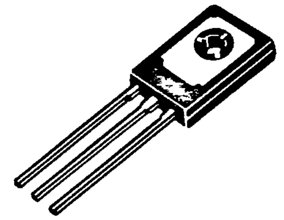
MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

BD434, BD436
BD438, BD440
BD442

PLASTIC MEDIUM POWER SILICON PNP TRANSISTOR

. . . for amplifier and switching applications Complementary types: BD433/435/437/439/441.

4 AMPERE
POWER TRANSISTOR
PNP SILICON

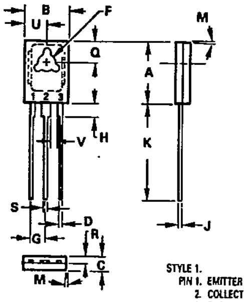


MAXIMUM RATINGS

Rating	Symbol	Type	Value	Unit
Collector Emitter Voltage	V_{CEO}	BD434 BD436 BD438 BD440 BD442	22 32 45 60 80	Vdc
Collector Base Voltage	V_{CBO}	BD434 BD436 BD438 BD440 BD442	22 32 45 60 80	Vdc
Emitter Base Voltage	V_{EBO}		5	Vdc
Collector current	I_C		4	Adc
Base Current	I_B		1	Adc
Total Device Dissipation $T_C = 25°C$ Derate above 25°C	P_D		 36 288	Watts mW/°C
Operating and Storage Junction Temperature range.	T_J, T_{stg}		−55 to +150	°C

THERMAL CHARACTERISTICS

	Symbol	Max.	Unit
Thermal Resistance Junction to Case	θ_{JC}	3.5	°C/W



STYLE 1.
PIN 1. EMITTER
2. COLLECTOR
3. BASE

NOTES:
1 MT = MAIN TERMINAL
2 LEADS, TRUE POSITIONED WITHIN 0 25mm (0.010) DIA TO DIM A & B AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10 60	11 04	0 425	0 435
B	7.50	7 74	0.295	0.305
C	2 42	2 66	0.095	0 105
D	0 51	0 66	0 020	0 026
F	2.93	3.17	0.115	0.125
G	2.32	2.46	0.091	0.097
H	1.27	2.41	0.050	0.095
J	0.39	0.63	0.015	0.025
K	14.61	16.63	0.575	0.655
M	3° TYP		3° TYP	
Q	3.76	4.01	0.148	0.158
R	1 15	1.39	0 045	0.055
S	0.64	0.88	0 025	0.035
U	3.69	3.93	0 145	0.155
V	1.02	—	0 040	—

CASE 77-05
TO-126

BD434, BD436, BD438, BD440, BD442

T-33-/9

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Collector Emitter Breakdown Voltage (I_C = 100 mA, I_B = 0)	BD434	BV_{CEO}	22			Vdc
	BD436		32			
	BD438		45			
	BD440		60			
	BD442		80			
Collector Base Breakdown Voltage (I_C = 100 μA, I_B = 0)	BD434	BV_{CBO}	22			Vdc
	BD436		32			
	BD438		45			
	BD440		60			
	BD442		80			
Emitter Base Breakdown Voltage (I_E = 100 μA, I_C = 0)		BV_{EBO}	5			Vdc
Collector Cutoff Current (V_{CB} = 22 V, I_E = 0)	BD434	CBO			0.1	mAdc
(V_{CB} = 32 V, I_E = 0)	BD436				0.1	
(V_{CB} = 45 V, I_E = 0)	BD438				0.1	
(V_{CB} = 60 V, I_E = 0)	BD440				0.1	
(V_{CB} = 80 V, I_E = 0)	BD442				0.1	
Emitter Cutoff Current (V_{EB} = 5 V)		I_{EBO}			1	mAdc
DC Current Gain (I_C = 10 mA, V_{CE} = 5 V)	BD434	H_{FE}	40			
	BD436		40			
	BD438		30			
	BD440		20			
	BD442		15			
DC Current Gain (I_C = 500 mA, V_{CE} = 1 V)	BD434	H_{FE}	85		475	
	BD436		85		475	
	BD438		85		375	
	BD440		40		475	
	BD442		40		475	
DC Current Gain (I_C = 2 A, V_{CE} = 1 V)	BD434	H_{FE}	50			
	BD436		50			
	BD438		40			
	BD440		25			
	BD442		15			
Collector Saturation Voltage (I_C = 2 A, I_B = 0.2 A)	BD434	$V_{CE\,(sat)}$			0.5	Vdc
	BD436				0.5	
(I_C = 3 A, I_B = 0.3 A)	BD438				0.7	
	BD440				0.8	
	BD442				0.8	
Base—Emitter on voltage (I_C = 2 A, V_{CE} = 1 V)	BD434/436/438	$V_{BE(ON)}$			1.1	Vdc
	BD440/442				1.5	
Current Gain Bandwidth Product (V_{CE} = 1 V, I_C = 250 mA, f = 1 MHz)		f_T	3			MHz

3

T-33-19

FIGURE 1 – COLLECTOR SATURATION REGION

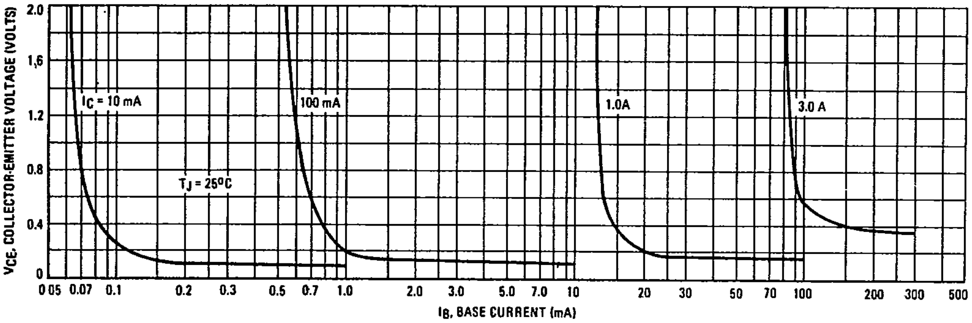


FIGURE 2 – CURRENT GAIN

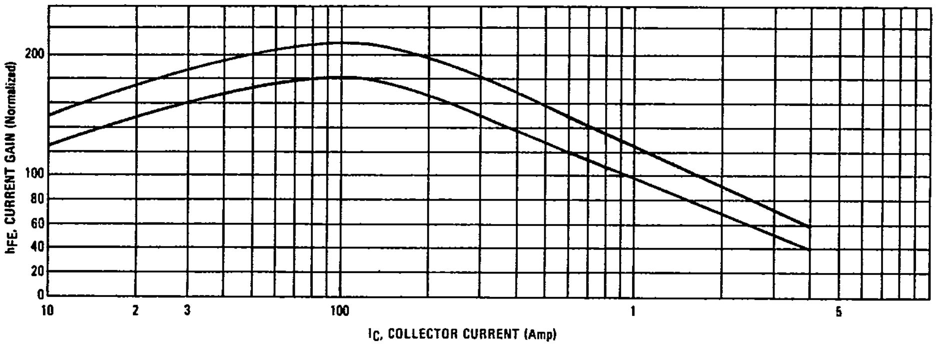


FIGURE 3 – "ON" VOLTAGE

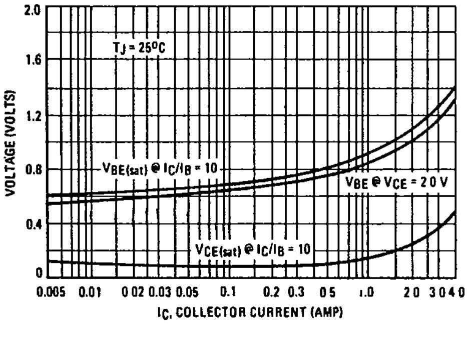


FIGURE 4 – ACTIVE REGION SAFE OPERATING AREA