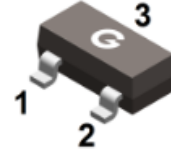
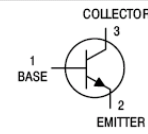


Features

- High current gain
- Excellent h_{FE} linearity
- Low noise between 30Hz and 15kHz
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



SOT-23

Mechanical Data

- Case: SOT-23
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBC846A/B	SOT-23	3000 pcs / Tape & Reel	1A/1B
TBC847A/B/C	SOT-23	3000 pcs / Tape & Reel	1E/1F/1G
TBC848A/B/C	SOT-23	3000 pcs / Tape & Reel	1J/1K/1L

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	TBC846	TBC847	TBC848	Unit
Collector-Base Voltage	V_{CBO}	80	50	30	V
Collector-Emitter Voltage	V_{CEO}	65	45	30	V
Emitter-Base Voltage	V_{EBO}	6	6	5	V
Collector Current (Continuous)	I_C	100			mA
Collector Current (Peak)	I_{CM}	200			mA

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	250	mW
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	409	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case ^{*1}	$R_{\theta JC}$	225	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Lead ^{*1}	$R_{\theta JL}$	197	$^\circ\text{C/W}$
Operating Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note 1: The data tested by surface mounted on a 15mm * 15mm * 1mm FR4-epoxy P.C.B

Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage TBC846	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	80	-	-	V
Collector-Base Breakdown Voltage TBC847			50	-	-	
Collector-Base Breakdown Voltage TBC848			30	-	-	
Collector-Emitter Breakdown Voltage TBC846	$V_{(BR)CEO}$	$I_C = 10\text{mA}, I_B = 0$	65	-	-	V
Collector-Emitter Breakdown Voltage TBC847			45	-	-	V
Collector-Emitter Breakdown Voltage TBC848			30	-	-	V
Emitter-Base Breakdown Voltage TBC846	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	6	-	-	V
Emitter-Base Breakdown Voltage TBC847			6	-	-	V
Emitter-Base Breakdown Voltage TBC848			5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = 30\text{V}, I_E = 0$	-	-	15	nA
		$V_{CB} = 30\text{V}, I_E = 0$	-	-	5	μA
		$T_J = 150^\circ\text{C}$	-	-	-	-
Emitter-base Cut-off Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	-	-	100	nA
Collector-emitter Cut-off Current	I_{CEO}	$V_{CE} = 30\text{V}, I_B = 0$	-	-	1	μA
DC Current Gain TBC846/847/848A	h_{FE}	$V_{CE} = 5\text{V}, I_C = 10\mu\text{A}$	-	110	-	-
DC Current Gain TBC846/847/848B			-	250	-	-
DC Current Gain TBC847/848C			-	480	-	-
DC Current Gain TBC846/847/848A		$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	110	-	220	-
DC Current Gain TBC846/847/848B			200	-	450	-
DC Current Gain TBC847/848C			420	-	800	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$	-	0.09	0.25	V
		$I_C = 100\text{mA}, I_B = 5\text{mA}$	-	0.20	0.60	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$	-	0.70	0.90	V
		$I_C = 100\text{mA}, I_B = 5\text{mA}$	-	0.90	1.10	V
Base-Emitter Voltage	$V_{BE(ON)}$	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	0.58	0.66	0.70	V
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	-	-	0.77	V
Transition Frequency	f_T	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$ $f = 100\text{MHz}$	100	-	-	MHz
Collector Capacitance	C_C	$V_{CB} = 10\text{V}, I_E = I_C = 0$ $f = 100\text{MHz}$	-	2.5	-	pF

Ratings and Characteristic Curves-TBC846/847/848A (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

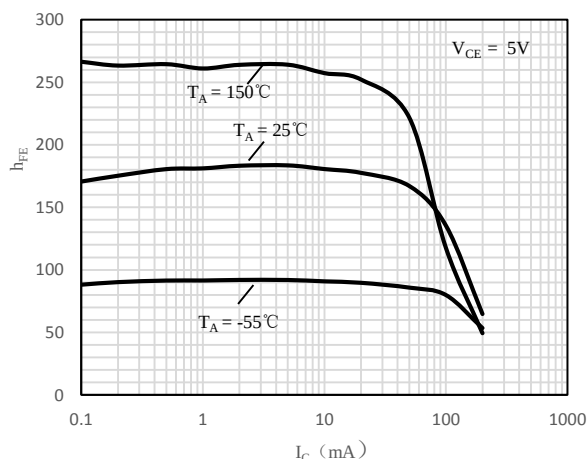


Fig 1 h_{FE} vs. I_C

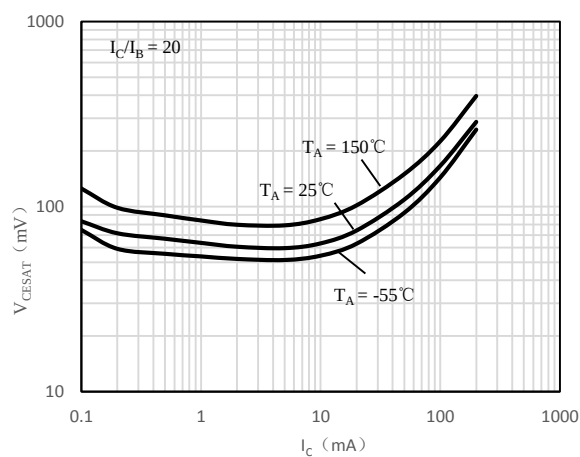


Fig 2 $V_{CE(sat)}$ vs. I_C

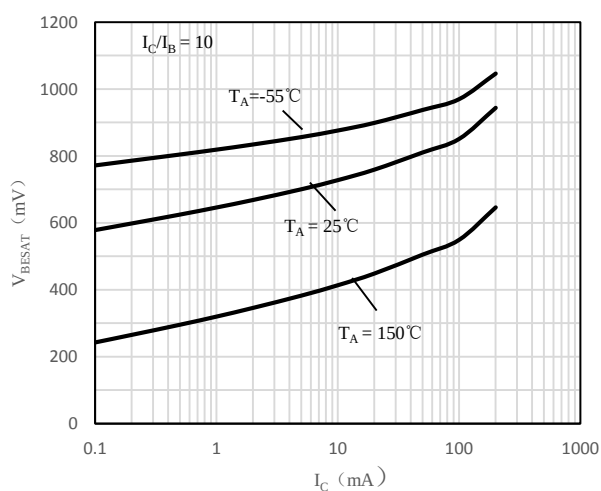


Fig 3 $V_{BE(sat)}$ vs. I_C

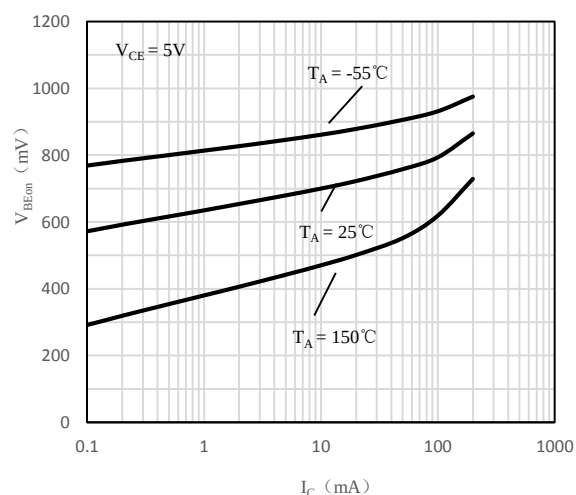


Fig 4 $V_{BE(on)}$ vs. I_C

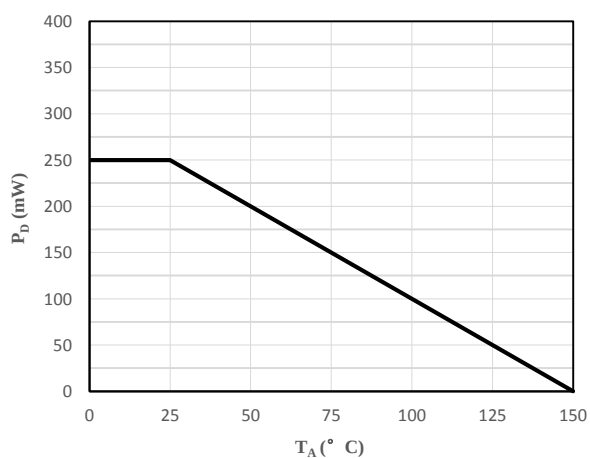


Fig 5 Power Derating Curve

Ratings and Characteristic Curves-TBC846/847/848B (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

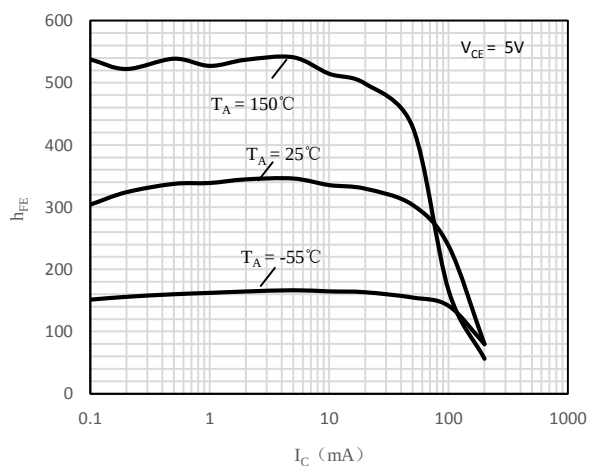


Fig 1 h_{FE} vs. I_C

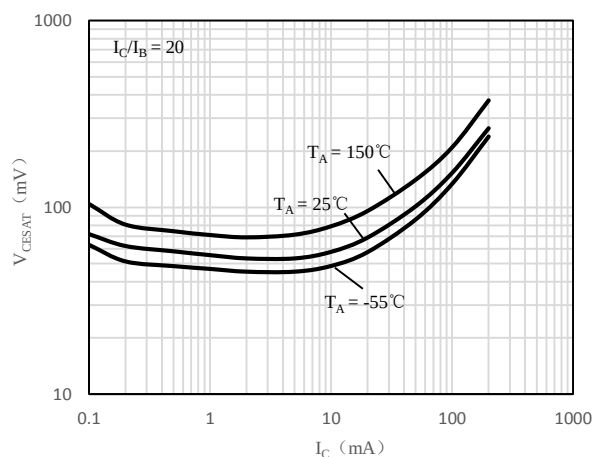


Fig 2 $V_{CE(sat)}$ vs. I_C

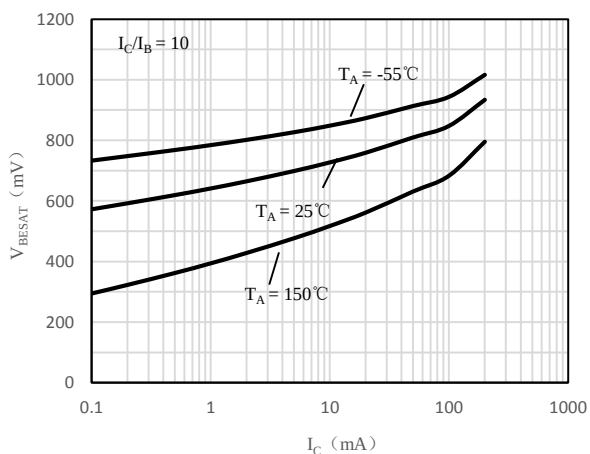


Fig 3 $V_{BE(sat)}$ vs. I_C

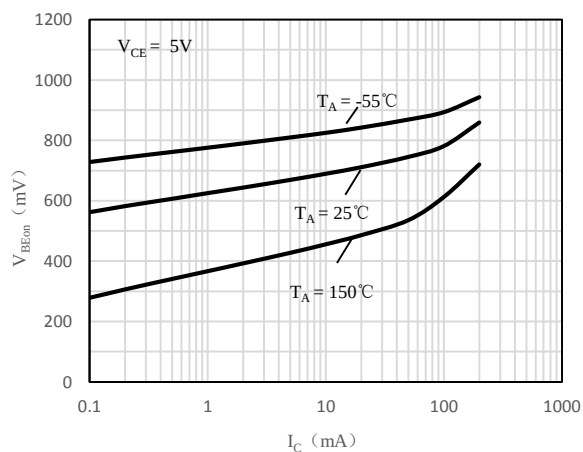


Fig 4 $V_{BE(on)}$ vs. I_C

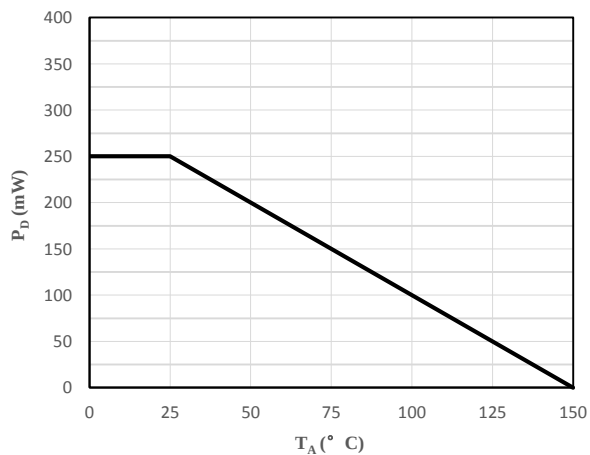


Fig 5 Power Derating Curve

Ratings and Characteristic Curves-TBC847/848C (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

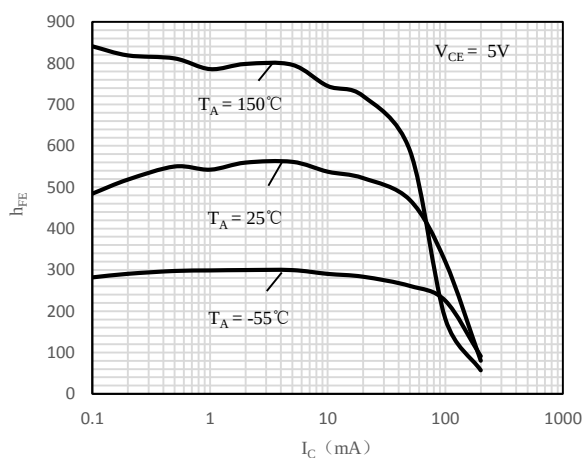


Fig 1 h_{FE} vs. I_C

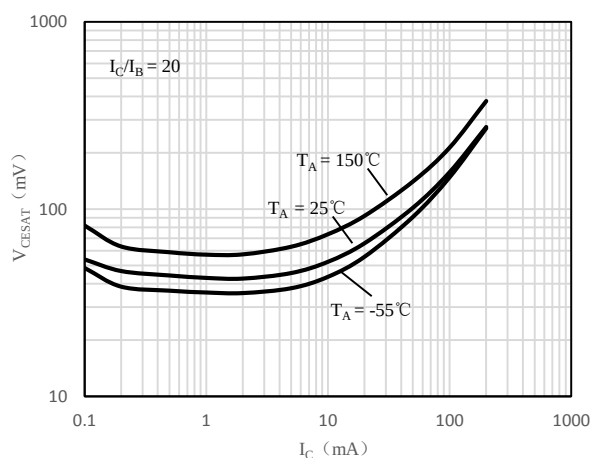


Fig 2 $V_{CE(sat)}$ vs. I_C

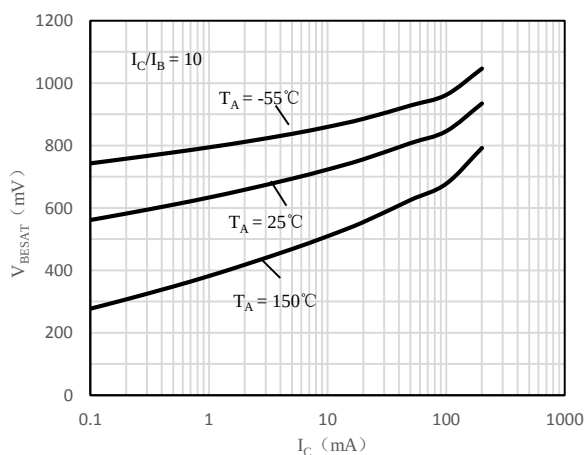


Fig 3 $V_{BE(sat)}$ vs. I_C

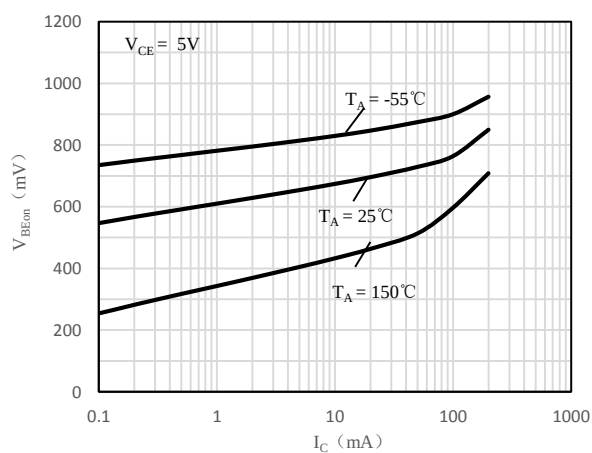


Fig 4 $V_{BE(on)}$ vs. I_C

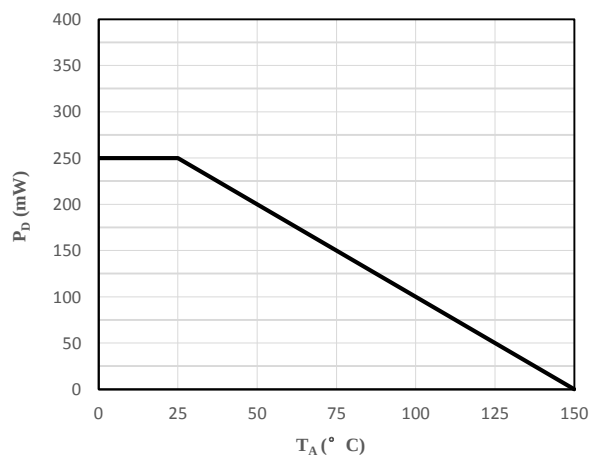
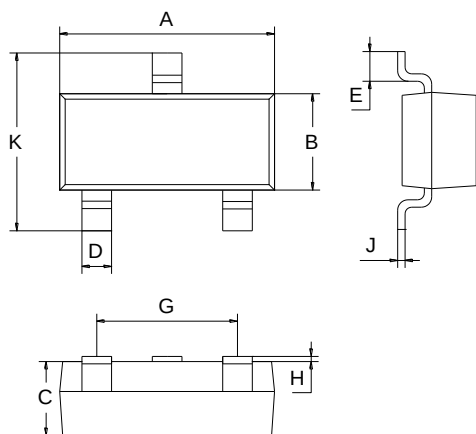


Fig 5 Power Derating Curve

Package Outline Dimensions (Unit: mm)



SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.9	1.1
D	0.3	0.5
E	0.35	0.48
G	1.80	2.00
H	0.02	0.1
J	0.05	0.15
K	2.20	2.60

Package Outline Dimensions (Unit: mm)

SOT-23

