2SAR542F3

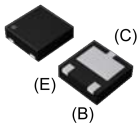
PNP -3.0A -30V Middle Power Transistor

Datasheet

Parameter	Value
V_{CEO}	-30V
I_C	-3A

●**Outline**

HUML2020L3

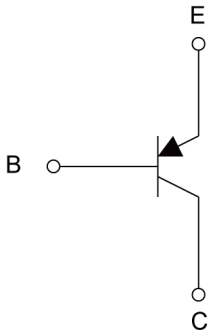


2SAR542F3

●**Features**

1) Suitable for Middle Power Driver.
2) Low $V_{CE(sat)}$
   $V_{CE(sat)}$=-0.20V(Max.).
   (I_C/I_B=-1A/-50mA)
3) High collector current.
   I_C=-3A(max),I_{CP}=-6A(max)
4) Leadless small SMD package (HUML2020L3)
   Excellent thermal and electrical conductivity.
5) Lead Free/Rohs Compliant.

●**Inner circuit**



B: BASE
C: COLLECTOR
E: EMITTER

●**Application**

Motor driver,LED driver

Power supply

●**Packaging specifications**

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
2SAR542F3	HUML2020L3	2020	TR	180	8	3000	MQ

●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	-3	A
	I_{CP}*1	-6	A
Base current	I_B	-500	mA
Power dissipation	P_D*2	1.0	W
	P_D*3	2.1	W
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} = -30V	-	-	-100	nA
Emitter cut-off current	I_{EBO}	V_{EB} = -4V	-	-	-100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = -1A, I_B = -50mA	-	-90	-200	mV
DC current gain	h_{FE}	V_{CE} = -2V, I_C = -500mA	200	-	500	-
Transition frequency	f_T	V_{CE} = -10V, I_E = 100mA, f = 100MHz	-	240	-	MHz
Output capacitance	C_{ob}	V_{CB} = -10V, I_E = 0mA, f = 1MHz	-	40	-	pF
Turn-On time	t_{on}*4	I_C = -2.5A, V_{CC} = -10V	-	45	-	ns
Storage time	t_{stg}*4	I_{B1} = -250mA	-	200	-	ns
Fall time	t_f*4	I_{B2} = 250mA	-	25	-	ns

*1 Pw=1ms 1PULSE

*2 Mounted on FR4 board(25.4×25.4×1.6mm, Cu PAD:645mm^2).

*3 Pw=10ms
Mounted on FR4 board(25.4×25.4×1.6mm, Cu PAD:645mm^2).

*4 SEE SWITCHING TIME TEST CIRCUIT

●Electrical characteristic curves(T_a = 25°C)

Fig.1 Grounded Emitter Propagation Characteristics

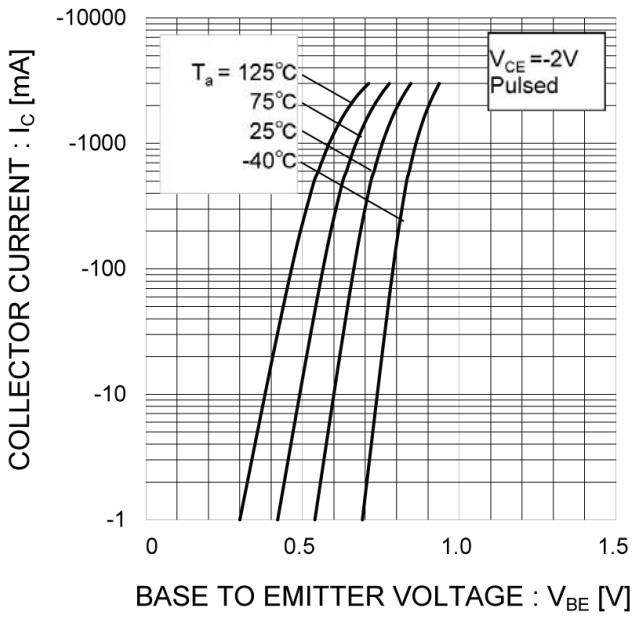


Fig.2 Typical Output Characteristics

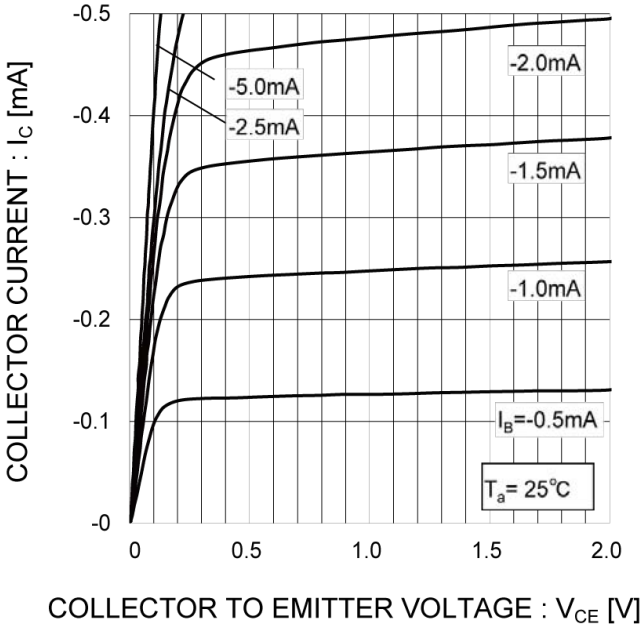


Fig.3 DC Current Gain vs. Collector Current(I)

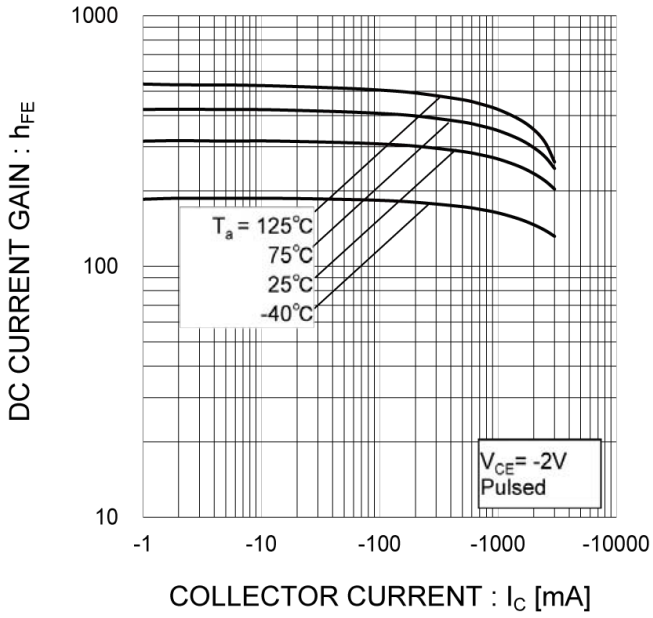
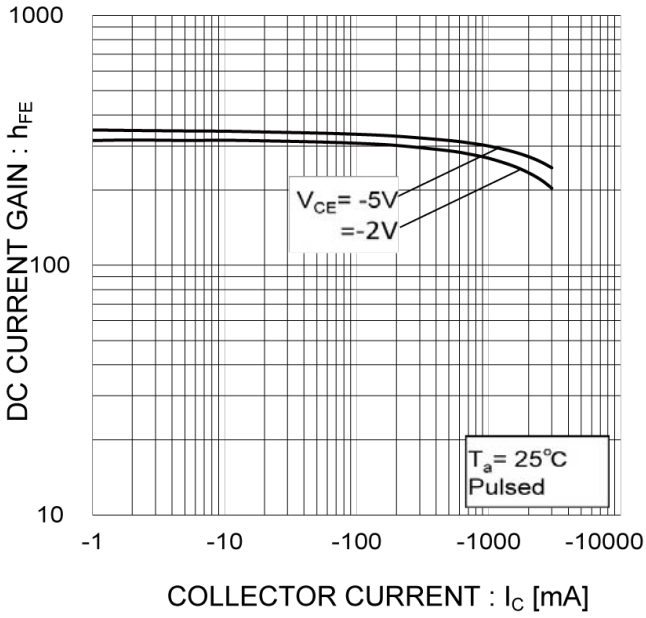


Fig.4 DC Current Gain vs. Collector Current(II)



●Electrical characteristic curves(T_a = 25°C)

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

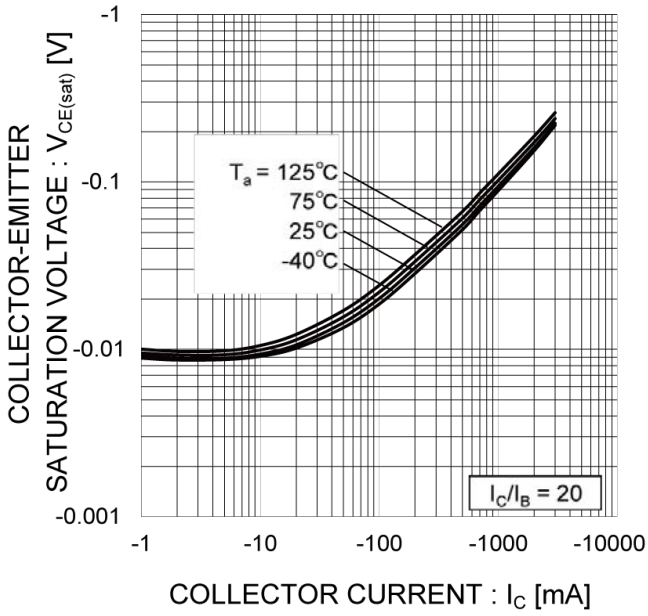


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current(II)

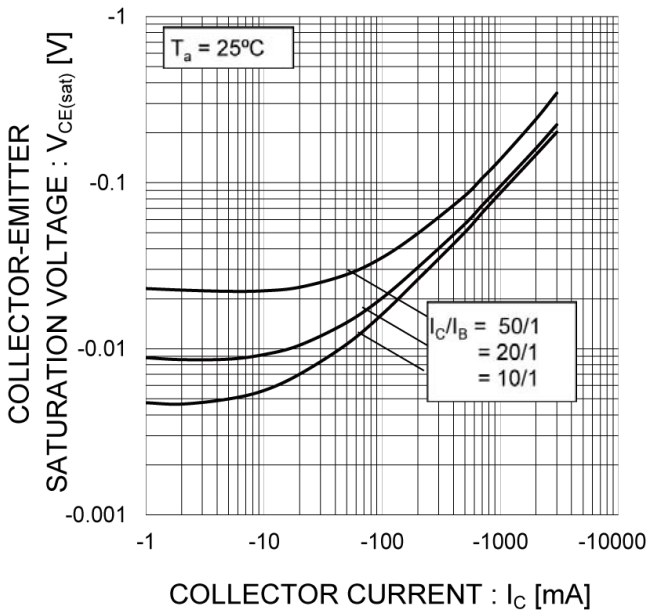


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current

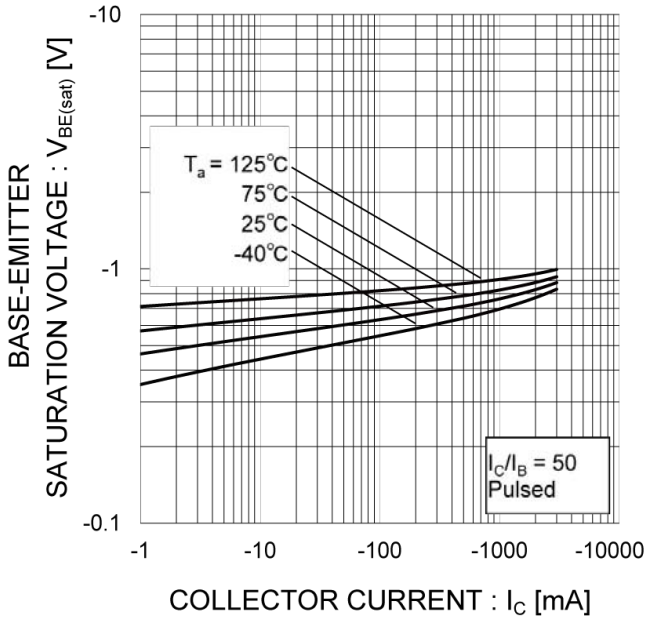
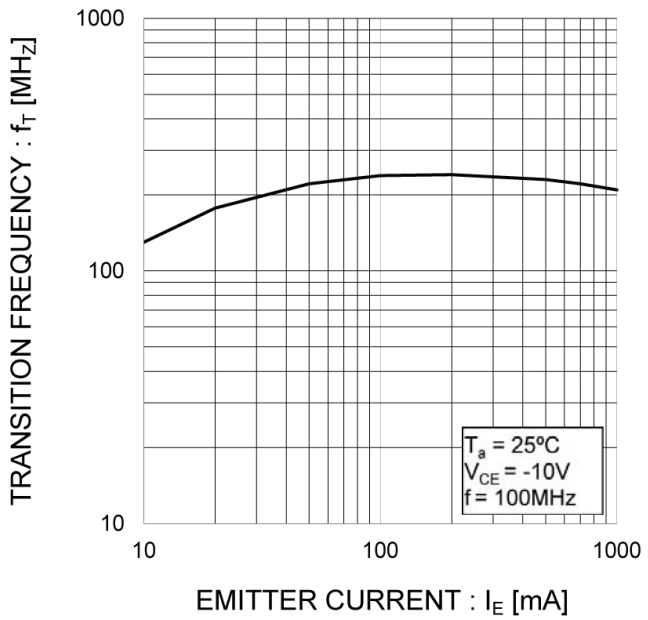


Fig.8 Gain Bandwidth Product vs. Emitter Current



●Electrical characteristic curves(T_a = 25°C)

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

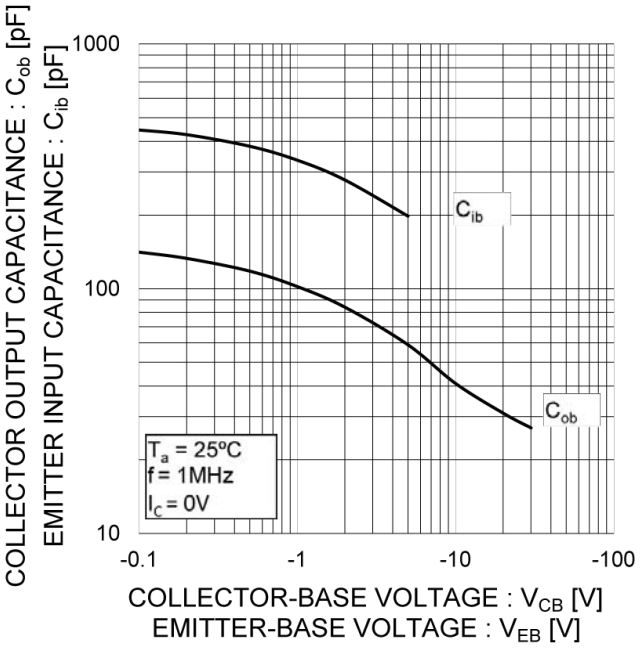
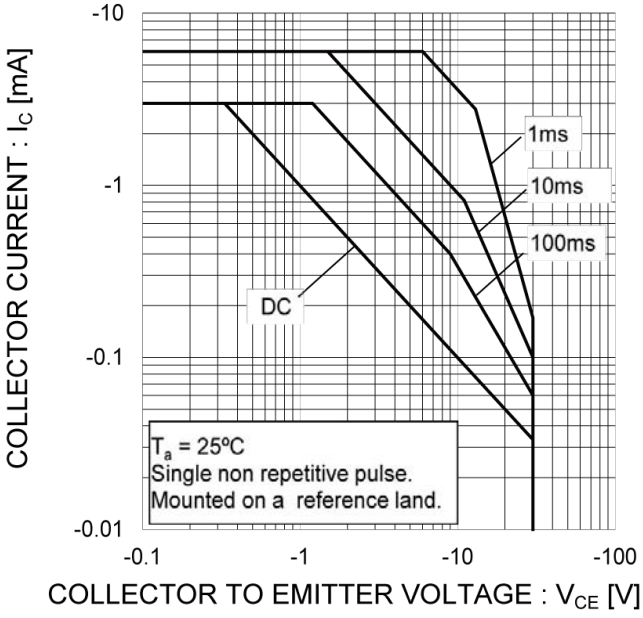
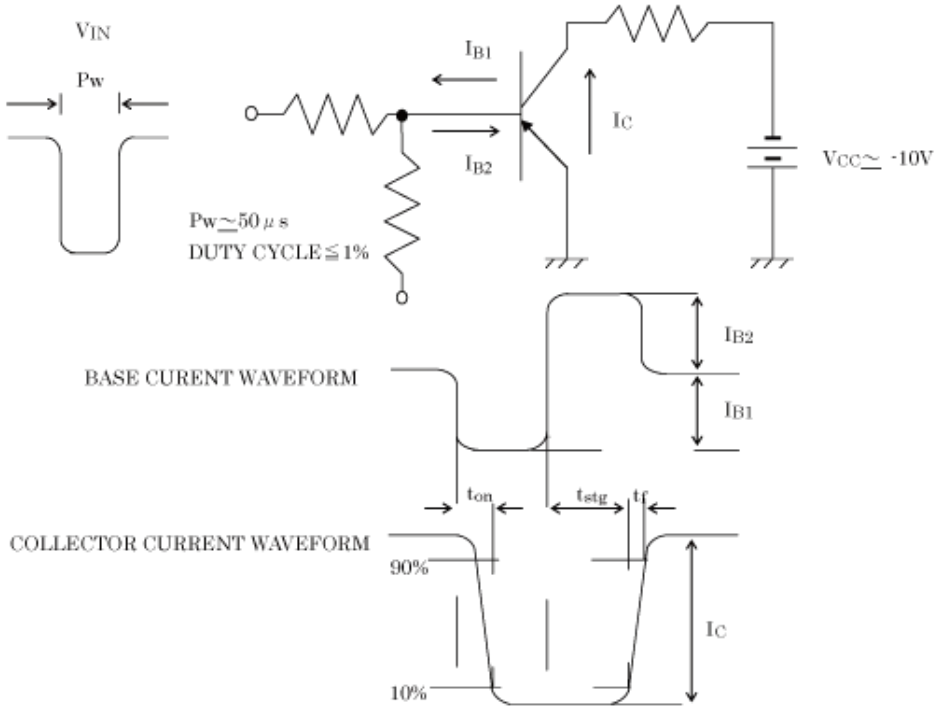


Fig.10 Safe Operating Area



SWITCHING TIME TEST CIRCUIT



●Dimensions

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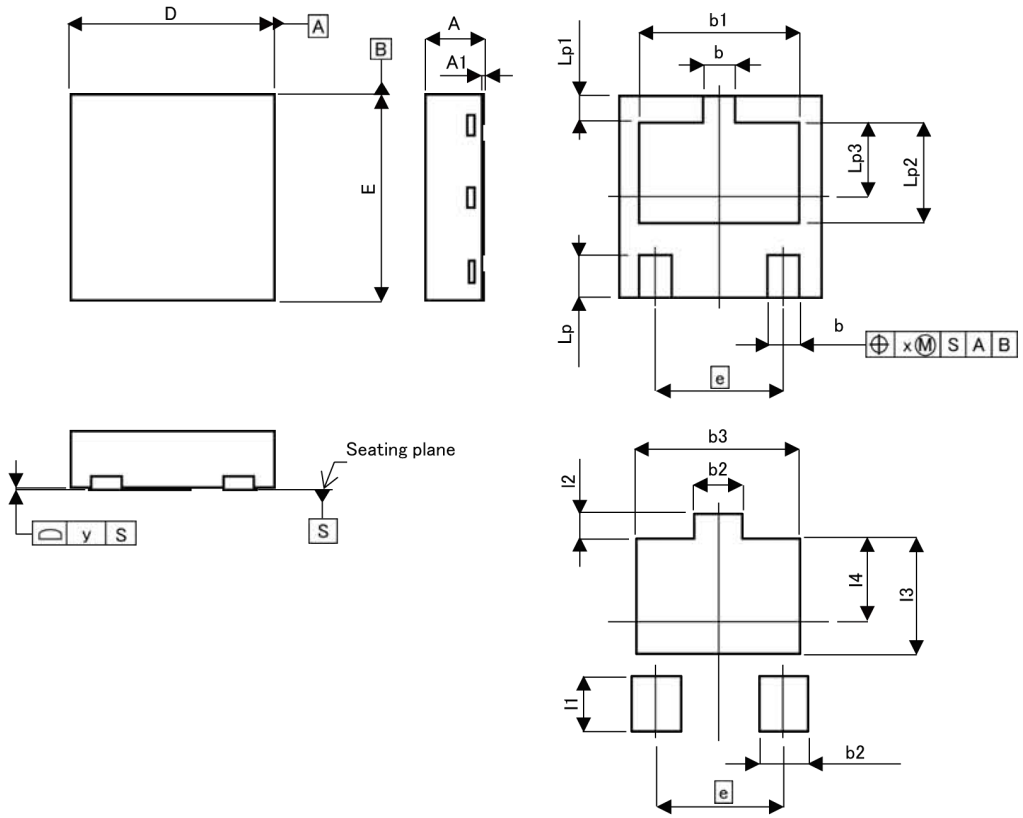

Pattern of terminal position areas
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.55	0.65	0.022	0.026
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
b1	1.40	1.60	0.055	0.063
D	1.90	2.10	0.075	0.083
E	1.90	2.10	0.075	0.083
e	1.30		0.051	
Lp	0.35	0.45	0.014	0.018
Lp1	0.25 REF		0.01 REF	
Lp2	0.90	1.10	0.035	0.043
Lp3	0.70	0.80	0.028	0.031
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.45	-	0.018
b3	-	1.60	-	0.063
l1	-	0.55	-	0.022
l2	0.25 REF		0.01 REF	
l3	-	1.10	-	0.043
l4	-	0.80	-	0.031

Dimension in mm/inches

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