

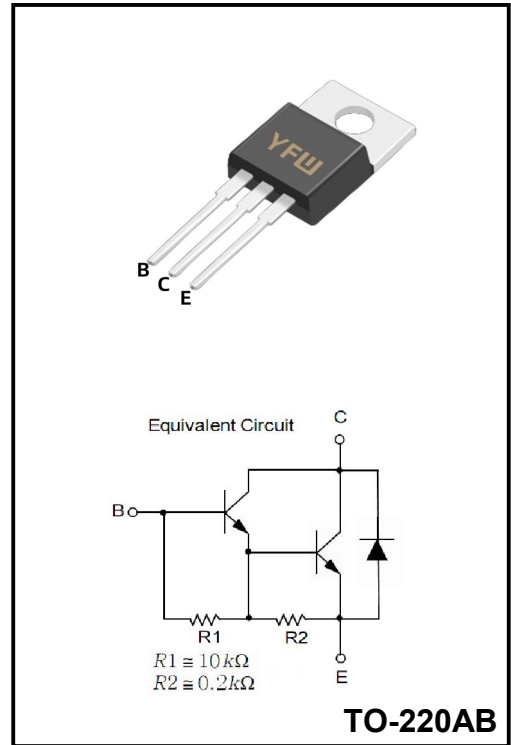
NPN Plastic-Encapsulate Transistors

Description

BD649 are NPN silicon power darlington transistors with diode and resistors in a TO- 220 AB plastic package. The collectors of the two transistors are electrically connected to the metallic mounting area. These darlington transistors for AF applications are outstanding for particularly high current gain. Together with BD650, they are particularly suitable for use as complementary AF push-pull output stages

Features

- ◆62.5 W at 25°C Case Temperature
- ◆8 A Continuous Collector Current
- ◆Minimum hFE of 750 at 3 V, 3 A
- ◆Low collector-emitter saturation voltage
- ◆Complementary to BD650



Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Value	Unit
Collector-Base Voltage		BV_{CBO}	100	V
Collector-Emitter Voltage		BV_{CEO}	100	V
Emitter-Base Voltage		BV_{EBO}	5	V
Collector Current (DC)		I_C	8	A
Collector Current (Pulse)		I_{CP}	12	A
Base Current		I_B	150	mA
Collector Dissipation	Ta =25 °C	P_C	2	W
	Tc =25 °C		62.5	
Junction Temperature		T_j	150	°C
Storage Temperature		T_{stg}	-55~150	°C
Thermal Resistance junction to case		$R_{\theta JC}$	2	°C/W
Thermal Resistance junction to Ambient		$R_{\theta JA}$	80	°C/W

Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	BV_{CBO}	$I_C = 5mA, I_E = 0$	100			V
Collector-emitter breakdown voltage	BV_{CEO}	$I_C = 100mA, I_B = 0$	100			V
Emitter-base breakdown voltage	BV_{EBO}	$I_E = 2mA, I_C = 0$	5			V
Collector cut-off current	I_{CBO}	$V_{CB} = 100V, I_E = 0$			0.2	mA
Collector cut-off current	I_{CEO}	$V_{CE} = 50V, I_E = 0$			0.5	mA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			2	mA
DC current gain*	h_{FE}	$V_{CE} = 3V, I_C = 0.5A$ $V_{CE} = 3V, I_C = 3A$ $V_{CE} = 3V, I_C = 6A$	1500 750 750			
Collector-emitter saturation voltage*	$V_{CE(sat)}$	$I_C = 3A, I_B = 12mA$			2.0	V
Base-Emitter ON Voltage*	$V_{BE(on)}$	$V_{CE} = 3V, I_C = 3A$			2.5	V
Protective diode	V_F	$I_F = 3A$			1.8	V

* Pulse Test : $PW \leq 300\mu s$, Duty cycle $\leq 2\%$

Typical Characteristics

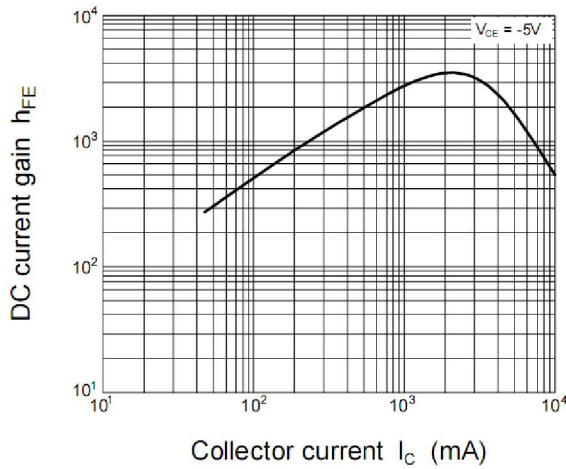


Figure 1. DC current Gain

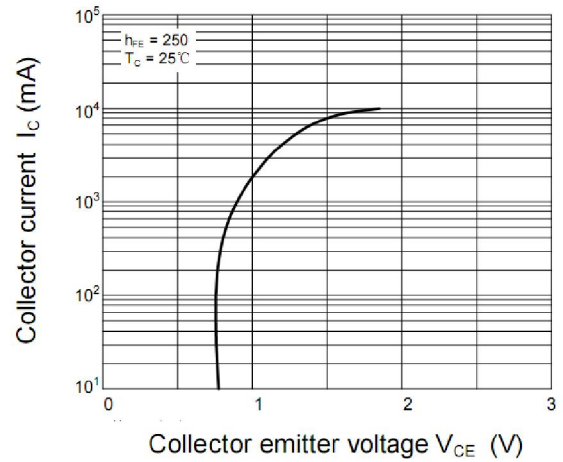


Figure 2. Collector-Emitter Voltage vs Collector current

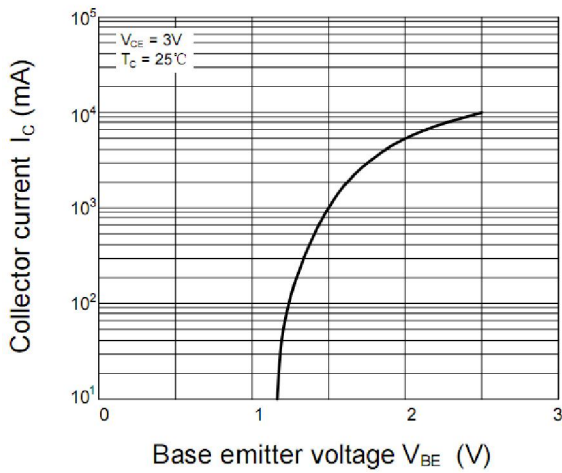


Figure 3. Collector current vs base-emitter Voltage

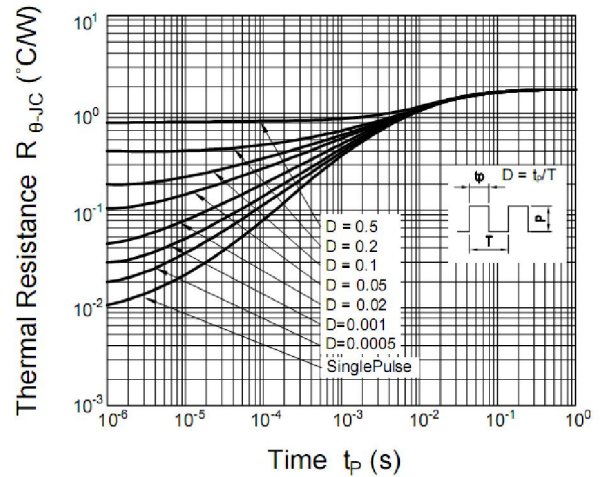


Figure 4. ransient thermal impedance junction to case at various duty cycles

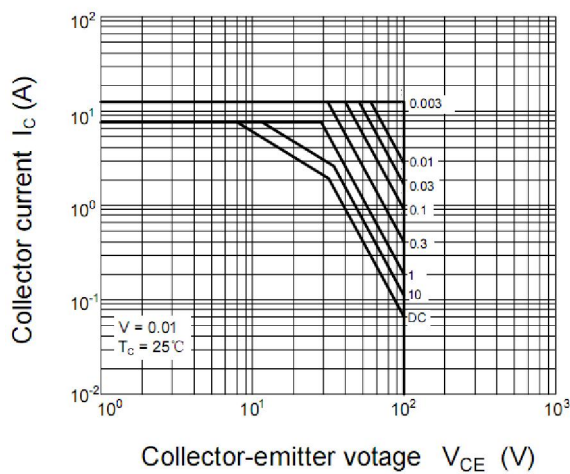


Figure 5. Safe Operating Area

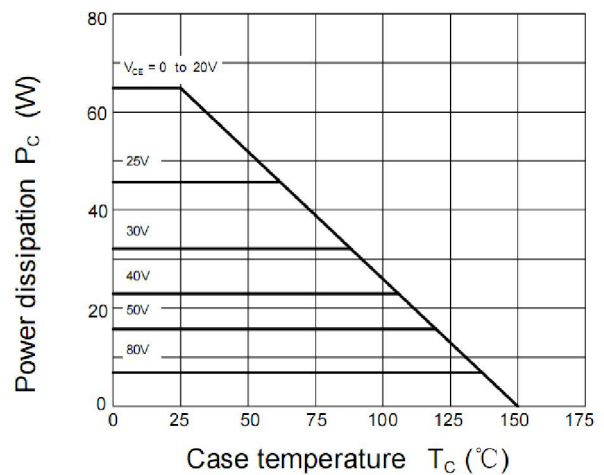
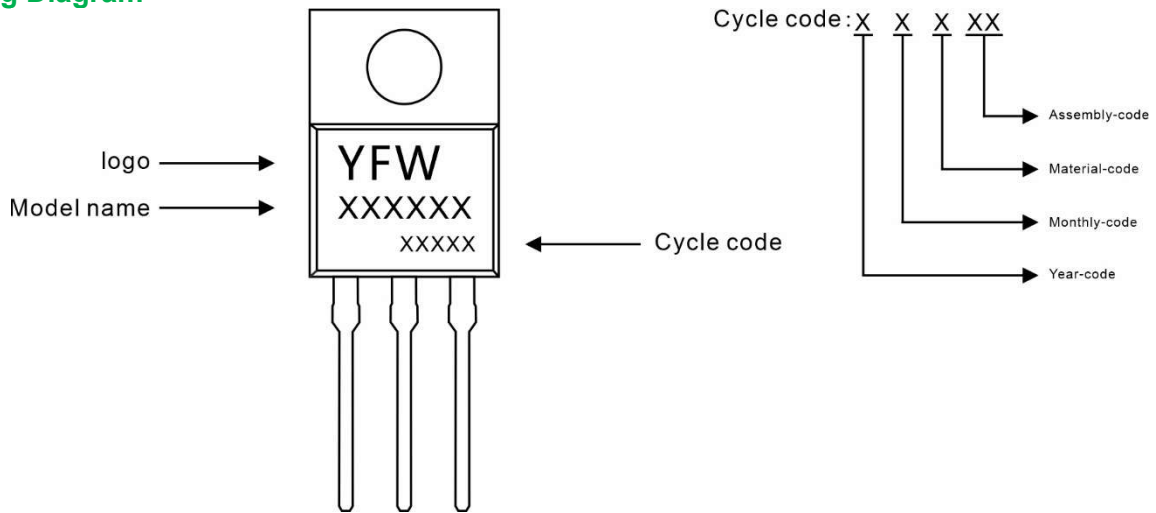


Figure 6. Power Derating

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
BD649	TO-220AB	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220AB

Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156

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