



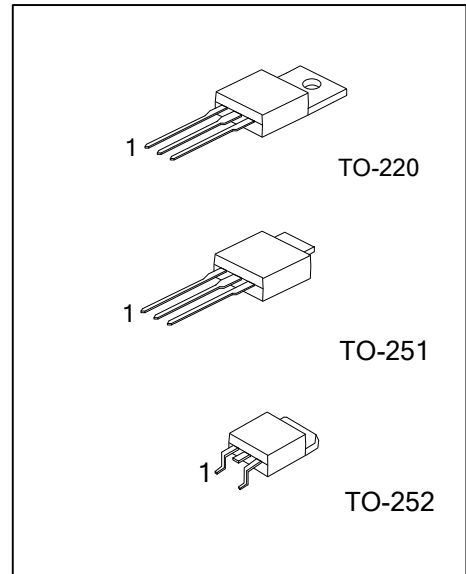
# 2SD1804

## NPN SILICON TRANSISTOR

### HIGH CURRENT SWITCHING APPLICATIONS

■ FEATURES

- \* Low collector-to-emitter saturation voltage
- \* High current and high  $f_T$
- \* Excellent linearity of  $h_{FE}$ .
- \* Fast switching time
- \* Small and slim package making it easy to make UTC 2SD1804 applied sets smaller.



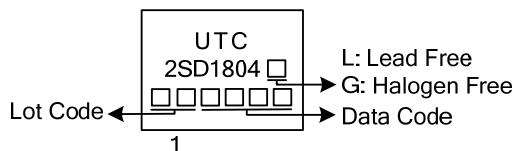
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2SD1804L-x-TA3-T	2SD1804G-x-TA3-T	TO-220	B	C	E	Tube
2SD1804L-x-TM3-T	2SD1804G-x-TM3-T	TO-251	B	C	E	Tube
2SD1804L-x-TN3-R	2SD1804G-x-TN3-R	TO-252	B	C	E	Tape Reel

Note: Pin Assignment: B: Base C: Collector E: Emitter

<p>2SD1804L-x-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Rank (4) Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) TA3: TO-220, TM3: TO-251, TN3: TO-252 (3) x: refer to Classification of <math>h_{FE1}</math> (4) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATING ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	60	V
Collector-Emitter Voltage		$V_{CEO}$	50	V
Emitter-Base Voltage		$V_{EBO}$	6	V
Collector Current		$I_C$	8	A
Collector Current(PULSE)		$I_{C(PULSE)}$	12	A
Collector Dissipation	$T_A=25^\circ\text{C}$	TO-220	2	W
		TO-251/TO-252	1	
	$T_C=25^\circ\text{C}$	TO-220	65	W
		TO-251/TO-252	20	
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55~+150	$^\circ\text{C}$

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

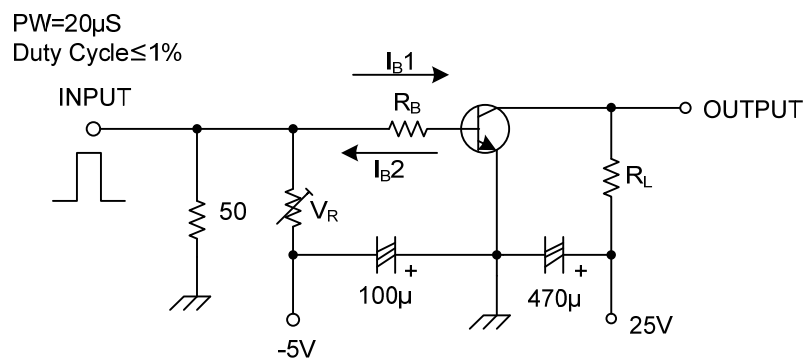
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=10\mu\text{A}, I_E=0$	60			V
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=1\text{mA}, R_{BE}=\infty$	50			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=10\mu\text{A}, I_C=0$	6			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=40\text{V}, I_E=0$			1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=4\text{V}, I_C=0$			1	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=2\text{V}, I_C=0.5\text{A}$	70		400	
	$h_{FE2}$	$V_{CE}=2\text{V}, I_C=6\text{A}$	35			
Gain-Bandwidth Product	$f_T$	$V_{CE}=5\text{V}, I_C=1\text{A}$		180		MHz
Output Capacitance	$C_{ob}$	$V_{CE}=10\text{V}, f=1\text{MHz}$		65		pF
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=4\text{A}, I_B=0.2\text{A}$		200	400	mV
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=4\text{A}, I_B=0.2\text{A}$		0.95	1.3	V
Storage Time	$t_{STG}$	See test circuit		500		ns
Fall Time	$t_F$	See test circuit		20		ns

■ CLASSIFICATION OF  $h_{FE1}$

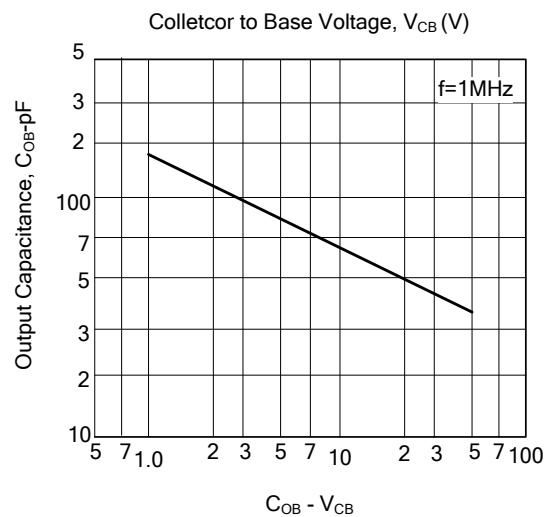
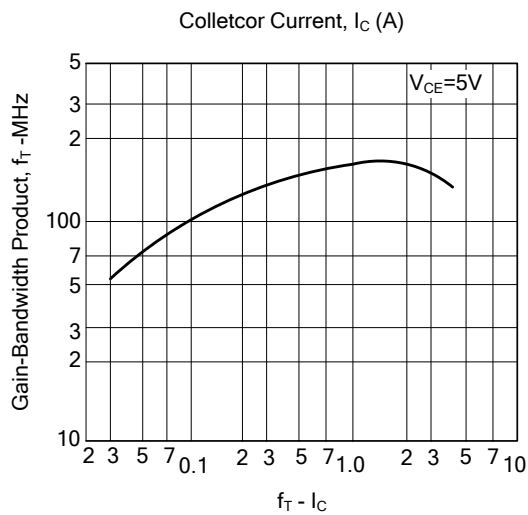
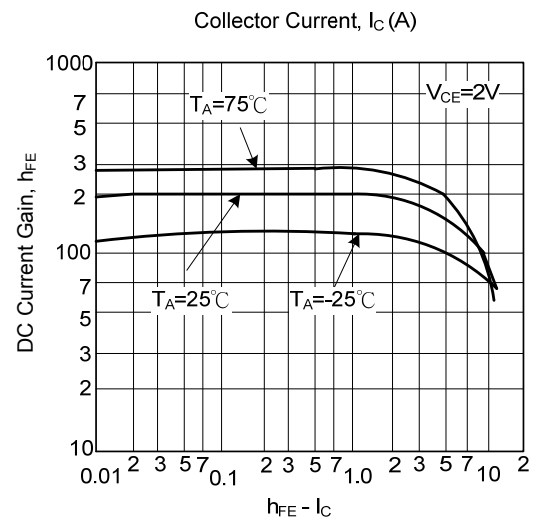
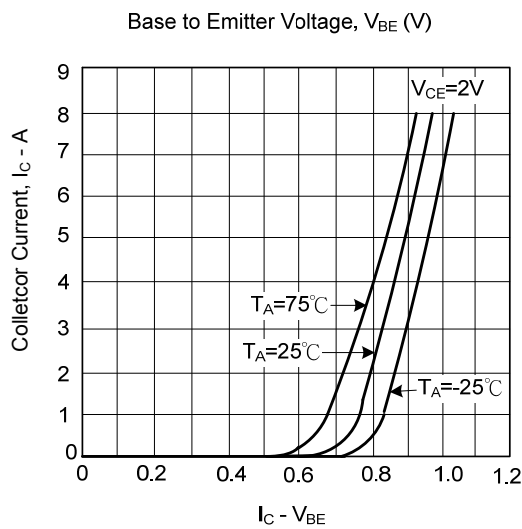
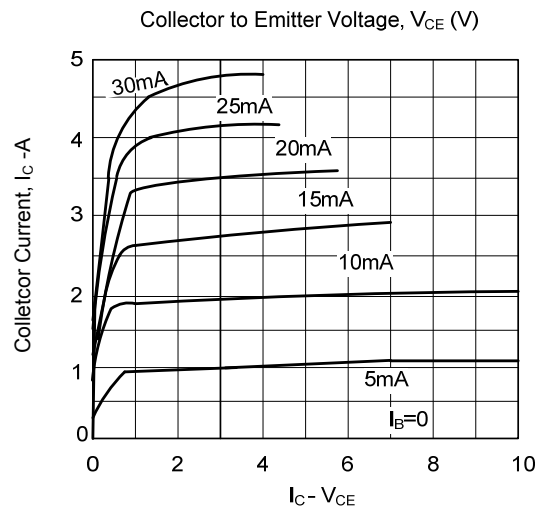
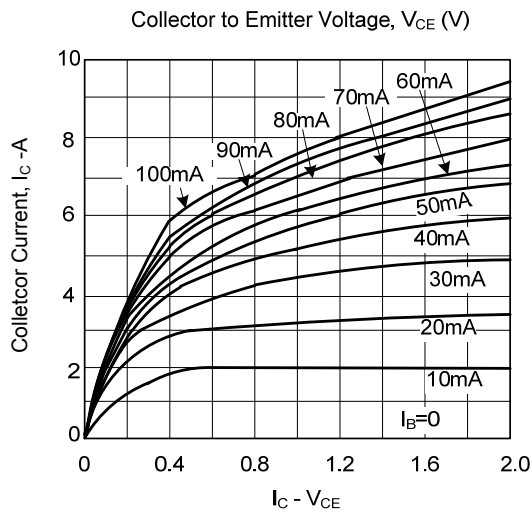
RANK	Q	R	S	T
RANGE	70-140	100-200	140-280	200-400

■ TEST CIRCUIT

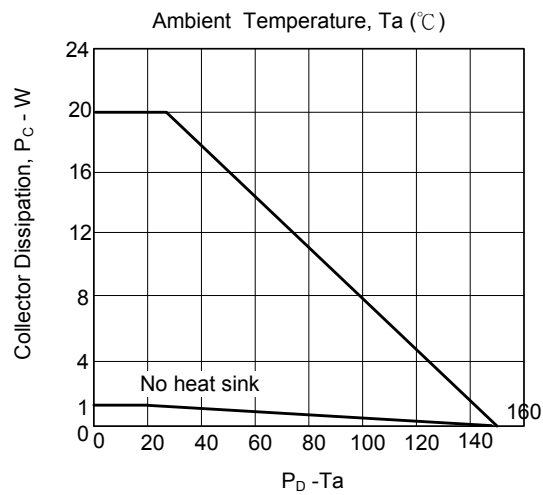
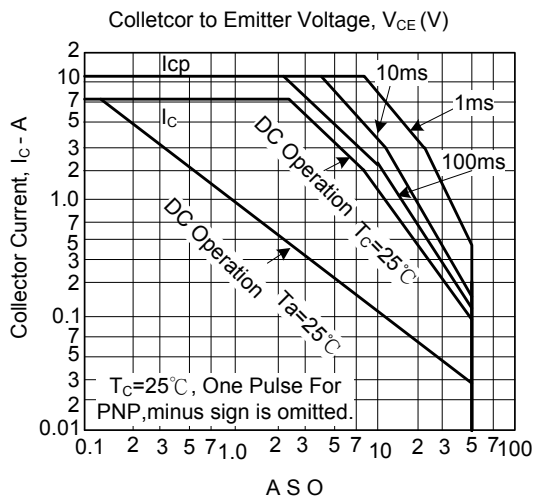
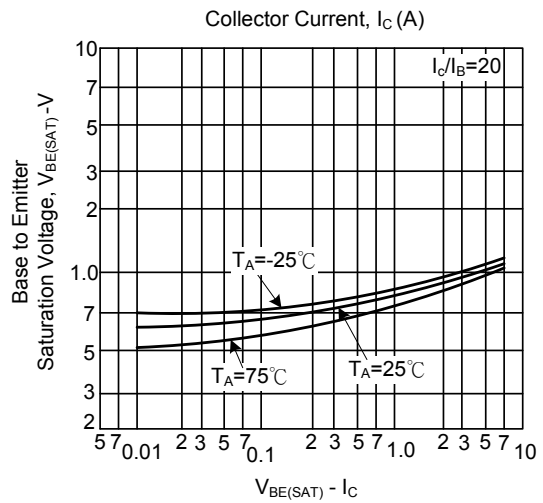
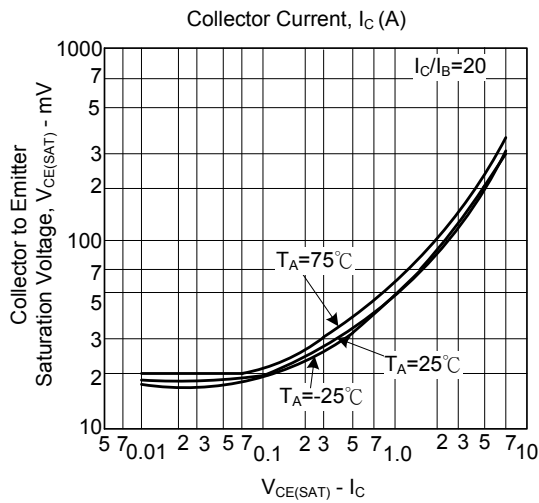


$I_C=10 I_{B1} = -10 I_{B2}=4A$   
Unit(resistance: Ω, capacitance: F)

## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS(Cont.)



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