

Parameter	Value
$V_{CEO}$	120V
$I_C$	50mA

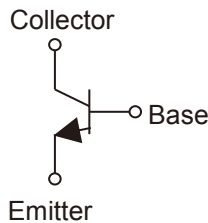
### ●Features

- 1) High Breakdown Voltage ( $V_{CEO}=120V$ ).
- 2) Complementary PNP Types :  
2SA1579FRA (UMT3) / 2SA1514KFRA (SMT3)
- 3) Complex transistors :  
IMX8FRA (SMT6)
- 4) Lead Free/RoHS Compliant.

### ●Outline

UMT3  2SC4102FRA SOT-323 (SC-70)	SMT3  2SC3906KFRA SOT-346 (SC-59)
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### ●Inner circuit



### ●Applications

High Voltage Amplifier

### ●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SC4102FRA	UMT3	2021	T106	180	8	3,000	Tx <sup>*1</sup>
2SC3906KFRA	SMT3	2928	T146	180	8	3,000	Tx <sup>*1</sup>

\*1 x :  $h_{FE}$  rank

● **Absolute maximum ratings** (Ta = 25°C)

Parameter		Symbol	Values	Unit
Collector-base voltage		$V_{CBO}$	120	V
Collector-emitter voltage		$V_{CEO}$	120	V
Emitter-base voltage		$V_{EBO}$	5	V
Collector current		$I_C$	50	mA
		$I_{CP}^{*1}$	100	mA
Power dissipation	2SC4102FRA 2SC3906KFRA	$P_D^{*2}$	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	$BV_{CEO}$	$I_C = 1\text{mA}$	120	-	-	V
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = 50\mu\text{A}$	120	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = 50\mu\text{A}$	5	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB} = 100\text{V}$	-	-	0.5	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 4\text{V}$	-	-	0.5	$\mu\text{A}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	-	-	0.5	V
DC current gain	$h_{FE}$	$V_{CE} = 6\text{V}, I_C = 2\text{mA}$	180	-	560	-
Transition frequency	$f_T$	$V_{CE} = 12\text{V}, I_E = -2\text{mA}$ $f = 100\text{MHz}$	-	140	-	MHz
Output capacitance	Cob	$V_{CB} = 12\text{V}, I_E = 0\text{mA},$ $f = 1\text{MHz}$	-	2.5	-	pF

\*1  $P_W = 100\text{ms}$  Single Pulse

\*2 Each terminal mounted on a reference footprint

●  **$h_{FE}$  rank categories**

Rank	R	S
$h_{FE}$	180 to 390	270 to 560

●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

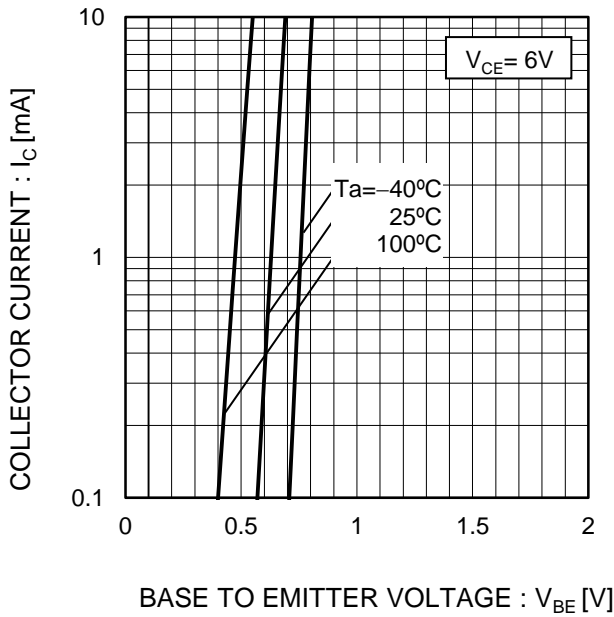


Fig.2 Typical Output Characteristics

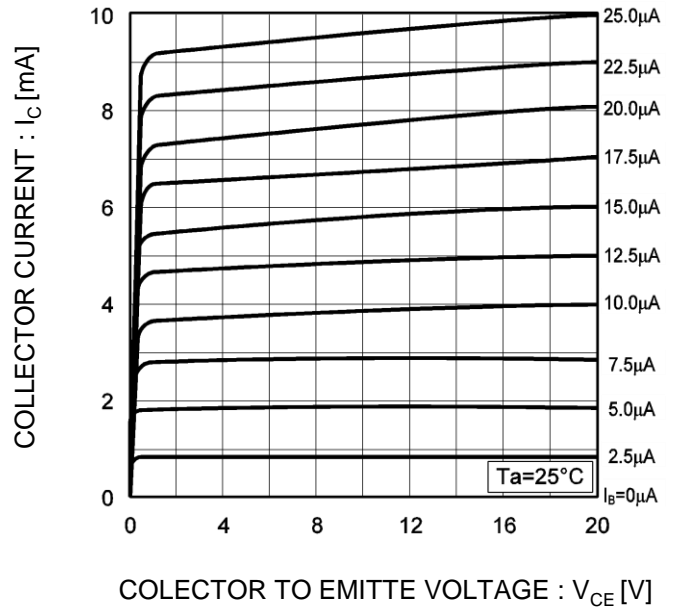


Fig.3 DC Current Gain vs. Collector Current(I)

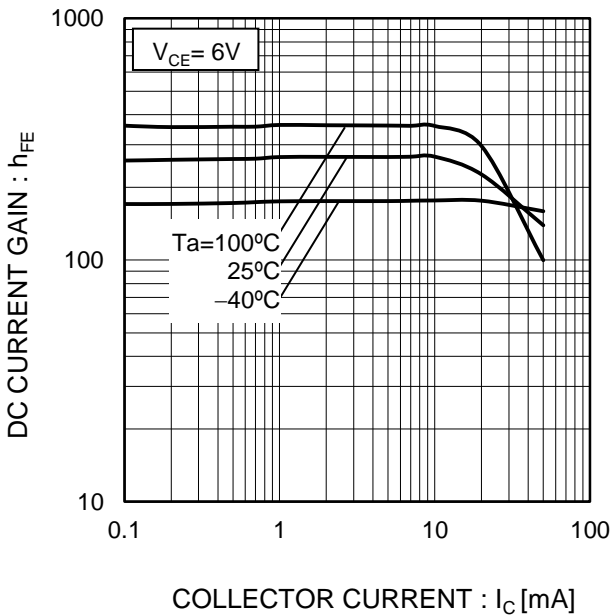
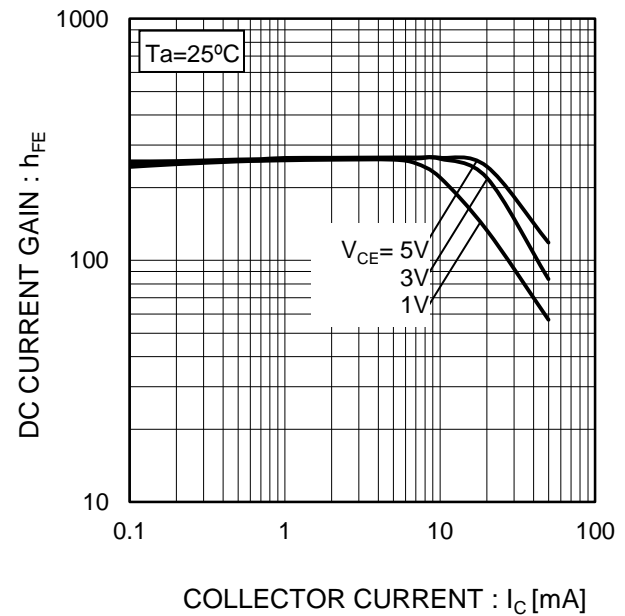


Fig.4 DC Current Gain vs. Collector Current(II)



●Electrical characteristic curves(Ta = 25°C)

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

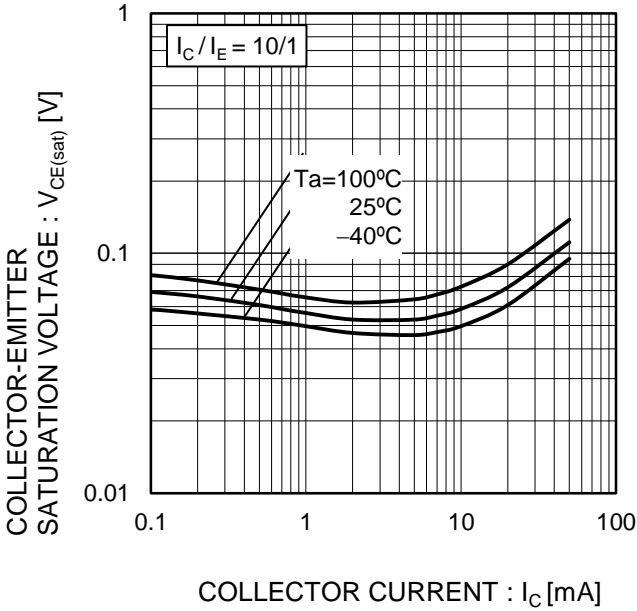


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

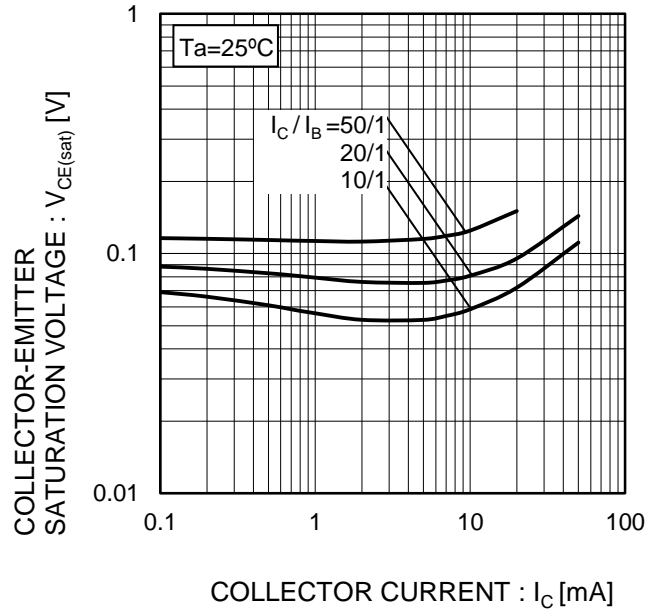


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

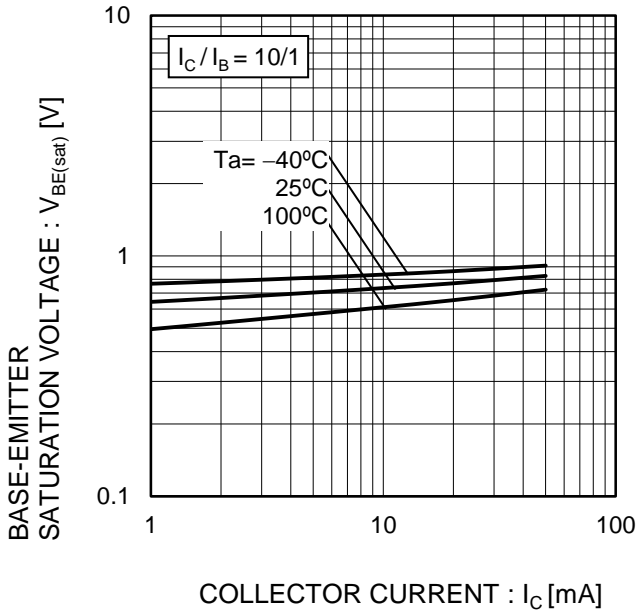
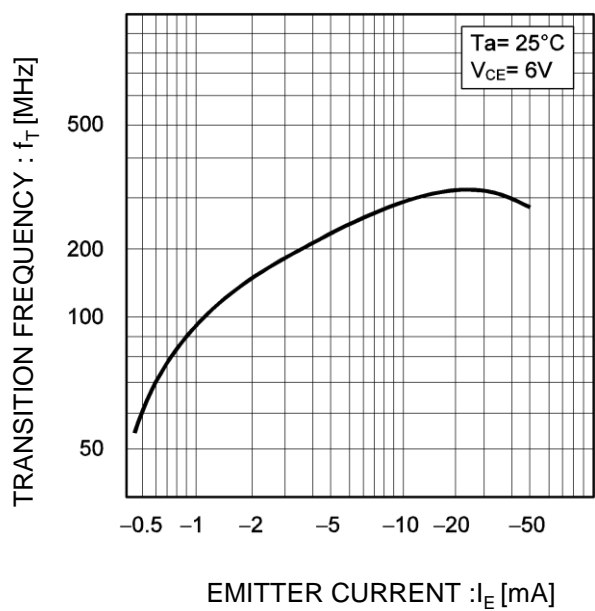


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

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

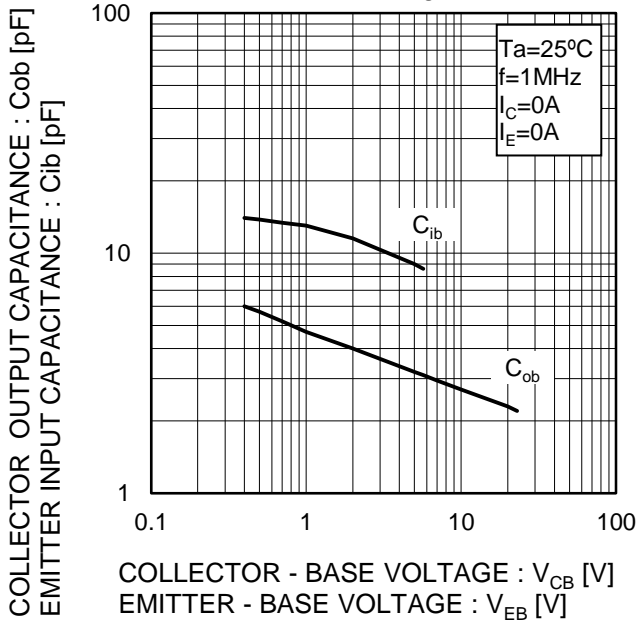


Fig.10 Safe Operating Area

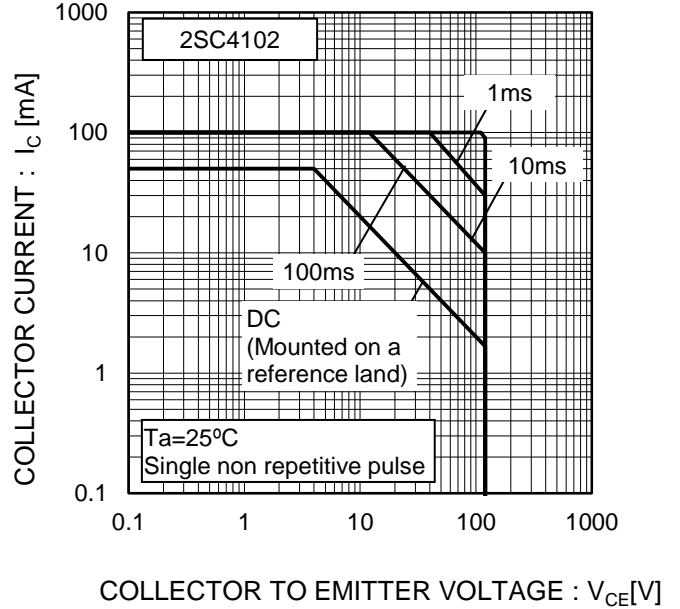
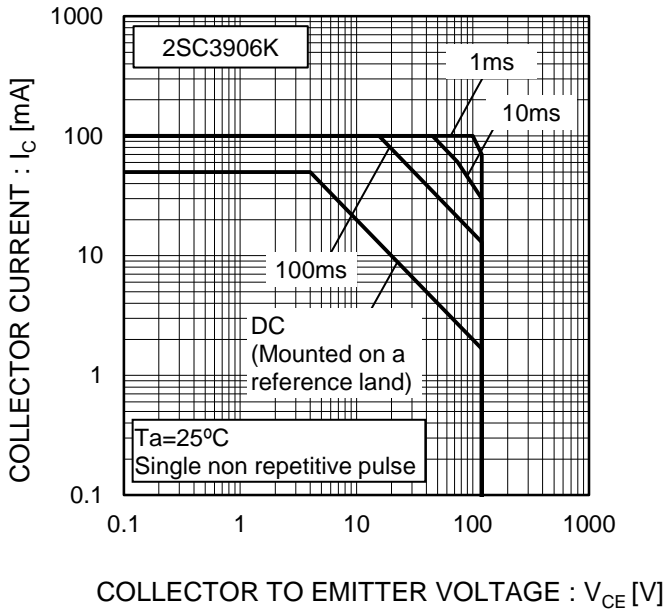
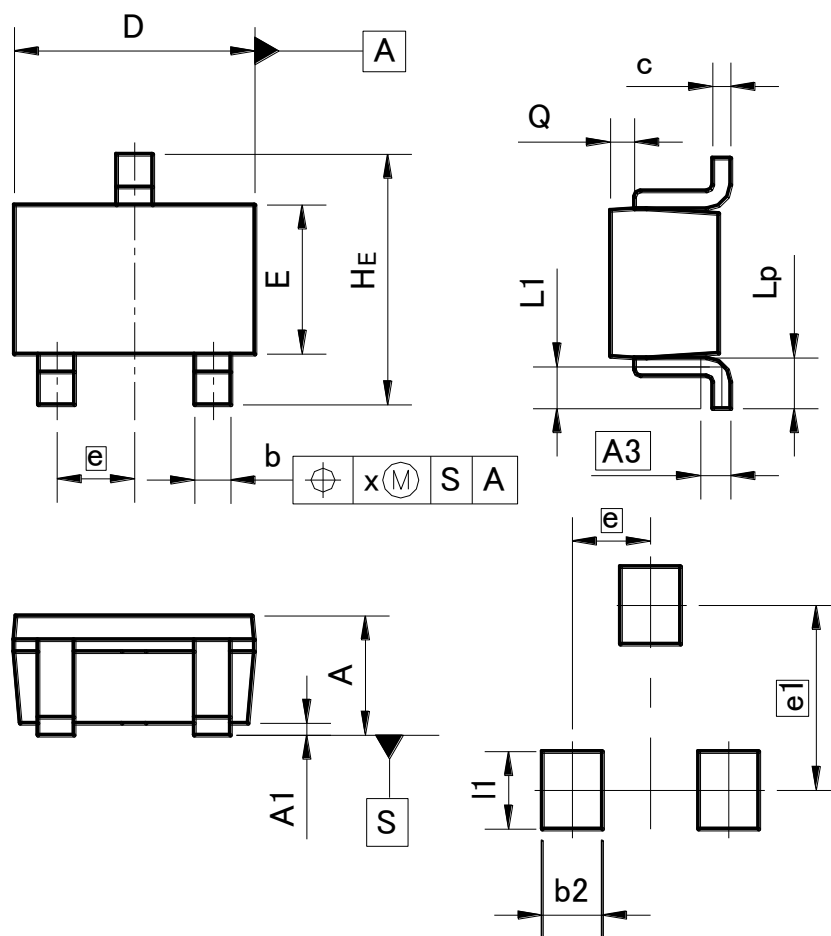


Fig.11 Safe Operating Area



●Dimensions (Unit : mm)

UMT3



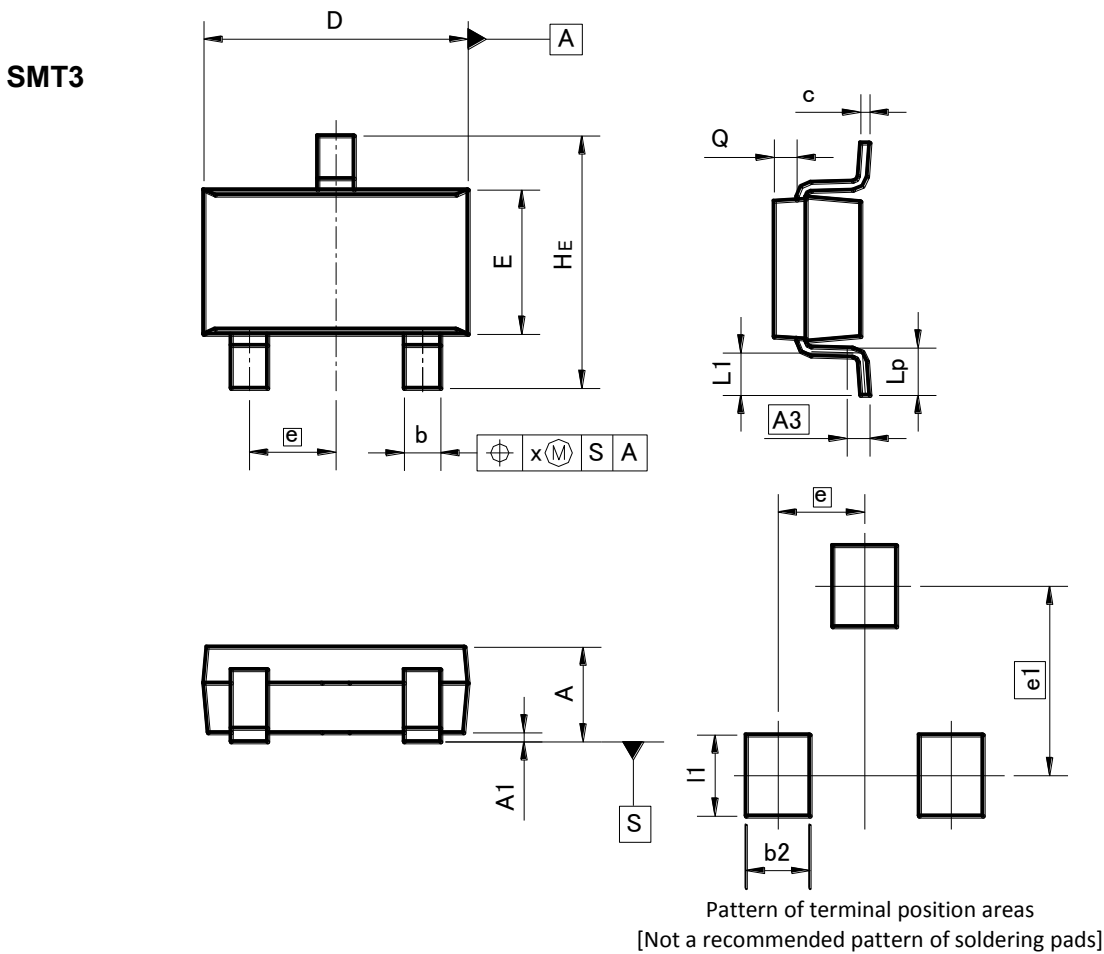
Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

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

●Dimensions (Unit : mm)



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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