



# 2SD1781A

## NPN Low Vce(sat) Transistor

**Voltage**

**50V**

**Current**

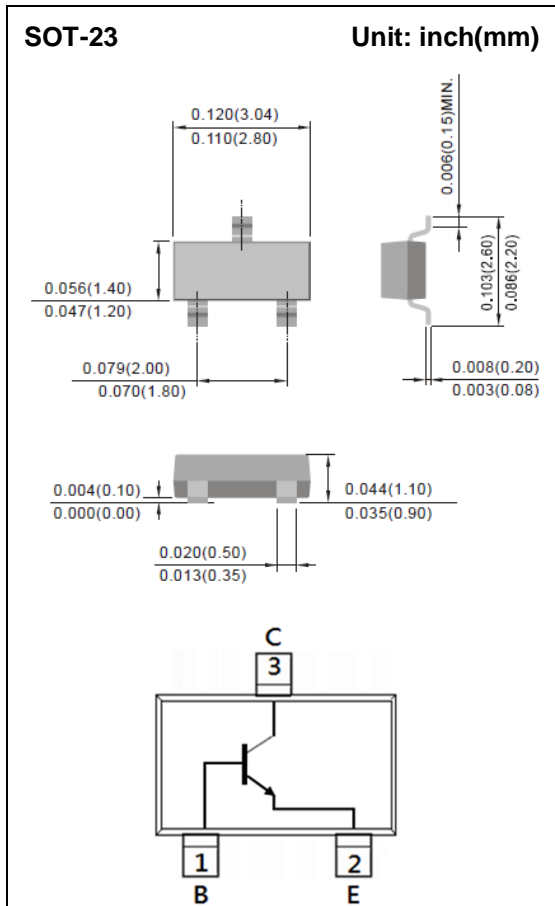
**3A**

### Features

- Silicon NPN epitaxial type
- Low Vce(sat) 0.14V(max)@Ic/Ib= 1A/100mA
- High collector current capability
- Excellent DC current gain characteristics
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std. (Halogen Free)

### Mechanical Data

- Case: SOT-23 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams



### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS
Collector-Base Voltage	V <sub>CBO</sub>	100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Collector Current (DC)	I <sub>C</sub>	3	A
Collector Current (Pulse)	I <sub>CP</sub>	5	A
Collector Power Dissipation	P <sub>D</sub>	1.25	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Thermal Resistance from Junction to Ambient <sup>(Note)</sup>	R <sub>θJA</sub>	100	°C/W

Note: Mounted on FR4 with 2oz. PCB at 1 inch square copper pad.



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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>OFF Characteristics</b>						
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=10\text{mA}, I_B=0\text{A}$	50	-	-	V
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=0.1\text{mA}, I_E=0\text{A}$	100	-	-	V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=0.1\text{mA}, I_C=0\text{A}$	7	9.4	-	V
Collector-Base Cutoff Current	$I_{CBO}$	$V_{CB}=30\text{V}, I_E=0\text{A}$	-	1	100	nA
Emitter-Base Cutoff Current	$I_{EBO}$	$V_{EB}=4\text{V}$	-	1	100	nA
Collector-Emitter Cutoff Current	$I_{CES}$	$V_{CES}=30\text{V}$	-	1	100	nA
<b>ON characteristics</b>						
DC Current Gain	$h_{FE}$	$V_{CE}=5\text{V}, I_C=50\text{mA}$	300	-	-	-
		$V_{CE}=5\text{V}, I_C=0.5\text{A}$	300	500	900	
		$V_{CE}=5\text{V}, I_C=1\text{A}$	200	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=100\text{mA}, I_B=1\text{mA}$	-	52	75	mV
		$I_C=500\text{mA}, I_B=50\text{mA}$	-	53	100	
		$I_C=1\text{A}, I_B=100\text{mA}$	-	94	140	
Base-Emitter Saturation voltage	$V_{BE(SAT)}$	$I_C=1\text{A}, I_B=100\text{mA}$	-	0.87	1.1	V
Base-Emitter Turn-on voltage	$V_{BE(on)}$	$I_C=1\text{mA}, V_{CE}=2\text{V}$	-	0.52	1.1	
Transition Frequency	$f_T$	$I_C=100\text{mA}, V_{CE}=5\text{V}$ $f=100\text{MHz}$	-	250	-	MHz
Collector Output Capacitance	$C_{OB}$	$V_{CB}=10\text{V}, I_E=0\text{A},$ $f=1\text{MHz}$	-	13	-	pF



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## TYPICAL CHARACTERISTIC CURVES

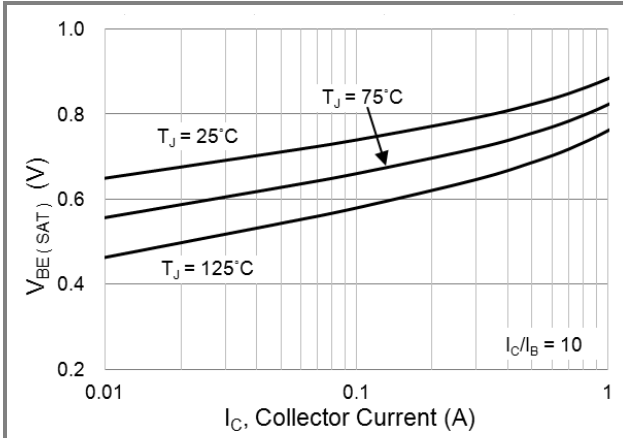


Fig.1 Typical Base-Emitter Saturation Voltage

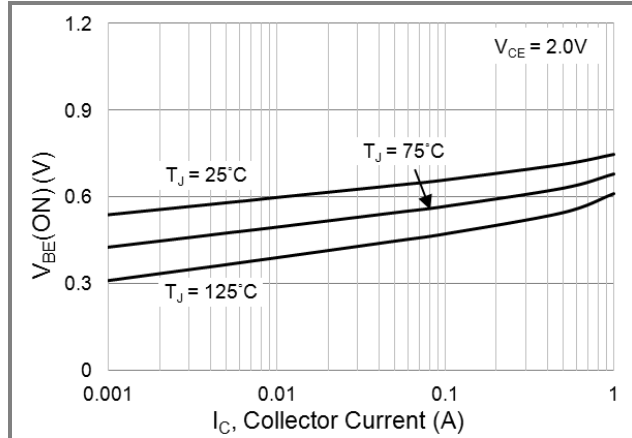


Fig.2 Typical Base-Emitter Turn-on Voltage

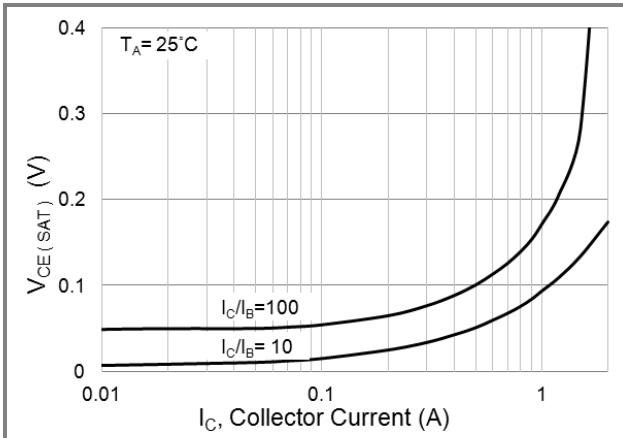


Fig.3 Typical Collector-Emitter Saturation

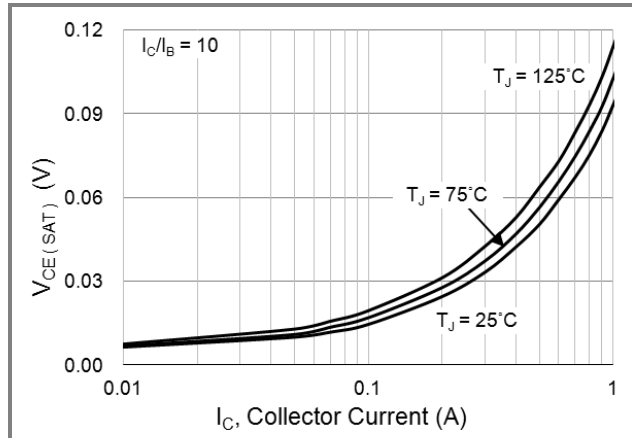


Fig.4 Typical Collector-Emitter Saturation

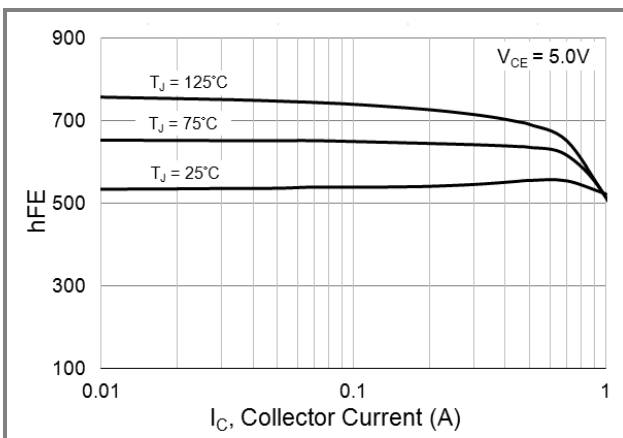


Fig.5 Typical DC Current Gain vs Collector Current

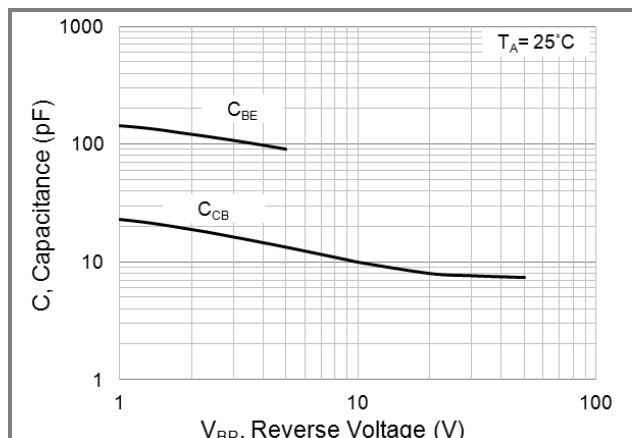


Fig.6 Typical Capacitance



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## PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
2SD1781A_R1_00001	SOT-23	3K pcs / 7" reel	D81	Halogen free
2SD1781A_R2_00001	SOT-23	12K pcs / 13" reel	D81	Halogen free

## MOUNTING PAD LAYOUT

