



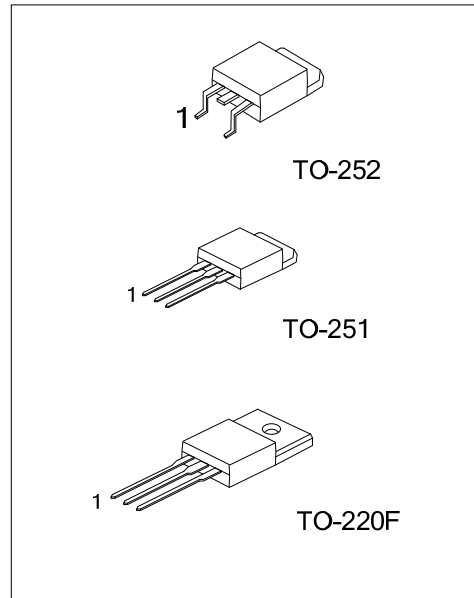
# 2SD1816

## 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-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-TN3-T	2SD1816G-x-TN3-T	TO-252	B	C	E	Tube
2SD1816L-x-TN3-R	2SD1816G-x-TN3-R	TO-252	B	C	E	Tape Reel

<p>2SD1816L-x-TM3-T</p>	<p>(1) Packing Type (2) Package Type (3) Rank (4) Lead Plating</p>	<p>(1) T: Tube, R: Tape Reel (2) TF3: TO-220F, TM3: TO-251, TN3: TO-252 (3) x: refer to Classification of <math>h_{FE1}</math> (4) G: Halogen Free ,L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS (Ta =25°C )

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 1)		8	A
Collector Power Dissipation	TO-251/TO-252	$P_D$	1	W
	TO-220F		2	W
Junction Temperature		$T_J$	+150	°C
Storage Temperature		$T_{STG}$	-40 ~ +150	°C

Note1: Duty=1/2, Pw=20ms

Note2: 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 (Ta=25°C, unless otherwise specified)

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

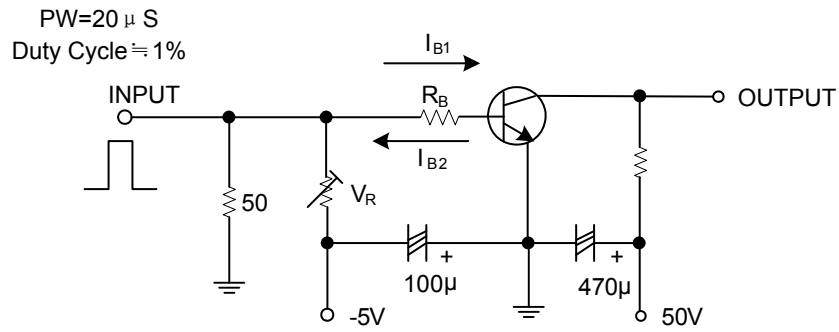
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## NPN PLANAR TRANSISTOR

### ■ CLASSIFICATION of $h_{FE1}$

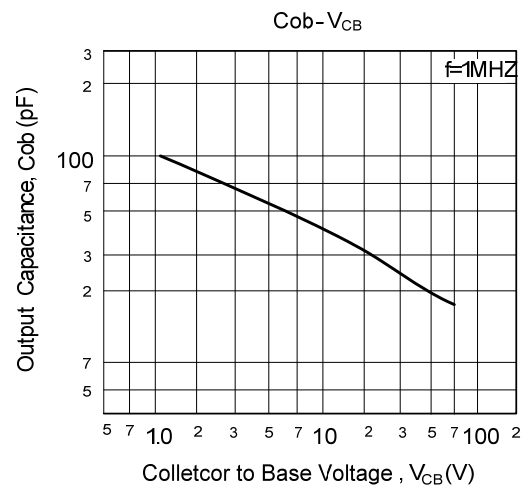
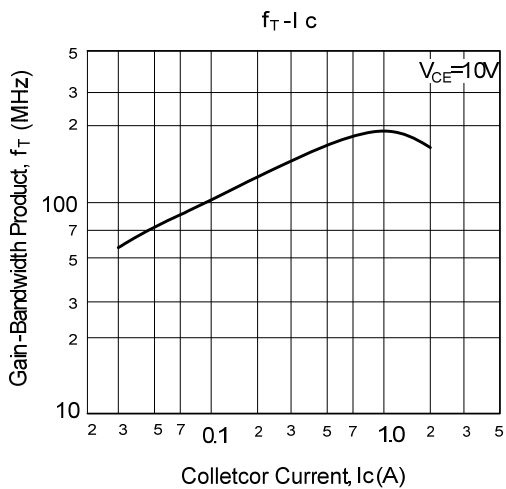
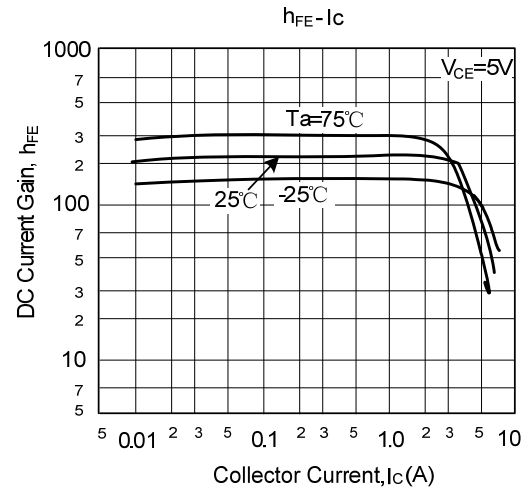
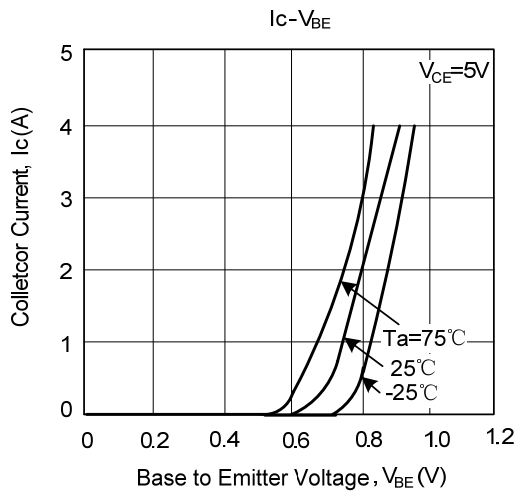
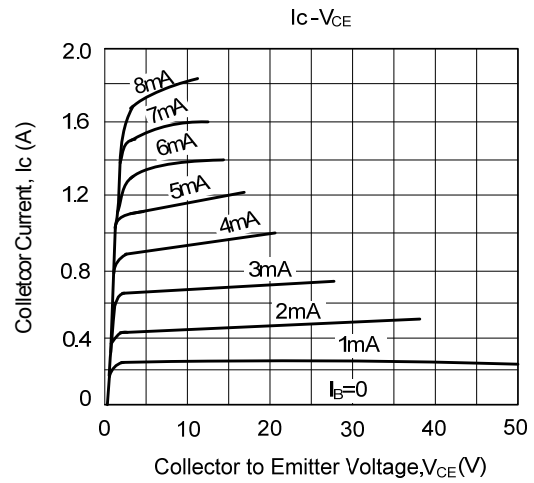
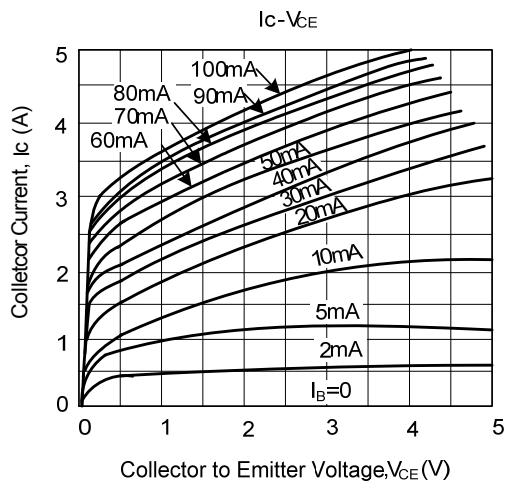
RANK	R	S	T	Q
RANGE	100 - 200	140 - 280	200 - 400	70 - 140

### ■ TEST CIRCUIT

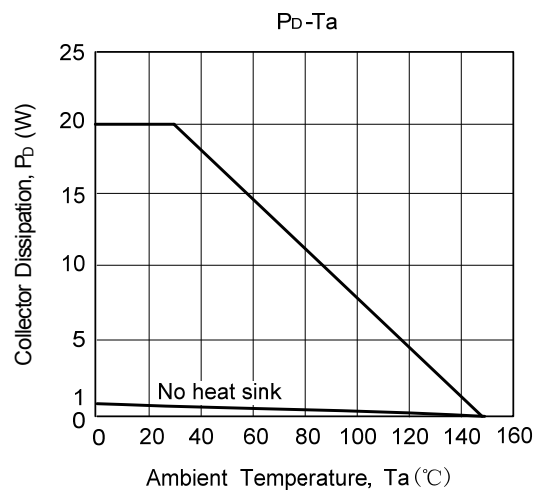
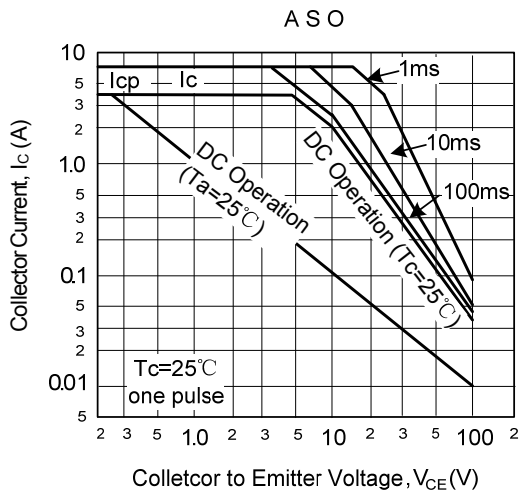
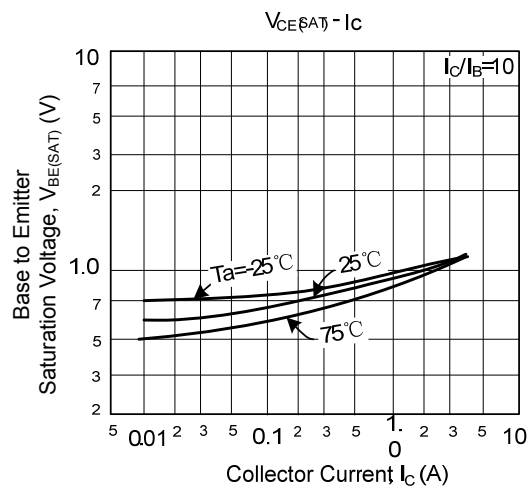
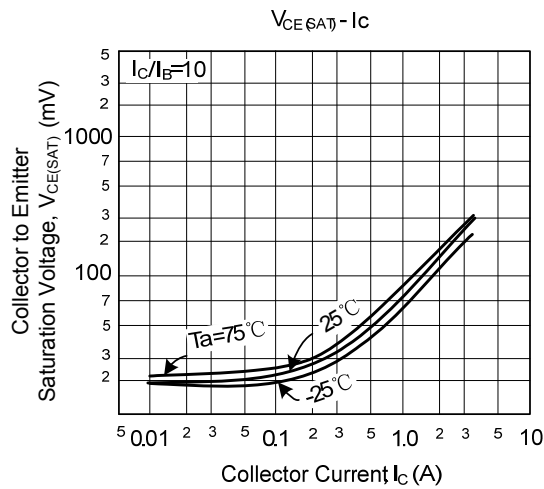


$I_C=10, I_{B1}=-10, I_{B2}=2A$   
Unit (resistance:  $\Omega$ , capacitance: F)

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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