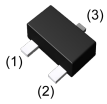
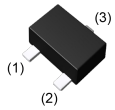
2SCR502EB / 2SCR502UB

NPN 500mA 30V General purpose transistors

Datasheet

Parameter	Value
V_{CEO}	30V
I_C	0.5A

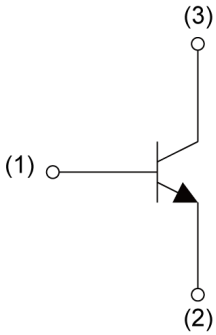
●Outline

EMT3F	UMT3F
	
2SCR502EB SOT-416FL	2SCR502UB SOT-323FL

●Features

1)General purpose.
2)Complementary PNP types :
  2SAR502EB(EMT3F)/2SAR502UB(UMT3F)
3)Collector current is large.
4)Low $V_{CE(sat)}$.

●Inner circuit



(1) Base
(2) Emitter
(3) Collector

●Application

LOW FREQUENCY AMPLIFIER

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SCR502EB	EMT3F	1616	TL	180	8	3000	LW
2SCR502UB	UMT3F	2021	TL	180	8	3000	LW

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●Absolute maximum ratings (T_a = 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	0.5	A
		I_{CP} *2	1	A
Base current		I_B	0.15	A
Power dissipation	2SCR502EB	P_D *3	150	mW
	2SCR502UB		200	
Junction temperature		T_j	150	℃
Range of storage temperature		T_{stg}	-55 to +150	℃

●Electrical characteristics (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector-base breakdown voltage	BV_{CBO}	I_C = 100μA	30	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C = 1mA	30	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E = 100μA	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	-	100	300	mV
DC current gain	h_{FE}	V_{CE} = 2V, I_C = 100mA	200	-	500	-
Transition frequency	f_T *4	V_{CE} = 10V, I_E = -100mA, f = 100MHz	-	360	-	MHz
Output capacitance	C_{ob}	V_{CB} = 10V, I_E = 0A, f = 1MHz	-	3	-	pF

*1 Limited by power dissipation.

*2 Pw=10ms, Single pulse.

*3 Each terminal mounted on a reference land.

*4 Pulsed

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●Electrical characteristic curves(T_a = 25°C)

Fig.1 Grounded Emitter Propagation Characteristics

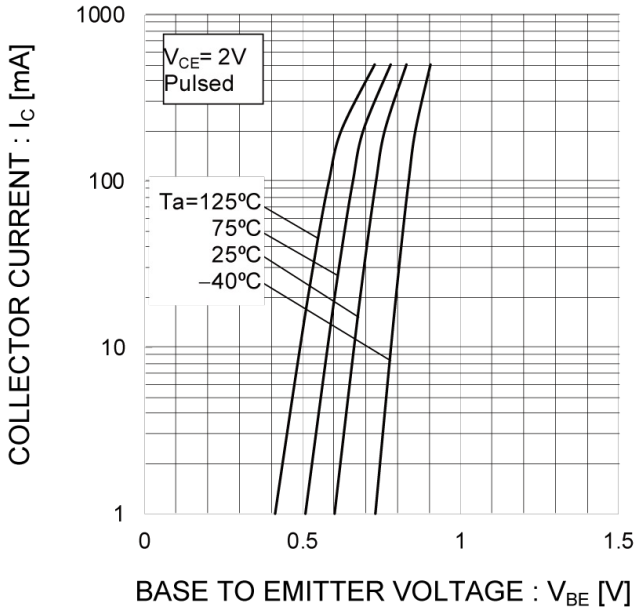


Fig.2 Typical Output Characteristics

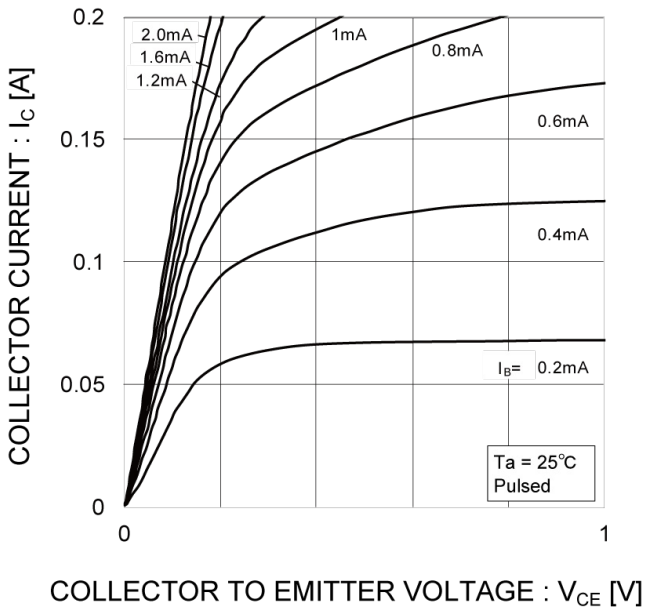


Fig.3 DC Current Gain vs. Collector Current(I)

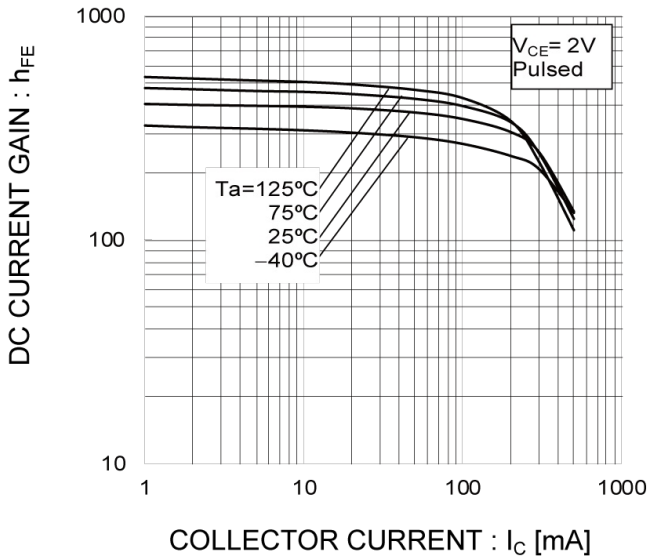
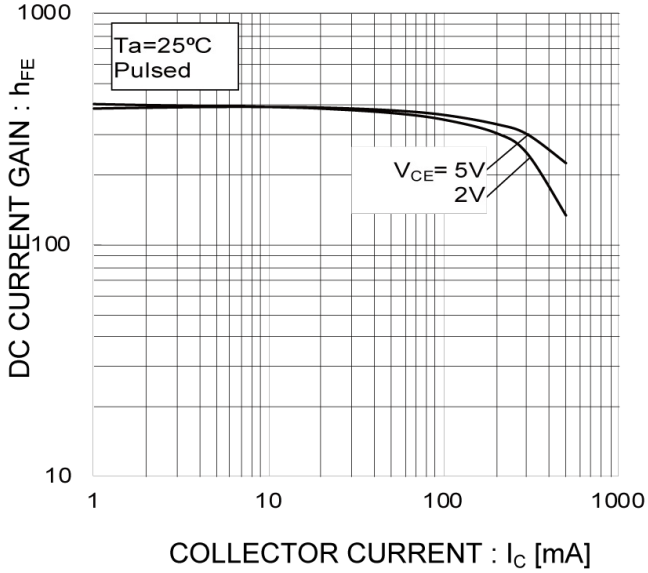


Fig.4 DC Current Gain vs. Collector Current(II)



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●Electrical characteristic curves(T_a = 25°C)

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

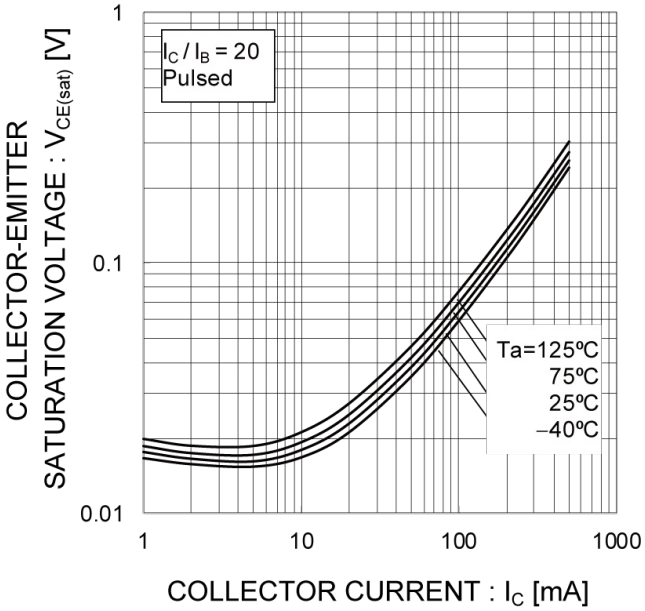


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current(II)

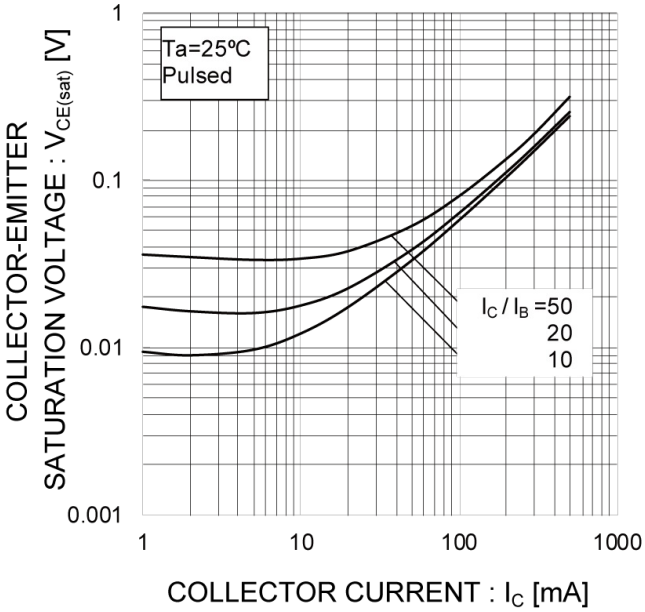


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

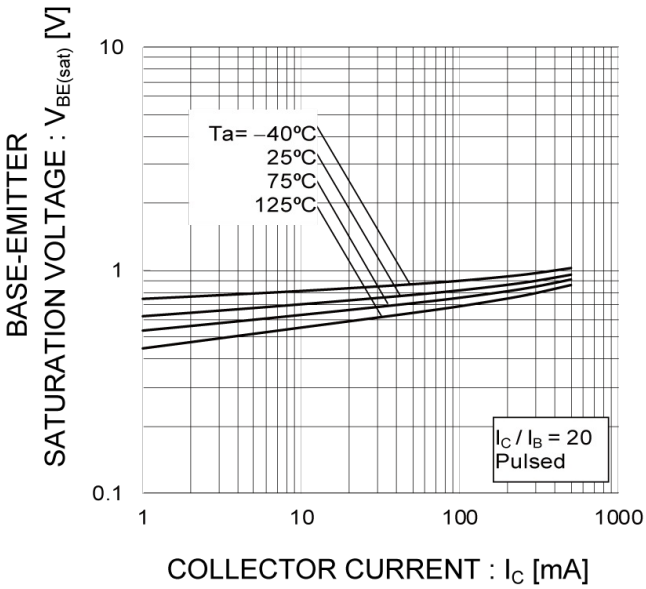
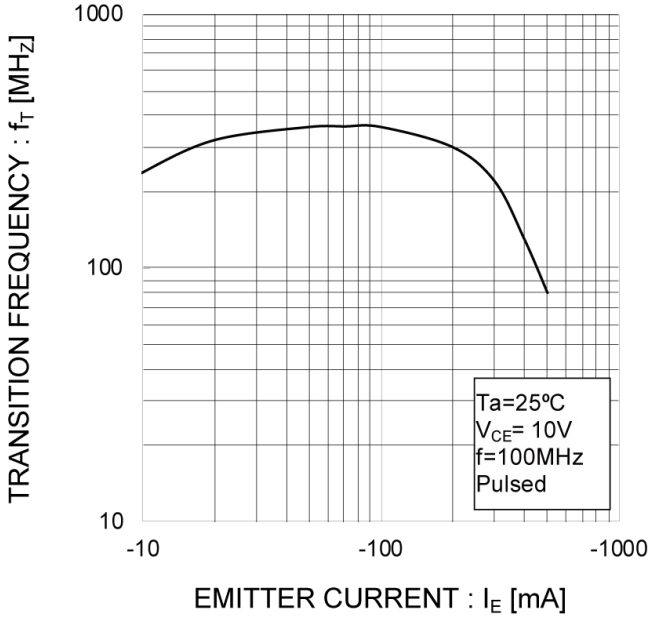


Fig.8 Gain Bandwidth Product vs. Emitter Current



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●Electrical characteristic curves(T_a = 25°C)

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

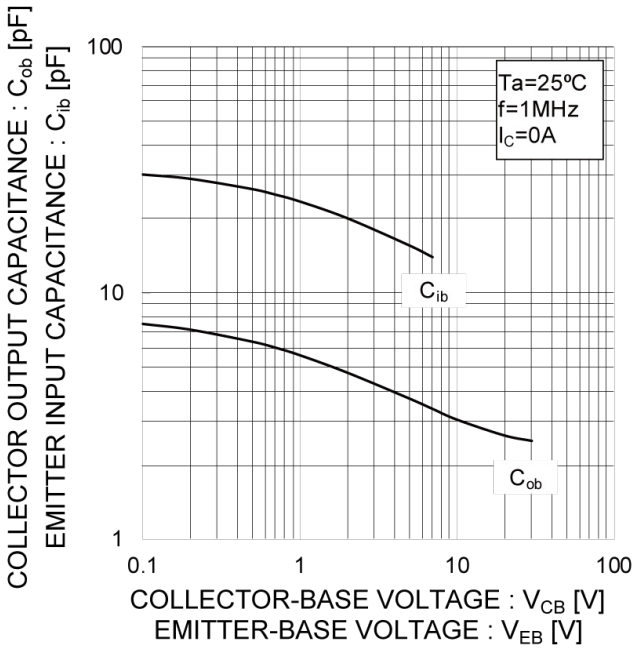


Fig.10 Safe Operating Area

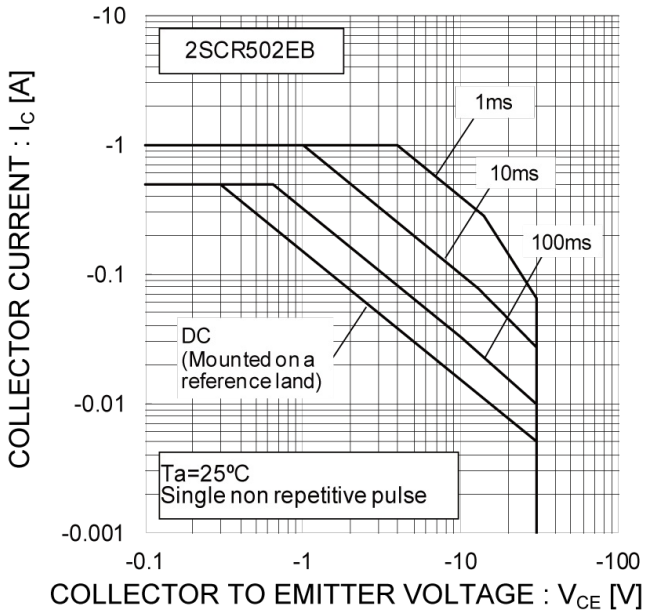
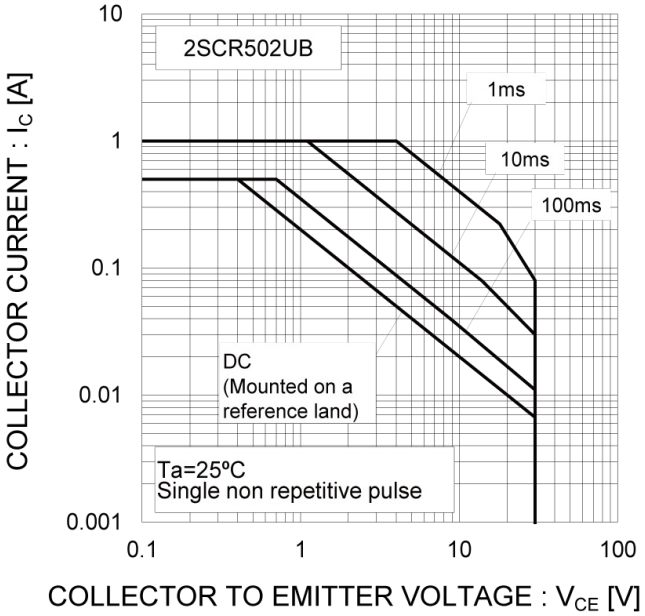


Fig.11 Safe Operating Area



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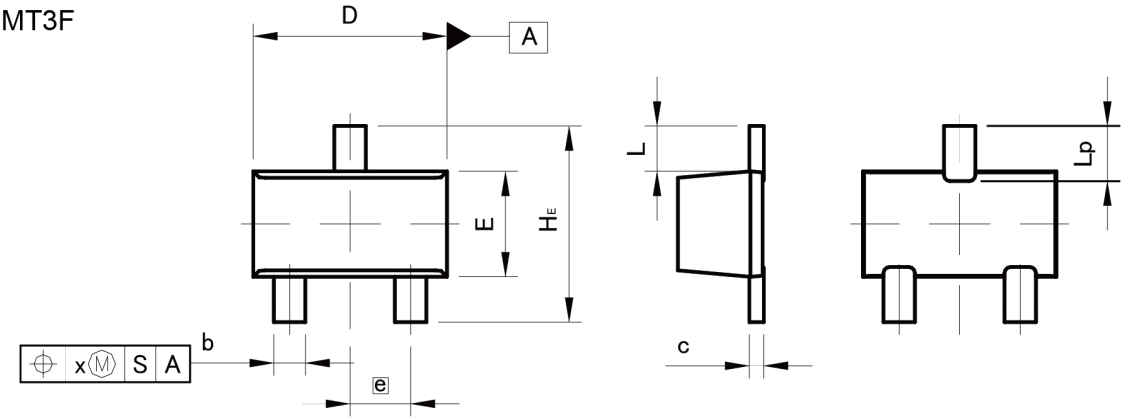
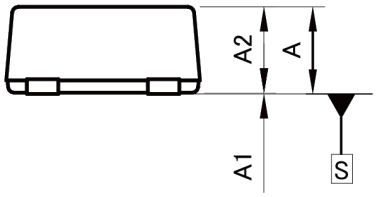
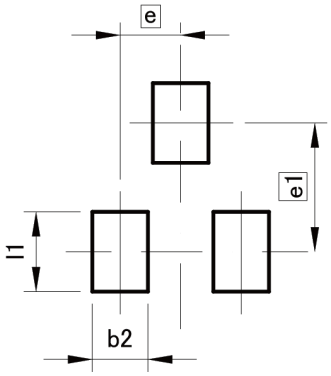
●Dimensions

EMT3F







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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.65	0.85	0.026	0.033
A1	0.00	0.10	0.000	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	0.030	0.038
e	0.50		0.020	
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
b2	–	0.46	–	0.018
e1	–	1.05	–	0.041
l1	–	0.65	–	0.026

Dimension in mm/inches

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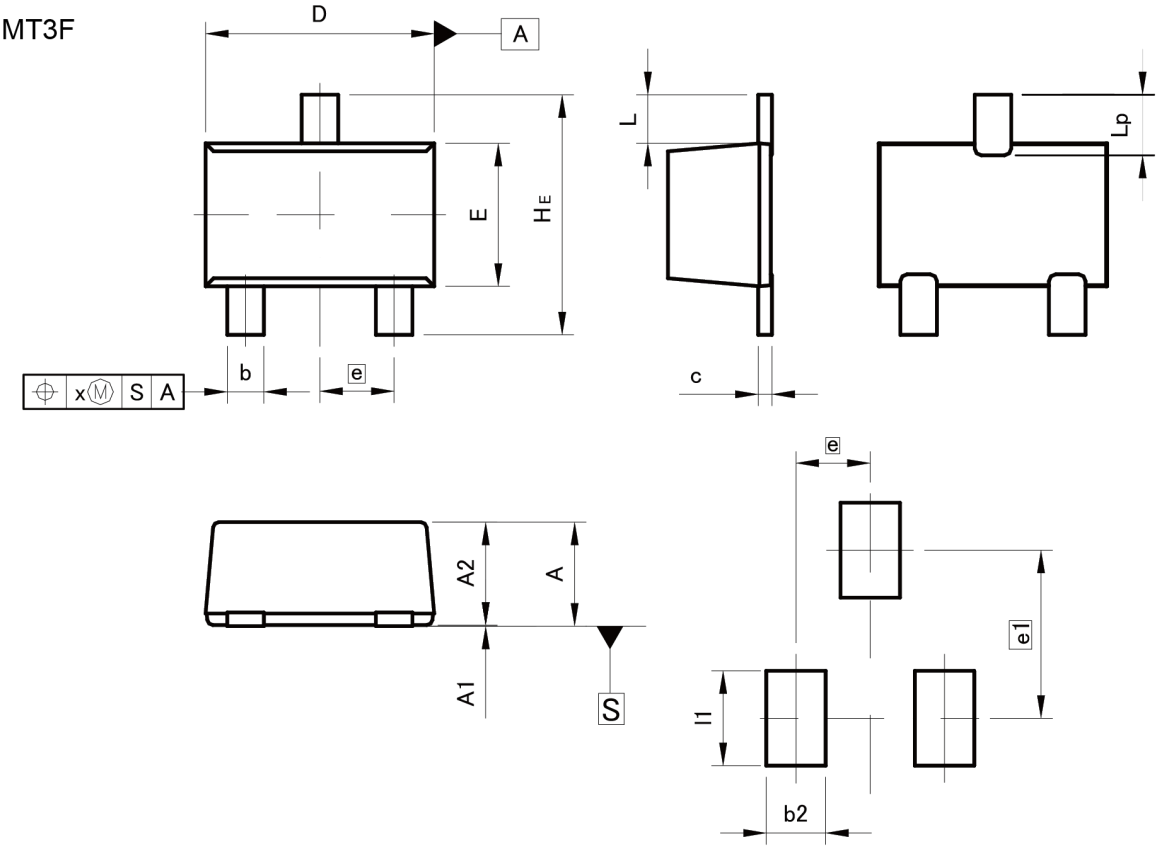
●Dimensions

UMT3F



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.85	1.05	0.033	0.041
A1	0.00	0.10	0.000	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		0.026	
HE	2.00	2.20	0.079	0.087
L	0.43		0.017	
Lp	0.43	0.63	0.017	0.025
x	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	–	0.52	–	0.020
e1	1.47		0.058	
l1	–	0.83	–	0.033

Dimension in mm/inches

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