

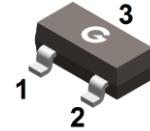
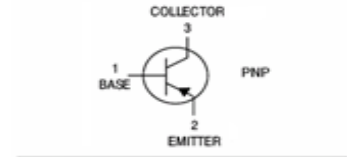
Features

- Low current
- Low voltage
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF

Mechanical Data

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



SOT-23

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBC856A/B	SOT-23	3000 pcs / Tape & Reel	3A/3B
TBC857A/B/C	SOT-23	3000 pcs / Tape & Reel	3E/3F/3G
TBC858A/B/C	SOT-23	3000 pcs / Tape & Reel	3J/3K/3L

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	TBC856	TBC857	TBC858	Unit
Collector-Base Voltage	V _{CBO}	-80	-50	-30	V
Collector-Emitter Voltage	V _{CEO}	-65	-45	-30	V
Emitter-Base Voltage	V _{EBO}	-5	-5	-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°C)	P _D	250	mW
Thermal Resistance Junction-to-Air *1	R _{θJA}	409	°C/W
Thermal Resistance Junction-to-Case *1	R _{θJC}	225	°C/W
Thermal Resistance Junction-to-Lead *1	R _{θJL}	197	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°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 TBC856	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0$	-80	-	-	V
Collector-Base Breakdown Voltage TBC857			-50	-	-	
Collector-Base Breakdown Voltage TBC858			-30	-	-	
Collector-Emitter Breakdown Voltage TBC856	$V_{(BR)CEO}$	$I_C = -10\text{mA}, I_B = 0$	-65	-	-	V
Collector-Emitter Breakdown Voltage TBC857			-45	-	-	V
Collector-Emitter Breakdown Voltage TBC858			-30	-	-	V
Emitter-Base Breakdown Voltage TBC856	$V_{(BR)EBO}$	$I_E = -1\mu\text{A}, I_C = 0$	-5	-	-	V
Emitter-Base Breakdown Voltage TBC857			-5	-	-	V
Emitter-Base Breakdown Voltage TBC858			-5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = -30\text{V}, I_E = 0$	-	-	-15	nA
Emitter-base Cut-off Current	I_{EBO}	$V_{EB} = -5\text{V}, I_C = 0$	-	-	-100	nA
DC Current Gain TBC856/857/858A	h_{FE}	$V_{CE} = -5\text{V}, I_C = -2\text{mA}$	125	-	250	-
DC Current Gain TBC856/857/858B			220	-	475	-
DC Current Gain TBC857/858C			420	-	800	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$	-	-	-0.3	V
		$I_C = -100\text{mA}, I_B = -5\text{mA}$	-	-	-0.65	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$	-	-0.70	-	V
		$I_C = -100\text{mA}, I_B = -5\text{mA}$	-	-0.85	-	V
Base-Emitter Voltage	$V_{BE(ON)}$	$V_{CE} = -5\text{V}, I_C = -2\text{mA}$	-0.6	0.65	-0.75	V
		$V_{CE} = -5\text{V}, I_C = -10\text{mA}$	-	-	-0.82	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	$V_{CB} = -10\text{V}, I_E = I_C = 0$ $f = 1\text{MHz}$	-	4.5	-	pF

Ratings and Characteristic Curves-TBC856/857/858A (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

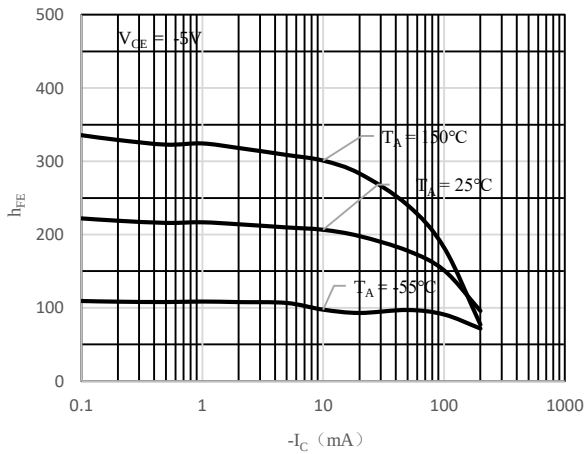


Fig 1 h_{FE} vs. I_C

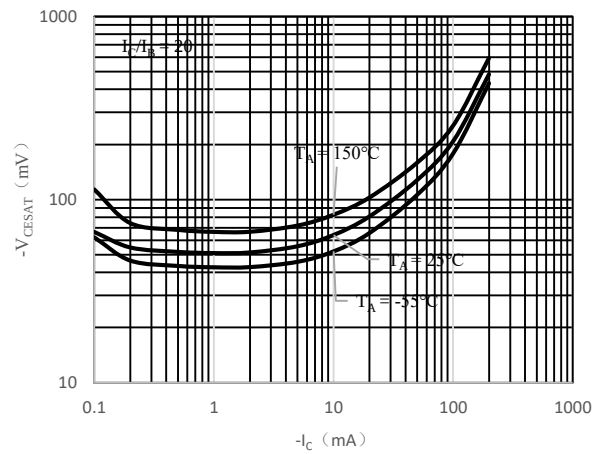


Fig 2 $V_{CE(sat)}$ vs. I_C

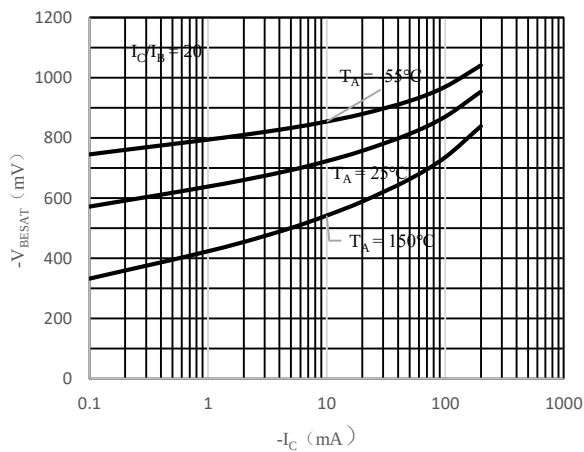


Fig 3 $V_{BE(sat)}$ vs. I_C

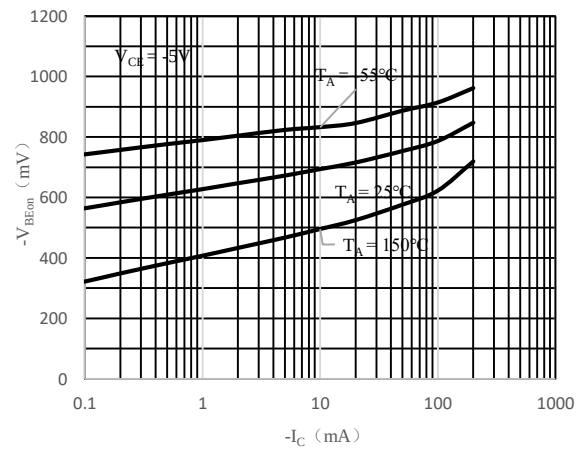


Fig 4 $V_{BE(on)}$ vs. I_C

Ratings and Characteristic Curves-TBC856/857/858B (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

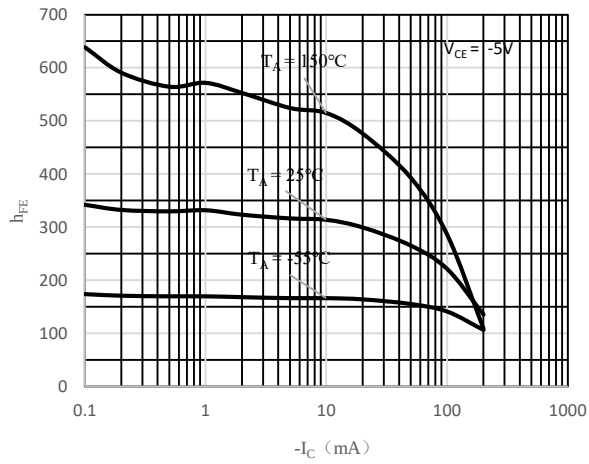


Fig 1 h_{FE} vs. I_C

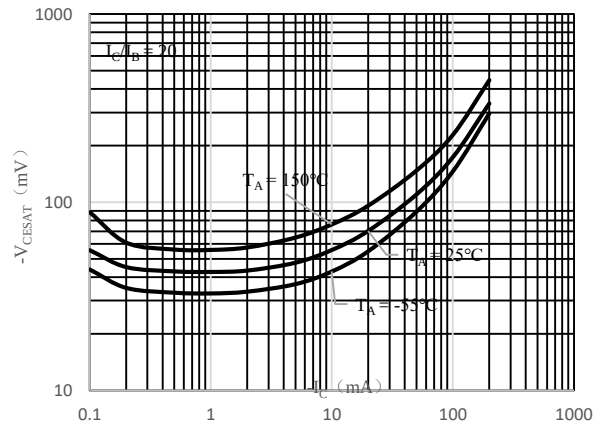


Fig 2 $V_{CE(sat)}$ vs. I_C

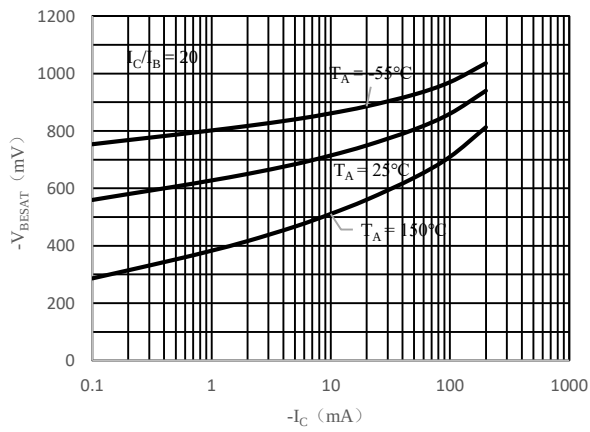


Fig 3 $V_{BE(sat)}$ vs. I_C

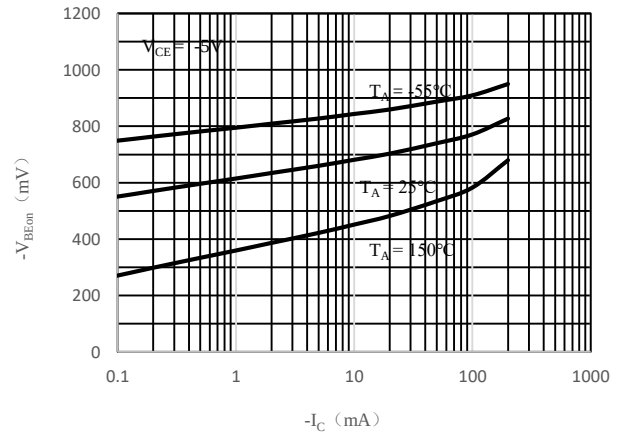


Fig 4 $V_{BE(on)}$ vs. I_C

Ratings and Characteristic Curves-TBC857/858C (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

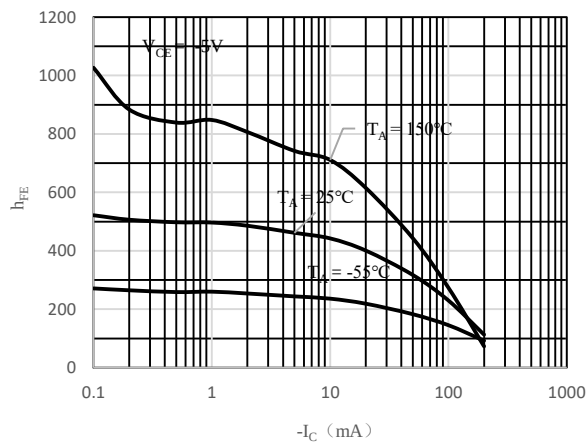


Fig 1 h_{FE} vs. I_C

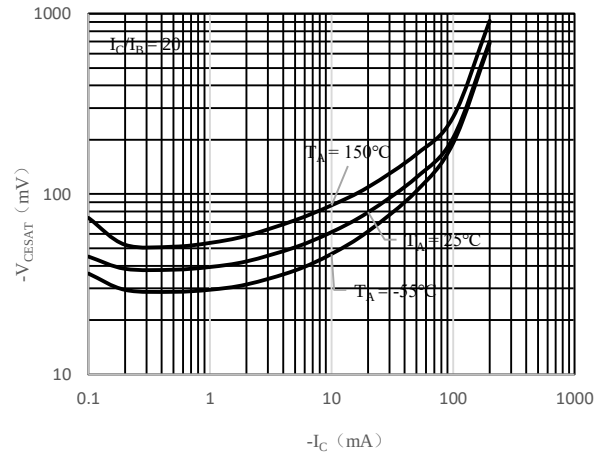


Fig 2 $V_{CE(sat)}$ vs. I_C

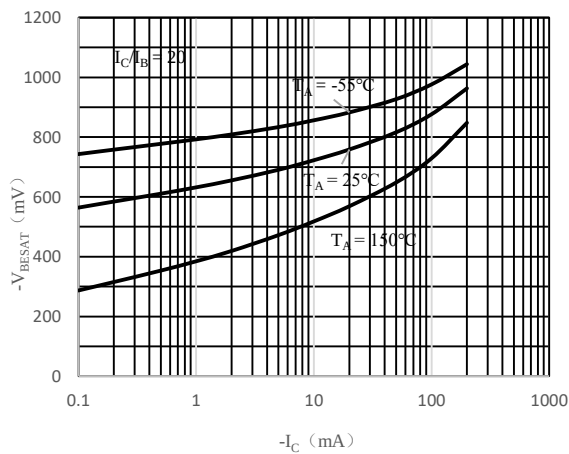


Fig 3 $V_{BE(sat)}$ vs. I_C

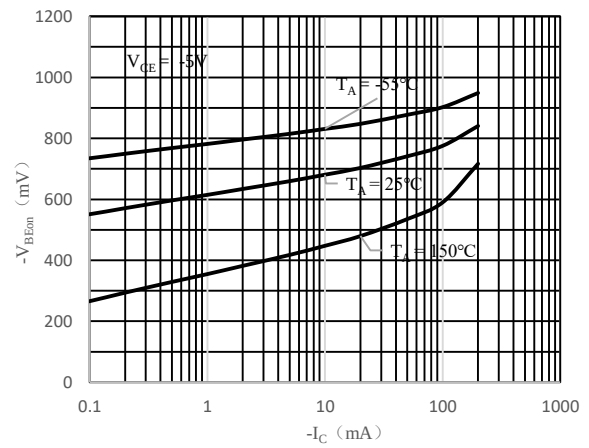
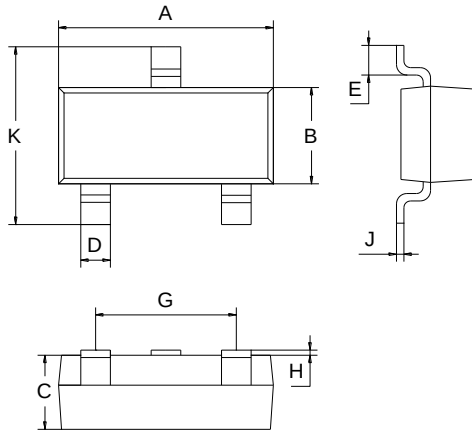


Fig 4 $V_{BE(ON)}$ vs. I_C

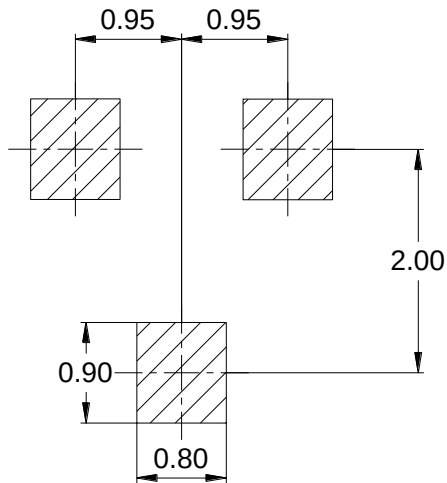
Package Outline Dimensions (Unit: mm)



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



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