

**isc Silicon NPN Darlington Power Transistor**
**2SD1309**
**DESCRIPTION**

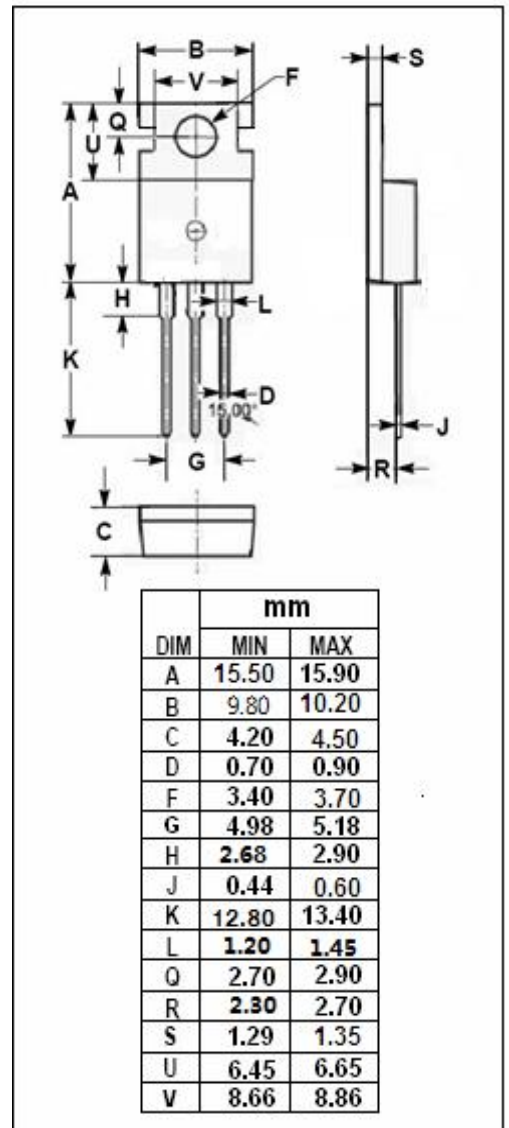
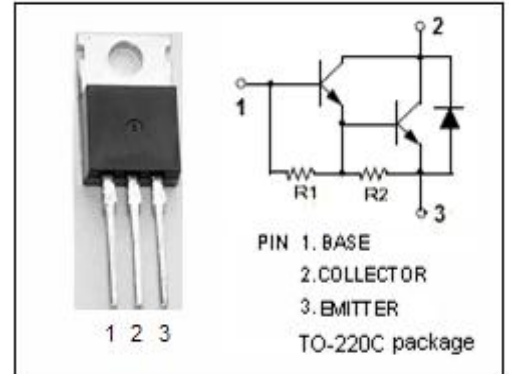
- High DC Current Gain  
:  $h_{FE} = 2000(\text{Min}) @ I_C = 3A$
- Collector-Emitter Sustaining Voltage-  
:  $V_{CEO(\text{SUS})} = 100V (\text{Min})$
- Low Collector-Emitter Saturation Voltage-  
:  $V_{CE(\text{sat})} = 1.5V (\text{Max}) @ I_C = 3A$
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

**APPLICATIONS**

- Designed for audio frequency amplifier and low-speed switching industrial use.

**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector-Base Voltage	150	V
$V_{CEO}$	Collector-Emitter Voltage	100	V
$V_{EBO}$	Emitter-Base Voltage	7	V
$I_C$	Collector Current	8	A
$I_{CM}$	Collector Current-peak	12	A
$I_B$	Base Current	0.8	A
$P_C$	Collector Power Dissipation @ $T_c = 25^\circ\text{C}$	40	W
	Collector Power Dissipation @ $T_a = 25^\circ\text{C}$	1.5	
$T_j$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-55~150	$^\circ\text{C}$



## isc Silicon NPN Darlington Power Transistor

2SD1309

## ELECTRICAL CHARACTERISTICS

T<sub>c</sub>=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>CEO(SUS)</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 30mA; I <sub>B</sub> = 0	100			V
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 3A; I <sub>B</sub> = 3mA			1.5	V
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 3A; I <sub>B</sub> = 3mA			2.0	V
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> = 100V; I <sub>E</sub> = 0			1.0	μ A
I <sub>EBO</sub>	Emitter Cutoff Current	V <sub>EB</sub> = 5V; I <sub>C</sub> = 0			5	mA
h <sub>FE-1</sub>	DC Current Gain	I <sub>C</sub> = 3A; V <sub>CE</sub> = 2V	2000		15000	
h <sub>FE-2</sub>	DC Current Gain	I <sub>C</sub> = 5A; V <sub>CE</sub> = 2V	500			
t <sub>on</sub>	Turn-on Time			1.0		μ s
t <sub>stg</sub>	Storage Time	I <sub>C</sub> = 3A, R <sub>L</sub> = 16.7 Ω, I <sub>B1</sub> = I <sub>B2</sub> = 3mA, V <sub>CC</sub> ≈ 50V		3.5		μ s
t <sub>f</sub>	Fall Time			1.2		μ s

◆ h<sub>FE-1</sub> Classifications

M	L	K
2000-5000	3000-7000	5000-15000

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