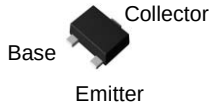
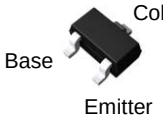
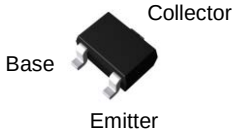
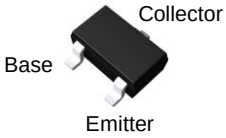
2SD2707 / 2SD2654 / 2SD2351 / 2SD2226K

NPN 150mA 50V Muting Transistors Datasheet

Parameter	Value
V_{CEO}	50V
I_C	150mA

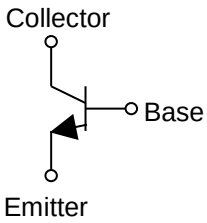
●Outline

VMT3  2SD2707 (SC-105AA)	EMT3  2SD2654 SOT-416 (SC-75A)
UMT3  2SD2351 SOT-323 (SC-70)	SMT3  2SD2226K SOT-346 (SC-59)

●Features

1) High DC current gain.
   h_{FE} =2700 (Max.)
2) High emitter-base voltage.
   V_{EBO} is Min. 12V
3) Low $V_{CE(sat)}$
   $V_{CE(sat)}$=0.3V(Max.)
   (I_C/I_B=50mA/5mA)
4) Lead Free/RoHS Compliant.

●Inner circuit



●Applications

Muting circuit

●Packaging specifications

Part No.	h_{FE}	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SD2707	V	VMT3	1212	T2L	180	8	8,000	BJx*1
2SD2654	VW	EMT3	1616	TL	180	8	3,000	BJx*1
2SD2351	VW	UMT3	2021	T106	180	8	3,000	BJx*1
2SD2226K	VW	SMT3	2928	T146	180	8	3,000	BJx*1

*1 x : h_{FE} rank

●Absolute maximum ratings (Ta = 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
Collector current		I_C	150	mA
		I_{CP} *1	200	mA
Power dissipation	2SD2226K,2SD2351	P_D *2	200	mW
	2SD2351,2SD2707		150	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	50	-	-	V
Collector-base breakdown voltage	BV_{CBO}	I_C = 10μA	60	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E = 10μA	12	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = 50V	-	-	0.3	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 12V	-	-	0.3	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 50mA, I_B = 5mA	-	-	0.3	V
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}	V_{CB} = 5V, I_E = 0mA f = 1MHz	-	3.5	-	pF

*1 P_W=10ms Single pulse.

*2 Each terminal mounted on a reference footprint

●h_{FE} rank categories

Rank	V	W
h_{FE}	820 to 1800	1200 to 2700

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

Fig.1 Ground Emitter Propagation Characteristics

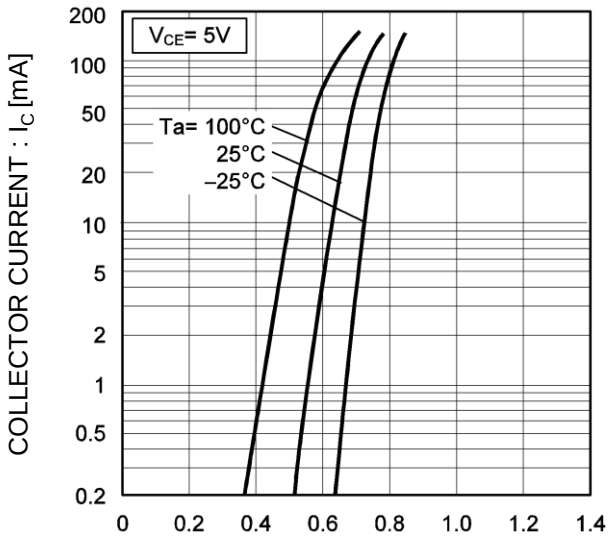


Fig.2 Typical Output Characteristics

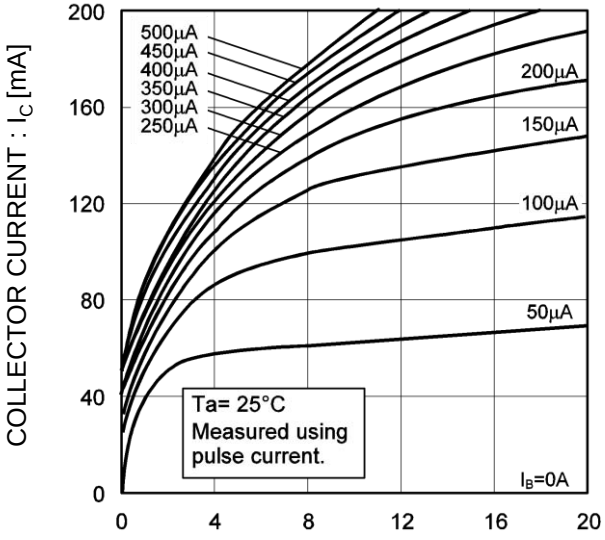


Fig.3 DC Current Gain vs. Collector Current(I)

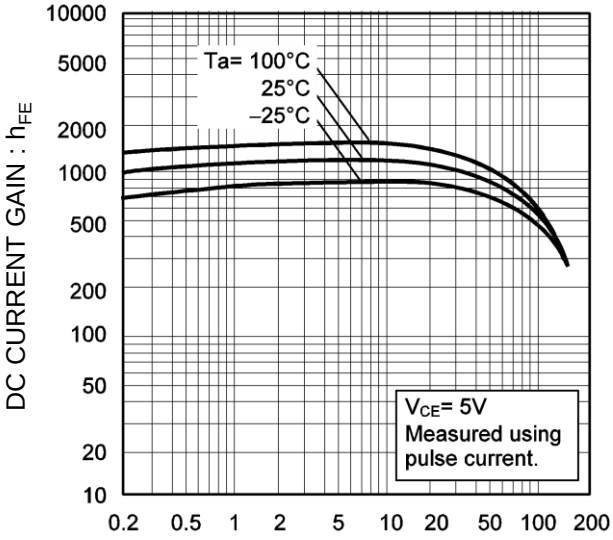
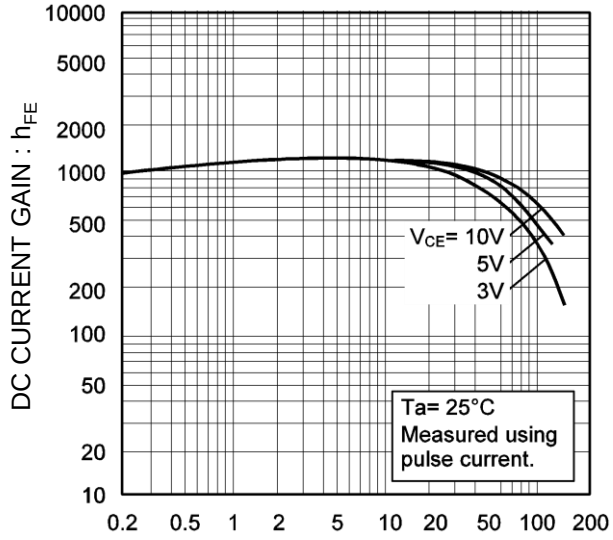


Fig.4 DC Current Gain vs. Collector Current(II)



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

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

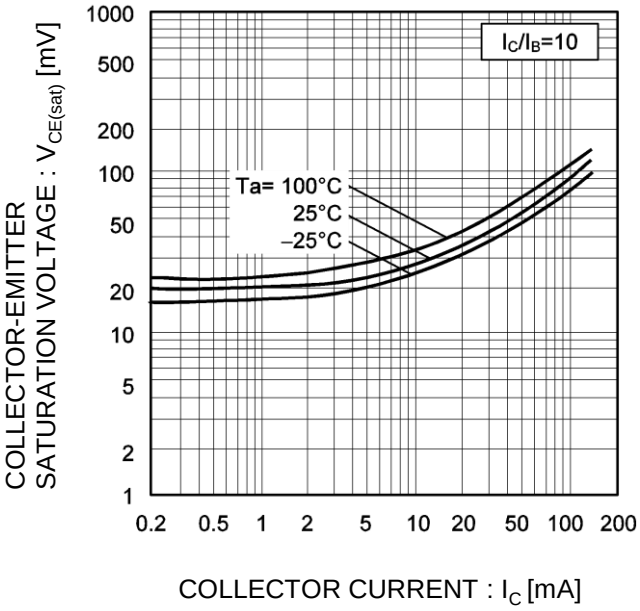


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

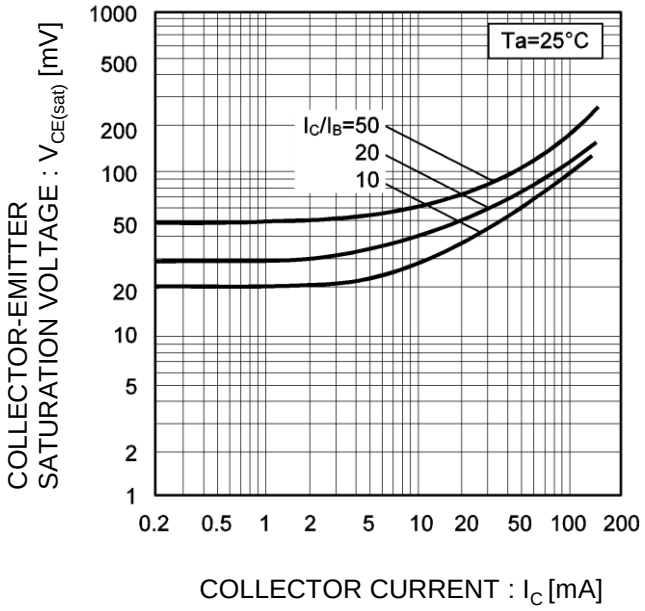


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

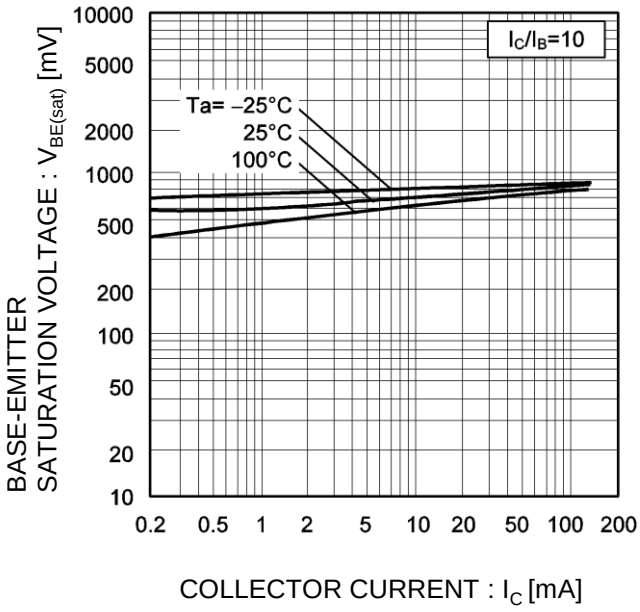
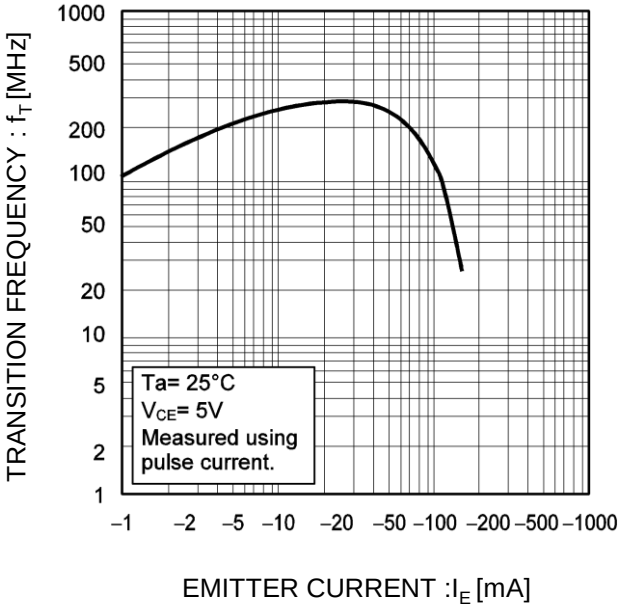


Fig.8 Gain Bandwidth Product vs. Emitter Current



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

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

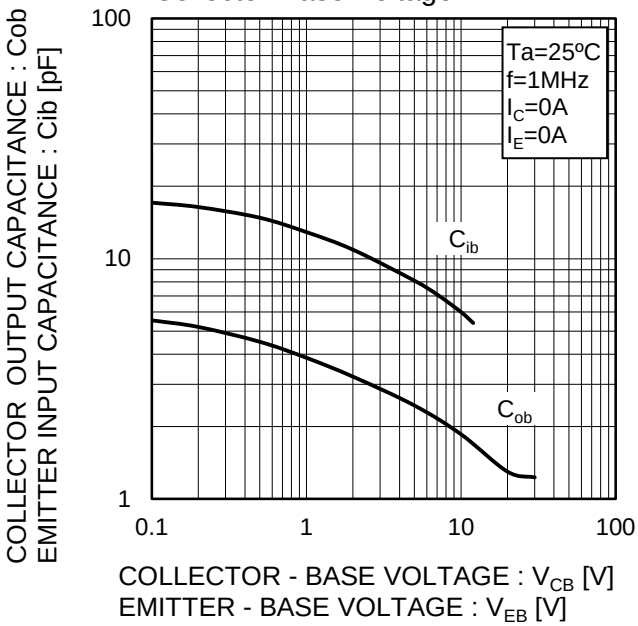


Fig.10 ON-state resistance vs. base current characteristics

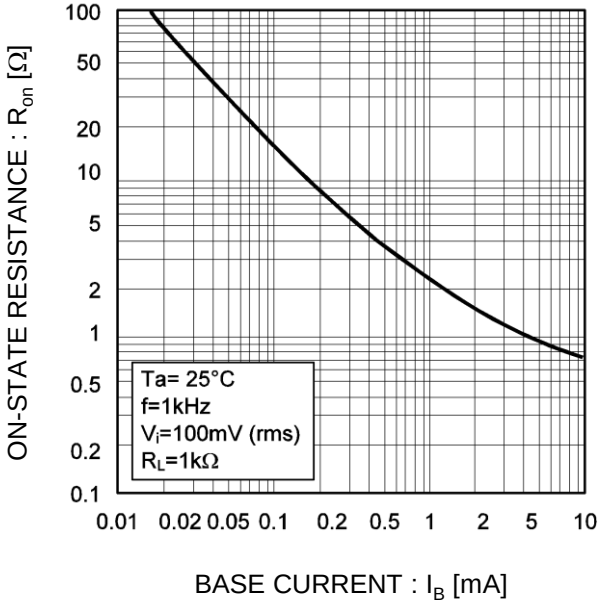


Fig.11 Safe Operating Area

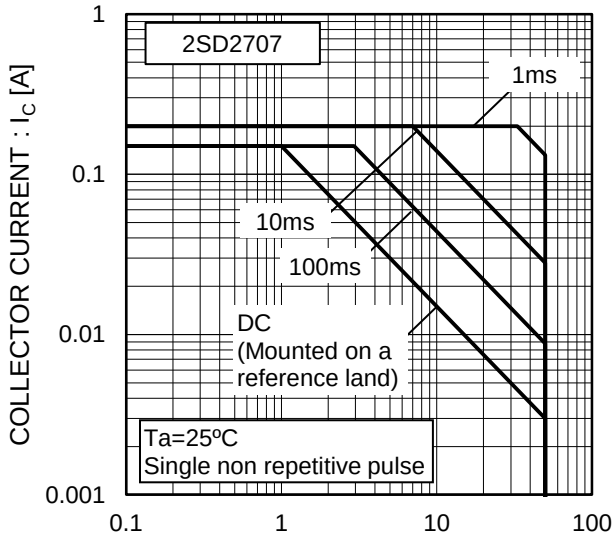
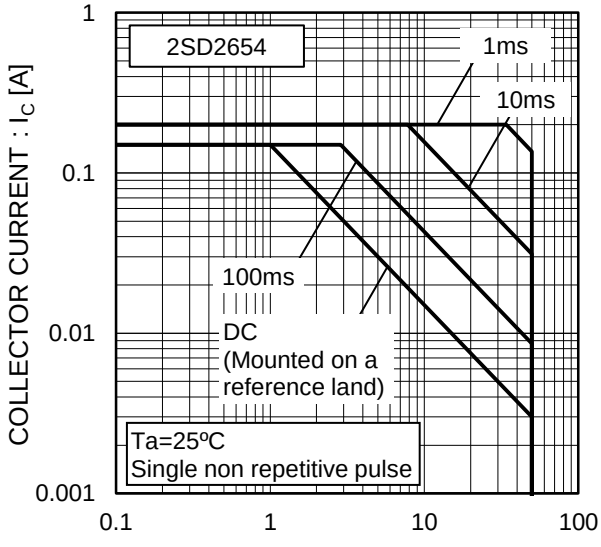


Fig.12 Safe Operating Area



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

Fig.13 Safe Operating Area

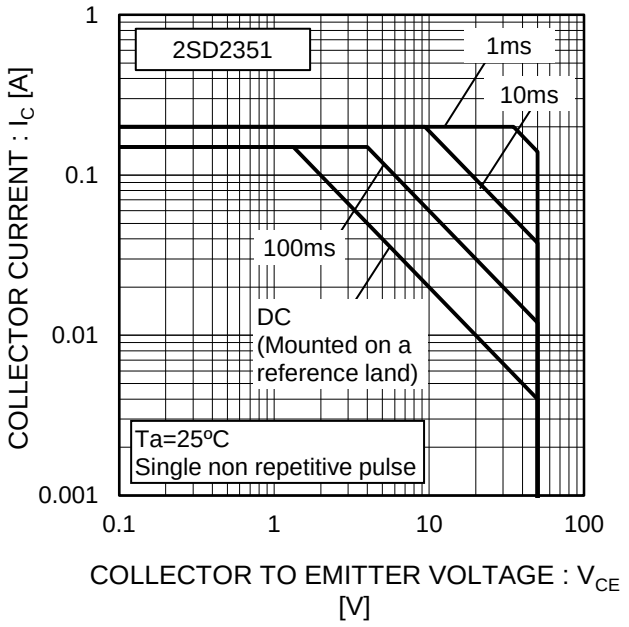
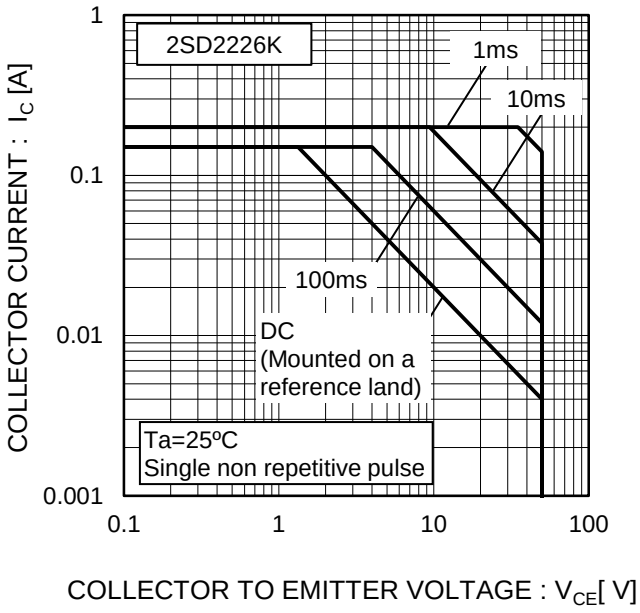
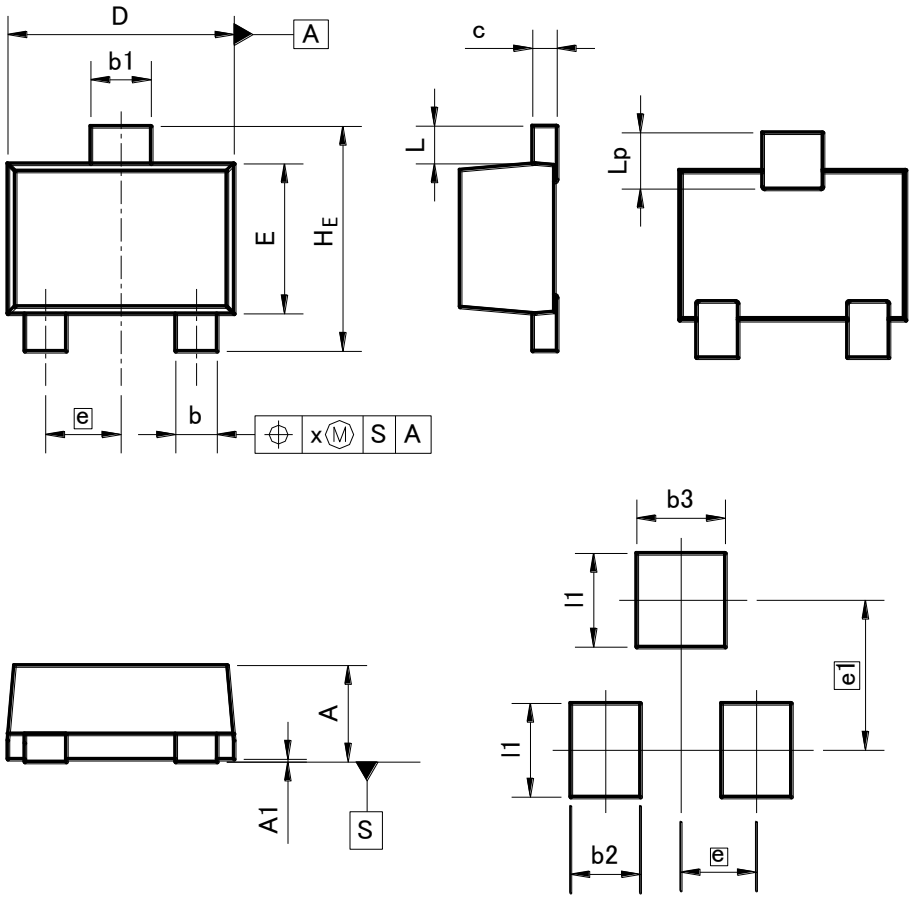


Fig.14 Safe Operating Area



●**Dimensions** (Unit : mm)

VMT3



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

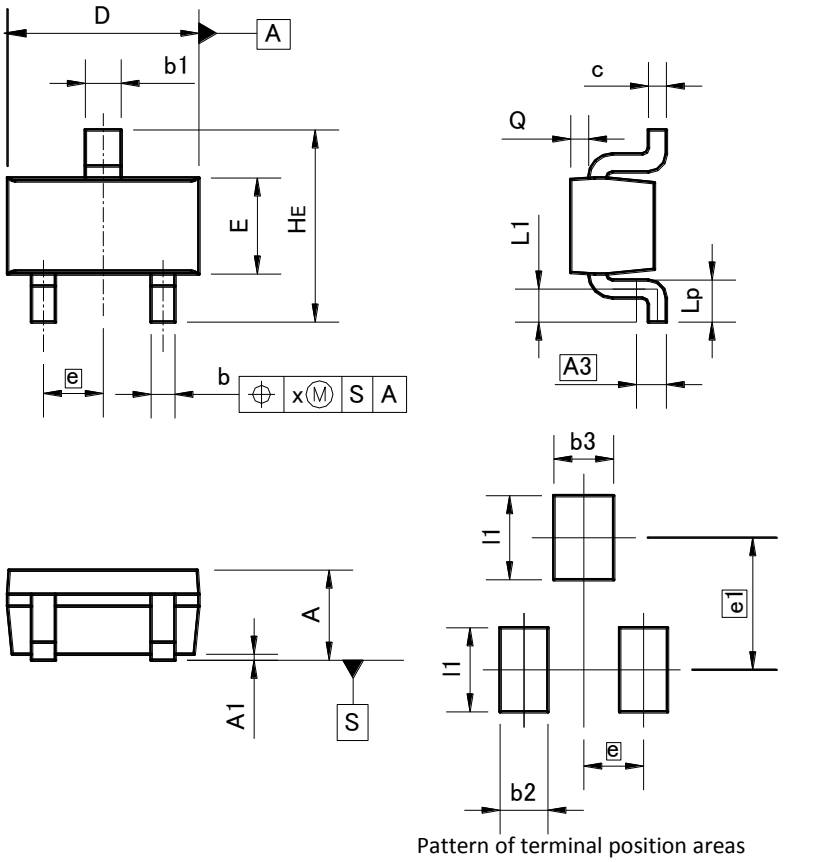
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.45	0.55	0.018	0.022
A1	0.00	0.10	0.000	0.004
b	0.17	0.27	0.007	0.011
b1	0.27	0.37	0.011	0.015
c	0.08	0.18	0.003	0.007
D	1.10	1.30	0.043	0.051
E	0.70	0.90	0.028	0.035
e	0.40		0.02	
HE	1.10	1.30	0.043	0.051
L	0.10	0.30	0.004	0.012
Lp	0.20	0.40	0.008	0.016
x	−	0.10	−	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	−	0.37	−	0.015
b3	−	0.47	−	0.019
e1	0.80		0.031	
l1	−	0.50	−	0.020

Dimension in mm / inches

●**Dimensions** (Unit : mm)

EMT3



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

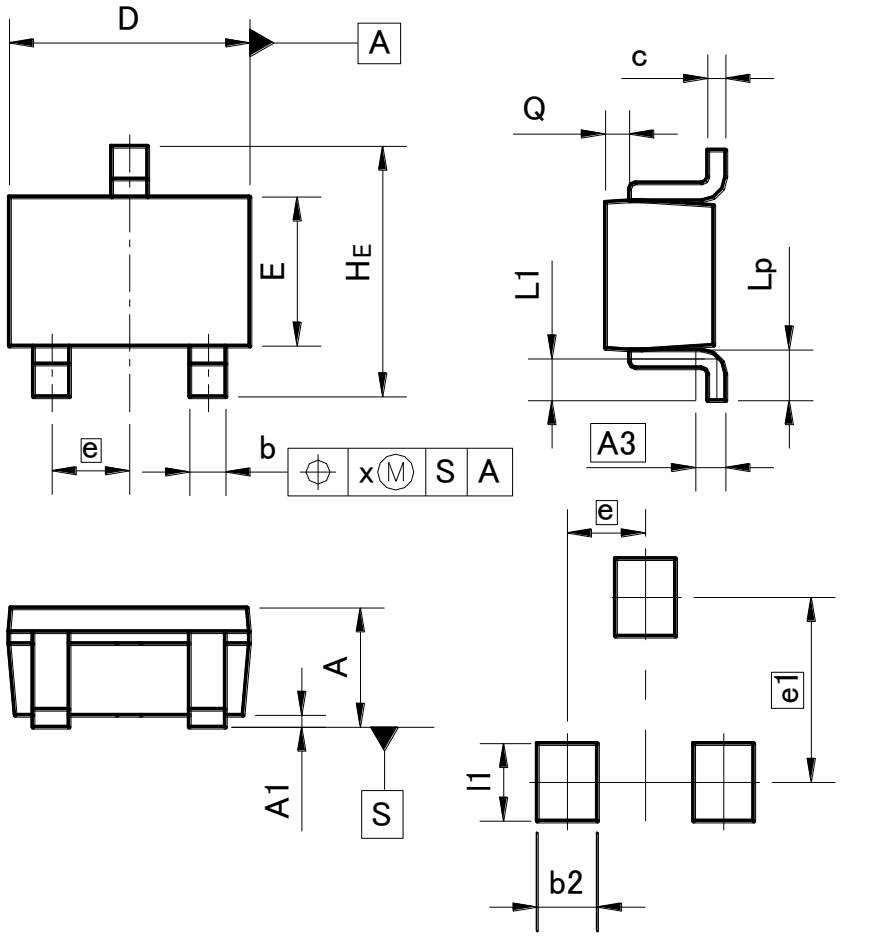
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.60	0.80	0.024	0.031
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
e	0.50		0.020	
HE	1.40	1.80	0.055	0.071
L1	0.10	–	0.004	–
Lp	0.15	–	0.006	–
Q	0.05	0.25	0.002	0.010
x	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	–	0.40	–	0.016
b3	–	0.50	–	0.020
e1	1.10		0.043	
l1	–	0.70	–	0.028

Dimension in mm / inches

●**Dimensions** (Unit : mm)

UMT3



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

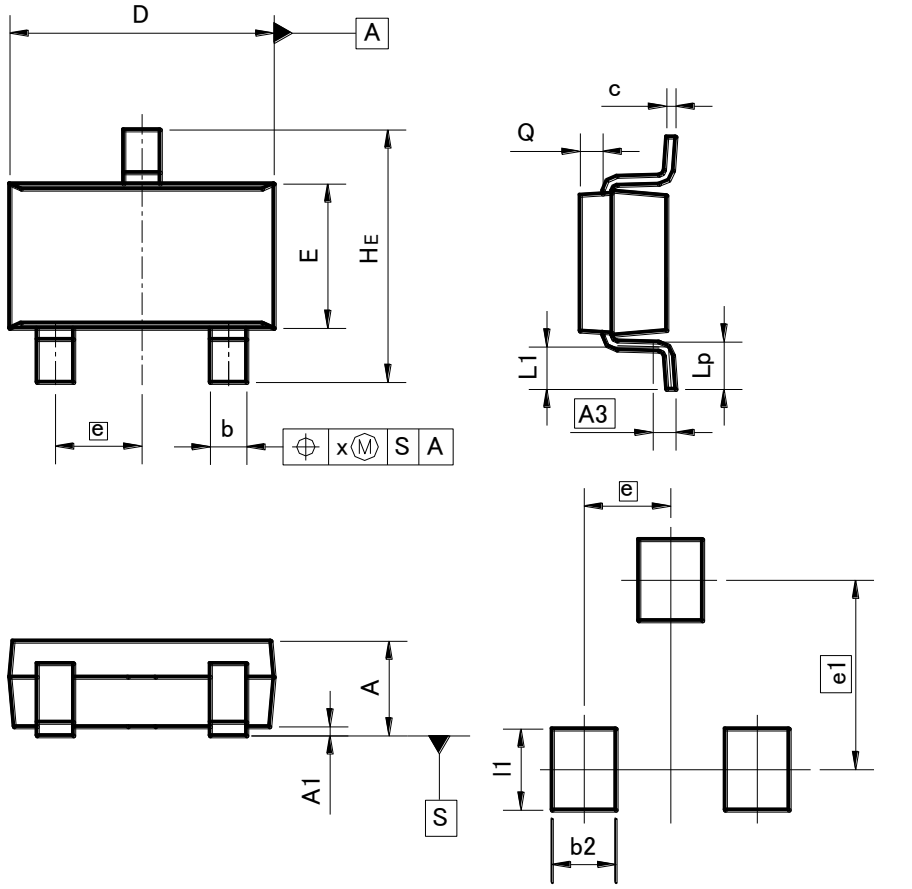
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	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

●**Dimensions** (Unit : mm)

SMT3



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	0.35	0.50	0.014	0.020
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	−	0.10	−	0.004
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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