



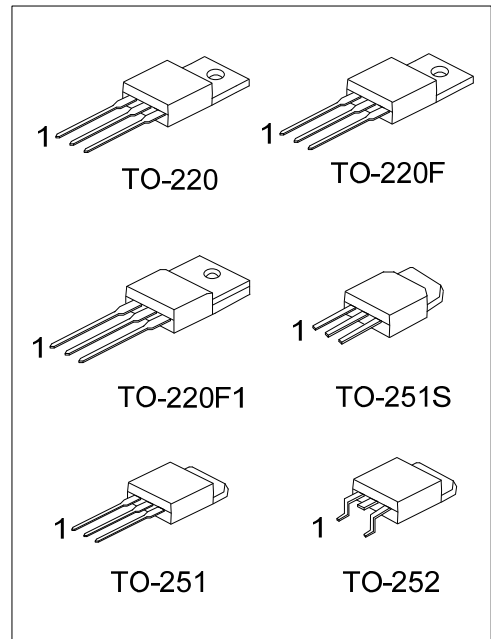
# 2SD1816

## NPN PLANAR TRANSISTOR

### HIGH CURRENT SWITCHING APPLICATIONS

■ FEATURES

- \* Low collector-to-emitter saturation voltage
- \* Good linearity of  $h_{FE}$
- \* Small and slim package facilitating compactness of sets.
- \* High  $f_T$
- \* Fast switching speed



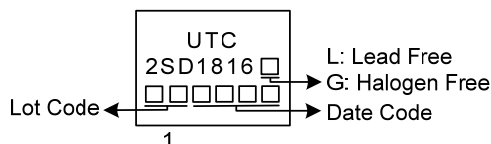
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2SD1816L-x-TA3-T	2SD1816G-x-TA3-T	TO-220	B	C	E	Tube
2SD1816L-x-TF1-T	2SD1816G-x-TF1-T	TO-220F1	B	C	E	Tube
2SD1816L-x-TF3-T	2SD1816G-x-TF3-T	TO-220F	B	C	E	Tube
2SD1816L-x-TM3-T	2SD1816G-x-TM3-T	TO-251	B	C	E	Tube
2SD1816L-x-TMS-T	2SD1816G-x-TMS-T	TO-251S	B	C	E	Tube
2SD1816L-x-TN3-R	2SD1816G-x-TN3-R	TO-252	B	C	E	Tape Reel

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

<p>2SD1816G-x-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel                  (2) TA3: TO-220, TF1: TO-220F1, TF3: TO-220F, TM3: TO-251, TMS: TO-251S, TN3: TO-252                  (3) x: refer to Classification of <math>h_{FE1}</math>                  (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	120	V
Collector-Emitter Voltage		$V_{CEO}$	100	V
Emitter-Base Voltage		$V_{EBO}$	6	V
Collector Current	DC	$I_C$	4	A
	PULSE(Note 2)		8	A
Collector Power Dissipation	TO-220/TO-220F TO-220F1	$P_D$	2	W
	TO-251/TO-251S TO-252		1	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-40 ~ +150	$^\circ\text{C}$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

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

2. Duty=1/2, Pw=20ms.

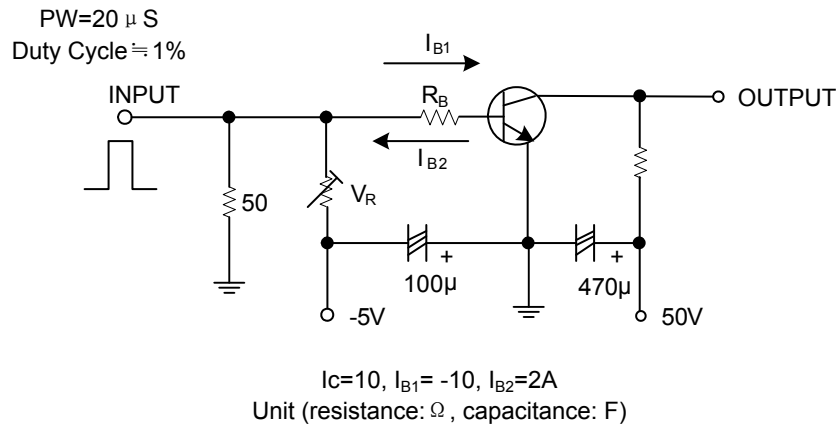
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Base Breakdown Voltage	$BV_{CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	120			V
Collector Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = 1\text{mA}, R_B = \infty$	100			V
Emitter Base Breakdown Voltage	$BV_{EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	6			V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 2\text{A}, I_B = 0.2\text{A}$		0.9	1.2	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 2\text{A}, I_B = 0.2\text{A}$		150	400	mV
Collector Cut-Off Current	$I_{CBO}$	$V_{CB} = 100\text{V}, I_E = 0$			1	$\mu\text{A}$
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB} = 4\text{V}, I_C = 0$			1	$\mu\text{A}$
DC Current Transfer Ratio	$h_{FE1}$	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$	70		560	
	$h_{FE2}$	$V_{CE} = 5\text{V}, I_C = 3\text{A}$	40			
Transition Frequency	$f_T$	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}$		180		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$		40		pF
Turn-on Time	$t_{ON}$	See test circuit		100		ns
Storage Time	$t_{STG}$	See test circuit		900		ns
Fall Time	$t_F$	See test circuit		50		ns

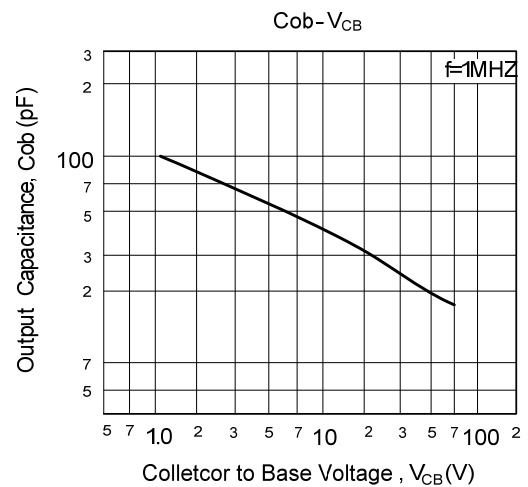
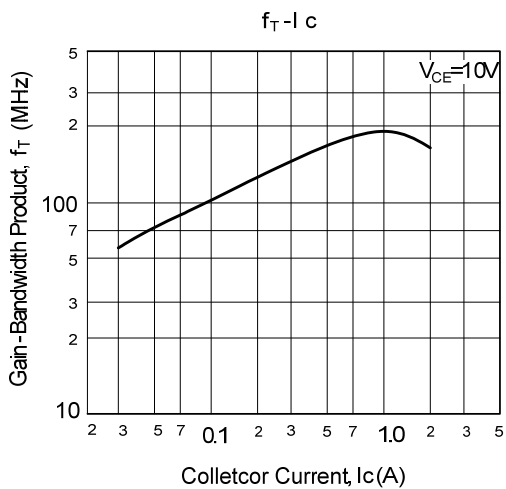
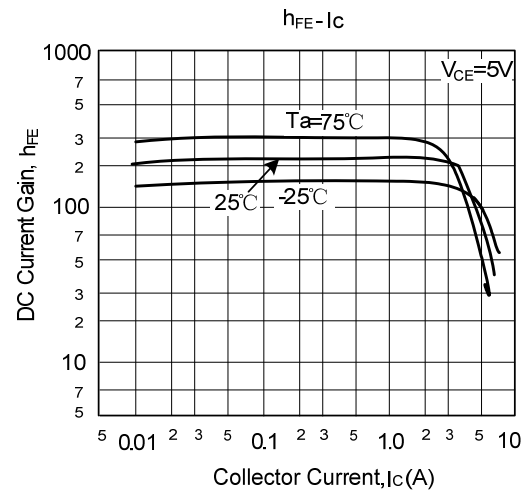
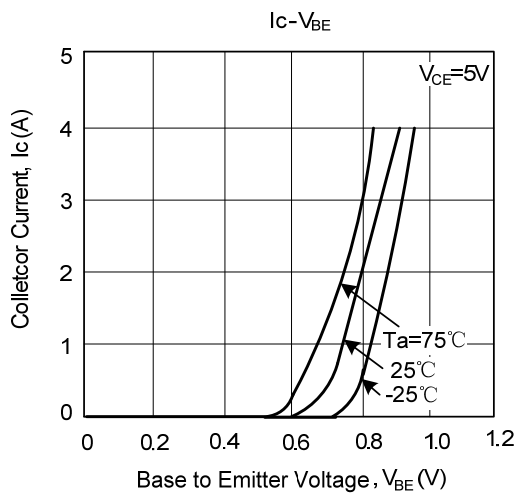
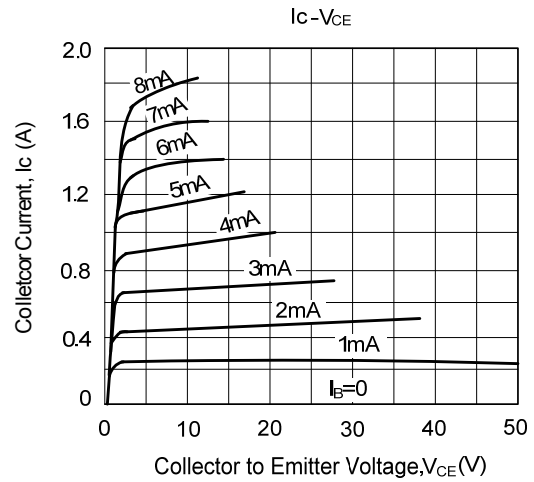
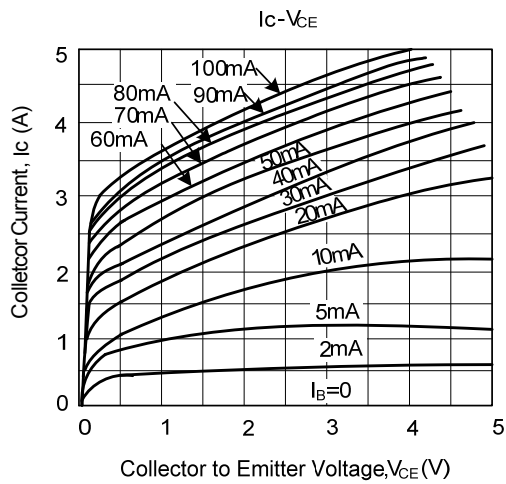
■ CLASSIFICATION of  $h_{FE1}$

RANK	Q	R	S	T	H
RANGE	70 - 140	100 - 200	140 - 280	200 - 400	270 - 560

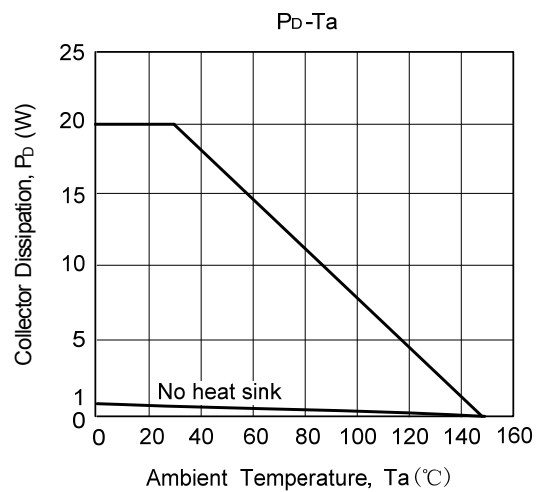
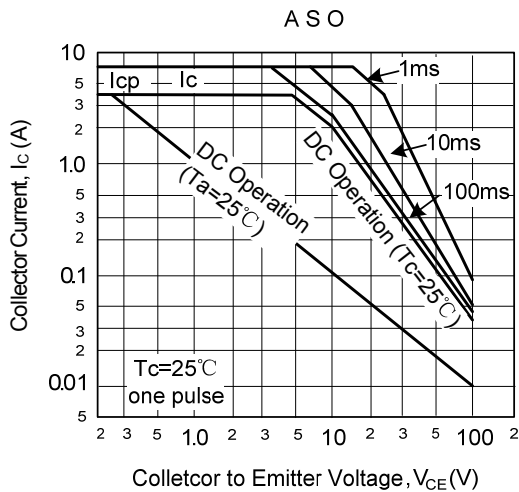
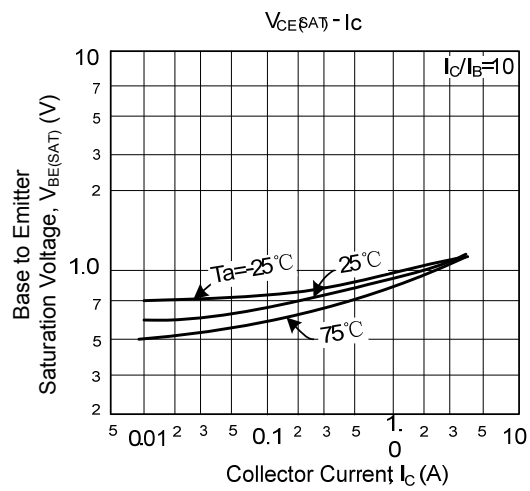
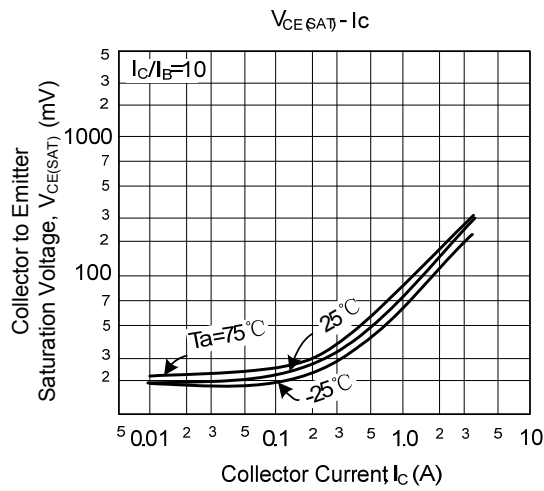
■ TEST CIRCUIT



## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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