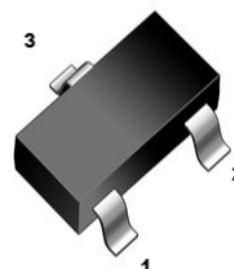




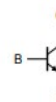
1. Features

- Darlington Amplifier

SOT-23



1 base
2 emitter
3 collector



2. Mechanical Data

- Case: Molded Plastic, SOT-23 .
- Epoxy: UL 94V-0 rate flame retardant.
- Terminals: Plated Leads Solderable per MIL-STD-750, Method-2026.
- Marking: K2D
- Mounting Position : Any.

3. Maximum Ratings

Electrical Characteristics Rating at 25°C ambient temperature unless otherwise specified.

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	30	V
Collector-Emitter Voltage	V_{CES}	30	V
Emitter-Base Voltage	V_{EBO}	10	V
Collector Current	I_C	500	mA
Total Device Dissipation	P_{tot}	300	mW
Derate above 25°C		2.8	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction Temperature	T_J	-55~+150	°C
Storage Temperature	T_{stg}	-55~+150	°C

4. Electrical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Condition	Min	Max	Unit
Collector Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=100\mu\text{A}$	30	-	V
Collector Saturation Voltage	$V_{CE(sat)}$	$I_C=100\text{mA}, I_B=0.1\text{mA}$	-	1.5	V
Base On Voltage	$V_{BE(on)}$	$I_C=100\text{mA}, V_{CE}=5\text{V}$	-	2	V
Collector Cutoff Current	I_{CBO}	$V_{CB}=30\text{V}$	-	100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=10\text{V}$	-	100	nA
DC Current Gain	h_{FE}	$V_{CE}=5\text{V}, I_C=10\text{mA}$ $V_{CE}=5\text{V}, I_C=100\text{mA}$	5000 10000	-	-
Current Gain - Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=10\text{mA}, f=100\text{MHz}$	125	-	MHz



5. Rating And Characteristic Curves

Fig.1 Static Characteristic

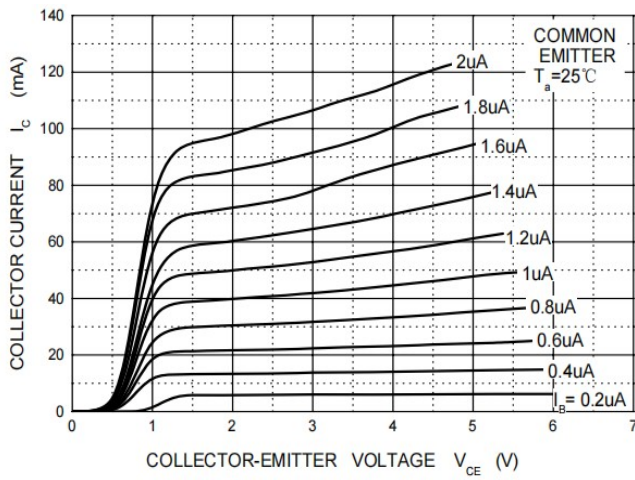


Fig.2 $h_{FE} - I_C$

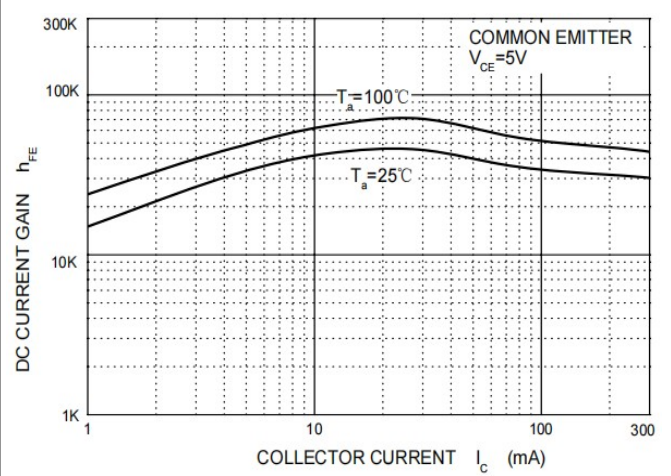


Fig.3 $V_{CE(sat)} - I_C$

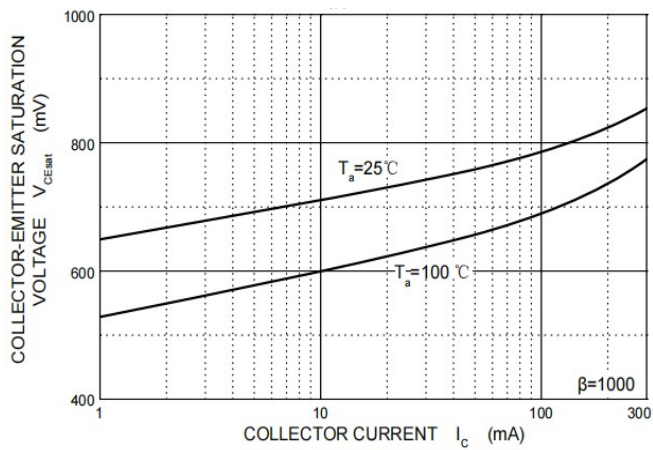


Fig.4 $V_{BE(sat)} - I_C$

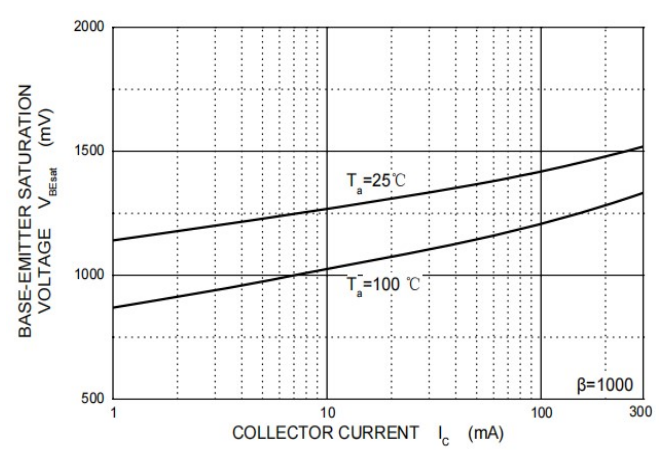


Fig.5 $I_C - V_{BE}$

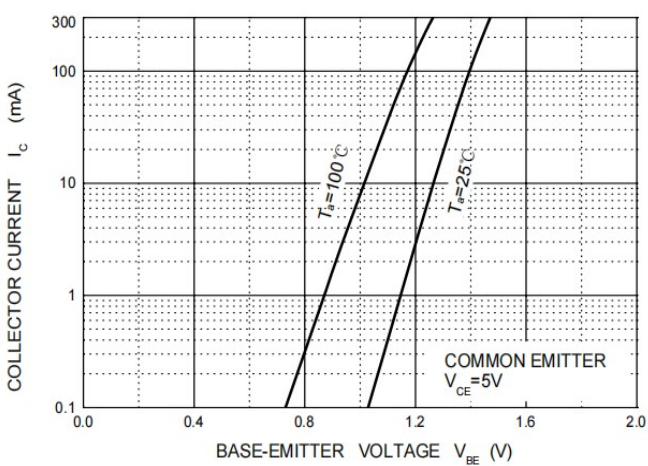


Fig.6 $C_{ob}/C_{ib} - V_{CB}/V_{EB}$

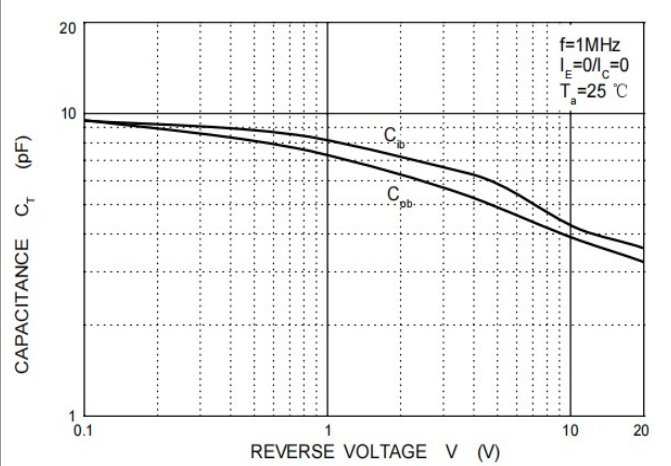




Fig.7 $f_T - I_C$

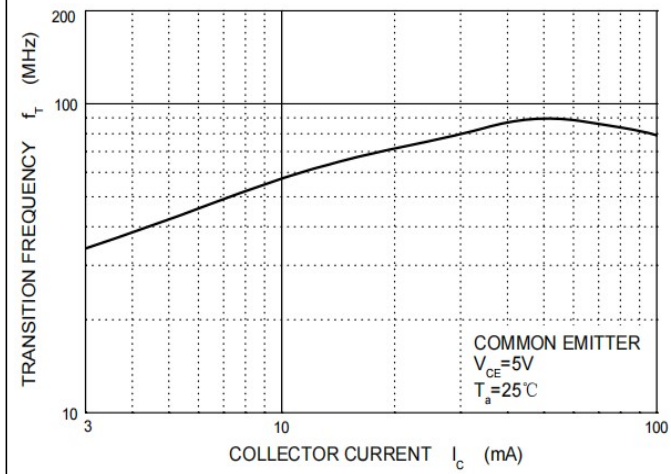
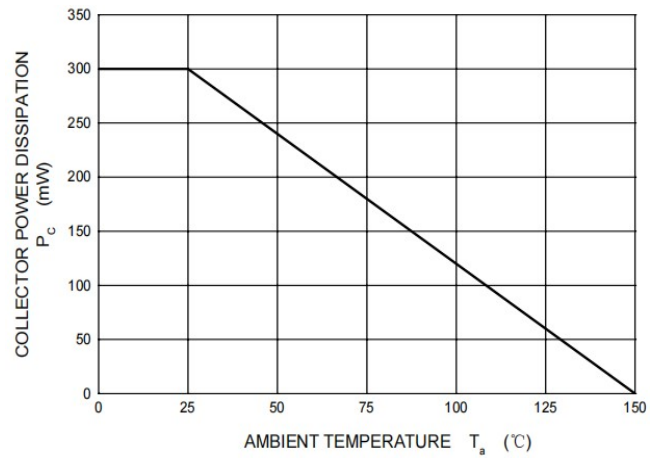
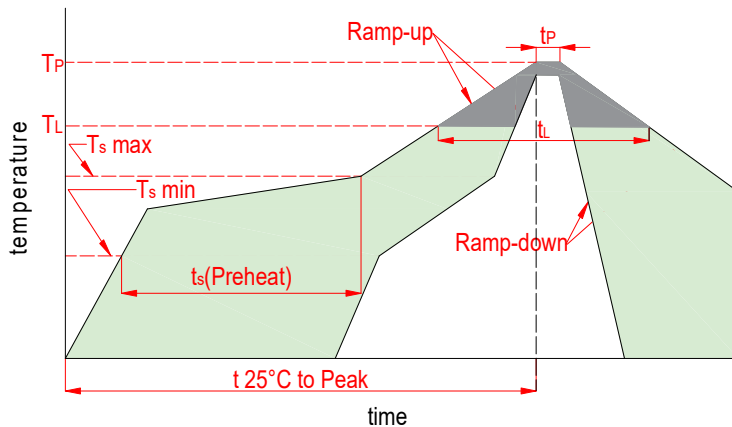


Fig.8 $P_C - T_a$



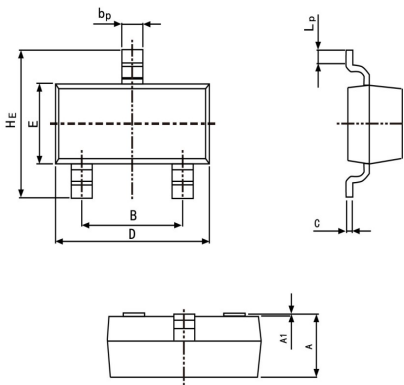


6. Soldering Parameters



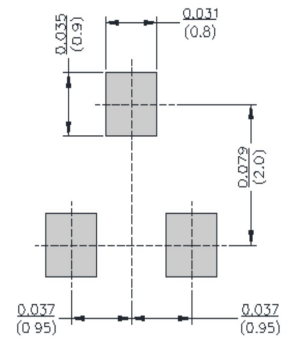
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150°C
	Temp. max(T_s (min))	200°C
	Time(min to max)(t_s)	60~120s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3°C/s max
T_s (max) to T_L -Ramp-up Rate		3°C/s max
Reflow	Temp.(T_L)(Liquidus)	217°C
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		260 ^{+0/-5} °C
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6°C/s max
Time 25°C to peak Tempe.(T_p)		8 minutes max
Do not exceed		260°C

7. Dimensions

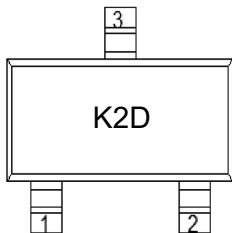


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.035	0.045	0.90	1.15
B	0.070	0.081	1.78	2.05
bp	0.012	0.020	0.30	0.51
C	0.003	0.007	0.08	0.18
D	0.110	0.118	2.80	3.00
E	0.047	0.055	1.20	1.40
HE	0.087	0.110	2.20	2.80
A1	0.000	0.004	0.00	0.10
LP	0.008	0.020	0.20	0.50

Mounting PAD Layout



8. Part Marking System



9. Package Information

Package	Part Number	Tape Width(mm)	Quantity(pcs)
SOT-23	MMBTA13	8	3000



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