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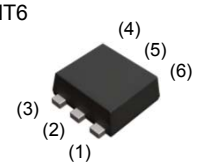
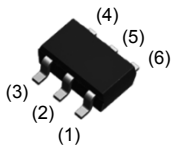
US6H23 / IMH23

NPN 600mA 20V Digital Transistors (Bias Resistor Built-in Transistors) For Muting.

Datasheet

Parameter	Tr1 and Tr2
V_{CEO}	20V
V_{EBO}	12V
I_C	600mA
R_1	4.7kΩ

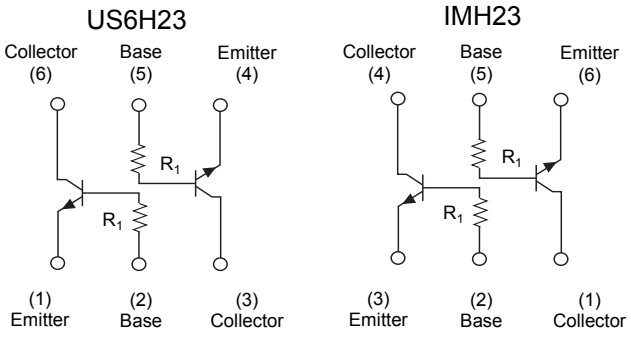
●Outline

TUMT6	SMT6
	
US6H23	IMH23 SOT-457 (SC-74)

●Features

1) Built-In Biasing Resistors
2) Two DTC643T chips in one package.
3) Low saturation voltage, typically
   $V_{CE(sat)}$ =40mV at I_C / I_B=50mA / 2.5mA, makes these transistors ideal for muting circuits.
4) These transistors can be used at high current levels, I_C=600mA.
5) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
6) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of completely eliminating parasitic effects.
7) Lead Free/RoHS Compliant.

●Inner circuit



●Application

Muting circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
US6H23	TUMT6	2021	TN	180	8	3,000	H23
IMH23	SMT6	2928	T110	180	8	3,000	H23

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●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter		Symbol	Values	Unit
Collector-base voltage		V_{CBO}	20	V
Collector-emitter voltage		V_{CEO}	20	V
Emitter-base voltage		V_{EBO}	12	V
Collector current		I_C	600	mA
		I_{CP} *1	1	A
Power dissipation	US6H23	P_D *2	1(TOTAL) *3	W
	IMH23	P_D *4	300(TOTAL) *5	mW
Junction temperature		T_j	150	°C
Range of storage temperature		T_{stg}	−55 to +150	°C

●Electrical characteristics (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	BV_{CBO}	I_C= 50μA	20	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C= 1mA	20	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E= 50μA	12	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = 20V	-	-	0.5	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 12V	-	-	0.5	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C / I_B= 50mA / 2.5mA	-	40	150	mV
DC current gain	h_{FE}	V_{CE}= 5V , I_C= 50mA	820	-	2700	-
Input resistance	R_1	-	3.29	4.7	6.11	kΩ
Transition frequency	f_T *6	V_{CE} = 10V, I_E = −50mA f = 100MHz	-	150	-	MHz
Output ON Resistance	R_{on}	V_I = 5V R_L = 1kΩ, f = 1kHz	-	0.55	-	Ω

*1 P_W=10ms, Single pulse

*2 Mounted on a ceramic board

*3 700mW per element mounted on ceramic board.

*4 Each terminal mounted on a reference footprint

*5 200mW per element must not be exceeded.

*6 Characteristics of built-in transistor

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●Electrical characteristic curves(Ta = 25°C)

Fig.1 Grounded emitter propagation characteristics

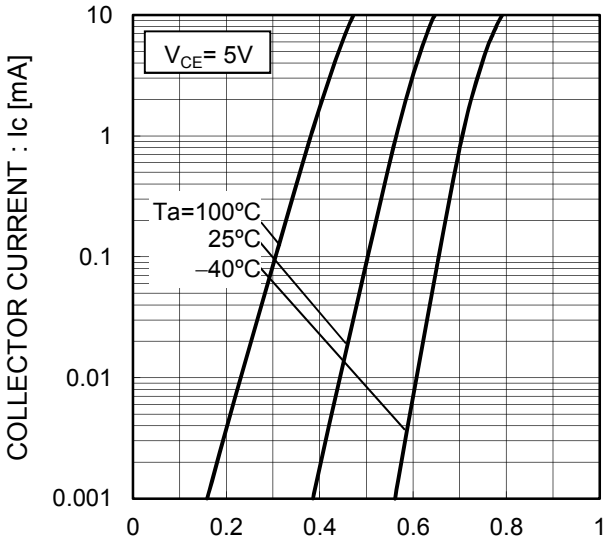


Fig.2 Grounded emitter output characteristics

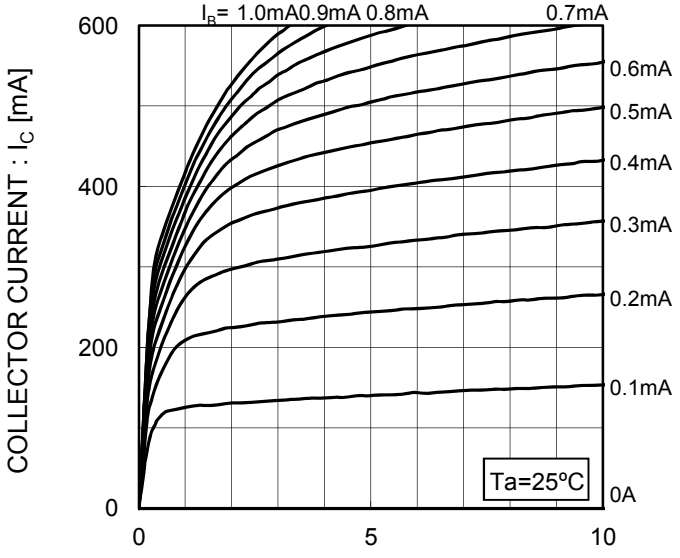


Fig.3 DC Current gain vs. Collector Current

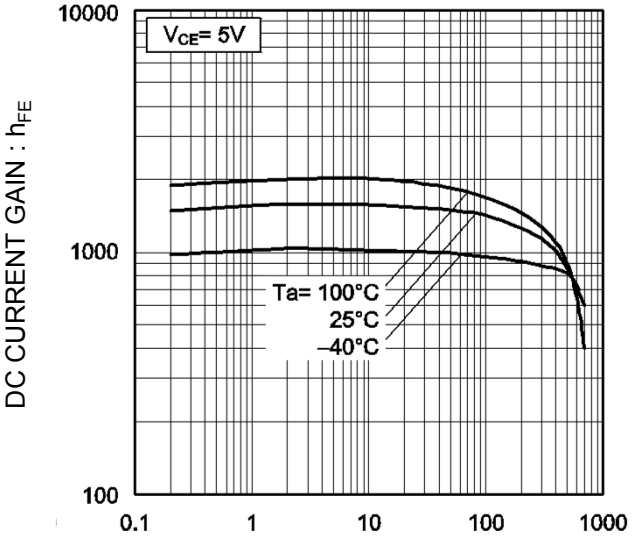
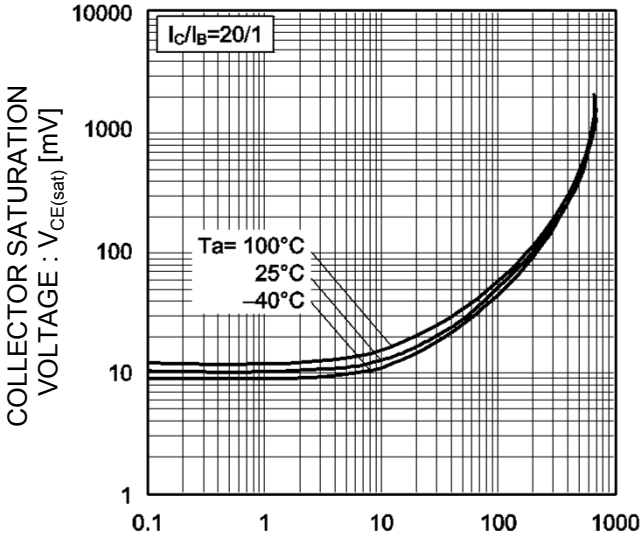


Fig.4 Collector-emitter saturation voltage vs. Collector Current



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●**Electrical characteristic curves**(Ta = 25°C)

Fig.5 Output ON resistance vs. input voltage

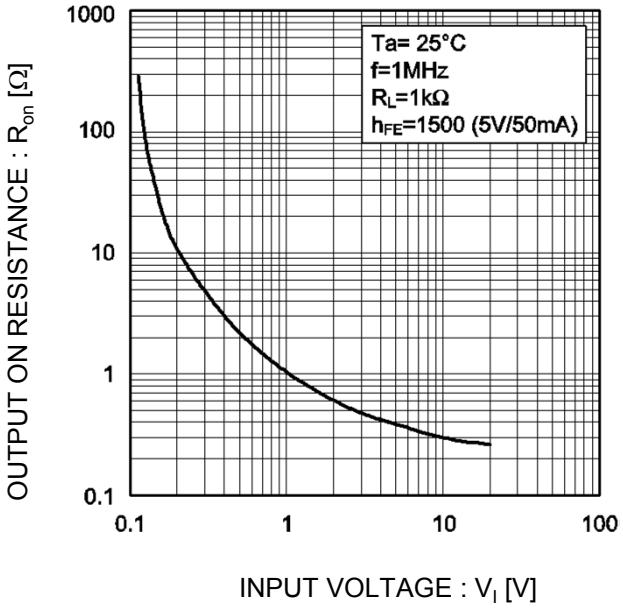
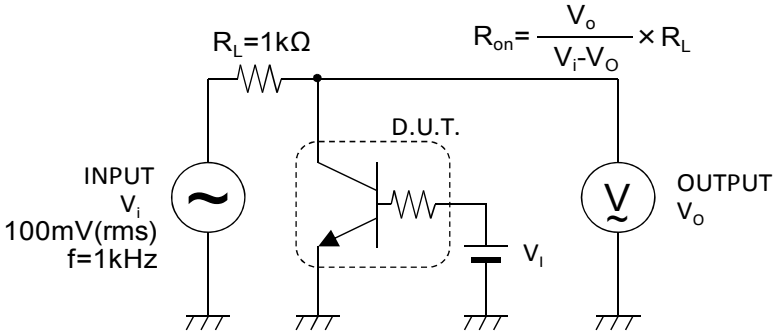


Fig.6 Ron measurement circuit.



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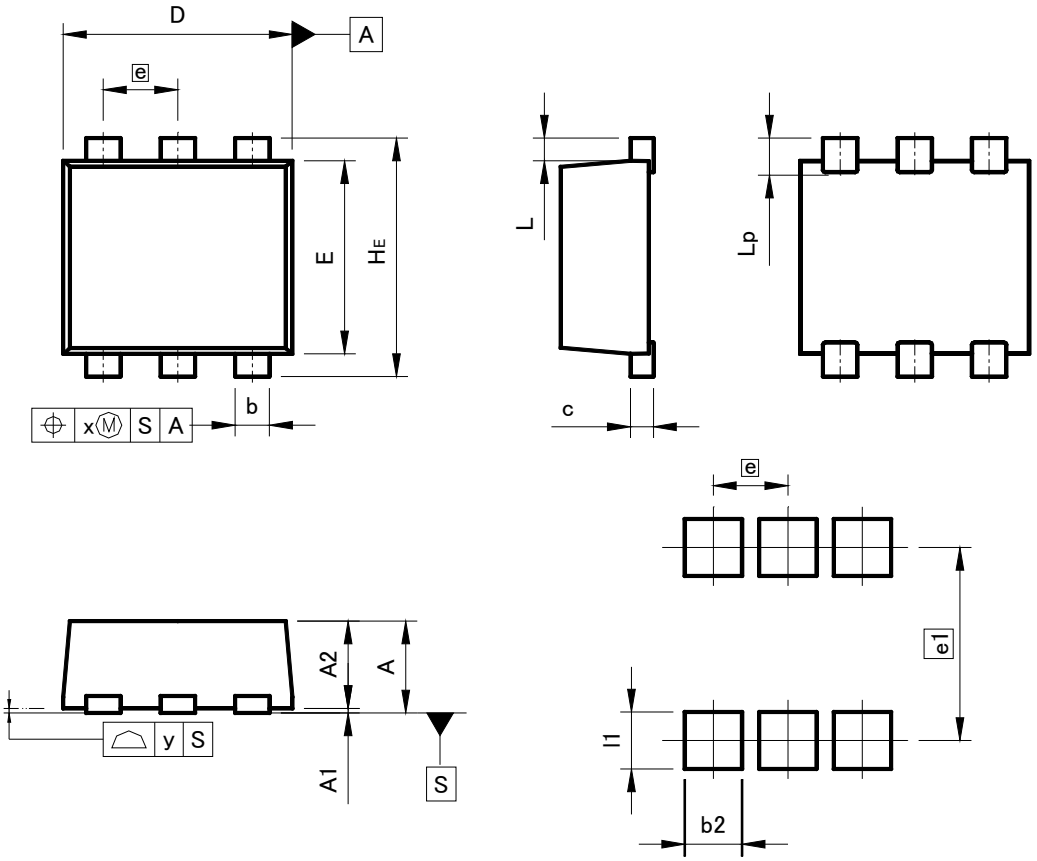
●**Dimensions** (Unit : mm)

TUMT6



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	−	0.85	−	0.033
A1	0.00	0.10	0.000	0.004
A2	0.72	0.82	0.028	0.032
b	0.25	0.40	0.010	0.016
c	0.12	0.22	0.005	0.009
D	1.90	2.10	0.075	0.083
E	1.60	1.80	0.063	0.071
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L	0.20		0.008	
Lp	−	0.40	−	0.016
x	−	0.10	−	0.004
y	−	0.10	−	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	−	0.50	−	0.020
e1	1.70		0.067	
l1	−	0.50	−	0.020

Dimension in mm / inches

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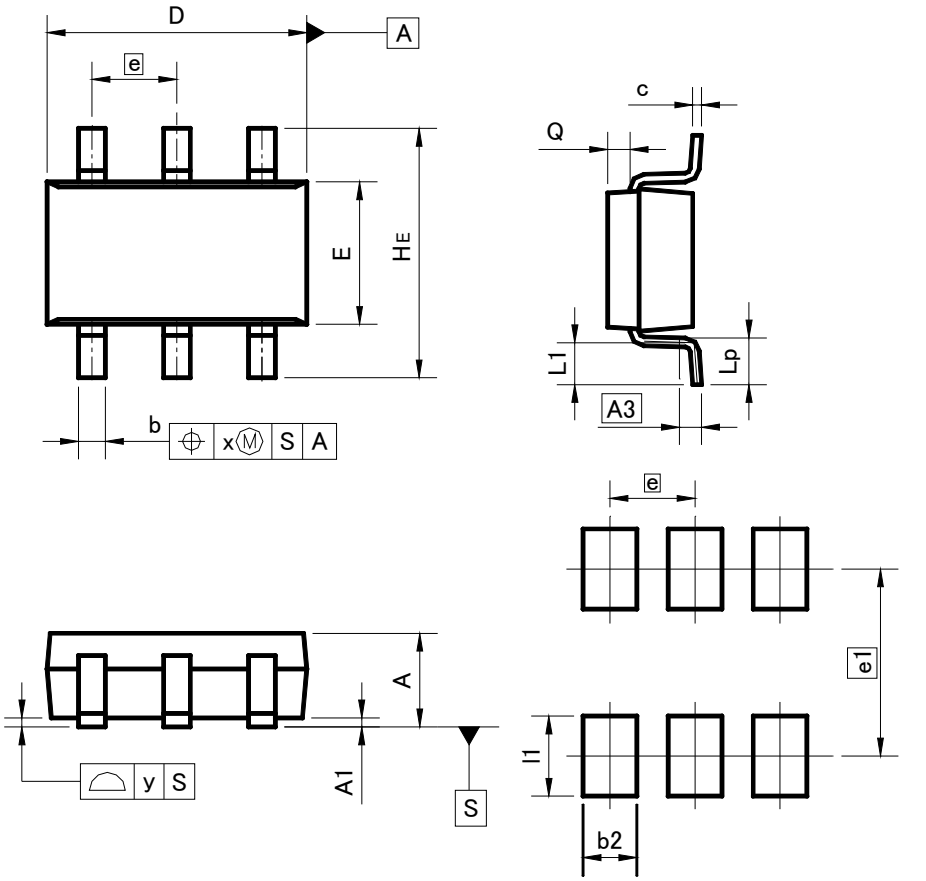
●**Dimensions** (Unit : mm)

SMT6



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.25	0.40	0.010	0.016
c	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
e	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	−	0.20	−	0.008
y	−	0.10	−	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2		0.60	−	0.024
e1	2.10		0.083	
l1	−	0.90	−	0.035

Dimension in mm / inches

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