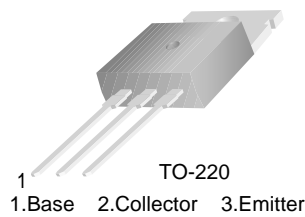


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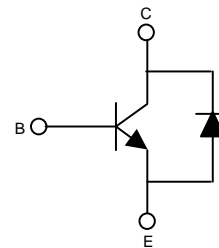
High Voltage Fast Switching NPN Power Transistor

Features

- Built-in Diode between Collector and Emitter
- Suitable for Electronic Ballast and Switch Mode Power Supplies



Internal Schematic Diagram



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	700	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	9	V
I_C	Collector Current (DC)	8	A
I_{CP}	* Collector Current (Pulse)	16	A
I_B	Base Current (DC)	4	A
P_C	Collector Dissipation ($T_C = 25^\circ\text{C}$)	80	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 ~ 150	$^\circ\text{C}$

* Pulse Test: PW = 300ms, Duty Cycle = 2% Pulsed

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C = 500\mu\text{A}, I_E = 0$	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}, I_B = 0$	400			V
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 500\mu\text{A}, I_C = 0$	9			V
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	mA
h_{FE1} h_{FE2}	DC Current Gain	$V_{CE} = 5\text{V}, I_C = 2\text{A}$ $V_{CE} = 5\text{V}, I_C = 5\text{A}$	8 5		40 30	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 2\text{A}, I_B = 0.4\text{A}$ $I_C = 5\text{A}, I_B = 1\text{A}$ $I_C = 8\text{A}, I_B = 2\text{A}$			1 2 3	V

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 2A, I_B = 0.4A$			1.2	V
		$I_C = 5A, I_B = 1A$			1.6	V
V_F	Diode Forward Voltage	$I_C = 3A$			2.5	V
C_{ob}	Output Capacitance	$V_{CB} = 10V, I_E = 0, f = 1MHz$		60		pF
t_{STG}	Storage Time	$V_{CC} = 125V, I_C = 5A$ $I_{B1} = -I_{B2} = 1A, R_L = 50\Omega$			3	μs
t_F	Fall Time				0.7	μs
t_{STG}	Storage Time	$V_{CC} = 30V, I_C = 5A, L=200\mu H$ $I_{B1}=1A, R_{BB} = 0\Omega, V_{BE(OFF)} = -5V$ $V_{CLAMP} = 250V$			2.3	μs
t_F	Fall Time				150	ns

* Pulse test: PW = 300 μs , Duty cycl e= 2%

h_{FE} Classification

Classification	H1	H2
h_{FE1}	15 ~ 28	26 ~ 39

Typical Characteristics

Figure 1. Static Characteristic

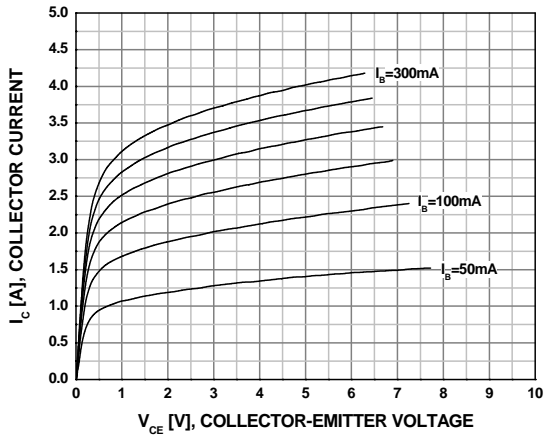


Figure 2. DC Current Gain (H1 Grade)

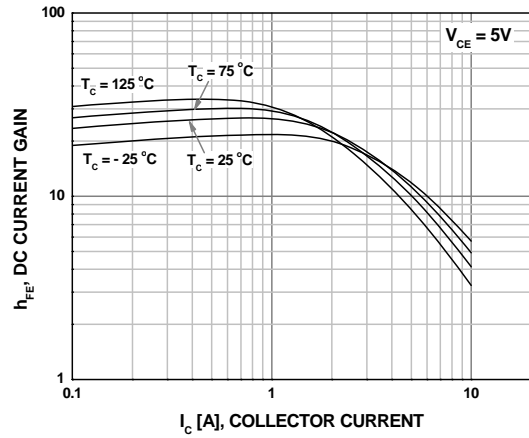


Figure 3. DC Current Gain (H2 Grade)

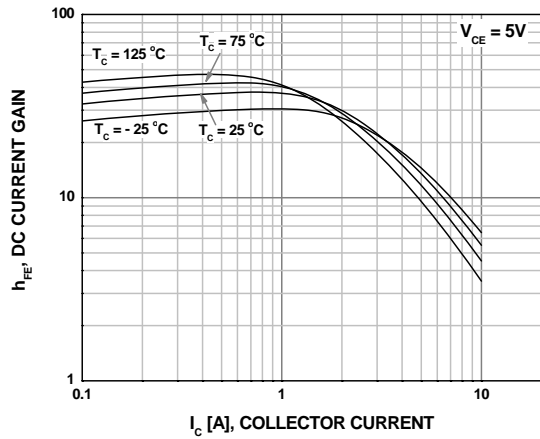


Figure 4. Collector-Emitter Saturation Voltage

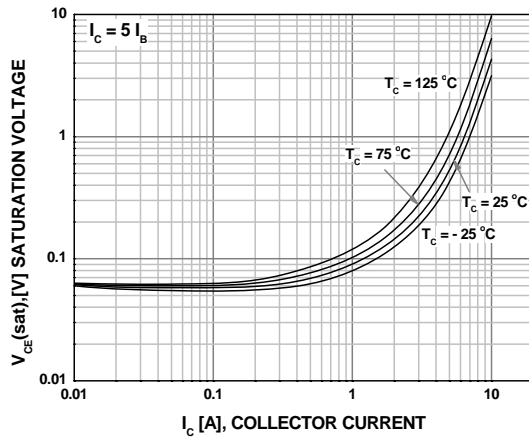


Figure 5. Base-Emitter Saturation Voltage

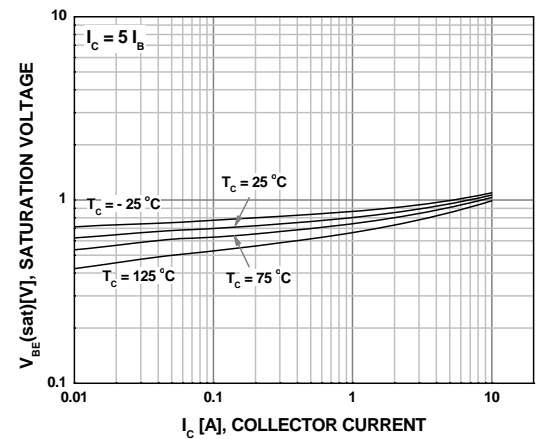
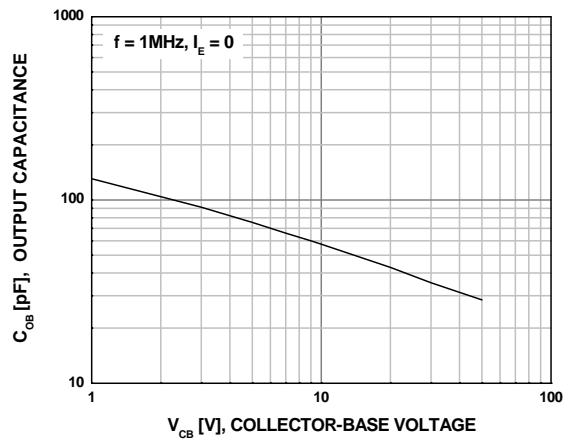


Figure 6. Output Capacitance



Typical Characteristics (Continued)

Figure 7. Power Derating

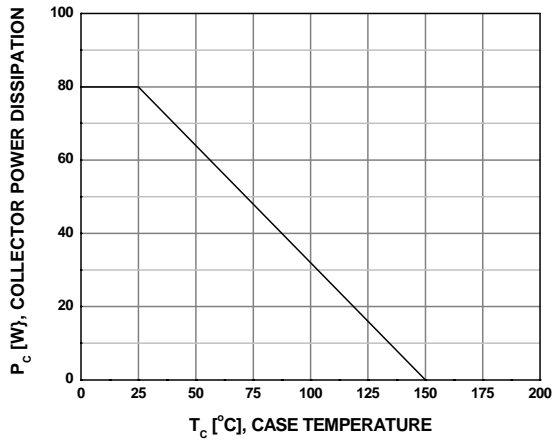


Figure 8. Reverse Biased Safe Operating Area

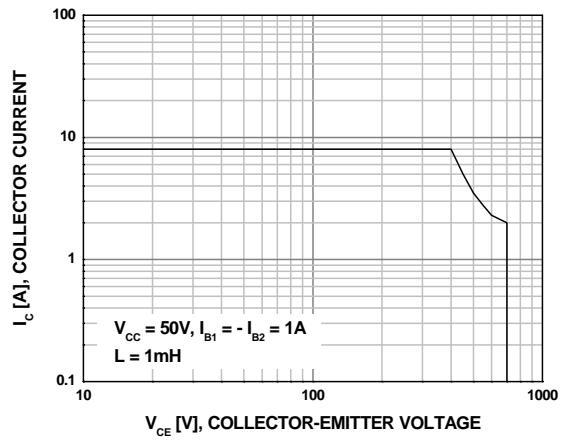
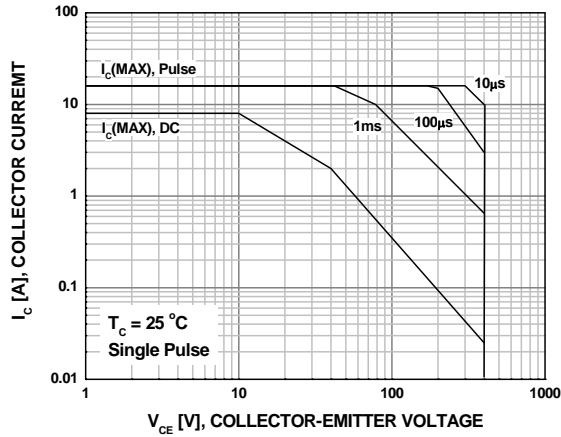
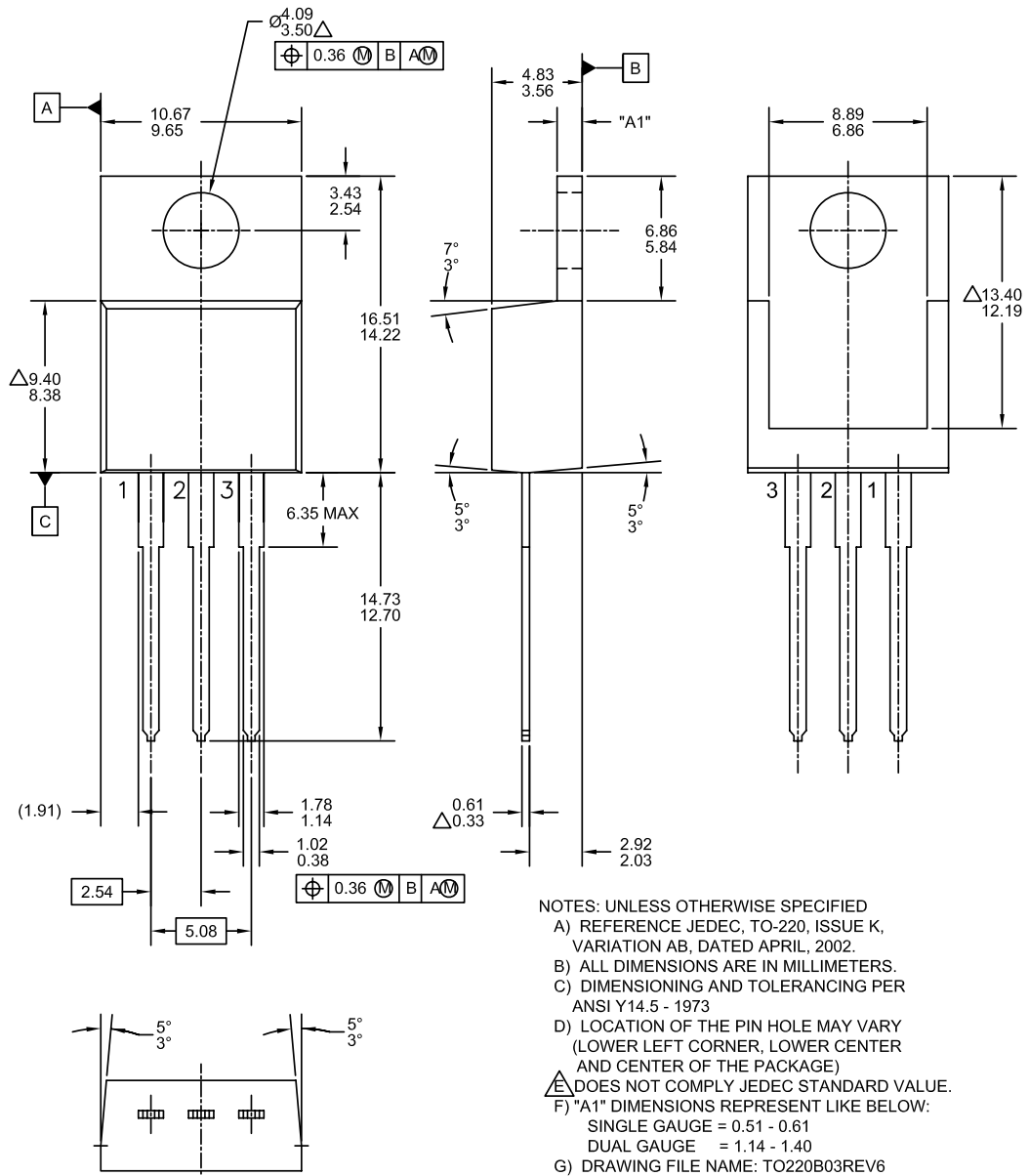


Figure 9. Forward Biased Safe Operating Area



Mechanical Dimensions

TO220



- NOTES: UNLESS OTHERWISE SPECIFIED
- A) REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AB, DATED APRIL, 2002.
 - B) ALL DIMENSIONS ARE IN MILLIMETERS.
 - C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973
 - D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
 - E) DOES NOT COMPLY JEDEC STANDARD VALUE.
 - F) "A1" DIMENSIONS REPRESENT LIKE BELOW:
 SINGLE GAUGE = 0.51 - 0.61
 DUAL GAUGE = 1.14 - 1.40
 - G) DRAWING FILE NAME: TO220B03REV6



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