BD439/BD440
BD441/BD442

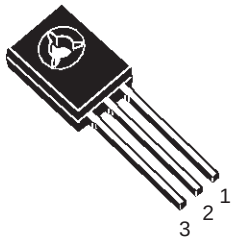
COMPLEMENTARY SILICON POWER TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES

DESCRIPTION

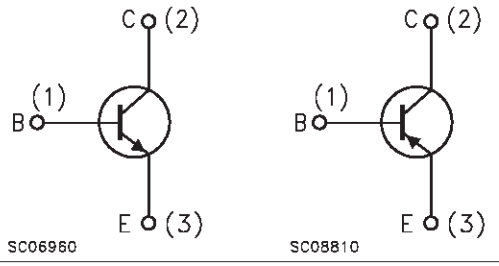
The BD439 and BD441 are silicon epitaxial-base NPN power transistors in Jedec SOT-32 plastic package, intented for use in power linear and switching applications.

The complementary PNP types are BD440, and BD442 respectively.



SOT-32

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value		Unit
		NPN	BD439	BD441	
		PNP	BD440	BD442	
V_{CBO}	Collector-Base Voltage (I_E = 0)		60	80	V
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)		60	80	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		60	80	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)		5		V
I_C	Collector Current		4		A
I_{CM}	Collector Peak Current (t ≤ 10 ms)		7		A
I_B	Base Current		1		A
P_{tot}	Total Dissipation at $T_c \leq 25\ ^oC$		36		W
T_{stg}	Storage Temperature		-65 to 150		^oC
T_j	Max. Operating Junction Temperature		150		^oC

For PNP types voltage and current values are negative.

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case Max	3.5	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient Max	100	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BD439/440** V_{CB} = 60 V for **BD441/442** V_{CB} = 80 V			100 100	µA µA
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	for **BD439/440** V_{CB} = 60 V for **BD441/442** V_{CB} = 80 V			100 100	µA µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA for **DB439/440** for **BD441/442**	60 80			V V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 2 A I_B = 0.2 A			0.8	V
V_{BE}*	Base-Emitter Voltage	I_C = 10 mA V_{CE} = 5 V I_C = 2 A V_{CE} = 1 V		0.58	 1.5	V V
h_{FE}*	DC Current Gain	I_C = 10 mA V_{CE} = 5 V for **BD439/440** for **BD441/442** I_C = 500 mA V_{CE} = 1 V for **BD439/440** for **BD441/442** I_C = 2 A V_{CE} = 1 V for **BD439/440** for **BD441/442**	 20 15 40 40 25 15	 130 130 140 140		
h_{FE1}/h_{FE2}*	Matched Pair	I_C = 500 mA V_{CE} = 1 V			1.4	
f_T	Transition frequency	I_C = 250 mA V_{CE} = 1 V	3			MHz

* Pulsed: Pulse duration = 300 ms, duty cycle 1.5 %

SOT-32 (TO-126) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.445
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.040		0.106
c1	1.0		1.3	0.039		0.050
D	15.4		16.0	0.606		0.629
e		2.2			0.087	
e3	4.15		4.65	0.163		0.183
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100