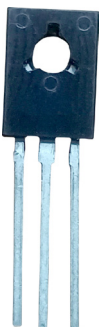


Single Bipolar Transistor multicomp^{PRO}



RoHS
Compliant

Applications

- Intended for use in Medium Power Linear and Switching Applications

Absolute Maximum Ratings (Ta = 25°C Unless otherwise specified)

Parameter	Symbol	BD440	BD442	Unit
Collector Base Voltage	V _{CBO}	60	80	V
Collector Emitter Voltage	V _{CES}			
Collector Emitter Voltage	V _{CEO}			
Emitter Base Voltage	V _{EBO}	5		
Collector Current	I _C	4		A
Collector Peak Current (t=10ms)	I _{CM}	7		
Base Current	I _B	1		
Total Dissipation @ T _C =25°C	P _{TOT}	36		W
Derate above 25°C	P _D	10		mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +150		°C

Thermal Resistance

Description	Symbol	Value	Unit
Junction to Case	R _{θ(j-c)}	3.5	°C/W
Junction to Ambient in free air	R _{θ(j-a)}	100	

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Electrical Characteristics at (Ta = 25°C Unless otherwise specified)

Parameter	Symbol	Test Condition	Min./Min	BD440	BD442	Unit
Collector Cut off Current	I _{CBO}	V _{CB} =Rated, V _{CBO} , I _E =0	Max	100		μA
Collector Cut off Current	I _{CES}	V _{BE} =0, V _{CE} =Rated V _{CES}		100		
Emitter Cut off Current	I _{EBO}	V _{EB} =5V, I _C =0		1		mA
Collector Emitter Sustaining Voltage	V _{CEO(SUS)} ¹	I _C =100mA, I _B =0	Min	60	80	V
Collector Emitter Saturation Voltage	V _{CE (sat)} ¹	I _C =2.0A, I _B =0.2A	Max	0.8		
Base Emitter On Voltage	V _{BE (on)} ¹	I _C =10mA, V _{CE} =5V		(typ) 0.58		
		I _C =2.0A, V _{CE} =1V	Max	1.5		
DC Current Gain	h _{FE} ¹	I _C =10mA, V _{CE} =5V	Min	20	15	
		I _C =500mA, V _{CE} =1V		40		
		I _C =2.0A, V _{CE} =1V		25	15	
h _{FE1} ¹ / h _{FE2}	Matched Pairs	I _C =500mA, V _{CE} =1V	Max	1.4		
Current Gain Bandwidth Product	f _T	I _C =250mA, V _{CE} =1V	Min	3		MHz

Note:

1. Pulsed Pulse Duration=300 μs , Duty Cycle=1.5%

Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

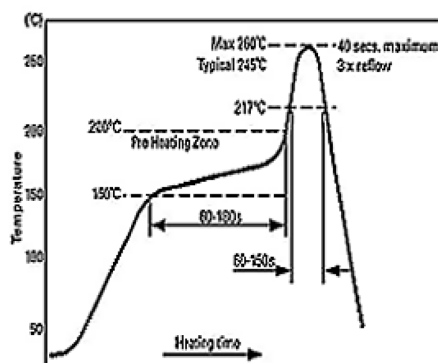
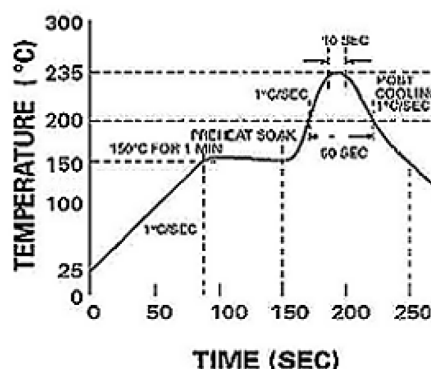


Figure 2



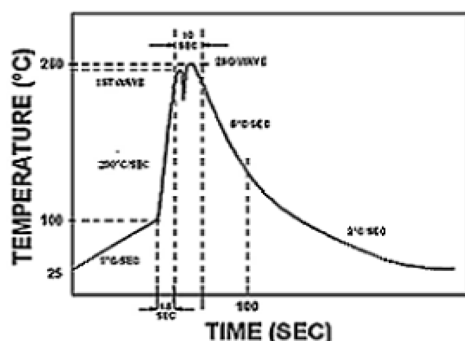
Single Bipolar Transistor multicomp^{PRO}

Reflow profiles in tabular form

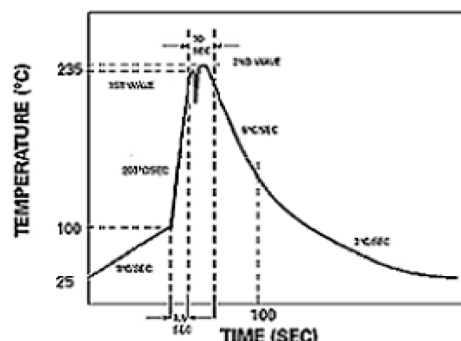
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	150-170°C 60-180 seconds	150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	200°C 30-50 seconds	217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



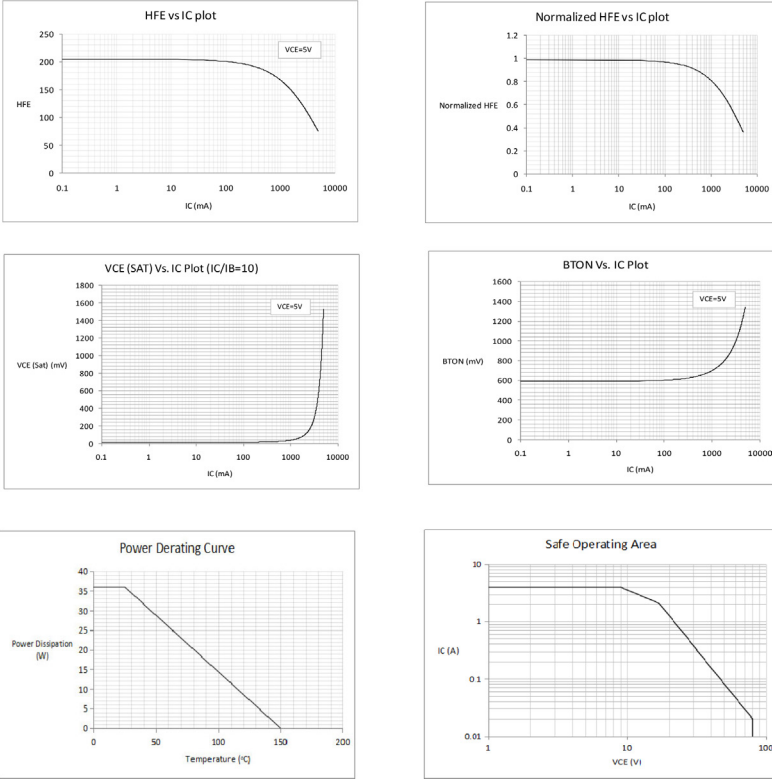
Wave Profiles in Tabular Form

Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	Typical 1-2, Max 4°C/Sec
Final preheat Temperature	Within 125°C of Solder Temp	Within 125°C of Solder Temp
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max.

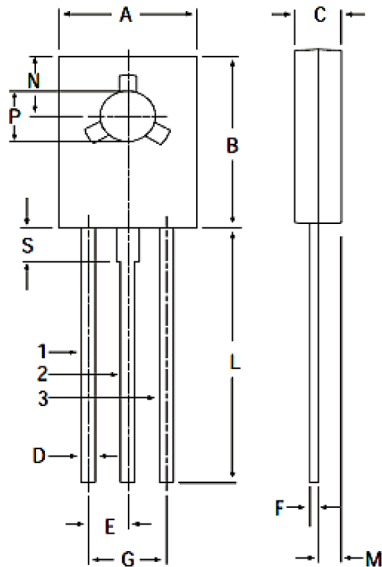
Dimensions : Millimetres

Single Bipolar Transistor multcompPRO

Typical Characteristics Curves



TO-18 Leaded Plastic Package

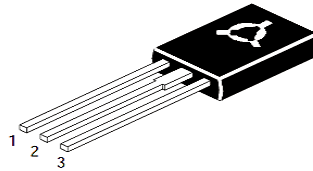


DIM	MIN	MAX
A	7.4	7.8
B	10.5	10.8
C	2.4	2.7
D	0.7	0.9
E	2.25 TYP.	
F	0.49	0.75
G	4.5 TYP.	
L	15.7 TYP.	
M	1.27 TYP.	
N	3.75 TYP.	
P	3	3.2
S	2.5 TYP.	

Single Bipolar Transistor multicomp^{PRO}

PIN CONFIGURATION

1. EMITTER
2. COLLECTOR
3. BASE



Part Number Table

Description	Part Number
Single Bipolar Transistor, PNP, 60V, 4000mA, 36W, TO-126	BD440
Single Bipolar Transistor, PNP, 80V, 4000mA, 36W, TO-126	BD442

Dimensions : Millimetres

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