NPN Transistors

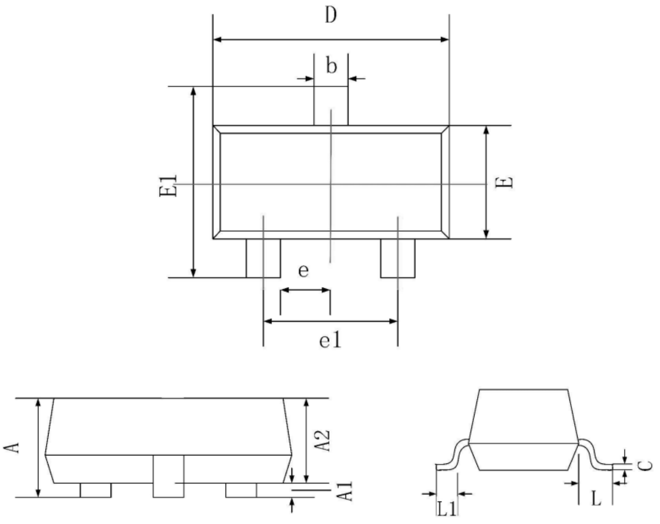
Primary characteristics

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage	80	V
V_{CEO}	Collector-emitter voltage	80	V
V_{EBO}	Emitter-base voltage	12	V
P_C	Collector power dissipation	200	mW

Features

- **SOT-23** case for easy automatic insertion.
- High current gain.

Case dimensions



SOT-23

Unit		A	A1	A2	b	c	D	E	E1	e	e1	L	L1
mm	Min.	0.9	0	0.9	0.3	0.08	2.8	1.2	2.25	0.95 TYP	1.8	0.55 REF	0.3
	Max.	1.15	0.1	1.05	0.5	0.15	3.0	1.4	2.55		2.0		0.5
mil	Min.	35	0	35	12	3	110	47	89	37 TYP	71	22 REF	12
	Max.	45	4	41	20	6	118	55	100		79		20

Maximum ratings (T_a = 25°C unless otherwise stated)

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	80	V
Collector-emitter voltage	V_{CEO}	80	V
Emitter-base voltage	V_{EBO}	12	V
Collector current	I_C	500	mA
Collector power dissipation	P_C	200	mW
Thermal resistance junction to ambient	$R_{\theta JA}$	625	°C/W
Junction and storage temperature range	T_J,T_{stg}	-55~+150	°C

Electrical characteristics (T_a = 25°C unless otherwise stated)

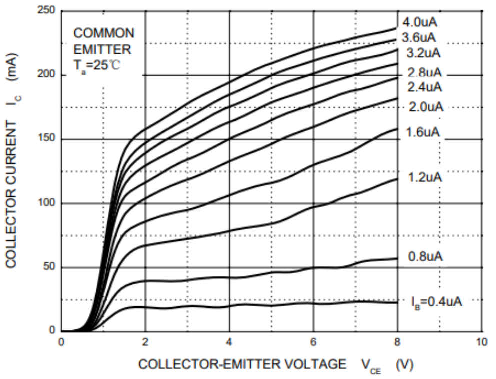
Parameter	Symbol	Test condition	Value			Unit
			Min.	Typ.	Max.	
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=100µA, I_E=0	80	-	-	V
Collector-emitter sustain voltage	$V_{CEO(sus)}$	I_C=100µA, V_{BE}=0	80	-	-	V
Emitter-base voltage	$V_{(BR)EBO}$	I_E=10µA, I_C=0	12	-	-	V
Collector cut-off current	I_{CBO}	V_{CB}=60V, I_E=0	-	-	0.1	µA
Collector cut-off current	I_{CES}	V_{CE}=60V, V_{BE}=0	-	-	0.5	µA
Emitter cut-off current	I_{EBO}	V_{EB}=10V, I_C=0	-	-	0.1	µA
DC current gain[1]	$h_{FE(1)}$	V_{CE}=5V, I_C=10mA	10			
	$h_{FE(2)}$	V_{CE}=5V, I_C=100mA	10			
Collector-emitter saturation voltage[1]	$V_{CE(sat)1}$	I_C=10mA, I_B=0.01A			1.2	V
	$V_{CE(sat)2}$	I_C=100mA, I_E=0.1A			1.5	
Base-emitter voltage[1]	V_{BE}	V_{CE}=5V, I_C=100mA	-	-	2	V
Collector output capacitance	C_{ob}	V_{CB}=1V, I_E=0, f=1MHz	-	-	8	pF
Transition frequency	f_T	V_{CE}=5V, I_C=10mA, f=100MHz	125	-	-	MHz

Note:

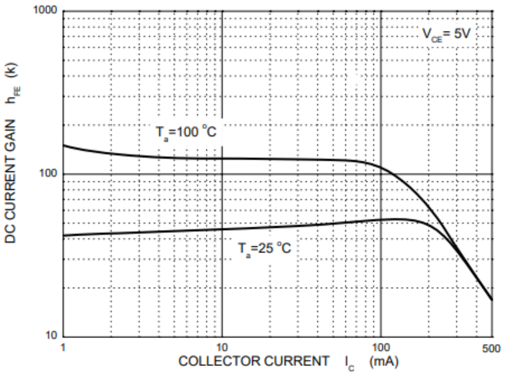
1) Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2.0%.

Typical characteristics

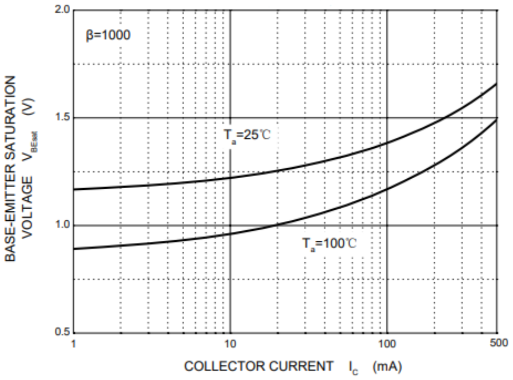
Static characteristic



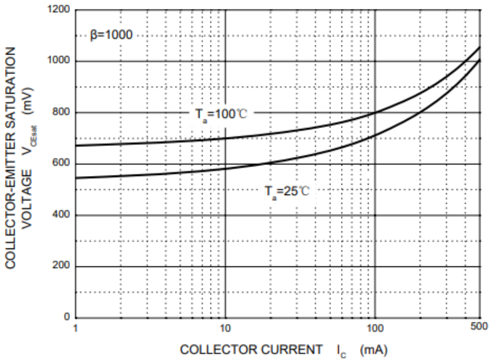
DC current gain vs. Collector current



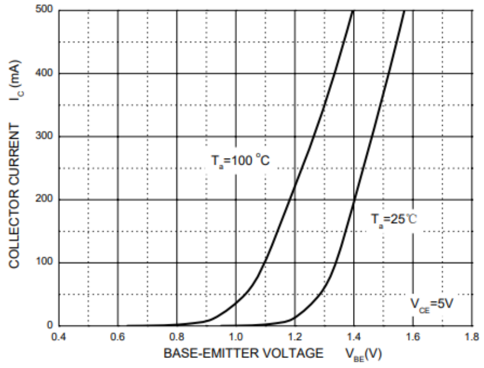
Base-emitter saturation voltage



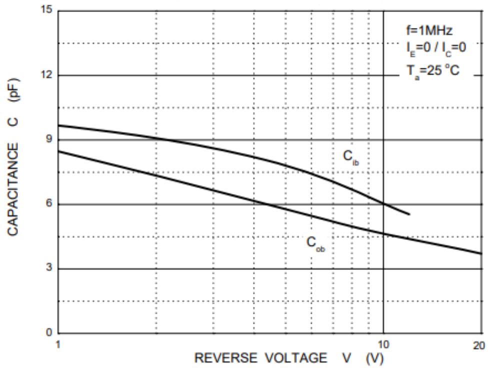
Collector current



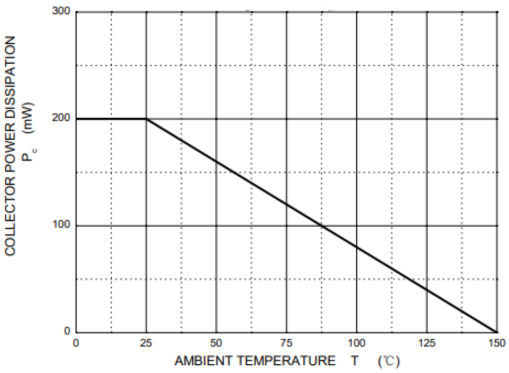
Collector current vs. Base-emitter voltage



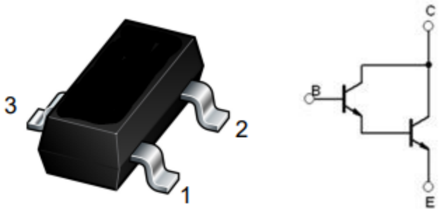
Capacitance vs. Reverse voltage



Collector power dissipation vs. Ambient temperature



Pinning



1-Base, 2-Emitter, 3-Collector

Ordering information

Part Number	Package	Shipping Quantity	Dimensions
MMBTA28	SOT-23	**3000 pcs / reel**	---

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