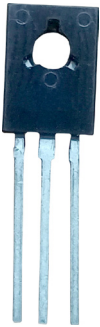


Single Bipolar Transistor multicomp^{PRO}

RoHS
Compliant



Description

Designed for use as Audio Amplifier and Drivers Utilizing

Applications

- Driver stages in hi-fi amplifier and television circuit.

Features

- This product is available in AEC-Q101 Qualified and PPAP Capable also.

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

Parameter	Symbol	BD137/BD138	BD139/BD140	Unit
Collector -Emitter Voltage	V _{CEO}	60	80	V
Collector -Emitter Voltage (R _{BE} =1kW)	V _{CER}		100	
Collector -Base Voltage	V _{CBO}			
Emitter Base Voltage	V _{EBO}	5		
Collector Current	I _C	1.5		A
Collector Peak Current	I _{CM}	2		
Base Current	I _B	0.5		
Power Dissipation @ Ta=25°C	P _D	1.25		W
Derate above 25°C		10		mW/°C
Power Dissipation @ Tc=25°C		12.5		W
Derate above 25°C		100		mW/°C
Power Dissipation @ Tc=70°C		8		W
Operating And Storage Junction Temperature Range	T _J , T _{STG}	-55 to +150		°C
Junction to Ambient in free air	R _{th(j-a)}	100		°C/W
Junction to Case	R _{th(j-c)}	10		

Newark.com/multicomp-pro
Farnell.com/multicomp-pro
sg.element14.com/b/multicomp-pro

multicomp^{PRO}

Single Bipolar Transistor **multicomp**PRO

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Collector Emitter Sustaining Voltage	$V_{CE0(sus)1}$	$I_C=30mA, I_B=0$ BD137/BD138	40	--	--	V	
		BD139/BD140	60	--	--		
Collector Cut off Current	I_{CBO}	$V_{CB}=30V,$	--	--	0.1	V	
		$V_{CB}=30V, I_E=0, T_C=125^\circ C$	--	--	10	μA	
Emitter Cut off Current	I_{EBO}	$V_{EB}=5V, I_C=0$	--	--	10	μA	
DC Current Gain	h_{FE}^1	$I_C=0.005A, V_{CE}=2V$	25	--	--	μA	
		$I_C=0.15A, V_{CE}=2V$	40	--	250		
		$I_C=0.5A, V_{CE}=2V$	25	--	--		
DC Current Gain		$I_C=0.15A, V_{CE}=2V$	-6	40	--	100	
			-10	63	--	160	
			-16	100	--	250	
			-25	160	--	400	
Collector Emitter Saturation Voltage		$I_C=0.5A, I_B=0.05A$	--	--	0.5	V	
Base Emitter On Voltage		$I_C=0.5A, V_{CE}=2V$	--	--	1.0	V	

Note:

1. Pulse test:- Pulse width=300 μs , duty cycle=2%
2. For PNP devices voltage and current values will be negative (-)

Typical Characteristics Curves

Fig 1: DC current Gain

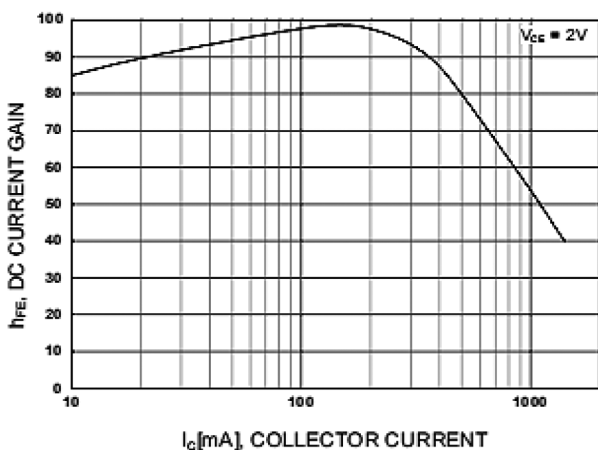
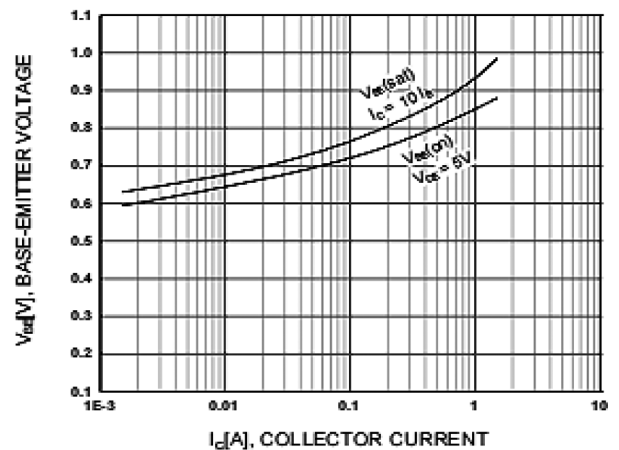


Fig 2: Base-Emitter Voltage



Single Bipolar Transistor **multicomp**PRO

Fig 3: . Power Derating

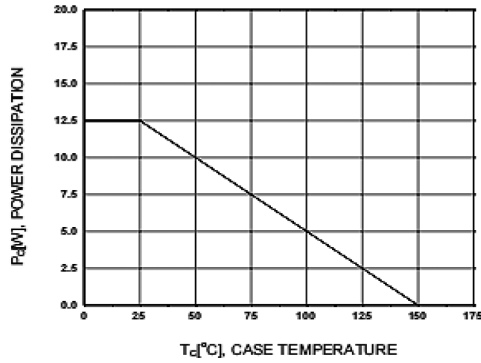


Fig 4: Collector-Emitter Saturation Voltage

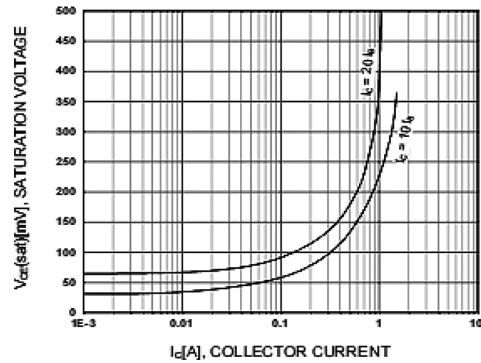
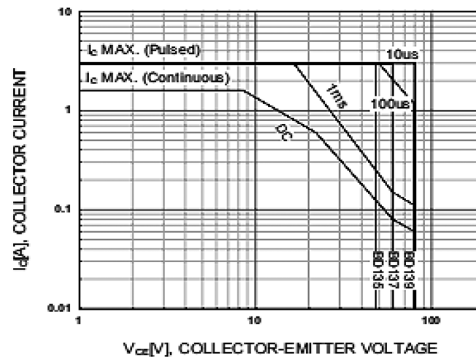
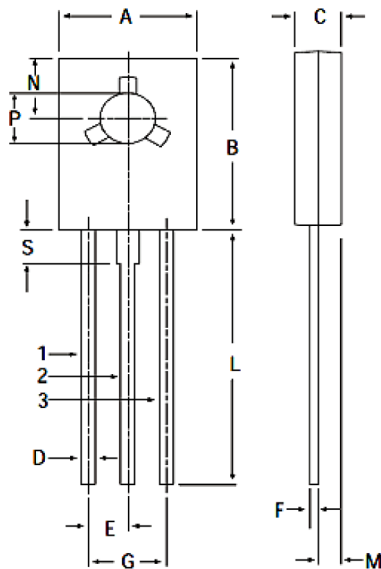


Fig 5: Safe Operating Area



TO-18 Leadless Plastic Package



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

Dimensions : Millimetres

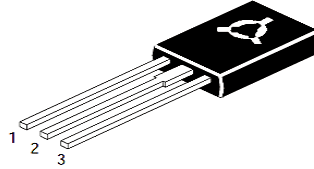
Newark.com/multicomp-pro
 Farnell.com/multicomp-pro
 sg.element14.com/b/multicomp-pro

multicompPRO

Single Bipolar Transistor multicomp^{PRO}

PIN CONFIGURATION

1. EMITTER
2. COLLECTOR
3. BASE



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

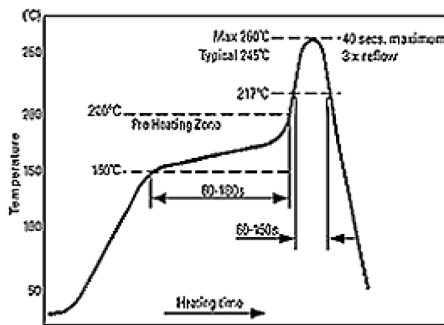
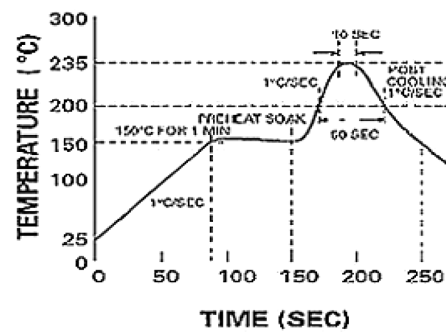


Figure 2



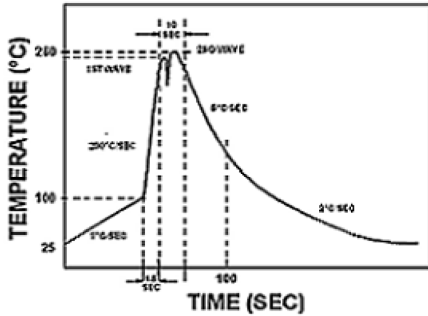
Reflow profiles in tabular form

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.

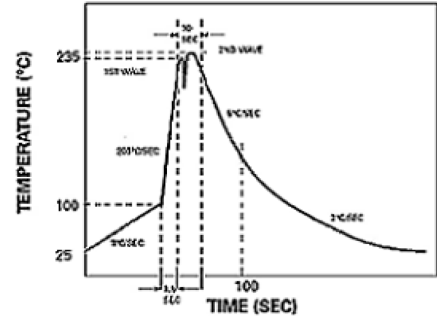
Single Bipolar Transistor **multicomp**PRO

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.

Part Number Table

Description	Part Number
Single Bipolar Transistor, NPN, 60V, 1500mA, 12.5W, TO-126	BD137
Single Bipolar Transistor, NPN, 60V, 1500mA, 12.5W, 10A DC, TO-126	BD137-10
Single Bipolar Transistor, NPN, 60V, 1500mA, 12.5W, 16A DC, TO-126	BD137-16
Single Bipolar Transistor, PNP, 60V, 1500mA, 12.5W, TO-126	BD138
Single Bipolar Transistor, PNP, 60V, 1500mA, 12.5W, 10A DC, TO-126	BD138-10
Single Bipolar Transistor, PNP, 60V, 1500mA, 12.5W, 16A DC, TO-126	BD138-16
Single Bipolar Transistor, NPN, 80V, 1500mA, 12.5W TO-126	BD139
Single Bipolar Transistor, NPN, 80V, 1500mA, 12.5W, 16A DC, TO-126	BD139-16
Single Bipolar Transistor, PNP, 80V, 1500mA, 12.5W, 16A DC, TO-126	BD140-16
Single Bipolar Transistor, PNP, 80V, 1500mA, 12.5W, 25A DC, TO-126	BD140-25

Dimensions : Millimetres

Important Notice : This data sheet and its contents (the "Information") belong to the members of the AVNET group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp Pro is the registered trademark of Premier Farnell Limited 2019.

Newark.com/multicomp-pro
Farnell.com/multicomp-pro
sg.element14.com/b/multicomp-pro

multicompPRO