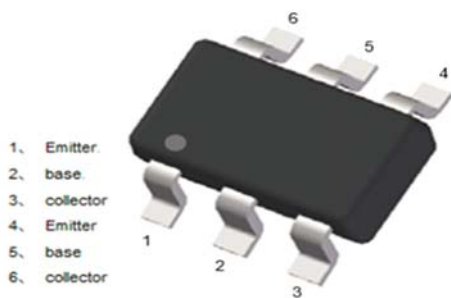
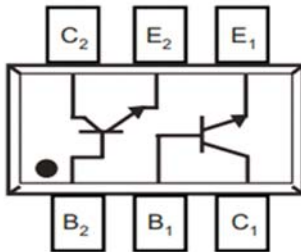


## Dual NPN Small Signal Transistor



### Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic insertion

### Application

- Signal amplification
- Switching circuit

### Mechanical data

- **Package:** SOT-363S
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102C

### ■ Maximum Ratings ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Device marking code				K4A
Collector-base voltage	$V_{CBO}$	V	$I_C = 10\mu\text{A}, I_E = 0$	60
Collector-emitter voltage	$V_{CEO}$	V	$I_C = 1\text{mA}, I_B = 0$	40
Emitter-base voltage	$V_{EBO}$	V	$I_E = 10\mu\text{A}, I_C = 0$	5
Collector current	$I_C$	mA		200
Power dissipation	$P_D$	mW		200
Operation junction temperature	$T_j$	$^\circ\text{C}$		-55 to +150
Storage temperature	$T_{STG}$	$^\circ\text{C}$		-55 to +150



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## ■ Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	V	I <sub>C</sub> =10μA, I <sub>E</sub> =0	60		
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	V	I <sub>C</sub> =1mA, I <sub>B</sub> =0	40		
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	V	I <sub>E</sub> =10μA, I <sub>C</sub> =0	5		
Base cutoff current	I <sub>CBL</sub>	nA	V <sub>CE</sub> =30V, V <sub>EB(OFF)</sub> =3V			50
Collector cutoff current	I <sub>CEX</sub>	nA	V <sub>CE</sub> =30V, V <sub>EB(OFF)</sub> =3V			50
DC current gain	h <sub>FE1</sub>		V <sub>CE</sub> =1V, I <sub>C</sub> =0.1mA	40		
	h <sub>FE2</sub>		V <sub>CE</sub> =1V, I <sub>C</sub> =1mA	70		
	h <sub>FE3</sub>		V <sub>CE</sub> =1V, I <sub>C</sub> =10mA	100		300
	h <sub>FE4</sub>		V <sub>CE</sub> =1V, I <sub>C</sub> =50mA	60		
	h <sub>FE5</sub>		V <sub>CE</sub> =1V, I <sub>C</sub> =100mA	30		
Collector-emitter saturation voltage	V <sub>CE(sat)1</sub>	V	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA			0.2
	V <sub>CE(sat)2</sub>	V	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.3
Base-emitter saturation voltage	V <sub>BE(sat)1</sub>	V	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA	0.65		0.85
	V <sub>BE(sat)2</sub>	V	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.95
Transition frequency	f <sub>T</sub>	MHz	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz	300		
Delay time	t <sub>d</sub>	ns	V <sub>CC</sub> =3V, I <sub>C</sub> =10mA, V <sub>BE</sub> =0.5V, I <sub>B1</sub> =1mA			35
Rise time	t <sub>r</sub>	ns				35
Storage time	t <sub>s</sub>	ns	V <sub>CC</sub> =3V, I <sub>C</sub> =10mA, I <sub>B1</sub> =-I <sub>B2</sub> =1mA			200
Fall time	t <sub>f</sub>	ns				50

## ■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	R <sub>θJ-A</sub> <sup>(1)</sup>	°C/W	615
Thermal resistance, junction-to-case	R <sub>θJ-C</sub> <sup>(1)</sup>	°C/W	500

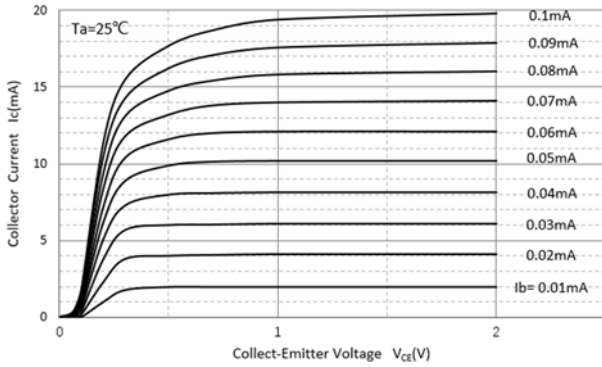
### Note:

(1) Device mounted on PCB, single-sided copper, with standard footprint

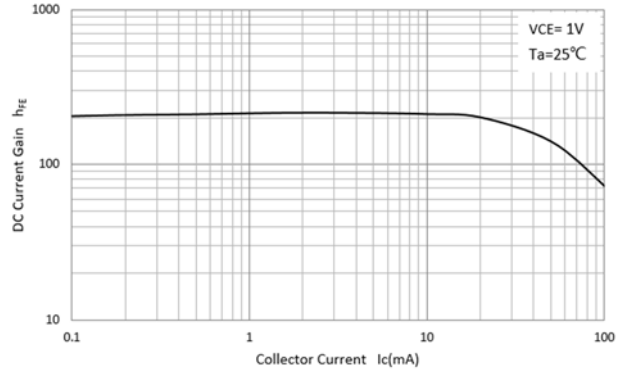


## ■ Characteristics

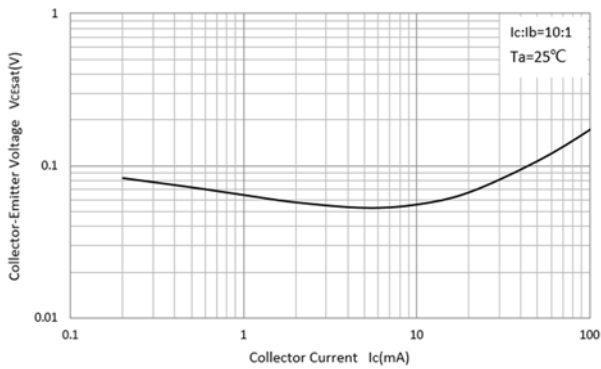
**Fig 1: Static Characteristics**



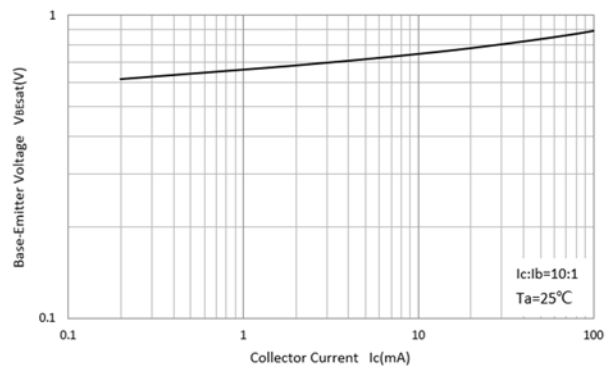
**Fig 2: Dc Current Gain**



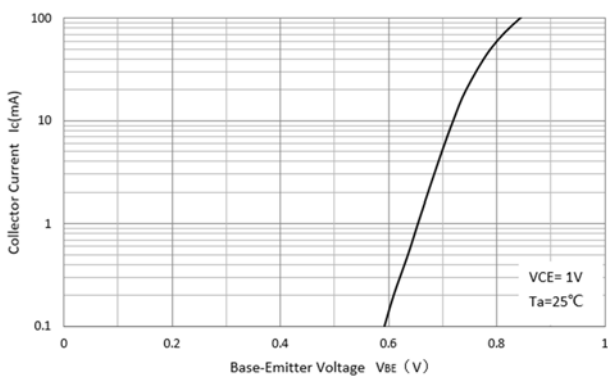
**Fig 3: Collector-Emmitter Saturation Voltage**



**Fig 4: Base-Emmitter Saturation Voltage**



**Fig 5: Base-Emmitter Voltage**



**Fig 6: Cob/Cib- $V_{CB}/V_{EB}$**

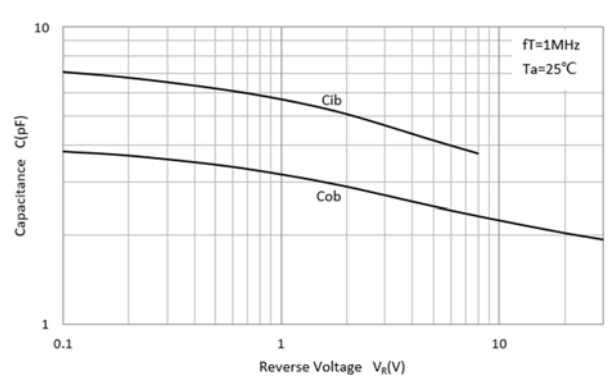
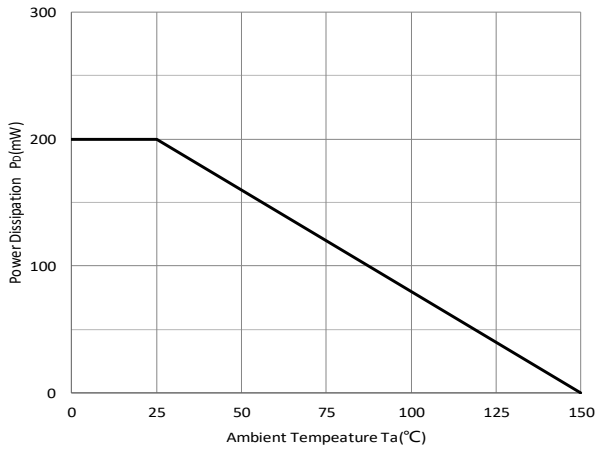




Fig 7: P<sub>D</sub>-T<sub>a</sub> Curve





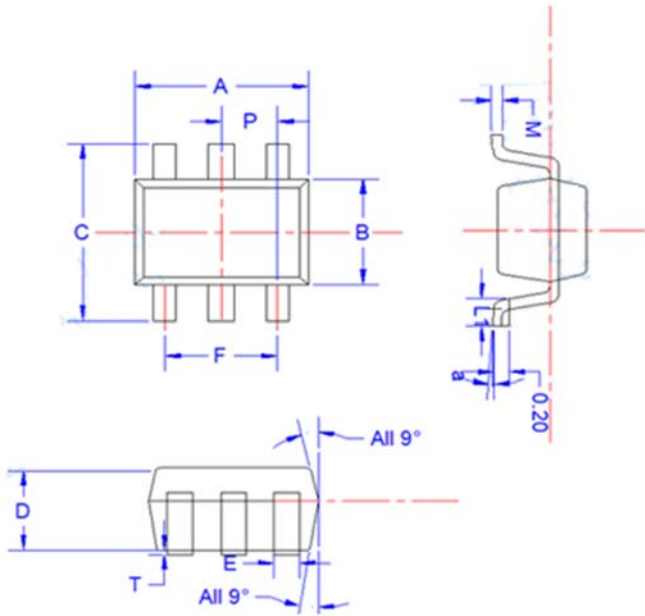
# DMMT3904S

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## ■ Ordering Information

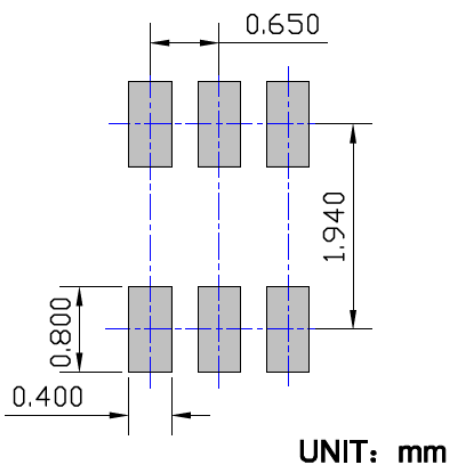
Preferred P/N	Packing Code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
DMMT3904S	F2	Approximate 0.009	3000	30000	120000	7" reel
DMMT3904S	F3	Approximate 0.009	10000	/	210000	7" reel

## ■ Outline Dimensions



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
E	0.15	0.25	0.35
B	1.15	1.25	1.35
C	2.00	2.10	2.20
P	0.650BSC		
A	1.80	2.00	2.20
T	0.00	0.05	0.100
D	0.90	0.95	1.00
L1	0.20	0.30	0.40
a	4°±4°		
M	0.10	0.15	0.25

## ■ Suggested Pad Layout





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