

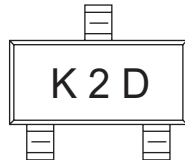
SOT-23 Plastic-Encapsulate Transistors

MMBTA13 TRANSISTOR (NPN)

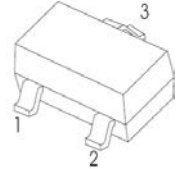
FEATURES

Darlington Amplifier

Marking : K2D



SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

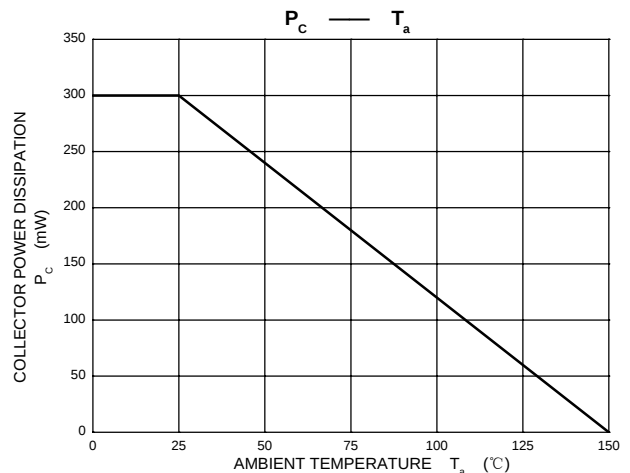
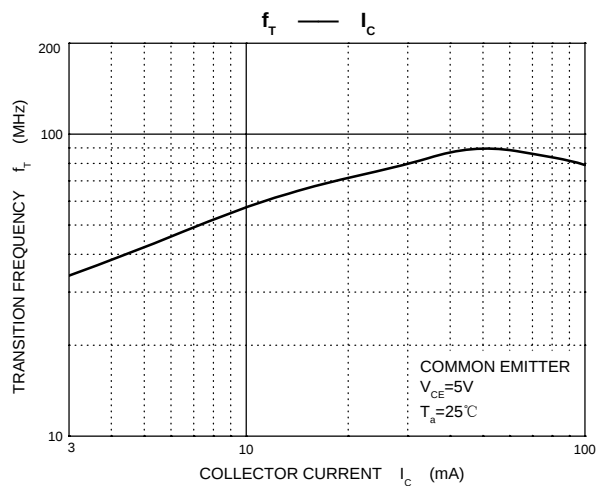
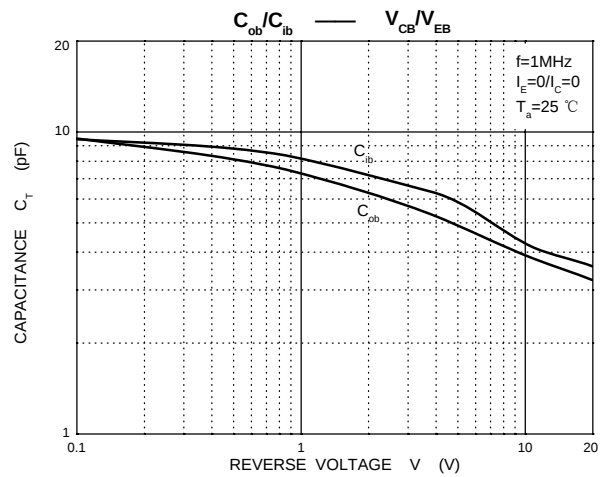
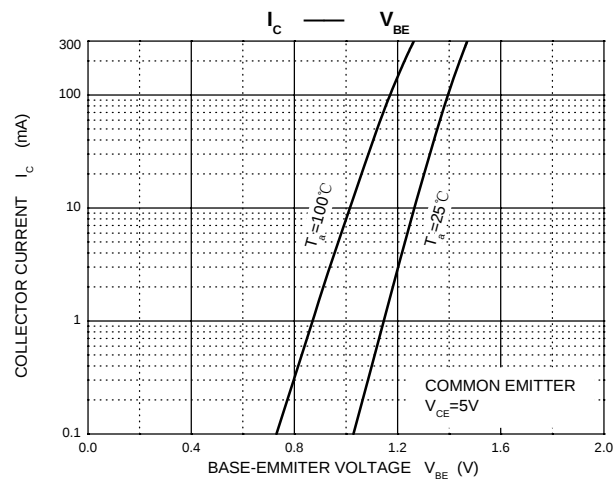
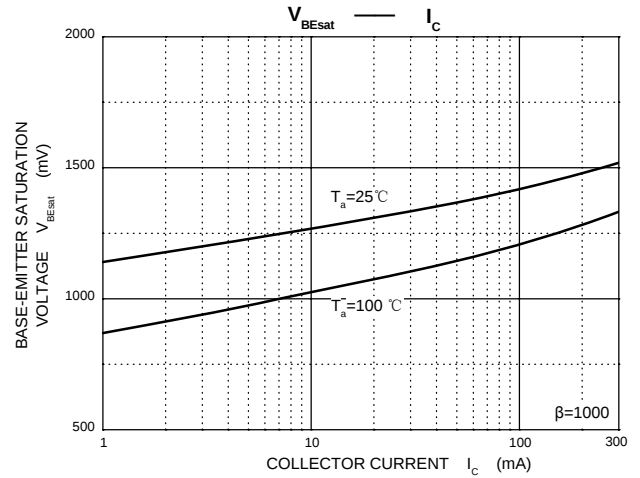
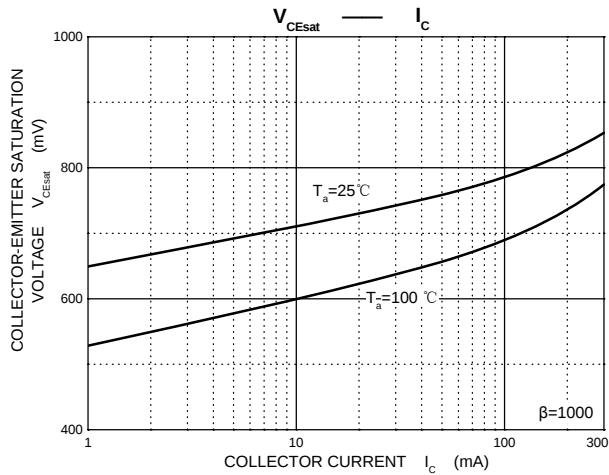
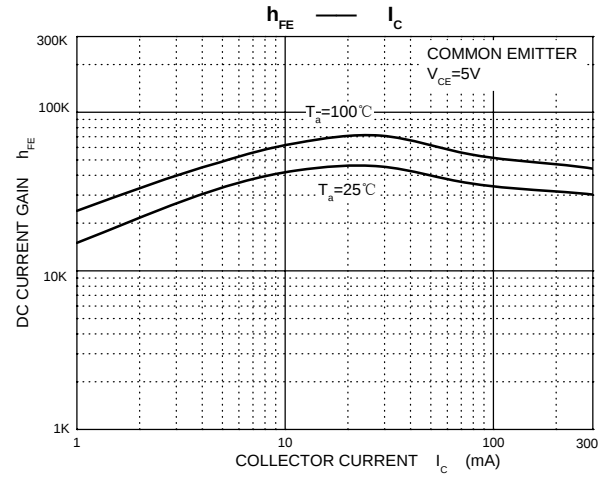
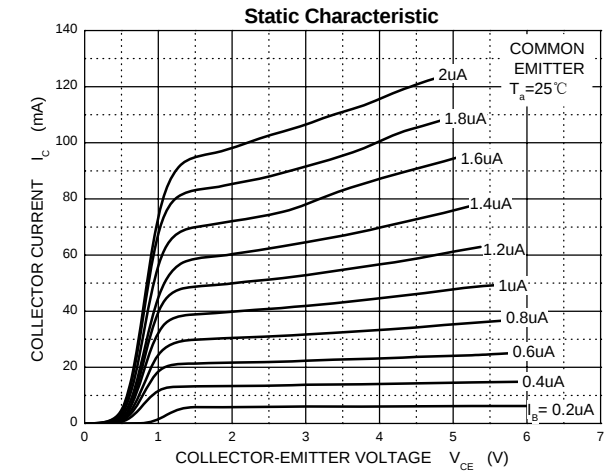
Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage	30	V
V _{CEO}	Collector-Emitter Voltage	30	V
V _{EBO}	Emitter-Base Voltage	10	V
I _C	Collector Current -Continuous	0.3	A
P _C	Collector Power Dissipation	300	mW
R _{θJA}	Thermal Resistance from Junction to Ambient	417	°C/W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55~+150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

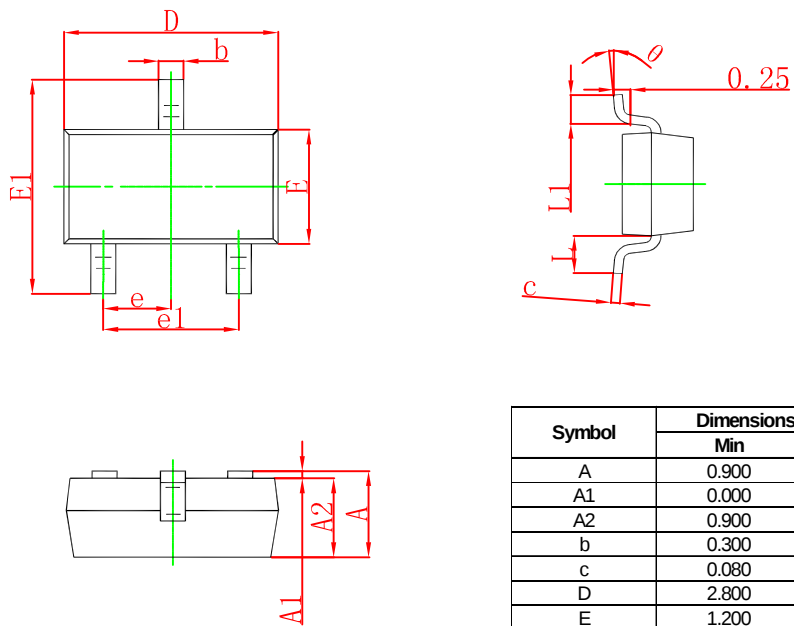
Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 100μA, I _E =0	30		V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 100μA, I _B =0	30		V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = 100μA, I _C =0	10		V
Collector cut-off current	I _{CBO} *	V _{CB} =30 V, I _E =0		0.1	μA
Emitter cut-off current	I _{EBO} *	V _{EB} = 10V, I _C =0		0.1	μA
DC current gain	h _{FE(1)} *	V _{CE} =5V, I _C = 10mA	5000		
	h _{FE(2)} *	V _{CE} =5V, I _C = 100mA	10000		
Collector-emitter saturation voltage	V _{CE(sat)} *	I _C =100mA, I _B =0.1mA		1.5	V
Base-emitter saturation voltage	V _{BE(sat)} *	I _C =100mA, I _B =0.1mA		2	V
Base-emitter voltage	V _{BE} *	V _{CE} =5V, I _C = 100mA		2.0	V
Transition frequency	f _T	V _{CE} =5V, I _C = 10mA f=100MHz	125		MHz
Collector output capacitance	C _{ob}	V _{CB} =10V, I _E =0, f=1MHz		12	pF

* Pulse Test : pulse width≤300μs, duty cycles≤2%.

Typical Characteristics

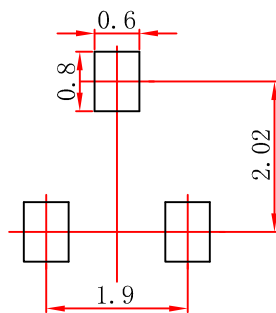


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.