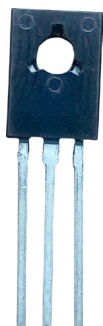


Single Bipolar Transistor multicomp^{PRO}



Application

- Audio frequency, High Frequency and Power Amplifier

RoHS
Compliant

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) ¹		2.5		
Base current (DC)	I _B	0.3		
Total power dissipation up to T _A = 25°C	P _{tot}	1.2		W
Total power dissipation up to T _C = 25°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		μA
Emitter Cut off Current	I _{EBO}	I _C = 0; V _{EB} = 3V		1		
Breakdown voltages	V _{CEO}	I _C = 1mA; I _B = 0		120	160	V
	V _{CBO}	I _C = 1mA; I _E = 0				
	V _{EBO}	I _E = 1mA; I _C = 0				
Saturation voltage	V _{CEsat} ¹	I _C = 1A; I _B = 0.2A		5		
Base-emitter voltage	V _{BE (sat)} ¹			0.7		
			1.3			
DC Current Gain	h _{FE} ¹	I _C =5mA, V _{CE} =5V	Min	35		
		I _C =0.3mA, 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 ≤ 300μs, Duty cycle ≤ 2%

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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

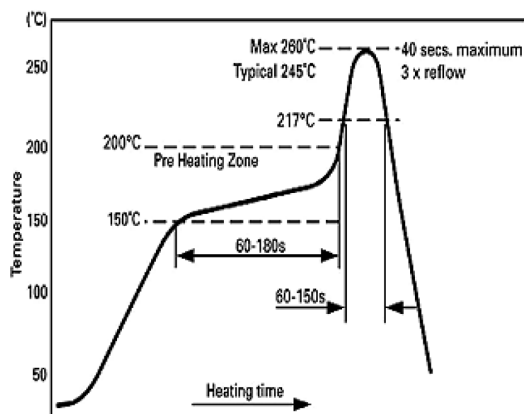
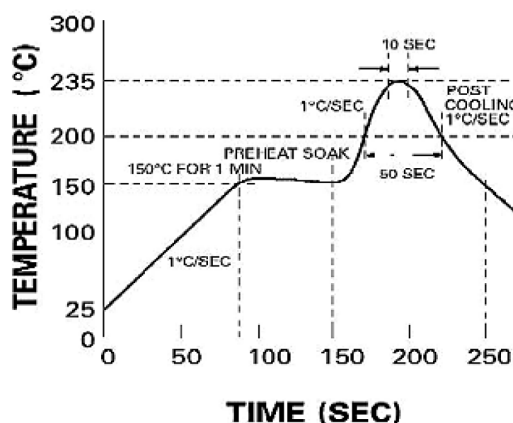


Figure 2



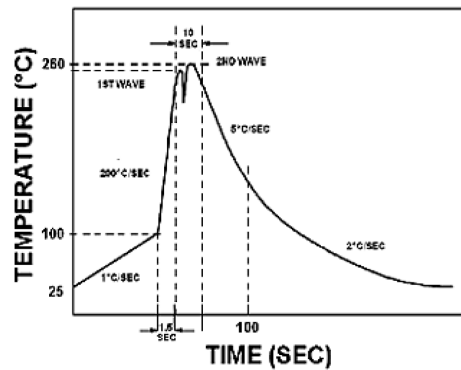
Reflow profiles in tabular form

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.

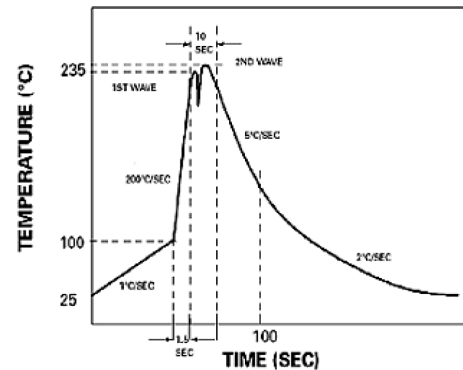
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Recommended Wave Solder Profiles

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

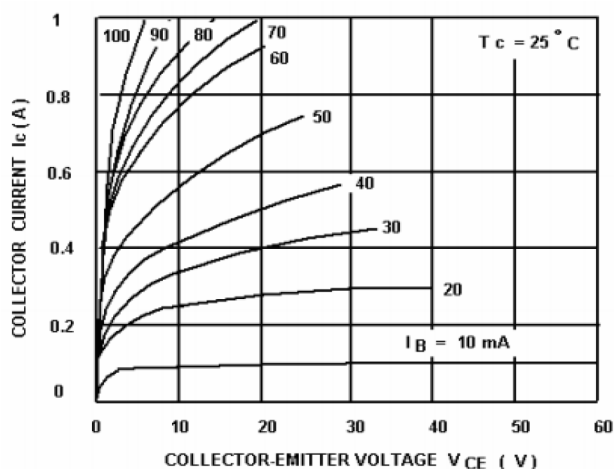
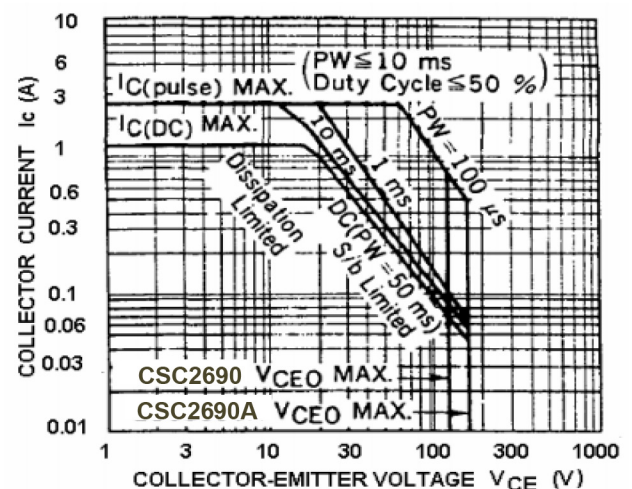


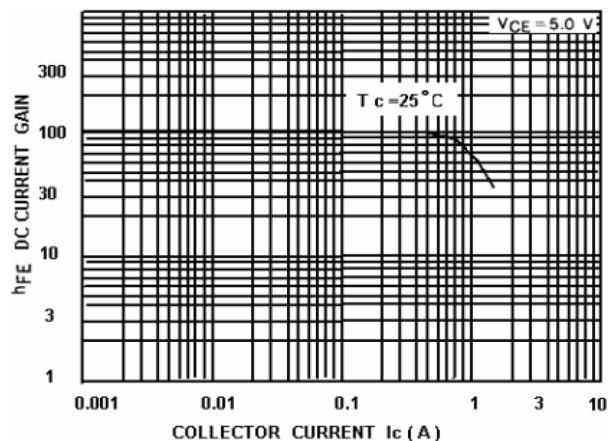
Fig. 2. Safe Operating Area



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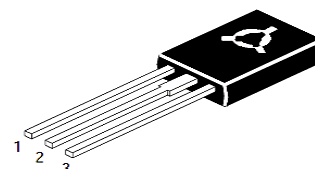
Typical Characteristics Curves

Fig. 3. DC Current Gain

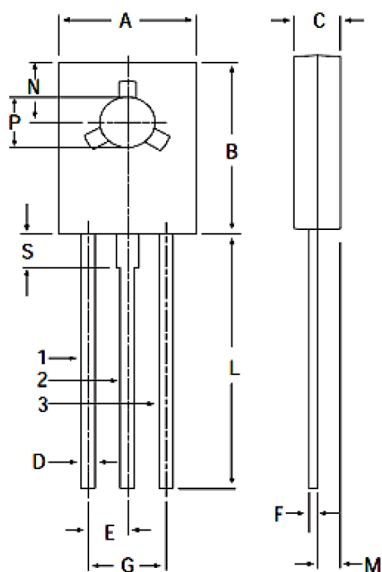


PIN CONFIGURATION

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

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