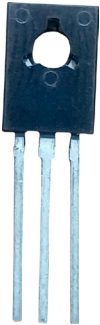


# Single Bipolar Transistor multicomp<sup>PRO</sup>

RoHS  
Compliant



## Application

- Audio frequency, High Frequency and Power Amplifier

## Features:

1. Complementary PNP Transistors CSA1220, CSA1220A
  2. This product is available in AEC-Q101 Compliant and PPAP Capable also.
- Note: For AEC-Q101 compliant products, please use suffix -AQ in the part number while ordering.

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

Parameter	Symbol	CSC 2690	CSC 2690A	Unit
Collector-base voltage (open emitter)	$V_{CBO}$	120	160	V
Collector-emitter voltage (open base)	$V_{CEO}$			
Emitter Base Voltage (open collector)	$V_{EBO}$	5		
Collector current (DC)	$I_C$	1.2		A
Collector Current (Pulse) <sup>1</sup>		2.5		
Base current (DC)	$I_B$	0.3		
Total power dissipation up to $T_A = 25^\circ\text{C}$	$P_{tot}$	1.2		W
Total power dissipation up to $T_C = 25^\circ\text{C}$		20		
Junction Temperature	$T_j$	150		°C
Storage temperature	$T_{stg}$	-65 to +150		

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

Parameter	Symbol	Test Condition	Min./Min	CSB649 CSD669	CSB649A	Unit
Collector Cut off Current	$I_{CBO}$	$I_E = 0; V_{CB} = 120V$	Max	1		$\mu\text{A}$
Emitter Cut off Current	$I_{EBO}$	$I_C = 0; V_{EB} = 3V$		1		
Breakdown voltages	$V_{CEO}$	$I_C = 1\text{mA}; I_B = 0$		120	160	V
	$V_{CBO}$	$I_C = 1\text{mA}; I_E = 0$				
	$V_{EBO}$	$I_E = 1\text{mA}; I_C = 0$				
Saturation voltage	$V_{CEsat}^1$	$I_C = 1A; I_B = 0.2A$		0.7		
Base-emitter voltage	$V_{BE(sat)}^1$		1.3			
DC Current Gain	$h_{FE}^1$	$I_C = 5\text{mA}, V_{CE} = 5V$	Min	35		
		$I_C = 0.3\text{mA}, V_{CE} = 5V^2$		60 ~ 320		
Output capacitance	$C_{ob}$	$V_{CB} = 10V, I_E = 0$	Typ	19		pF
Transition frequency	$f_T$	$I_C = 0.2A; V_{CE} = 5V$		155		MHz

Note:

1. Pulse test  $t_p \leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$

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

multicomp<sup>PRO</sup>

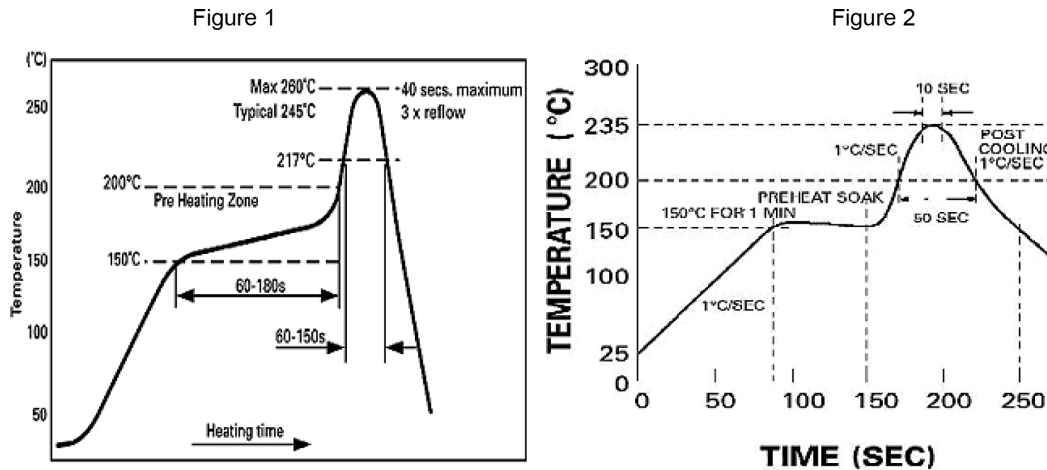
# Single Bipolar Transistor **multicomp**PRO

## 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.



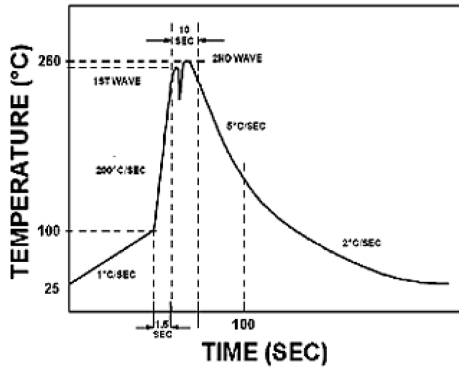
## Reflow profiles in tabular form

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.

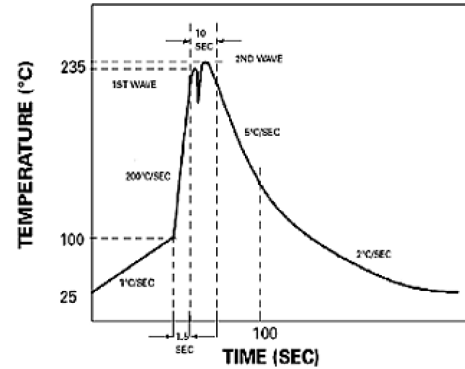
# Single Bipolar Transistor **multicomp**PRO

## 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.

## Typical Characteristics Curves

Fig. 1. Static Characteristic

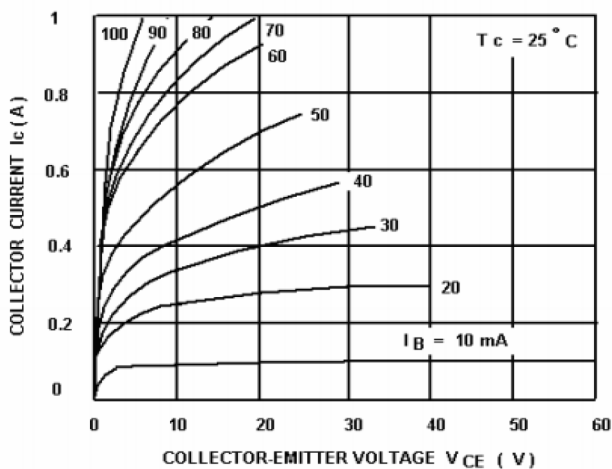
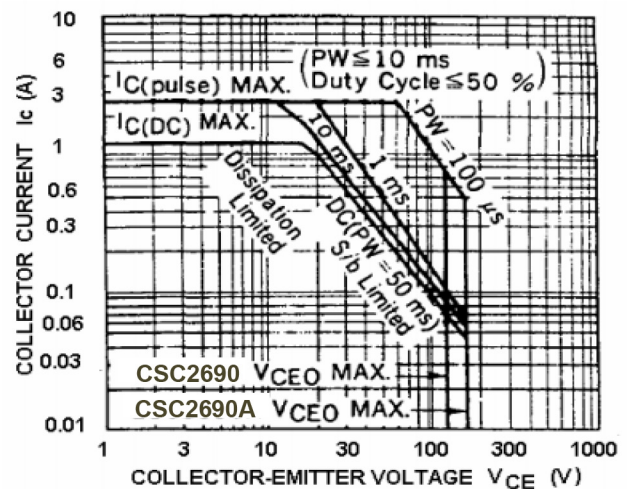


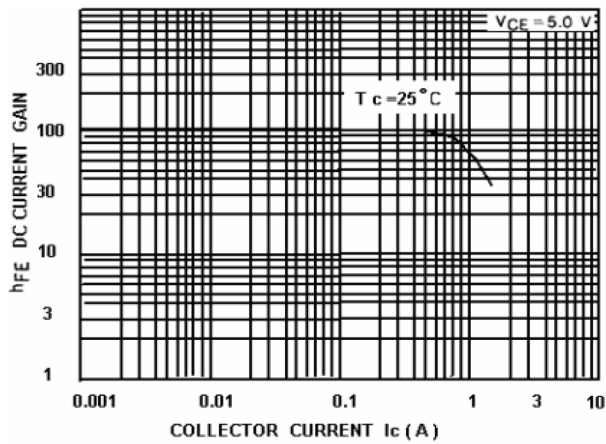
Fig. 2. Safe Operating Area



# Single Bipolar Transistor **multicomp**PRO

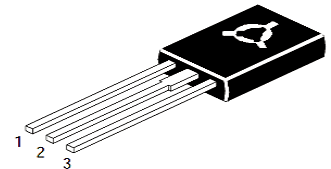
## Typical Characteristics Curves

Fig. 3. DC Current Gain

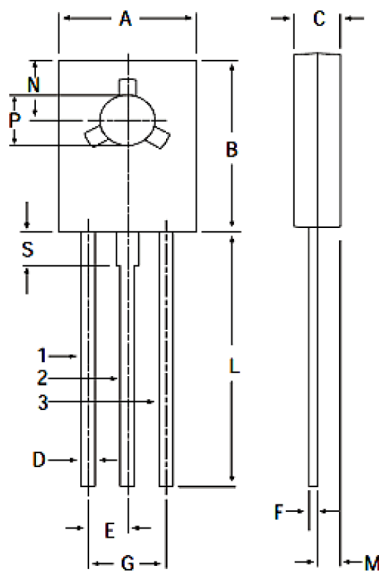


### PIN CONFIGURATION

1. EMITTER
2. COLLECTOR
3. BASE



### TO-126 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	
G	4.5 TYP.	
L	15.7 TYP.	
M	1.27 TYP.	
N	3.75 TYP.	
P	3	3.2
S	2.5 TYP.	

### Part Number Table

Description	Part Number
Single Bipolar Transistor, NPN, 120V, 1200mA, 20W, TO-126	CSC2690
Single Bipolar Transistor, NPN, 160V, 1200mA, 20W, TO-126	CSC2690A

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

**multicomp**PRO