

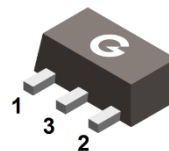
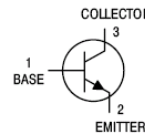
Features

- Low saturation voltage
- High saturation current capability
- Complementary pair with 2SB1188
- RoHS compliant with Halogen-free

HF

Mechanical Data

- Case: SOT-89
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208



SOT-89

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
2SD1766	SOT-89	1000 pcs / Tape & Reel	DBP/DBQ/DBR

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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	40	V
Collector-Emitter Breakdown Voltage	V _{CEO}	32	V
Emitter-Base Breakdown Voltage	V _{EBO}	5	V
Collector Current (Continuous)	I _C	2	A
Collector Current (Peak)	I _{CM}	2	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T _A = 25°C)	P _D	0.5	W
Thermal Resistance Junction-to-Air ^{*1}	R _{θJA}	45	°C/W
Thermal Resistance Junction-to-Case ^{*1}	R _{θJC}	17	°C/W
Thermal Resistance Junction-to-Lead ^{*1}	R _{θJL}	7	°C/W
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 1 inch² FR-4 board with 2OZ copper

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 50\mu\text{A}$, $I_E = 0$	40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$	32	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 50\mu\text{A}$, $I_C = 0$	5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = 20\text{V}$, $I_E = 0$	-	-	1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 4\text{V}$, $I_C = 0$	-	-	1	μA
DC Current Gain	h_{FE}	$V_{CE} = 3\text{V}$, $I_C = 0.5\text{A}$	82	-	390	-
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2\text{A}$, $I_B = 0.2\text{A}$	-	0.5	0.8	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 2\text{A}$, $I_B = 0.2\text{A}$	-	-	1.2	V
Output Capacity	C_{ob}	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$, $I_E = 0$	-	30	-	pF
Current-Gain—Bandwidth Product	f_T	$I_C = 0.05\text{A}$, $V_{CE} = 5\text{V}$ $f = 100\text{MHz}$	-	100	-	MHz

Classification of h_{FE}

Rank	P	Q	R
Range	82-180	120-270	180-390
Marking	DBP	DBQ	DBR

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

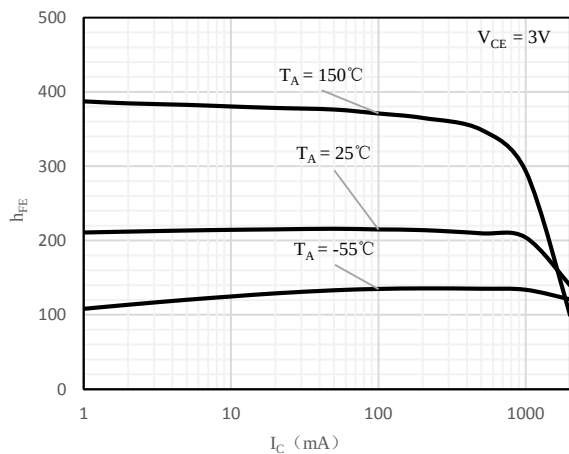


Fig 1 h_{FE} vs. I_C

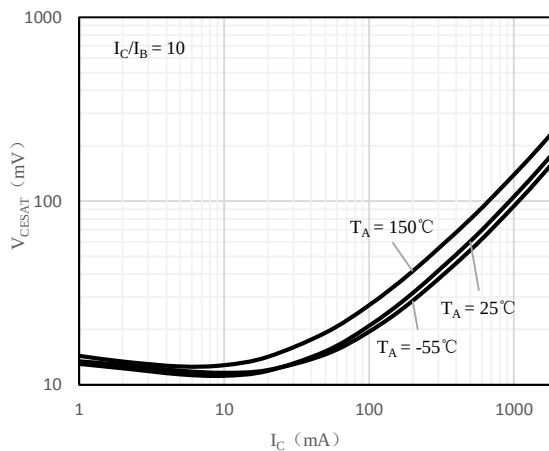


Fig 2 $V_{CE(sat)}$ vs. I_C

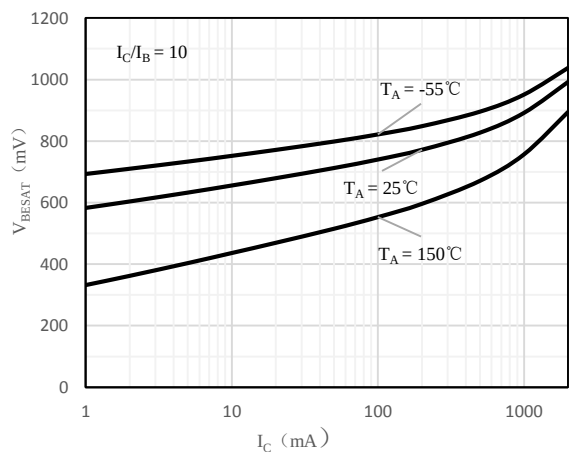


Fig 3 $V_{BE(sat)}$ vs. I_C

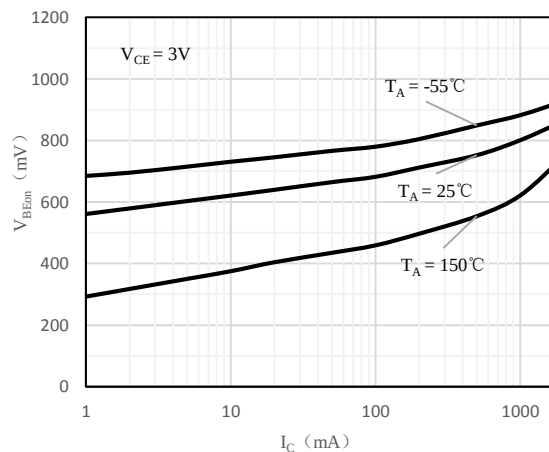


Fig 4 $V_{BE(on)}$ vs. I_C

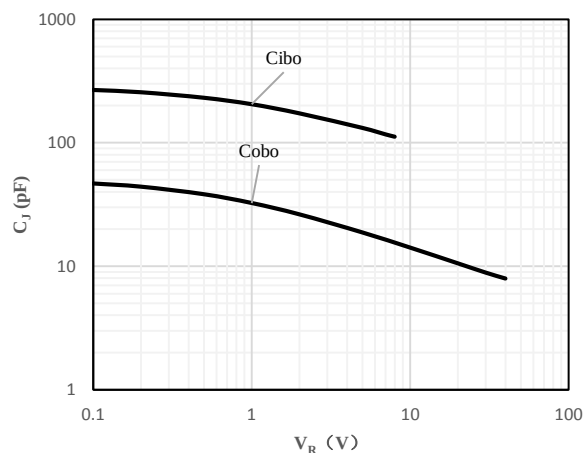


Fig 5 C_J vs. V_R

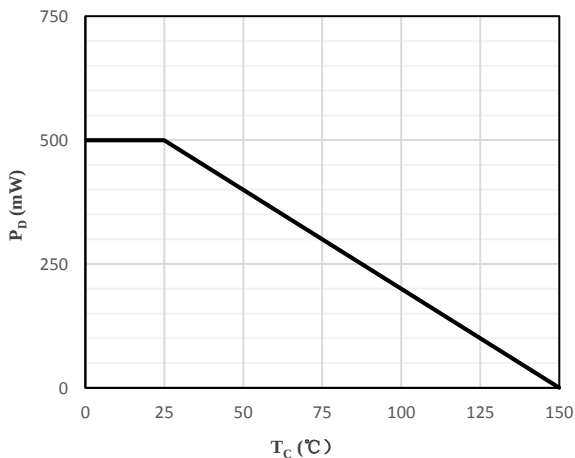


Fig 6 Steady State Power Derating

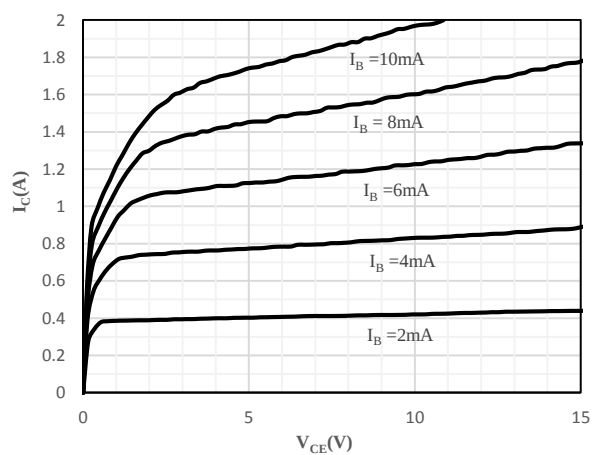
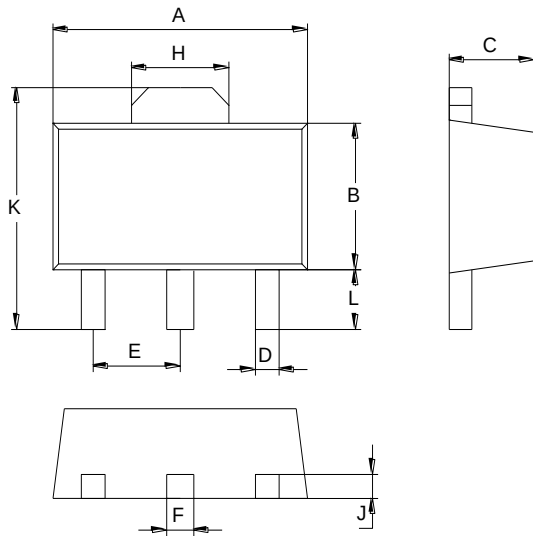


Fig 7 I_C vs. V_{CE}

Package Outline Dimensions (Unit: mm)



SOT-89		
Dimension	Min.	Max.
A	4.30	4.70
B	2.25	2.65
C	1.30	1.70
D	0.30	0.50
E	1.40	1.60
F	0.38	0.58
H	1.60	1.80
J	0.30	0.50
L	0.90	1.10
K	3.95	4.35

Mounting Pad Layout (Unit: mm)

SOT-89

