

Parameter	Value
V_{CEO}	50V
I_C	150mA

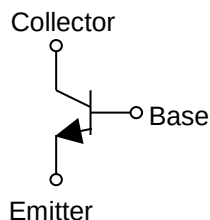
●Features

- 1) High DC current gain.
 $h_{FE} \approx 2700$ (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.

●Outline

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

●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}	$I_C = 1\text{mA}$	50	-	-	V
Collector-base breakdown voltage	BV_{CBO}	$I_C = 10\mu\text{A}$	60	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = 10\mu\text{A}$	12	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = 50\text{V}$	-	-	0.3	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 12\text{V}$	-	-	0.3	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}, I_B = 5\text{mA}$	-	-	0.3	V
DC current gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 1\text{mA}$	820	-	2700	-
Transition frequency	f_T	$V_{CE} = 5\text{V}, I_E = -10\text{mA}$ $f = 100\text{MHz}$	-	250	-	MHz
Output capacitance	C_{ob}	$V_{CB} = 5\text{V}, I_E = 0\text{mA}$ $f = 1\text{MHz}$	-	3.5	-	pF

*1 $P_W = 10\text{ms}$ 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($T_a = 25^\circ\text{C}$)

Fig.1 Ground Emitter Propagation Characteristics

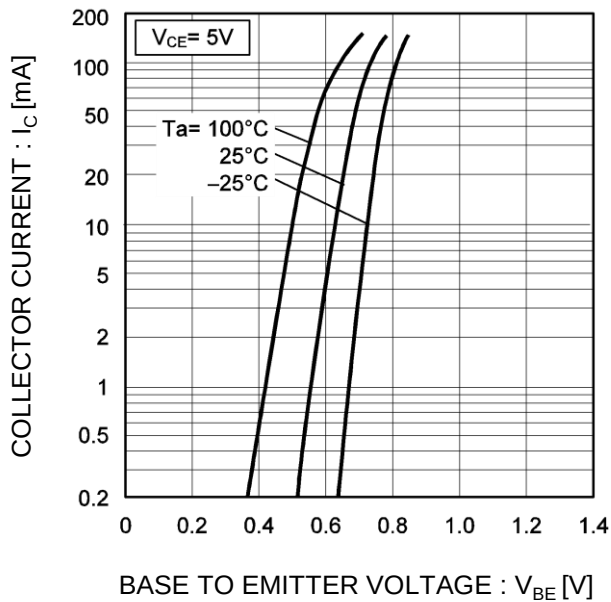


Fig.2 Typical Output Characteristics

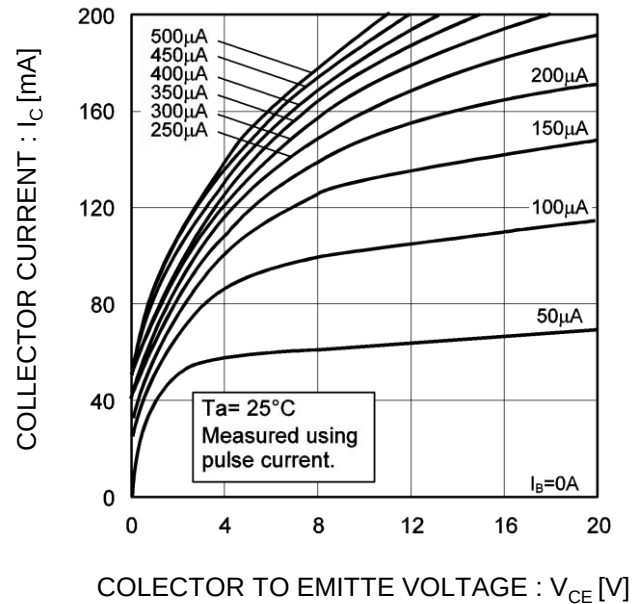


Fig.3 DC Current Gain vs. Collector Current(I)

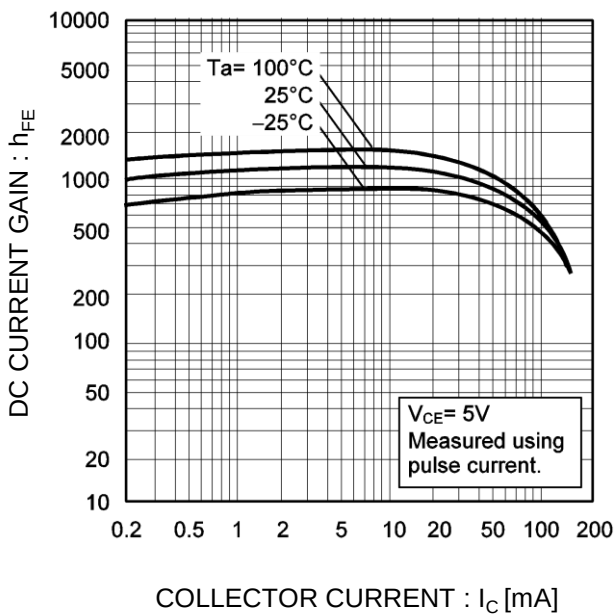
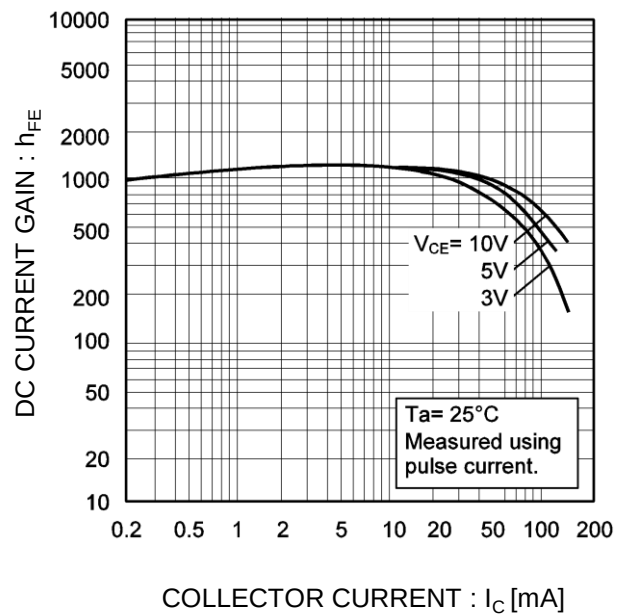


Fig.4 DC Current Gain vs. Collector Current(II)



●Electrical characteristic curves(Ta = 25°C)

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

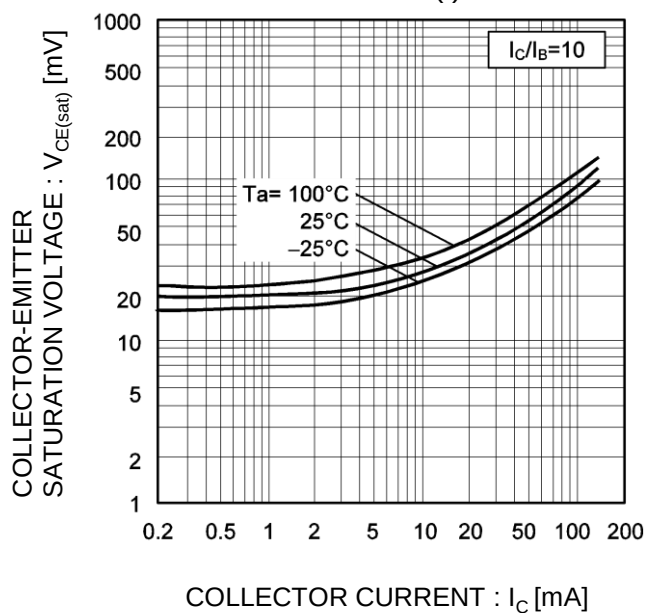


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

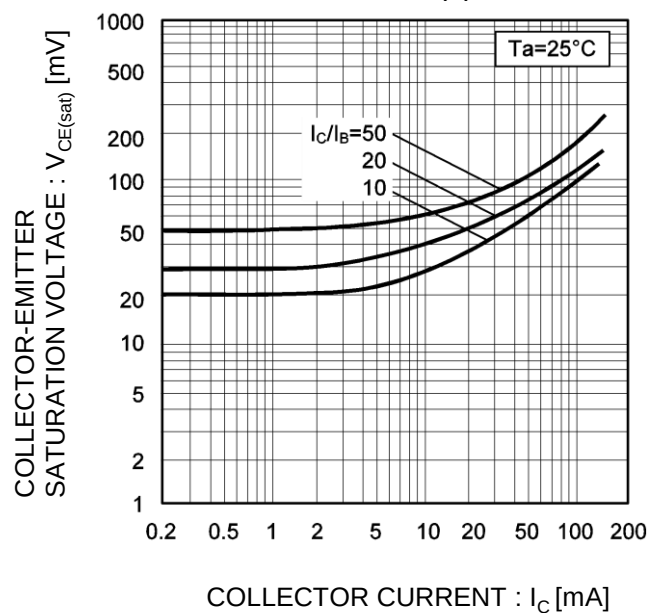


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

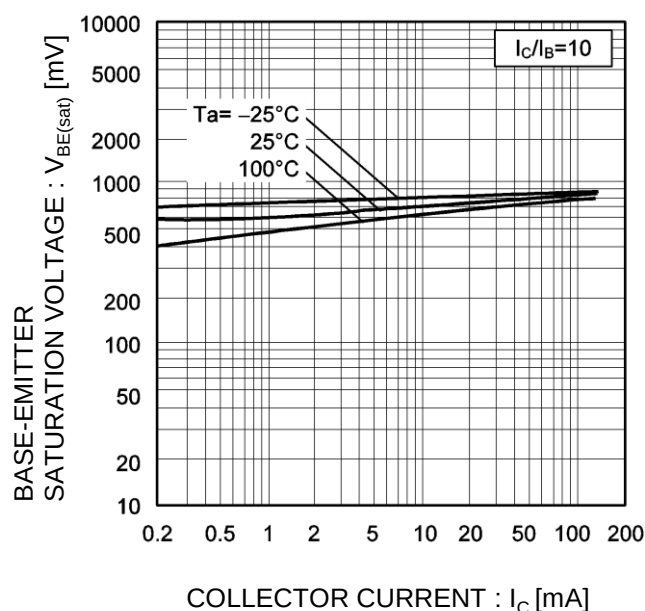
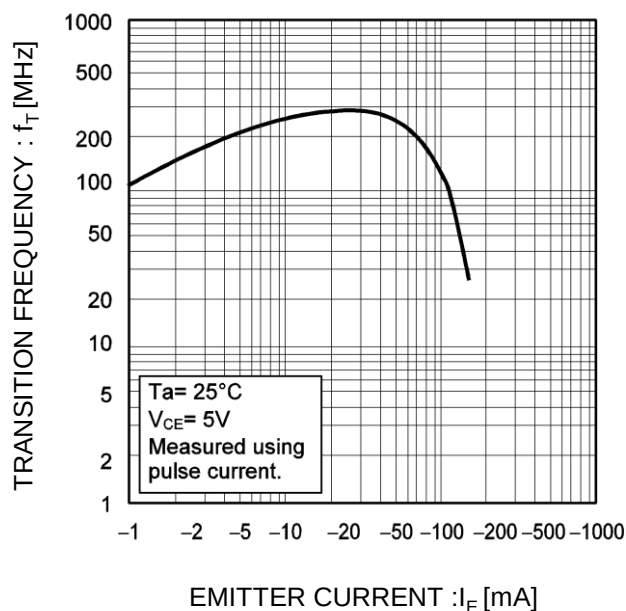


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

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

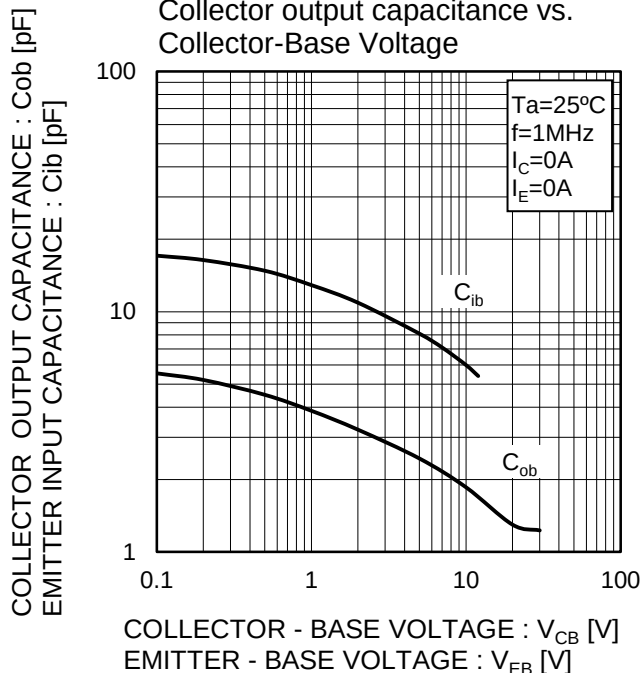


Fig.10 ON-state resistance vs.
base current characteristics

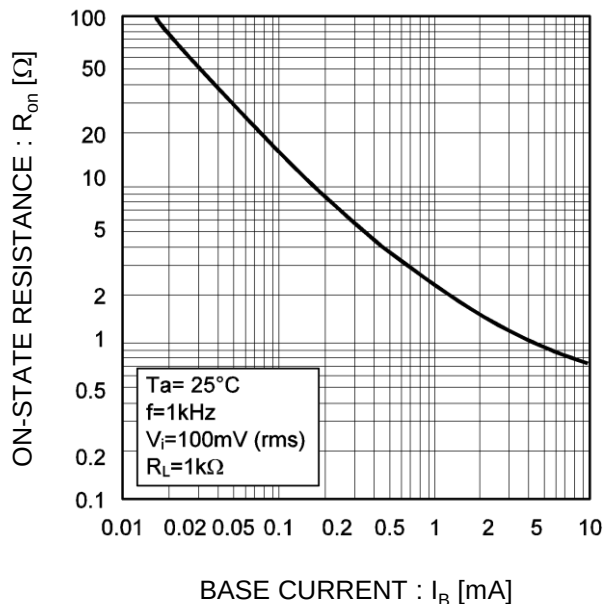


Fig.11 Safe Operating Area

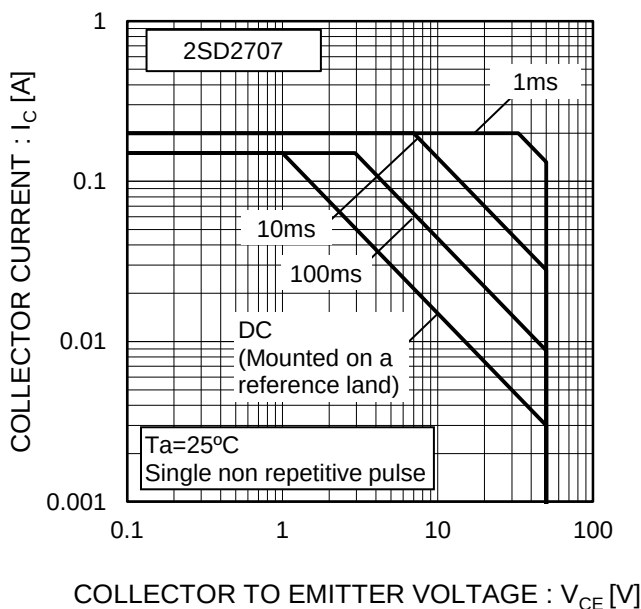
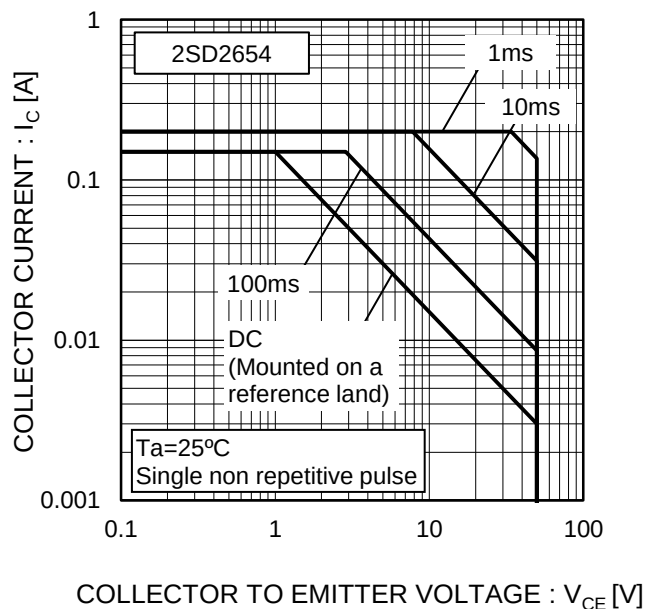


Fig.12 Safe Operating Area



●Electrical characteristic curves($T_a = 25^\circ\text{C}$)

Fig.13 Safe Operating Area

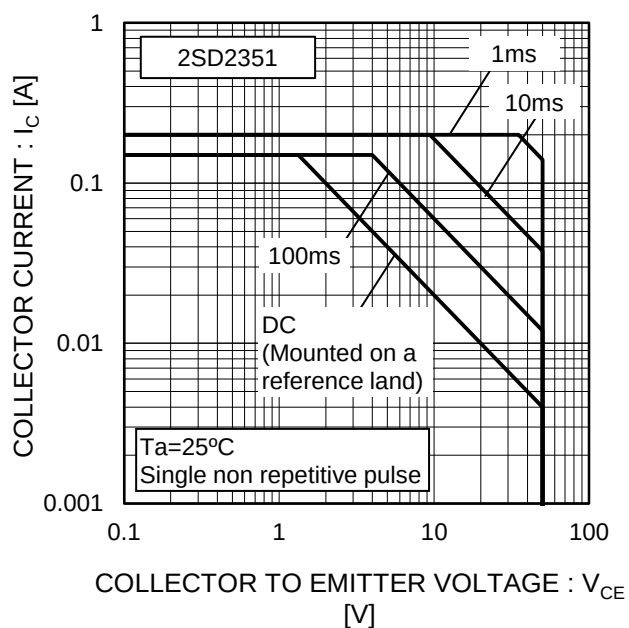
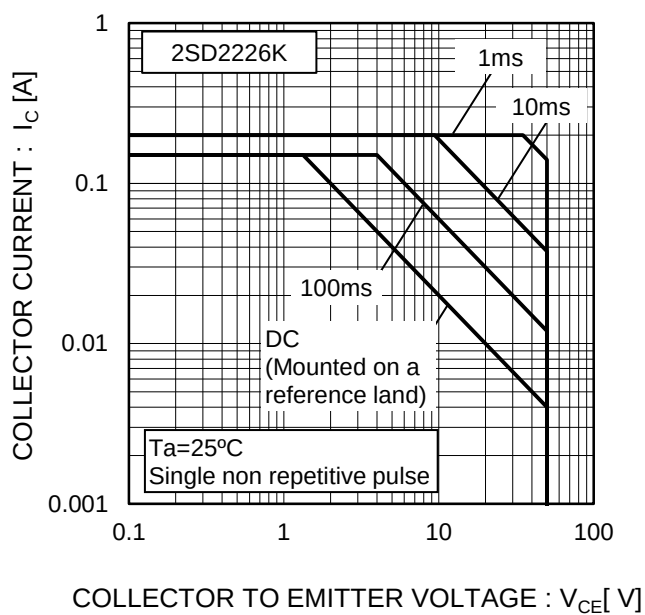
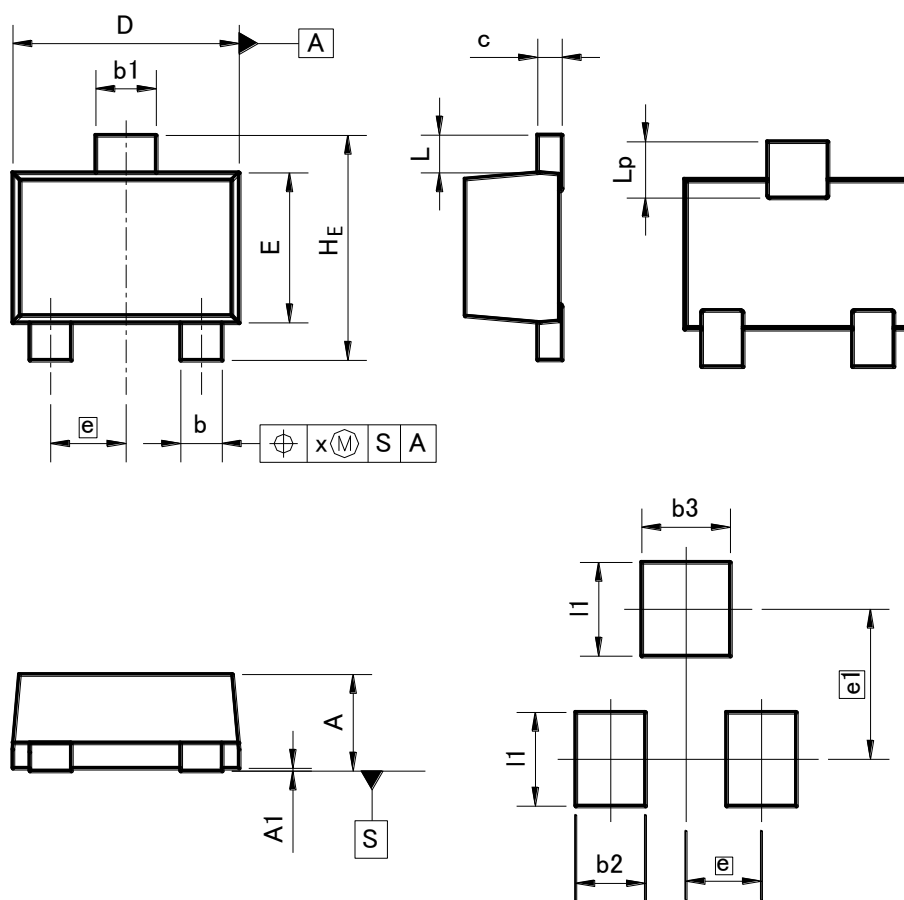


Fig.14 Safe Operating Area



●Dimensions (Unit : mm)

VMT3



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

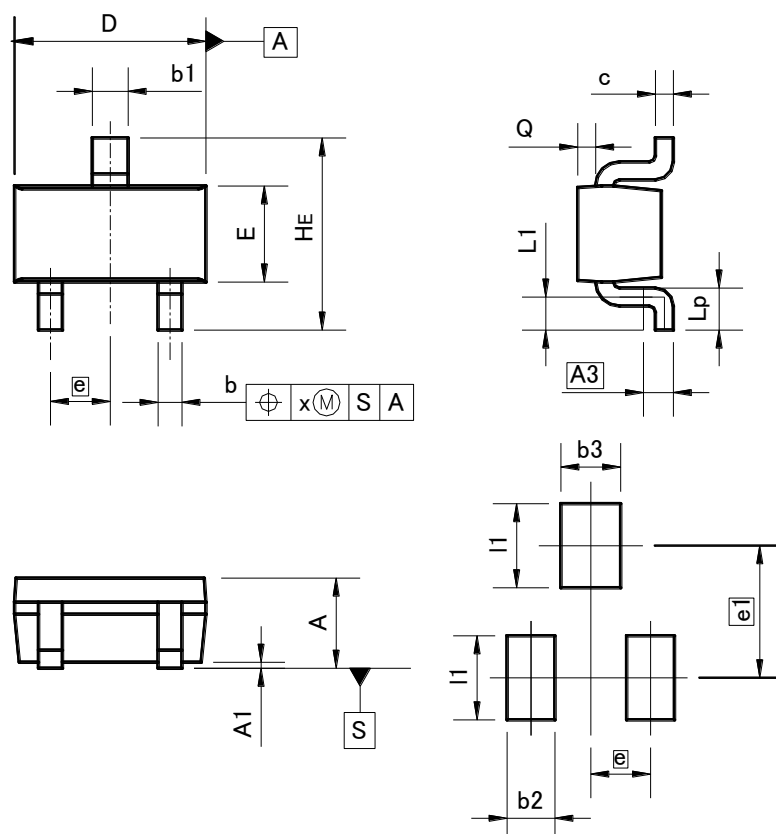
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.45	0.55	0.018	0.022
A1	0.00	0.10	0.000	0.004
b	0.17	0.27	0.007	0.011
b1	0.27	0.37	0.011	0.015
c	0.08	0.18	0.003	0.007
D	1.10	1.30	0.043	0.051
E	0.70	0.90	0.028	0.035
e	0.40		0.02	
HE	1.10	1.30	0.043	0.051
L	0.10	0.30	0.004	0.012
Lp	0.20	0.40	0.008	0.016
x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

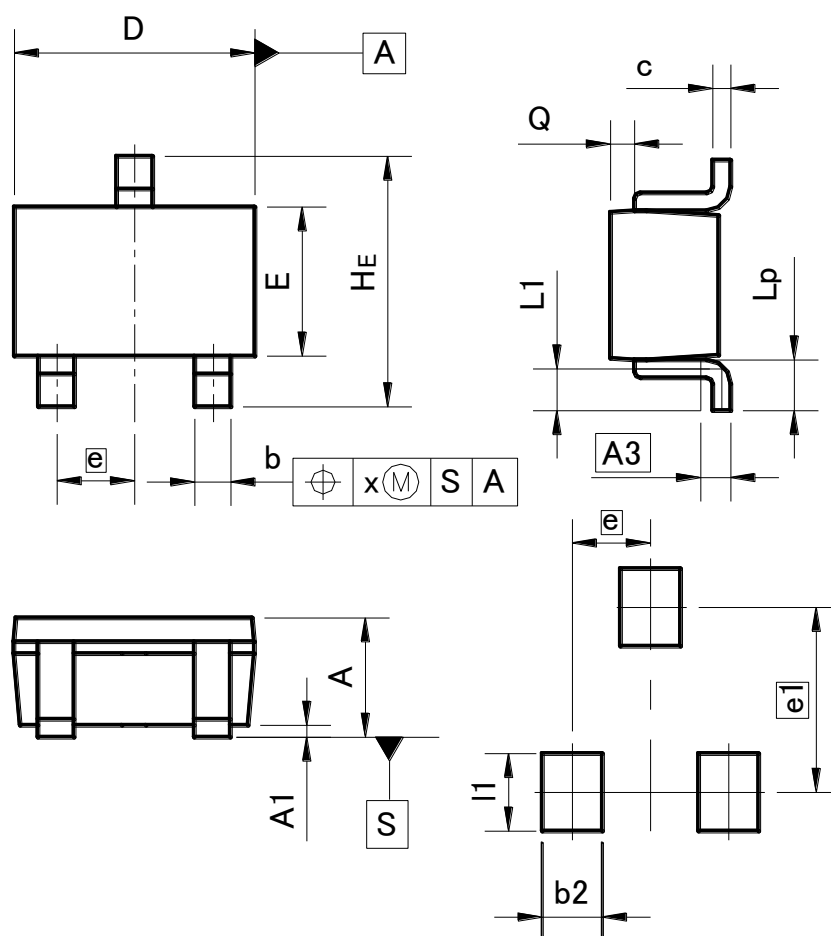
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.60	0.80	0.024	0.031
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
e	0.50		0.020	
HE	1.40	1.80	0.055	0.071
L1	0.10	—	0.004	—
Lp	0.15	—	0.006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

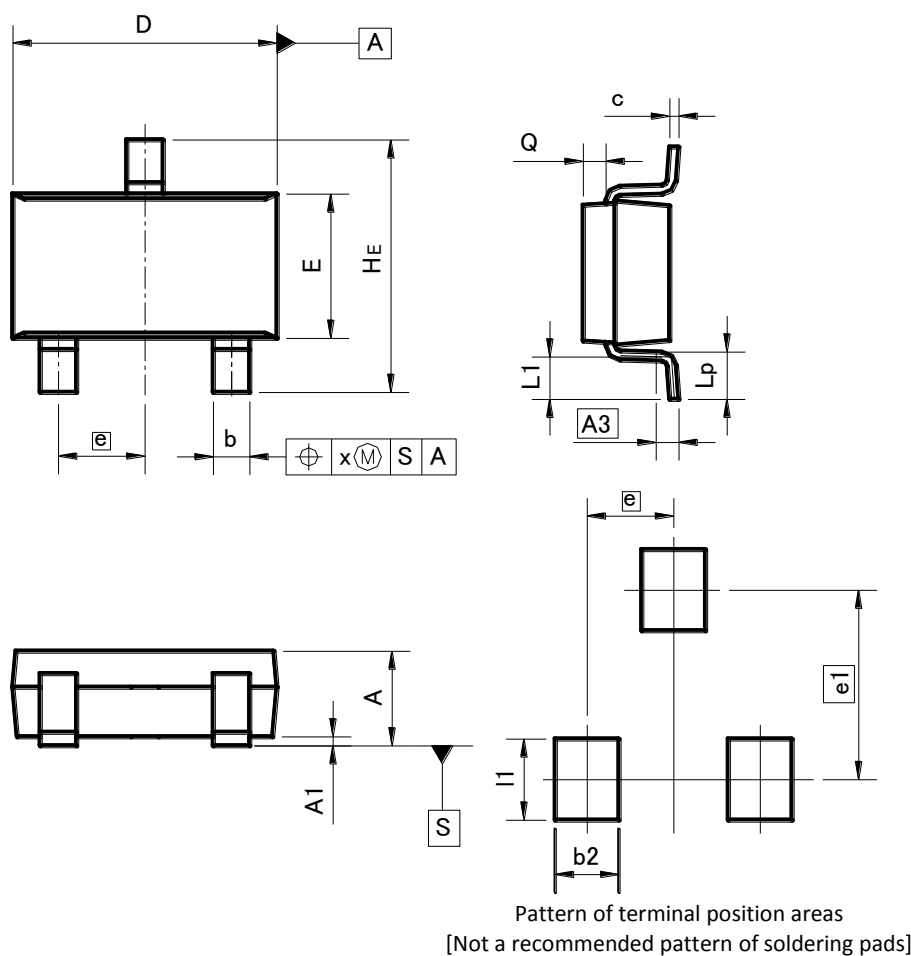
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30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



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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