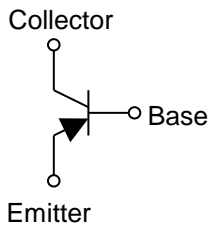


Parameter	Value
V_{CEO}	-30V
I_C	-500mA

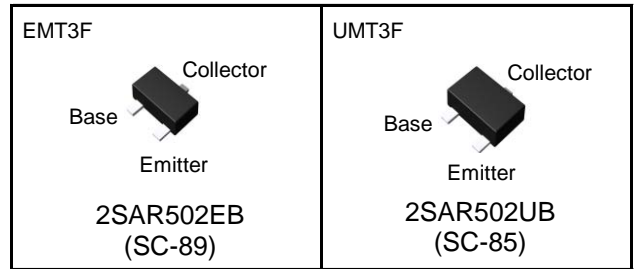
●Features

- 1) General Purpose.
- 2) Complementary NPN Types :
2SCR502EB (EMT3F) / 2SCR502UB (UMT3F)
- 3) Large collector current :
 $I_c = \text{max.} 500\text{mA}$
- 4) Low $V_{CE(sat)}$
- 5) Lead Free/RoHS Compliant.

●Inner circuit



●Outline



●Applications

Switching circuit, LED driver circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
2SAR502EB	EMT3F	1616	TL	180	8	3,000	LT
2SAR502UB	UMT3F	2021	TL	180	8	3,000	LT

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

Parameter		Symbol	Values	Unit
Collector-base voltage		V_{CBO}	-30	V
Collector-emitter voltage		V_{CEO}	-30	V
Emitter-base voltage		V_{EBO}	-6	V
Collector current		I_C^{*1}	-500	mA
Power dissipation	2SAR502EB	P_D^{*2}	150	mW
	2SAR502UB		200	mW
Junction temperature		T_j	150	°C
Range of storage temperature		T_{stg}	-55 to +150	°C

*1 Limited by power dissipation

*2 Each terminal mounted on a reference land

● **Electrical characteristics** (Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = -1mA$	-30	-	-	V
Collector-base breakdown voltage	BV_{CBO}	$I_C = -100\mu A$	-30	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = -100\mu A$	-6	-	-	V
Collector cut-off current	I_{CBO}	$V_{CB} = -25V$	-	-	-200	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -4V$	-	-	-200	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -200mA, I_B = -10mA$	-	-0.15	-0.40	V
DC current gain	h_{FE}^{*3}	$V_{CE} = -2V, I_C = -100mA$	200	-	500	-
Transition frequency	f_T^{*3}	$V_{CE} = -10V, I_E = 100mA$ $f = 100MHz$	-	520	-	MHz
Output capacitance	Cob	$V_{CB} = -10V, I_E = 0A,$ $f = 1MHz$	-	4.0	-	pF

*3 Pulsed

●Electrical characteristic curves(Ta = 25°C)

Fig.1 Ground Emitter Propagation Characteristics

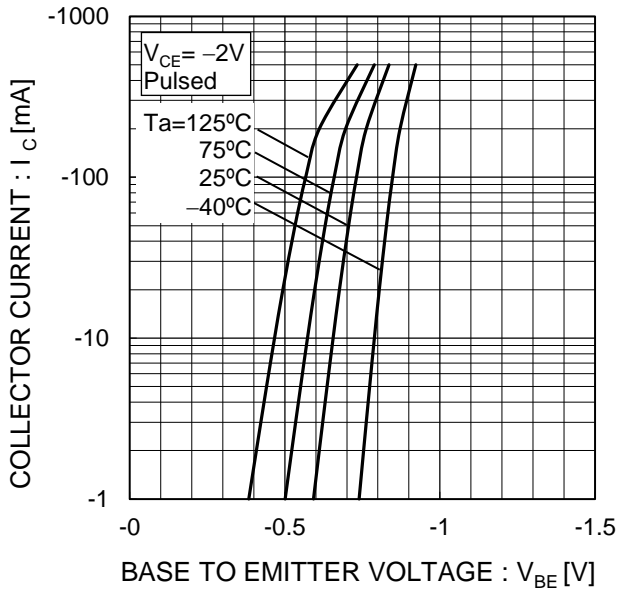


Fig.2 Typical Output Characteristics

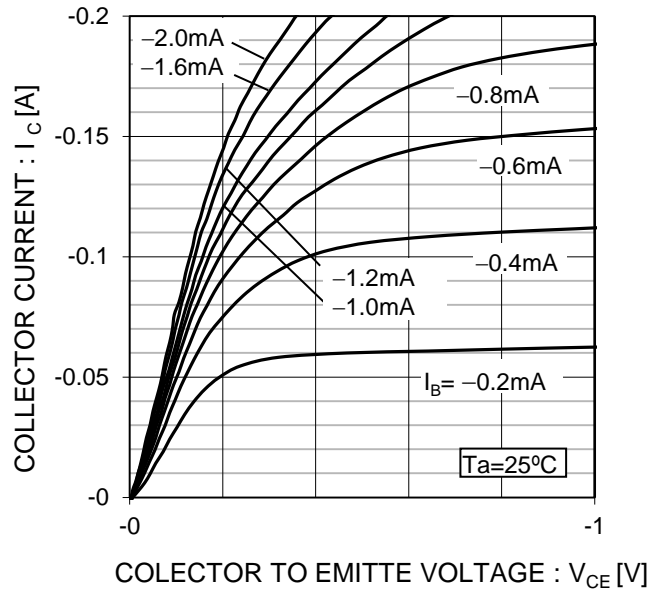


Fig.3 DC Current Gain vs. Collector Current (I)

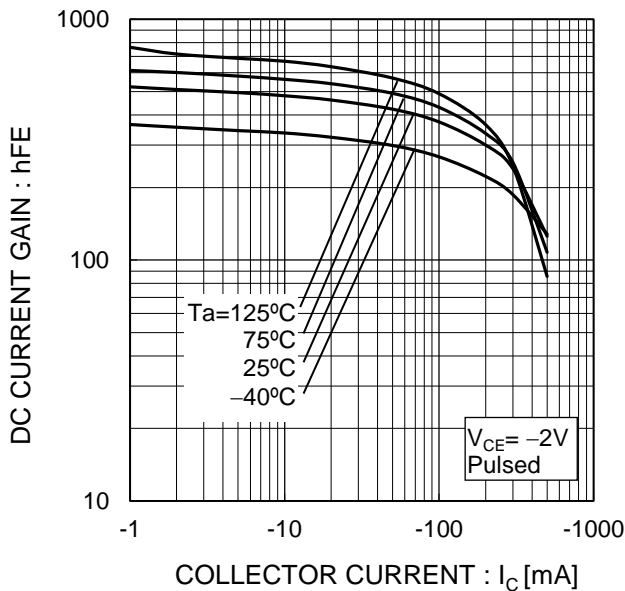
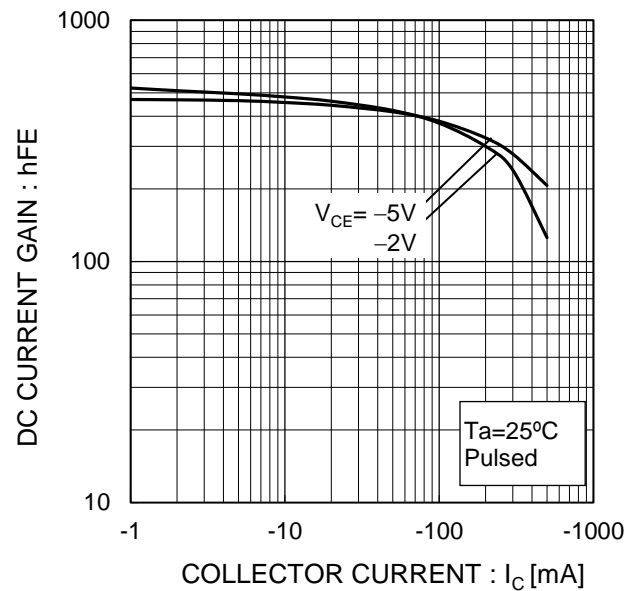


Fig.4 DC current gain vs. output current



●Electrical characteristic curves(Ta = 25°C)

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

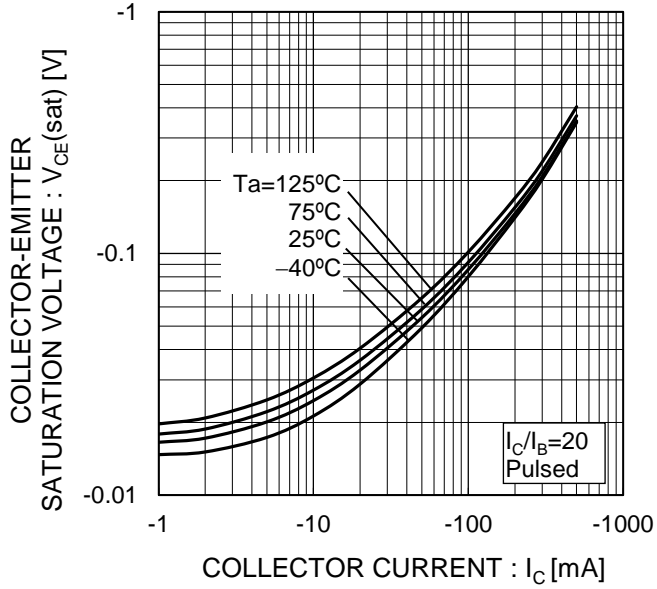


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current (II)

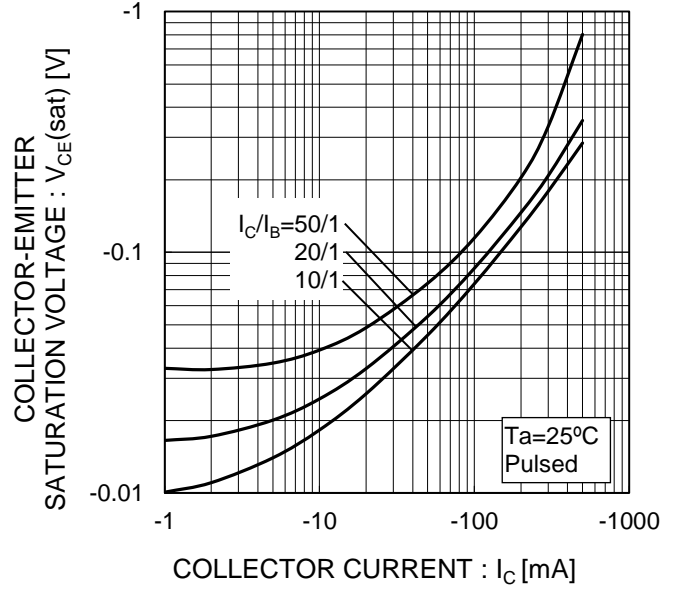


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

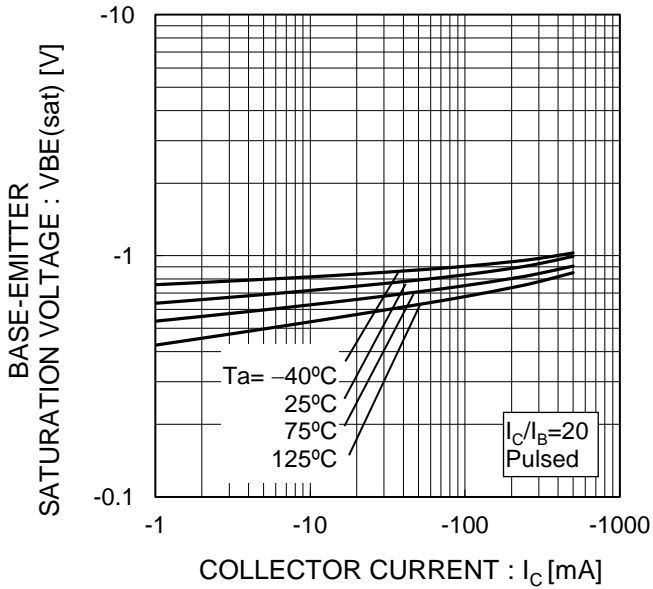
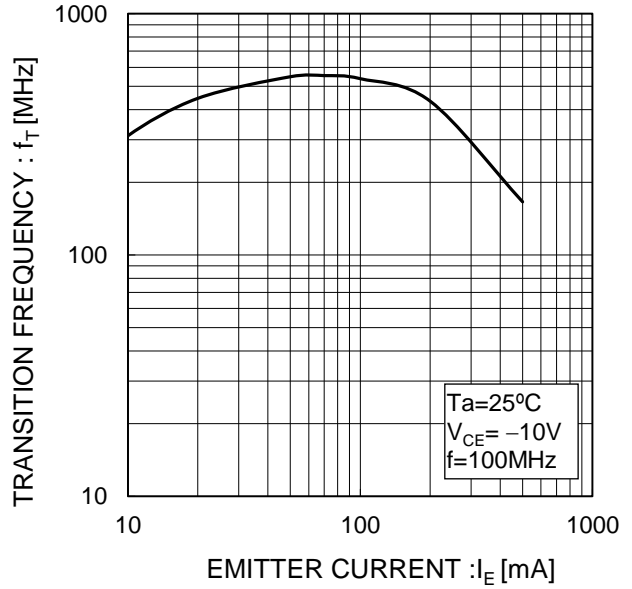


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(Ta = 25°C)

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

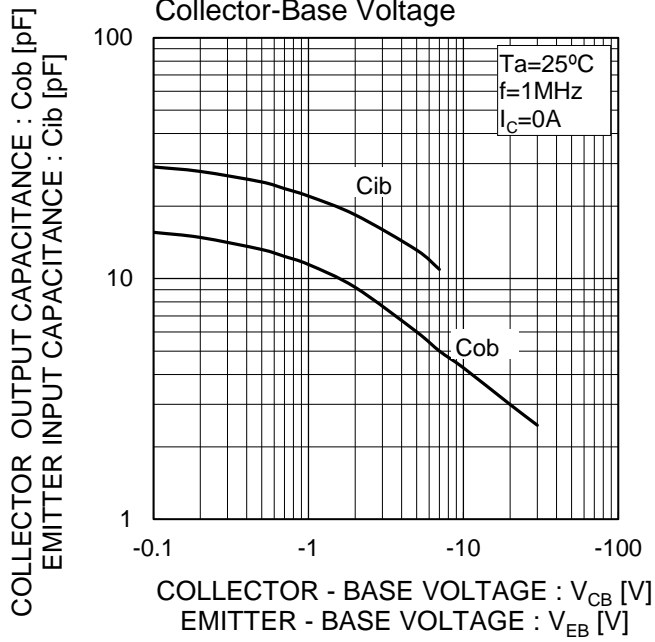


Fig.10 Safe Operating Area

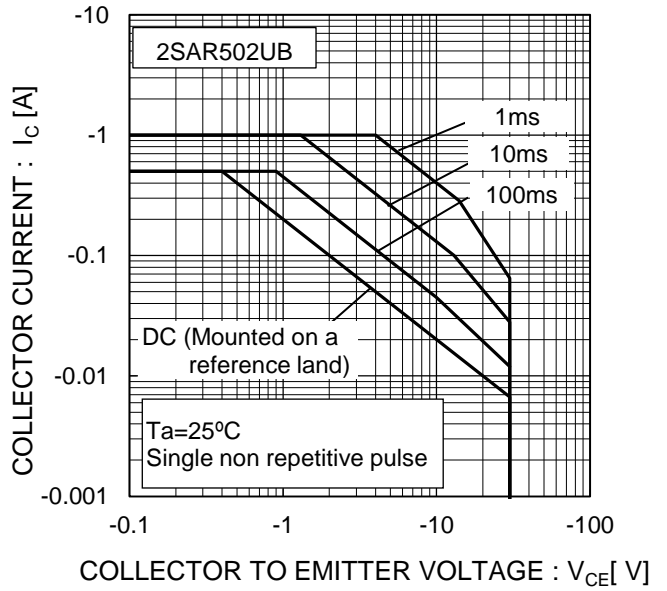
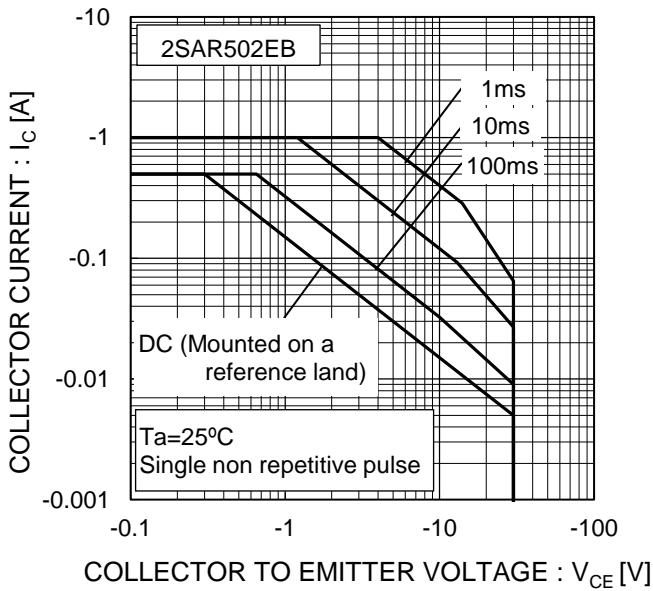
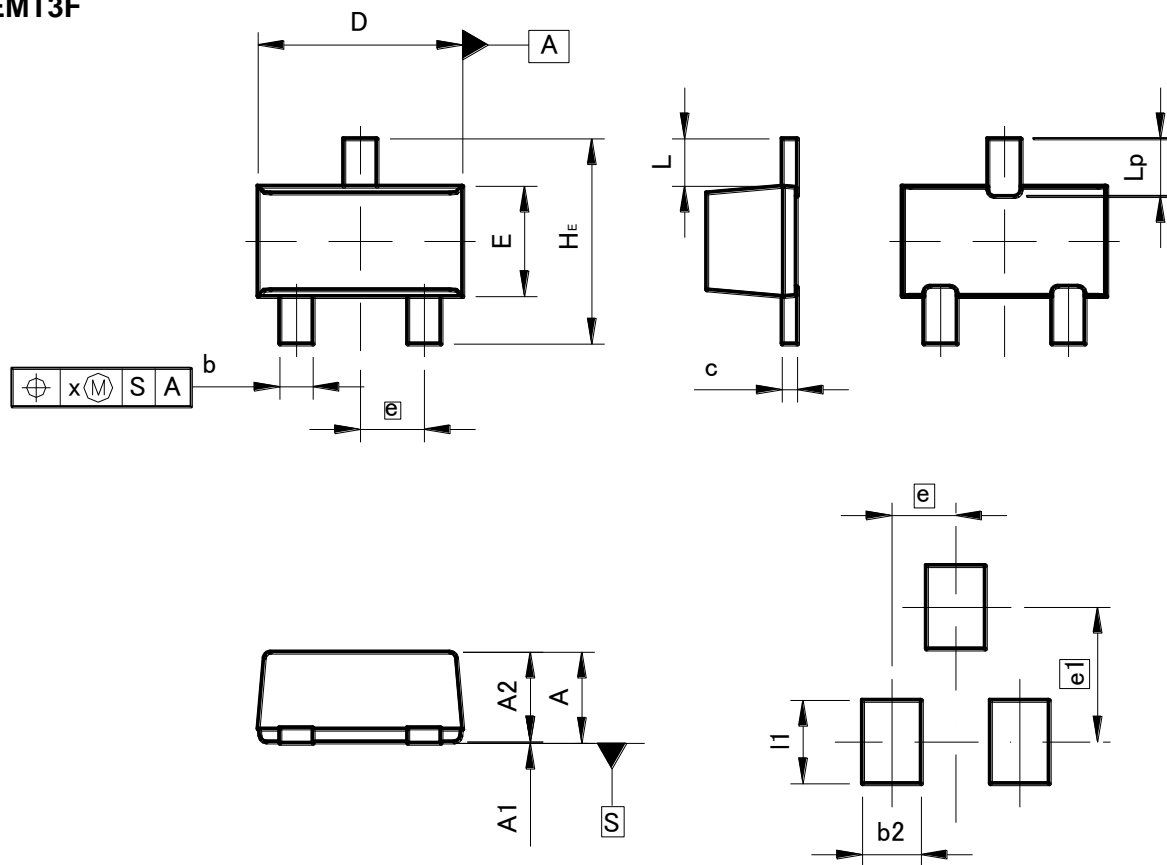


Fig.11 Safe Operating Area



●Dimensions (Unit : mm)

EMT3F



Pattern of terminal position areas

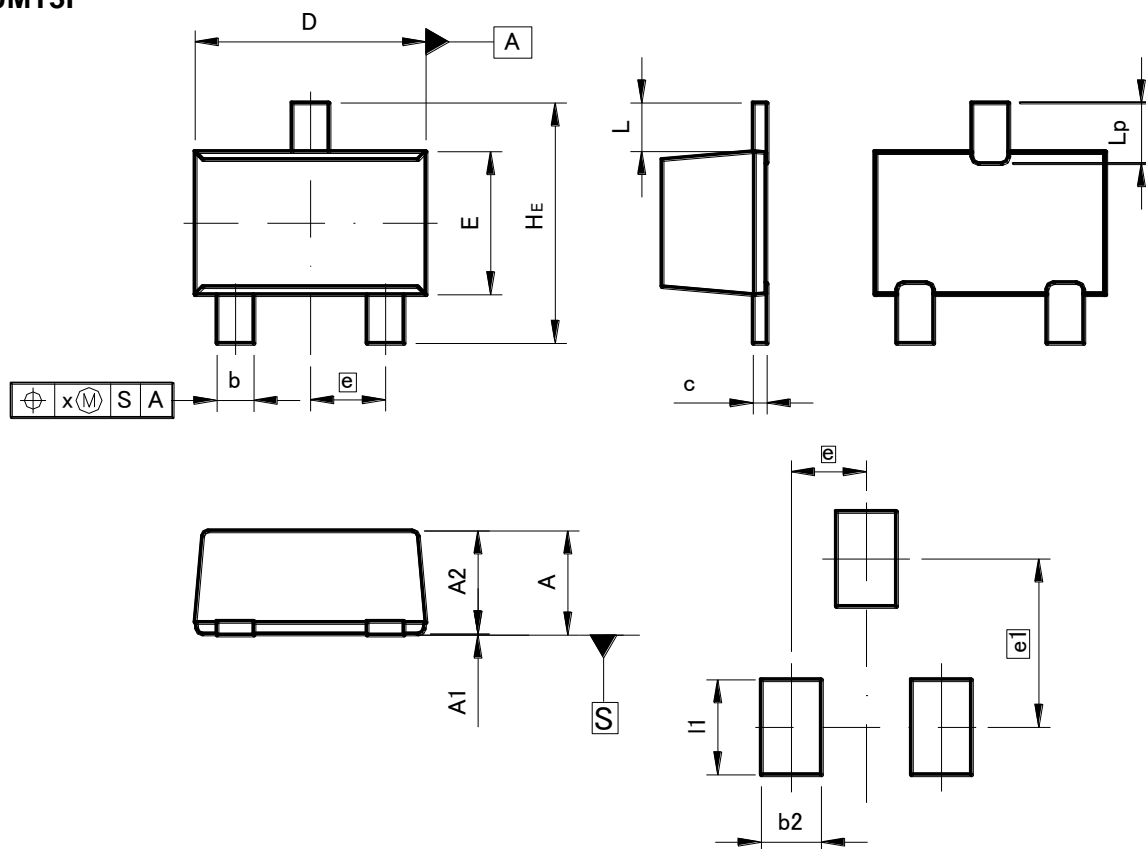
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.65	0.85		
A1	0.00	0.10	0	0.004
A2	0.60	0.80	0.024	0.031
b	0.21	0.36	0.008	0.014
c	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	0.76	0.96	0.03	0.038
e	0.50		0.02	
HE	1.50	1.70	0.059	0.067
L	0.37		0.015	
Lp	0.35	0.55	0.014	0.022
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	-	1.05	-	0.041
b2	-	0.46	-	0.018
l1	-	0.65	-	0.026

Dimension in mm/inches

●Dimensions (Unit : mm)

UMT3F



Pattern of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.85	1.05	0.033	0.041
A1	0.00	0.10	0	0.004
A2	0.80	1.00	0.031	0.039
b	0.27	0.42	0.011	0.017
c	0.08	0.18	0.003	0.007
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.03	
HE	2.00	2.20	0.079	0.087
L	0.425		0.02	
Lp	0.43	0.63	0.017	0.025
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.47		0.058	
b2	-	0.52	-	0.02
l1	-	0.83	-	0.033

Dimension in mm/inches

Notes

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