

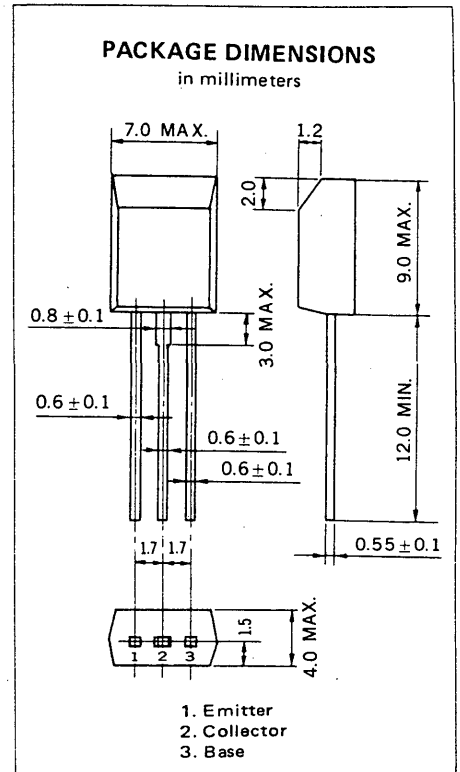
**DESCRIPTION** The 2SB1117 is a Low  $V_{CE(sat)}$  transistor which has a large current capability and wide ASO. It is suitable for driver of solenoid or motor, or electronic flash.

- FEATURES**
- Low Collector Saturation Voltage.  
 $V_{CE(sat)} = -0.2$  V TYP. (@  $I_C/I_B = -2.0$  A/ $-0.2$  A)
  - Large Current.  
 $I_{C(DC)} = -3.0$  A,  $I_{C(pulse)} = -5.0$  A
  - High DC Current Gain. :  
 $h_{FE} = 300$  TYP. (@  $V_{CE} = -2.0$  V,  $I_C = -1.0$  A)
  - High Total Power Dissipation. :  $P_T = 1.0$  W
  - Complementary to the NEC 2SD1617 NPN Transistor.

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures	
Storage Temperature	-55 to +150 °C
Junction Temperature	150 °C Maximum
Maximum Power Dissipation ( $T_a = 25$ °C)	
Total Power Dissipation	1.0 W
Maximum Voltages and Currents ( $T_a = 25$ °C)	
$V_{CBO}$ Collector to Base Voltage	-30 V
$V_{CEO}$ Collector to Emitter Voltage	-25 V
$V_{EBO}$ Emitter to Base Voltage	-6.0 V
$I_C$ Collector Current (DC)	-3.0 A
$I_C$ Collector Current (pulse)*	-5.0 A

\*PW ≤ 10 ms, Duty Cycle ≤ 50 %



**ELECTRICAL CHARACTERISTICS ( $T_a = 25$  °C)**

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$h_{FE1}^{**}$	DC Current Gain	135	300	600	—	$V_{CE} = -2.0$ V, $I_C = -1.0$ A
$h_{FE2}^{**}$	DC Current Gain	81			—	$V_{CE} = -2.0$ V, $I_C = -2.0$ A
$f_T$	Gain Bandwidth Product	100	280		MHz	$V_{CE} = -5.0$ V, $I_E = 1.0$ A
$C_{ob}$	Output Capacitance		90		pF	$V_{CB} = -10$ V, $I_E = 0$ , $f = 1.0$ MHz
$I_{CBO}$	Collector Cutoff Current			-100	nA	$V_{CB} = -30$ V, $I_E = 0$
$I_{EBO}$	Emitter Cutoff Current			-100	nA	$V_{EB} = -6.0$ V, $I_C = 0$
$V_{BE}^{**}$	Base to Emitter Voltage	-600	-660	-700	mV	$V_{CE} = -2.0$ V, $I_C = -0.1$ A
$V_{CE(sat)1}^{**}$	Collector Saturation Voltage		-0.2	-0.3	V	$I_C = -2.0$ A, $I_B = -0.2$ A
$V_{CE(sat)2}^{**}$	Collector Saturation Voltage		-0.3	-0.5	V	$I_C = -3.0$ A, $I_B = -0.3$ A
$V_{BE(sat)}^{**}$	Base Saturation Voltage		-1.0	-1.2	V	$I_C = -2.0$ A, $I_B = -0.2$ A
$t_{on}$	Turn On Time		80		ns	$V_{CE} = -10$ V, $I_C = -500$ mA $I_{B1} = -I_{B2} = -50$ mA $V_{BE(off)} = 2$ to 3 V
$t_{stg}$	Storage Time		500		ns	
$t_f$	Fall Time		70		ns	

\*\*Pulsed PW ≤ 350 μs, Duty Cycle ≤ 2%

**Classification of  $h_{FE1}$**

Rank	L	K	U
Range	135 to 270	200 to 400	300 to 600

Test Conditions:  $V_{CE} = -2.0$  V,  $I_C = -1.0$  A

TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

