

Single Bipolar Transistor multicomp^{PRO}

RoHS
Compliant

Discription

- The CSD882 is NPN Silicone Transistor suited for the Output Stage of 3 watt audio amplifier, Voltage regulator, DC-DC converter and relay driver.

Features:

- Low Saturation Voltage:
 $V_{CE(sat)} \leq 0.5V$ (@ $I_C = 2A$, $I_B = 0.2A$)
- Excellent h_{FE} linearity and high h_{FE} .
 h_{FE} : 60 to 400 (@ $V_{CE} = 2V$, $I_C = 1A$)
- Less Cramping space required due to small and thick package and reducing the trouble for attachment to a radiator no insulator bushing required
- This product is available in AEC-Q101 Qualified and PPAP Capable also.
Note: For AEC-Q101 qualified products, please use suffix -AQ in the part number while ordering.



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

Parameter	Symbol	Value	Unit	
Maximum Temperature storage Temperature	T_{stg}	-55 to +150	°C	
Maximum Temperature Junction Temperature	T_j	150		
Maximum Total power Dissipation	P_{tot}	$T_a = 25^\circ C$	1	W
		$T_c = 25^\circ C$	10	
Collector to Base Voltage	P_{tot}	40	V	
Collector to Emitter Voltage	V_{CEO}	30		
Emitter to Base Voltage	V_{EBO}	5		
Collector Current (DC)	$I_{C(DC)}$	3	A	
Collector Current (Pulse)	$I_{C(Pulse)}^1$	7		

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

Parameter	Symbol	Test Condition	Min.	TYP.	MAX.	Unit
DC Current Gain	$h_{FE 1}$	$V_{CE} = 2.0V$, $I_C = 20mA$ ²	30	150	--	
DC Current Gain	$h_{FE 2}$	$V_{CE} = 2.0V$, $I_C = 1.0A$ ²	60	160	400	
Gain Bandwidth Product	f_T	$V_{CE} = 5.0V$, $I_C = 0.1A$	--	90	--	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10V$, $I_E = 0$, $f = MHz$		45		pF
Collector Cutoff Current	I_{CBO}	$V_{CB} = 30V$, $I_E = 0$,	--	--	1	µA
Emitter Cutoff Current	I_{CBO}	$V_{EB} = 3.0V$, $I_C = 0$				
Collector Saturation Voltage	$V_{CE(sat)}$	$I_C = 2.0A$, $I_B = 0.2A$ ²	0.3	--	0.5	V
Base Saturation Voltage	$V_{BE(sat)}$	$I_C = 2.0A$, $I_B = 0.2A$ ²	1		2	

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Classification of h_{FE}

Rank	R	Q	P	E
Range	60 to 120	100 to 200	160 to 320	200 to 400

Test Conditions: $V_{CE} = 2.0V$, $I_C = 1.0A$

Note:

1. Pulse test: $PW \leq 300\mu s$, duty cycle=2%
2. Pulse test: $PW \leq 350\mu s$, duty cycle=2%

Typical Characteristics Curves

Fig 1: Total Power Dissipation vs Ambient Temp

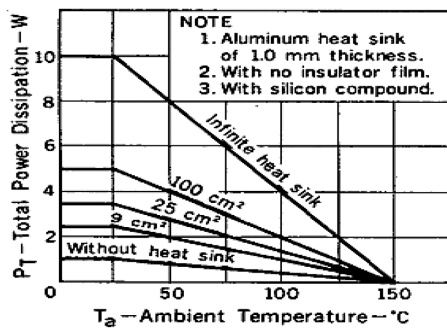


Fig 2: Thermal Resistance vs Pulse Width

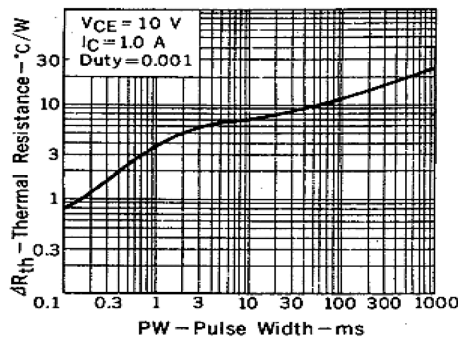


Fig 3: Collector Current vs Collector to Emitter Voltage

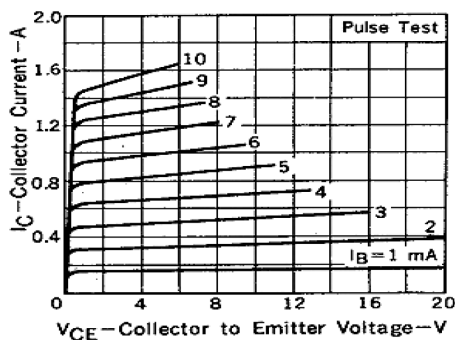


Fig 4: Derating Curves for all types

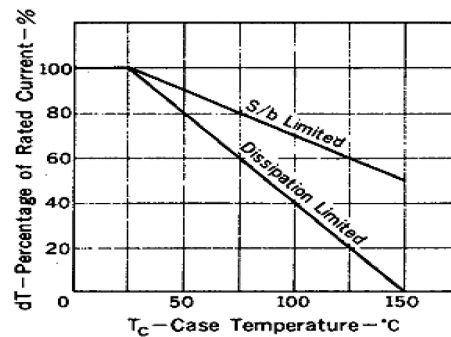


Fig 5: Safe Operating Areas

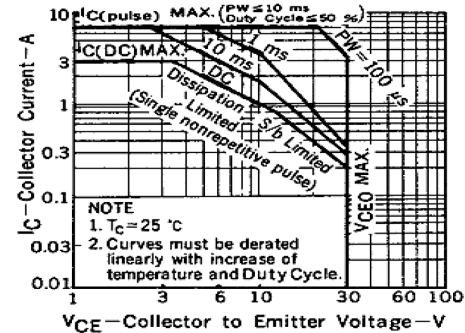
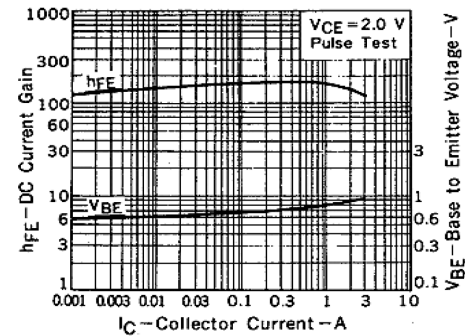


Fig 6: DC Current Gain vs Collector Current



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Fig 7: Base & Collector Saturation Voltage vs Collector Current

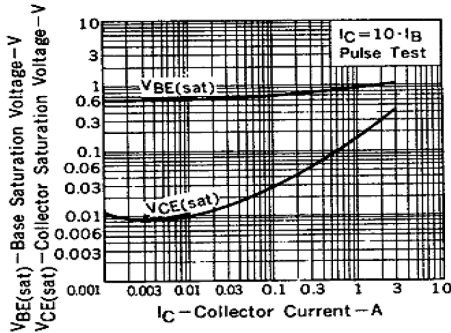


Fig 9: Gain Bandwidth Product vs Collector Current

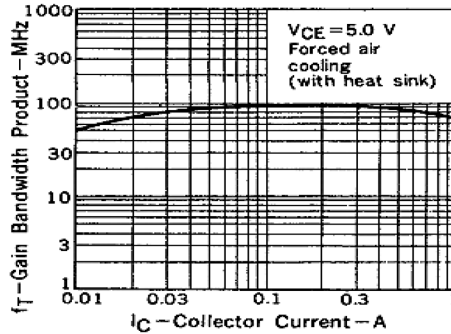
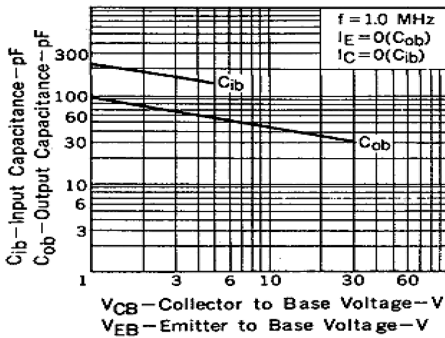
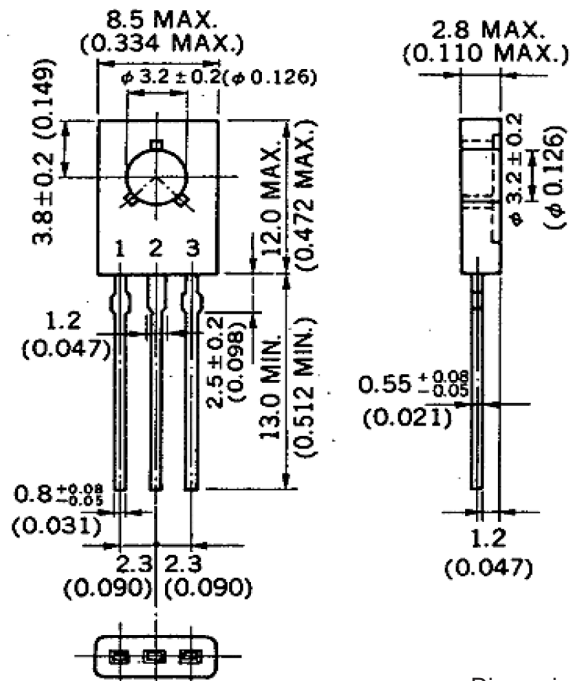


Fig 8: Input & Output Capacitance vs Reverse Voltage



TO-18 Leaded Plastic Package



PIN CONFIGURATION

- 1. Emitter
- 2. Collector
- 3. Base

Dimensions : Millimetres

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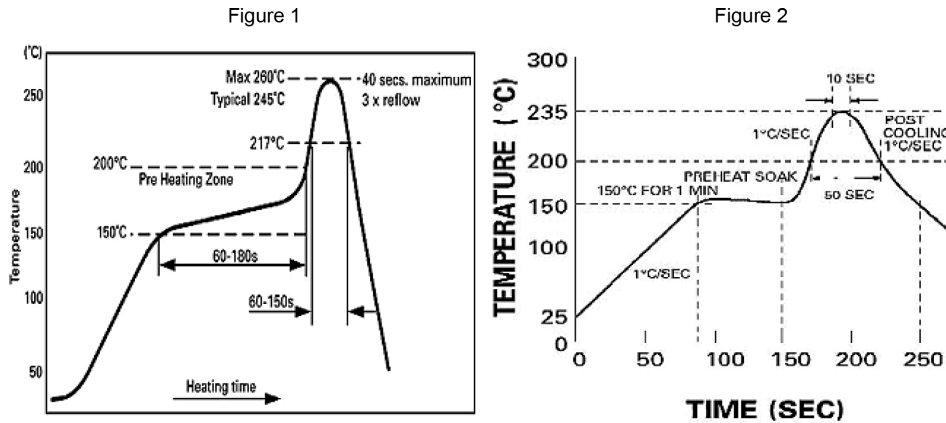
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Recommended Reflow Solder Profiles

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.



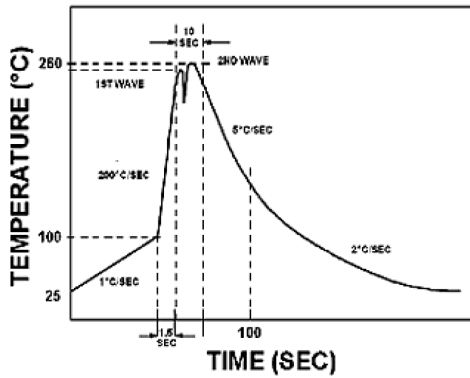
Reflow profiles in tabular form

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.

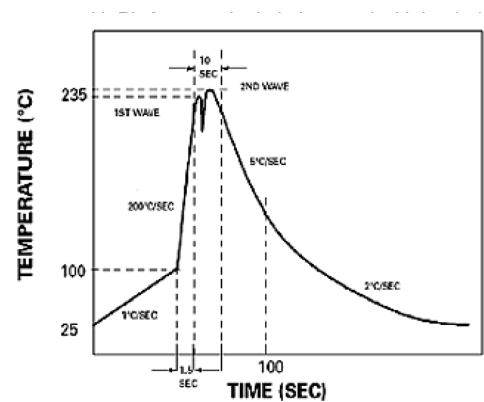
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Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free



The Recommended solder Profile For Devices



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, 30V, 3000mA, 10W, TO-126	CSD882

Dimensions : Millimetres

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