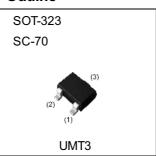


General Purpose Transistor (50V, 150mA)

Parameter	Value
V _{CEO}	50V
Ι _C	150mA



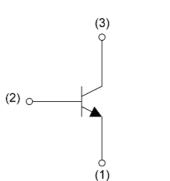
Inner circuit



Features

1)High DC current gain.

- 2)High emitter-base voltage. (V_{CBO}=12V)
- 3)Low saturation voltage.
 - (Max. $V_{CE(sat)}$ =300mV at I_C/ I_B=50mA/5mA)



(1) Emitter(2) Base(3) Collector

Application

LOW FREQUENCY AMPLIFIER

Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SD2351	SOT-323 (UMT3)	2021	T106	180	8	3000	BJ

● Absolute maximum ratings (T_a = 25°C)

Parameter	Symbol	Values	Unit
Collector-base voltage	V _{CBO}	60	V
Collector-emitter voltage	V _{CEO}	50	V
Emitter-base voltage	V _{EBO}	12	V
	I _C	150	mA
Collector current	I _{CP} *1	200	mA
Power dissipation	P _D *2	200	mW
Junction temperature	Tj	150	°C
Range of storage temperature	T _{stg}	-55 to +150	°C

•Electrical characteristics ($T_a = 25^{\circ}C$)

Deremeter	Cumph of	Conditions	Values			Unit	
Parameter	Symbol	bol Conditions -		Min. Typ.		Onit	
Collector-base breakdown voltage	BV _{CBO}	BV _{CBO} I _C = 10μA		-	-	V	
Collector-emitter breakdown voltage	BV _{CEO}	BV _{CEO} I _C = 1mA		-	-	V	
Emitter-base breakdown voltage	BV _{EBO}	Ι _Ε = 10μΑ	12	-	-	V	
Collector cut-off current	I_{CBO} $V_{CB} = 50V$		-	-	300	nA	
Emitter cut-off current	I _{EBO}	V _{EB} = 12V	-	-	300	nA	
Collector-emitter saturation voltage	V _{CE(sat)}	I _C = 50mA, I _B = 5mA	-	-	300	mV	
DC current gain	h _{FE}	V _{CE} = 5V, I _C = 1mA	820	-	2700	-	
Transition frequency	f _T	V _{CE} = 5V, I _E = -10mA, f = 100MHz	-	250	-	MHz	
Output capacitance	$C_{ob} \qquad \begin{array}{l} V_{CB} = 5V, I_E = 0A, \\ f = 1MHz \end{array}$		-	3.5	-	pF	

hFE values are calssified as follows :

rank	V	W	-	-	-
h _{FE}	820-1800	1200-2700	-	-	-

*1 Pw=10ms, Single Pulse

*2 Each terminal mounted on a reference land.



• Electrical characteristic curves(T_a = 25°C)

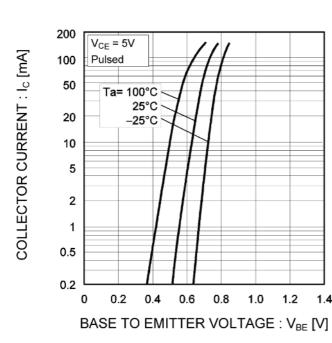


Fig.1 Ground Emitter Propagation Characteristics

200 500µА 450µА 400µА 350µА 300µА 250µА COLLECTOR CURRENT : I_c [mA] 200µA 160 150µA 100µA 120 80 50µA 40 Ta= 25°C Pulsed I_B=0A 0 0 4 8 12 16 20

Fig.2 Typical Output Characteristics

COLLECTOR TO EMITTER VOLTAGE : $V_{\text{CE}}\left[V\right]$

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

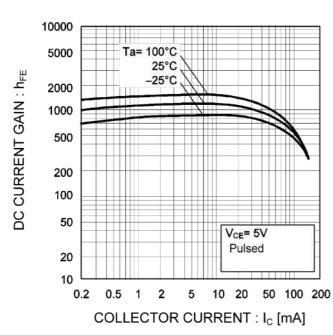
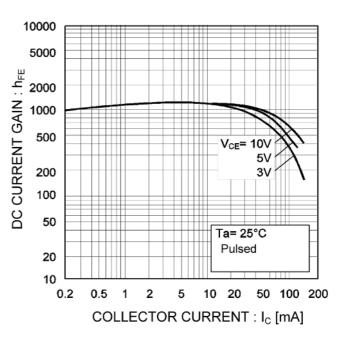


Fig.4 DC Current Gain vs. Collector Current (II)





•Electrical characteristic curves(T_a = 25°C)

vs. Collector Current (I)

Fig.5 Collector-Emitter Saturation Voltage

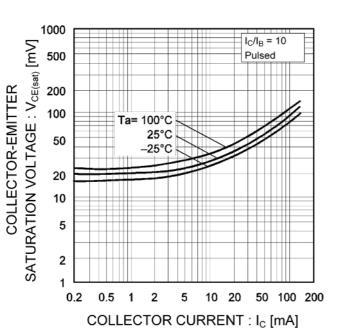


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

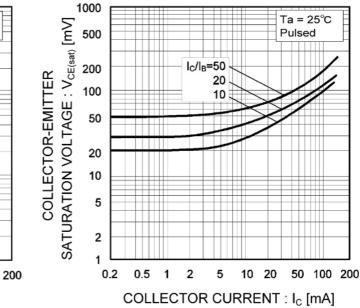


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

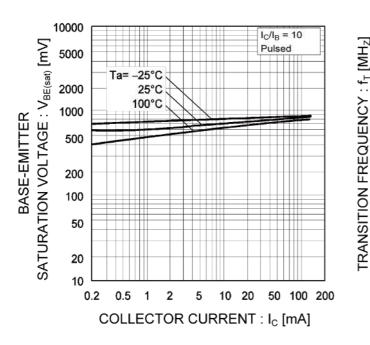
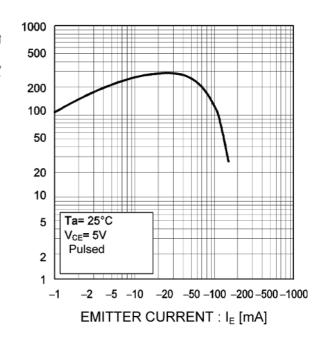


Fig.8 Gain Bandwidth Product vs. Emitter Current



● Electrical characteristic curves(T_a = 25°C)

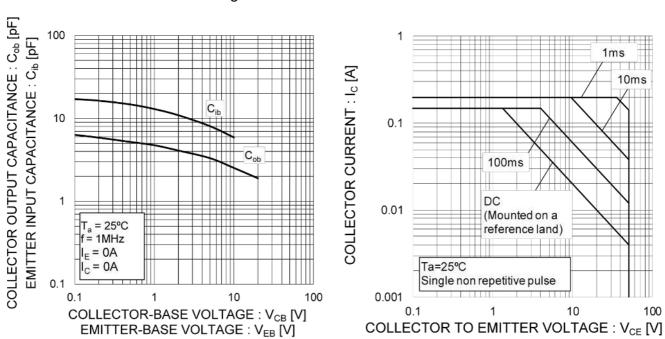
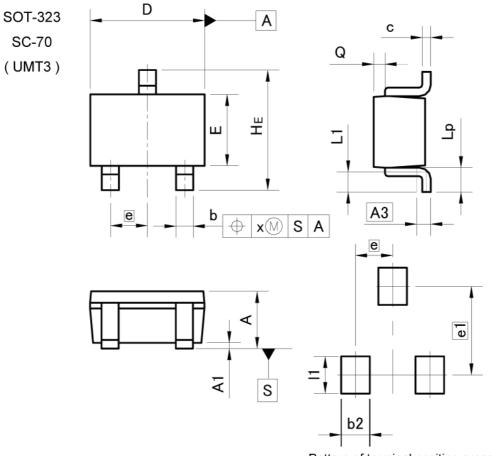


Fig.10 Safe Operating Area

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



Dimensions



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

DIM	MILIM	ETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
A	0.80	1.00	0.031	0.039	
A1	0.00	0.10	0	0.004	
A3	0.2	25	0.0	D1	
b	0.25	0.40	0.01	0.016	
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	0.0	65	0.03		
HE	2.00	2.20	0.079	0.087	
L1	0.20	0.50	0.008	0.02	
Lp	0.25	0.55	0.01	0.022	
Q	0.10	0.30	0.004	0.012	
x	_	0.10	_	0.004	

DIM	MILIMETERS		INCHES	
DIW	MIN	MAX	MIN	MAX
e1	1.55		0.06	
b2	-	0.50	L	0.02
1	-	0.65	-	0.026

Dimension in mm/inches



Notice

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1. Our Products are designed and manufactured for application in ordinary electronic equipments (such as AV equipment, OA equipment, telecommunication equipment, home electronic appliances, amusement equipment, etc.). If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment ^(Note 1), transport equipment, traffic equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

(Note1) Medical Equipment Classification of the Specific Applications

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

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 - [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure
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 - [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.
- 2. 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

Precautions Regarding Application Examples and External Circuits

- 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.
- 2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

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
- 2. 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.

Precaution for Product Label

QR code printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

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Since concerned goods might be fallen under listed items of export control prescribed by Foreign exchange and Foreign trade act, please consult with ROHM in case of export.

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