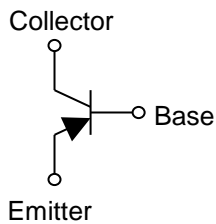


Parameter	Value
V_{CEO}	-12V
I_C	-1.5A

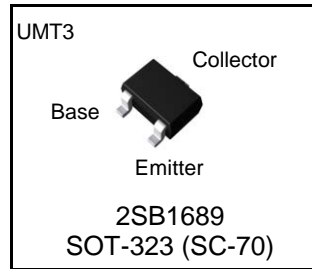
●Features

- 1) A Collector current is large.General Purpose.
- 2) Collector saturation voltage is low.
 $V_{CE(sat)} \leq -200mV$
 At $I_C = -500mA$, $I_B = -25mA$
- 3) Complementary NPN Types :
 2SD2652
- 4) Lead Free/RoHS Compliant.

●Inner circuit



●Outline



●Applications

Driver circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SB1689	UMT3	2021	T106	180	8	3,000	EV

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Values	Unit
Collector-base voltage	V_{CB0}	-15	V
Collector-emitter voltage	V_{CEO}	-12	V
Emitter-base voltage	V_{EBO}	-6	V
Collector current	I_C	-1.5	A
	I_{CP}^{*1}	-3	A
Power dissipation	P_D^{*2}	200	mW
Junction temperature	T_j	150	°C
Range of storage temperature	T_{stg}	-55 to +150	°C

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = -1mA$	-12	-	-	V
Collector-base breakdown voltage	BV_{CB0}	$I_C = -10\mu A$	-15	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = -10\mu A$	-6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = -15V$	-	-	-100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -6V$	-	-	-100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -500mA, I_B = -25mA$	-	-110	-200	mV
DC current gain	h_{FE}^{*3}	$V_{CE} = -2V, I_C = -200mA$	270	-	680	-
Transition frequency	f_T^{*3}	$V_{CE} = -2V, I_E = 200mA$ $f = 100MHz$	-	400	-	MHz
Output capacitance	C_{ob}	$V_{CB} = -10V, I_E = 0mA$ $f = 1MHz$	-	12	-	pF

*1 $P_W = 10ms$ Single pulse.

*2 Each terminal mounted on a reference footprint

*3 Pulsed

●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

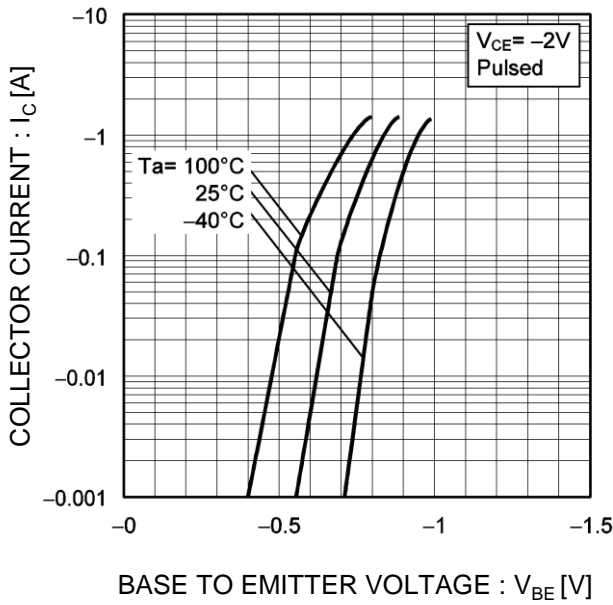


Fig.2 Typical Output Characteristics

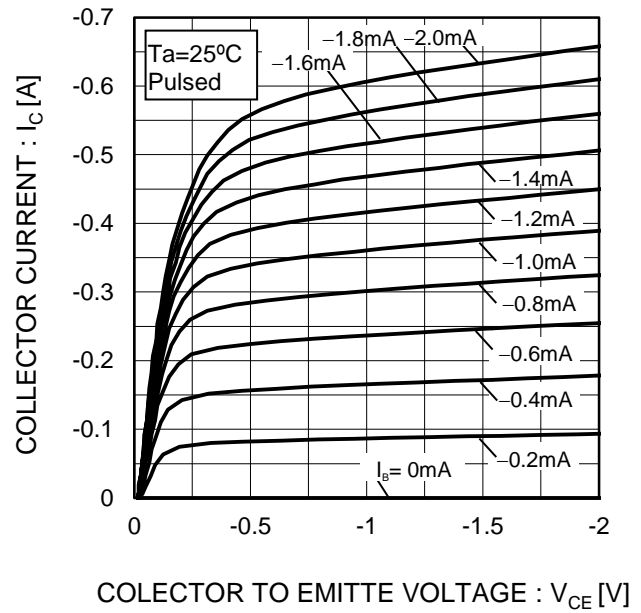


Fig.3 DC Current Gain vs. Collector Current(I)

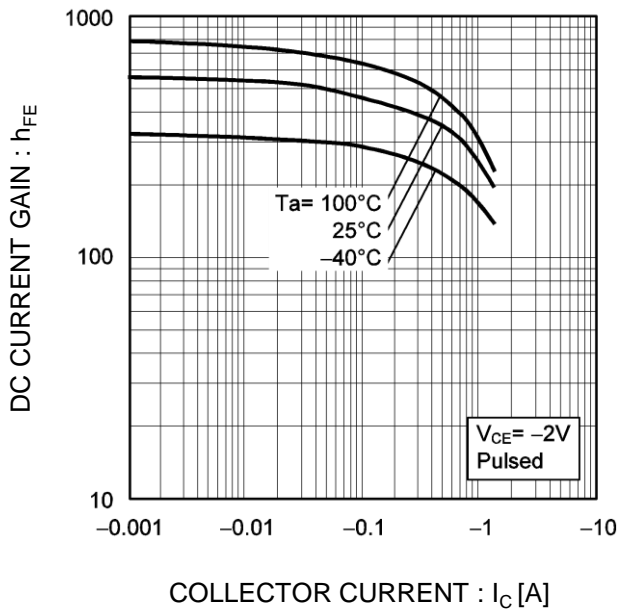
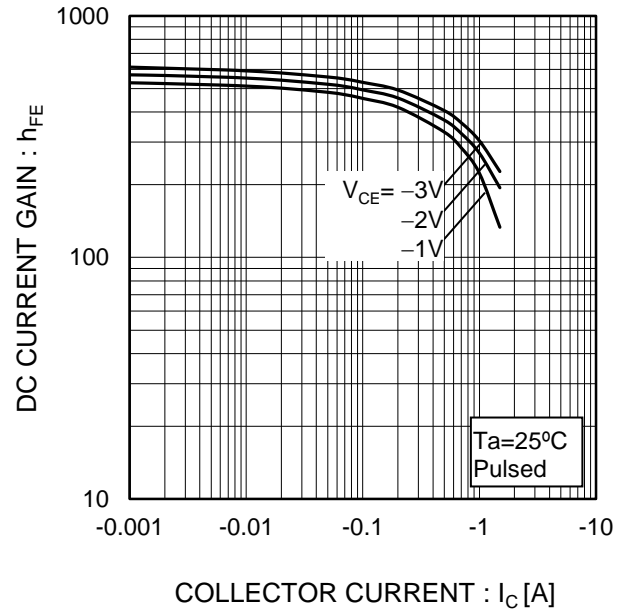


Fig.4 DC Current Gain vs. Collector Current(II)



●Electrical characteristic curves(Ta = 25°C)

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

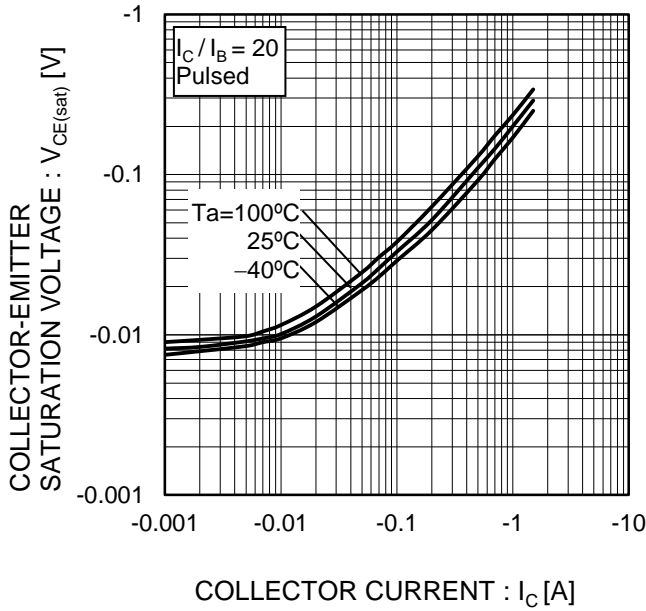


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

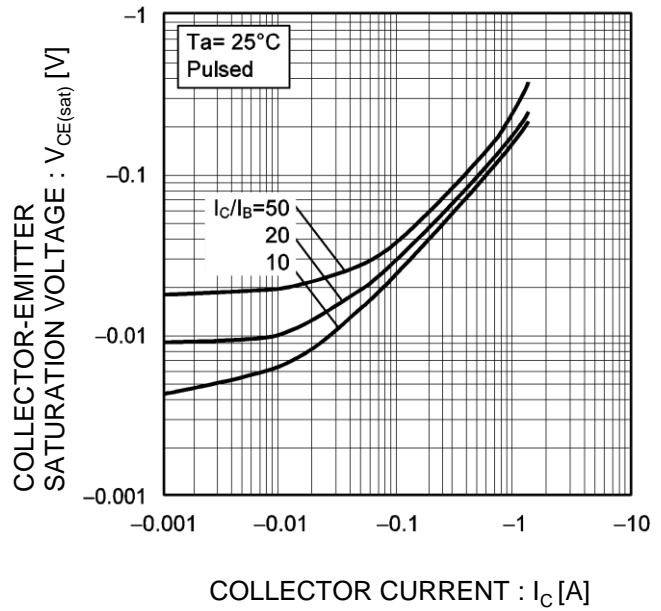


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

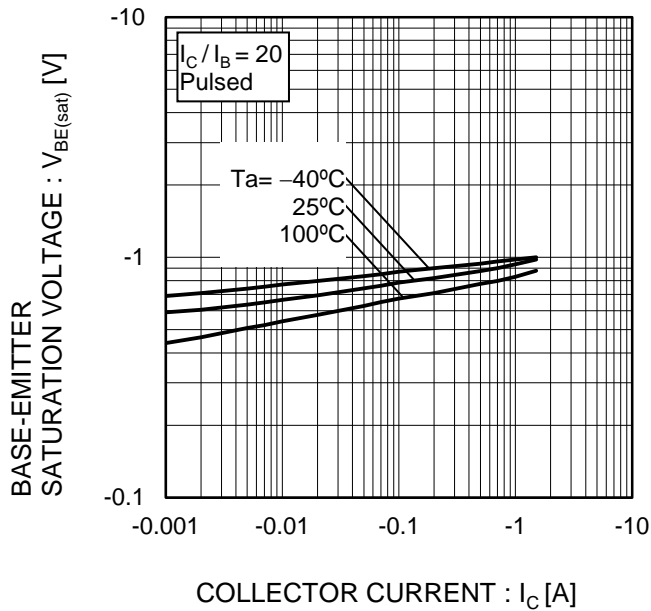
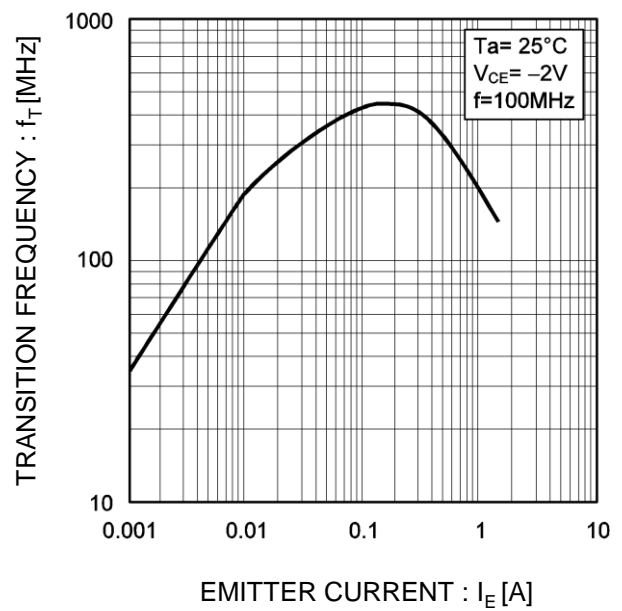


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

Fig.9 Emitter input capacitance vs. Emitter-Base Voltage
Collector output capacitance vs. Collector-Base Voltage

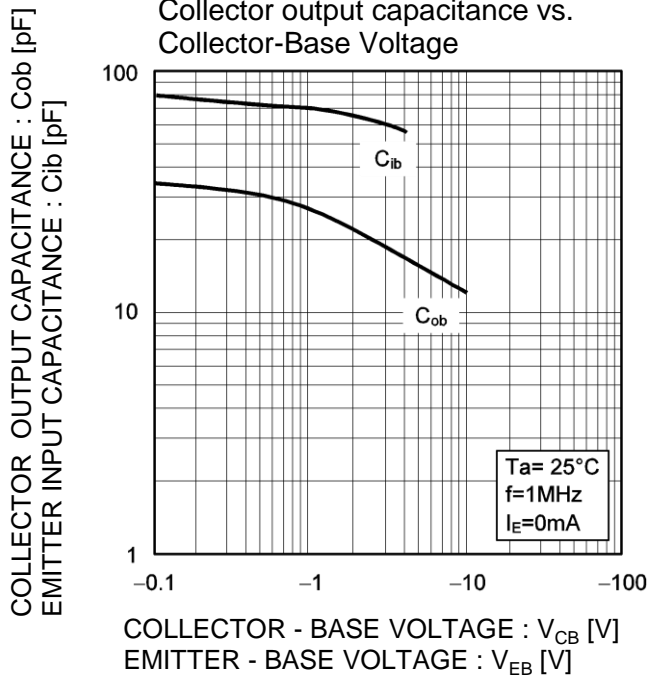
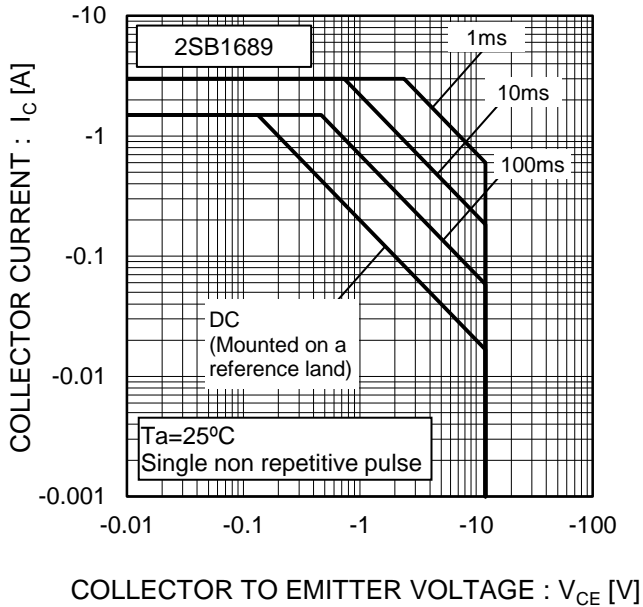
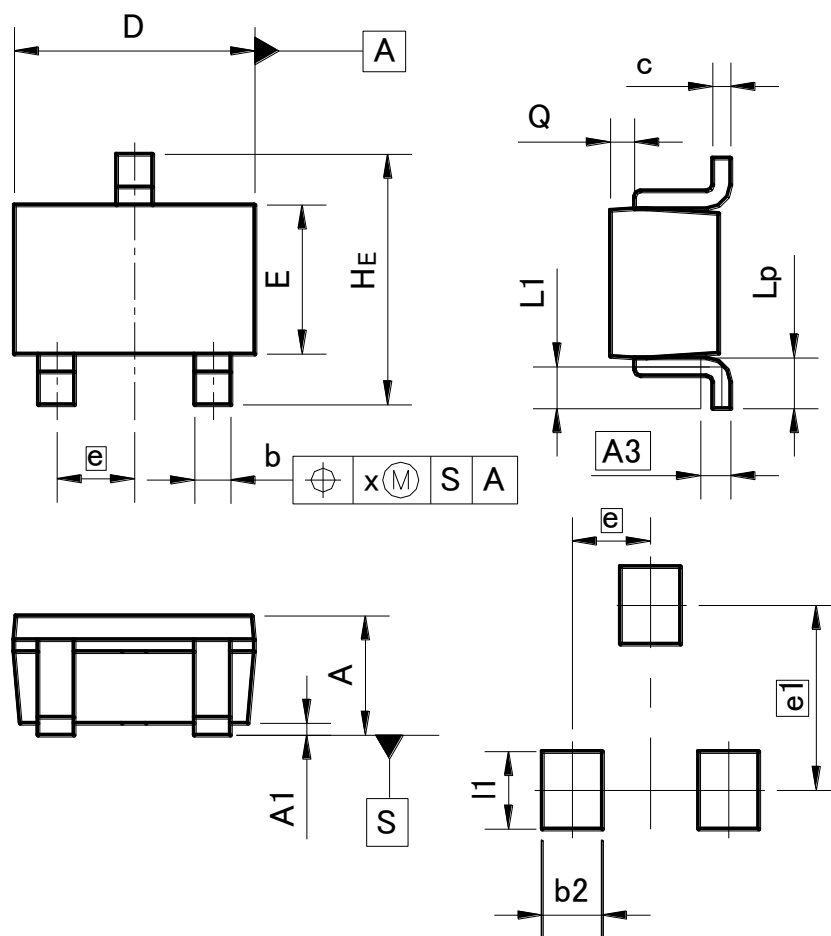


Fig.10 Safe Operating Area



●Dimensions (Unit : mm)

UMT3



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	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
e	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
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.50	-	0.020
e1	1.55		0.061	
l1	-	0.65	-	0.026

Dimension in mm / inches

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