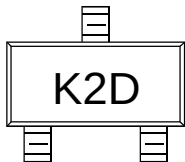
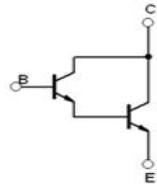
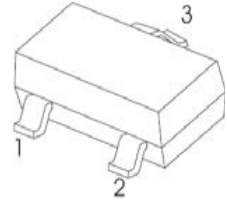


SOT-23 Plastic-Encapsulate Transistors**MMBTA13**

DARLINGTON TRANSISTOR (NPN)

FEATURES

- Darlington Amplifier

MARKING**Equivalent Circuit****SOT - 23**

1. BASE
2. EMITTER
3. COLLECTOR

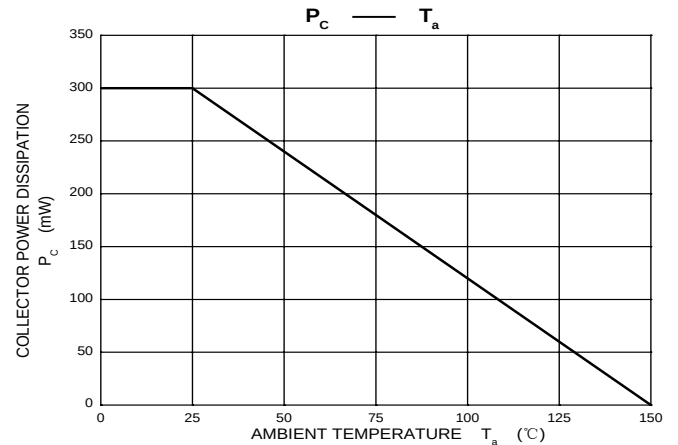
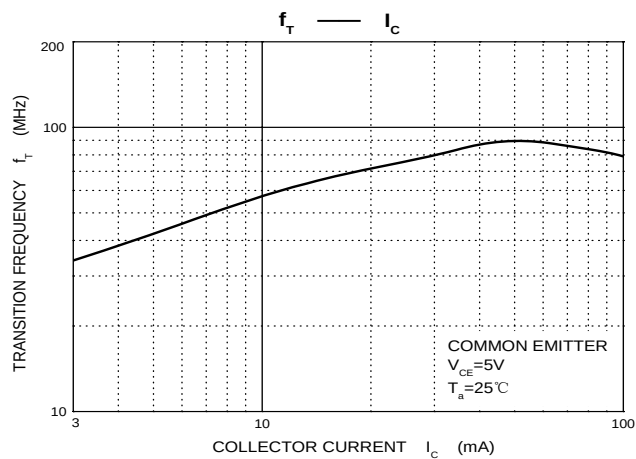
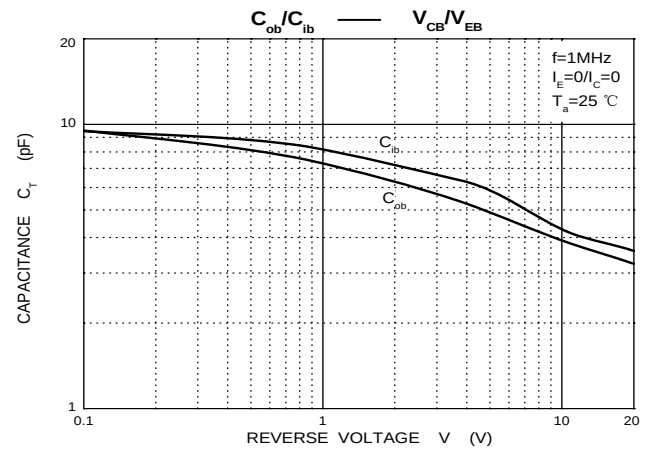
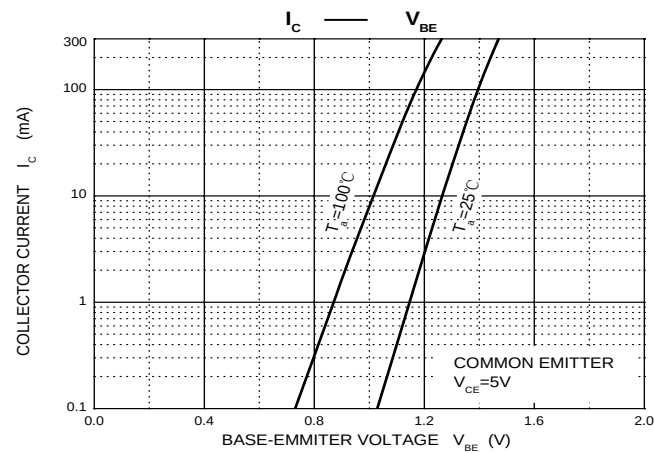
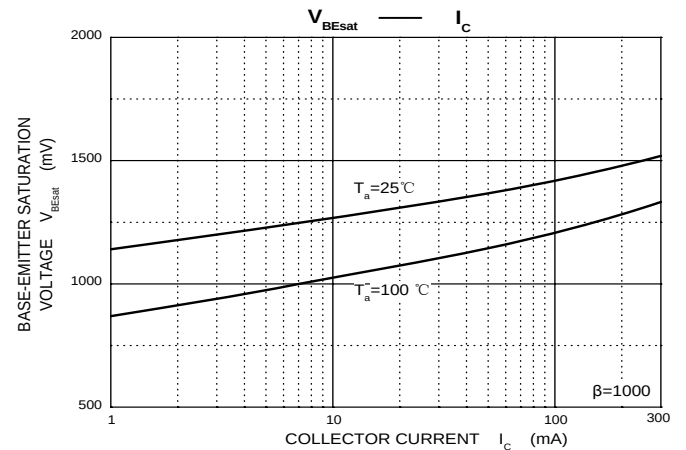
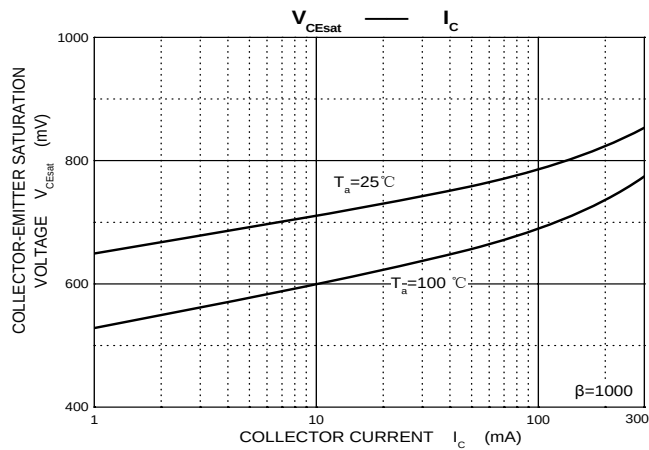
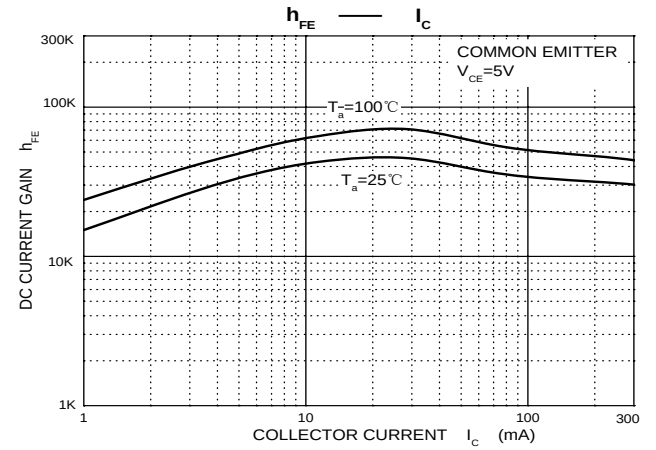
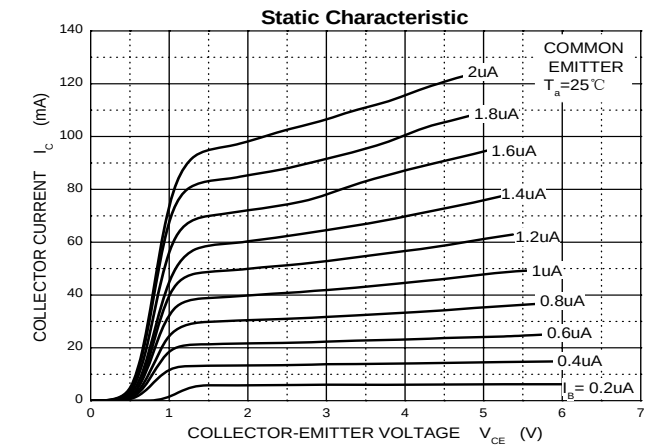
MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

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
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	417	$^{\circ}\text{C}/\text{W}$
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	$^{\circ}\text{C}$

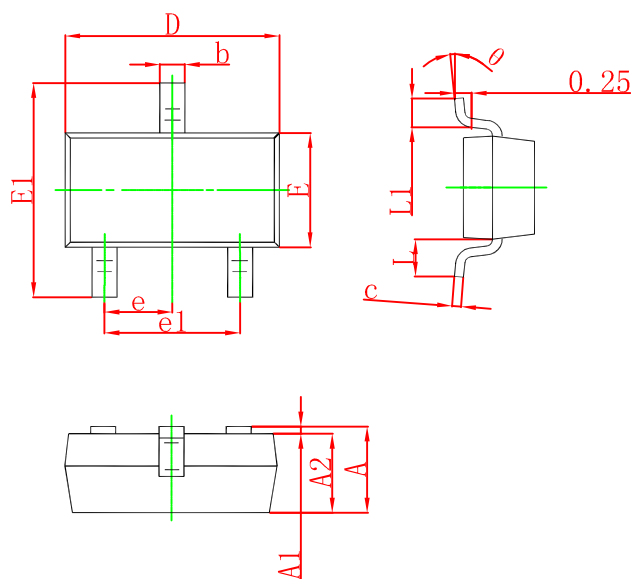
ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}, I_E=0$	30		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=100\mu\text{A}, I_B=0$	30		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}, I_C=0$	10		V
Collector cut-off current	I_{CBO}^*	$V_{CB}=30\text{V}, I_E=0$		0.1	μA
Emitter cut-off current	I_{EBO}^*	$V_{EB}=10\text{V}, I_C=0$		0.1	μA
DC current gain	$h_{FE(1)}^*$	$V_{CE}=5\text{V}, I_C=10\text{mA}$	5000		
	$h_{FE(2)}^*$	$V_{CE}=5\text{V}, I_C=100\text{mA}$	10000		
Collector-emitter saturation voltage	$V_{CE(sat)}^*$	$I_C=100\text{mA}, I_B=0.1\text{mA}$		1.5	V
Base-emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=100\text{mA}, I_B=0.1\text{mA}$		2	V
Base-emitter voltage	V_{BE}^*	$V_{CE}=5\text{V}, I_C=100\text{mA}$		2.0	V
Transition frequency	f_T	$V_{CE}=5\text{V}, I_C=10\text{mA}$ $f=100\text{MHz}$	125		MHz
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		12	pF

Typical Characteristics

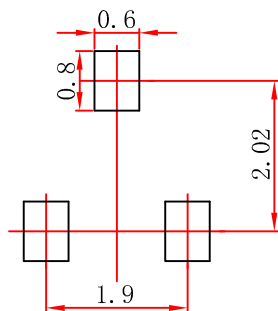


Package Outline Dimensions (SOT-23)



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°

Suggested Pad Layout (SOT-23)



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.