
EMT18	SOT-563 (EMT6)	1616	T2R	180	8	8000	T18
UMT18N	SOT-363 (UMT6)	2021	TR	180	8	3000	T18
IMT18	SOT-457 (SMT6)	2928	T108	180	8	3000	T18

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

<It is the same ratings for the Tr1 and Tr2>

Parameter			Values	Unit
Collector-base voltage			-15	V
Collector-emitter voltage			-12	V
Emitter-base voltage			-6	V
			-500	mA
Collector current		I _{CP} *1	-1	Α
Power dissipation EMT18/ UMT18N IMT18		P _D *2*3	150	mW/Total
		P _D *2*4	300	mW/Total
Junction temperature			150	°C
Range of storage temperature			-55 to +150	°C

● Electrical characteristics (T_a = 25°C)

<It is the same characteristics for the Tr1 and Tr2>

Darameter	Cumabal	Conditions	Values			Linit	
Parameter	Symbol Conditions —		Min.	Тур.	Max.	Unit	
Collector-base breakdown voltage	BV_CBO	I _C = -10μA	-15	-	-	V	
Collector-emitter breakdown voltage	BV _{CEO}	I _C = -1mA	-12	-	-	V	
Emitter-base breakdown voltage	BV_{EBO}	I _E = -10μA	-6	-	-	V	
Collector cut-off current	I _{CBO}	V _{CB} = -15V	-	-	-100	nA	
Emitter cut-off current	I _{EBO}	V _{EB} = -6V	1	-	-100	nA	
Collector-emitter saturation voltage	V _{CE(sat)}	I _C = -200mA, I _B = -10mA	1	-100	-250	mV	
DC current gain	h _{FE}	$V_{CE} = -2V, I_{C} = -10mA$	270	-	680	-	
Transition frequency	f_T	$V_{CE} = -2V, I_{E} = 10mA,$ f = 100MHz	-	260	-	MHz	
Output capacitance	C _{ob}	V _{CB} = -10V, I _E = 0A, f = 1MHz	-	6.5	-	pF	

^{*1} Pw=1ms Single Pulse

^{*2} Each terminal mounted on a reference land

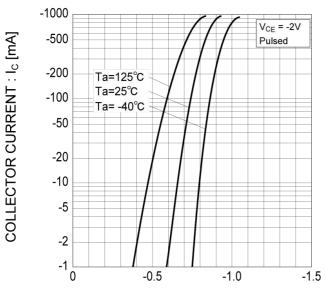
^{*3 120}mW per element must not be exceeded.

^{*4 200}mW per element must not be exceeded.

● Electrical characteristic curves (T_a = 25°C)

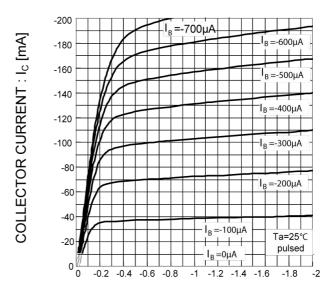
<For Tr1 and Tr2 in common>

Fig.1 Grounded emitter propagation characteristics



BASE TO EMITTER VOLTAGE : V_{BE} [V]

Fig.2 Typical output characteristics



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

Fig.3 DC current gain vs. collector current (I)

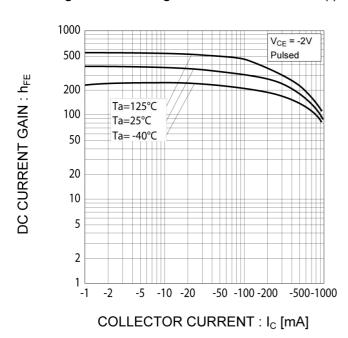
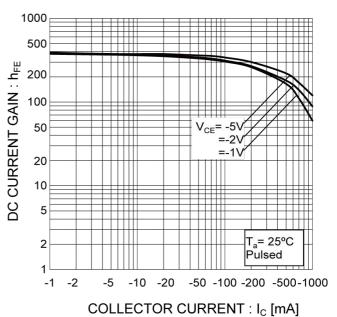


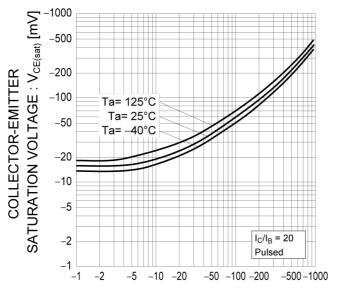
Fig.4 DC current gain vs. collector current (II)



● Electrical characteristic curves (T_a = 25°C)

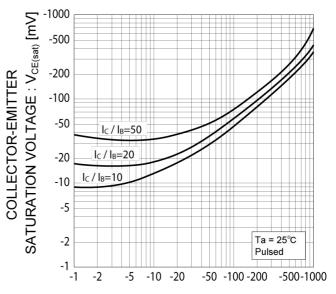
<For Tr1 and Tr2 in common>

Fig.5 Collector-emitter saturation voltage vs. collector current (I)



COLLECTOR CURRENT: Ic [mA]

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



COLLECTOR CURRENT: Ic [mA]

Fig.7 Base-emitter saturation voltage vs. collector current

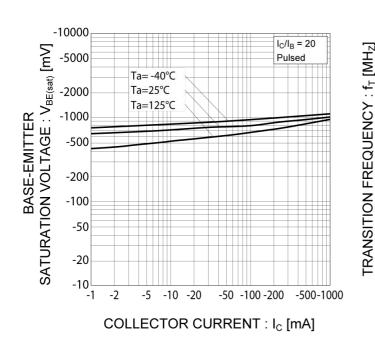
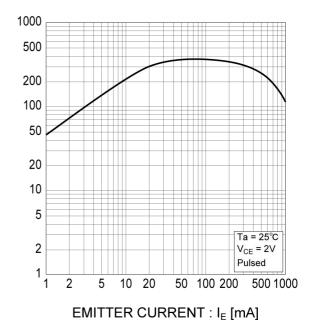


Fig.8 Gain bandwidth product vs. emitter current



● 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

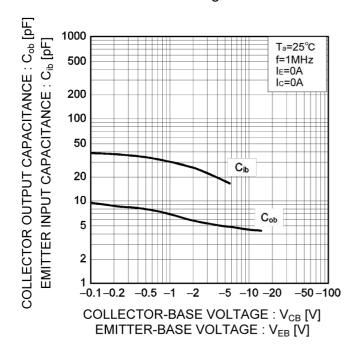


Fig.10 Safe Operating Area

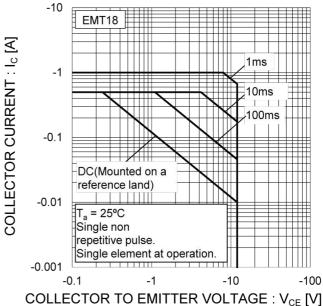


Fig.11 Safe Operating Area

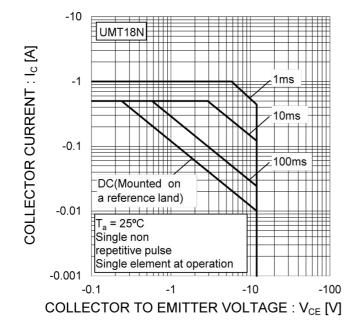
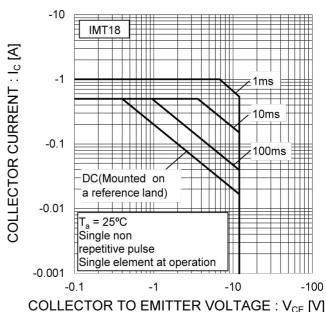
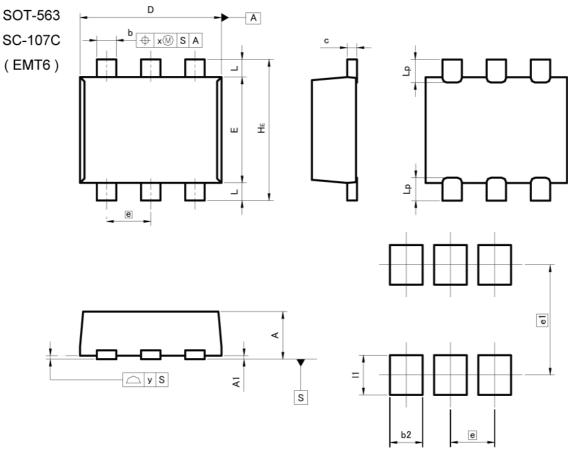


Fig.12 Safe Operating Area



Dimensions



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

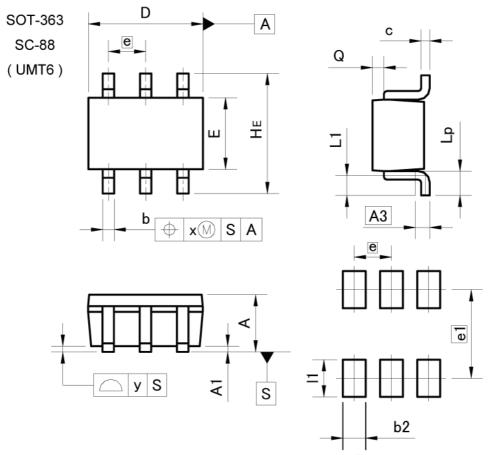
DIM L	MILIM	ETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
Α	0.45	0.55	0.018	0.022	
A1	0.00	0.10	0.000	0.004	
b	0.17	0.27	0.007	0.011	
С	0.08	0.18	0.003	0.007	
D	1.50	1.70	0.059	0.067	
E	1.10	1.30	0.043	0.051	
е	0.9	50	0.0	0.020	
HE	1.50	1.70	0.059	0.067	
L	0.10	0.30	0.004	0.012	
Lp		0.35		0.014	
x	20	0.10	720	0.004	
У	-	0.10	-	0.004	

DIM -	MILIMETERS		INC	HES
DIM L	MIN	MAX	MIN	MAX
b2	= 8	0.37	-	0.015
e1	1.	1.25		049
11	_	0.45	-	0.018

Dimension in mm/inches



Dimensions



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

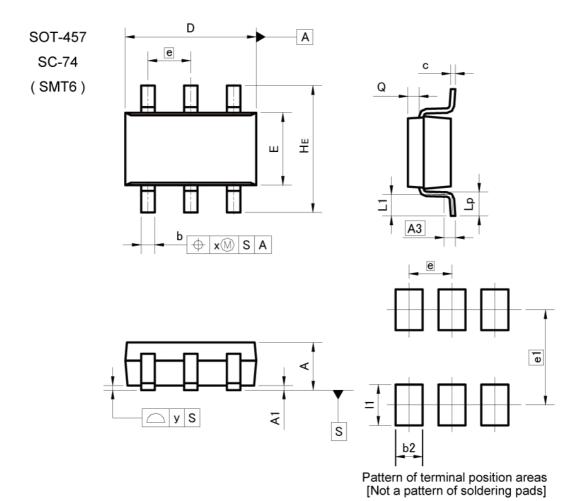
DIM	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.	25	0.0	10
b	0.15	0.30	0.006	0.012
С	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.	65	0.0	26
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
х	=-	0.10	47	0.004
у	 -22	0.10	9 7.	0.004

DIM	MILIMETERS		INC	HES
DIW	MIN	MAX	MIN	MAX
b2	- 4	0.40) =	0.016
e1	1.	1.55		061
11		0.65		0.026

Dimension in mm/inches



Dimensions



DIM -	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.	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.	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
x	550	0.20	50)	0.008
У	750	0.10	=:	0.004

DIM -	MILIMETERS		INC	INCHES	
DIM	MIN	MAX	MIN	MAX	
b2		0.60	57/2	0.024	
e1	2.	2.10		083	
11	=1	0.90	77 2	0.035	

Dimension in mm/inches



Notes

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Notice

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JAPAN	USA	EU	CHINA
CLASSⅢ	CLASSIII	CLASS II b	CLASSⅢ
CLASSIV	CLASSIII	CLASSⅢ	CLASSIII

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 - [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure
- 3. Our Products are designed and manufactured for use under standard conditions and not under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc, prior to use, must be necessary:
 - [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
 - [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
 - [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
 - [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Sealing or coating our Products with resin or other coating materials
 - [g] Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
 - [h] Use of the Products in places subject to dew condensation
- 4. The Products are not subject to radiation-proof design.
- 5. Please verify and confirm characteristics of the final or mounted products in using the Products.
- 6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- 7. De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta). When used in sealed area, confirm the actual ambient temperature.
- 8. Confirm that operation temperature is within the specified range described in the product specification.
- 9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

- 1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

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- 1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
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Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of lonizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

- 1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
 - [a] the Products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
 - [b] the temperature or humidity exceeds those recommended by ROHM
 - [c] the Products are exposed to direct sunshine or condensation
 - [d] the Products are exposed to high Electrostatic
- Even under ROHM recommended storage condition, solderability of products out of recommended storage time period
 may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is
 exceeding the recommended storage time period.
- 3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
- 4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

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Notice-PGA-E Rev.001

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Rev.001

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